Characterisation Studies of Humberware from Wetherby, West Yorkshire

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Archaeological excavations on the line of the A1 near Wetherby, West Yorkshire, revealed a medieval settlement from which a large amount of medieval pottery was recovered.

From the inception of pottery use to the beginning of the 14th century the majority of the pottery used on the site was obtained locally but from that point onwards the majority of the pottery used on the site is of Humberware, a regional pottery tradition for which several production centres are known and others are inferred, since Humberwares with fabrics which do not match those of known production sites occur.

To establish the source of the Wetherby vessels, six vessels were selected for thin section and chemical analysis (Table 1). The samples were chosen to include the visual range of textures, forms and decorative methods and therefore included examples of unglazed vessels, probably drinking jugs, an overfired vessel and one with a copper-stained lead glaze, applied alongside a white slip. The latter technique is uncommon in Humberware in general but is the principal glazing technique used at the Humberware kiln site at Blue Bridge Lane, Fishergate, York, which was recently excavated by Field Archaeology Specialists Ltd.

Table 1

TSNO	Site Code	Context	DN	CNAME	FORM	ACTION	COMMENTS
V2675	WW/16A/03	852	DR35	HUM	JUG	TS;ICPS	
V2673	WW/6/03	6016	DR51	HUM	DJ/JUG	TS;ICPS	UNGLAZED
V2676	WW/6/03	6020	DR52	HUM	DJ	TS;ICPS	UNGLAZED
V2671	WW/16A/03	847	DR56	HUM	JUG	TS;ICPS	SEMI-VITRIFIED
V2672	WW/16A/03	853	DR37	HUM	JUG	TS;ICPS	CUGL AND WHSL EXT
V2674	WW/16A/03	853	DR38	HUM	JUG	TS;ICPS	

Description

Thin Section Analysis

The following inclusions were noted in thin section:

- Angular quartz. Moderate, up to 0.3mm across. Several grains have one or more straight sides suggesting that they are overgrown and derive from an orthoquarzite.
- Rounded quartz. Sparse, up to 0.5mm across, monocrystalline unstrained grains.

- Rounded chert. Sparse, up to 0.3mm across. Some fragments are colourless and some have a brown colour. No sign of internal structure (such as quartz inclusions, voids or fossils)

- Plagioclase feldspar. Sparse twinned grains up to 0.3mm across.

- Altered feldspar. Sparse, subangular fragments up to 0.3mm across.

- Mudstone. Rounded fragments of dark (organic?) mudstone with clear bedding.

- Rounded red clay pellets. Sparse fragments of dark brown to red clay/iron up to 0.5mm across. No visible bedding.

- Muscovite. Moderate laths up to 0.3mm long (not visible in the over-fired sample).

- Biotite. Tentatively identified sparse laths up to 0.3mm long.

- Irregular voids. Sparse voids of rough oval shape up to 1.5mm long. Most filled with quartz-rich soil post-burial.

The groundmass contains streaks of dark brown/red clay with fewer inclusions that the background and lenses of lighter-coloured clay with a higher silt content than the background. The background itself consists of anisotropic to isotropic baked clay minerals, abundant quartz and muscovite silt, up to 0.1mm across.

Not every feature is present in each section but the general impression is that these samples are from the same source. None of the features present are diagnostic, however, and all occur widely in the Vale of York, including the York and Holme-upon-Spalding Moor Humberwares. They are probably present throughout the Vale of York in glacial clays. The sorting and high silt content may suggest that the clays are of lacustrine origin rather than boulder clay. However, no sampling of these clays has taken place.

Chemical Analysis

A range of major and minor elements were measured using Inductively Coupled Plasma Spectroscopy under the supervision of Dr J N Walsh, Royal Holloway College, London. The major elements were measured as percent oxides (Appendix 1) and the minor and trace elements were measured in parts per million (Appendix 2).

Although silica content was not measured, it was estimated by subtracting the total quantity of measured major elements from 100%. For the Wetherby Humberware, the mean estimated silica content was 67.17% +/- 1.67%. Thus, the Wetherby samples have a similar silica content to Humberware form the production sites of Holme-upon-Spalding Moor and

West Cowick and to samples from consumer sites at Barton-upon-Humber, a lower silica content to that from a consumer site at Wawne, in East Yorkshire, and a slightly higher silica content than samples from the Fishergate site in York (Fig 1).

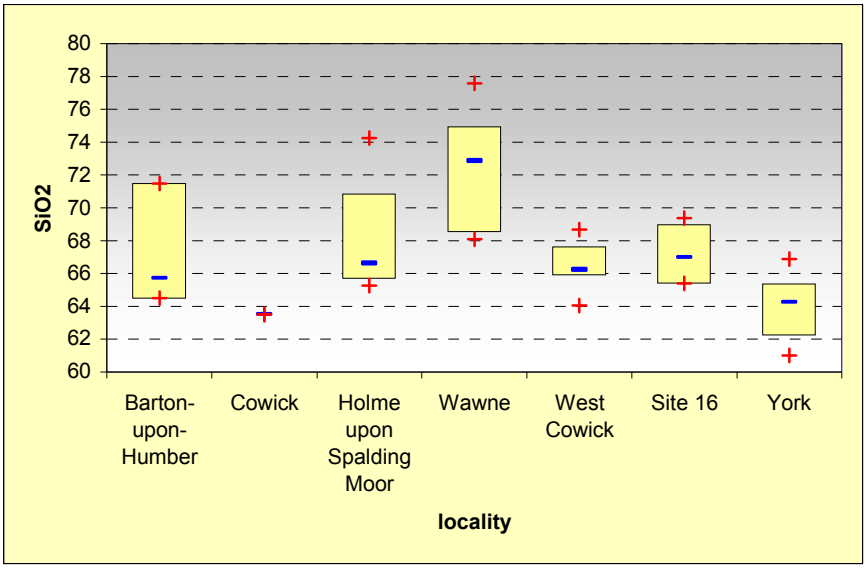

Figure 1

The data were then normalised to Aluminium (to take account of the variable quartz sand contents) and analysed using Factor Analysis.

Fig 2 shows a plot of the first two factors found in this analysis and indicates that the Humber mouth sites (Wawne and Barton-upon-Humber) have negative F1 scores which distinguish their samples from the remainder. However, the Vale of York/Humber wetlands sites all have similar compositions although the West Cowick samples have negative F2 scores whereas the Holme-upon-Spalding Moor, York and Wetherby samples have neutral or positive F2 scores.

This analysis therefore discounts a Humber estuary or Humber wetlands source for the Wetherby Humberware but allows either a Holme-upon-Spalding Moor or York source.

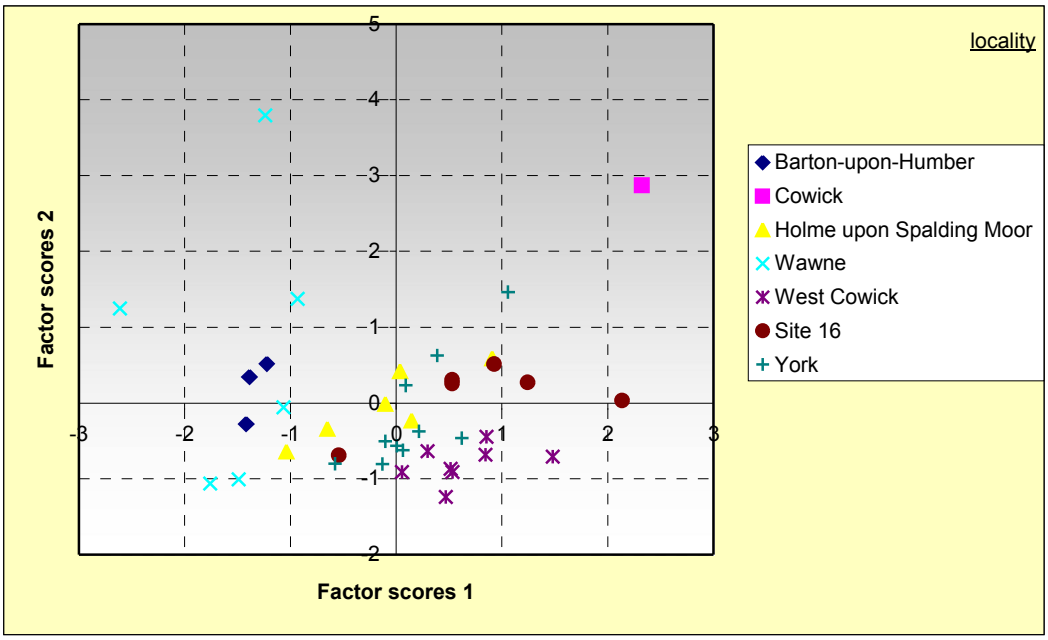

Figure 2

The factor analysis was then repeated for just these three sites (Fig 3). This showed that there are differences between the samples from the three groups. These differences are mainly accounted for by the trace elements: High Factor 1 scores depend on Vanadium and Chromium values; Negative Factor 1 scores depend on Cerium and Lanthanum values and high Factor 2 scores depend mainly on Lithium values. Since these elements tend to be affected by post-burial alteration (both leaching and adsorption) and since a small element of contamination by soil is inevitable in porous ceramics, the analysis was then repeated using only the major elements and the least mobile trace elements. This analysis revealed the same separation of the three groups and showed that there are differences in the Zirconium and Sodium contents of the Wetherby and York/Holme-upon-Spalding Moor samples, with four of the Wetherby samples having lower Zirconium and higher Sodium than the others (Fig 4). It therefore seems likely that the differences between the Wetherby and York/Holme-upon-Spalding Moor Humberwares are not due simply to post-burial alteration.

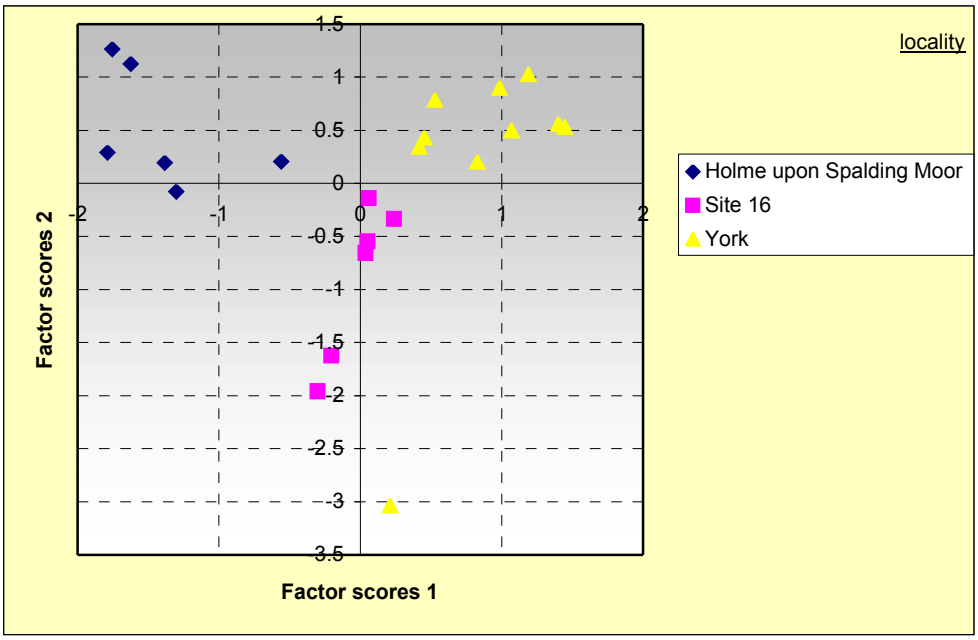

Figure 3

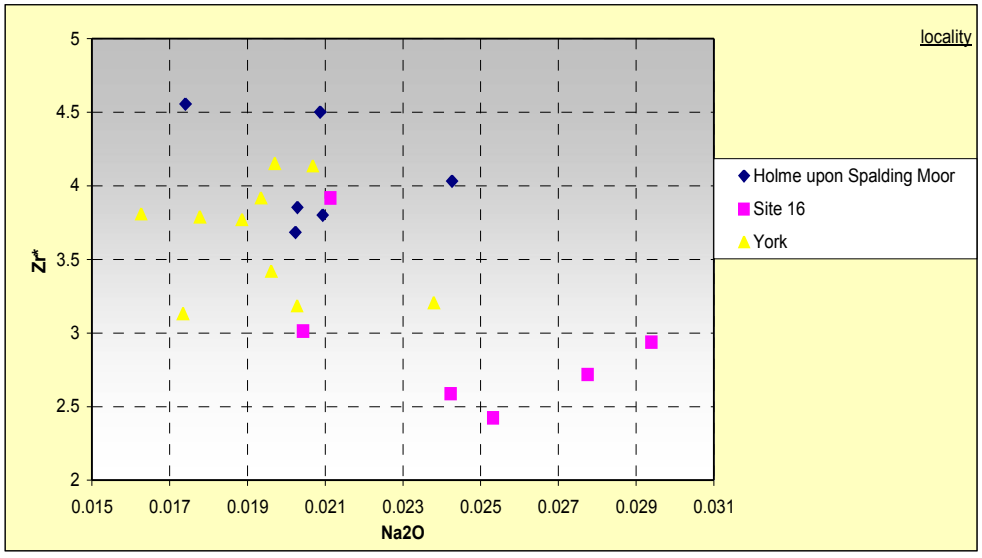

Figure 4

Conclusion

The thin section analysis confirms that the Humberware from Wetherby is made from a different clay from that used for the earlier medieval wares but is similar in texture and in its rock and mineral suite to that used at York and Holme-upon-Spalding Moor to produce Humberwares. The Cowick Humberwares, by contrast contain a higher silt content and probably utilized post-glacial clays laid down in the Humber wetlands.

The chemical analysis suggests that the Wetherby samples all came from a single source but that this source is distinguishable from the York and Holme-upon-Spalding Moor samples. However, the presence of soil-filled voids in the Wetherby samples clearly demonstrates that there is some contamination of the samples. It is unlikely that this contamination could be responsible for the differences in composition observed between the Wetherby, York and Holme-upon-Spalding Moor fabrics.

In conclusion, it is likely that the Wetherby Humberwares were produced at an undiscovered site in the Vale of York utilising similar glacial clays to those used at York and Holme-upon-Spalding Moor. Such clays probably occur close to the site itself, filling valleys cutting through the Permian limestone hills as well as further east in the main vale.

Appendix 1

TSNO	Al2O3	Fe2O3	MgO	CaO	Na2O	K2O	TiO2	P2O5	MnO
V2674	19.57	6.74	2.13	1.30	0.40	3.19	0.76	0.42	0.086
V2675	18.03	6.12	2.33	1.60	0.53	2.96	0.76	0.34	0.085
V2672	18.56	6.30	2.45	1.19	0.47	3.07	0.74	0.42	0.085
V2671	19.39	6.11	2.70	1.60	0.41	3.29	0.80	0.18	0.086
V2673	18.16	5.32	2.00	0.71	0.44	2.93	0.76	0.24	0.058
V2676	17.29	5.97	2.19	1.28	0.48	2.90	0.72	0.27	0.084
Mean	18.50	6.09	2.30	1.28	0.46	3.06	0.76	0.31	0.081
SD	0.87	0.46	0.25	0.33	0.05	0.16	0.03	0.10	0.011

Appendix 2

TSNO	Ba	Cr	Cu	Li	Ni	Sc	Sr	V	Y	Zr*	La	Ce	Nd	Sm	Eu	Dy	Yb	Pb	Zn	Co
V2671	489	113	33	92	50	17	121	118	28	76	48	84	45	9	2	6	3	828	94	24
V2672	624	108	33	99	60	16	117	101	20	45	47	83	42	8	2	5	2	2,405	102	22
V2673	484	104	28	93	55	15	97	100	18	47	45	79	43	7	1	5	2	211	91	20
V2674	601	118	46	97	62	17	117	114	22	59	51	91	40	9	2	6	3	657	107	21
V2675	586	107	34	93	57	16	112	101	21	53	46	82	43	7	2	6	2	3,221	100	21
V2676	523	100	31	87	54	15	102	84	23	47	44	75	39	8	2	6	2	214	90	20
Mean	551.2	108.3	34.2	93.5	56.3	16.0	111.0	103.0	22.0	54.5	46.8	82.3	42.0	8.0	1.6	5.5	2.3	1,256.1	97.3	21.3
SD	60.3	6.4	6.2	4.2	4.3	0.9	9.5	12.0	3.4	11.7	2.5	5.4	2.2	0.6	0.1	0.6	0.4	1,257.2	6.7	1.5