Characterisation of a possible sherd of North Lincolnshire Shell-Tempered Ware from Wetherby

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Shell-tempered wares form a small element in the medieval pottery found on sites in the Vale of York from the 8th to the 13th centuries. The forms and visual appearance of the fabric suggest a Lincolnshire source for these vessels but little is known for certain about the trade in these goods. A sherd from a thick-walled everted rimmed jar identified as a North Lincolnshire Shell-Tempered ware vessel by Jane Young was sampled to compare with other examples of Lincolnshire shelly wares, both from Yorkshire and Lincolnshire.

The sample, V2436, was thin-sectioned at the University of Manchester by Steve Caldwell and stained using Dickson's method ({Dickson 1965 #44803}). A sample of the fabric was prepared by Peter Hill and analysed at Royal Holloway College, London, under the supervision of Dr J N Walsh.

Petrological Analysis

Description

The following inclusion types were noted in thin section:

- Bivalve Shell. Abundant voids up to 2.0mm across. Mostly lined with dark brown phosphate and filled with unfired clay, both probably post-burial. There are no original shell nor calcitic alteration products present. Some of these fragments range up to 0.4mm thick but there are a number of thin, almost straight, fragments c.0.1mm thick.

- Rounded quartz. Sparse fragments ranging from c.0.1mm up to 1.0mm across. The larger grains are more rounded than the smaller ones. Most of the grains are unstrained and monocrystalline but strained, polycrystalline grains also occur.

- Chert. Sparse rounded grains, ranging from c.0.1mm to 0.5mm across.

- Fine-grained sandstone. Rounded fragments of fine-grained sandstone or siltstone, ranging from c.0.1mm to 0.5mm across.

- Rounded opaques. Sparse dark brown to opaque grains up to 0.5mm across. Some are well-rounded, some tabular and some are agglomerations of smaller rounded grains.

The groundmass consists of optically anisotropic baked clay minerals with moderate rounded dark brown to opaque grains, sparse quartz and sparse muscovite up to 0.05mm across.

Interpretation

The shell inclusions appear to be similar to those found in central and north Lincolnshire vessels tempered with weathered shelly limestone of the Great Oolite formation. With no shell surviving, however, it is impossible to be certain. There are, however, no echinoid shells, echinoid spines, oolitic opaque grains or punctate brachiopod shell fragments, all of which can occur in shell-gritted wares made from lower Jurassic shelly clays. Conceivably, weathered shelly limestones of Permian date might produce similar shelly sands. The quartzose sand is derived from Permo-Triassic sandstones, such as those which occur at the base of the Permian Lower Magnesian Limestone which outcrops to the west of Wetherby, but which also occurs widely within the Trent valley and Lincolnshire limestone uplands, both in terrace sands and wind-blown cover sands.

The thin section evidence is consistent with a Lincolnshire origin, utilising clays and shell sand from the dip slope of the Jurassic ridge, but does not discount an origin in the Permian limestones west of Wetherby.

Chemical Analysis

A range of major elements was measured as percent oxides (Appendix 1) and a range of minor and trace elements was measured as parts per million (Appendix 2). Having seen the very high quantity of secondary clay and phosphate present in the thin section it is unlikely that the chemical data will be very reliable, except perhaps in providing a clue as to the composition of the soil matrix in which the sample was buried.

An estimate of the quantity of silica in the sample was made by subtracting the total quantity of oxides from 100%. For this sample, the estimate is 70.0%, which is remarkably high for a fabric in which there is only a small proportion of visible quartz. The element counts were normalised to aluminium to take account of the large variation in the surviving shell content in these samples.

Comparison with other samples of shell-tempered wares of known or supposed Lincolnshire origin shows that the Wetherby piece contains the lowest magnesium, calcium, strontium and lithium content and the highest chromium content of any of the samples. Assuming a Lincolnshire origin, this would imply leaching of the magnesium, calcium, strontium and lithium (or contamination by clay with much lower values for these elements) and enrichment with chromium (or that chromium is present in high quantities in the clay infilling of the shell voids).

Omitting these elements, and those which might be present in phosphate infilling of the shell voids, a factor analysis was carried out of the twelve remaining elements. Two factors were found and a plot of the F1 against F2 scores (Fig 1) shows that the Wetherby sample falls into the centre of a large diffuse cluster which consists of Northern Maxey-type ware,

Northern Maxey-type ware, Subfabric Q (MAXQ) and early Lincolnshire fine-shelled ware (ELFS) whilst North Lincolnshire Fine Shelled ware (NLFS) and Lincolnshire Early Medieval Shelly ware (LEMS), Southern Maxey-type ware (RMAX) and Lincoln Kiln Type ware (LKT) are peripheral. Of these, only the LKT ware is known from kiln sites (in Lincoln) whilst MAXQ is a variant only found to the south of the Witham. The NLFS cluster includes samples of Northern Maxey-type ware which might also be made somewhere to the north of Lincoln and south of Brigg (at which point the shelly limestone is buried under Quaternary sands).

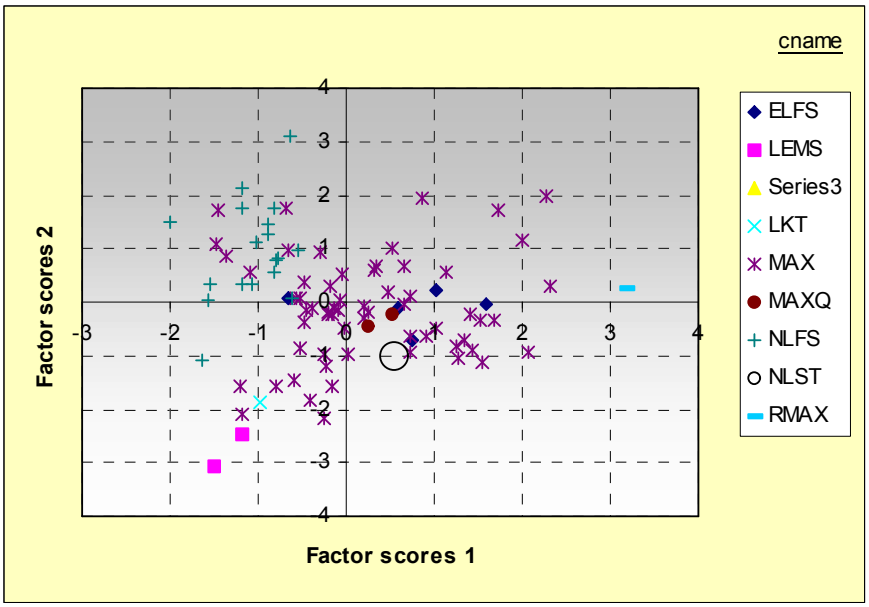

Figure 1

Conclusion

Although the sherd has suffered a large amount of leaching and infilling of the pores during burial the thin section evidence is consistent with a Lincolnshire origin and the chemical data suggests a source in central Lincolnshire (i.e. between Lincoln and Sleaford).

Appendices

Appendix 1

TSNO	Al2O3	Fe2O3	MgO	CaO	Na2O	K2O	TiO2	P2O5	MnO
V2436	17.14	7.88	0.79	0.48	0.22	2.05	0.78	0.43	0.155

Appendix 2

TSNO	Ba	Cr	Cu	Li	Ni	Sc	Sr	V	Y	Zr*	La	Ce	Nd	Sm	Eu	Dy	Yb	Pb	Zn	Co
V2436	934	138	33	28	97	18	63	120	42	103	55	132	59	12	2	7	3	79	148	27