

Characterisation studies of an imported English coarseware from the Horse Cross, Perth (PE43 2003)

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Excavations at the Horse Cross, Perth, by SUAT, revealed a medieval midden immediately outside the defences of the medieval town. Amongst the pottery found there were sherds with a calcareous temper which were recognised by Derek Hall as not being the same as the London-area shelly-sandy ware which has previously been found at 12th-century sites in eastern Scotland and sample sherds and photographs were sent to the author. Two sherds were examined using thin section and chemical analyses (Table 1).

Table 1

TSNO	Action	Context	Cname	Form
V2204	TS;ICPS	1050	GSS	JAR
V2203	TS;ICPS	918	GSS	JAR

Petrological Analysis

V2203

The following inclusions were noted in thin section:

- Well-rounded quartz grains c.0.3-0.8mm across. Some of these have dark red iron-rich veins and coating, indicating their origin in a ferruginous sandstone. The appearance of the grains indicates that they originated in a lower Cretaceous deposit.
- Rounded nacreous bivalve shell up to 1.0mm long. The shell is composed of non-ferroan calcite. Some of the shell fragments are surrounded by a calcareous marl matrix which indicates their origin in a shelly limestone.
- Angular white flint up to 1.0mm across.
- Rounded micaceous siltstone up to 1.0mm across.
- Rounded micrite up to 1.0mm across. Spherical microfossils filled with a slightly coarser-grained calcite suggest that these fragments are chalk.
- Rounded opaque grains up to 0.5mm across.

The groundmass consists of inclusionless baked clay minerals. The margins of the sample are oxidized, very light brown and anisotropic whereas the core is black, with a sharp boundary between the core and margins.

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- Rounded opaque grains up to 0.5mm across.
- Thin-walled bivalve shell up to 0.5mm long.
- Oolites with a ferroan micrite core
- Rounded sandstone up to 1.5mm containing rounded quartz grains, opaque grains and a sparry ferroan calcite matrix.
- Rounded limestone up to 1.0mm across containing quartz, dolomite and rounded opaque grains in groundmass of ferroan calcite and clay minerals.
- Rounded chert with chalcedonic inclusions up to 1.0mm.
- Angular basic igneous rock up to 0.4mm across containing laths of plagioclase feldspar in an amorphous groundmass.

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Interpretation

The two samples differ slightly in composition but this is likely to be due solely to the heterogeneous nature of the sand temper. The sand contains a mixture of Jurassic limestone, lower Cretaceous sandstones and chert and upper Cretaceous chalk and flint whereas the groundmass indicates the use of an organic inclusionless, light-firing clay, probably either a facies of the Oxford Clay or the Kimmeridge Clay.

These characteristics indicate a source in eastern England to the south of the Humber Estuary. Potential source areas occur in the central Clay vale in Lincolnshire, from Market Rasen to Horncastle, in the Ely area and at various locations in Cambridgeshire and

Bedfordshire. Of these areas only Ely actually has archaeological evidence for the production of similar pottery.

Chemical Analysis

Samples of the two sherds were prepared and submitted to Royal Holloway College, London, for chemical analysis using ICP-AES. A range of major elements were measured as percent oxides whilst minor and trace elements were measured as parts per million (Appendix 1). The data from Perth were compared with those from a range of analyses of sandy, calcareous coarsewares from eastern England. These included samples from three production sites: Baston and Bourne, both in south Lincolnshire, and several different sites in Ely, Cambridgeshire. In addition, samples from consumer sites in the north east of England, thought to be from coastally-traded coarsewares of 11th/12th-century date, were also included (these samples come from three sites: Newcastle-upon-Tyne, Hart Manor, near Hartlepool and Orby in the Lincolnshire wolds. The data were all normalised to Al₂O₃ in order to discount the effect of variations in quartz content and the resulting dataset was then analysed using factor analysis (Fitch 2001 #44933). Six factors with eigenfactors greater than 1.0 were found. Factor 1 scores reflect the main variation in the dataset, followed by Factor 2 and so on.

A plot of the F1 scores against the F2 scores revealed that only one sample differed in its F1 score (a sample from Ely) whilst two main clusters, one minor cluster, and an outlier could be defined by their F2 scores (Fig 1). The Horse Cross samples plot with the main Ely/Bourne/Baston cluster which also includes four samples from Hart. The remaining Hart, Newcastle and Orby samples plot in the second main cluster, along with a few of the Ely samples.

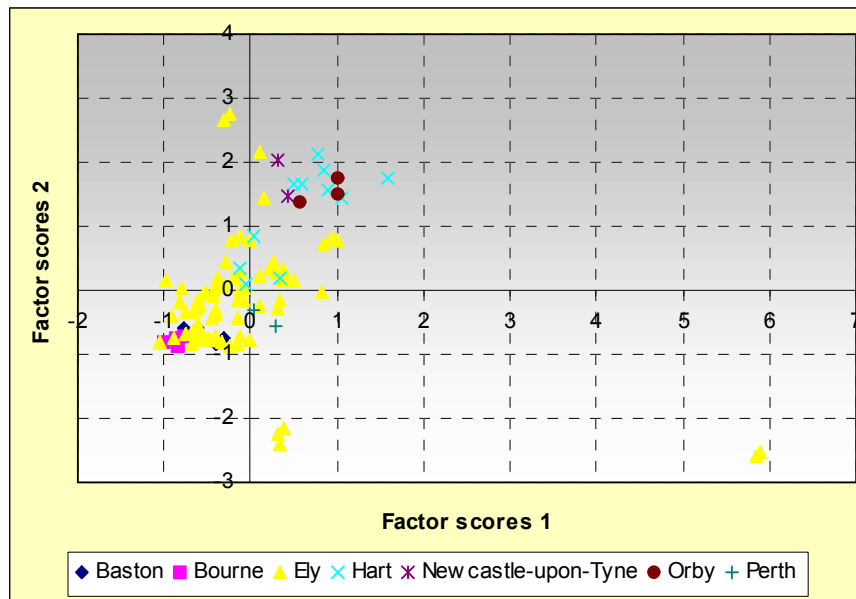


Figure 1

A plot of F3 against F4 (Fig 2) shows that most of the Ely samples are distinguished from the remainder by their F4 scores whilst the two Perth samples, one from Ely and one from Hart, also have high F4 scores but are distinguished by high F3 scores. High Factor 3 scores are mainly the result of P2O5 weightings and may be due to post-burial contamination with phosphate although no such contamination was noted in thin section, and neither were there any inclusions noted which might be responsible for enriched phosphate.

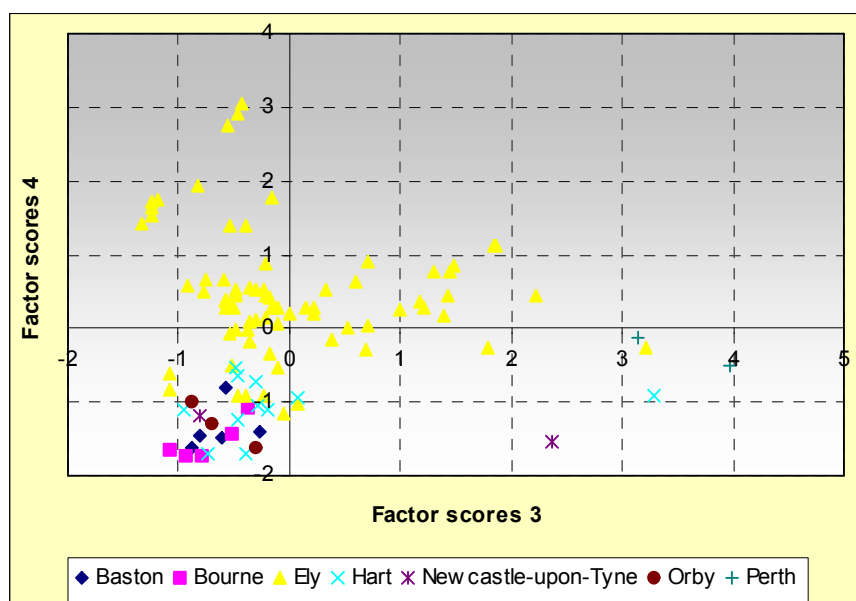


Figure 2

In a plot of the Factor 5 and 6 scores (Fig 3) the Bourne and Baston samples can be distinguished from those from Hart and Orby whilst the Ely samples show a wide variation in composition. The Horse Cross samples plot close to the Bourne and Baston samples but in a region of the graph only occupied by Ely samples.

Conclusion

Thin section analysis clearly demonstrates a source for these two samples in Eastern England and points to Ely as a likely source. Chemical analysis confirms that there is no difference in composition between the Horse Cross and a variety of Ely wares which, on the contrary, are distinguished from visually similar coarsewares found on sites on the Lincolnshire and north-eastern English coast. However, this analysis has raised the possibility that some of these coastally-traded samples may also be Ely exports. The Ely pottery industry seems to have flourished throughout the medieval period, from the 12th century to the 15th or 16th century. The distinctive black core, sparse glaze, or complete lack of glaze and coarse finish are characteristics of the industry throughout the medieval period

Appendix 1a.

TSNO	Al ₂ O ₃	Fe ₂ O ₃	MgO	CaO	Na ₂ O	K ₂ O	TiO ₂	P ₂ O ₅	MnO
V2203	13.5	4.82	0.98	4.18	0.18	2.88	0.5	2.01	0.049
V2204	13.37	4.58	0.95	3.92	0.2	2.93	0.48	2.29	0.036

Appendix 1b.

TSNO	Ba	Cr	Cu	Li	Ni	Sc	Sr	V	Y	Zr*	La	Ce	Nd	Sm	Eu	Dy	Yb	Pb	Zn	Co
V2203	394	103	80	47	54	14	171	120	24	74	36	74	37.694	6.036	1.72944	4.1	2.3	62.6	122	15
V2204	613	100	59	46	49	14	203	114	23	69	36	66	37.506	5.784	1.57536	3.9	2.2	66.356	153	12