# Characterisation of Anglo-Scandinavian wares from Derby (QSD)


## *Alan Vince*


Excavations at Queen Street, Derby, undertaken by Trent and Peak Archaeological Unit produced a collection of Anglo-Scandinavian and medieval pottery. An assessment of this pottery by Chris Cumberpatch revealed that this collection included a small collection of fresh pottery of late 9th to 11th-century date and a specialist assessment of the shelly wares by Jane Young showed that the shelly wares were all Lincoln products and included types which could be dated to the late 9th to mid 10th centuries.

On the basis of this assessment, the Anglo-Scandinavian sherds were shown to the author for consideration as part of the Northumbrian Anglo-Saxon Pottery Project and, with permission of T&PAU, a series of samples were taken for thin section and chemical analysis. The results confirm the Lincoln origin of the shelly ware and show that in addition several of the wheelthrown greywares from the site are also Lincoln products. A jar thought visually to be a local copy of Stamford ware was shown to be a genuine Stamford product and a sample of Torksey-type ware also compared well with samples from the Torksey kilns. A single sample of coarser wheelthrown ware was shown to have been tempered with a Carboniferous-derived sand and shown not to be York A ware. However, the precise source is unknown.

## Thin Section Analysis

Thin sections were prepared by Steve Caldwell, University of Manchester, and stained using Dickson's method (Dickson 1965).

### Lincoln Wares

#### Lincoln Gritty ware

A single sample of Lincoln Gritty ware was taken (Young and Vince 2005, LG). The fabric contains medium-grade sand and the vessel is a jar with a sagging base (Figs 1 and 2).


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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/avac2008046.pdf


*Figure 1 V4964*


*Figure 2 V4964*

In thin section, moderate grains of subangular and rounded quartz ranging up to 0.5mm across are present, together with rounded laminated mudstone fragments. The mudstone contains no quartz, has prominent bedding and contains scattered angular dark brown to opaque grains up to 0.1mm across. The groundmass consists of optically anisotropic baked clay minerals, no quartz silt and abundant dark brown to opaque grains up to 0.1mm across.

### Lincoln Kiln Type Shelly ware

Samples of six shelly ware vessels were taken. Two of these came from dishes or bowls which date to the late 9$^{th}$ to early 10$^{th}$ century (V4972 and V4974) and a third came from a jar with an everted, lid-seated rim, a type datable to the late 9$^{th}$ to mid 10$^{th}$ century (V4971).

All six have similar characteristics in thin section, containing angular fragments of thick-walled, nacreous bivalve non-ferroan calcite shell, sometimes with a thin coating of ferroan calcite/clay cement, which also fills boreholes in the shell.

Sparse to moderate dark brown mudstone fragments are present in V4970, V4971, V4972 and V4973.

The groundmass consists of optically anisotropic baked clay minerals and abundant dark brown to opaque grains up to 0.1mm across. Quartz silt is absent.


*Figure 3 V4974*

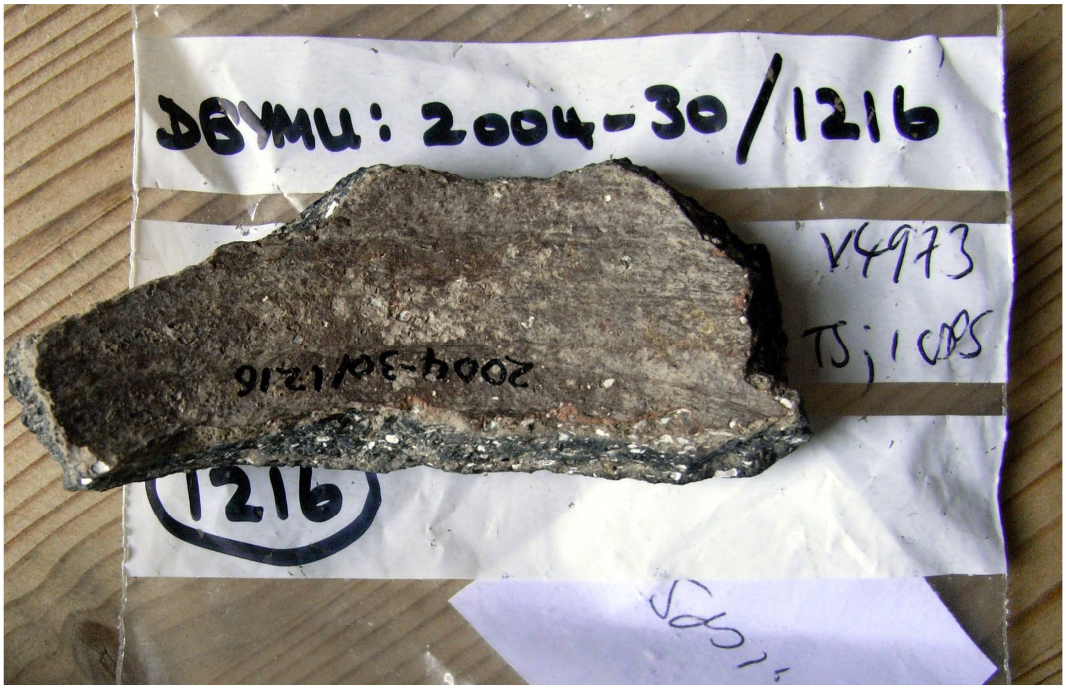


*Figure 4 V4973*

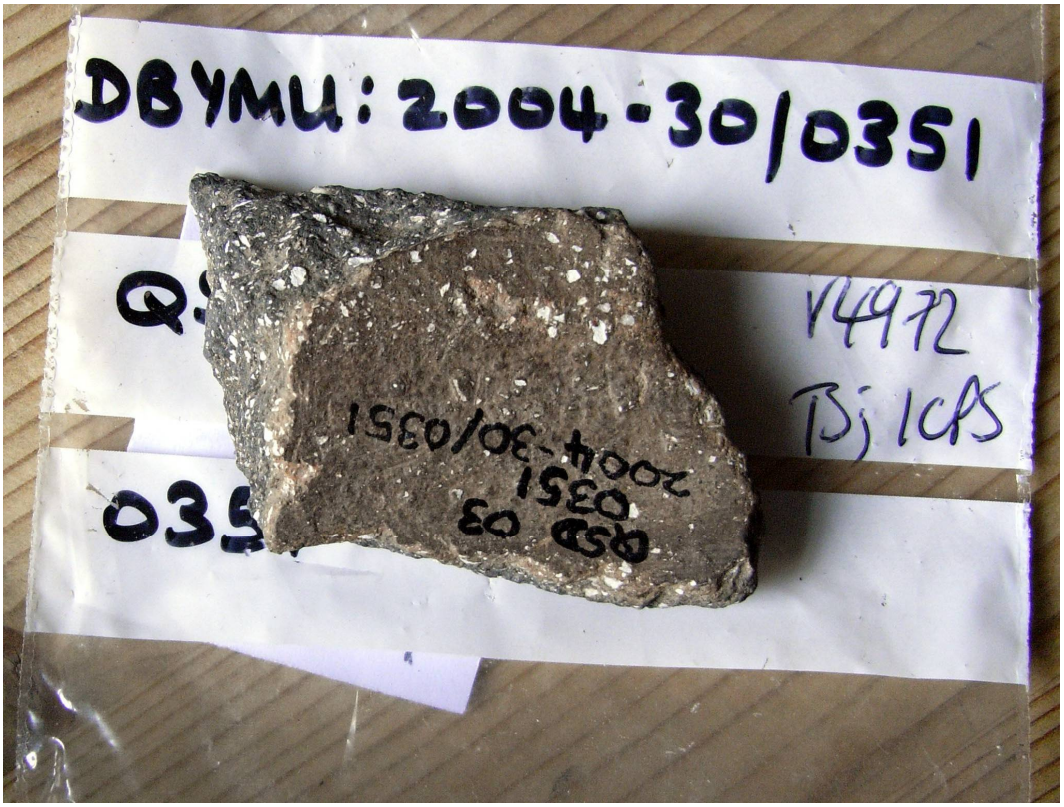


*Figure 5 V4972*


*Figure 6 V4971*


*Figure 7 V4971*

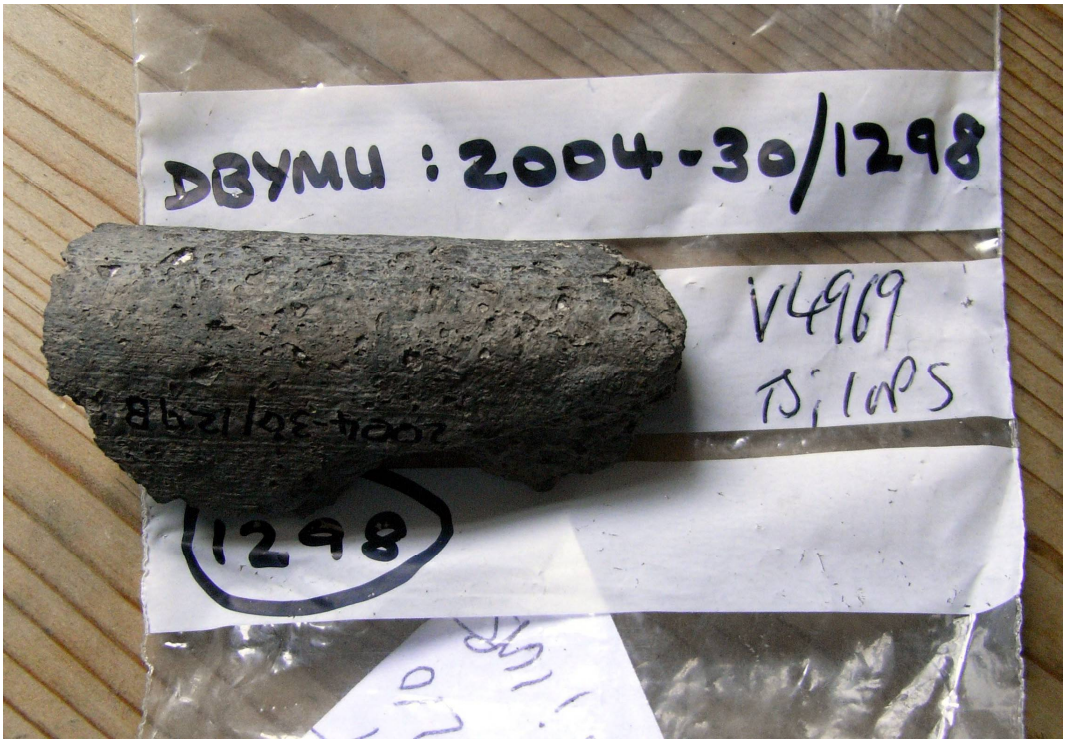


*Figure 8 V4969*


*Figure 9 V4969*

Lincoln Late Saxon Sandy Ware (LSLS)

Four samples of wheelthrown sandy ware visually identical to those produced at Lincoln were sampled. Two of these come from vessels (possibly the same one) decorated with multiple lines of square-tooth roller stamping (V4967 and V4968). The other two samples come from jars with everted rims (V4962 and V4963).

In thin section, all samples contained moderate to abundant subangular to rounded quartz up to 0.3mm across, sparse chert and fine-grained sandstone of similar size and roundness. In addition they contain subangular fragments of dark brown to opaque mudstone, some of which shows clear bedding, up to 0.5mm across.

The groundmass consists of optically anisotropic baked clay minerals and abundant dark brown to opaque grains up to 0.1mm across.

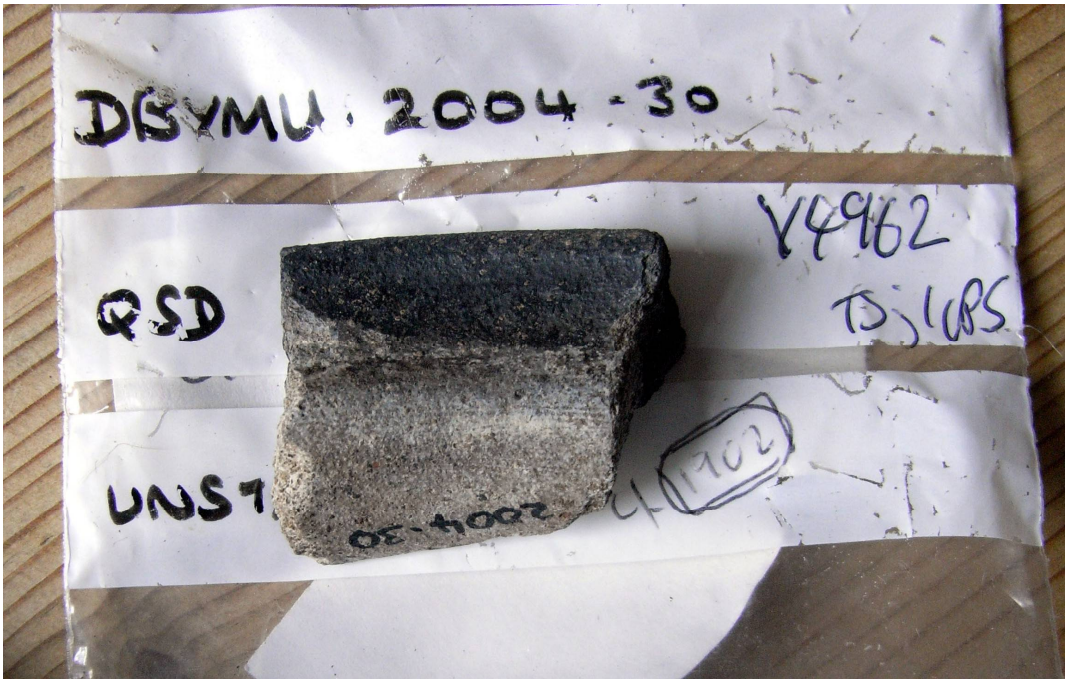


*Figure 10 V4962*


*Figure 11 V4968*


*Figure 12 V4967*


*Figure 13 V4963*

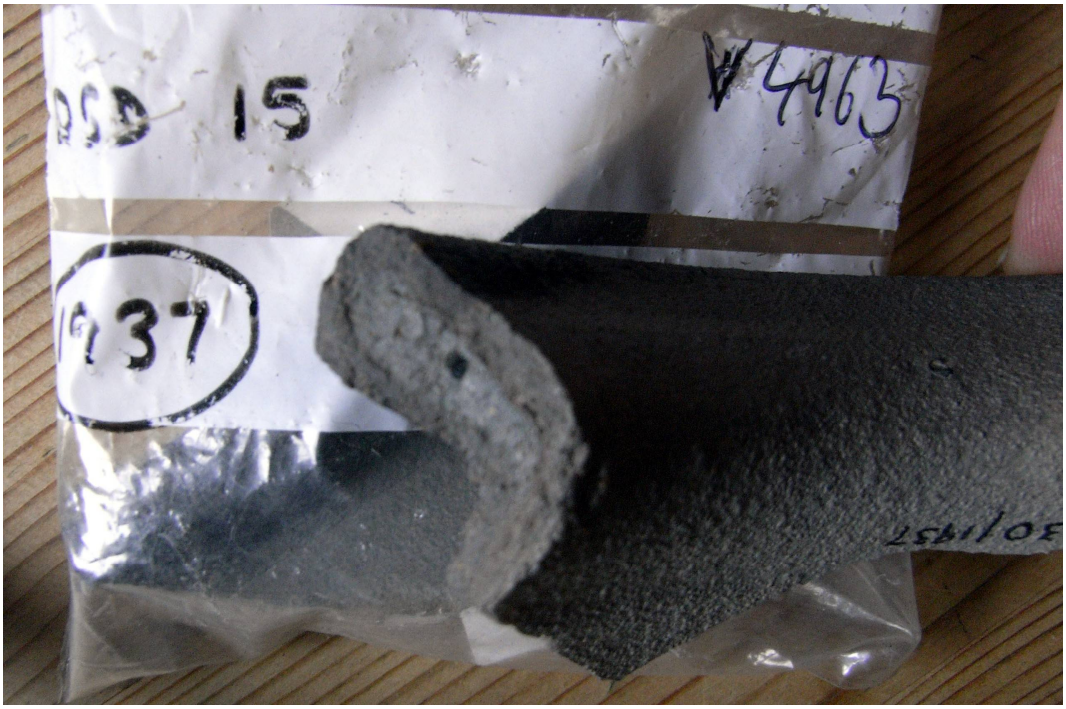


*Figure 14 V4963*

**Stamford Ware**

A sample of a jar with a collar rim was examined in thin section and using ICPS.

In thin section the sample contains abundant subangular and rare rounded quartz grains up to 0.2mm across, sparse rounded light-coloured clay pellets up to 2.0mm across, with sparse quartz inclusions of similar size and shape to those in the body, and sparse rounded opaque grains, containing sparse quartz inclusions and altered by firing to a vesicular slag. Rare irregular calcareous inclusions up to 0.3mm across lined with calcite post-firing, were also present. The groundmass consists of optically anisotropic baked clay minerals and angular quartz grains ranging from c.0.05mm up to c.0.2mm across.

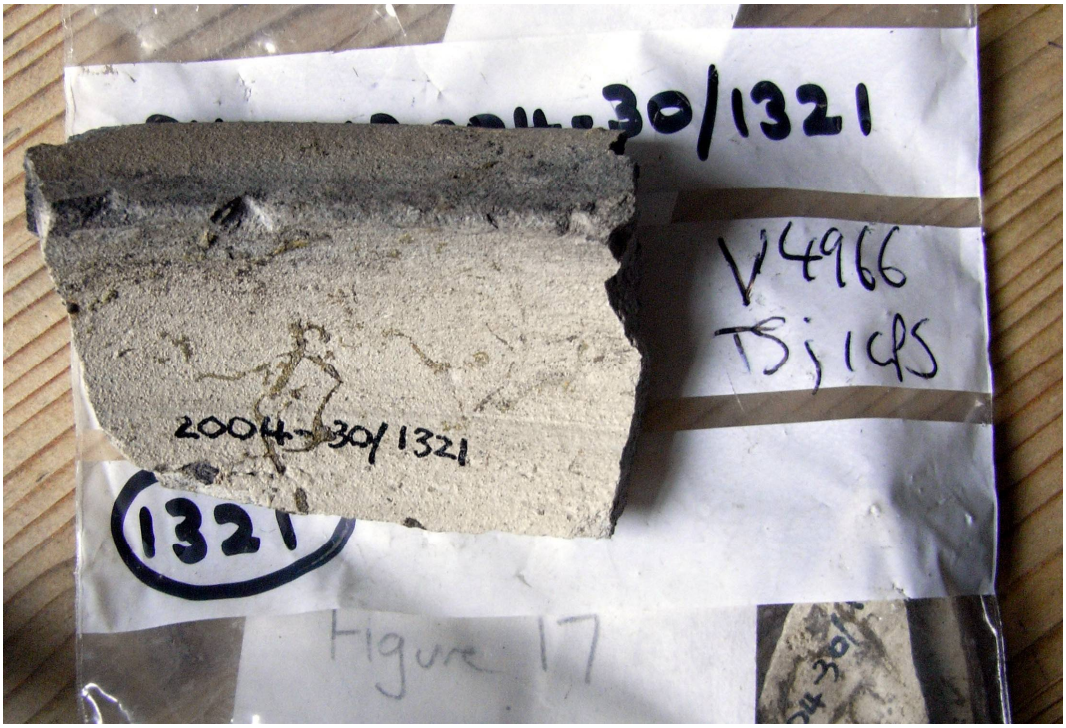


*Figure 15 V4966*


*Figure 16 V4966*

**Torksey Ware**

A single sample of Torksey ware, the everted rim of a jar, was examined in thin section and using ICPS.

In thin section, the sample contains a similar quartzose sand to that in LSLS but with a higher maximum grain size and, probably as a consequence, more notable sandstone and chert

grains. The groundmass contains sparse angular quartz grains, up to 0.-5mm across and no dark brown or opaque grains. A single rounded ferroan calcite grain is present, c.0.3mm across.

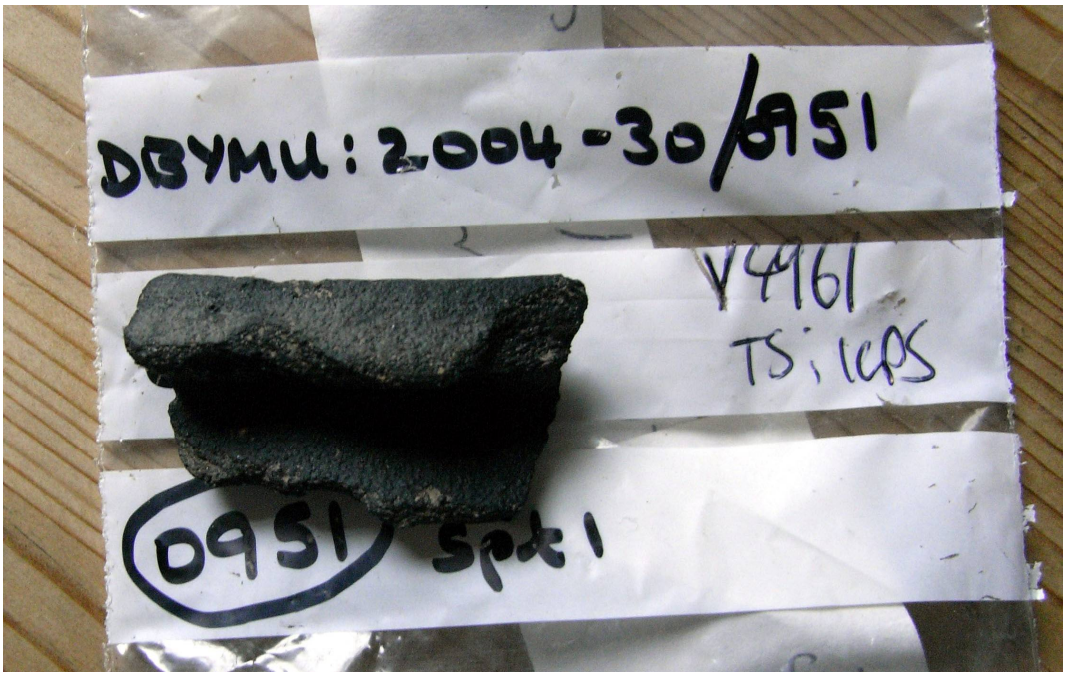


*Figure 17 V4961*

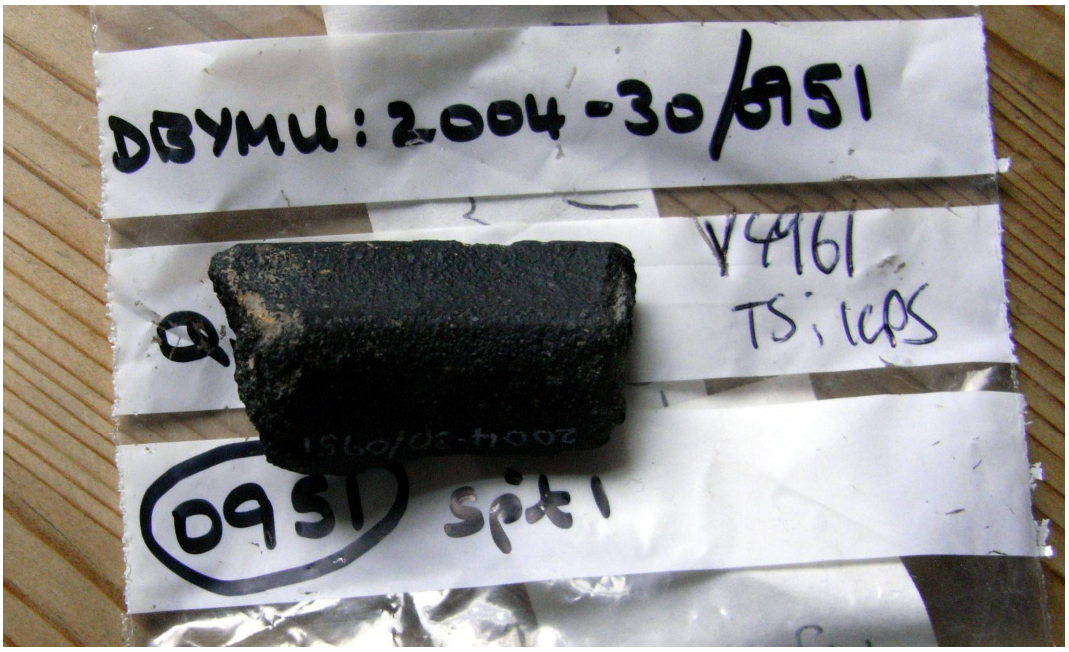


*Figure 18 V4961*

**York A ware**

Thin section analysis of V4965 revealed presence of the following inclusion types: moderate fragments of coarse-grained sandstone up to 1.5mm across, with overgrown quartz grains and plagioclase feldspar, both up to 0.8mm across, and some kaolinite cement in the

interstices between the overgrown grains; laths of muscovite up to 0.5mm long; rounded fragments of mudstone with prominent bedding, up to 1.0mm long. The groundmass consists of optically anisotropic baked clay minerals, sparse angular quartz and muscovite laths up to 0.01mm across.


*Figure 19 V4965*


*Figure 20 V4965*

## Chemical Analysis

Offcuts from each sample were taken and the surfaces and margins removed mechanically, leaving a small block of pottery protected as far as possible from post-burial contamination. This was crushed to a fine powder and submitted to Dr J N Walsh, Royal Holloway College, London, where it was analysed using Inductively-Coupled Plasma Spectroscopy (ICP-AES). The frequency of a series of major elements was determined and expressed in percent oxides (App 1) and the frequency of a series of minor elements was determined in parts per million (App 2). The raw data were normalised to aluminium and then compared with other data using the WinSTAT add-in for Excel (2002). The main analytical tool was Factor Analysis in which the original variables (normalised element frequencies) are replaced by a smaller number of Factors. Each element is assigned a weighting showing its contribution to the overall factor score and examining this table of weightings it is possible to determine which elements co-vary and which contribute most strongly, either positively or negatively, to the Factor score.

### Lincoln wares

The Derby data were compared with samples of production waste from various sites in Lincoln:

- Flaxengate. Samples of wasters of Lincoln Gritty, Lincoln Late Saxon Sandy ware and Lincoln Kiln-type shelly ware were taken from a pits found on sites on the east side of Flaxengate in 1945-47 and in 1989.
- Danesgate (unpublished excavation in advance of construction of The Collection). The same insula as the Flaxengate site above.
- Silver Street (Miles and Wacher 1989)

Further comparanda consisted of sherds of another Lincoln shelly ware (LSH) from Beverley and Melton, both in East Yorkshire, and a sample of Lincoln kiln-type ware from Market Weighton, East Yorkshire.

Factor analysis found four factors and a plot of the first two factor scores (Fig 21) found that the Derby, Beverley and Market Weighton samples have higher F2 scores than the Lincoln comparanda.

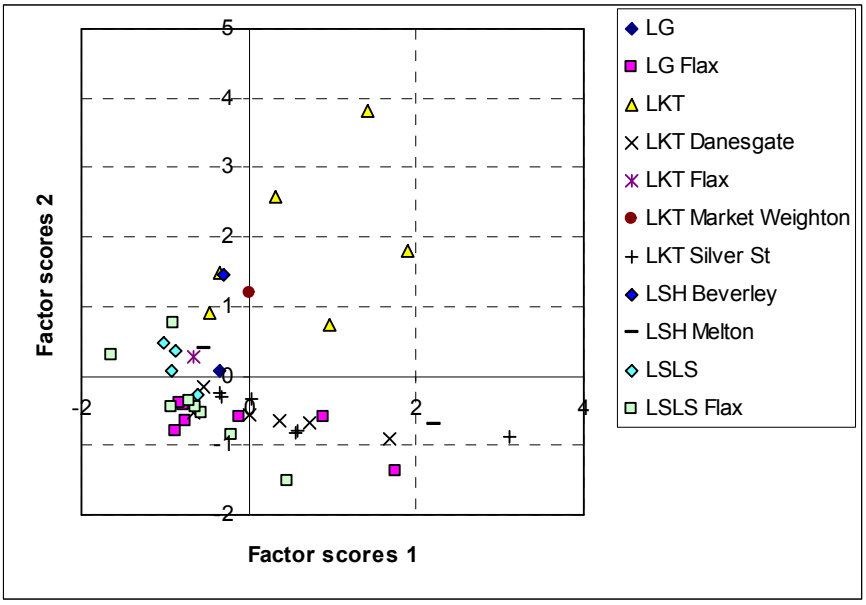


*Figure 21*

Examination of the weighting table indicates that high F2 scores are due mainly to manganese and barium and a plot of the normalised scores for these two elements confirms that both elements are higher in the Derby shell-tempered samples than in the Lincoln comparanda (Fig 22).

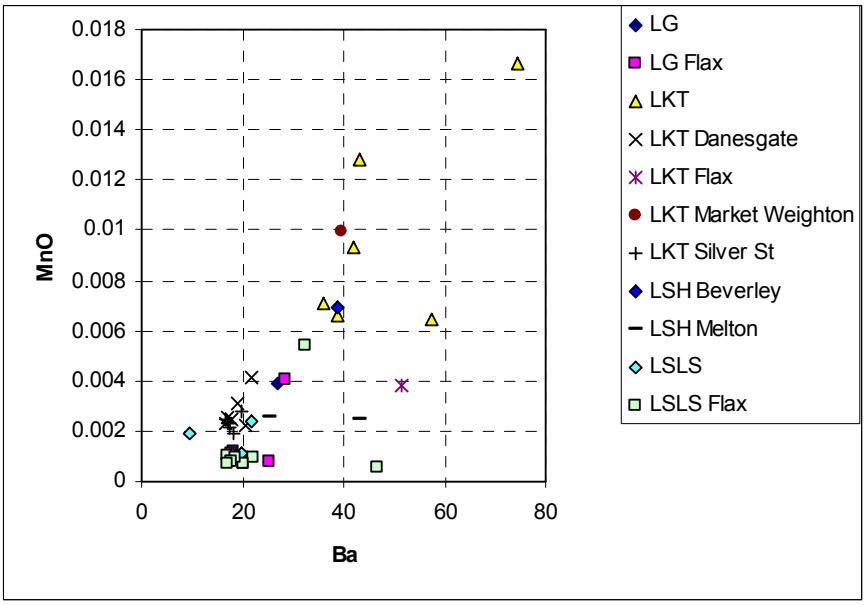


*Figure 22*

A plot of the third and fourth factor scores (Fig 23) indicates that most of the samples have similar scores. The exceptions are one of the Derby LSLS samples and one of the LSLS samples from Flaxengate. Finally, the iron and vanadium levels were examined, since a study of the Lincoln data has previously shown that vanadium is enhanced, relative to iron, in

several samples from the Flaxengate site. One of the Derby samples has a high vanadium content, but associated with a lower iron content than any of the Lincoln or other comparanda. This result casts some doubt on the identity of that sample, V4962, since this is the same sample which was distinguished by a low F3 score and high F4 score in Fig 23. There are a small number of probable Lincoln products from sites in the city which were made from light-firing clay, presumably the Lower Estuarine Beds, but none of these have been analysed, nor are wasters known.

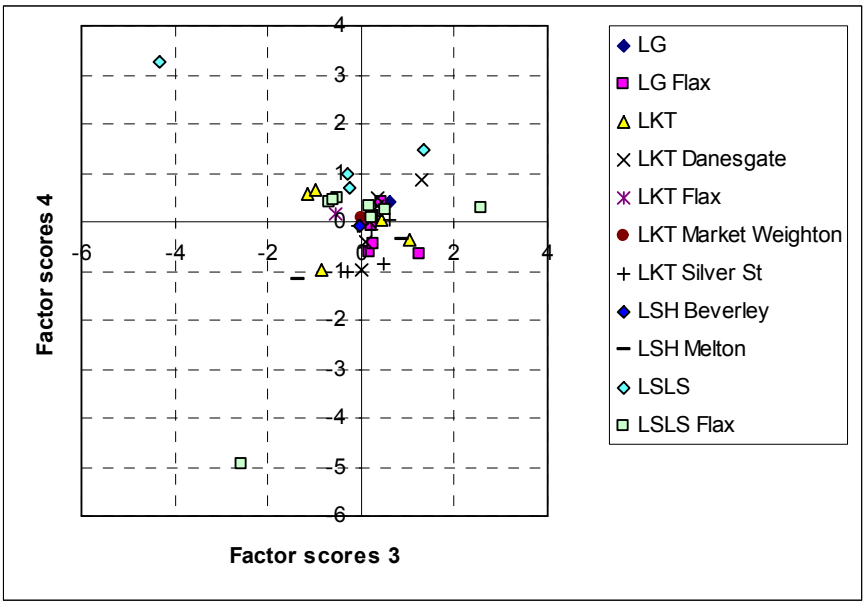


*Figure 23*

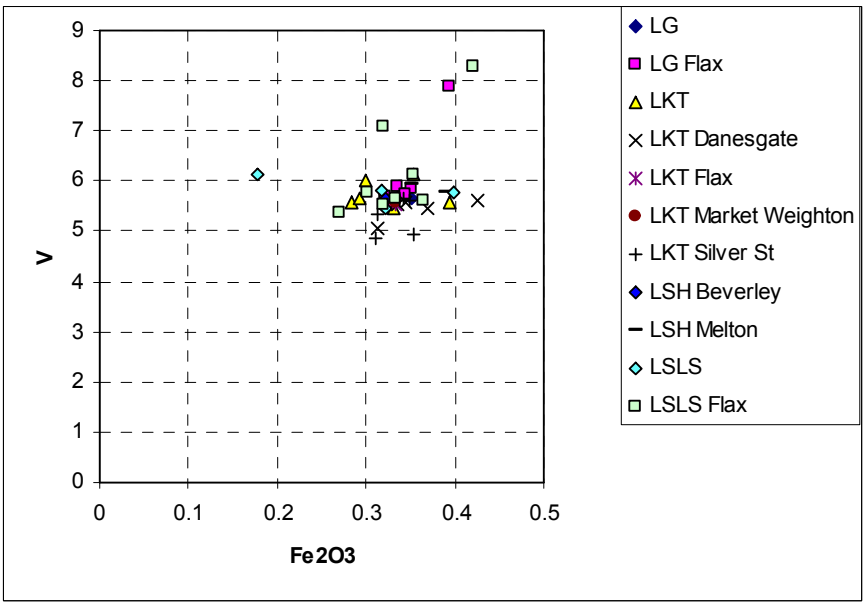


*Figure 24*

### Stamford Ware

The ICPS data for the Stamford ware jar handle was analysed alongside samples of Stamford ware and Developed Stamford ware and samples of Yorkshire and Derbyshire whitewares. The sample clearly grouped with Stamford products and the analysis was therefore repeated only including Stamford ware comparanda.

The comparanda come from:

- the Castle kiln, dated to the late 9th century (Kilmurry 1977)
- Developed Stamford ware from sites throughout the British Isles and Scandinavia.
- samples of 11th to 12th-century date from Doncaster.
- a late 11th-century vessel from Saddler Street, Durham (Vince et al. 2007)
- The Pantiles site in Stamford (Kilmurry 1980)
- A yellow-glazed, probably mid 12th-century vessel from Perth High Street
- Ingmanthorpe Manor, West Yorkshire (Vince and Young 2007)
- Wharf Road, Stamford (Mahany and Simpson 1982)

Factor analysis of this data showed that the samples could be divided into two groups on the basis of the second factor scores (Fig 25). The Derby sample has a low F2 score, similar to finds from Wharf Road and the Castle kiln. All of the samples with high F2 scores are clearly post-conquest, the earliest being the Saddler Street sample.

Within the first group, the Wharf Road samples have high F1 scores whilst three of the six Castle kiln samples, and one from Doncaster, have low F1 scores. The Derby sample has a high F1 score and therefore matches best with the Wharf Road samples. Both Wharf Road and the Castle kiln are pre-conquest, and the coarseness of the fabric also points to a pre-conquest date. However, typologically, the collar rim almost certainly points to a post-conquest date, in which case this vessel might have been made be quite early in the post-conquest period (Fig 26 shows the same plot as Fig 25, but coded according to date.

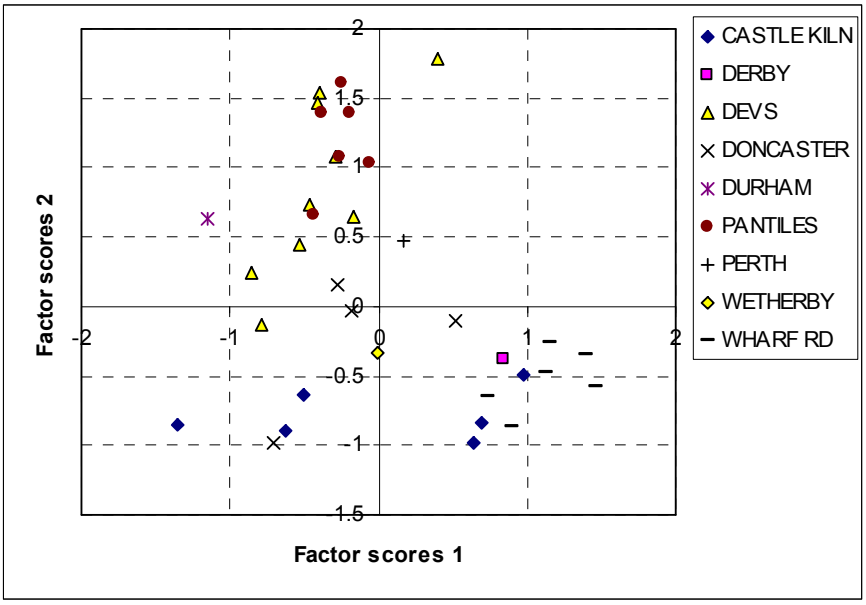


*Figure 25*

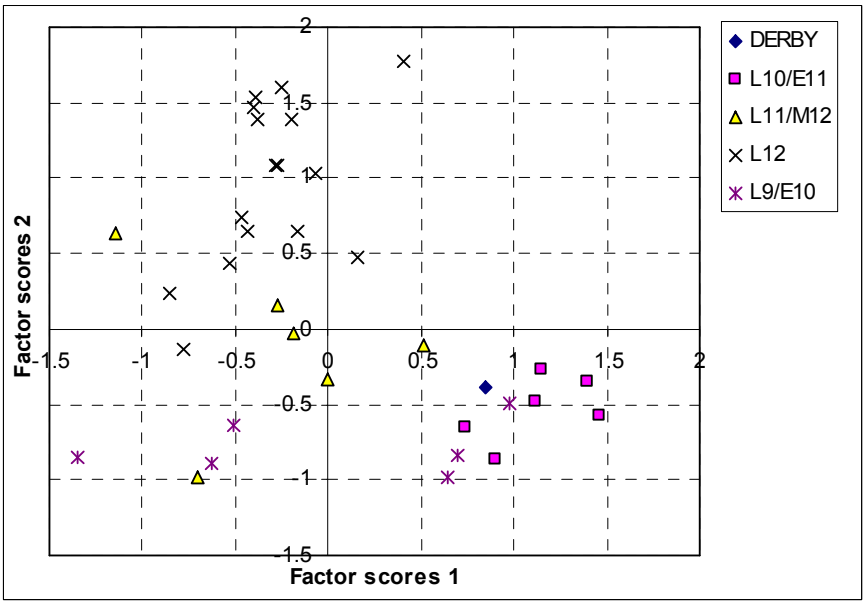


*Figure 26*

### Torksey ware

The Derby Torksey ware ICPS data was compared with a series of comparative groups, including the Lincoln sandy wares analysed and described above. Other samples came from:

- St Peter's Church, Barton-upon-Humber
- Newark (wasters of Torksey-type ware found alongside wasters of Newark late Saxon ware, NEWS)

- Late 9th to 10th century Torksey-type ware with prominent calcareous inclusions, from Flixborough.
- Samples from the seven kilns excavated at Torksey by Maurice Barley (Barley 1964; Barley 1981)
- Samples of Torksey ware from various sites (Coppergate, York; Beverley Lurk Lane; Doncaster; Sprotbrough), mostly of mid 10th to mid 11th-century date.

Factor analysis indicated that all of the samples formed a large diffuse cluster, based on the four factor scores, but that within that cluster it was possible to exclude almost all the comparative data since either one of the factor scores separated the Derby sample from the comparative group. Finally, only two sites remained, Kilns 2 and 3 at Torksey (Figs 25 and 26). None of the four factors distinguished these two groups of samples from each other or from the Derby sample.

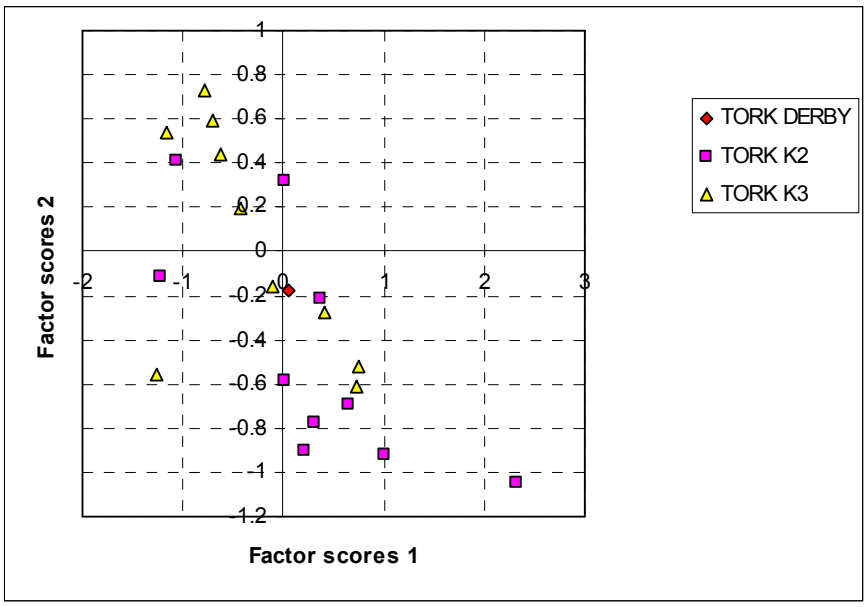


*Figure 27*

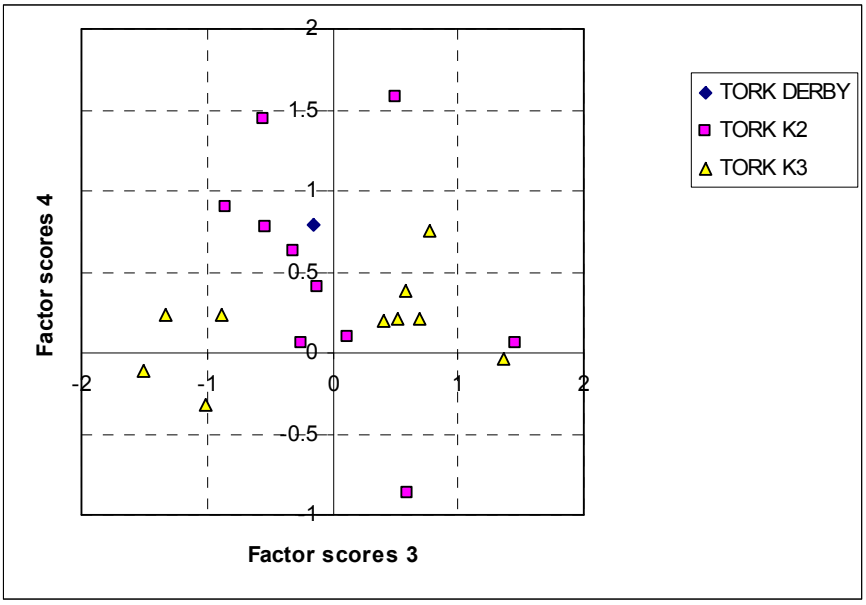


*Figure 28*

### York A ware

The ICPS data for V4965 was compared with that for various groups of analyses of pottery produced in West Yorkshire, Derbyshire and Staffordshire. Most of those from Staffordshire could be excluded. These included samples from the Sneyd Green kiln in Stoke-upon-Trent; various groups of early to mid Anglo-Saxon date from Catholme. Similarly, a number of the Derbyshire analyses could be quickly distinguished from the Derby sample and were excluded. This left a small group of comparanda:

- A series of samples of groups defined in the South Yorkshire and North Derbyshire Fabric Collection (Cumberpatch 2004, BUH02, BUH03, BUH04, BUH04OX, DMSW, DUFFIELD).
- Three samples of whiteware mortaria probably made at Rocester (ROCESTER MORT).
- Samples of sandstone sand-tempered ware from Catholme (2002).
- Samples of York A ware, from the Thorner kiln and from consumer sites in Beverley, Doncaster, Newcastle-upon-Tyne, Sprotbrough, York, Swillington,.Ingmanthorpe Manor and York.

Factor analysis of this data revealed four factors. A plot of the first two factors showed no clear separation of groups but a plot of the third and fourth factors (Fig 29) placed the Derby sample in the centre of the York A ware group with the South Yorkshire/North Derbyshire samples, the Catholme sandstone sand-tempered and the Duffield groups clearly separated.

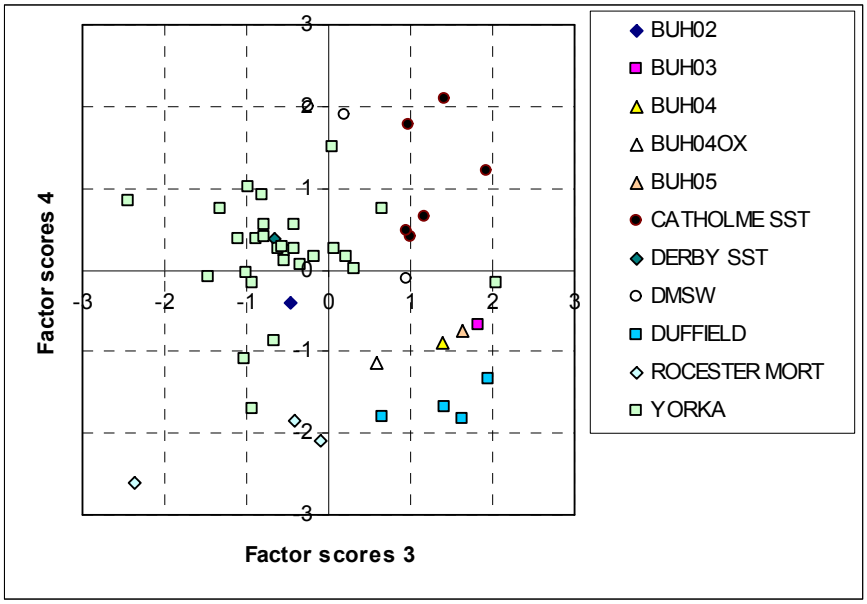


*Figure 29*

## Discussion and Conclusions

The thin section evidence is consistent with a Lincoln source for the Lincoln Gritty, Lincoln Kiln Type and Lincoln Late Saxon Sandy ware samples. All were made from a clay which contains abundant dark brown to opaque grains, presumably iron-rich, and most also contain fragments of dark brown to opaque mudstone. These traits are paralleled with samples from the pottery waste found on the site of The Collection, situated in the lower city on the fringes of the early Anglo-Scandinavian settlement, and are probably due to the use of Upper Lias clay quarried from the hillside. The quartzose sand probably also occurred within the lower city, although at a lower level than the Danesgate site and may have been imported, although not from any great distance. The shell, however, seems to have been collected from a shelly marl outcrop to the east of the city. Similar deposits have been observed at Potterhanworth but no doubt sources closer to Lincoln existed.

However, the chemical analysis indicates a difference in composition between the Derby LKT samples and those from Lincoln. This difference is mainly in barium and manganese content. Since it does not affect the sandy wares, and the thin sections indicate the same parent clay was used for all three fabrics found at Derby, the difference must be connected with the shell inclusions. Barium can substitute for calcium and it is possible that the local groundwater at Derby is enriched in barium. Similarly, there is dark staining around the edges of several of the thin sections, and these might indicate the present of manganese enrichment. However, such contamination should have been avoided by the removal of the outer surfaces of the samples. Furthermore, Some of the comparanda, from Beverley, Melton and Market Weighton, are also enhanced in barium and/or manganese. It is possible, therefore, that at some point during the history of the Lincoln pottery industry the source of shell sand was

changed, introducing barium and manganese into the fabric. Given the overall similarity of the LKT samples to Lincoln products, in both thin section and chemical composition, it is unlikely that the Derby finds come from some other source.

Pottery of Lincoln origin has been identified visually at several sites in the Trent valley, including Repton and Nottingham. However, this is the first scientific confirmation of these visual identifications. It gives confidence to the visual identifications and shows that there is a pattern of contact from Lincoln up the Trent valley, either by boat from Torksey or overland, following the Fosse Way to Bingham and then a riverside route via Nottingham.

The complete dominance of Lincolnshire ceramics in this Anglo-Scandinavian phase is interesting. If the pottery dated to the period of maximum Scandinavian control, between the 870s and the early decades of the 10th century, one might have expected to find a mixture of south-east midlands and Lincolnshire ceramics, assuming that trade was conducted mainly within polities rather than between them. However, the dominance of Lincolnshire would fit well with the apparent political situation in the 920s to950s. Such a date might also explain the lack of Stafford-type ware, which is known from sites such as Rocester and Barton Blount, about 10 to 11 miles west of Derby, since production at Stafford appears to have begun in the mid/late 10th century.

The Torksey ware sample has characteristics in thin section which are consistent with a Torksey source and which discount a Lincoln origin. The chemical composition not only confirms Torksey as the likely source, and excludes Newark, a closer source to Derby, but also indicates that the products of kilns 1, 4, 5, 6 and 7 can be distinguished from the Derby sample whereas kilns 2 and 3 cannot. Both of these kilns produced roller-stamped vessels for which a late 9th to mid 10th century date is likely. There are, of course, an unknown number of kilns at Torksey which have yet to be discovered and sampled (and at least a further 10 which have been discovered in the past decade) but at least the analysis is consistent with an early date.

The Stamford ware vessel is quite coarse in texture for a vessel produced in the late 11th or 12th centuries (a date given by the collar rim). However, the chemical composition places the sample within the Stamford group and, within that group, indicates a similar fabric to the Castle and Wharf Road samples, both pre-conquest, rather than with the Pantiles kiln and Developed Stamford ware and other samples of post-conquest date. The chemical composition grouping, however, is probably only partly a chronological one, in that the sampled production sites for the later types lie to the northeast of Stamford whilst the Castle and Wharf Road kilns lie respectively in the west and southeast of the town. Production in southern area, however, probably continued into the 12th century, as is shown by a large waster pit excavated on the High Street St Martins frontage, south of the Welland (Mahany

1982, Site DD Quarry/pit 8). A close parallel for the Derby vessel comes from that quarry pit (Mahany 1982 Fig 41 No.147).

By the later 11th century, Stamford ware was being traded widely in midland England, and is present, for example, in 11th-century assemblages in Hereford, Worcester and Gloucester. The presence of a Stamford ware vessel as Derby is therefore unsurprising but is nevertheless of interest that this vessel is identical in form and date to those produced at Pontefract, presumably a daughter industry of Stamford, but so far as can be determined without sampling the Pontefract waste this Derby piece is a Stamford product not a Yorkshire copy. This is probably due to the fact that Derby is closer to Stamford (about 55 miles as the crow flies) than it is to Pontefract (63 miles north) as well as to the relative output of the two industries.

The York A ware jar contains a sand derived from Coal Measures (or upper Millstone Grit) sandstones. The lack of well-rounded quartz grains indicates that the sand was not produced by a river eroding Permian or Triassic strata, thus probably excluding the environs of Derby itself. Suitable areas, geologically, lie immediately north of Derby, on the east side of the Pennines, and similar sands do occur in ceramics made in that area. However, no known Anglo-Scandinavian pottery industry is known there. Indeed there is very little evidence indeed for any ceramics dating to the 9th to 11th centuries from the area. The nearest known production site is at Thorner, which supplied York and a surrounding rural hinterland. However, the thin section evidence is consistent with a Thorner source and the ICPS data shows no significant difference from the York A/Thorner ware and, conversely shows that the composition is not similar to other wares from Derbyshire or Staffordshire. A source to the south or west of Derby is also excluded because here is little evidence for the use of pottery to the west of Derby, until the later 10th century introduction of Stafford ware. Therefore, it seems that this vessel is the first recorded instance of its type in Derby, 81 miles to the south of the production site.

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*Appendix 1*

| TSNO | Action | Context | class | Cname | Subfabric | Description | Form | Part | Use |
|---|---|---|---|---|---|---|---|---|---|
| V4961 | TS;ICPS | 0951 | POTTERY | TORK | | | JAR | R | |
| V4962 | TS;ICPS | UNSTRAT | POTTERY | LSAX | WHITEWARE WITH MED Q SAND | | JAR | R | |
| V4963 | TS;ICPS | 1937 | POTTERY | LSLS | | | JAR | R | |
| V4964 | TS;ICPS | 1937 | POTTERY | LG | | | JAR | B | |
| V4965 | TS;ICPS | 0998 | POTTERY | LSAX | SST SAND | | JAR | R | |
| V4966 | TS;ICPS | 1321 | POTTERY | ST | LIKE EST BUT COARSER SAND AND SPARSE WHITE CLAY PELLETS | COLLARED RIM | JAR | R | SOOTED EXT |
| V4967 | TS;ICPS | 1937 | POTTERY | LSLS | | SQUARE-TOOTH RSD ON SHOULDER | JAR | BS | SOOTED EXT |
| V4968 | TS;ICPS | 1937 | POTTERY | LSLS | ORGANIC MUDSTONE;RQ | SQUARE-TOOTH RSD ON SHOULDER | JAR | BS | |
| V4969 | TS;ICPS | 1298 | POTTERY | LKT | | | INT-RIM BOWL | R | |
| V4970 | TS;ICPS | 1303 | POTTERY | LKT | | | JAR | BS | |
| V4971 | TS;ICPS | UNSTRAT | POTTERY | LKT | | L9/M10 | JAR | R | |
| V4972 | TS;ICPS | 0351 | POTTERY | LKT | | L9/E10 | DISH/BOWL | BS | |
| V4973 | TS;ICPS | 1216 | POTTERY | LKT | | IRON-RICH SLIP INT (OR MADDER?) | JAR | BS | POSSIBLE STAINED INT |
| V4974 | TS;ICPS | UNSTRAT | POTTERY | LKT | | L9/E10 | DISH/BOWL | R | |