Characterisation of some Medieval Wares from Fremlin Walk, Maidstone (FWM03)

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Amongst the medieval pottery recovered from the Fremlin Walk excavations, Maidstone, were a number of sherds of glazed wares which from their splash glaze, body thickness and other characteristics appeared to be of 12th or 13th century date, contemporary with the first London-type ware and Tyler Hill ware. Visually, these wares appeared to be distinct from either of those wares and have a general similarity (all contain a sand which includes a high proportion of water-polished rounded quartz grains, for example). Four samples were taken to determine whether or not they form a single group and to establish whether the fabric(s) can be distinguished from London-type and Tyler Hill wares and from the products of the Maidstone kiln, which appears to be slightly later in date.

A single sample of medieval greyware was sampled. Visually, this fabric appeared similar to the greyware produced at Limpsfield and the chosen sample came from a bunghole pitcher, or cistern, a type which is mainly current in southeast England in the later medieval period. This sample was taken for comparison with the products of the Limpsfield industry and with the shelly wares, with which the fabric also has a strong resemblance.

Table 1

TSNO	Box	REFNO	Action	class	Cname	Subfabric	Form	Part
V2869			TS;ICPS	POTTERY	MEDLOC	M38A2?	CIST	BS
V2870			TS;ICPS	POTTERY	MEDLOC	M10B(M4?)	JUG	BS
V2871			TS;ICPS	POTTERY	MEDLOC	M4	JUG	BS
V2872			TS;ICPS	POTTERY	MEDLOC	M10B	JUG	B
V2873			TS;ICPS	POTTERY	MEDLOC	M10B	JUG	H

Thin Section Analysis

Thin sections of the five samples were produced by Steve Caldwell, Dept of Earth Sciences, University of Manchester, and stained using Dickson's Method (1965). Inspection of the sections indicates that they can be divided into four groups whose petrological characteristics are described below.

Group 1 (V2870, V2871)

The distinguishing characteristics of Group 1 are the presence of rounded micrite pellets and a rounded quartzose sand.

The following inclusion types were noted in thin section:

- Quartz. Abundant rounded grains, some with haematite coating and veins, up to 0.5mm across.
- Micrite. Sparse rounded fragments up to 1.0mm across, some with a brown halo of phosphate.
- Muscovite. Sparse laths up to 0.5mm long.
- Clay pellets. Sparse rounded pellets of silty clay, up to 1.0mm across. Some are poorly defined and appear to be lenses in the groundmass.
- Chalcedony. A single cross-section of a probable silicious sponge spine, 0.2mm across.

The groundmass is composed of optically anisotropic or isotropic (V2871) clay with steaks of dark brown clay/iron, sparse spherical dark brown grains, sparse quartz silt and few other inclusions.

Group 2 (V2869)

The distinguishing characteristics of Group 2 are a rounded quartzose sand with no micrite pellets.

The following inclusion types were noted in thin section:

- Quartz. As Group 1.
- Clay pellets. As Group 1.

The groundmass is poorly mixed and includes a large lens of quartz-free clay with moderate ferroan calcite microfossils up to 0.05mm across. Streaks of dark brown clay/iron and sparse spherical dark brown grains are present in the lens and the remaining groundmass (which is otherwise similar to Group 1.

Group 3 (V2873)

The distinguishing characteristics of Group 3 are the presence of abundant opaque grains in the groundmass.

The following inclusion types were noted in thin section:

- Quartz. As Group 1 but more abundant and containing some grains up to 1.0mm across
- Opaques. Rare rounded opaque grains up to 0.3mm across.

The groundmass consists of optically anisotropic baked clay minerals and abundant spherical dark brown/opaque grains (probably pyrites) up to 0.05mm across.

Group 4 (V2872)

The distinguishing characteristics of Group 4 are thin-walled shell fragments and large rounded fine-grained sedimentary rock fragments.

The following inclusion types were noted in thin section:

- Quartz. Moderate, poorly sorted rounded grains up to 1.0mm across, including examined with iron-stained veins.
- Chert. Sparse rounded grains up to 1.0mm across.
- Siltstone. Moderate rounded pellets ranging from c.0.5mm to 3.0mm across. The fragments vary in size range of quartz silt and in the ratio of quartz to clay minerals.
- Bivalve shell. Moderate thin-walled shell fragments composed of non-ferroan calcite, up to 1.0mm long.
- Ostracods. Sparse fragments up to 0.3mm long, some composed of non-ferroan calcite and others either voids or voids filled with phosphate.
- Opaques. Sparse rounded dark brown to opaque inclusions up to 1.0mm across.
- Phosphate. Sparse brown-stained fragments up to 0.3mm across.

The groundmass consists of optically anisotropic but mostly opaque black clay minerals with abundant angular quartz silt up to 0.05mm across and sparse muscovite laths up to 0.1mm long.

Chemical Analysis

Samples of each sherd were prepared by Peter Hill and analysed at Royal Holloway College, London, Department of Geology under the supervision of Dr J N Walsh using Inductively-Coupled Plasma Spectroscopy (ICP-AES).

A range of major, minor and trace elements were measured. The major elements were measured as percent oxides (App 2) and the remainder in parts per million (App 3). To counteract variations in composition brought about by the addition of quartz sand, the results were normalised to Aluminium. Silicon, which is not measured, was estimated by subtracting the total measured oxides from 100%. These estimates indicate that the silica content varied from 66% to 77%.

These normalised data show some variations between the groups, but because of the small size of the groups (mostly just one sample) their significance is limited. The data could, however, be compared with that from the five shell-tempered ware samples, which consist of four examples of North Kent Medieval Shell-tempered ware (NKMS) and one singleton (Shelly Group 3); samples from the medieval pottery kiln found on the site of the museum at Maidstone (Maidstone ware); and samples of Tyler Hill pottery and ceramic building material both from the production site just north of Canterbury and from a consumer site at Iwade.

This dataset of 28 analyses was analysed using Factor Analysis, using the Winstat for Excel package (). This found five Factors, accounting in total for almost 80% of the variability in the data.

A plot of the first two factor scores, F1 against F2, showed that the F1 scores separated the Tyler Hill pot and CBM and the shelly group 3 sample from the remainder whilst F2 distinguished Tyler Hill pottery from Tyler Hill CBM samples (the shelly sample grouping with the pottery). The weightings which contributed to the F1 score suggest that these high –F1 samples contain more titanium, magnesium, chromium, vanadium and iron than the Maidstone wares whilst the F2 scores are influenced mainly by differences in Rare Earth Elements (mainly Dysprosium, Neodymium, Lanthanum and Ytterbium).

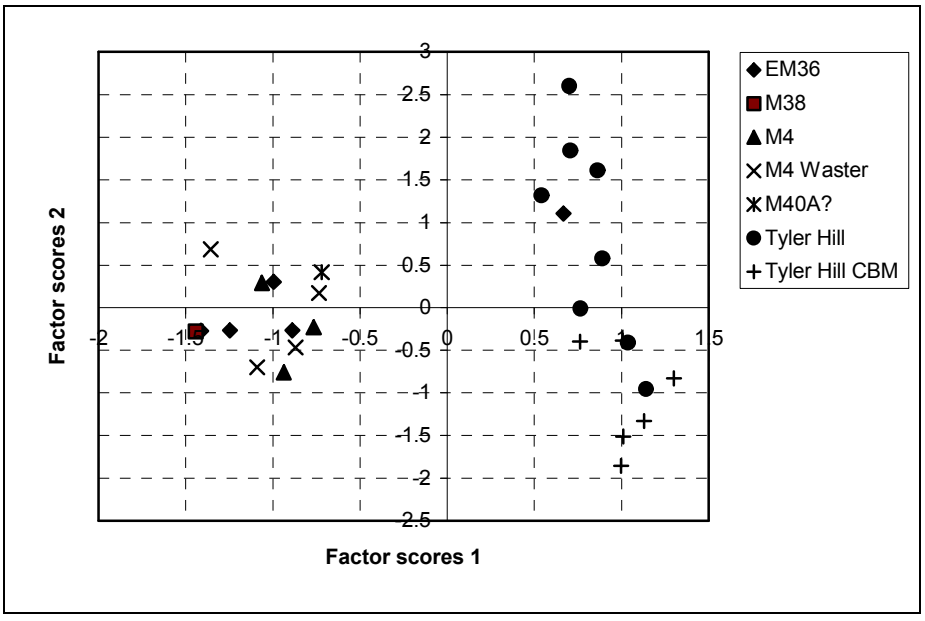

Figure 1

A plot of F3 against F4 (Fig 2) indicates that the F3 scores again distinguish some Tyler Hill CBM from Tyler Hill pottery (due mainly to Nickel and Cobalt weightings) whilst F4 scores separate the Maidstone kiln samples from the remainder. F4 scores depend on a wide range of elements.

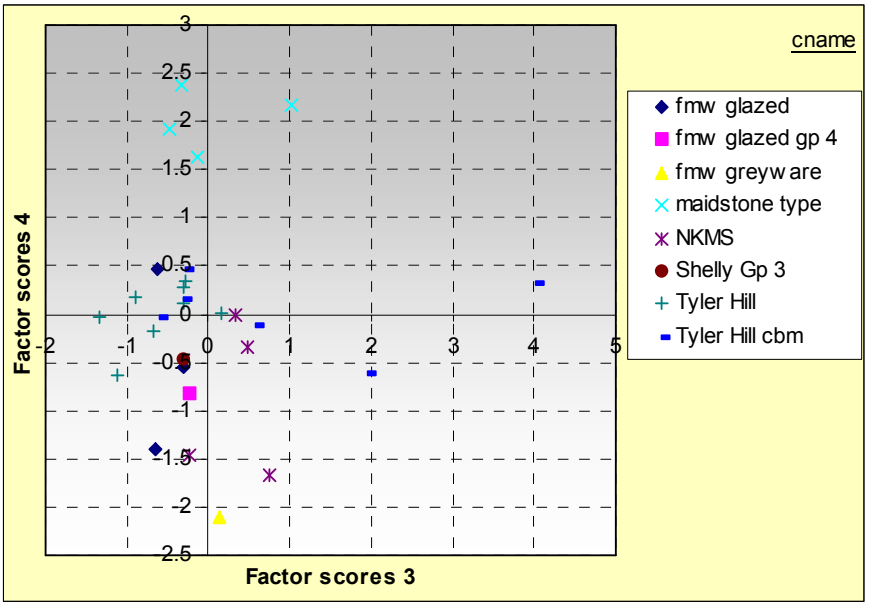

Figure 2

Finally, the F5 scores separate the Shelly Group 3 sample from the remainder. This is mainly due to Strontium.

Discussion

The thin sections indicate that Groups 1, 2 and 3 have very similar (or the same) quartzose sand. The micrite fragments in Group 1 might have entered the fabric together with the quartzose sand or they may have been present in the parent clay. It may be that the sample of Group 3, V2873, was made from a batch of clay which contained a large amount of pyrites. Furthermore, the section of Group 2, V2869, indicates the presence of two distinct clays in the groundmass, one of which contains microfossils.

This group of fabrics (Gps 1 to 3) shares a number of petrological characteristics with the shell-tempered wares from the site (with the exception of Shelly Group 3, which is from a different source). The chemical analysis shows some differences between the shelly and non-shelly wares but this is probably due in the main to the shell and other inclusions rather than to differences in the clay itself. Therefore, on the evidence of these few samples, it seems possible that a single production centre was supplying Maidstone with much of its shell-tempered ware, its sandy greyware (based on a single sample!) and with some of its glazed earthenware.

The degree of similarity of these wares is such that they can all be readily distinguished in thin section from the products of the Maidstone kiln and therefore their similarity is probably not due to the lack of variability in the chemical composition of locally-available potting clays.

Group 4, however, is very different both in its groundmass and inclusions and is therefore more certainly produced at a different centre from the remainder. Despite this, the chemical analysis shows that the Group 4 sample is more similar to other Maidstone samples than to samples from Tyler Hill and it is therefore suggested that it is the product of another local industry. The inclusion suite is consistent with an origin in an area of lower Cretaceous rocks.

In all cases, the petrology of the fabrics is sufficiently distinctive to suggest that it would be possible to locate the clay beds being used through a program of sampling and analysis of clays.

Appendix 1

TSNO	Al2O3	Fe2O3	MgO	CaO	Na2O	K2O	TiO2	P2O5	MnO
V2869	13.4	3.95	0.89	6.93	0.2	2.24	0.5	2.27	0.12
V2870	13.128	4.116	0.72	6.816	0.204	1.92	0.468	1.248	0.0492
V2871	15.69	4.53	0.99	8.56	0.22	2.22	0.62	0.7	0.073
V2872	14.99	4.91	0.83	1.93	0.25	2.24	0.67	1.23	0.063
V2873	12.85	4.88	0.6	1	0.15	2.04	0.51	1.09	0.07

Appendix 2

TSNO	Ba	Cr	Cu	Li	Ni	Sc	Sr	V	Y	Zr*	La	Ce	Nd	Sm	Eu	Dy	Yb	Pb	Zn	Co
V2869	583	83	27	75	60	12	249	92	16	58	29	66	31	4	1	4	2	47	118	18
V2870	594	82	32	67	50	12	204	91	22	55	31	60	33	5	1	4	2	3,948	65	16
V2871	468	91	19	116	59	14	263	107	19	62	32	60	33	5	1	4	2	339	66	17
V2872	523	101	28	74	44	14	186	114	21	67	39	73	41	7	1	4	2	195	91	18
V2873	297	93	25	33	35	12	132	103	17	63	29	53	30	5	1	3	2	952	46	12

Bibliography

Winstat for Microsoft (r) Excel. Fitch, Robert K. 2001.