SOME EARLY PRODUCTS OF THE BRILL POTTERY, BUCKINGHAMSHIRE

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A small group of early Medieval Brill pottery of unusual fabric is described, and the writer comments, on the basis of experimental evidence, on the production of lead glazed, calcium carbonate gritted wares.

In July 1953 one of us (E. M. J.) excavated four medieval pottery kilns at Temple Farm, Brill, Buckinghamshire. Three of these kilns were superimposed, and the lowermost one was cut into an already existing waster dump [I], which in turn sealed an earlier waster heap containing sherds, clearly manufactured on the site, but distinct from all other known types of Brill pottery. Further examples of this type of pottery were recovered during the course of the 1978 excavations at Brill [2]. It is this distinct and – as will be seen – early type of Brill pottery which is discussed in this paper.

After all possible joins had been made between matching sherds 111 separate, non-joining pieces remained, representing at least 17 vessels with 10 different rim forms. Since many tens of thousands of medieval sherds were recovered, this group forms a very rare type of Brill pottery. All the vessels illustrated and described here are from the 1953 excavations; the vessels from the 1978 excavations are of the types shown in Figures 1.1 and 1.4.

Neutron Activation Analysis has been carried out on 13 of these sherds; this showed clearly that all the samples belonged to a consistent group, quite distinct from other forms of Brill pottery, both medieval and post-medieval, that have been examined [3]. Five of these same sherds have also been examined in thin section, and a number of others petrographically [4].

All the vessels appear to have been large storage/cooking pots, with everted rims and sagging bases. The internal base-angles had been strengthened by the addition of an applied strip; these strips were so carefully marvered in as to be barely visible, even in section. Only in the case of Fig. 1.12 was this reinforcing strip obvious, as it had partly broken away during firing. The vessels are all fairly straight sided with strong shoulders (see Fig. 2 for a suggested re-construction). The irregular wall thickness suggests that they were hand made, though perhaps finished on a turntable, particularly the rims, which show faint rilling.

The fabric (with one exception, not illustrated) is soft, easily scratched by a finger nail, and consists of a fine slightly sandy clay matrix containing many inclusions: rounded quartz grains, angular fragments of flint and chert, limestone fragments including ooliths, iron oxide particles and small water-worn pebbles, all of which can be seen with the naked eye. These inclusions are usually about 2.00 mm. in length, though they are occasionally as large as 5.00 mm. Most sherds contain all of these inclusions, though flint/chert and limestone are by far the commonest, and one of these two always predominates. However, since the relative proportions of these two fillers can reverse from one part of a sherd to another they must represent a variation within a single fabric, i.e. the clay was not homogeneous. Whether this is a result of natural variations in the clay or is due to the mixing of clays and/or fillers it is not possible to say. Even though the individual inclusion types are irregularly dispersed, the density of all inclusions is fairly uniform throughout the clay matrix; this leads to the conclusion

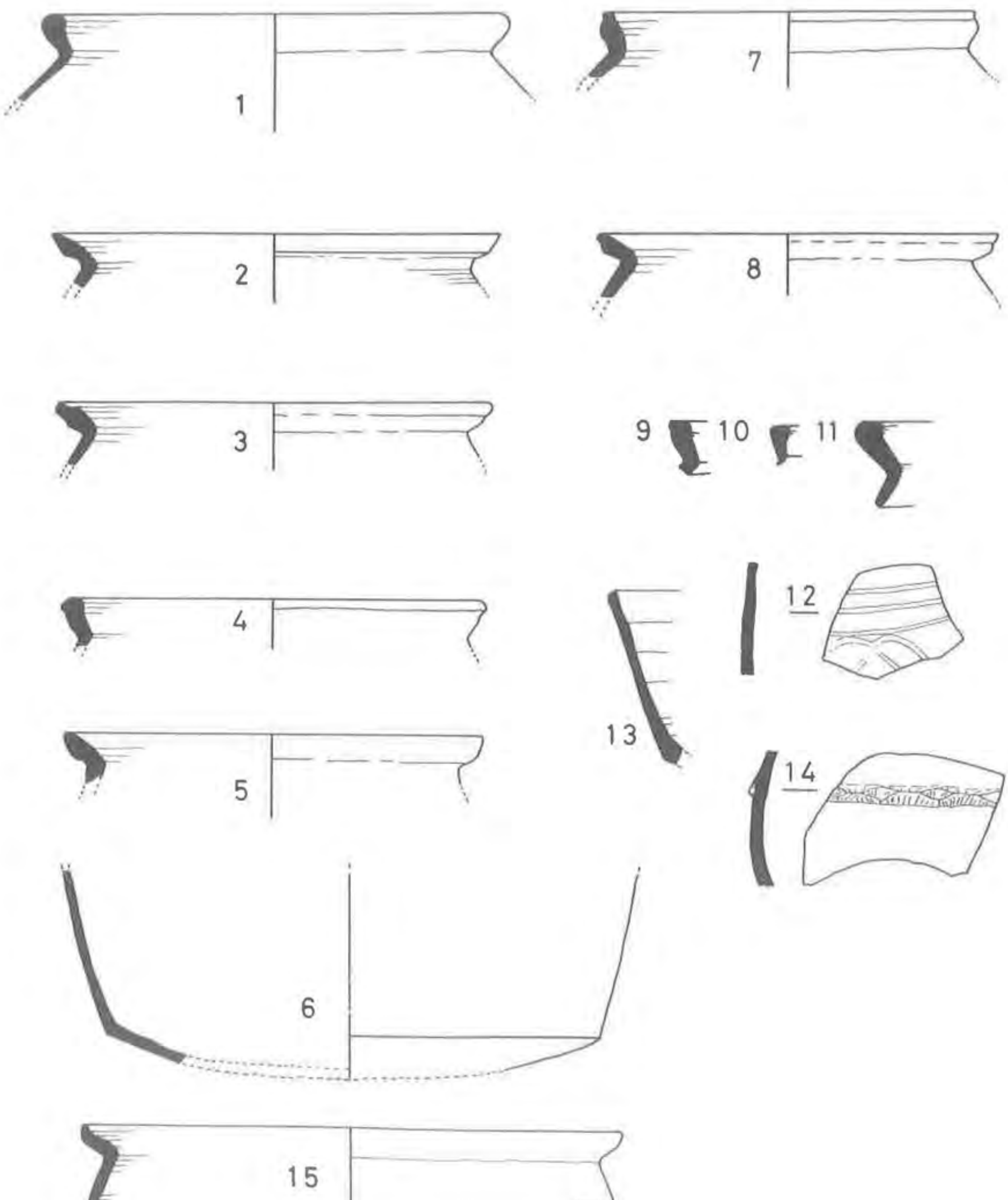

Fig. 1 Early Brill pottery (¼ scale).

that the potter was concerned with the inclusions in general – as a filler – rather than with the specific types of inclusion. In a number of sherds the calcium carbonate inclusions have been leached out, producing a corky appearance. All the pottery is of a buff or red to brick red colour throughout. Within this range the colour varies quite markedly, even within a single sherd, as a result of local conditions inside the kiln. Grey cores are rare, occurring only intermittently in the centre of the thickened rims.

This colour range indicates that the pottery was fired in neutral to oxidising conditions, at least during the latter stages of firing. One or two reduced sherds were found but this was probably the result of accidental secondary firing.

Of the 111 separate sherds, 89 are clearly wasters, and show evidence of fracturing, spalling and glaze failure. In fact all the certain wasters show evidence of some form of glaze fault. The glaze normally occurs on the interior of the vessel, and often runs over the inner surface of the rim.

Three types of glaze were noted:–

1 A matt, pale yellow wash.
2 A thin, patchy, yellow-green glaze.
3 A thick, dull, yellowish opaque glaze.

Refiring in a small electric test kiln to a temperature of 850° C. in an oxidising atmosphere had no apparent effect on glazes 1 and 2; however, glaze 3 was altered into a thick, glossy, translucent, yellow-green glaze.

On the basis of a series of experiments carried out on lead-based glazes it is suggested that glazes 1 and 2 had been applied too sparingly, i.e. there was not enough lead oxide present to combine with the silica in the clay to form a lead silicate. The successful refiring of glaze 3 suggests that this glaze was adequately prepared, but had not been fired to a high enough temperature. As a result of this underfiring free lead oxide/sulphide was left suspended in the partially formed glaze, and this accounts for its original dull opaque appearance [5].

The source of the lead used by medieval potters for their glazes has never been convincingly established; though it is generally asserted that lead sulphide in the form of powdered galena was used. However, the series of glaze experiments referred to above casts some doubt on this view. It proved impossible to produce any glaze from raw lead sulphide in an oxidising atmosphere, the lead sulphide merely turning into a white powder, probably lead sulphate. The explanation for this lies in the fact that the amount of oxygen involved in the reaction is critical; if there is too much then lead sulphate is formed. This compound is stable at temperatures well above those which could be achieved in a medieval pottery kiln. The following equations demonstrate this problem:–

$$2PbS + 3O_2 \longrightarrow 2PbO + 2SO_2$$

and

$$PbS + 2O_2 \longrightarrow PbSO_4$$

However, lead oxide in the form of lead monoxide (Pb0) proved to be a perfectly satisfactory raw material. It will be noted that if lead sulphide is heated with the correct amount of oxygen it first forms lead monoxide, which then combines with the silica in the clay body to form a complex lead silicate (i.e. a glaze). Lead monoxide can be prepared by heating metallic lead in air; it would therefore have been widely and easily available in the medieval period. On the other hand, galena would have to be imported from the limited areas in Britain in which it occurs. There is no evidence for such a trade, though there was of course extensive trade in metallic lead, for roofing etc. [6]. It is still possible that galena was used, as it certainly was in later times, particularly if the firings were under reducing conditions. Firing under reducing conditions would solve the problem of excess oxygen, but there is a risk of the glaze being reduced to metallic lead.

Some support for the view that lead monoxide was the normal compound used may be found in the results of a series of spectrographic analyses carried out on a group of medieval glazes very like the ones under discussion here [7]. The analysed glazes showed a high percentage of tin, (5 – 10%) and the suggestion was made that this was due to the derivation of the lead oxide-based glaze from pewter or solder.

Within a few days of the refiring experiments taking place the samples began to disintegrate; this was almost certainly due to the heating of the calcium carbonate inclusions. A series of experiments carried out by Yee indicate that pottery containing even quite small amounts of calcium carbonate cannot be heated above about 650° C. in an oxidising atmosphere [8]. This is because calcium dioxide disassociates from calcium carbonate on heating, and the resulting calcium oxide hydrates and expands on cooling, causing stresses which can fracture the pottery. The temperature at which carbon dioxide disassociates depends on the form of calcium carbonate involved (in the case of Calcite for example it is 610° C.).

Firing in a reducing atmosphere suppresses the disassociation of carbon dioxide and permits calcium carbonate to be fired to at least 1,000° C. [9].

In the case of lead-glazed wares a temperature of at least 800° C. is required to form a satisfactory glaze. Since in wares containing calcium carbonate this can only be achieved in reducing conditions, the risk of producing a reduced glaze or even metallic lead is high. The problems of balancing atmosphere and temperature may well explain the rarity of medieval lead-glazed, calcium carbonate gritted wares. Some medieval potters do seem to have solved the problem, for example, Lyveden Type B [10] but even here the odd reduced glaze occurs, e.g. Lyveden Type B No. 2.09 [11].

In the case of the pottery, described here which was fired in netrual-oxidising conditions, it would have been impossible to fire it to a sufficiently high temperature to form a glaze without the fabric disintegrating. It could not have been fired above 750° C. and probably to rather less than that. This suggested low-temperature firing is supported by the refiring experiments and by the presence of unaltered calcite in the examples examined in thin section.

Apart from the glaze, decoration is limited to two sherds with an applied, thumbed, horizontal cordon (Figure 1.14), one sherd with grooved decoration (Figure 1.12), and five body sherds with simple incised parallel lines.

No close parallels for this type of pottery have yet been found, and no similar wares are known from the Brill area. The rim forms bear a superficial resemblance to those of Lyveden B and C pans, but the fabric and overall vessel forms are rather different [12]. Better parallels occur in the West of England, e.g. Whittington Court shows similar forms and glazes though the fabric is different [13]. Selsey Common also shows similar forms and glazes but again the fabric is different [14]. West Woodhay has similar forms and a flint gritted fabric [15]. The closest parallel we have noted comes from Langdowne, Bath, and shows a generally similar form and fabric (see Figure 1.15).

This type of Brill pottery seems then to have general affinities with the West of England and with pottery styles conventionally dated to the thirteenth century. The possibility of a West Country potter moving into the Brill area must be considered as one explanation of this small and peculiar group. The absence of the type from medieval sites in the Brill area suggests that it was an experiment which was quickly abandoned in favour of more suitable clays and styles.

A date in the mid thirteenth century or slightly earlier seems likely for the group as a whole. The form, the fabric, and such

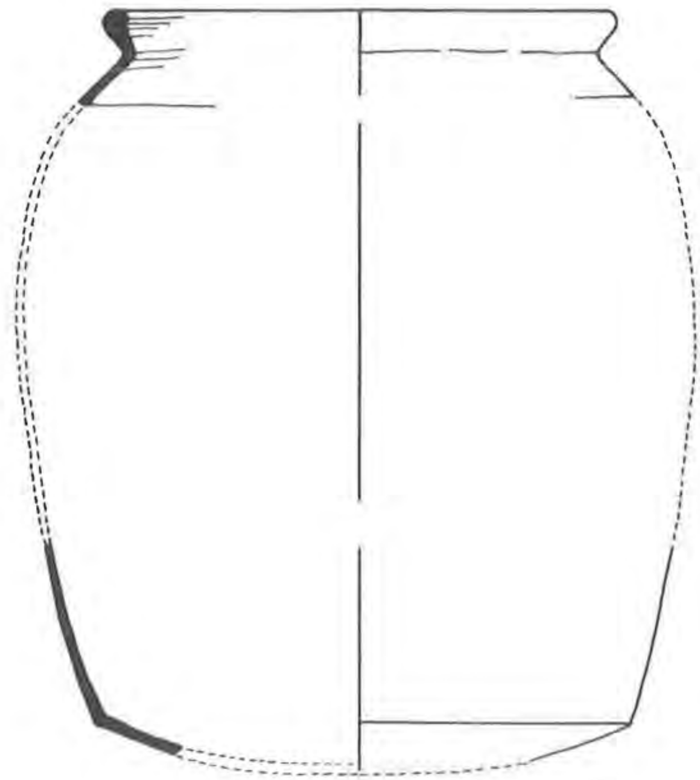

Fig. 2 Reconstruction of early Brill ware vessel (¼ scale)

stratigraphic evidence as is available suggest that this may be the earliest type of Brill pottery yet identified; examples were found in a deposit sealed beneath Kiln E, which has been archaeomagnetically dated to 1300 – 1350 [16].

Catalogue

All sherds are from cooking/storage vessels.

1) Rim: everted, thickened internally to form a slight flange; some external smoke blackening ; traces of glaze on the interior; entirely oxidised buff/red.
2) Rim: everted, thickened externally and poorly finished leaving a ragged join; traces of green glaze on interior; oxidised buff/red, intermittent grey core.
3) Rim: everted and thickened externally; better finished than 2); thin wash of glaze internally; fully oxidised buff/red.
4) Rim: everted and thickened to give slightly clubbed effect; unglazed; corky surface: oxidised buff/red.
5) Rim: everted, thickened externally and roughly smoothed into neck; slight trace of internal glaze; oxidised buff/red.
6) Base: sharp external angle, internally thickened with an applied strip; sagging base; some internal grooving suggests a wheel finish; externally smoke blackened; underfired internal glaze some of which had run into a fracture; oxidised buff.
7) Rim: everted; externally the top is pinched up to form a short collar, but is carefully smoothed into the internal curve; thin wash of glaze over the interior up to the top of the rim, and very slight traces on the exterior; fully oxidised buff/red.
8) Rim: everted, thickened externally and smoothed almost imperceptibly into the neck; unglazed: oxidised buff/red.
9) Rim sherd: diameter uncertain; everted and thickened producing slight clubbing; unglazed: oxidised buff/red.
10) Rim sherd: uncertain diameter; slightly everted and thickened internally; unglazed; corky surface; fully oxidised brick red.
11) Rim sherd: diameter uncertain; everted and thickened internally forming slight flange; unglazed; smoke blackened on both surfaces; corky surfaces; neutral-oxidised grey/buff.
12) Body sherd: internal pale yellow glaze wash; hand made, wheel finished; an attempt had been made to smooth the outer surface when the clay was evidently too dry; some crude incised decoration consisting of three shallow parallel grooves and a band in a figure of eight pattern had been added, also when the clay was very dry; oxidised, buff outer surfaces, brick red core.
13) Base: sharp external angle, internally thickened with applied strip, clearly visible where it had broken away during firing: internal grooving (wheel thrown or at least finished); internal pale yellow glaze wash: some external blackening; corky surface; at least five shallow grooves running horizontally round the vessel; fully oxidised brick red.
14) Body sherd, shoulder: internal patchy yellow-green wash of glaze; externally, at the point of maximum curvature, an applied, horizontal thumbed strip, the upper edge well smoothed into the body, the lower rather rough and ragged; fully oxidised brick red.
15) Rim: everted; heavily smoke blackened inside and out; unglazed; fabric very similar to 1 – 14 but appears to have been fired in reducing conditions, with a short final period of oxidisation; from Langdowne, Bath.

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