Data from this report is used in Abrams & Ingham (2008)

Characterisation Studies of Iron Age Pottery from the A428 Caxton to Hardwick Improvement Scheme, Cambridgeshire (CH1131)

[Abrams and Ingham 2008, CD-Rom Appendix 6]

Alan Vince

Samples of Iron Age pottery and natural clay from archaeological sites excavated on the line of the A428 Caxton to Hardwick Improvement Scheme were submitted for characterisation. The samples were first examined at x20 magnification using a binocular microscope and then thin sections were produced (Table 1).

TSNO	REFNO	Sitecode	Context	class	cname	subfabric
V3673		ch1131 site 3	NATURAL	POTTERY	CLAY	
V3674		ch1131 site 8	NATURAL	POTTERY	CLAY	
V3676	SAMPLE 5	ch1131 site 2	20190	POTTERY	IASST	Q7
V3677	SAMPLE 10	ch1131 site 7	70032	POTTERY		Q6
V3678	SAMPLE 12	ch1131 site 7	70116	POTTERY		Q7
V3679	SAMPLE 14	ch1131 site 7	70174	POTTERY		Q7
V3680	SAMPLE 07	ch1131 site 7	70194	POTTERY		S2
V3681	SAMPLE 17	ch1131 site 7	70198	POTTERY		Q8
V3682	SAMPLE 11	ch1131 site 7	70262	POTTERY		Q6
V3683	SAMPLE 19	ch1131 site 7	70356	POTTERY		Q9
V3684	SAMPLE 13	ch1131 site 7	70357	POTTERY		Q7
V3685	SAMPLE 15	ch1131 site 7	70376	POTTERY		Q8
V3686	SAMPLE 04	ch1131 site 7	70386	POTTERY		Q6
V3687	SAMPLE 18	ch1131 site 7	70419	POTTERY		Q9
V3688	SAMPLE 09	ch1131 site 7	70429	POTTERY		Q6
V3689	SAMPLE 06	ch1131 site 7	70460	POTTERY		S2
V3690	SAMPLE 16	ch1131 site 7	70507	POTTERY		Q8
V3691	SAMPLE 02	ch1131 site 8	80017	POTTERY		S2
V3692	SAMPLE 01	ch1131 site 8	80006	POTTERY		Q9
V3693	SAMPLE 20	ch1131 site 8	80037	POTTERY		Q9
V3694	SAMPLE 08	ch1131 site 8	80034	POTTERY		S2
V3695	SAMPLE 03	ch1131 site 8	80034	POTTERY		Q8
V3783	SAMPLE 21	ch1131 site 2	20190	POTTERY		Q3
V3784	SAMPLE 22	ch1131 site 7	70174	POTTERY		Q3
V3785	SAMPLE 24	ch1131 site 8	80034	POTTERY		Q3
V3786	SAMPLE 25	ch1131 site 8	80037	POTTERY		Q3
V3787	SAMPLE 23	ch1131 site 7	70507	POTTERY		Q3

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http://www.postex.demon.co.uk/index.html

A copy of this report is archived online at
http://www.avac.uklinux.net/potcat/pdfs/avac2006007.pdf

Description

For samples V3673 to V3895, the description is based firstly on x20 magnification study with further details and other inclusion types added from thin section analysis clearly identified as such by (TS). For the remaining five sections, V3783-7, the description is based solely on thin section evidence.

V3673

- Chalk. Moderate rounded fragments up to 20mm across.
- Organics. Moderate decayed organics up to 10mm long.
- Subangular quartz. Sparse fragments up to 2.0mm across.
- Bivalve shell. Sparse fragments up to 5.0mm across.
- Opaques. Sparse rounded dark brown grains up to 0.5mm across.
- Flint. Sparse angular fragments up to 10mm across.
- Rounded quartz. Sparse polished grains up to 2.0mm across.
- Oolitic limestone. Sparse fragments up to 2.0mm across.

The groundmass consists of mottled brown and dark grey clay with no visible inclusions.

V3674

- Chalk. Moderate rounded fragments up to 15mm across.
- Limonite. Sparse angular fragments up to 10mm across.

The groundmass consists of dark grey unfired clay with no visible inclusions.

V3676

- Sandstone. Abundant angular fragments of grain-supported sandstone up to 10mm long. The sandstone fragments vary from white to red in colour and all consist of angular quartz grains
- Subangular to angular quartz. Abundant grains similar in size to those found in the sandstone, c.0.2-0.3mm across.
- Rounded quartz. Sparse polished rounded grains up to 0.3mm across.
- Limestone. Sparse rounded grains up to 3.0mm across. In thin section, this is identified as chalk.
- Mudstone (TS). Sparse rounded pellets up to 1.0mm.
- Ferroan calcite (TS). Sparse fragments up to 0.2mm across.

- Opaques (TS). Sparse rounded grains up to 0.5mm across.
- Rounded quartz (TS). Sparse rounded grains up to 0.5mm across, probably of Lower Cretaceous origin.
- Organics. Sparse voids up to 1.0mm across surrounded by dark halos.

The groundmass consists of fine-textured dark grey clay with no visible silt-sized inclusions. In thin section the groundmass is noticeably laminated.

V3677

- Chalk. Moderate fragments of rounded chalk up to 1.0mm across.
- Shelly limestone. Sparse angular fragments of grey limestone with some shell fragments, up to 1.0mm across. None seen in thin section.
- Bivalve Shell. Moderate rounded fragments of shell. In thin section these appear to be inoceramic shells
- Subangular quartz. Sparse fragments up to 1.0mm across.
- Mudstone. A single rounded fragment of black mudstone, 3.0mm long.
- Clay pellets. Sparse rounded fragments up to 1.0mm across.
- Organics. Moderate voids up to 1.0mm long surrounded by dark halos.
- Ferroan calcite (TS). Sparse angular fragments up to 0.2mm across.
- Microfossils (TS). Sparse spherical calcite spheres c.0.1mm across.

The groundmass consists of dark grey clay with moderate angular quartz of fine sand/coarse silt grade (maximum 0.2mm in thin section), and moderate rounded black grains up to 0.1mm across.

V3678

- Flint. Moderate subangular fragments up to 10mm across.
- Chalk. Moderate rounded fragments up to 3.0mm across.
- Rounded quartz. Sparse polished rounded grains up to 0.4mm long.
- Organics. Moderate voids surrounded by darkened halos, up to 1.0mm long.
- Shell. Sparse angular shell fragments up to 1.0mm across. In thin section these were identified as inoceramid shell.
- Opaques. Sparse rounded dark brown grains and spherical black grains up to 0.2mm across.
- Echinoid shell (TS). Sparse ferroan calcite shell up to 0.4mm across.

- Mudstone (TS). Sparse rounded brown pellets up to 1.0mm across.
- Ferroan calcite (TS). Sparse angular fragments up to 0.2mm across.
- Microfossils (TS). Sparse c.0.1mm across.

The groundmass consists of dark grey clay with light brown margins. The clay contains moderate ill-sorted angular quartz up to 0.2mm across.

V3679

- Chalk. Moderate fragments of rounded chalk up to 1.0mm across.
- Shelly limestone. Sparse angular fragments of grey limestone with some shell fragments, up to 1.0mm across.
- Shell. Moderate rounded fragments of shell. In thin section these were identified as nacreous, non-ferroan calcite shell.
- Rounded quartz. Sparse fragments of polished quartz up to 1.0mm across.
- Sandstone. Sparse rounded fragments of fine-grained sandstone up to 1.0mm across. None seen in thin section.
- Organics. Moderate voids up to 1.0mm long surrounded by dark halos.
- Mudstone (TS). Sparse brown pellets up to 1.0mm across.
- Opaques (TS). Sparse rounded grains up to 0.5mm across.
- Microfossils (TS). Sparse c.0.1mm.
- Echinoid shell (TS). Sparse rounded fragments up to 0.5mm across
- Muscovite (TS). Sparse laths up to 0.5mm long

The groundmass consists of dark grey clay with moderate angular quartz of fine sand/coarse silt grade (up to 0.2mm in thin section), and moderate rounded black grains up to 0.1mm across. In thin section there were indications that the groundmass had been calcareous although no calcareous inclusions remain.

V3680

- Bivalve shell. Abundant fragments up to 1.0mm long. In thin section these were identified as nacreous, non-ferroan calcite shell.
- Punctate brachiopod. Moderate fragments up to 1.0mm long.
- Rounded quartz. Sparse polished quartz up to 0.7mm across.
- Clay pellets. Sparse rounded grains up to 1.0mm across.

- Chalk (TS). Sparse fragments up to 1.0mm across, including one containing an inoceramic shell.
- Ferroan Calcite (TS). Sparse angular fragments up to 0.2mm across.
- Opaques (TS). Sparse rounded pellets up to 0.5mm across.
- Shelly limestone (TS). Sparse rounded fragments containing nacreous, non-ferroan calcite bivalve shell in a ferroan calcite matrix.

The groundmass consists of dark grey clay with a brown external margin. It contains sparse well-rounded black grains and possible fine-grained calcareous inclusions (not noted in thin section). In thin section the groundmass is laminated, variegated and has no visible inclusions.

V3681

- Rounded quartz. Moderate polished grains up to 2.0mm across.
- Bivalve shell. Sparse nacreous, non-ferroan calcite (TS) fragments up to 2.0mm across. One contains abundant angular dark brown grains in a white calcareous cement.
- Opaques. Abundant dark brown rounded grains up to 2.0mm across but mainly less than 0.2mm across.
- Marl pellets. Moderate rounded fragments up to 2.0mm across containing abundant shell fragments. Possibly grog or Jurassic shelly marl pellets.
- Punctate brachiopod. Sparse fragment up to 0.5mm across. Moderate in thin section, with dark brown/opaque filling of the holes.
- Microfossils (TS). Sparse c.0.1mm across. One has a dark brown/opaque filling.
- Subangular quartz (TS). Sparse grains up to 0.4mm across.
- Ferroan calcite (TS). Sparse angular fragments up to 0.2mm across.
- Organics (TS). Sparse carbonised inclusions up to 1.5mm long.
- Echinoid shell (TS). Sparse rounded fragments up to 0.5mm across.
- Muscovite (TS). Sparse laths up to 0.5mm long.

The groundmass consists of dark grey clay with a light brown external margin. It contains abundant fine quartz, dark brown rounded opaques and calcareous inclusions up to 0.1mm across. Sparse muscovite up to 0.1mm is visible in thin section.

V3682

- Chalk. Sparse rounded fragments up to 3.0mm across.

- Opaques. Moderate angular dark brown fragments up to 4.0mm across.
- Sandstone (TS). Sparse fine-grained sandstone fragments up to 1.0mm across with overgrown quartz grains.
- Organics (TS). Sparse carbonised fragments.
- Quartz (TS). Sparse subangular grains up to 0.4mm across.
-

The groundmass consists of light grey clay with abundant angular quartz and sparse muscovite (TS) up to 0.1mm across and abundant calcareous inclusions, including probable ostracods. These could not be identified in thin section which did, however, confirm that the groundmass was calcareous.

V3683

- Rounded quartz. Sparse polished grains up to 1.0mm across.
- Subangular quartz. Abundant grains up to 0.2mm across.
- Mollusc shell. Abundant thin-walled shell fragments, either land or freshwater mollusca up to 1.0mm across (confirmed in thin section).
- Clay pellets. Moderate rounded dark brown clay pellets up to 1.0mm across. Some contain rounded dark brown inclusions up to 0.2mm across.
- Organics. Moderate voids up to 1.0mm long surrounded by darkened halos.
- Sandstone (TS). Sparse fine-grained sandstone fragments up to 1.0mm across containing overgrown quartz grains.
- Chalk (TS). Sparse fragments up to 0.5mm across.
- Ferroan calcite (TS). Sparse angular fragments up to 0.2mm across.
- Opaques (TS). Sparse rounded grains up to 0.5mm across.
- Bryozoa (TS). A single fragment of unstained bryozoan 1.0mm across.
- Calcite (TS). Moderate fragments of sparry calcite up to 0.5mm across.

The groundmass consists of dark grey calcareous clay (confirmed in thin section).

V3684

- Sandstone. Sparse rounded fragments up to 1.0mm across. The sandstone is grain-supported and includes sparse dark grains in addition to quartz. The grains are overgrown (TS).

- Chalk, Moderate rounded fragments up to 2.0mm across. One of these contains numerous thin cylindrical fossils.
- Clay Pellets. Moderate rounded dark brown fragments up to 2.0mm across.
- Rounded quartz. Sparse polished grains up to 1.0mm across.
- Subangular quartz. Abundant subangular grains up to 0.2mm across.
- Bivalve shell. Sparse fragments up to 2.0mm long.
- Opaques. Sparse subangular dark brown grains up to 1.0mm across
- Ferroan calcite (TS). Sparse angular fragments up to 0.2mm across.
- Organics (TS). Sparse carbonised inclusions up to 1.0mm long.

The groundmass consists of black calcareous clay, secondarily oxidized on one edge.

V3685

- Rounded Quartz. Moderate polished grains up to 3.0mm across, some with a haematite coating.
- Subangular quartz. Abundant grains up to 0.2mm across.
- Opaques. Sparse rounded grains up to 0.5mm across. Abundant subangular grains up to 0.2mm across.
- Organics. Abundant voids up to 10mm long
- Flint. Sparse angular flint up to 0.5mm long.

The groundmass consists of black clay with a dark brown external margin. In thin section, it is seen to contain moderate angular quartz and sparse muscovite silt.

V3686

- Chalk. Moderate rounded fragments up to 3.0mm across.
- Bivalve Shell. ~Sparse fragments up to 3.0mm across. Some with a calcareous matrix and fine-grained opaque inclusions adhering.
- Rounded quartz. Sparse polished grains up to 0.5mm across.
- Organics. Abundant voids up to 5.0mm long.
- Shell (TS). Sparse inoceramic shell up to 1.0mm long.
- Quartz (TS). Sparse subangular quartz up to 0.4mm across.
- Microfossils (TS). Sparse examples c.0.1mm across.
- Flint (TS). Sparse angular fragments up to 0.4mm across.

The groundmass consists of dark grey clay and contains abundant angular quartz up to 0.1mm across, calcareous inclusions and organic voids.

V3687

- Rounded quartz. Sparse polished grains up to 0.4mm across.
- Organics. Abundant voids up to 5.0mm long surrounded by darkened halos.
- Clay pellets. Moderate dark brown rounded pellets up to 3.0mm across.
- Flint. Sparse angular fragments up to 1.0mm across.
- Opaques. Sparse spherical black grains.
- Quartz (TS). Sparse subangular grains up to 0.4mm across.

The groundmass consists of dark grey clay and abundant angular quartz and sparse muscovite laths up to 0.1mm across.

V3688

- Chalk. Moderate rounded fragments up to 3.0mm across.
- Organics. Abundant voids up to 5.0mm long surrounded by darkened halos.
- Bivalve Shell. Sparse angular fragments of nacreous, non-ferroan calcite shell (TS) up to 1.0mm long.
- Clay pellets. Moderate dark brown rounded grains up to 1.0mm across.
- Subangular quartz. Abundant grains up to 0.2mm across.
- Ferroan calcite (TS). Sparse angular fragments up to 0.2mm across.
- Microfossils (TS). Sparse c.0.1mm across.
- Flint (TS). Sparse angular fragments up to 1.5mm across.
- Echinoid shell (TS). Sparse rounded ferroan calcite fragments up to 0.4mm across.
- Rounded quartz (TS). Sparse grains up to 0.5mm across.
- Muscovite (TS). Sparse laths up to 0.5mm long.
- Shelly limestone (TS). Sparse rounded fragments up to 0.5mm composed of non-ferroan calcite bivalve shell in a ferroan calcite groundmass.

The groundmass consists of dark grey clay and abundant angular quartz and sparse muscovite laths up to 0.1mm across. In thin section the groundmass is seen to be calcareous.

V3689

- Rounded quartz. Sparse polished grains up to 3.0mm across. Some with haematite coating.
- Bivalve shell. Sparse nacreous, non-ferroan calcite (TS) fragments up to 3.0mm long.
- Organics. Abundant voids up to 10.0mm long surrounded by darkened halos.
- Flint. Sparse angular brown-stained (TS) fragments up to 1.0mm across.
- Opaques. Abundant spherical black grains up to 0.3mm across.
- Ferroan calcite (TS). Sparse angular fragments up to 0.2mm across.
- Shelly limestone (TS). Sparse fragments up to 0.5mm across.

The groundmass consists of dark grey clay and abundant angular quartz (up to 0.2mm, TS) and sparse muscovite laths up to 0.1mm across.

V3690

- Rounded quartz. Sparse polished grains up to 4.0mm across, some with haematite coating.
- Organics. Abundant voids surrounded by darkened halos.
- Opaques. Abundant rounded dark brown grains, rarely up to 4.0mm long but mainly up to 0.2mm across.
- Subangular quartz. Abundant grains up to 0.2mm across.
- Flint (TS). Moderate subangular brown-stained flint fragments up to 1.0mm across.

The groundmass consists of dark grey clay and abundant angular quartz and sparse muscovite laths up to 0.1mm across. In addition, in thin section abundant opaque grains less than 0.1mm across are visible in the groundmass.

V3691

- Angular Sandstone. Abundant fragment up to 4.0mm across. Some are similar to those in V3276. Others are a medium-grained quartz/muscovite sandstone.
- Flint. Sparse angular brown-stained (TS) fragments up to 0.5m across.
- Rounded quartz. Sparse polished quartz up to 3.0mm across.
- Subangular quartz. Abundant grains up to 0.2mm across.
- Opaques (TS). Sparse rounded grains up to 0.4mm across.
- Organics (TS). Sparse carbonised fragments up to 1.5mm long.

- Microfossils (TS). Sparse, c.0.1mm across.
- Sparry Calcite (TS). Moderate angular fragments, some containing echinoid spines and fish bone. The rock is recrystallised and traces of fossils are present as “ghosts”.
- Metamorphic rock (TS). A single rounded fragment 0.5mm across. The rock consists of bands of quartz, muscovite and biotite, with grains up to 0.3mm long. It is probably a schist.

The groundmass consists of dark grey clay and abundant angular quartz and moderate muscovite laths up to 0.1mm across.

V3692

- Bivalve shell. Sparse fragments of nacreous, non-ferroan calcite shell (TS) up to 3.0mm across.
- Angular flint. Sparse fragments up to 2.0mm across.
- Rounded quartz. Sparse polished grains up to 2.0mm across.
- Clay pellets. Moderate rounded dark brown grains up to 5.0mm across.
- Organics. Moderate voids up to 4.0mm long surrounded by darkened halos.
- Ferroan calcite (TS). Sparse angular fragments up to 0.2mm across.
- Opaques (TS). Sparse rounded fragments up to 0.4mm across.
- Quartz (TS). Sparse subangular fragments up to 0.4mm across.
- Microfossils (TS). Sparse, c.0.1mm across.

The groundmass consists of dark grey clay and abundant angular quartz and moderate muscovite laths up to 0.1mm across.

V3693

- Angular limestone. Moderate fragments up to 3.0mm across.
- Rounded quartz. Sparse polished grains up to 1.0m across.
- Angular flint. Sparse fragments up to 1.0mm across.
- Opaques. Moderate subangular haematite fragments up to 0.3mm across.
- Subangular quartz. Abundant grains up to 0.3mm across.
- Organics. Moderate voids up to 10.0mm long surrounded by darkened halos.
- Ferroan calcite (TS). Sparse angular fragments up to 0.2mm across.
- Bivalve shell (TS). Moderate fragments of nacreous, non-ferroan calcite bivalve shell up to 1.0mm long.

- Shelly limestone (TS). Sparse fragments of limestone containing bivalve shell fragments in a ferroan calcite groundmass.

The groundmass consists of dark grey clay, abundant angular quartz and moderate haematite fragments up to 0.1mm across.

V3694

- Bivalve shell. Abundant angular fragments of nacreous, non-ferroan calcite bivalve shell (TS) up to 5.0mm long.
- Organics. Abundant voids up to 4.0mm long surrounded by darkened halos.
- Opaques. Sparse shiny black spherical grains up to 0.3mm across.
- Sandstone (TS). Sparse inclusions of fine-grained sandstone up to 1.5mm across.
- Ferroan calcite (TS). Sparse angular fragments up to 0.2mm across.
- Rounded quartz (TS). Sparse rounded quartz grains up to 0.5mm across.
- Quartz (TS). Sparse subangular quartz grains up to 0.4mm across.
- Flint (TS). Sparse rounded brown-stained fragments up to 1.0mm across.
- Shelly limestone (TS). Sparse rounded fragments up to 0.5mm across.

The groundmass consists of dark grey clay with moderate angular quartz grains up to 0.1mm across..

V3695

- Subangular quartz. Abundant grains up to 0.3mm across.
- Angular flint. Sparse fragments up to 1.0mm across.
- Rounded quartz. Sparse polished grains up to 3.0mm across. Some with a haematite coating.
- Opaques. Sparse rounded haematite up to 4.0mm across. Moderate spherical black shiny grains up to 0.3mm across.
- Organics. Moderate voids surrounded by darkened halos.
- Flint (TS). Sparse angular fragments up to 1.5mm across.
- Muscovite (TS). Sparse laths up to 0.5mm long.

The groundmass consists of dark grey clay, abundant angular quartz and moderate muscovite laths up to 0.1mm long.

V3783

- Sandstone. Sparse fine-grained sandstone fragments up to 1.5mm across, some with a red cement.
- Chalk. Moderate fragments up to 2.0mm across.
- Ferroan calcite. Sparse angular fragments up to 0.2mm across.
- Organics. Sparse carbonised fragments up to 1.5mm long.
- Quartz. Abundant subangular grains up to 0.4mm across.
- Rounded quartz. Sparse grains up to 0.4mm across.
- Calcareous sandstone. Sparse subangular fragments of a sandstone with ferroan calcite cement, up to 1.0mm across.

The groundmass consists of laminated, variegated clay with no visible inclusions less than 0.1mm.

V3784

- Chalk. Sparse rounded fragments up to 1.0mm across.
- Ferroan calcite. Sparse angular fragments up to 0.2mm across.
- Opaques. Sparse rounded grains up to 0.4mm across.
- Rounded quartz. Sparse grains up to 0.4mm across.
- Organics. Sparse fragments up to 1.5mm long.
- Bivalve shell. Moderate fragments of nacreous, non-ferroan calcite bivalve shell up to 1.0mm long.
- Quartz. Abundant subangular grains up to 0.4mm across.
- Flint. Sparse rounded fragments up to 1.0mm across.
- Echinoid shell. Sparse ferroan calcite fragments up to 0.4mm across.

The groundmass consists of dark grey clay with moderate angular quartz silt up to 0.1mm across.

V3785

- Ferroan calcite. Sparse angular fragments up to 0.2mm across.
- Opaques. Moderate rounded fragments up to 1.0mm across.
- Rounded quartz. Sparse fragments up to 0.4mm across.
- Organics. Sparse carbonised fragments up to 1.5mm long.

- Bivalve shell. Moderate fragments of nacreous, non-ferroan calcite bivalve shell up to 1.0mm long.
- Quartz. Abundant subangular fragments up to 0.4mm across.
- Echinoid shell. Sparse rounded ferroan calcite fragments up to 0.4mm across.

The groundmass consists of dark grey clay with moderate angular quartz up to 0.1mm across.

V3786

- Organics. Sparse angular fragments up to 0.5mm across.
- Quartz. Sparse subangular fragments up to 0.4mm across.
- Rounded quartz. Moderate fragments up to 0.2mm across.

The groundmass consists of variegated lenses of clay with moderate angular quartz up to 0.1mm across.

V3787

- Organics. Sparse angular fragments up to 0.5mm across.
- Quartz. Sparse subangular fragments up to 0.4mm across.
- Flint. Sparse rounded fragments up to 1.0mm across.
- Rounded quartz. Moderate fragments up to 0.2mm across.

The groundmass consists of variegated lenses of clay with moderate angular quartz up to 0.1mm across.

Discussion

Both of the clay samples are chalky boulder clay. One contains clasts of Upper Cretaceous origin in a clay which is probably of Jurassic origin whilst the other contains clasts of Middle Jurassic, Lower Cretaceous and Upper Cretaceous origin in a clay of unknown derivation. Without a large programme of clay sampling and analysis it is not possible to say whether these two samples are typical of the range of fabrics found in the boulder clay in this area. However, it is clear from the thin sections that most of the samples contain material of more than one geological era.

The broad trends followed by the glaciers in the Ice Age are well-established for East Anglia and adjacent areas (Chatwin 1961). To judge by the two clay samples and the character of most of the pot samples, the boulder clay deposited in the Caxton to Hardwick area was transported southwards and reflects the solid geology of central and northern Cambridgeshire and central and eastern Lincolnshire.

No material derived from the igneous rocks of Leicestershire was present. These occur in samples of Anglo-Saxon pottery apparently made in the Peterborough area, the Cambridge area and the Thetford area. It may be that the lack of such inclusions in these Iron Age vessels indicates a cultural choice by the potters, or it may be a feature of the boulder clays of the Caxton to Hardwick areas.

Similarly, there are no definitely identified examples of material derived from the Triassic sands and sandstones of the midlands (well-rounded, matt-surfaces quartz grains, cherts and siltstones/fine sandstones).

Oolitic limestones, characteristic of the lower to middle Jurassic, are absent in the pot samples but were found in one of the clays.

Middle and Upper Jurassic rocks, on the other hand, are common and occur in most of the samples. These include fine-grained sandstones with overgrown quartz grains, the nacreous, non-ferroan calcite bivalve shell, the echinoid shell fragments and the punctate brachiopods. The latter tend to be common in shelly pottery fabrics made in Bedfordshire and southwest Cambridgeshire and are rare or absent in shelly fabrics produced in Northamptonshire and northwest Cambridgeshire. However, if boulder clay was being used then it may well be that the inclusions found within it are representative of the solid geology of areas to the north (the presence of Cretaceous rocks and minerals is consistent with a northerly origin for the clays).

Calcareous clays are a feature of the upper Jurassic (Oxford Clay and Kimmeridge Clay) and examples of moderately calcareous clay are present. However, none of the samples was produced from clay with such a high calcareous content that it forms a yellow ceramic.

Lower Cretaceous strata are also present in many of the samples. The most distinctive inclusions of this age are polished quartz grains, noted in 22 of the samples. However, the calcareous sandstone noted in V3783 is also probably of lower Cretaceous origin. The highly micaceous and silty clay found in the Gault, which outcrops to the south of the pipeline, is not definitely represented in these samples although five samples do have quartz and muscovite silt in the groundmass (V3685, V3687, V3689, V3691-2).

Upper Cretaceous strata are represented by rounded chalk and fresh, angular flint. Chalk is present in both clay samples and 12 of the pot samples whilst fresh flint is present in just four samples, one of which does not contain chalk (V3695).

Finally, brown-stained, rounded or subangular flint is probably indicative of Tertiary or later deposits and is found in six samples (V3689, V3690, V3691, V3694, V3784, and V3787). In the southeast midlands, outside of the Thames basin, such grains are probably derived from Tertiary rocks which have been completely removed by glaciation or from deposits in the North Sea. On their own, they might indicate a source for the pots within the Tertiary regions of southern England. However, in most cases they occur alongside the same wide range of inclusion types as the remaining samples. The exceptions are V3690 and V3787. Both are

fine-textured sandy wares. To these two could be added a further four samples which do not contain distinctive Jurassic or Cretaceous rock types (V3685, V3687, V3695, and V3786). All have a silty groundmass, which also separates them from the majority. Two of these six samples are also unusual in having small rounded quartz grains (V3786 and V3787).

A high proportion of these pot samples contain organic inclusions. These would usually be interpreted as being deliberate additions, perhaps in the form of dung. They are certainly responsible for the dark grey colour of many of the samples. However, one of the two boulder clay samples, V3673, also contains moderate organic inclusions. These are presumably of post-glacial origin. Similarly, the thin-walled mollusc shell found in V3683 is probably of post-glacial origin although the remaining inclusions in this sample indicate that it was made from boulder clay.

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