Petrological analysis of Medieval Ely wares from consumer sites.

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Introduction

Following the discovery of medieval potting waste at Ely a project to characterise the products of the industry and to establish the distribution of Ely wares was instigated by Cambridgeshire County Council. The first stage of this project was to analyse a series of samples of medieval Ely wares from the Potters Lane site (Vince 2000). These wares were classified as Medieval Ely ware (MEL), Calcareous Medieval Ely ware (CMEL), Late Medieval Ely ware (LMEL) and Calcareous Late Medieval Ely ware (CLMEL). A single sample of Medieval Ely ware was assigned to a separate fabric group on this basis of its coarse texture (Medieval Ely ware - coarse variant, COARSE MEL). The petrological characteristics of these groups are summarised in Table 1. The conclusions of this study were that the late medieval wares may have been made from a glauconitic clay or were tempered with a sand rich in glauconite but that otherwise the tempering materials were similar throughout, with a fine quartz sand fraction present in all but COARSE MEL and a coarse sand/gravel present in varying quantities in all samples, but particularly common in COARSE MEL. The carbon-rich nature of the late medieval Ely clays may suggest that an organic clay was being used in the late medieval period which may either indicate that clay pits were being dug deeper, into unweathered clay, or that a difference source of clay was being used. However, in the few oxidized examples of late medieval wares the same laminated clay with streaks of darker brown clay were noted, which would favour the former over the latter interpretation. Furthermore, it is clear from the present study that carbon-rich fabrics are typical of medieval Ely wares from consumer sites.

Table 1

Ware	Quartz	Rounded Flint	Opaques	Chalk	Glauconite	Others	Groundmass
COARSE MEL	Rounded 'Greensand' with some iron-staining	Stained and patinated	Rounded red with matt surface	Sparse	None noted	Fish bone?, ferroan calcite echinoid shell	Laminated
MEL	Mainly subrounded and	Sparse	Sparse	Sparse	Altered grains present	Ferroan calcite, non-	Laminated

	less than 0.5mm but some rounded 'Greensand'					ferroan calcite bivalve	
CMEL	As MEL	Sparse	Sparse	Sparse	None noted	Chert, sandstone with bivalves	Laminated, possibly more silt than MEL
LMEL	As MEL	Sparse, less than in MEL	Sparse	Sparse	Altered and fresh		Mainly either isotropic or carbon-rich but otherwise like MEL
CLMEL	As MEL	Sparse	Sparse	Sparse	Altered	Glauconitic sandstone, bivalve	As LMEL

In this second stage, samples of the five characterised Ely wares from consumer sites in Ely and elsewhere were thin-sectioned together with a Chalky Ely Ware (CHEL) and sherds which were tentatively identified as Bourne/Baston or Ely products. A sample of waster sherds from the Bourne and Baston medieval pottery industries was therefore included in the study (Table 2).

Table 2

Locality	site name	County	Sitecode	No of samples	TS nos
Ely	Jubilee Terrace	Cambridgeshire	ELYJT95	6	V828-V833
Ely	Lisle Lane	Cambridgeshire	ELYLL95	5	V823-V827
Huntingdon	St Germain Street	Cambridgeshire	HUNSTG99	1	V834
Huntingdon	Stukeley Road	Cambridgeshire	HUNSR99	4	V835-V838
Orton Longueville	Botolph Bridge DMV	Cambridgeshire	ORLBB00	3	V820-v822
Peterborough	The Still	Cambridgeshire	PETTS95	3	V817-V819
Ramsey	Ramsey Abbey	Cambridgeshire	RASAB96	5	V843-V847
Swavesey	Blackhorse Lane	Cambridgeshire	SWABL99	2	V848-V849
Swavesey	School Lane	Cambridgeshir	SWASL97	3	V850-

		e			V852
Wisbech	Market Mews	Cambridgeshire	WISMM96	5	V839-V842, V853
Kings Lynn	Baker Lane	Norfolk	KL 69 BL	2	V877-V878
Kings Lynn	Marks and Spencer	Norfolk	KL M&S	3	V874-V876
Bourne	Commercial Garage, Eastgate	Lincolnshire	Bourne	5	V901-V905
Baston	Hall Farm	Lincolnshire	BHF93	5	V906-V910

Petrological Descriptions

COARSE MEL

A single sample of this fabric was submitted, V831. In addition, however, another three sherds have characteristics in thin section which enable them to be assigned to this fabric: V826, V830 and V840. The flint in V840 was angular and fresh rather than the rounded, stained flint in the other three samples. This fabric also contained a fragment of Lower Greensand chert. Only one sample had laminae of different colour clays and two have the carbon-rich cores which at Potters Lane were typical of late medieval Ely wares. With these exceptions, the sherds all had similar characteristics to each other and to the one sample of this fabric from Potters Lane.

MEL

Of the remaining samples of MEL, 38 samples in total, the majority contained the same range of inclusions as those from Potters Lane: abundant subangular quartz with sparse larger rounded quartz grains, some with definite characteristics of quartz from the Greensand and similar Cretaceous deposits; sparse rounded opaque grains; sparse rounded stained flint and angular fresh flint; sparse rounded chalk fragments; rounded nacreous bivalve shell (non-ferroan calcite), sparry ferroan calcite (cement from a limestone), ferroan calcite microfossils; non-ferroan calcite shells of *inoceramus* and/or similar large flat molluscs and a range of minor inclusions. These include echinoid shell and spines, fossil bone and lower Greensand chert. Altered glauconite grains were noted in a few sections, but almost always as single grains. Most of these sections had carbon-rich fabrics with thin oxidized margins and surfaces and very few had any evidence for variegated clay matrices (six sections in total). Comparison with the Bourne and Baston wares indicates that the calcareous inclusions in those wares is probably of Jurassic origin (as befits their source) and thus it is the presence of chalk which is distinctive of MEL. There were a few sections where chalk was either definitely never present or where the calcareous inclusions were too badly altered by firing for positive identification. These are listed in Table 3.

TSNO	Chalk?	Other diagnostic inclusions	Conclusion
V817	Not present	Rounded flint, rounded opaques, carbon-rich body, laminated clay pellets, calcareous fine-grained sandstone, nacreous bivalve shell, ferroan calcite.	Could be Bourne/Baston ware
V824	Some rounded voids may once have contained chalk	Rounded flint, Rounded opaques, some limestone fragments (ferroan calcite) but generally low in calcareous inclusions.	Probably MEL
V825	Not present	No flint, no rounded opaques (but silt-sized TiO-rich minerals are present), sparse quartz silt in groundmass	Not MEL and no evidence for likely source area
V835	Not present	Rounded flint, no rounded opaques, calcareous inclusions include echinoid shell fragments	Probably MEL
V839	Not present	Not a calcareous fabric. No flint or rounded opaques	Not MEL and no evidence for likely source area

V842	Not certain - heat altered		Probably MEL
V846	Not certain - heat altered		Probably MEL
V847	Not certain - heat altered		Probably MEL
V848	Not certain - heat altered		Probably MEL
V852	Not present	Possibly no Greensand quartz, no flint, and quartz sand is finer than normal. Echinoid shell is present.	Probably not MEL and no evidence for likely source area
V853	Not present	Rounded flint, no rounded opaques (TiO silt present). One large rounded calcareous nodule.	Not MEL and no evidence for likely source area

In addition, several of the thin-sections revealed finer-textured quartz sand than in the Potters Lane samples or in the remainder of the current collection. These samples are: V838, V842, V843, V844, V845, V846, V847, V874. Three of these samples have already been noted because the calcareous inclusions were heat altered. They did, however, contain other calcareous inclusions which could be identified, including echinoid shell and nacreous bivalve shell. The fact that these samples include no example from Ely and all of the Ramsey Abbey samples, suggests that they may come from a separate source but the rounded opaque grains and positive identification of rounded chalk in four sections distinguishes the group from the Bourne/Baston wares.

No differences were noted between the sherds identified by eye as Calcareous Medieval Ely, and Late Medieval Ely ware and those identified as MEL. The samples of 'Grimston soft ware' (GSW) each had petrological characteristics which suggest that they are Ely products. However, three of the four samples contained fresh angular flint fragments, which is unusual and in two cases (V877 and V878) the samples contained abundant specks of iron pyrites, both as alteration of the haematite in the rounded opaque grains and coating the boundaries of clasts and laminae. This material is presumed to be due to burial conditions.

Bourne and Baston wares

The samples of Bourne ware come from a known kiln site and were chosen so as to cover the visual range of textures present in the kiln's products. Those from Baston, on the other hand, were found on excavation of a domestic plot and recognised as wasters or seconds because of the presence of warping or glaze over broken edges. There is thus a likelihood of the Baston sherds being atypical of the Baston industry (which is known to have existed through documentary records) and certainly all five Baston samples have isotropic clay matrices. This relatively high firing temperature also makes it difficult to study the calcareous inclusions although none appear to have been completely burnt out, which places an upper limit on the original firing temperature.

There are four quite distinct fabrics present within the Bourne/Baston samples, approximately but not completely corresponding to the two separate sources:

a) Abundant very fine sand (ie up to 0.2mm across) and little calcareous material V901, V902, V903, V905, V908

b) Moderate rounded sand and little calcareous material V904

c) Abundant very fine sand and abundant calcareous material V909

d) Moderate rounded sand and abundant calcareous material V906, V907 and V910

The rounded sand includes a few fragments which have a cement of non-ferroan micrite still adhering to them and it is clear that some, if not all of this rounded sand is derived from a calcareous sandstone. Angular flint is not found in these samples and the rounded cryptocrystalline silica grains which are present (but not common) are more probably cherts. Similarly, the rounded opaque haematite grains which characterise Medieval Ely wares are either absent or rare in the Bourne and Baston sections and where they do occur they are less well-rounded and often have a spongy texture. Instead, small silt-sized fragments, probably of TiO, occur in all of these samples, even in sections where very fine sand is absent. Thus they are likely to have been present in the clay itself rather than the fine sand. There is no chalk and no glauconite in any of the sections. Almost all of the sections contained one or two large rounded pellets of laminated clay (clay relicts). The calcareous inclusions are in the main purple-stained micrite with some nacreous bivalve shell. Some appear to be calcareous nodules, with a vaguely concentric structure. However, one section contained an echinoid spine (V903). However, the fragments of *inoceramus* shell found in the medieval Ely wares was not found in these sections, and neither were ferroan calcite microfossils.

Finally, it was noted that the clay matrix of both groups of samples was often laminated with slight evidence for variegation. There was not, however, any correspondence between the incidence of laminated clay pellets and laminated groundmass.

Thus, there are several diagnostic features which will allow medieval Ely wares to be distinguished from Bourne/Baston wares. On the basis of the samples examined it is possible that Baston wares are more calcareous than those from Bourne, although this separation was not perfect and one Baston sample, V908, contained no calcareous inclusions at all and neither was there any evidence that such inclusions had ever been present.

Bibliography

Vince, A G (August 2000) *Characterisation studies of medieval pottery from Potter's Lane, Ely 1995.* Report prepared for Cambridgeshire County Council.