

Assessment of the Pottery from Melton, East Yorkshire (OSA04 EX03)

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Introduction

The Melton excavations undertaken by On-Site Archaeology produced a large collection of pottery, ranging in date from the Early Bronze Age to the late 18th century. A high proportion of the pottery consists of smashed vessels, in which a third or more of the vessel is present, either in one piece or more often smashed into small sherds. These vessels not only provide good evidence for the overall form of the pots concerned but, because they are unlikely to have moved far from where they were initially broken, they provide good evidence for the date of backfilling of the contexts they were found in and evidence for the location of contemporary settlement.

The site was excavated in several different areas and initial analysis of the pottery, presented here, suggests that settlement shifted in and out of these areas.

Methodology

The pottery was recorded by Alan Vince and Kate Steane, with advice on Roman vessels from Barbara Precious. The initial record of the pottery consists of an Access table which lists the pottery by context, ware code and form, with details of decoration, use and condition. Vessels were selected for illustration on the basis that prehistoric and early Anglo-Saxon vessels with a shoulder to rim profile were sufficiently rare to be worthy of illustration whilst Roman and medieval sherds were only selected on the advice of the relevant specialist (Barbara Precious and Alan Vince).

Description

Quantity and condition

A total of 4345 sherds of pottery were recorded in the assessment. They come from no more than 1839 vessels and weigh in total 55.004 Kg. They range from near-complete vessels (although most of these are smashed into small sherds, and could not be displayed without considerable expenditure on conservation and restoration) to tiny chips. Many of the larger assemblages contained small chips which may have broken off the larger sherds after excavation. These were ignored whilst similar-sized chips which were the only finds in an assemblage were identified, where possible. Most of the pottery from prehistoric, Roman and Anglo-Saxon contexts showed little sign of abrasion and the sherds were large and

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often include joining sherds, or sherds clearly from the same vessel. There was little evidence found for sherd links between contexts, but this was probably because of the general visual similarity of many of the vessels. However, where sherd links were found between bags, it usually emerged that the bags were either from the same context, or were fills of the same feature. Thus, the evidence suggests that pottery was mainly discarded in a single location with minimal dispersal.

The medieval pottery includes assemblages of similar character to the earlier finds, indicative of occupation on site and primary refuse disposal, together with a scatter of smaller, more abraded sherds, of similar age and later, which indicate that in the later medieval period parts of the site were ploughed, possibly with the importation of manure, containing artefacts.

Post-medieval and early modern pottery was scarce, suggesting either that ploughing/manuring had ceased or that ridge and furrow had been filled in and subsequent ploughing only affected the topsoil, removed by machine.

Earlier Prehistoric

The excavators on site suggested that certain features might be of Neolithic date but no pottery of early to middle Neolithic date was present. It is possible that some sherds of later Neolithic date were present, since the wall thickness and general shape of the vessels is similar to that of later pottery. Thus, where a context was initially identified as being of earlier prehistoric date and produced pottery these sherds have been coded as EBA- followed by their principal inclusion type. These include vessels with linear incised decoration found in the fill of the Early Bronze Age grave, 2631.

Grave 2631 also produced sherds from three beakers with stabbed comb decoration. They are of two different fabrics: EBAERR contains small angular fragments of rock up to 3.0mm across, mostly of basic igneous rock, in a groundmass of finer inclusions, mostly quartz and muscovite. At x20 magnification, it seems to be a similar fabric to IAERR, which contains larger rock fragments, but is also similar to samples of Early Yorkshire boulder clay. It is likely that this fabric was made from a boulder clay with no preparation, other than to remove any rock fragments over 3.0mm, which would be easily found with the fingers when working the clay. Thin section and chemical analysis is recommended in order to test this interpretation. The second fabric, EBAGROG, contains few quartzose inclusions and has a smooth feel. However, at x20 magnification it is seen to contain angular fragments of clay, mudstone or grog (previously-fired clay or pottery fragments). It appears to be finer in texture than its Iron Age equivalent, IAGROG, where a contrast in colour between the argillaceous inclusions and the groundmass confirms that they are indeed grog. Thin section and chemical analysis is recommended to test this interpretation and to confirm/refute the

proposal that the two fabrics were made in different places, or at least from very different raw materials.

Grave 2631 also produced a sherd from a vessel with limestone inclusions, coded here as EBALST. This is similar, or identical, to the equivalent Iron Age fabric, IALST, and it is suggested that it may be an intrusive Iron Age sherd (the burial was disturbed by a tree throw). However, this sherd, and a visually-similar one from an Iron Age feature (1472) should be shown to a specialist in early prehistoric pottery to confirm that they are of Iron Age date. A contingency should be set aside for thin section and chemical analysis of this fabric, although the sherds are probably too small for thin section.

An isolated cremation in a jar, found in Area 14 could not be fully assessed, since it was too fragile to move and is at present (July 2005) in the conservation laboratory at York Archaeological Trust. A sliver of the body was submitted for identification of the fabric and this appears to be a thick-walled, grog-tempered ware, which is unlike the Iron Age and Roman grog-tempered wares from Melton. It is therefore coded as EBAGROG and provision has been made for it to be examined at York by a specialist on earlier prehistoric pottery.

In total, 96 sherds of potential earlier prehistoric date were recorded. They probably represent only 4 or 5 vessels at most. Twenty-five of these sherds, representing no more than 7 vessels, show signs of use (burnt food or soot deposits) and the specialist may recommend Lipid analysis of these.

Later Prehistoric to Early Roman

No pottery with features diagnostic of Middle or Late Bronze Age date were present in the collection and it is likely that the area was not settled during this period. This may be because it was a reserved space or because it was used as pasture, both of which would result in a lack of pottery finds.

There is, however, a large amount of Iron Age to early Roman pottery from the site, amounting in total to 2768 sherds, from no more than 1085 vessels and weighing in total 32.855 Kg (just over half of the total assemblage).

Fabrics

Various members of the British Museum Department of Scientific Research have carried out thin section analysis on Iron Age/Early Roman pottery from a variety of sites in East Yorkshire (summarised in 2004). Their work suggests that there was some centralised production in the region, for example in the Vale of Pickering, utilising sparry calcite from the Chalk and glauconitic Speeton Clay, but they imply that elsewhere in the region the distribution of pottery fabrics might be governed by the availability of material in local clays

(for example, they found a correlation between sites on the Boulder Clay, from which erratic pebbles were naturally present, and the incidence of Erratic Tempered Ware). The Melton site, however, is in extremely good location to test their conclusions (see below, Archaeological Potential).

All of the Iron Age pottery was examined at x20 magnification and assigned to a fabric code, based on the texture of the fabric and nature of the principal inclusions.

Erratic Tempered Ware

The majority of the sherds are of Erratic Tempered Ware (coded IAERR in the archive catalogue). The classic examples of this fabric have a fine-textured or sandy groundmass and contain moderate large angular rock fragments in the order of 1.0 to 5.0mm across, which often erupt out of the pot surface, being of similar size to the vessel walls. Thin section analysis at the British Museum has suggested that the larger inclusions were composed of a limited number of rock types and could most easily be explained as being deliberate temper, produced by crushing or fire-cracking a small number of erratic pebbles. This sample interpretation had previously been put forward by Peter Wardle for Bronze Age pottery in Yorkshire (Swain 1987).

This interpretation seems to fit most of the IAERR sherds from Melton, but in addition there are some where the rock inclusions are sub-rounded or show signs of weathering (e.g. a white or grey skin with darker interior, caused by the differential erosion of ferromagnesian and feldspathic inclusions). Furthermore, there are several examples where the number of rock types present in the inclusions is too wide to fit this interpretation. Their appearance is similar to that of samples of boulder clay collected by one of the authors (AV) which tend to have an ill-sorted sandy groundmass, composed mainly of quartz grains, with a variety of larger rock fragments, some rounded and others angular. Boulder clay collected from the Basal Till at Tealby, in the Lindsey Marshes, has a very similar composition to the Erratic Tempered Ware of East Yorkshire, suggesting that even the vessels whose fabric fits the Wardle/British Museum model could be made from self-tempered boulder clay.

Within the Melton collection there are a number of vessels which include abundant fragments of a biotite granite. This is a rare component of East Yorkshire boulder clays but is present in the Vale of York, probably mainly at the sides of the valley and masked by post-glacial lacustrine deposits in much of the centre of the vale. If so, then one would not expect to find any rocks or minerals of Cretaceous origin present, whereas if it was made from East Yorkshire boulder clay with selected biotite granite fragments added to it, then flint, chalk and Lower Cretaceous polished quartz and glauconite ought to be present. It is recommended that a selection of the 33 sherds of this subfabric are examined in thin section

and using ICPS to see if a local source is possible and to compare the fabric with that of Anglo-Saxon vessels with similar inclusions.

Other examples contain, in addition to angular igneous or metamorphic rock fragments, chalk, flint, sandstones, clay ironstone, limestone, and oolitic limestone. These are consistent with an East Yorkshire claylands origin since they originated in Jurassic or Cretaceous strata immediately north or west of the main boulder clays. By comparing the fabric of a sample of these vessels with that of samples of fired clay from the Melton site, which is mainly likely to be of local origin, it would be possible to establish whether any of this pottery could have been produced locally (i.e. in the strip of land between the Chalk wolds and the Humber).

Limestone Tempered Wares (LOOL, IALST and IAPOOL)

The British Museum researchers recognised limestone-tempered ware as a minor element in Iron Age pottery assemblages in East Yorkshire. However, at Melton it forms a large proportion of the pottery. In fact, in total, 1007 sherds containing a limestone temper were recorded, making it the most common ware group. These could be subdivided into three groups:

- LOOL. 458 sherds, containing brown, iron-rich ooliths or pellets, c.0.1-0.2mm across. In addition, this limestone contains bivalve shell, and echinoid shell and spines in a fine-grained calcite mudstone groundmass. Thin sections of this fabric, from a site at Elloughton, indicate that it is similar in many respects to the fabric of Dales Shelly ware, supposedly containing fossil bivalve shell from the Rhaetic limestone, which outcrops on the southern bank of the Humber, immediately south of Brough. However, the limonite ooliths are probably from the Lower Lias, being particularly well-developed in the Frodingham Ironstone, but also present in earlier and later strata within the Lower Lias (Kent 1980, 25-32), some of which outcrop north of the Humber (i.e. locally to Melton). The Elloughton finds were probably all post-conquest in date, and include some wheelthrown vessels, however, at Melton handmade LOOL vessels occur in some assemblages in association with fresh-looking, smashed vessels of Iron Age character and it is likely that these are of pre-conquest date (although the site also produced some LOOL vessels found with early 2nd-century wheelthrown greyware and oxidized wares). A sample of the potentially pre-conquest vessels should be examined in thin section and using chemical analysis and compared with the Elloughton finds. The aims of this analysis would be to see whether or not it was possible to distinguish a pre- and post-conquest phase in LOOL production. The vessels should also be examined carefully to see if there are any changes in typology which might indicate the influence of Roman production techniques or typology. There are some small assemblages of Roman greyware from the site which are not associated with any LOOL vessels, and it may be

that the use of this fabric died out before the Melton settlement was abandoned, in the mid 2nd century.

- Oolitic Limestone Tempered Ware (IAOOL). 192 sherds, containing angular fragments of an oolitic limestone, which contains some shell and echinoid spine fragments but is mainly composed of packed limestone ooliths. This is clearly a Middle Jurassic Limestone and it should be possible to establish the identity of the limestone and from there establish the likely source of these sherds. The closest local source would be the Cave Oolite, outcropping just to the west of Melton. The lower beds of the Cave Oolite contain a distinctive coral (*Haploecia straminea*, Kent 1980, 51 and Plate 9 No.12) and small brachiopods (*Acanthothiris*, Kent 1980, 51-2 and Plate 9 Nos. 8a & 8b). Both of these fossils could be visible in thin section and it is therefore recommended that a sample of oolitic limestone-tempered sherds is examined in thin section and by chemical analysis.
- Other Limestone Tempered Ware (IALST). 356 sherds contained limestone inclusions which did not contain either limonite or calcite ooliths and these were grouped together as IALST. It is clear, however, that several distinct limestones are present and, as with the two previous limestone-tempered groups, the fragments appear to be tempered with unweathered rock fragments with a single lithology, giving the potential to identify the rock and, thereby, the source of the vessels. Echinoid spines and bivalve shell fragments were noted in some of these sherds. It is recommended that a sample of these sherds is examined in thin section and by chemical analysis. If this analysis indicates the presence of distinctive fabric groups then it may prove necessary to re-examine the entire 356 sherds, since the chronological and spatial distribution of the fabrics may provide further information about the trading history and chronology of the Melton site.

Shell-Tempered Wares (IASH)

Two hundred and ninety sherds of Iron Age to Early Roman pottery were tempered with shell. Shell-Tempered wares were recognised by the British Museum researchers as a major component of Iron Age assemblages in Yorkshire and their distribution suggested that these vessels were probably made in Lincolnshire, or in the area of Jurassic rocks which outcrops north of the Humber. There is no suggestion from this distribution that recent shell from the North Sea coast or the Humber estuary was used.

Characterisation studies of shell-tempered wares from Lincolnshire, Nottinghamshire and South Yorkshire shows that it is possible to distinguish vessels made from clays with a natural shell sand component from those made from crushed or weathered shelly limestone and that regional groups can be identified (for example, there is one group produced in the

middle Trent valley which is found on sites in Nottinghamshire, South Yorkshire and western central Lincolnshire and a group where the shell comes from Middle Jurassic shell shelly limestone, or loosely cemented shell sand, which is found on sites throughout northern Lincolnshire, including the Wolds, and has also been found at Ferrybridge, in the Vale of York, to the west of the Melton site. Examination at x20 magnification suggests that the Middle Trent group is not present at Melton but that the group with Middle Jurassic shell inclusions is present, but alongside sherds with a different fabric. Some of the latter might be locally-produced (some Lower Jurassic rocks north of the Humber might have shelly limestone or clay facies, whilst a small area of Middle Jurassic shelly limestone, the Upper Cornbrash, rocks outcrops near North Ferriby, Kent 1980, 51), or they may be from North Lincolnshire, and some do have a very similar appearance to the fabric of Dales Shelly ware). It is recommended that a sample of these shell-tempered wares is examined in thin section and by chemical analysis and compared with previously-collected data.

Lower Cretaceous Quartz Tempered Ware (IAGSQ)

One hundred and twenty eight sherds, representing no more than 19 vessels, contained moderate to abundant water-polished rounded quartz grains of Lower Cretaceous origin. These quartz grains are extremely distinctive at x20 magnification and occur first in the Lower Cretaceous Spilsby Sandstone of the southern Lincolnshire Wolds and, in much lower quantities, the Red Chalk and Carstone of Yorkshire (Kent 1980, 89). Iron-cemented sandstones containing these polished quartz grains occur in Lincolnshire (the Claxby Ironstone) and in small outcrops along the western side of the Wolds in Yorkshire (Goodmanham, Millington and Kirby Underdale, Kent 1980, 90). Since some of the Melton sherds contain sandstones with a silica cement with no iron-staining, they are probably Spilsby Sandstone and therefore these vessels are probably of East Lincolnshire origin. However, a more definite result could be obtained by the use of thin section and chemical analyses and it is particularly important to establish whether or not there are two groups present, one from Lincolnshire and the other from Yorkshire or whether they are all Lincolnshire, and thus evidence for the use of a Humber crossing between south and north Ferriby.

Flint-Tempered Ware (IAFLINT)

One hundred and seven sherds, representing no more than 71 vessels, contained inclusions of angular flint. This fabric group is recognised by the British Museum researchers as being a major component of Iron Age ceramics in East Yorkshire. Their description of the fabric indicates that it has a very fine groundmass, which is true of the Melton examples, and that the flint is likely to have been fire-cracked. This, however, is not the case for the Melton pottery where it is sometimes quite clear that the edges of the grains have been blunted by weathering, and the grains are almost all patinated uniformly, whereas fire-cracking would

lead to flakes with sharp edges and variable patination. Furthermore, a few fragments of erratic rock, of similar size to the flint, were noted in the Melton fabric. It is more likely, therefore, that the Melton flint-tempered ware was tempered with a flint gravel. Such gravels occur at the present day on the Humber Foreshore at North Ferriby (personal observation) and in quaternary gravels at the base of the Wolds near Sancton (representing a buried post-glacial arm of the Humber). Thus, the combination of a very clean clay with a predominantly flint gravel (with no calcareous inclusions) suggests a local origin utilising a Jurassic clay and post-glacial flint gravel. It would be useful to produce thin sections and chemical analyses of this fabric for comparison with other wares of supposed local origin (such as some of the limestone-tempered wares) and to compare these with the thin sections made for the British Museum project and now housed at the Department of Scientific Research at the British Museum.

Calcite-Tempered Ware (IACALC)

Ninety-seven sherds, representing no more than 19 vessels, contained abundant angular fragments of sparry calcite. The British Museum researchers have demonstrated that in thin section much of this pottery contains glauconite and was therefore made from Speeton Clay, which only outcrops in the Vale of Pickering. The calcite is sometimes seen to have chalk adhering to the sparry calcite in thin section and this indicates that it formed in veins cutting through the Chalk. Sparry calcite itself has a wider potential outcrop and to establish that the Melton sherds were indeed made in the Vale of Pickering it would be necessary to examine a sample of these sherds in thin section and using chemical analysis. One sherd contained a fossil belemnite, which is consistent with a chalk origin for the calcite.

Calcite-Tempered wares were produced in the Vale of Pickering from the Neolithic through to the early/mid Anglo-Saxon period and a comparative sample of Roman and Anglo-Saxon fabrics from West Heslerton (carried out by the author, AV, indicates that there were petrological and chemical differences between the two groups. It might therefore be possible to establish differences between Iron Age and Roman Calcite tempered wares using the same techniques but if no differences were found this would imply that, unlike the transition from the Roman to the Anglo-Saxon industry, there was no shift in production, or production methods.

Grog-Tempered Ware (IAGROG)

Sixty-nine sherds, representing no more than 17 vessels, contained angular fragments of grog as their main constituent. Grog, crushed fragments of previously-fired ceramic, was added to pottery from at least the early Bronze Age onwards and is a common tempering material in Romano-British ceramics. There is, therefore, no reason why the technique should not have been used throughout the Iron Age. However, there are a number of problems involved in the study of this ware:

- by eye it is often difficult to distinguish between grog made from low-fired ceramics and relict clay, formed by the incomplete mixing of the parent clay
- mudstone, too, can be mistaken for grog since it can form angular fragments
- grog can be added to a variety of different fabrics and is of itself no strong indication of the source of the fabric and characterisation therefore has to be based on less obvious rock and mineral inclusions. Flint and an unidentified limestone were noted at x20 magnification, for example
- It is possible that Early Bronze Age vessels have been mis-identified as Iron Age ones, and establishing a difference in fabric between these two groups would be extremely useful

For these reasons, it is suggested that a sample of grog-tempered vessels is examined in thin section and by chemical analysis

Sandstone-Tempered Wares (IASST)

Forty-two sherds, representing no more than 12 vessels, contain angular fragments of sandstone as their main inclusion type. They are distinguished from the Erratic-Tempered ware, which also contains sandstone fragments, because of the complete lack of erratic inclusions and it is possible that they are either locally produced (the Kellaways Sand has a sandstone facies which outcrops locally) or are from the Vale of York, where most of the fluvio-glacial sands are composed almost entirely of quartz and feldspar derived from Carboniferous sandstones. In either case, thin sections would be able to confirm/refute the visual identifications. Therefore, it is recommended that a sample of these sherds is examined in thin section and by chemical analysis.

Sand-Tempered Wares (IASANDY)

Twenty four sherds, representing no more than twenty-three vessels, contained quartz sand as their main inclusion type. These sherds represent only a tiny fraction of the Iron Age pottery from Melton and probably come from a variety of sources (other inclusions noted are shell and Lower Cretaceous quartz).

Organic-Tempered Ware (IAORG)

Six sherds, representing six vessels, contain numerous voids which originally contained organic inclusions. The presence of salt-surfacing on the sherds indicates that they are made from a calcareous clay, which is seen to be silty at x20 magnification. These characteristics are identical to that of briquetage from sites in the Lincolnshire Fens and the Lindsey Marshes. The sherds are very small (13gm in total) and, being extremely porous are likely to

be contaminated through the percolation of local groundwater after burial. Therefore, it is not possible to compare their fabric in detail with that of Lincolnshire briquetage and local Humber estuary silt, to see if they are evidence for local salt extraction or came to the site filled with Lincolnshire salt.

Slag-Tempered Ware (IASLAG)

Six sherds representing no more than four vessels, all from Area 4, contain moderate angular fragments of vesicular slag. Iron Age slag-tempered wares are a distinctive class, known, for example, from Easingwold and Ferrybridge, both in the Vale of York. They have been studied by Paul Buckland, who suggests that the use of slag might indicate that the vessels were made in a community specialising in iron production or iron working and that since pottery is easier to characterise than the finished metal artefacts it might be possible to use slag-tempered pottery to study the more ephemeral, but probably much more significant, iron industry. Iron Age slag-tempered vessels are known to the author from sites in East Yorkshire and North Lincolnshire and it is recommended that samples of the Melton vessels are compared with samples from these sites (3 comparative vessels in total).

Roman

Nine hundred and sixteen sherds of pottery of definite Roman date were recovered from the Melton excavations, in addition to the sherds of one of the limestone-tempered handmade ware which are probably of early Roman date (see above, LOOL). These sherds represent no more than 496 vessels and weigh 15.844 Kg.

Fabrics

The pottery was assigned initially to 27 different ware codes, mostly based on those used at the City of Lincoln, the YAT excavations at Brough and the OSA excavations at Elloughton (Table 1) but several of these are capable of refinement/replacement and in several cases this extra detail would provide useful information about the dating of the site and supply of pottery.

In addition to the handmade, "native" limestone-tempered pottery described above (LOOL), there are a number of wares present which were wheelthrown and which supplied the site with the majority of its cooking wares. Most of these were probably obtained from within 20-30 miles of the site. Much of the greyware and oxidized ware (GREY, OXID) has similar forms and decoration to that produced at Kexby, North Lincolnshire, and it would be possible to obtain comparative samples of the Kexby ware and establish, using thin section and chemical analyses, whether or not the pottery was being produced at Kexby and traded across the Humber (which would be evidence for the existence of a ferry connection between Winterton and Brough on Humber) or whether similar pottery was being made on

the north bank of the Humber. It is therefore recommended that a sample of Kexby wasters and a sample of Melton examples are analysed in thin section and by chemical analysis. The results of this analysis might then lead to a requirement for re-examination of some of the pottery, which could be limited to specific assemblages rather than the entire collection, to re-classify the sherds concerned. These sherds would have been classified initially as GFIN, GREY, GRFF, OX, or OXF. These wares account in total for 715 sherds, representing no more than 432 vessels.

In addition, there are several fabric groups which are certainly not Kexby products but for which no source is known. It is known from previous work in the area (P Didsbury) that during the 2nd century there was a shift from North Lincolnshire-style wares to those produced in the Vale of York, for example at Hasholme, Throlam or Holme-upon-Spalding Moor. It seems from this assessment that very little of the pottery from Melton could be of this type, probably because the site was abandoned before this shift took place. A total of 131 sherds were of various "local" wares of unknown origin. They include coarse gravel-tempered fabrics (28 sherds, COAR), grog-tempered ware (2 sherds, GROG), a micaceous greyware (1 sherd, GYMS) and a finer, wheelthrown version of the native limestone-tempered ware (26 sherds from no more than 4 vessels, LOOLFINE).

Forty sherds of Dales-type shelly ware were recovered from the excavations, representing no more than 15 vessels. Of these, at least 30 sherds (13 vessels) were dubious, in that they are jar body sherds with a similar fabric to Dales shelly ware but which lack the diagnostic lid-seated rims of this type. They might therefore be shelly wares produced in the same area as Dales shelly ware (North Lincolnshire) but at an earlier date, since there is some indication that there is a very similar fabric in use at Melton in the pre-Roman Iron Age and therefore every reason to suppose that there is a continuous tradition between their use and that of Dales shelly ware, which is thought to be mainly of mid to late 3rd century (or at least, that is the period when the ware was traded widely outside of its core territory).

Finally, there are 34 sherds of shell-tempered ware (other than LOOL or Dales shelly ware) of Roman date. These come from only two vessels, and therefore form a very small part of the supply of pottery to the Roman settlement.

Thirty-two sherds are of vessels from other parts of the British province. Thirteen sherds (four vessels) consists of mortaria, from Mancetter/Hartshill (MOMH), Colchester (MOCO), and unknown sources (MORT). The study of these vessels, which were specialised forms with their own patterns of distribution, is a specialist study and these sherds found be submitted for examination to Kay Hartley. The two unknown vessels should in addition be thin sectioned and chemical analyses obtained. The remaining 19 sherds, representing no more than 9 vessels, include coarsewares made outside of the region such as Crambeck Greyware, CRGR, Calcite-tempered ware (CALC – unless these are residual Iron Age

sherds) and Dorset Black Burnished ware (BB1) as well as Romano-British finewares, such as Parisian Ware (PART, 5 sherds from one vessel), Nene Valley colour-coated ware (3 sherds from a roughcast beaker) and a putative sherd of Verulamium Region Whiteware (VRW). As noted above, it would be useful to analyse samples of the Calcite-Tempered ware for comparison with the definite Iron Age examples (IACALC). The fabric of the Parisian ware vessel could be compared with that of Market Rasen Parisian ware, for which chemical composition data exists. The roughcast Nene Valley vessel is an unusual product for that industry, and the majority of the finds from Melton predate the start of large-scale production in the lower Nene Valley. It might therefore be worth submitting the sherds to specialists for confirmation of the identification.

Seventeen sherds of amphora were found at Melton, representing no more than five vessels. Four of these vessels are globular amphora, used to transport olive oil from southwestern Spain (DR20). Of these, one is a late fabric, of 2nd/3rd-century date. The fifth vessel is of unknown origin but is only a small featureless sherd (10gm) and therefore no idea of the form can be gained. It is probably not worth trying to establish its source.

Seventeen sherds of Samian ware (*terra sigillata*) were present at Melton. These represent no more than 13 vessels, of which 10 have been provisionally identified as South Gaulish vessels and three as being of Central Gaulish origin. It might be possible to refine these identifications if the sherds were submitted to a specialist and this might have implications for the date and pottery supply of the site.

Table 1

cname	Sherds	Vessels (max)	Weight
AMPH	1	1	10
BB1	7	2	12
CALC	4	3	17
CC	1	1	2
COAR	28	7	1180
CRGR	2	2	5
DR20	16	4	756
DWSH	10	2	293
DWSH?	30	13	265
GFIN	208	156	2812
GREY	431	252	7211
GRFF	1	1	14
GROG	2	2	22
GYMS	1	1	13
LOOLFINE	26	4	388

MOCO	9	1	486
MOMH	1	1	36
MORT	3	2	266
NVCC	3	1	6
OX	13	1	96
OXF	13	2	97
OXID	49	20	769
PART	5	1	103
SAMCG	4	3	33
SAMSG	13	10	186
SHEL	32	1	694
SHELF	2	1	66
VRW	1	1	6
Grand Total	916	496	15844

Forms

Most of the Roman pottery could be assigned to a form (Table 2). By far the most common form was the jar (85% of the identified vessels, 77% by sherd count and 62% by weight). Several other jar sherds were found but have been identified more closely (such as the rusticated jars, probably a Kexby product) The next most common form is a sharply carinated bowl (or wide-mouthed jar, B334), a typical product of the Kexby industry. However, sherds of this form account for less than 2% of the identified vessels, just under 5% by sherd count and just under 9% by weight. All other forms account for less than 1% of the identified vessels each.

Table 2

Form	Sherds	Vessels (Max)	Weight
JAR	719	441	9778
JAR, RUSTICATED	31	14	324
B334	47	9	1469
BOWL	9	7	270
AMPH	17	5	766
MORT	14	5	906
DISH	5	5	74
FLAG	5	5	26
JEV	14	4	471
?	5	4	30
JAR?	4	4	10
DOLIUM	16	3	978

DR30 COPY	14	2	410
DR18/31R	5	2	109
BEAKER	4	2	8
DR27	2	2	4
DR33	2	2	9
FLAG?	4	2	80
DREED	13	1	96
RDBK	12	1	96
BKC120	5	1	103
JLH	3	1	144
BEAKER, FOLDED	2	1	4
HM	2	1	66
D452	1	1	23
DR 36	1	1	2
DR15/17	1	1	13
DR18/31	1	1	59
DR22	1	1	10
DR37	1	1	1
JBK	1	1	19
PGB	1	1	6
Grand Total	962	532	16364

Further work could be undertaken on the typology of the Roman pottery and this is probably worth undertaking for specific assemblages, where large fragments of vessel are present and where there are several contemporary vessels present.

A number of Samian forms were present, either in Samian ware itself or in locally-produced copies, most of which were probably Kexby products.

Use

One hundred and ninety-six sherds of pottery representing no more than 77 vessels had traces of use. These consist mainly of sooting on the exterior (57 vessels), black or brown carbonised deposits on the interior (26 vessels), kettle fur (5 vessels) and the selective leaching of calcareous inclusions from the interior of vessels (4 examples). Most of these sherds come from jars, including rusticated jars and the B334 form but also include a dish with external sooting and a decorated bowl (a Dr 30 copy), a probable Kexby product. The proportion of vessels with definite evidence for use is far lower than for the Iron Age pottery and in addition to the obvious forms, such as drinking vessels (beakers and cups), dolia (huge storage jars), mortaria and flagons it is clear that a number of the jars were either not cooking vessels or that the method of cooking did not lead to the vessels being coated with

soot and food debris. It has to be remembered, however, that in addition to these Romanised vessels there were handmade vessels, mainly of LOOL which were probably used mainly for cooking.

The main contrast in forms between the Melton assemblage and other, more Romanised assemblages in Yorkshire, is the low quantity of bowls and dishes present. It seems, therefore, as though the Melton inhabitants adopted certain Romanised customs (such as the drinking of wine from small cups, filled from flagons and the use of the mortaria) but that their methods of cooking were closer to their pre-Roman forbears.

Early Anglo-Saxon

Two hundred and eighty-two sherds of pottery were identified as being of Early Anglo-Saxon date. They represent no more than 81 vessels and weigh in total 2.886 Kg.

Fabrics

An attempt was made to classify the fabrics of these sherds according to their main constituents but it is likely that most, in fact, have a similar, if variable, fabric, tempered with a calcareous gravel which includes grains of biotite granite, medium-grained sandstones, Lower Cretaceous quartz, rounded quartz gravel, and sandstones of Millstone Grit type. a similar wide range of inclusions was noted in the pottery found at the Sancton cremation cemetery (which are very similar visually to the Melton fabrics) but thin section and chemical analysis suggested that most were made from a similar parent clay, obtained from the Lower Jurassic. Visually, it is fairly easy to distinguish the Early Anglo-Saxon pottery fabrics from those of Iron Age date and this implies a complete break in potting traditions between the Iron Age/Roman and the early Anglo-Saxon periods. It is recommended that a sample of early Anglo-Saxon sherds are examined in thin section and by chemical analysis, to test whether the vessels are in fact all made from a single variable clay/sand source and to compare their petrology and chemical composition with that of samples from Sancton.

Forms

Only two forms were present in the collection. The jar and the bowl. The jars were large, globular vessels, mostly with simple rounded rims, either vertical or slightly everted. One stamped vessel was present but otherwise the vessels were undecorated and have no burnishing. The bowls are also simple, rounded rimmed vessels, with hemispherical bases and cylindrical walls.

Use

The majority of sherds found showed signs of use. These traces consisted mainly of external sooting (81 vessels) and internal deposits (mostly black, but one red, 85 vessels). No

evidence of leaching was present, but in most cases the calcareous inclusions were leached from both sides of the vessel, thus destroying this source of evidence. A single case with internal sooting was present (perhaps evidence for the use of the vessel as a lamp?).

There is no correlation of vessel form with traces of use and similar quantities of clean sherds, sooted sherds and those with internal deposits were found for jars and bowls. The internal sooting was noted on a jar, represented by three body sherds.

The frequency of use traces is much higher for these early Anglo-Saxon sherds than for either the Iron Age or Roman pottery and this may indicate differences in cooking practice.

Early to Mid Anglo-Saxon

Three sherds from a chaff-tempered jar were found at Melton. This fabric, tempered with abundant organic fragments with few other visible inclusions, is typically found in the north of England and in the midlands towards the end of the early Anglo-Saxon period, whereas it is found in the 5th and early 6th centuries south of the Thames. Examples are known, for example, from the mid Saxon settlement at Fishergate, York, and from West Heslerton, where the distribution on site suggests that it is one of the latest fabrics to be used in the early to mid Anglo-Saxon period. Since the sherd was found in a deposit which only otherwise produced Roman sherds and on a different area of the site from the early Anglo-Saxon pottery it is assumed that it post-dates the early Anglo-Saxon settlement. The presence of this one vessel, a jar, with external sooting and internal black deposit, suggests either that the site was only sparsely occupied at this time or that pottery formed only a small part of the material culture. Either option is possible, and the 2002 Elloughton site produced a hearth whose use was C14-dated to the 8th/9th centuries but no sherds of this date, whilst at Beverley, the Lurk Lane indicated Mid Saxon occupation, including a hoard of stycas and an Ipswich ware storage jar, but no other contemporary pottery.

Anglo-Scandinavian

Two sherds of wheelthrown, shell-tempered pottery were found at Melton. Such vessels were produced from the later 9th century onwards in midland and south-eastern England. These particular pieces were shown to Jane Young, who identified them as pre-Conquest Lincoln products (LSH, Fabric B? and Fabric C, Young and Vince 2006). They are probably of mid 10th to early 11th century date and are of types which were clearly out of use before the conquest. It is recommended that thin section and chemical analysis of these two sherds is carried out to confirm or refute the suggested Lincoln source.

Excavations, primarily at York and Beverley, show that pottery was not being made north of the Humber for perhaps a century, from the mid 10th to the mid 11th century, which is why the only pottery of this date which is found tends to have been made in Lincolnshire (Lincoln,

Torksey and Stamford). As with the single early to mid Anglo-Saxon vessel, these two sherds may give a false impression of the level of activity at Melton during this period.

Medieval

Eighty-five sherds of pottery, representing no more than 70 vessels and weighing 0.846 Kg, were datable to the earlier medieval period, between c.1150 and 1250 (Table 3). Several of these sherds are large and show little abrasion. Their condition is consistent with medieval settlement on the site rather than the accidental importation of pottery along with manure onto the fields.

Fabrics

The early medieval sherds are of three types: Beverley wares (BEVO*); Staxton-type ware of Beverley fabric (STAXT) and Staxton-type ware of local fabric (QC). The Beverley wares were of two fabrics, a calcareous, sandy fabric datable to the mid/late 12th century (BEVOA, 17 sherds, 9 vessels) and a fine silty fabric, datable from the mid 12th to the 14th centuries (BEVOB, 25 sherds, 22 vessels). No examples of Beverley C ware, a high-fired silty ware of later 13th to 14th century date, were present. 12th-century Beverley glazed wares have a splash glaze (BEVO1, 5 sherds, 4 vessels) whilst later 12th to 14th-century Beverley glazed wares have a glaze applied in liquid form (BEVO2, 32 sherds, 22 vessels). A small number of sherds either were unglazed or the glaze had been weathered (BEVOB, 11 sherds, 11 vessels). Most of the sherds were undecorated, but there were two sherds from jugs with an external white slip, one of which had a copper-stained green glaze. Taken together, these features suggest a mid to late 12th century date for the Beverley wares.

The Staxton-type ware with a local fabric (QC) have an inclusionless groundmass and are tempered with a mixed sand, which includes sparse to moderate oolites. Vessels with a similar fabric have been noted at Beverley and Wawne (where they are vastly outnumbered by STAXT), Hessle (16 STAXT sherds to 3 QC), and North Newbald, where they are the only Staxton-type fabric present. This distribution and the fabric suggests a source somewhere along the western edge of the Wolds, from Market Weighton to the Humber. It is recommended that a sample of these sherds is examined in thin section and by chemical analysis to test this potential source.

In Beverley itself, STAXT ware seems to be mostly a late 12th-century product, being replaced by wheelthrown, unglazed Beverley wares in the early 13th century. The lack of Reduced Chalky ware vessels at Melton suggests that either pottery was in limited use at Melton in the later 11th to early 12th century or that the medieval settlement was founded no earlier than the mid 12th century.

Forms

Three forms were present: jars, jugs and bowls. Jars were the most common form (44 sherds from no more than 40 vessels) followed by jugs (38 sherds from 27 vessels) with bowls a poor third (3 sherds, 3 vessels). The QC and STAXT jars were made by hand but have turntable-finished rims. The high proportion of jug sherds is comparable with urban assemblages of later 12th century date and suggests that there was no difficulty for the Melton inhabitants in obtaining glazed wares, a phenomenon which has been noted elsewhere with rural assemblages.

Table 3

cname	Sherds	Vessels (Max)	Weight
BEVO1A	3	2	49
BEVO1B	2	2	6
BEVO2A	14	7	340
BEVO2B	15	12	77
BEVOB	11	11	130
QC	34	30	178
STAXT	6	6	66
Grand Total	85	70	846

Use

Traces of use were present on the jars. It consists of sooting on the exterior (16 out of 44 sherds, 13 out of 40 vessels) black deposits on the inside (2 sherds, 1 vessel) and white deposits on the interior (1 sherd).

Late Medieval

Twenty-six sherds of pottery, representing no more than 24 vessels and weighing 0.159Kg were datable to the later 13th, 14th or 15th centuries. All were small and abraded and probably present as a result of manuring.

Fabrics

Most of the sherds came from Humberware vessels (HUM). This fabric group is a regional tradition which started in the later 13th century, becoming extremely common in the mid 14th century and continuing to dominate local ceramics into the 16th century (although most 16th-century vessels have a brown external slip which has been blistered during firing, none of which were present at Melton). The source of the Melton sherds is not known but the closest known production sites are at Holme-upon-Spalding Moor, West Cowick together with a source on the southern side of the Humber, supplying Barton-upon-Humber. Three sherds of Low Countries Red Earthenware (DUTR) were present. These were imported in large numbers to Hull in the 14th and 15th centuries and are common on rural settlements within

easy reach of Hull. Single examples of a North Yorkshire Whiteware (NYWW), probably a Brandsby-type ware, and a West Yorkshire gritty ware (NGR), were present.

Forms

Most of the sherds came from jugs (12 sherds), although a high proportion of the Humberware sherds could not be assigned to a form. Jars were the next most common form (3 sherds) followed by cauldrons (2-handled, tripod footed cooking vessels) and a possible skillets or frying pan. Both the latter types were present in Low Countries Red Earthenware.

Use

One of the Humberware jug sherds had a white deposit on the interior. Such deposits are common on Humberware vessels but their interpretation is unclear. No examples of sooting or burnt food deposits were present, but this is probably a reflection of the abraded condition of the sherds.

Post-medieval to Early Modern

Fourteen sherds of post-medieval to early modern pottery were recovered from Melton, representing no more than 17 vessels and weighing 0.24 Kg in total. The range of fabrics and forms is quite wide but whether this indicates the availability of pottery in the farms using the Melton fields or is evidence for the use of night soil from Hull is unknown.

Fabrics

Five sherds of lead-glazed earthenware were present. Three of these were of Ryedale ware, produced at sites on the fringes of the North Yorkshire Moors from the later 15th century into the 17th century. One was a brown-glazed earthenware of unknown, but local, origin (BERTH) and one was a plain lead-glazed red earthenware (GRE).

One sherd of slipped red earthenware, of unknown source, was present (SLIP). One sherd of Staffordshire slipware (STSL); three sherds from one Staffordshire-type press-moulded dish (STCO) and three sherds of Creamware (CREA). Creamware from sites in East Yorkshire has been found with marks indicating sources at Ferrybridge and Sunderland but Leeds and the Staffordshire potteries are also possible sources.

A single imported vessel, a Frechen stoneware (FREC) was present.

Forms

Bowls were the most common form present (4 sherds), with other forms represented by single vessels. These include a jar (BERTH), a dish (STCO), a small mug or bottle (FREC) and a posset pot (STSL).

The Creamware vessels consist of a jug, a jar? and a bowl.

Assessment

Stratigraphic Associations

No more than one thousand, eight hundred and twenty-one vessels were present in the Melton collection (Table 4). The pottery is considered here area by area. However, in reality many of these areas are contiguous and certain linear features run through more than one area. In the final publication, therefore, the pottery should be considered period by period across the whole site, identifying concentrations of settlement on a period by period basis.

Table 4

trench	eba	ia	ia-erom	rom	emsax	lsax	med	lmed	pmed	emod	Grand Total
Unstrat		41	3	21	5		6	9	2		87
01		51	2	3			25	1			82
02		2						1			3
03		25	7	19							51
04		126	123	341			1	1	1		593
05	16	62	8	55			2	1			144
05E		87	3	18	1		7	5	2		123
06		1		1							2
07		7		1					1		9
08		408	2	1			2	1		1	415
09		3									3
11		16	1	7			3				27
12		1		1			11				13
13							1	1	2	2	6
14B									1		1
15		16		8			2	3			29
16				1							1
17	4	17		12	74	2	11				120
20		52	18	41	1						112
Grand Total	20	915	167	530	81	2	71	23	9	3	1821

Area 1

Iron Age

Three features could be dated to the Iron Age on the basis of the ceramic assemblages they produced (Table 00). In total, 47 fragments were recovered from these features of which one is a fragment of fired clay and another a fragment of medieval flat roof tile, interpreted as being intrusive. The remainder are all sherds of handmade coarse-gritted fabrics. They were divided into four groups following x20 magnification study. In all cases, sherds of limestone-tempered vessels (IALST) were the most common type, followed by rock-tempered ware (IAERR) with flint-tempered and shell-tempered vessels being represented by 1 and 2 sherds respectively. The similarity in assemblage suggests that the features were filled contemporaneously and it may be possible to narrow down the chronology following further analysis. Three vessel rims were present (one bowl and two jars) and it may be possible to refine the date-range of these types (although this has not proved possible elsewhere in East Yorkshire).

Table 5

context group	FCLAY	IAERR	IAFLINT	IALST	IASH	MTIL	Grand Total
1135		2		4			6
4927	1	4		16	1	1	23
4930		3	2	13			18
Grand Total	1	9	2	33	1	1	47

Medieval

All remaining pottery from Area 1 came from features interpreted as being of medieval date. These include 16 sherds of Iron Age date, of similar fabrics to those from the Iron Age features, and six fragments of fired clay, which are undatable. Five sherds of early Roman date were present (LOOL and GREY) suggesting activity in the Area in the 1st to 2nd centuries. The remaining 30 sherds are all of medieval date (Table 00). The most common ware present is QC, a coarse sand-tempered ware containing sparse ooliths and thought to have been produced at North Newbald in the later 12th to mid 14th centuries. The remaining wares were mainly produced at Beverley (BEVO2, BEVO2A, BEVO2B, STAXT) and also probably date to the later 12th to mid 14th centuries. The lack of BEVO1 sherds suggests that there is no occupation on the site in the mid/late 12th century. A single sherd of Humberware is present (7030) and this would have been current in the mid 14th to 16th centuries. It either indicates that this occupation extended into this period or, more likely, is unrelated to the occupation and is evidence for later medieval manuring of the fields. No further work is required on the pottery from these features.

Table 6

cname	4078	4994	5007	5027	5029	5031	5033	5035	5064	5077	5145	5228	5233	5234	7030	7034	7060	Grand Total
BEVO2			1									1						2

BEVO2A	2																	2
BEVO2B							1										1	2
HUM														1				1
QC		2		5	2	3	2		1	2	1	1	1		1			21
STAXT	2																	2
Grand Total	2	2	2	1	5	2	3	2	1	1	2	2	1	1	1	1	1	30

Area 2

Only three sherds were recovered from Area 2. One of these is unstratified and the other two from the fill of gullies.

Gully 4194 produced a sherd of Iron Age date (IASAND) and Gully 5037 produced a sherd of late medieval pottery (HUM).

Area 3

Iron Age

Two definite Iron Age contexts produced pottery: the silt of the early Bronze Age round barrow, 7057, and the fill of ditch 5217. Neither assemblage is large, amounting to at most 5 vessels in total. Fabrics IAERR and IALST are present.

Iron Age to Roman

Seven ditches produced a mixture of Iron Age and Roman pottery in their fills. It is suggested that perhaps the ditches were established in the Iron Age period and recut and/or silted up during the Roman period. However, the earliest of these ditches, 5143, produced 43 sherds in total, of which 32 are of Roman date and these Roman sherds come from four separate contexts. They include a greyware jar with acute lattice decoration and sherds of a large flint-tempered *dolium* (found in contexts 3355, 3345 and 2691). It seems clear that this feature was not filled until some time after c.120 AD.

Ditch 5143 is cut by ditch 4037, which is probably contemporary with ditch 5141. Most of the pottery from the fills of these ditches is of Iron Age date, although it mainly consists of single sherds and there is no reason why they could not be re-deposited. This ditch also occurs in Area 4, where its fill can be dated to the mid 3rd century or later.

Ditches 4036 and 3289 cut the fill of 4037. Their fills produced a mixture of Iron Age and Roman pottery, including another acute lattice-decorated greyware jar, and therefore date to the mid 2nd century or later. One of the Iron Age vessels, from context 3283 in ditch 4036, consists of 90 sherds from no more than two vessels in IAERR. In Area 4, the fill of ditch 4037 is cut by a 4th-century corn dryer and therefore a similar late Roman date is possible for these two ditches.

There are therefore three generations of Romano-British ditches from this area, all of which contain similar pottery with no sign of a progression in date. It is worthwhile considering whether the later ones might not be much later than their accompanying finds, suggesting that there was little occupation in Area 3 during the period of their filling.

Area 4

Iron Age

Nine features produced only Iron Age pottery. The total quantity of pottery recovered from these features was small (11 sherds) and the sherds are small singletons (10 vessels, 0.139 Kg). It is therefore quite possible that some or all of these features are of later date.

However, a group of features within them are possibly associated with a gateway structure (3589, 3603, 3842 and 3845) and these at least are probably Iron Age. A wide range of fabrics were present (IAERR, IAFLINT, IASH, IASAND, IASST) with IAFLINT being the most common (4 sherds).

Iron Age or Early Roman

Ten features produced no sherds of Romanised wares but did contain sherds of LOOL, which is known to be in use in the early Roman period but may have come into use in the late Iron Age. Other handmade wares occur, but with one exception these consist of singletons of various fabrics, all of which are probably residual. The exception is a vessel in IASST from ditch 2735, which consists of 30 sherds from one vessel, although the total weight (50gm) suggests that this might have been quite a small sherd which was smashed on excavation, or during redeposition. Collections of sherds from single LOOL vessels occurred in several features (ditches 2735, 3194, 3342, 7028; pits 3407 and 3728. Single sherds came from grave 4260, pit 3570 and postholes 3963 and 4308.

Roman

Seven hundred and sixty-five sherds of pottery were recovered from deposits of Roman date in Area 4. They represent no more than 539 vessels and weigh in total 9.424Kg.

One hundred and seventy six of these sherds are of handmade wares of Iron Age character, not including 148 sherds of LOOL. In some contexts these wares are as numerous as the LOOL and wheelthrown Romano-British wares and in some cases smashed vessels are present. Particularly clear examples occur in the backfill of kiln 4374 (e.g. IAGROG and IAGSQ). It is unlikely that these types were still in use at the time of this backfill and this suggests wholesale redeposition of deposits with Iron Age cultural debris. Similar examples come from the fill of ditch 4037 (e.g. IAERR and IALST) and ditch 3946 (IAERR). All the remaining Iron Age pottery consists of non-joining sherds of varying fabrics.

Four hundred and forty sherds of Romanised wares were present, representing no more than 339 vessels and weighing 5.439Kg in total. Most of these are of types which were probably produced in North Lincolnshire and which may be more closely datable following further study, however, they are probably mostly of early to mid 2nd century date. Seven features contain sherds which can be more closely dated:

Four can be dated to the 2nd century. These consist of ditch 3195 (dated by a Parisian ware vessel); ditch 7026 (dated by a greyware jar with acute lattice burnished decoration); ditch 3955 (dated by a piece of 2nd-century Central Gaulish Samian ware) and ditch 3957 (also dated by a piece of Central Gaulish Samian ware).

Ditch 4037 is dated by a piece of Colchester Mortarium (c.140-200) and the base and body sherds from a jar in Dales Shelly ware. Unfortunately, in the absence of a rim this might be an Iron Age or early Roman vessel made in the same area as the 3rd century Dales ware.

The backfill of kiln 4374 produced sherds of a Dorset Black Burnished ware jar and the roughcast beaker of Nene Valley or Cologne colour-coated ware. Both of these could date to the mid 2nd century. Since the kiln was cut into the backfill of ditch 4037 it is likely that the pottery is all residual (as was the Iron Age pottery, noted above).

Post-Medieval

A pit, 3332, produced a single sherd of Ryedale ware and two residual sherds (one Roman and one medieval). It can therefore be dated to the later 15th century or later.

Area 5

Early Bronze Age

Ninety-two sherds were recovered from the fill of two graves, 2631 and 2721. The former contains parts of two or possibly three beakers and a vessel with incised decoration together with scraps of what may be Iron Age pottery (coded as IAERR and EBALST). The grave was disturbed by a tree throw and this may explain the later sherds and the fact that the sherds of the beakers are spread throughout several layers. The latter grave, 2721, produced scraps of flint-tempered and grog-tempered ware (coded as IAFLINT and EBAGROG). Neither is decorated, nor a large sherd, and it is likely that both are of Iron Age date. Nevertheless, all these sherds should be submitted to a specialist in earlier prehistoric pottery.

Iron Age

Iron Age pottery was recovered from thirteen features in Area 5. These include two ditches, 1137 and 1870, a square barrow, 2100, a cremation, 1372, and several pits, post-holes and

stakeholes (1308, 1310, 1337, 1446, 1472, 1591, 1593, and 2032). In total, these features produced 76 sherds of pottery, representing no more than 51 vessels and weighing 1.388 Kg. Erratic-tempered wares were the most common ware in all features (Table 6), followed by flint-tempered ware with all other fabric types being represented by one or two vessels each. However, one oolitic limestone-tempered was represented by six sherds, with a total weight of 337gm and is probably contemporary with the remainder.

The pottery therefore suggests that all the Iron Age features are broadly contemporary.

Table 7 Distribution of Vessels in Area 5 Iron Age Features by Ware

Context Type	context group	EBALST	IAERR	IAFLINT	IAGSQ	IALST	IAOOL	IASH	Grand Total
cremation	1372		4	1					5
ditches	1137		1	1					2
	1870		1						1
occupation	1337		6	4	1				11
	1446			4					4
	1472	1	3	2			1		7
	1591		1						1
	1593			1		1			2
	2032		1						1
square barrow	2100		8	6		1	1	1	17
Grand Total		1	25	19	1	2	2	1	51

Roman

Pottery was recovered from six ditches, two graves and the fill of a trackway. In total 256 sherds were present, representing 65 vessels and weighing 5.188 Kg. Most of the pottery came from a single deposit within ditch 7056 which produced the remains of several smashed vessels, clearly deposited at a single point in time and therefore in contemporary use. This assemblage is of considerable interest and should be examined by a specialist in Roman pottery and fully published (i.e. illustration, analysis of fabric, discussion of dating and source of supply). The group includes wheelthrown greyware and oxidized ware, probably of north Lincolnshire origin, but also handmade vessels, mainly of LOOL but also of IALST and a single large sherd of a jar in a similar fabric to Dales Shelly ware but whose diagnostic rim is missing.

A second ditch, 1276, produced an assemblage of similar date which would also repay specialist study. The remaining ditches produced only small quantities of greyware and cannot be closely dated. One of the graves (2532) also produced just one sherd of greyware whilst the other produced body sherds of Dales shelly type.

Finally, the trackway produced sherds from a greyware vessel.

Area 5E

Iron Age

Two hundred and eleven sherds of pottery came from features dated to the Iron Age. they represent no more than 65 vessels and weigh in total 1.8 Kg. These features form a discrete group spatially and are probably all contemporary (Table 7).

The most common fabric is erratic tempered ware, followed by flint-tempered ware. These two wares appear to be almost mutually exclusive in their distribution. The erratic tempered ware comes mainly from ditches, postholes and stake holes and the flint-tempered ware comes from pits. This suggests either a functional difference in the use of these wares or a chronological difference.

Table 8. Distribution of Iron Age vessels by ware type in Area 5E

context group	IAERR	IAFLINT	IAGROG	IALST	IAOOL	IASAND	IASH	IASST	Grand Total
1889	1	1		1		1	1		5
5045		1		1			3		5
5047		2							2
5111				1					1
5117	1								1
5123	6								6
5125	1						1		2
5129	12								12
5178					1				1
5180	1								1
5182	3			2					5
5184	4			11					15
5215	2								2
5219		1						1	2
5230		4							4
5241		1							1
5259							1		1
5269	1								1
5291	2								2
5351	1								1
5401								1	1
5479			1						1
5501	1			1			1		3
5510	1								1
5906	2								2
5908		1							1

5910	1								1
Grand Total	40	11	1	17	1	1	7	2	80

Late Iron Age or Roman

Three features produced sherds of LOOL and are probably of Roman date. However, since they contain no sherds of Romanised vessels they have been separated from the other, definite, Roman features (Table 8).

Table 9

context group	LOOL	LOOL/DWSH	Grand Total
5243	1	1	2
5405	1		1
5507	1		1
Grand Total	3	1	4

Roman

Three features (a grave, a pit and a posthole) produced sherds of Roman date (Table 9). In each case only a single sherd was found.

Table 10

context group	AMPH	GREY	IAERR	Grand Total
5121	1		1	2
5320		1		1
5513		1		1
5524		1		1
Grand Total	1	3	1	5

Late Roman

The fill of ditch 5494 produced four sherds, one of which is possibly late Roman Calcite-tempered ware (although it might be a residual Iron Age sherd). the remaining sherds are greyware, for which a closer date might be obtainable through specialist examination.

Early Anglo-Saxon?

The fill of posthole 5295 produced one sherd which might be of early Anglo-Saxon date, together with one calcite tempered sherd, of Iron Age or late Roman date, and two erratic tempered ware sherds.

Medieval

Sherds of Roman and medieval pottery were recovered from trackway 1890. The trackway itself is clearly of much earlier date but these sherds suggest that it was still in use, or at least visible as an earthwork, in the medieval period. The medieval sherds include a QC vessel and a BEVO1A vessel, suggesting a 12th-century date.

The fill of pit 5432 produced sherds of two BEVO2B vessels and a North Yorkshire whiteware, suggesting a late 12th to early 13th-century date.

Late Medieval

Four features associated with medieval agriculture produced mixed assemblages of pottery, of which the latest types present were Humberware (Table 10).

Table 11

context group	BEVO2B	GREY	GREY/HUM	HUM	IAERR	OXID	Grand Total
5161		1					1
5207		2	2			3	7
5345	1						1
5445		1		1		1	3
Grand Total	1	4	2	1	3	1	12

Post-Medieval

Two pits produced sherds of Ryedale ware, alongside earlier medieval pottery (Table 11). They probably date to the later 15th century or later.

Table 12

context group	DUTR	HUM	QC	RYEDALE	Grand Total
5330		2	2	1	5
5498	1			1	2
Grand Total	1	2	2	2	7

Areas 6, 7, 8 and 9

Iron Age

With the exception of a few sherds which might be intrusive, the features in these areas produced sherds of Iron Age date. In total, 905 sherds, representing no more than 419 vessels and weighing 10.704 Kg were recovered.

The most common fabric was erratic tempered ware followed by oolitic limestone tempered ware and other limestone tempered ware. There is no apparent patterning in the distribution of the various fabrics and it seems that the larger the assemblage the greater the number of

wares are represented in it (Table 12). Therefore, there is no evidence from this source for any difference in date between the various features. However, there are 22 vessels present which are complete enough for typological study. It is noteworthy that only two features produced sherds of LOOL (2876 and 3193) and in one instance (2876) the identification must be suspect (the sherd weighed 1gm) and in the other there are 22 other vessels present, all of which are of standard Iron Age wares.

Table 13

context group	IAERR	IAOOL	IALST	IASH	IAFLINT	IACALC	IAGROG	IAGSQ	IAORG	IASAND	IASST	IASILTY	Grand Total
1003	1												1
1007	3												3
1012	1	1		1									3
1014	1												1
1016	1												1
1022				1									1
1033	3			1									4
1035	1												1
1037	1						1						2
1100	1												1
1157					1								1
1264	2				1								3
1333		1											1
1368		1		1									2
1393							1	1					2
1397							1						1
1406	1												1
1409				1									1
1416							1						1
1418	1	1											2
1444					1								1
1458	4				1		1						6
1460	1												1
1487	7	1	2										10
1488		2	1										3
1496					1								1
1528	2												2
1578	1		1	1	1		1						5
1583	4	1	1							1			7
1600	4	41	7	2									54
1601	1		2	7						1			11
1668	1												1

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1674		1										1	
1678		1	1									2	
1683	1											1	
1696				1								1	
1704	1											1	
1706	22	5	13	2	1	2		1	1		1	1	49
1725		1											1
1772	1												1
1808						1							1
1812	3	4	1										8
1836		1	1										2
1846	1	2	1				1	1					6
1853				1									1
1856				2									2
1891		1											1
1892	3	2	1	6				1	1				14
1958			1										1
1983	5	1					1				1		8
1985	2		1	1	1								5
1993			1					1					2
2001					1								1
2013	1	4	3	4					1				13
2030		1	1	2		1							5
2045		1			1								2
2058	1												1
2060	1												1
2064	1												1
2078					1								1
2106		2											2
2137						4							4
2181								1					1
2278					1								1
2310	1												1
2348			2										2
2372								1					1
2433			1										1
2435	2	1	7										10
2475	1		1										2
2526	1		1										2
2534	1												1
2549								1					1
2563			2										2
2565	2		9										11
2590	1	2											3
2612				1									1

2613	1																						1	
2657				1																				1
2718	3	3	1	1																				8
2727	1						1																	2
2739	1																							1
2749				1																				1
2835	3																							3
2847	1	1																						2
2852	1																							1
2868	2			7			1					1												11
2870				1																				1
2883					2																			2
2887	1											1												2
2893				1																				1
2921				1																				1
2931	1																							1
2949	1																							1
2956				1	3																			4
2961	1																							1
2965																							2	2
2977							1																	1
2993																							2	2
3003	1			1																				2
3070				1																				1
3075	1																							1
3079																							1	1
3100				1																				1
3114	1			1	1																			3
3193	6	5	6	1	1	1	1	1																21
3271				2																				2
3272	3																							3
3273	2	2	1																					5
3823	2			1																				3
7004				1																				1
7005							1																	1
7019	1	2							1															4
7059	2			1	1	1								1										6
Grand Total	130	97	89	44	18	14	14	6	2	2	2	1												419

Later Activity

A handful of post-Iron Age sherds were recovered from these areas. In some cases they are clearly intrusive, for example, a sherd of Humberware from a horizontal midden deposit or a sherd of a flagon of Roman date from a deposit associated with a trackway.

The remaining sherds are few in number and only ever occur as single instances. If the stratigraphic analysis suggests that a post-Iron Age date is likely then these sherds will provide supporting evidence, but they cannot themselves prove that the sherds are not intrusive, given their scarcity.

Area 11

Iron Age or Roman

Two features produced sherds of Iron Age pottery. Ditch 5356 produced a small assemblage of sherds which provide only a *terminus post quem* whilst Ditch 6194 produced a larger assemblage, including joining sherds of a LOOL jar and 18 sherds from a shell-tempered jar.

Roman

Two features produced assemblages which include Roman pottery. Gully 6071 produced sherds from three greyware vessels and one coarse-gritted vessel which would probably be more closely datable if examined by a specialist. Ditch 6192 produced a larger group of sherds, two of which (from context 5327) are Romanised greyware whilst sherds from contexts 6213 and 6215 might be Iron Age or later Roman in date (Dales shelly ware and Calcite tempered ware respectively). Joining sherds of three Iron Age erratic tempered ware jars came from context 5325, suggesting perhaps that this ditch was open from the Iron Age onwards.

Medieval

Sherds of medieval pottery were present in pits 6077 and 6079. They include Beverley ware of later 12th or 13th century date.

Area 12

Iron Age

A small sherd of Iron Age pottery dates the fill of posthole 6075 to the Iron Age or later.

Roman

A sherd of a DR27 cup, of South Gaulish samian ware dates the fill of ditch 6128 to the later 1st century or later.

Medieval

Four sunken-featured building fills contained medieval pottery, all of later 12th to mid 13th century date. No residual sherds are present in these fills and the medieval assemblage is

composed of later 12th-century or later Beverley wares, Beverley- Staxton-type ware and QC vessels.

Area 13

Early Modern

Ditch 6197 produced a mixed assemblage of medieval, later medieval, post-medieval and early modern pottery, the latest sherds in which were a Creamware bowl and jug, dating the backfill to the later 18th century or later.

Areas 14 and 15

Bronze Age??

A single cremation (1020), in a handmade jar, was not seen as part of the assessment, since it was receiving a conservation assessment and was, in any case, too fragile to be easily transported. A small body sherd was extracted and examined at Lincoln, where it was seen to be grog-tempered and similar visually to sherds identified as being of earlier prehistoric date (coded EBAGROG). It is at present unwashed and has its contents present. It requires illustration and examination by a pottery specialist, or possibly more than one specialist, depending on decisions on its date.

Iron Age

The fills of three ditches (1041, 1523 and 1688), a pit (1522) and a posthole (1274) produced a small quantity of Iron Age pottery, 11 sherds in total (representing 7 vessels and weighing in total 0.028Kg). These sherds (mostly erratic tempered wares) date the features to the Iron Age period or later.

Roman

The fills of five ditches (1076, 1363, 1477, 1485 and 1651) contain pottery of Roman date. All the sherds are small with few joins (38 sherds in total, representing 17 vessels and weighing 0.237 Kg). No sherds of LOOL were present and few residual Iron Age wares (12 sherds) and this might suggest a later 2nd to early 3rd century date. However, this requires specialist study to see if the deposition dates can be refined.

Post-Medieval

The fill of ditch 1687 produced 2 sherds of medieval date (later 12th to mid 13th century).

Layer 1686 produced a sherd of late medieval Humberware, as did the fill of trackway 1563.

Modern

Trench 1043 produced a sherd of Staffordshire slipware posset pot of late 17th or 18th century date.

Area 17

Bronze Age?

Three postholes (5709, 5711 and 5715) produced grog-tempered sherds which may be of Bronze Age date but which require specialist study. In total, the features produced 6 sherds, representing no more than 4 vessels and weighing 0.028 Kg.

Iron Age

Four ditches (5979, 6046, 7050 and 7052), a pit (5677) and a posthole (5757) produced Iron Age pottery. In total, 12 sherds from no more than 9 vessels, weighing 0.050 Kg were present and thus these features might easily be of later date, since the sherds only provide a *terminus post quem*.

Roman

Four ditch fills (5457, 5566, 5928 and 7038) produced sherds of Roman pottery. The sherds are all wheelthrown greywares, with one vessel per feature (total 5 sherds, representing 4 vessels and weighing 0.161Kg). Here too, the sherds can only provide a *terminus post quem*.

Early Anglo-Saxon

The fills of eleven features produced sherds of early Anglo-Saxon date. These features include a natural hollow, 5721, ditches 5701 and 5928, gully 5830, layer 5662, pits 5560, and 5667 and postholes 5614 and 5774. A total of 279 sherds, representing no more than 81 vessels and weighing 2.892 Kg. All but seven of these sherds are of early Anglo-Saxon date and these Iron Age and Roman sherds are probably residual. However, two of the erratic tempered wares (from pit 5667) contain biotite, an unusual Iron Age feature but a common one in the Early Anglo-Saxon one and thus these sherds too might be of early Anglo-Saxon date. The Anglo-Saxon pottery assemblage includes several different fabrics but by far the most common fabric, ESAXLOC, is present in almost every assemblage and it is likely that the duration of occupation was short and that most of these features were contemporary. Two vessel forms are present, bowls and jars, and there is no evidence for any spatial difference in their deposition.

Medieval

Medieval pottery was found in the fills of six ditches (5661, 5809, 5843, 5848, 5929 and 5930), a gully (5843) and a pit (5838). In total, 40 sherds were present, representing no more than 22 vessels and weighing 0.623 Kg. Residual sherds consist of 9 sherds of Iron Age pottery, 9 sherds of Roman date and two Anglo-Scandinavian date, from pit 5838. The latter two sherds were larger and fresher than the others and suggest that either this medieval occupation phase began in the 10th/early 11th century or that there was some earlier but unrelated occupation. In total, 20 medieval vessels were present, of which all but three were Beverley glazed wares, including potentially mid 12th-century types. Some of the sherds have suspension glazes and therefore the occupation extends into the later 12th century but there are no sherds present which have to date to the 13th century.

Area 20

Iron Age

Six features produced sherds of Iron Age pottery. In total, 14 sherds were present, representing no more than 8 vessels and weighing 0.127 Kg. The pottery came from two ditches (3517 and 7001), three pits (3489, 3546 and 4023) and a posthole fill (3751). No feature produced more than 2 vessels and the pottery can therefore only provide a *terminus post quem* for their filling.

Limestone tempered ware is the most common type but erratic tempered ware and others (IAGROG and IAGSQ) were also present.

Late Iron Age or Early Roman

Four features produced sherds of LOOL but no Romanised wares. They may therefore be of later Iron Age or early Roman date. In total, 541 sherds representing no more than 25 vessels and weighing 8.696 Kg.

One feature, pit 3932, produced a single small sherd and can only be given a *terminus post quem*. However, the fills of ditches 3369 and 4293 both produced smashed vessels. Those from ditch 3369 are of erratic tempered ware and IAGSQ, as well as of LOOL and this suggests that either the ditch filled up over a period of time or that all three wares were in contemporary use. Similarly, in ditch 4293 there are smashed vessels of erratic tempered ware and IAGSQ as well as LOOL and it seems that the two ditches are of similar date.

Roman

Fourteen features produced sherds of Roman pottery, together with residual Iron Age wares. In total, 260 sherds, representing no more than 81 vessels and weighing 5.529 Kg. Several of these ditches have stratigraphic relationships, indicating that they were dug over a period of time (e.g. 4019 is cut by 4026 which is itself cut by 3892).

Three features contained sherds of LOOL, alongside Romanised wares, and these were consistently the earlier features in their respective stratigraphic relationships. It is likely that the sequence of Roman occupation started in the later 1st century and continued well into the 2nd century but the pottery requires examination by a specialist to see if a refined dating can be achieved.

Early to Mid Anglo-Saxon

Ditch 3392 produced a small assemblage of Roman pottery and sherds from a single chaff-tempered jar, probably of early to mid Anglo-Saxon date (i.e. 6th to 7th centuries). A second feature, 3383, produced a single sherd of Roman greyware and is stratigraphically later than 3392. There are no features of either ditch to distinguish them from those of Roman date and it is possible that the chaff-tempered vessel is intrusive to a Roman sequence.

Archaeological Potential

The Melton excavations have produced a ceramic sequence with a high potential for answering questions about the chronology and supply of pottery in this part of East Yorkshire, from the Early Bronze Age to the later 12th century AD. The only periods which are not well-represented are the mid to late Bronze Age (and an unknown part of the early Iron Age), the 3rd and 4th centuries AD, the Mid Saxon and the Anglo-Scandinavian periods. With these exceptions, the varied and distinctive nature of the local geology means that it should be possible to recognise wares made from quaternary deposits in the Vale of York, Jurassic clays from north of the Humber, quaternary deposits to the east of the Wolds, Jurassic clays from south of the Humber and the south-western part of the Lincolnshire Wolds. Because it seems that settlement shifted from area to area, there is only a limited amount of redeposition of earlier sherds in later deposits and the presence of several smashed vessels enables us to distinguish two types of dating evidence: a *terminus post quem*, which merely allows us to say that a deposit was laid down after a certain point in time, and a date range, which enables us to say that a deposit was probably laid down within a certain, limited date range.

Differences in the quantity and character of pottery in features of similar date also allow us to recognise areas of rubbish disposal and, from these, infer which areas were occupied at particular times.

To realise this potential, however, a certain amount of work is required to characterise the pottery fabrics and to determine whether or not the same raw materials were used over a long period of time or whether, in the context of Melton at least, certain fabrics have a narrow date range.

Following on from these characterisation studies, it may prove necessary to re-examine, and re-record, certain pottery assemblages to distinguish fabrics which have at present been given the same coding.

Retention

A very small quantity of pottery has had to be treated as unstratified, either because it was recovered from unstratified spoil or because of mistakes in the recording process. This is the only material which could be discarded, and it forms such a small proportion of the total that it is recommended that the benefits of discarding this pottery are outweighed by the extra costs involved in recording the process.

Costing and Method Statement

It is recommended that where a fabric has been selected for characterisation studies a group of 10 samples are selected, normally from large, illustratable vessels from potentially datable deposits. Subsamples would then be thin sectioned, at the University of Manchester, and stained using Dickson's method (Dickson 1965). This staining distinguishes non-ferroan and ferroan calcite (which, for example, helps to distinguish small shell fragments from sparry calcite limestone cement) and distinguishes both from dolomite. Fragments of dolomitic limestone are found in detrital deposits draining the Magnesian Limestone hills of south and west Yorkshire as well as in boulder clays containing Permian limestone fragments from northeastern England. A second subsample would then be prepared (by removal of the outer surfaces) and crushed to form c.1-2gm of powder. This powder would then be analysed at Royal Holloway College, London, using Inductively Coupled Plasma Spectroscopy (ICP-AES). This technique measures a number of major elements as percent oxides and a range of minor and trace elements as parts per million.

Comparative chemical data is available from a number of sites in East Yorkshire and surrounding counties, notably the type series of Iron Age pottery fabrics from Ferrybridge, Iron Age and Roman ceramics from Elloughton and Anglo-Scandinavian and medieval pottery from Beverley and Wawne. Current costs are £23.00 plus VAT for each thin section and analysis and £23.00 plus VAT for each ICPS analysis. A total of 174 samples are recommended (Table 13).

Table 14

Pottery Type	TS	ICPS	Total Cost	Total plus VAT
EBAERR	1	1	£46.00	£54.05
EBAGROG	5	5	£230.00	£270.25
EBALST	2	2	£92.00	£108.10
IAERR	10	10	£460.00	£540.50

IAERR (Biotite)	10	10	£460.00	£540.50
LOOL (half from potentially pre-conquest contexts and half stratified with RB vessels)	10	10	£460.00	£540.50
IAOOL	10	10	£460.00	£540.50
Samples of Cave Oolite	2		£46.00	£54.05
IALST	10	10	£460.00	£540.50
IASH	10	10	£460.00	£540.50
IAGSQ	10	10	£460.00	£540.50
IAFLINT	10	10	£460.00	£540.50
IACALC/CALC	10	10	£460.00	£540.50
IAGROG	10	10	£460.00	£540.50
IASST	10	10	£460.00	£540.50
IASLAG	7	7	£322.00	£378.35
Kexby-type wares and comparanda	20	20	£920.00	£1,081.00
MORT	2	2	£92.00	£108.10
Early Anglo-Saxon	13	13	£598.00	£702.65
Anglo-Scandinavian	2	2	£92.00	£108.10
QC	10	10	£460.00	£540.50
Total	174	172	£7,958.00	£9,350.65

A total of eighty-three vessels were selected for illustration. It is unlikely that specialist input will lead to further illustrations being required and in one case (later prehistoric) the specialist would prefer to have the drawings done in advance of being presented with the pottery. Charlotte Bentley has examined these sherds and estimates £650 plus VAT. This estimate includes the cost of public transport from Lincoln to York to draw the cremation urn from Area 14 and a full day. The work could be undertaken between September and December 2005.

Specialist advise/identification is required for the earlier prehistoric pottery (Carole Allen), for the later prehistoric pottery (Peter Didsbury) and for the Romano-British pottery (coarsewares – Barbara Precious, samian ware – Brenda Dickinson and mortaria – Kay Hartley). Estimates for this specialist work have been obtained for the earlier prehistoric pottery (5.5 days at £200 plus VAT and travel to York to examine the cremation from Area 14), the later prehistoric pottery (10 days at £200 per day, plus VAT) and for the Roman coarsewares (5 days at £200 per day, plus VAT). The samian and mortaria are estimated at £100 each, plus VAT.

These various studies will require the extraction, re-boxing and postage/delivery of pottery, potentially further extraction, depending on the results of characterisation studies, updating of the archive record and then re-integration of the sherds following specialist study. A budget of 9 days at £184 per day plus VAT is estimated to cover these processes.

The final report, consisting of sections written by Alan Vince, Carole Allen, Peter Didsbury, Barbara Precious with short notes by Brenda Dickinson and Kay Hartley, will be written and assembled by Alan Vince. Based on the time taken to carry out the assessment, a budget of 15 days at £184 plus VAT per day is proposed to cover both the text preparation and liaison with other authors.

The total estimated budget for the recommended work on the Melton pottery is therefore £16,790 plus VAT (Table 14).

Table 15

No	Task	Personnel	Cost	Cost plus VAT
1	Characterisation studies	University of Manchester; Royal Holloway College London; Alan Vince	£7,958.00	£9,350.65
2	Illustration	Charlotte Bentley	£650.00	£763.75
3	Early Prehistoric Pottery	Carole Allen	£1,100.00	£1,292.50
4	Later Prehistoric Pottery	Peter Didsbury	£2,000.00	£2,350.00
5	Roman Coarsewares	Barbara Precious	£1,000.00	£1,175.00
6	Samian ware	Brenda Dickinson	£100.00	£117.50
7	Mortaria	Kay Hartley	£100.00	£117.50
8	Extraction/re-integration of sherds and updating archive	Kate Steane	£1,656.00	£1,945.80
9	Production of final report and integration of specialist texts	Alan Vince	£2,760.00	£3,243.00
10			£17,174.00	£20,179.45

Timetable

Thin section and chemical analyses can take place concurrently. There is normally a 2-3 week turnaround time for chemical analysis and c.4-5 week turnaround for a large batch of thin sections, such as that recommended here. Both thin sections and chemical analyses are required before analysis of either is undertaken. In cases where a single rim is to be sampled and illustrated, the drawings should be undertaken first. The sequence of tasks is therefore:

- a) Illustrations. Duration: 6 weeks.
- b) characterisation studies (plus associated extraction time). Duration: 7 weeks.
- c) specialist studies (plus associated extraction time). Duration: 4 weeks.
- d) preparation of final report. Duration: 4 weeks.

Total duration: 21 weeks.

It would be possible to speed up the overall time by allowing some tasks to start before the preceding task is complete, but this would add to the cost of Task 8.

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