

Characterisation Studies of Medieval Pottery from Bardsey, West Yorkshire (ARC06005)

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Excavations at Church Lane, Bardsey, West Yorkshire, undertaken by Archaeoscope, revealed a sequence of medieval occupation starting in the 10th or 11th century and continuing into the 13th century. An assessment of the pottery from the site recommended that thin section and chemical analysis was employed to investigate certain aspects of the pottery and this paper presents the results of those studies. In total 16 samples were analysed, some using both thin section and chemical analysis and others just using chemical analysis (Table 1).

Table 1

TSNO	Context	cname	Form	Action	Description	subfabric
V5074	3126	YORKA?	JAR	TS;ICPS	ID?	
V5075	3126	YORKA?	JAR	TS;ICPS	ID?	
V5076	3034	YG	JUG	ICPS	STRAP HANDLE ATTACHED AT THE RIM; MORE THAN 30MM ACROSS	SOFT PINK
V5077	3002	YG	JAR	ICPS		
V5078	3088	YG	JAR	ICPS		
V5079	3098	YG	JAR	ICPS		
V5080	3070	YG	JAR	ICPS		
V5081	2004	YG	JAR	ICPS		
V5082	2004	YG	JAR	ICPS		
V5083	2004	YG	JAR	ICPS		
V5084	2012	YG	JAR	DR;ICPS	DIAMOND RSD	
V5085	3010	YG	JAR	DR;TS;ICPS		
V5086	3082	NGR	PEDESTAL LAMP	DR;TS;ICPS		
V5087	3126	YG	PEDESTAL LAMP	TS;ICPS		
V5088	3129	MTIL	FLOOR	DR;TS;ICPS	STAMPED DEC	
V5089	3002	NGR	JUG	DR;TS;ICPS	SHL=3000 VERT COMBED THUMBED STRIPS	MEDLOC 3

The evidence for pre-conquest occupation consists of residual sherds identified as York A ware. Two of these were selected for analysis to test this identification (V5074 AND V5075).

A series of samples of white gritty ware were selected because they did not appear visually to be identical to York Gritty ware, the 11th to 13th-century white gritty ware

produced (probably) at Potterton, which is only about 7 miles to the south of Bardsey and therefore is by far the most likely source of this ware. The samples are intended to confirm (or deny) this identification (V5076-85, V5087). One roller-stamp decorated sherd was sampled (V5084). Diamond roller stamping of this type is a feature of a group of white gritty ware vessels from Doncaster (DONCG) but this is the first example of supposed York Gritty ware origin to be tested. Another distinctive sample is from a jug with a wide strap handle attached to the body at the rim. This is an early typological feature, found on vessels of mid 12th century date but not later (V5076).

Two samples of Northern Gritty ware were taken. The first, V5086, comes from a pedestal lamp, selected because an almost identical form was present in York Gritty ware (V5087), and the second sample, V5089, is a local copy of Developed Stamford ware, decorated with applied strips with thumb-combing on the strips. This form is datable to the mid/late 12th to early 13th centuries and is therefore early in the Northern Gritty ware sequence.

Finally, a sample of an impressed floor tile, V5088, made from a red earthenware fabric was taken to establish whether the tile was produced locally.

Results

The thin sections were produced by Steve Caldwell, University of Manchester, and stained using Dickson's method (Dickson 1965). This staining is used to distinguish ferroan from non-ferroan calcite and dolomite. No calcareous inclusions were present in these sections however.

Subsamples were prepared by cutting off a block from the sample, removing all potentially contaminated surfaces, to a depth of c.1.0mm all over, and then crushing the remainder to a fine powder. These powders were submitted to Dr J N Walsh, Royal Holloway College, London, where they were analysed using Inductively-Coupled Plasma Spectroscopy (ICP-AES). A range of major elements were measured as percent oxides (App 1) and a range of minor and trace elements were measured as parts per million (App 2). Silica was estimated by subtracting the total measured oxides from 100% and the data were normalised to aluminium before study using Factor Analysis, a multivariate statistical technique in which a large number of variables is replaced by a smaller number of factors together with the weightings required to transform the original data to the new factors (2002).

York A ware

The two samples were both thin-sectioned and the following inclusion types were noted:

- Quartz sandstone. Moderate subangular fragments of sandstone up to 1.5mm across consisting of grains of quartz and rare microcline feldspar up to 0.5mm across. the grains are overgrown and offwhite kaolinite fills some of the voids.
- Clay pellets. Moderate dark red clay pellets, some mottled red/dark red, up to 1.0mm across. The pellets have a similar texture and quartz silt content to the groundmass.
- The groundmass consists of red optically anisotropic baked clay minerals and sparse angular quartz and muscovite laths up to 0.1mm long.

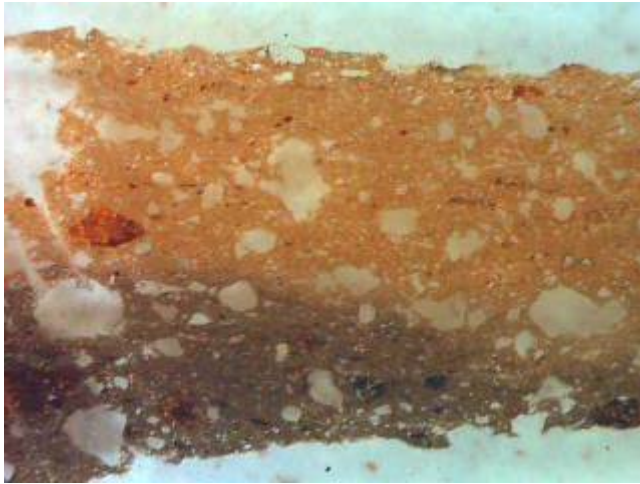


Figure 1 V5074

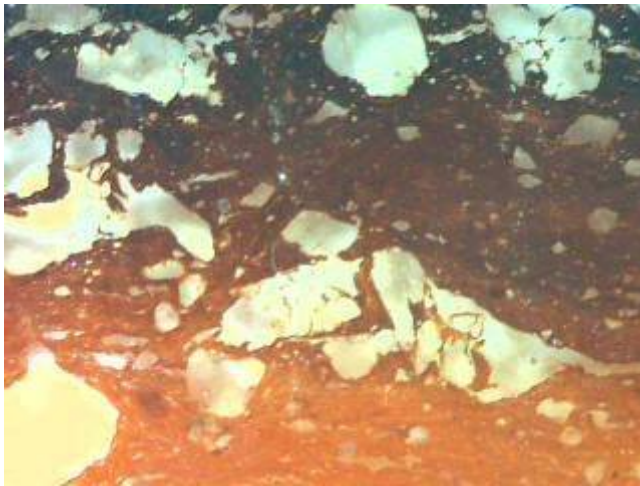


Figure 2 V5075

A distinctive feature of York A ware is the presence of baryte (Vince 2004a). Sometimes grains of baryte are present in thin section (not in either of these sections however) but more commonly it is recognised by a high barium value. The barium values for these two samples (relative to aluminium) were compared with those of samples from the production site at Thorner and with consumer sites at York, Beverley and elsewhere in

northern England (Fig 1). This comparison shows that the Thorner samples have a wide range of barium values which include several samples with higher values than found on consumer sites (probably at least in part due to contamination of the clay from groundwater after burial).

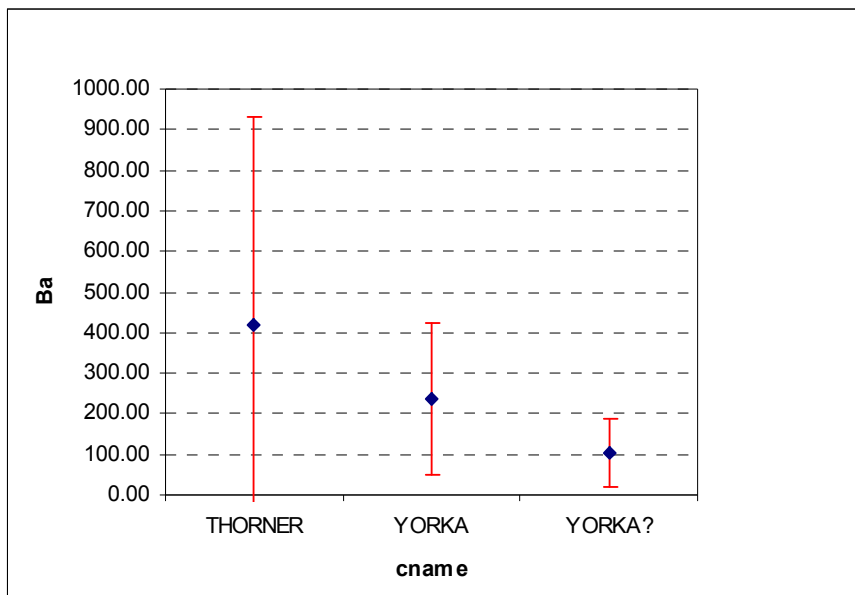


Figure 3 (Key: THORNER = wasters; YORKA = samples from consumer sites; YORKA? = samples from Bardsey).

The ICPS data were then examined using Factor Analysis. A plot of the first and second factor scores indicates that the Bardsey samples have high F1 scores, similar to some samples from York, Beverley, Swillington, Newcastle-upon-Tyne and Wetherby. However, the Thorner samples and most of those from York and Beverley, have negative F1 scores.

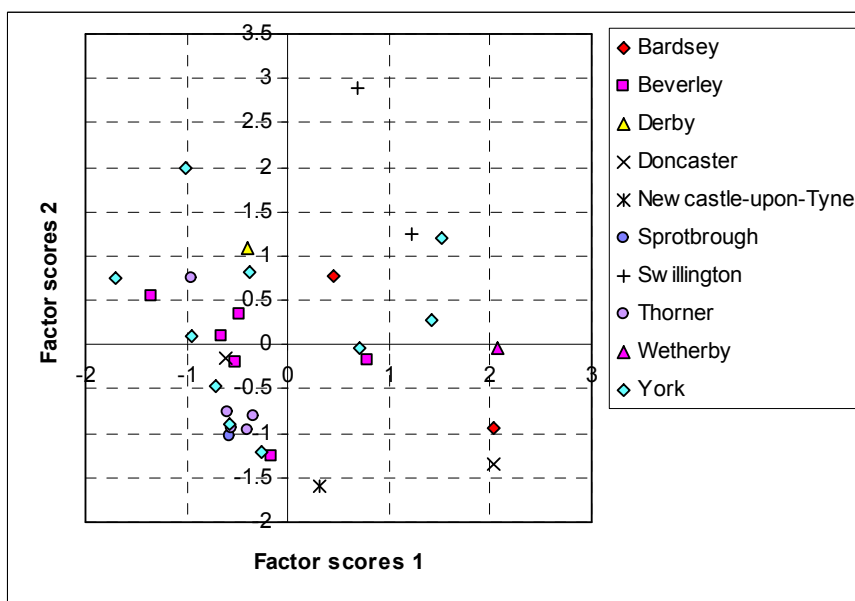


Figure 4

A plot of the F3 against F4 scores also separates the Bardsey samples from the majority, including all of the Thorner wasters (Fig 3). The Bardsey samples, and one from Beverley and that from Newcastle-upon-Tyne, have negative F3 scores.

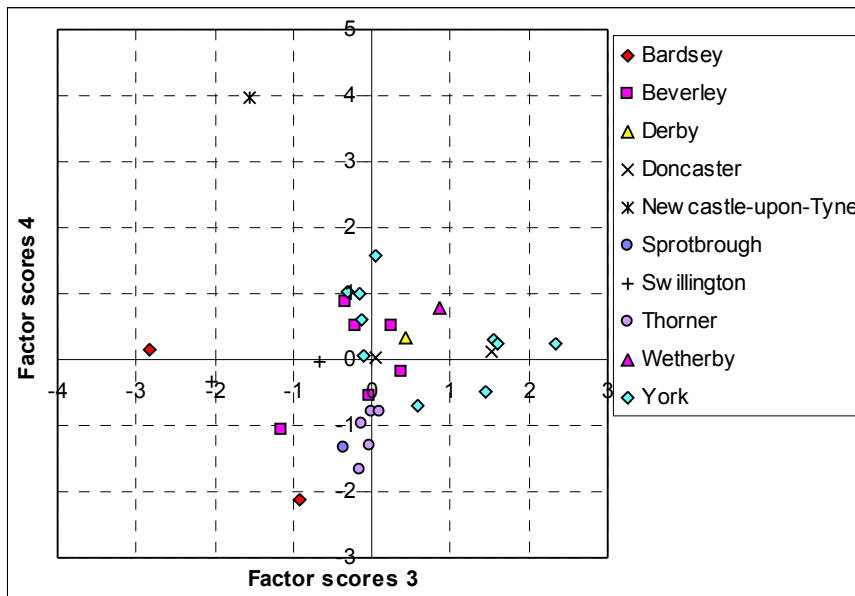


Figure 5

In conclusion, the ICPS data shows differences between the Bardsey York A samples and those from the Thorner production site and also some differences between these samples and others from consumer sites. Whilst not sufficient to disprove a York A identification, the chemical data offers only luke-warm support.

York Gritty ware

Eleven samples of York Gritty ware were taken.

Two of these samples were thin-sectioned: the pedestal lamp and a sample which visually was similar to a gritty ware produced in the North Yorkshire whiteware industry.

The following inclusion types were noted in thin section:

- Quartz sandstone. Moderate subangular fragments of sandstone up to 2.0mm across consisting of grains of quartz and rare microcline feldspar up to 1.5mm across. The grains are overgrown and offwhite kaolinite fills some of the voids.
- The groundmass consists of light brown optically anisotropic baked clay and sparse angular quartz up to 0.1mm across. In one section, V5085, the quartz silt is abundant.

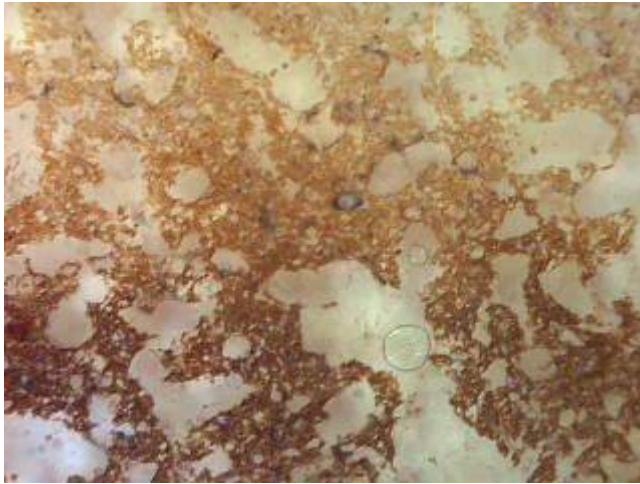


Figure 6 V5085

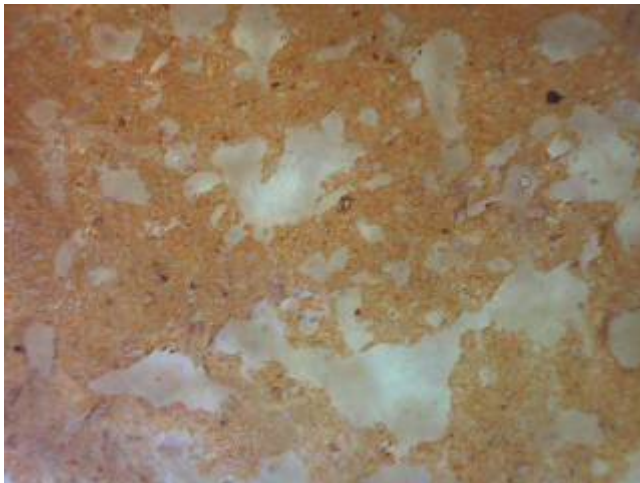


Figure 7 V5087

Factor analysis of the ICPS data indicates that the jug sample has a similar composition to the remainder but that the pedestal lamp has a higher F1 score whilst one of the jar samples has a higher F2 score than the remainder (Fig 4). Similar results come from the F3 and F4 scores (Fig 5). However, the outlying jar samples in Figs 4 and 5 are different and this suggests that the jar results reflect specific inclusions rather than a general difference in composition whilst the pedestal lamp does appear to be consistently different.

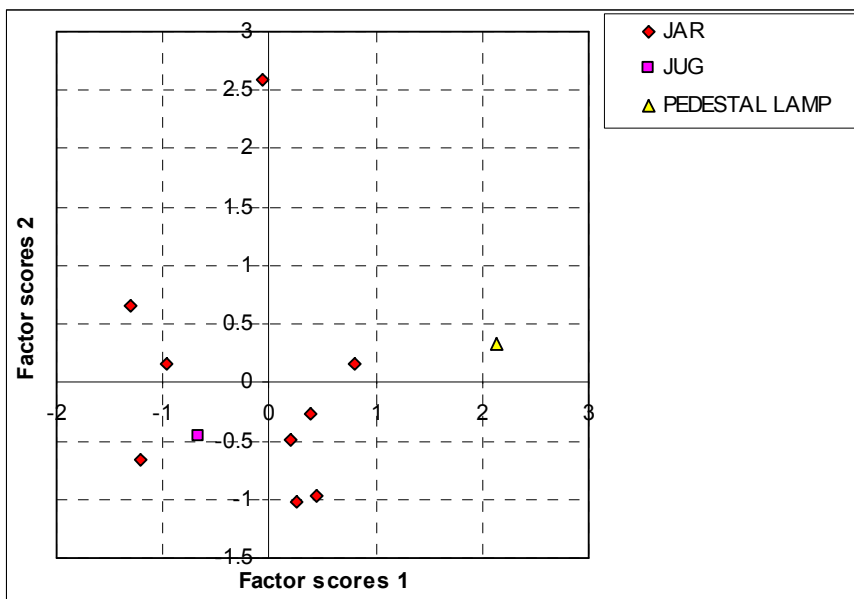


Figure 8

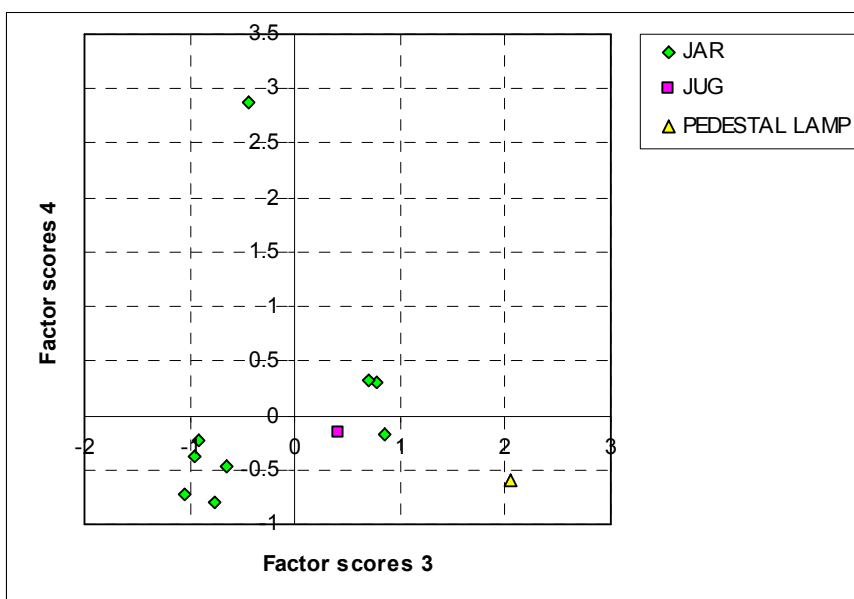


Figure 9

The ICPS data were then analysed together with samples of York Gritty ware from other consumer sites (no production waste is known) and with samples of the Doncaster gritty ware. The results of this study indicate that all of the Bardsey samples are comparable with York Gritty ware samples from other sites and not with the Doncaster ware (Fig 6). Neither the pedestal lamp nor the two aberrant jars are distinguished from the remainder of the Bardsey and other York Gritty ware samples.

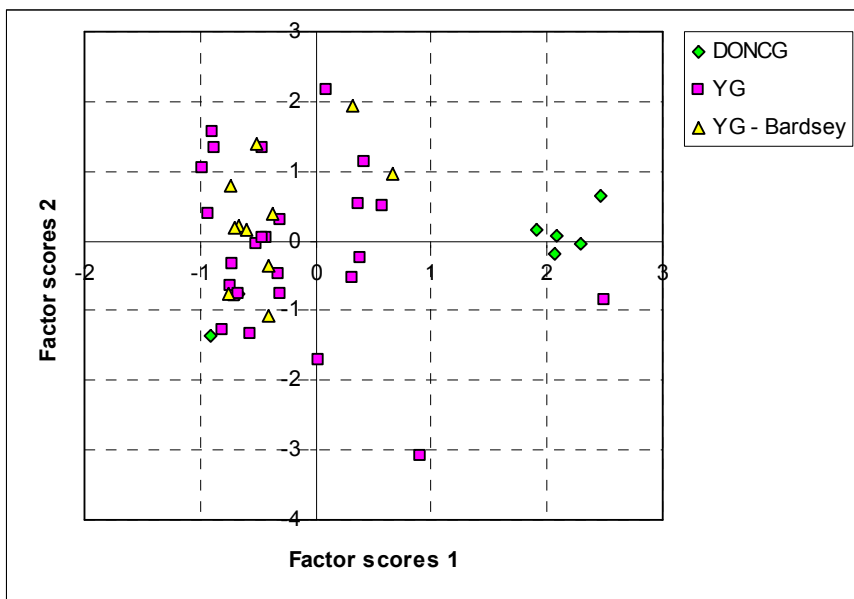


Figure 10

Northern Gritty ware

The two Northern Gritty ware samples were both thin-sectioned.

The following inclusion types were noted in the thin section of the pedestal lamp:

- quartz sandstone. Moderate subangular fragments of sandstone up to 1.0mm across containing mainly quartz with some plagioclase feldspar and perthite grains, up to 0.5mm across.
- The groundmass consists of variegated optically anisotropic baked clay with sparse angular quartz inclusions up to 0.1mm across.

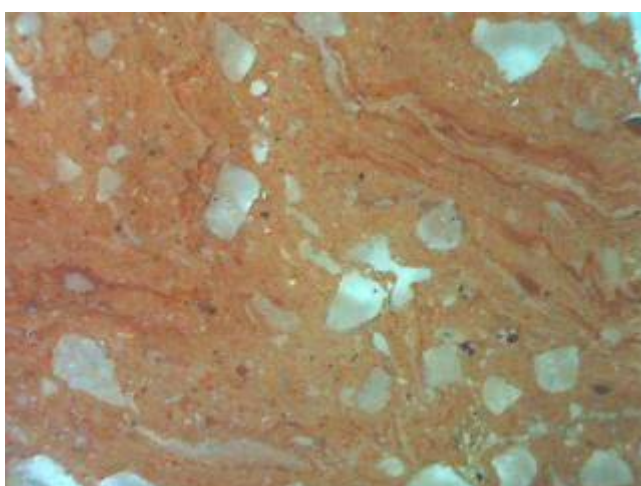


Figure 11

The jug thin section contains the following inclusion types:

- Quartz sandstone. Moderate fragments of subangular sandstone up to 1.5mm across composed of overgrown quartz and microcline grains with kaolinite in the interstices.
- The groundmass consists of opaque black baked clay minerals, except at the margins where the clay is off-white and anisotropic, with abundant angular quartz grains up to 0.2mm across and sparse muscovite laths up to 0.1mm long.

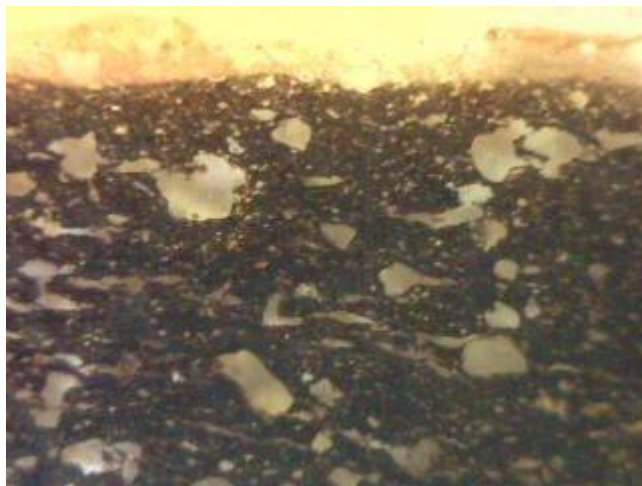


Figure 12 V5089

The ICPS data were compared with those from production sites at Baildon (Vince 2004b), Grantley (Vince 2004c) and Winksley (Bellamy and Le Patourel 1970) and with putative production waste from Sheffield (Vince 2008) and samples from Knaresborough (where there is documentary evidence for pottery production, Le Patourel 1968, but, as yet, no archaeological confirmation). Factor Analysis found six factors and a plot of the first two (Fig 7) showed that the pedestal lamp was indeed similar in composition to the York Gritty ware samples and that the jug sample was distinguishable from the Baildon, Winksley, Grantley and Knaresborough samples, being closest in composition to one of the two Sheffield samples and to the two York A samples from Bardsey. A plot of the third and fourth factor scores (Fig 8) confirms the similarity of the pedestal lamp to the York Gritty ware samples but separates the jug from the Sheffield samples, which all have higher F4 scores. The jug sample does, however, have similar F3 and F4 scores to the various production waste samples of Northern Gritty ware.

These results suggest that the pedestal lamp may well be a product of the same industry as the York Gritty ware whilst the jug sample is probably from an unsampled Northern Gritty ware source.

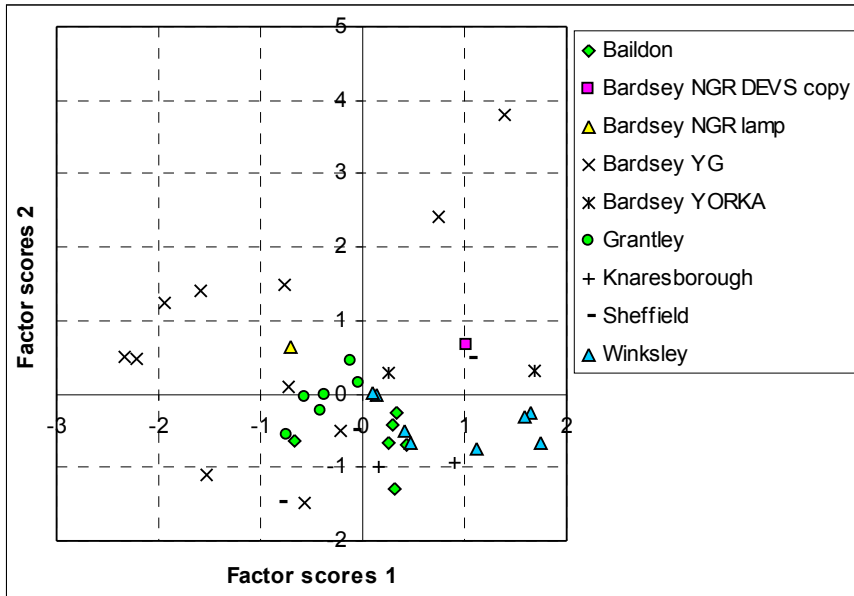


Figure 13

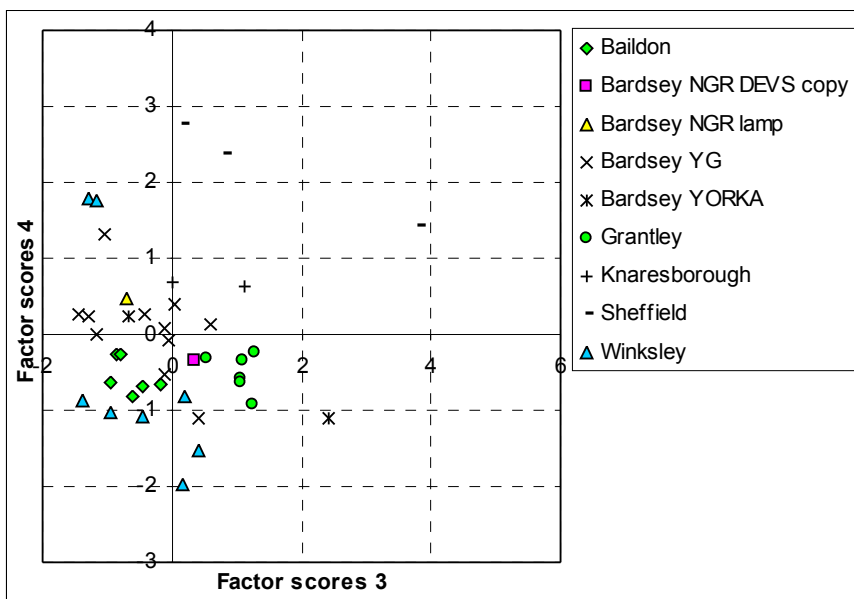


Figure 14

Floor tile

The tile sample was thin sectioned and the following inclusion types were noted:

- Quartz sandstone. Moderate angular fragments of sandstone up to 1.5mm across composed of overgrown quartz and feldspar grains with kaolinite cement.
- Clay pellets. Sparse dark red rounded pellets up to 0.5mm across.
- The groundmass consists of red optically anisotropic baked clay minerals with sparse angular quartz and muscovite laths up to 0.1mm long.

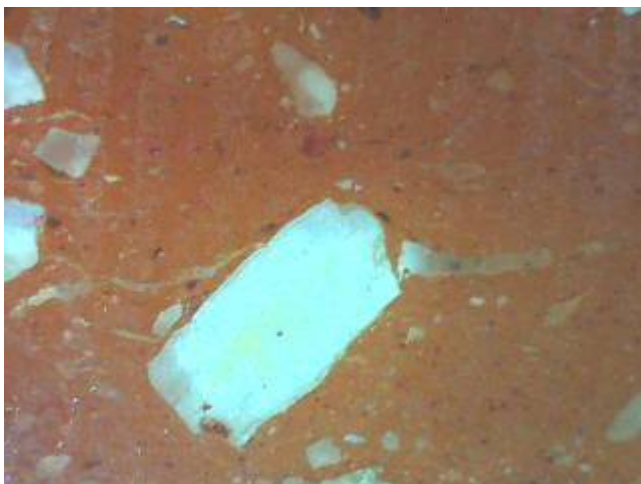


Figure 15 V5088

The ICPS data was compared with that from samples of Northern Gritty ware, Follifoot ware (a late medieval glazed red earthenware), Humberware and York Gritty ware. Despite the colour, the tile sample is as similar to Northern Gritty and York Gritty wares as it is to Humberware, suggesting that it was probably made from a red-firing carboniferous clay, or a superficial clay derived from such a source. The plot of F3 against F4 scores, in fact, places the tile alongside York Gritty ware and York A ware and distinct from both Humberware and Northern Gritty ware. These features point to a fairly local source (Thorner and Potterton being less than 10 miles from Bardsey). This is not, however to say that the tile was made at either centre.

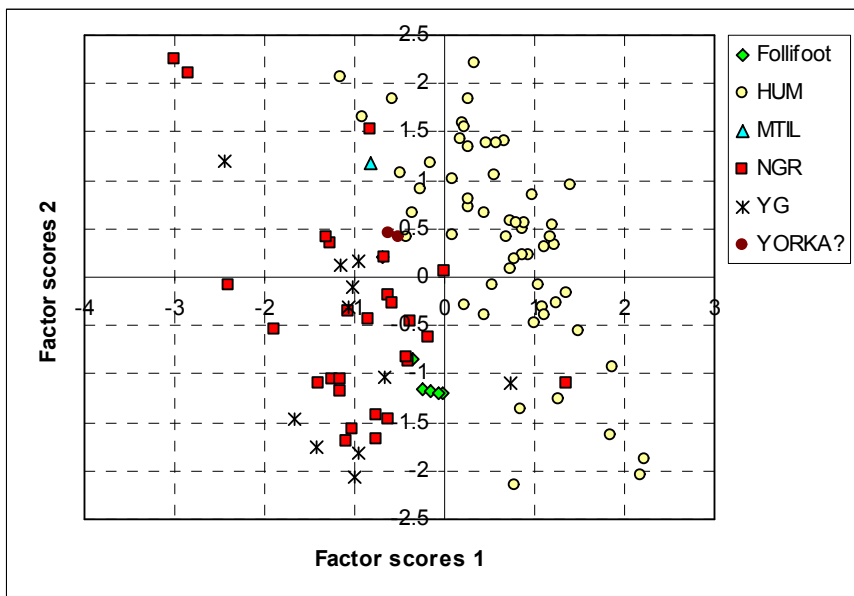


Figure 16

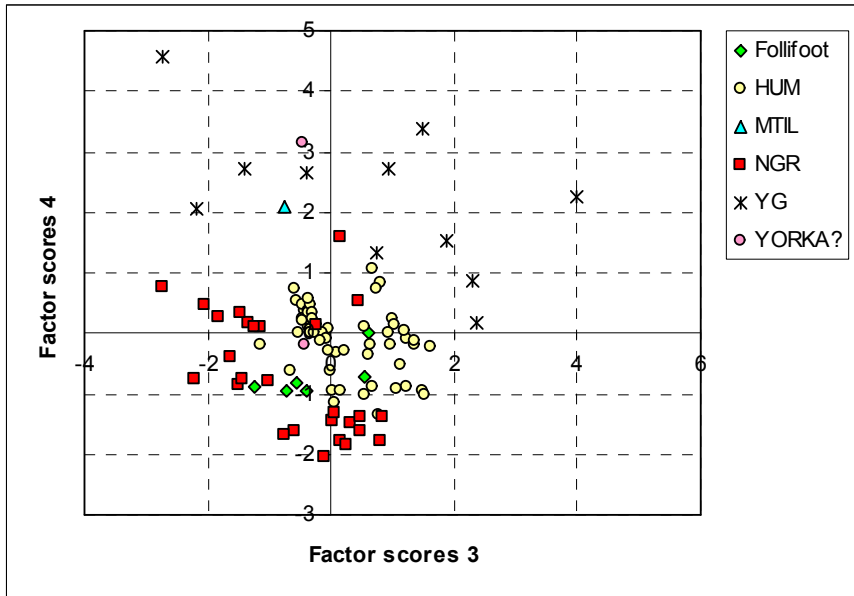


Figure 17

Conclusions

The thin section and chemical analyses indicate that the two York A ware samples from Bardsey might be from the Thorner production site but that they (and several other samples from consumer sites) do not match the samples of waste from the site published by Roberts and Cumberpatch (Cumberpatch and Roberts 1998-1999). The York Gritty ware, however, despite being visually atypical is clearly made from the same raw materials as samples from York and elsewhere. These analyses confirm that unglazed jugs with strap handles attached at the rim, jars with roller-stamped decoration and pedestal lamps were part of the York Gritty ware repertoire. The “Northern Gritty ware” pedestal lamp may well be another York Gritty ware vessel, misclassified because of its higher iron content in the groundmass. The Northern Gritty ware jug made in the Developed Stamford ware tradition, however, is clearly a true example of Northern Gritty ware, but not produced at any of the sampled production sites. Finally, the floor tile can be shown to be a local, West Yorkshire, product, and its similarity to the York A and York Gritty ware samples in chemical composition, both of which were produced a few miles to the south of Bardsey, suggests a similar source area for the tile. This is supported by the thin section, which shows similar characteristics to the Thorner wasters and York A ware (but again with no baryte grains present).

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Appendix 1

TSNO	Al2O3	Fe2O3	MgO	CaO	Na2O	K2O	TiO2	P2O5	MnO
V5074	18.64	4.54	0.83	0.46	0.50	1.25	0.69	0.26	0.068
V5075	22.66	6.89	0.72	0.40	0.21	1.91	0.76	0.29	0.047
V5076	25.03	5.95	0.56	0.91	0.17	1.98	0.70	2.93	0.014
V5077	25.75	6.01	0.67	0.34	0.19	1.90	0.87	0.60	0.013
V5078	23.84	6.38	0.60	0.47	0.21	1.81	0.80	0.87	0.018
V5079	23.46	3.45	0.82	0.31	0.31	2.72	0.91	0.16	0.020
V5080	29.27	7.22	0.78	0.28	0.19	2.08	0.92	0.33	0.024
V5081	25.52	3.85	1.01	0.40	0.20	2.75	0.86	0.54	0.071
V5082	23.28	2.76	0.88	0.37	0.33	2.67	0.86	0.52	0.023
V5083	20.38	3.97	0.68	0.32	0.40	2.62	0.89	0.54	0.020
V5084	23.66	2.99	0.86	0.31	0.28	2.67	0.96	0.15	0.013
V5085	21.44	3.36	0.71	0.41	0.38	2.62	0.91	0.19	0.014
V5086	25.58	6.82	0.89	0.26	0.25	2.47	0.91	0.25	0.017
V5087	20.73	6.13	1.07	0.23	0.27	2.56	0.76	0.11	0.032
V5088	24.50	8.99	1.31	0.17	0.33	3.43	0.76	0.33	0.021
V5089	20.85	4.67	0.83	0.49	0.40	1.66	0.81	0.53	0.027

Appendix 2

TSNO	Ba	Cr	Cu	Li	Ni	Sc	Sr	V	Y	Zr*	La	Ce	Nd	Sm	Eu	Dy	Yb	Pb	Zn	Co
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V5074	3,063	72	28	103	61	16	74	98	24	56	42	71	43	7	2	4	2	206	97	13
V5075	971	120	16	45	55	17	1,408	80	20	75	62	93	61	5	1	3	3	23	48	14
V5076	4,902	109	17	55	29	16	642	86	15	55	50	71	49	3	1	2	2	25	75	10
V5077	799	134	15	53	31	19	1,466	90	17	58	67	103	65	7	1	2	2	27	37	12
V5078	1,761	117	13	50	23	17	819	116	20	60	56	86	55	5	1	3	2	28	39	10
V5079	3,254	84	15	53	16	15	898	77	10	31	60	102	58	7	1	2	1	33	23	14
V5080	988	126	14	42	31	20	815	97	14	50	58	91	56	6	1	2	2	49	39	14
V5081	796	103	27	81	25	19	2,637	109	16	77	76	134	74	13	2	3	2	21	32	14
V5082	10,459	92	11	62	18	17	970	79	8	40	61	106	58	5	1	1	1	21	26	11
V5083	8,700	87	27	55	17	16	531	82	39	39	73	116	73	10	2	5	3	51	26	11
V5084	6,067	81	14	61	16	17	949	89	12	41	68	114	65	9	1	2	1	29	22	11
V5085	4,341	110	14	68	13	15	873	78	11	30	63	106	61	8	2	2	1	21	20	10
V5086	833	109	11	99	39	20	1,257	109	20	48	67	107	66	10	2	3	2	25	42	15
V5087	730	114	10	99	45	17	113	91	25	35	69	105	69	11	2	4	2	23	64	16
V5088	2,950	136	11	74	50	24	333	119	27	57	63	103	63	9	2	4	3	27	60	14
V5089	1,413	115	31	54	38	17	98	103	23	50	56	90	56	7	2	4	2	814	54	13