Characterisation Studies of Roman Pottery from Gedling and Margidunum, Nottinghamshire

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As part of the post-excavation analysis of the Roman pottery from an excavation at Gedling, Nottinghamshire, three samples of early Roman date (pre- or early Flavian) were selected for comparison with material from the Roman town of Margidunum, excavated by the University of Nottingham.

Table 1

TSNO	cname	Sitecode
V4543	RPOT	GTI06
V4544	RPOT	margidunum
V4545	RPOT	GTI06
V4546	RPOT	margidunum
V4548	RPOT	GTI06
V4549	RPOT	margidunum

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http://www.avac.uklinux.net/potcat/pdfs/avac2008009.pdf

The Gedling samples are of three distinct types: a rusticated girth beaker, an oxidised cordoned beaker or jar and the coarse ware of the group formerly known as Trent Valley ware.

Thin Section Analysis

V4543

The following inclusion types were noted:

- Quartz. Moderate well-rounded grains up to 0.3mm across.
- Chert. Sparse rounded fragments up to 0.5mm across.
- Siltstone/Fine sandstone. Sparse rounded fragments up to 0.4mm across.
- Mudstone. Sparse rounded pellets up to 0.4mm across. These are finer in texture than the groundmass but similar in colour.
- Organic mudstone. Sparse almost opaque rounded elongated grains up to 0.4mm across.
- Clay/iron. Sparse rounded pellets with mottled and oolitic dark brown and brown colour up to 0.5mm across.

The groundmass consists of dark brown optically anisotropic baked clay minerals, moderate angular quartz up to 0,05mm across, sparse muscovite laths up to 0.1mm long and sparse dark brown grains up to 0.05mm across.

Interpretation: the rounded quartz, siltstone/fine sandstone and chert are all consistent with a Trent valley cover sand derived from Triassic strata. The groundmass is siltier than most ceramics made from Triassic marls or Lower Jurassic clays although the dark brown grains in the groundmass, which are probably faecal or bacterial in origin, are found in Jurassic clays in the east Midlands. Mudstones occur in both the Triassic clays (the Mercian Mudstone) and in facies of the Lower Jurassic (e.g. the Upper Lias).

V4544

The following inclusion types were noted:

- Quartz. Sparse subangular grains up to 0.3mm across.
- Opaques. Rare rounded grains up to 0.2mm across.
- Siltstone. Sparse rounded grains up to 0.3mm across.
- Chert. Sparse rounded grains up to 0.3mm across.

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

Interpretation: inclusions over 0.1mm across are uncommon in this fabric but are typical of Triassic sands and cover sands derived from them. Silty, micaceous clays of this sort are rare in the Trent valley, except for estuarine clays in the Humber estuary and lower Trent valley.

V4545

The following inclusion types were noted:

- Shell. Abundant shell-shaped voids up to 0.5mm long filled with brown phosphate.
- Opaques. Rare rounded grains up to 0.3mm across.

The groundmass consists of optically anisotropic baked clay minerals and rare angular quartz grains up to 0.1mm across.

Interpretation: although the shell is completely leached and replaced, this is quite likely to be the same fabric as V4546.

V4546

The following inclusion types were noted:

- Shell. Moderate non-ferroan calcite bivalve shell fragments up to 0.5mm long.
- Punctate Brachiopod shell. Sparse non-ferroan calcite shell.
- Echinoid shell. Sparse non-ferroan calcite shell fragments.
- Marl. Rounded fragments containing ferroan calcite, bivalve shell, punctate brachiopod shell and echinoid shell in a clay groundmass similar to that of the matrix.
- Echinoid spines. Rare up to 0.2mm across in section and up to 1.0mm long.

The groundmass consists of optically anisotropic baked clay minerals, ferroan calcite fragments and rare angular quartz grains up to 0.1mm across.

Interpretation: this is probably a lower Jurassic (or possibly Rhaetic) shelly marl. Similar fossil suites occur in the Humber valley, immediately north of the river and east of the Wolds, and in north Lincolnshire. The latter include Dales Shelly ware, which, by contrast with this sample, has a silty groundmass.

V4548

The following inclusions were noted in thin section:

- Quartz. Sparse well-rounded monocrystalline grains up to 0.3mm across. Sparse well-rounded monocrystalline grains with a lower sphericity, perhaps of lower

Cretaceous origin. Abundant angular and subangular grains ranging from less than c.0.1mm to c.0.3mm.

- Chert. Rare rounded grains up to 0.3mm across.
- Muscovite. Sparse laths up to 0.3mm long.
- Opaques. Rare angular fragments up to 1.0mm across.

The groundmass consists of dark brown optically anisotropic baked clay minerals, with laminae filled with brown phosphate.

Interpretation: the texture of this fabric is not typical of Trent valley sands, nor is the presence of Lower Cretaceous grains usual. A non-local origin is therefore possible but the section includes too few distinctive traits to indicate the source.

V4549

The following inclusion types were noted in thin section:

- Quartz. Abundant well-rounded monocrystalline grains up to 0.4mm across.
- Chert. Sparse rounded grains up to 0.3mm across.
- Sandstone. Sparse rounded grains up to 0.4mm across containing quartz grains up to 0.2mm across.
- Siltstone. Sparse rounded grains up to 0.4mm across.
- Calcareous grains. Sparse non-ferroan calcite grains, mostly partially replaced by brown phosphate, up to 0.5mm across.
- Grog. Moderate angular fragments of isotropic light grey grog up to 1.0mm across, some showing signs of laminated structure and containing rounded quartz inclusions. These fragments have a different texture to the groundmass.

The groundmass consists of dark brown, optically isotropic baked clay minerals with rare angular quartz inclusions up to 0.1mm across.

Interpretation: the quartzose sand in this sample is composed entirely of material likely to be of Triassic origin and typical of the Trent valley. The clay matrix is fine-textured and similar to lower Jurassic clays which outcrop in the Trent valley. The grog has been deliberately added as crushed pottery.

Chemical Analysis

Samples of each vessel were prepared and submitted to Royal Holloway College, London, where they were analysed using Inductively-coupled Plasma Spectroscopy under the supervision of Dr J N Walsh. A range of major elements was analysed and expressed as percent oxides (App 1) and a range of minor and trace elements was measured and

expressed as parts per million (App 2). The data were normalised to aluminium and the relationships between the various samples was examined using the Factor Analysis program from WinSTAT for Excel (2002).

The four untempered or sand-tempered samples were compared with data from samples of known origin from sites in the Trent Valley and neighbouring areas:

- Doncaster (samples of Roman greywares, analysed as possible Late Saxon imports, presumably locally-made)
- Newark (two samples of Newark Torksey-type ware).
- Roxby (samples of greyware and oxidised ware wasters and comparable material from a consumer site at Melton, East Yorkshire)
- Torksey (samples from the seven kilns excavated by Barley in the 1960s).

Factor analysis was carried out and a bi-plot of the first and second factors (Fig 1) indicated that the sample from Gedling (V4548) with a illsorted quartz sand temper which included lower Cretaceous grains does not match any of the Trent valley comparanda. The remainder are more similar in chemical composition to Torksey products than to any of the other comparanda. However, a bi-plot of the third and fourth factors (Fig 2) separates all of the Margidunum and Gedling sandy wares from the Torksey wares and especially the two samples with a silty groundmass (V4543 and the Margidunum silty sample, V4544). Assuming that the Late Saxon Torksey wares have similar compositions to the Roman Trent valley greywares from the same areas, then this result probably allows us to discount the lower Trent valley as a source for any of the Gedling or Margidunum samples.

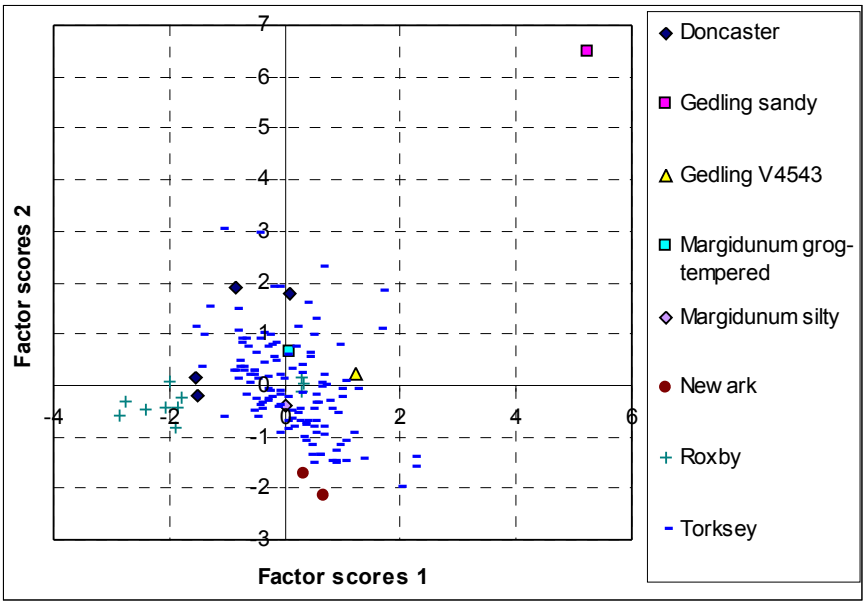

Figure 1

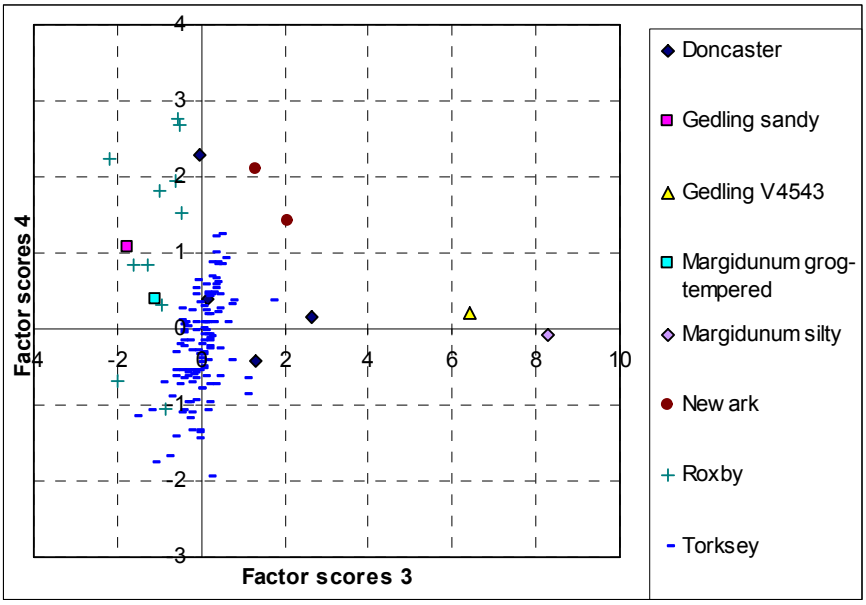
Factor scores 4
Factor scores 3
4
3
2
1
0
-1
-2
-3
-4
-2
0
2
4
6
8
10
Doncaster
Gedling sandy
Gedling V4543
Margidunum grog-tempered
Margidunum silty
New ark
Roxby
Torksey

Figure 2

The shell tempered wares differ in petrology. There is no sign of echinoid shell or punctate brachiopod in V4545, although all of the shell in this sample has been leached and replaced by brown phosphate. Nevertheless, it is likely that these distinctive types would be recognisable even by the voids left by the leached shell. Therefore, there is no reason to suppose that the two samples have the same source.

Shell temper in which the shell consists almost entirely of bivalve shell or calcareous cement are common in the mid Saxon period in central and northern Lincolnshire (MAXQ and MAX respectively) and were probably also present in the Roman period. A similar fabric occurs on sites in the Thames basin in the late Saxon period, although it is thought to have been produced in Oxfordshire, exploiting deposits of Oxford clay (London LSS). Samples of these two fabrics were compared with V4545.

Factor analysis of this data revealed four factors and a bi-plot of F1 versus F2 (unillustrated) showed that all of the comparanda form a single cluster with the Gedling sample separated by its F2 score. The bi-plot of F3 against F4 also shows the Gedling sample as an outlier but also separates the London LSS from the Northern Maxey-type ware samples (Fig 3, in which the Gedling sample is shown as “SHEL”).

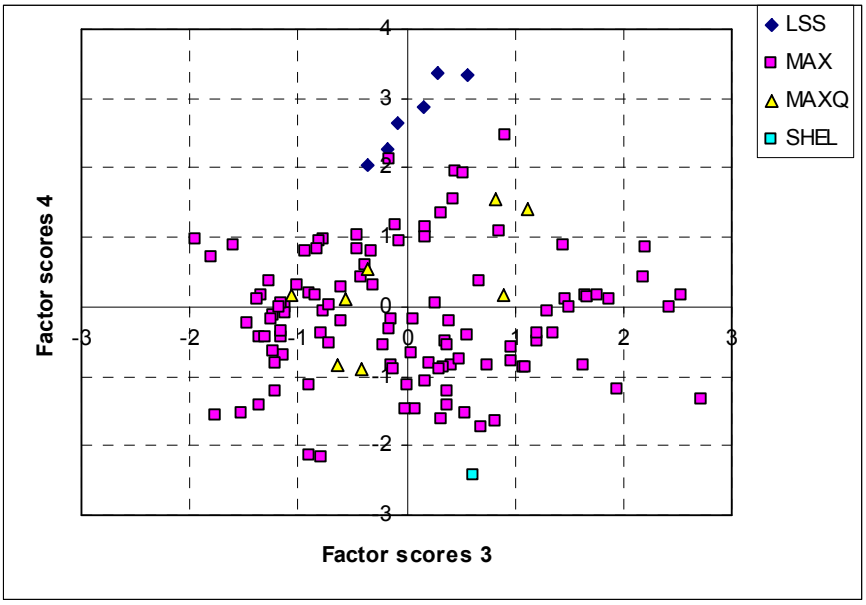

Figure 3

Shelly wares containing punctate brachiopods and echinoid shell and spines occur in East Yorkshire in the Iron Age, but apparently not in the Roman period; North Lincolnshire (Dales ware, which has fine quartz sand in the groundmass, absent in the Margidunum fabric, and LOOL, which is mainly handmade, and also has fine sand/coarse silt inclusions in the groundmass, together with opaque ooliths of limonite). No other comparable local sources are known but similar wares occur in Cambridgeshire (Southern Maxey-type ware, RMAX, the Roman Haddon kiln, Vince 2003, and another Roman kiln at Earith. Similar wares were

also made in Bedfordshire, and samples of one such group, medieval shelly ware wasters from Harrold Middle School, have been analysed. Harrold is also the centre of the major late Roman shelly ware industry, although shelly ware was also produced in the area earlier (Brown 1994; Woods 1994). Factor analysis found four factors and a plot of F1 against F2 separates the Southern Maxey ware samples from the remainder (Fig 4) whilst a plot of F3 versus F4 (Fig 5) separates the Margidunum sample from the Haddon samples, leaving only the Earith and Harrold samples as potential sources. A factor analysis of just these three groups indicates that the Margidunum sample can be separated from both, but is more similar to the Harrold material than to the Earith wasters (Fig 6).

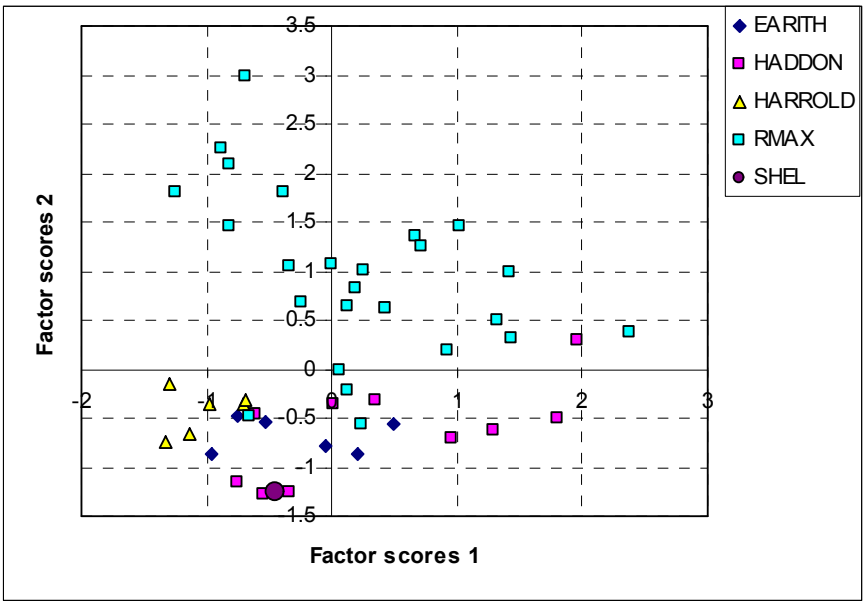

Figure 4

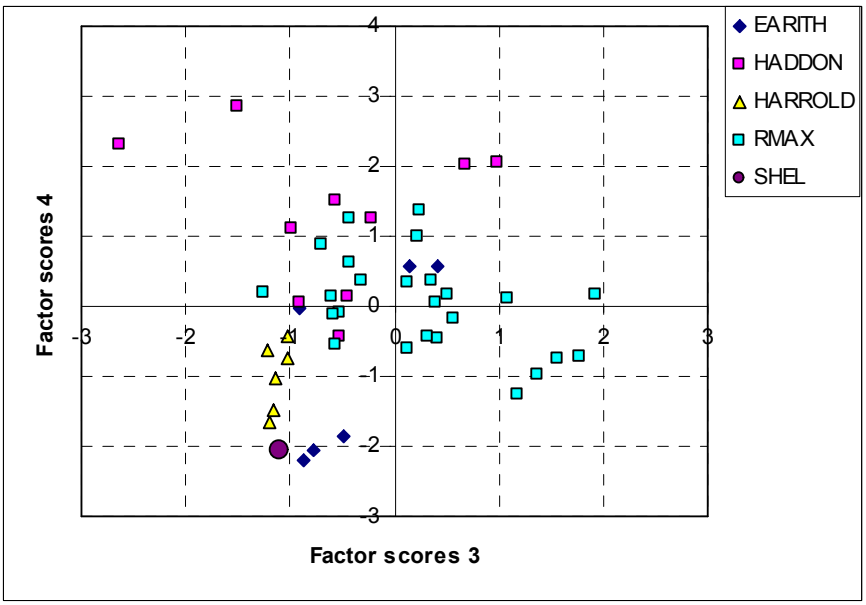

Figure 5

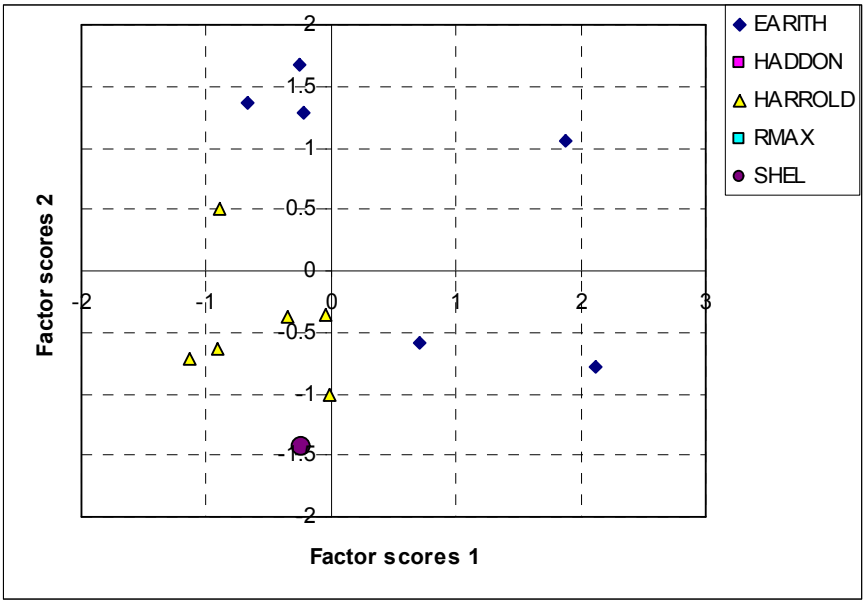
EARITH
HADDON
HARROLD
RMAX
SHEL
Factor scores 2
Factor scores 1
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2
-1
0
1
2
3

Figure 6

Conclusions

The Gedling and Margidunum samples all have differences in thin section and in chemical composition. Local sources (i.e. Trent Valley or surrounding areas) are possible for most of the sandy ware samples but one, V4548, does not appear to be a local product, which is remarkable given that it comes from a crude handmade vessel whilst two, V4543 and V4544, have a silty groundmass which is not typical of the lower Trent Valley.

In thin section the two shell-tempered wares can be distinguished from each other and from most local comparative material (although very little work has been undertaken on the characterisation of Lincolnshire Romano-British shell-tempered wares with the exception of Dales ware). No close parallel was found for the shelly ware from Gedling whilst the sample from Margidunum is close in composition and petrological characteristics to samples of medieval date from Harrold, Bedfordshire. Here too further comparative material is required.

Bibliography

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Appendix 1

TSNO	Al2O3	Fe2O3	MgO	CaO	Na2O	K2O	TiO2	P2O5	MnO
V4543	16.38	8.65	4.96	0.74	0.24	3.52	0.73	0.27	0.118
V4544	17.18	7.71	5.66	0.72	0.57	4.94	0.80	0.31	0.099
V4545	24.01	10.33	0.39	1.55	0.10	0.93	1.03	0.69	0.037
V4546	19.03	4.02	0.83	19.21	0.24	1.57	0.60	1.14	0.030
V4548	11.59	11.16	0.74	1.01	0.56	1.29	0.50	1.27	0.144
V4549	18.36	6.57	1.37	1.40	0.27	2.73	0.77	0.70	0.082

Appendix 2

TSNO	Ba	Cr	Cu	Li	Ni	Sc	Sr	V	Y	Zr*	La	Ce	Nd	Sm	Eu	Dy	Yb	Pb	Zn	Co
V4543	440	138	27	80	87	17	47	103	30	47	37	72	40	9	2	5	3	24	126	23
V4544	573	135	21	122	86	18	89	99	28	62	37	74	39	8	1	4	3	15	107	18
V4545	929	152	53	25	117	24	62	213	51	114	50	104	55	15	3	8	4	27	53	29
V4546	324	79	26	33	30	16	655	98	31	87	33	78	36	10	2	5	3	15	53	10
V4548	757	74	32	66	91	10	76	83	34	40	33	69	37	9	2	6	3	33	195	25
V4549	630	77	28	105	61	16	192	134	32	53	40	77	42	9	2	4	3	12	103	16