Characterisation Studies of Roman wheelthrown wares from Melton, East Yorkshire (OSA04 EX03)

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Excavations at Melton, East Yorkshire, revealed a sequence of prehistoric to medieval occupation and landuse. Studies of the prehistoric and early to mid Anglo-Saxon pottery indicate that it was mainly produced north of the Humber and probably within 10 miles of the site. It has been suggested, however, that in the Roman period there was a complete break in supply and that in the early 2nd century the majority of the pottery used in the Melton area was obtained from potteries in North Lincolnshire.

To test this hypothesis and to investigate the source of some of the less common types used at Melton a series of samples of oxidized and grey vessels were taken (Table 1, V3772-6). These were examined using thin sections and chemical analysis and the results compared with a series of samples from the Roxby kiln site in north Lincolnshire (V4551-6).

Table 1

TSNO	Sitecode	Context	cname	Form
V3772	RXWH	US	GREY	DISH
V3773	RXWH	US	GREY	JAR
V3774	RXWH	US	OXID	BOWL
V3775	RXWH	US	OXID	BEAKER
V3776	RXWH	US	OXID	BOWL
V4551	OSA04EX03	1279	RXOX	B334
V4552	OSA04EX03	3905	OXID	DR30 COPY
V4553	OSA04EX03	1279	ROXGR	B334
V4554	OSA04EX03	1279	ROXGR	JAR
V4555	OSA04EX03	1279	ROXGR	B334
V4556	OSA04EX03	1279	RXOX	JAR

Thin Section Analysis

Thin sections were prepared by Steve Caldwell, University of Manchester.

Roxby

Five samples of pottery waste from the Roxby kiln were analysed. Three were reduced greyware vessels and two were oxidized. However, in thin section all five have a similar range of inclusions and a similar groundmass and are therefore probably all made from the same clay and sand. However, a sample of fired clay, either from the kiln superstructure or from kiln furniture, has a rather different fabric and is described separately.

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http://www.avac.uklinux.net/potcat/pdfs/avac2007110.pdf

Pottery Fabric

The following inclusion types were noted:

- Quartz. Moderate to abundant subangular quartz grains up to 0.2mm across and sparse well-rounded grains up to 0.3mm across. The difference in size between the subangular and quartz grains is greater in the two oxidized sherds than in the greywares.
- Opaques. Sparse to moderate well-rounded grains up to 1.5mm across. Some contain sparse subangular quartz grains up to 0.2mm across and muscovite laths up to 0.1mm long but most are inclusionless.
- Sandstone/iron pan. Rare subangular fragments up to 1.0mm across consisting of well-rounded quartz grains up to 0.3mm across in an opaque groundmass.
- Mudstone. A single large rounded fragment of laminated mudstone, 3.0mm long, containing slightly more quartz and muscovite than the groundmass.

The groundmass consists of optically isotropic baked clay minerals, abundant angular quartz up to 0.05mm across and moderate muscovite laths up to 0.1mm long.

Fired Clay

- Quartz. Abundant well-rounded grains up to 0.3mm across.
- Chert. Sparse well-rounded grains up to 0.3mm across.
- .Phosphate. Sparse well-rounded brown grains up to 0.3mm across.
- Opaques. Sparse well-rounded grains up to 3.0mm across.

The groundmass consists of isotropic baked clay minerals, abundant angular quartz up to 0.1mm across, subangular opaque grains up to 0.1mm across

Interpretation: the quartz sand is probably mainly of Triassic origin. Similar sands occur in Nottinghamshire, the Trent Valley and wind blown and alluvial cover sands in central and western Lincolnshire, and along the Lindsey marshes. The opaque grains are probably derived from Lower Jurassic deposits such as the Frodingham Ironstone or to recent iron pan. The phosphate deposits in this case appear to be an original feature of the sand rather than post-burial infilling of rounded voids.

Roxby-type ware from Melton

Six samples of oxidized and greywares from Melton were thin-sectioned. Five have a very similar appearance in thin section and the sixth is slightly different.

Standard Fabric

- Quartz. Abundant well-rounded grains up to 0.5mm across.

- Sandstone. Sparse well-rounded grains containing quartz grains c.0.1-0.2 mm across.
- Chert. Sparse well-rounded grains up to 0.5mm across
- Opaques. Sparse well-rounded grains up to 0.3mm across

The groundmass consists of optically anisotropic baked clay minerals, moderate angular quartz up to 0.1mm across and sparse muscovite laths up to 0.1mm long.

Interpretation: This fabric seems to contain less, and smaller, opaque grains than the Roxby kiln although the general character of the two wares is very similar.

Finer Fabric

The following inclusion types were noted:

- Quartz. Moderate grains of well-rounded, rounded, subangular and angular grains ranging from c.0.2mm to c.1.0mm. The larger grains tend to be more rounded than the smaller and the angular grains include some with straight faces which are almost certainly from overgrown sandstones.
- Opaques. Sparse well-rounded grains up to 1.0mm across but mostly up to 0.2mm across.

The groundmass consists of optically isotropic baked clay, abundant angular quartz up to 0.1mm across, moderate rounded dark brown and opaque grains up to 0.1mm across and sparse muscovite up to 0.2mm long.

Interpretation: This fabric too is very similar but not identical in character to that from Roxby. It is less certain, though still likely, that the majority of the rounded grains are of Triassic origin. The angular grains probably include some from Millstone Grit or similar sandstones and there is no concentration of smaller angular grains of the type which appears to come from the Upper Jurassic Kellaways sand or Kellaways rock which outcrops north of the Humber.

Chemical Analysis

Samples were taken for chemical analysis using Inductively-Coupled Plasma Spectroscopy at Royal Holloway College, London, under the supervision of Dr J N Walsh. A range of major elements was measured in percent oxides (App 1) and a range of minor elements was expressed in parts per million (App 2).

Silica was not measured but was estimated by subtraction of the total oxides from 100%. The data were then normalised to aluminium to take account of variations in silica content, which has a diluting effect on other element values.

The silica content is very similar for all samples, with a Mean of 66.8 +/- 1.01%. Factor analysis of the normalised data revealed four factors of which the second distinguishes the Roxby from the Melton samples (Fig 1). The third and fourth factors distinguish the finer fabric and two of the standard fabric samples from Roxby from the remainder (Fig 2).

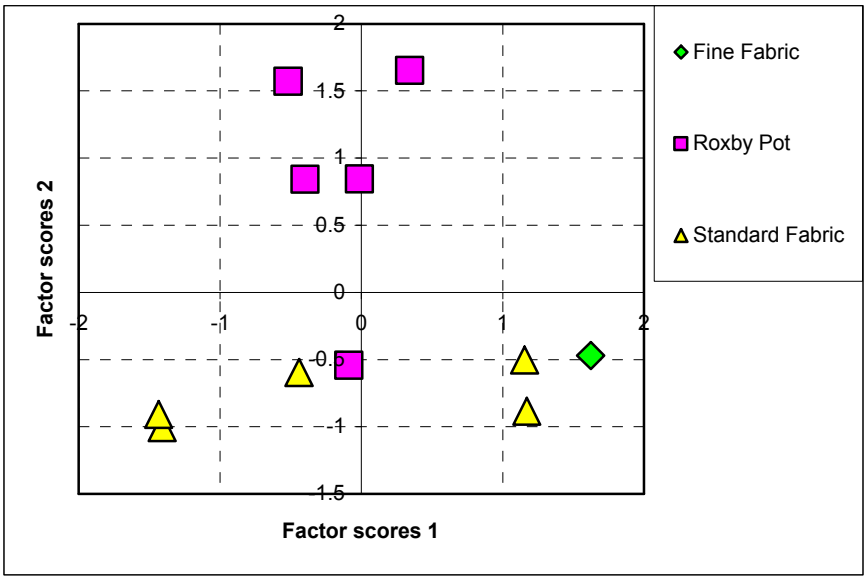

Figure 1

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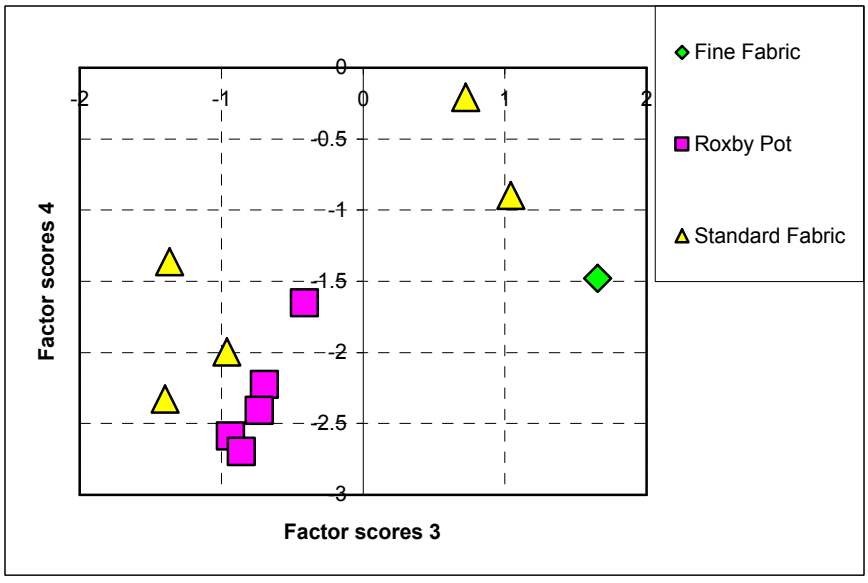

Figure 2

Analysis of the Roxby and Melton Roman wares alongside various other wares indicates three factors and the first distinguishes the majority of Melton prehistoric samples made from a variety of clays north of the Humber, from the Roxby and Melton Roxby-types samples (Fig 3). Samples from the York area were also clearly distinguished (Fig 3 york and yorkd). However, it is not possible

in this analysis to clearly separate the Roxby samples from some of the local Melton ones. Factor 1 is mainly determined by high Rare Earth element scores and low vanadium scores whilst Factor 2, which distinguishes the Roxby from the Melton Roxby-type samples, is distinguished by high Sc and V. However, the values are actually extremely similar for both groups.

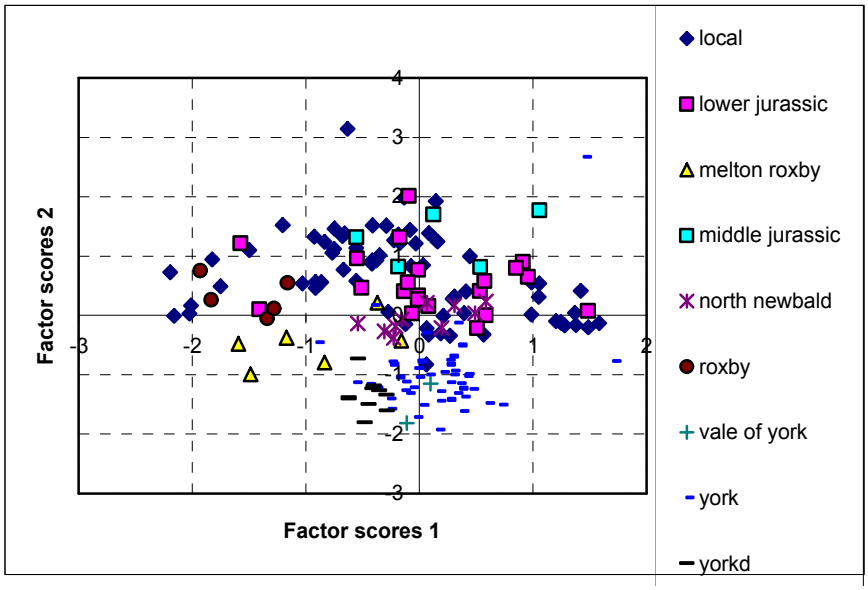

Figure 3

Conclusions

Both the thin section analysis and the chemical composition suggest that there are differences between the Roxby kiln waste samples and those from Melton but the range of inclusion types is similar and there is no overlap in factors between the Melton prehistoric samples and the Melton Roxby-type ware. This suggests that the Melton Roxby-type ware samples are probably from one or more North Lincolnshire kilns but are perhaps not from Roxby itself (or at least not from the batch represented in the kiln waste). The DR30 copy, sample V4552, is apparently very similar to a vessel produced at Dragonby and this is consistent with the difference in fabric between that sample and the remainder.

Appendix 1

TSNO	Al2O3	Fe2O3	MgO	CaO	Na2O	K2O	TiO2	P2O5	MnO
V3772	20.94	7.03	1.36	0.78	0.39	2.87	1.04	0.30	0.024
V3773	17.97	5.96	1.27	0.62	0.52	2.62	0.86	0.18	0.026
V3774	22.13	7.90	1.51	0.47	0.38	3.03	1.06	0.51	0.020
V3775	23.18	7.94	1.71	0.38	0.40	2.90	1.02	0.15	0.031
V3776	19.72	8.16	1.33	0.34	0.45	2.83	0.96	0.28	0.027
V3777	18.41	13.03	0.94	1.41	0.26	2.42	0.85	0.58	0.074
V4551	21.90	7.63	1.33	0.73	0.37	2.95	1.01	0.22	0.024
V4552	19.53	6.01	1.10	0.81	0.31	2.61	0.98	0.47	0.089
V4553	18.14	8.08	1.16	0.58	0.24	2.91	0.84	0.17	0.025
V4554	17.74	8.98	1.04	0.74	0.23	2.74	0.75	0.28	0.025
V4555	15.00	5.07	0.81	1.21	0.32	2.14	0.69	0.71	0.041
V4556	18.60	7.29	1.52	1.14	0.35	2.52	0.75	0.15	0.067

Appendix 2

TSNO	Ba	Cr	Cu	Li	Ni	Sc	Sr	V	Y	Zr*	La	Ce	Nd	Sm	Eu	Dy	Yb	Pb	Zn	Co
V3772	433	107	23	70	38	19	93	168	16	112	39	73	17	6	1	3	3	29	90	16
V3773	402	94	20	103	37	17	102	149	15	106	39	70	22	6	1	3	2	40	80	16
V3774	462	137	23	77	39	21	93	207	18	129	41	77	19	6	1	2	3	28	86	16
V3775	420	137	29	125	50	20	81	170	22	123	42	84	27	9	2	4	3	26	121	19
V3776	403	111	21	67	40	19	82	168	19	111	42	84	26	8	1	2	3	31	138	16
V3777	368	125	20	85	72	20	126	259	36	127	53	109	62	15	3	6	5	46	137	28
V4551	464	111	34	139	46	19	135	118	18	61	42	73	41	6	1	2	2	23	111	15
V4552	532	93	24	126	85	15	106	146	20	56	42	101	44	8	2	4	3	21	129	25
V4553	391	80	29	52	23	15	99	152	13	58	37	66	37	5	1	2	2	21	58	10
V4554	377	76	30	32	23	15	86	143	22	52	40	67	39	5	1	2	2	21	59	10
V4555	433	74	21	67	56	13	98	179	20	45	34	80	35	7	1	3	2	19	96	15
V4556	464	86	29	85	62	17	95	132	32	46	41	86	42	9	2	4	3	19	87	19