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A Prehistoric Jar from Bempton, North Yorkshire

Alan Vince and Peter Didsbury

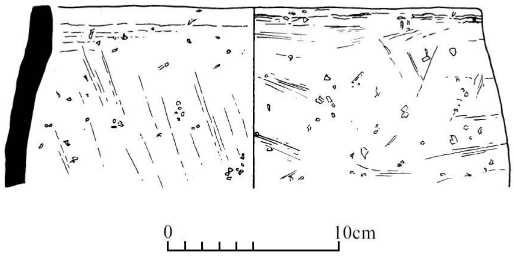

Figure 1 (Illustration by C Bentley)

An archaeological evaluation carried out by On-Site Archaeology at Bempton, North Yorkshire, produced evidence for Iron Age occupation which included several sherds making up the rim of a jar. An assessment of the finds by Alan Vince suggested that these sherds should be studied further because of their potential to provide information about the date of the occupation and the source of the pottery.

Typology by Peter Didsbury

The vessel is a hand-built jar of slack profile, with an upright flat-topped rim. The inner face of the rim is essentially vertical for *c*. 50mm, below which the interior profile displays a slight outward curvature. The vessel may be thought of as a slight barrel shape, modified by the addition of an upright rim.

Jars with flat-topped upright rims above relatively shapeless bodies, or ones having a slightly rounded shoulder, are common in mid to late Iron Age assemblages in eastern Yorkshire and over a wider area of northern and eastern England. Challis and Harding (1975, 96-97) describe the rim form as one of the commonest in 'Late La Tène' assemblages from the region. Among a number of examples illustrated by those authors, the two closest parallels for the vessel under discussion are: fig. 33, no. 2 (from Garton Slack) and fig. 49, no. 1 (from Levisham Moor, Enclosure 'A'). An example with a slightly more rounded shoulder (*op. cit.* fig. 39, no. 7) comes from Faxfleet 'A', a site conventionally dated to the first century B.C., and an example with the rim modified by finger-tipped decoration comes from a similarly late phase at Wharram Percy (Didsbury 2004, fig. 101, no. 5). Several comparable forms also occur at Creyke Beck, Cottingham (Didsbury forthcoming, perhaps particularly fig. 16, no. 10, and fig. 25, no. 182). The parallels quoted suggest that the form was current in the Arras Culture period and afterwards in East Yorkshire, apparently lasting at least into the first century B.C. A single earlier example, from Thrussington in Leicestershire, is attributed by Challis and Harding to the 'Middle La Tène' (*op. cit.* fig. 15, no. 15).

Petrological Analysis by Alan Vince

Description

The following inclusions were noted in the thin section:

- Biotite granite/gneiss. Moderate angular and subangular fragments of a coarse-grained rock composed of biotite sheaves, altered feldspar, perthite and quartz. Several of the quartz grains are strained and have an elongated outline, suggesting a degree of metamorphism. There is also some mosaic quartz crystals formed along altered feldspar/perthite boundaries. Most of the fragments have sharp edges but a few have the most extreme points slightly rounded. The fragments vary in size from c.0.3mm to over 6.0mm long. The fragments are traversed by brown staining, especially along crystal boundaries and in the altered feldspars.

- Dark brown clay pellets. Sparse rounded fragments with few inclusions, up to 0.3mm across.

- Rhombic voids. A few voids, up to 1.0mm long, were present, partially filled with unfired clay. They may have been calcite and are probably not plucked feldspar grains, which tend not to have such a stepped outline.

- Angular quartz. Moderate fragments c.0.05m to 0.15mm across. The larger grains show signs of rounding.

- Muscovite. Sparse laths up to 0.2mm long.

The groundmass consists of optically anisotropic baked clay minerals with few inclusions less than 0.1mm across.

Interpretation

A large amount of thin section analysis has taken place on prehistoric pottery in Yorkshire, notably that of Peter Wardle on earlier Bronze Age pottery (1991) and various members of the Department of Scientific Research at the British Museum for the later Bronze Age and Iron Age (Freestone and Middleton 1991;Freestone and Humphrey 1992). A major theme of this work is that glacial erratics were collected and used as a gravel to temper vessels. A feature of these Erratic Tempered Wares is that the main inclusions tend to be of one or two different lithologies indicating that one or two erratic pebbles were crushed (or more likely fire-cracked).

The thin section of this vessel is consistent with the ETW interpretation, except that when the inclusions are examined carefully it can be seen that there are few with acute-angled edges and some with definite rounding. Also, where deliberate erratic tempering was used the fragments tend to be more even in size and coarser in texture than the inclusions in this vessel. Visually, the texture of the fabric is similar to that of samples of naturally-occurring boulder clay.

Furthermore, the combination of a coarse sand/gravel composed of biotite granite and a finer quartz/muscovite sand/fine silt is found in the Anglo-Saxon pottery of Yorkshire and the north-east of England and in those cases is assumed to be derived from the use of boulder clay derived from Scandinavia, the Scottish border or the lake district, depending on the location of the parent clay. However, it has to be admitted that attempts to find and sample such clays by one of the authors (AV) have failed. Samples of boulder clay from Robin Hoods Bay, Mappleton, Filey and Easington indicate that clays deposited along the east coast tend to have mixed sand/gravel inclusions, some being angular and some rounded (and clearly derived from reworking of earlier riverine or marine deposits, similar in composition to the present-day beach). The erratic rocks in these samples tend to be fine-grained basic igneous rocks, of dolerite or basalt, although acid igneous rocks, metamorphic rocks and non-local sedimentary rock fragments also occur. Two samples of boulder clay from Pontefract contained only fragments of Carboniferous shales and mudstones, similar in character to the local solid geology. If boulder clays rich in biotite granite do occur naturally in Yorkshire, then they are clearly not ubiquitous. The distribution of Anglo-Saxon pottery in Yorkshire with these biotite granite inclusions also suggests that the main East Yorkshire boulder clay which outcrops from the south and east flanks of the Wolds to the coast and the Humber is not the source, since this fabric is uncommon there. It is also rare in the southern part of the Vale of York, in the southern part of the Wolds and in the Tees Valley. Instead, this biotite-rich fabric is most common on Anglo-Saxon sites in the vicinity of Catterick and in the northern part of the Yorkshire Wolds. In both areas, assemblages with up to a third of the pottery having this fabric are known. One interpretation of this data would be that biotite-rich boulder clays exist in the upper Vale of York and pots from that area were traded in the Anglo-Saxon period south-westwards along the Wolds. Another would be to question whether pockets of biotite-rich boulder clay existed somewhere in the Wolds themselves.

Chemical Analysis by Alan Vince

Methodology

A range of major and minor elements were measured using Inductively Coupled Plasma Spectroscopy (ICP-AES). The major elements were measured as percent oxides (App 1) and the minor elements as parts per million (App 2). Because of the dilution effect of quartz (silica is not measured), the values were divided by that of Aluminium oxide before analysis.

An estimate of the silica content was made by subtracting the sum of the oxides from 100%. For the Bempton sample, the estimated silica content is 76%. For comparison, boulder clay samples from Yorkshire taken by the author range from 61.5% to 83.3% estimated silica.

Comparison with boulder clays and pottery made from boulder clays

The normalised data were compared with a range of boulder clay samples, a daub sample and samples of Anglo-Saxon vessels with either biotite-granite or mixed erratic inclusions. On the basis of this analysis, undertaken using Factor Analysis on the transformed data, it was possible to clearly separate some of the samples from the Bempton sample and these were subsequently excluded from further analysis. They include samples of clay and pottery from the Holderness peninsula (Easington) and samples of pottery from Piercebridge and Catterick. The remaining samples include clay samples from Filey, Mappleton, Pontefract and Robin Hood's Bay; a daub sample from Wawne; a pot sample from the north-east of England (Binchester); pottery from two sites in the Tees valley (Hartlepool and Norton); pottery from three sites in the Vale of York (Ferrybridge, Scorton and West Lilling) and pottery from six sites on the Wolds or its fringes (Elmswell, Hayton, Rudston, Sancton, Sewerby, and West Heslerton).

Factor analysis of this data revealed five major factors, accounting in total for 57% of the variability in the dataset. Bi-plots of pairs of factors indicates that there is no difference between the pottery samples from the different regions but they can be distinguished from the boulder clay samples (none of which contain biotite-granite inclusions). Fig 2 shows the plot of F1 against F2 with the Bempton sample located in the centre of the cluster of pottery samples. Similar plots were examined for F3 against F4 and F3 against F5. No apparent patterning was visible. This evidence is consistent with either a homogenous composition for biotite-rich boulder clays no matter where in Yorkshire they originate but is also consistent with the exploitation of a single clay source and trade from that source.

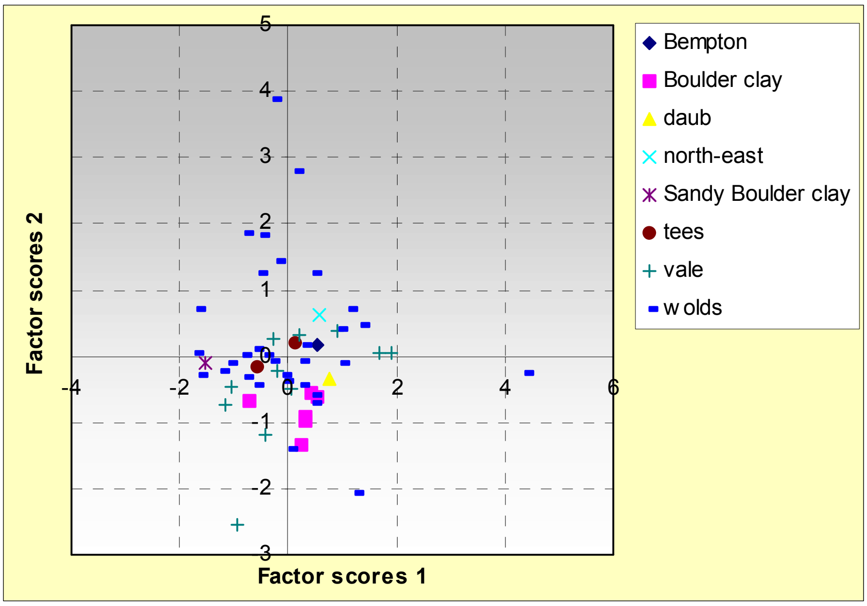

Figure 2

Conclusions

It is arguable that the Bempton jar was tempered with crushed erratic rock but a case is made here for its production from a biotite-granite rich boulder clay. Anglo-Saxon vessels made from such a clay occur over a wide area of northern England, from the Humber in the south to Binchester in the north from the North Sea coast to the centre of the Vale of York in the west. There is no petrological or chemical difference between the fabrics of these vessels and the Bempton jar cannot be distinguished from samples of these Anglo-Saxon vessels. By contrast, it is different in petrological and chemical composition from samples of boulder clay

Acknowledgements

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References

Challis, A. and Harding, D.W. 1975 *Later Prehistory from the Trent to the Tyne.* British Archaeological Report **20** (Oxford).

Didsbury, P. 2004 '17. The Iron Age and Roman Pottery', in Rahtz and Watts 2004, 139-183.

Didsbury, P. forthcoming 'The Pottery', in Neale and Simpson, forthcoming.

Freestone, I. C. and Humphrey, M. S. (1992) "Report on the petrology of prehistoric pottery from Staple Howe, Yorkshire.".

Freestone, I. C. and Middleton, A. P. (1991) "Report on the petrology of pottery from Iron Age cemeteries at Rudston and Burton Fleming." in I. M. Stead, ed., *Iron Age cemeteries in East Yorkshire: Excavations at Burton Fleming, Rudstone, Garton-on-the-Wolds, and Kirkburn*, English Heritage Archaeol Rep 22 English Heritage in association with the British Museum, London, 162-164

Neale, P.G.E. and Simpson, R.K. forthcoming 'An Iron Age Open Settlement at Creyke Beck, near Hull, East Yorkshire'.

Rahtz, P. and Watts, L. 2004 *The North Manor Area and North-west Enclosure*. Wharram, A Study of Settlement on the Yorkshire Wolds, **IX**. York University Archaeological Publications **11**. English Heritage.

Wardle, Peter (1991) *Earlier Prehistoric Pottery Production and Ceramic Petrology in Britain*.

BAR British Series 225 Oxford, BAR.

Appendix 1

TSNO	Al2O3	Fe2O3	MgO	CaO	Na2O	K2O	TiO2	P2O5	MnO
V2988	13.1575	4.769	0.722	0.684	0.8645	2.318	0.6555	0.513	0.0342

Appendix 2

TSNO	Ba	Cr	Cu	Li	Ni	Sc	Sr	V	Y	Zr*	La	Ce	Nd	Sm	Eu	Dy	Yb	Pb	Zn	Co
V2988	458	79	17	50	41	11	77	85	19	60	35	68	37	7	1	4	2	68	72	11