

Ancient Monuments Laboratory
Report 48/96

A PETROLOGICAL EXAMINATION OF
MIDDLE SAXON IPSWICH WARE
POTTERY (ENGLISH HERITAGE WARE
PROJECT)

D F Williams

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Summary

A large project involving the thin sectioning of some 186 sherds of Ipswich ware from a variety of sites was undertaken as part of a wide-ranging programme of petrological and chemical analysis done in a number of stages. The final petrological report suggests that there are two main fabric groups (accounting for 163 sherds) which were almost certainly made in Ipswich itself. A sandy fabric containing fairly well-sorted quartz grains and a "pimply" fabric where large quartz grains protrude through the surfaces of the vessel. Both fabrics can be recognized in the hand-specimen. The remaining sherds appear as "outliers" to the main groupings, although there is at present no reason to suspect that they may not also have been made at Ipswich.

Author's address :-

D F Williams
UNIVERSITY OF SOUTHAMPTON
Highfields
Southampton
HANTS
SO9 5NH

A PETROLOGICAL EXAMINATION OF MIDDLE SAXON IPSWICH WARE

POTTERY

[ENGLISH HERITAGE IPSWICH WARE PROJECT]

D.F. Williams, Ph.D., FSA

[English Heritage Ceramic and Lithic Petrology Project]

Department of Archaeology, University of Southampton

Introduction

A large programme of thin section analysis was undertaken on selected sherds of Middle Saxon Ipswich Ware. This formed part of an English Heritage research project on Ipswich Ware undertaken by Northamptonshire Archaeology. In total, one hundred and eighty-six sherds of Ipswich Ware were examined petrologically, together with a sample of local clay recovered from Crown Street, Ipswich. The sherds which were examined came from a variety of sites, with the majority of samples chosen by Paul Blinkhorn, Project Officer, Northamptonshire Archaeology.

A large number of the sample sherds came from Ipswich itself, where a series of kilns producing Ipswich Ware have been known for some time [Hurst and West, 1957; Smedley and Owles, 1963; Blinkhorn, 1989]. These samples were supplemented by a number of sherds of "Ipswich-type Ware" from the following sites: Barking Abbey, Essex; Brandon, Suffolk; Canterbury, Kent; North Raunds, Northants; Flixborough, Humberside; and Terrington St. Clement, Norfolk.

Some initial work on trying to characterize Ipswich Ware has already been attempted by the writer some years ago as an HBMC petrology report [1976a].

Then, twenty-six sherds of Ipswich Ware were examined in thin section. Material was included from Treasury, Whitehall; Althorpe Grove, Battersea; Castor, Northants; Rickingham, Suffolk; Waltham Abbey, Essex; Blythburgh, Suffolk; Tattingstone, Suffolk; together with Ipswich itself, including "wasters" from the kilns in Carr Street and Cox Lane. The majority of the samples were divided into two main fabric divisions, mainly on the basis of the size, rounding and frequency of the quartz grains present in the clay matrix, with three sherds seemingly falling outside of the two main groups to form a much smaller third group. To the best of the writer's knowledge, only a small section of this work has ever been published [Williams, 1976b]. In view of this, and because it seems useful to include as wide a range of samples of Ipswich Ware as possible, the original body of petrological work has been included in the present project in a slightly modified form.

Method

Upon receipt of the pottery samples, small pieces were detached from each of the sherds, mounted on glass slides and prepared for examination in thin section under the petrological microscope. This technique allows the determination of the non-plastic inclusions present in the clay body of the pottery, together with a consideration of their relative textures [for details of the method see Peacock, 1970; Williams, 1990]. Due to the extremely small size of the majority of the clay minerals, it was not possible to comment on the actual mineral composition of the clay itself.

Petrology

In the hand-specimen, the majority of the Ipswich Ware sample sherds tend to be darkish grey in colour [around Munsell 5YR 5/1 - 2.5Y N4/] and occur in a hard, sandy fabric. They sometimes display a colour variation in the core, which produces a "sandwich" effect. Thin sectioning of this body of material confirms that quartz is the most common non-plastic inclusion present in the clay. This, however, can present certain problems, for quartz is a common constituent of much Saxon pottery, making it difficult to tie down sandy fabrics to likely production centres without comparable material from known sources.

On the basis of the range and texture of the non-plastic inclusions present in the sherds examined under the petrological microscope, the majority of samples have been divided into two main fabric groupings. The remaining samples appear to fall outside of these two groups and most have been listed individually with fabric descriptions under site headings.

GROUP 1

The sherds which make up this group tend to be darkish grey in colour, hard and reasonably smoothish to the touch, with visible small quartz grains and some shreds of mica. When viewed under the petrological microscope, frequent fairly well-sorted angular to subangular grains of quartz can be seen, generally measuring below 0.30mm in size but with some larger grains as well, including a number which are polycrystalline in appearance. Also present are flecks of mica, some small pieces of chert in the same size-range as the smaller quartz grains, a little quartzite, a few small discrete grains of felspar, iron oxides and occasional fragments of ironstone and fine-grained sandstone.

Nos. [11], [14], [17], [21], [23], [28] and [31] also contain a few well-rounded light brownish pellets of glauconite, scattered throughout a clay matrix which tends to be a lighter colour than the other sherds in this group. It is possible that glauconite may also be present in some of the other sherds listed here, but the very dark reduced clay matrix which most of the samples display makes it difficult to note if the odd dark grain of glauconite occurs. In this connection, it is worth noting that glauconite pellets are also present in a sample of clay recovered from Crown Street, Ipswich [see below].

[1]. Carr Street, Ipswich, Suffolk [IBM 1935-74A]

Waster (complete vessel) from the kilns discovered on the site of the Co-op extension on the south side of Carr Street in 1935 [Hurst, 1957, Fig. 1, no. 5].

[2]. Cox Lane, Ipswich, Suffolk [958-252A]

Bodysherd (ninth century A.D. pit).

[3]. Cox Lane, Ipswich, Suffolk [958-252B]

Bodysherd (ninth century A.D. pit).

[4]. Cox Lane, Ipswich, Suffolk [958-252C]

Bodysherd (ninth century A.D. pit).

[5]. Cox Lane, Ipswich, Suffolk [958-252D]

Rim from large jar (middle Saxon pit).

[6]. St. Helen's Street, Ipswich, Suffolk [IAS 36010003]

Complete large jar (unstratified).

[7]. Lower Brook Street, Ipswich, Suffolk [IAS 45020001]

Bodysherd (unstratified).

[8]. Ipswich, Suffolk [IBM 1920-53-12]

Rim from large jar.

[9]. Ipswich, Suffolk [IBM 1920-53-13]

Rim from large jar.

[10]. Ipswich, Suffolk [IP 2 - same no. on sample bag as

[168]]

Rim sherd.

[11]. Greyfriars' Road, Ipswich, Suffolk [IP 5]

Base from small jar (backfill of late Mediaeval pit).

[12]. Foundation Street, Ipswich, Suffolk [IP 6]

Shoulder of lugged pitcher (backfill of middle Saxon pit).

[13]. Ipswich, Suffolk [IP 6 - same no. on sample bag as

[12]]

Bodysherd.

[14]. Buttermarket, Ipswich, Suffolk [IP 7]

Large jar (backfill of late Mediaeval pit).

[15]. Ipswich, Suffolk [IP 8].

Small jar.

[16]. Ipswich, Suffolk [IP 10]

Large jar.

[17]. Ipswich, Suffolk [IP 13]

Rim from small jar [Type IIIJ].

[18]. Ipswich, Suffolk [IP 14]

Medium jar.

[19]. Ipswich, Suffolk [IP 15]

Rim from small jar [Type IA] (middle Saxon well).

[20]. Ipswich, Suffolk [IP 20]

Rim from medium jar [Type IA].

- [21]. Ipswich, Suffolk [IP 25]
Small jar.
- [22]. Ipswich, Suffolk [IP 26]
Rim from small jar [Type IA].
- [23]. Ipswich, Suffolk [IP 27]
Rim from small jar [Type IA].
- [24]. Ipswich, Suffolk [IP 28]
Bodysherd.
- [25]. Ipswich, Suffolk [IP 29]
Rim from small jar [Type IA].
- [26]. Ipswich, Suffolk [IP 33]
Rim from small jar [Type IA].
- [27]. Ipswich, Suffolk [IP 39]
Rim from large jar [Type IA].
- [28]. Ipswich, Suffolk [IP 41]
Small jar.
- [29]. Ipswich, Suffolk [IP 48]
Medium jar.
- [30]. Ipswich, Suffolk [IP 49]
Rim from small jar [Type IA].
- [31]. Ipswich, Suffolk [IP 51]
Small jar.
- [32]. Ipswich, Suffolk [IP 52]
Rim from small jar [Type IA].
- [33]. Ipswich, Suffolk [IP 55]
Rim from small jar [Type IA].
- [34]. Ipswich, Suffolk [IP 56]
Spout from pitcher.

[35]. Ipswich, Suffolk [IP 57]

Large jar.

[36]. Ipswich, Suffolk [DS1.2]

Stamped sherd.

[37]. Ipswich, Suffolk [DS1.7]

Stamped sherd.

[38]. Brandon, Suffolk [Br 2]

Lower body of a fairly large vessel

(middle Saxon).

[39]. Brandon, Suffolk [Br 5]

Bodysherd from a stamped storage vessel (middle Saxon).

[40]. Brandon, Suffolk [Br 6]

Rim from small jar (middle Saxon).

[41]. Brandon, Suffolk [Br 14]

Upper shoulder (unstratified).

[42]. Brandon, Suffolk [Br 18]

Upper shoulder of medium jar (middle Saxon).

[43]. Brandon, Suffolk [Br 19]

Upper shoulder of small jar (middle Saxon).

[44]. Brandon, Suffolk [Br 22]

Upper shoulder of medium jar (middle Saxon).

[45]. Brandon, Suffolk [Br 26]

Upper shoulder of medium jar (middle Saxon).

[46]. Brandon, Suffolk [Br 31]

Upper shoulder of medium jar (middle Saxon).

[47]. Brandon, Suffolk [Br 33]

Upper shoulder of medium jar (middle Saxon).

[48]. Brandon, Suffolk [Br 34]

Upper shoulder of medium jar (middle Saxon).

[49]. Brandon, Suffolk [Br 35]

Upper shoulder of medium jar (middle Saxon).

[50]. Brandon, Suffolk [Br 37]

Upper shoulder of Medium jar (middle Saxon).

[51]. Brandon, Suffolk [Br 38]

Rim from medium jar [Type IE] (unstratified).

[52]. Brandon, Suffolk [Br 39]

Upper shoulder from small jar (middle Saxon).

[53]. Brandon, Suffolk [Br 47]

Upper shoulder from small jar (middle Saxon).

[54]. Brandon, Suffolk [Br 49]

Rim from small jar [Type IA] (middle Saxon).

[55]. Brandon, Suffolk [Br 52]

Upper shoulder from small jar (middle Saxon).

[56]. Brandon, Suffolk [Br 53]

Pitcher rim [Type IA] (middle Saxon).

[57]. Brandon, Suffolk [Br 54]

Upper shoulder from small jar (middle Saxon).

[58]. Brandon, Suffolk [Br 57]

Upper shoulder from medium jar (middle Saxon).

[59]. Brandon, Suffolk [DS1.3]

Stamped sherd.

[60]. Brandon, Suffolk [DS1.4]

Stamped sherd.

[61]. Treasury, Whitehall, London [78-50]

Bodysherd (floor of Saxon hall dated *c.* A.D. 800-1000).

- [62]. Treasury, Whitehall, London [78-4]
Rim sherd (floor of Saxon hall dated c. A.D. 800-1000).
- [63]. Treasury, Whitehall, London [IX-205]
Bodysherd.
- [64]. Treasury, Whitehall, London [205.5]
Base sherd.
- [65]. Althorpe Grove, Battersea, London [AG77-TRE53]
Stamped bodysherd.
- [66]. Barking Abbey, Essex [Ba 3]
Shoulder sherd from a fairly large vessel (context 79).
- [67]. Barking Abbey, Essex [Ba 4]
Bodysherd from fairly large vessel (unstratified).
- [68]. Barking Abbey, Essex [Ba 5]
Bodysherd from a fairly large vessel (unstratified).
- [69]. Canterbury, Kent [CY 2]
Bodysherd from extremely large jar.
- [70]. Canterbury, Kent [CY 3]
Base sherd from large vessel.
- [71]. Canterbury, Kent [CY 4]
Bodysherd from large vessel.
- [72]. Canterbury, Kent [CY 5]
Bodysherd from large vessel.
- [73]. Flixborough, Humberside [Fx 6]
Bodysherd with handle scar from pitcher, (unstratified).

[74]. Flixborough, Humberside [FX 7]

Base sherd from small to medium-sized vessel
(unstratified).

[75]. North Raunds, Northamptonshire [NR 1]

Bodysherd from large vessel.

[76]. North Raunds, Northamptonshire [NR 3]

Bodysherd from large vessel.

[77]. North Raunds, Northamptonshire [NR 5]

Bodysherd from fairly large vessel.

GROUP 2

In the hand-specimen, the sherds which make up this group are particularly distinctive and are invariably easy to identify by eye. Like the sherds in Group 1, they are hard, sandy and mostly dark grey in colour. However, the most prominent feature which they share is a scatter of large quartz grains which either bulge or protrude through the surfaces of the vessel, giving rise to the term "pimply" Ipswich Ware, recognized some time ago [Hurst, 1959, 14]. This characteristic makes them quite rough to the touch.

In thin section, there is a groundmass of moderate to frequent small angular to subangular quartz grains, the majority below 0.10mm in size, with a sparse scatter of fairly well-rounded larger grains of various sizes up to around 2.50mm across, some of them cracked and polycrystalline in appearance. Also present are moderately frequent flecks of mica, small pieces of chert, some quartzite, a little ironstone, iron oxide and occasional small discrete grains of feldspar.

A few of the sherds are slightly coarser than the rest: Nos. [86], [88 - also contains a few pellets of glauconite], [90], [91], [98], [99], [114]-[116], [126], [127], [129] and [133]. While in Nos. [136] and [137] from Brandon and Nos. [158] and [163] from Terrington St. Clement, the clay matrix is somewhat finer than occurs in the other sherds in the group. Two sherds from North Raunds, Nos. [155] and [156], one from Terrington St. Clement, No. [161] and five from Brandon, Nos. [118], [122], [130], [135], [139] seem to have the same groundmass as the rest of the samples, but rather interestingly they lack the larger quartz grains which are characteristic of this group.

The noticeable disparity between the two different size-grades of quartz present in most of the sherds suggests that the larger grains were probably deliberately added to the clay by the potter as a form of temper prior to the forming of the vessel. However, in a small number of sherds this form of "tempering" does not appear to have been added to the clay for some reason. It should be pointed out that Group 2 is not just a fabric version of Group 1 with added larger quartz grains. The clay matrices and associated non-plastic inclusions do appear to be different for each group.

[78]. Cox Lane, Ipswich, Suffolk [IBM 961-5-D]

Large bodysherd waster.

[79]. Vernon Street, Ipswich, Suffolk [IAS 74020090]

Bodysherd (middle Saxon ditch).

[80]. Vernon Street, Ipswich, Suffolk [IAS 74020090]

Bodysherd (middle Saxon ditch).

[81]. Foundation Street, Ipswich, Suffolk [IP 3]

Shoulder from large jar (backfill of middle Saxon pit).

- [82]. Foundation Street, Ipswich, Suffolk [IP 4]
Bodysherd from large jar (backfill of middle Saxon pit).
- [83]. Ipswich, Suffolk [IP 5]
Base from small jar (backfill of late Mediaeval pit).
- [84]. Ipswich, Suffolk [IP 7]
Bodysherd from large jar.
- [85]. Ipswich, Suffolk [IP 11]
Rim from small jar [Type IC].
- [86]. Ipswich, Suffolk [IP 12]
Rim from small jar [Type IIK].
- [87]. Ipswich, Suffolk [IP 17]
Rim from small jar [Type IE].
- [88]. Ipswich, Suffolk [IP 18]
Medium jar.
- [89]. Ipswich, Suffolk [IP 19]
Rim from large jar [Type IIIJ].
- [90]. Ipswich, Suffolk [IP 21]
Large jar.
- [91]. Ipswich, Suffolk [IP 22]
Rim from small jar [Type IC].
- [92]. Ipswich, Suffolk [IP 24]
Pierced rim-lug from Buttermarket-type jar.
- [93]. Ipswich, Suffolk [IP 30]
Small jar.
- [94]. Ipswich, Suffolk [IP 31]
Rim and pierced lug from jar.

- [95]. Ipswich, Suffolk [IP 32]
Rim from large jar [Type IIIJ].
- [96]. Ipswich, Suffolk [IP 34]
Rim from medium jar [Type IC].
- [97]. Ipswich, Suffolk [IP 35]
Rim from small jar [Type IA].
- [98]. Ipswich, Suffolk [IP 36]
Rim from medium jar [Type IA].
- [99]. Ipswich, Suffolk [IP 37]
Rim from medium jar [Type IIK].
- [100]. Ipswich, Suffolk [IP 38]
Rim from medium jar [Type IC].
- [101]. Ipswich, Suffolk [IP 40]
Small jar.
- [102]. Ipswich, Suffolk [IP 42]
Small jar.
- [103]. Ipswich, Suffolk [IP 43]
Small jar.
- [104]. Ipswich, Suffolk [IP 44]
Rim from small jar [Type IC].
- [105]. Ipswich, Suffolk [IP 45]
Small jar.
- [106]. Ipswich, Suffolk [IP 46]
Large jar.
- [107]. Ipswich, Suffolk [IP 47]
Rim from medium jar [Type IIK].
- [108]. Ipswich, Suffolk [IP 50]
Rim from large jar [Type IIK].

- [109]. Ipswich, Suffolk [IP 53]
Rim from small jar [Type IC].
- [110]. Ipswich, Suffolk [IP 54]
Rim from medium jar [Type IIK].
- [111]. Brandon, Suffolk [Br 3]
Bodysherd from fairly large vessel (middle Saxon).
- [112]. Brandon, Suffolk [Br 4]
Bodysherd from fairly large vessel (middle Saxon).
- [113]. Brandon, Suffolk [Br 7]
Rim from small jar (middle Saxon).
- [114]. Brandon, Suffolk [Br 8]
Upper shoulder of medium jar (middle Saxon).
- [115]. Brandon, Suffolk [Br 10]
Upper shoulder of medium jar (middle Saxon).
- [116]. Brandon, Suffolk [Br 12]
Upper shoulder of large jar (middle Saxon).
- [117]. Brandon, Suffolk [Br 13]
Upper shoulder of medium jar (middle Saxon).
- [118]. Brandon, Suffolk [Br 15]
Rim from small jar [Type IC] (middle Saxon).
- [119]. Brandon, Suffolk [Br 16]
Upper shoulder (middle Saxon).
- [120]. Brandon, Suffolk [Br 20]
Upper shoulder of medium jar (middle Saxon).
- [121]. Brandon, Suffolk [Br 21]
Upper shoulder of medium jar (middle Saxon).
- [122]. Brandon, Suffolk [Br 23]
Upper shoulder of small jar (middle Saxon).

[123]. Brandon, Suffolk [Br 24]

Upper shoulder of medium jar (middle Saxon).

[124]. Brandon, Suffolk [Br 25]

Upper shoulder of small jar (middle Saxon).

[125]. Brandon, Suffolk [Br 27]

Upper shoulder of medium jar (middle Saxon).

[126]. Brandon, Suffolk [Br 28]

Upper shoulder of medium jar (middle Saxon).

[127]. Brandon, Suffolk [Br 30]

Upper shoulder of medium jar (middle Saxon).

[128]. Brandon, Suffolk [Br 32]

Rim from medium jar [Type IC] (middle Saxon).

[129]. Brandon, Suffolk [Br 36]

Upper shoulder of medium jar (middle Saxon).

[130]. Brandon, Suffolk [Br 40]

Upper shoulder of medium jar (middle Saxon).

[131]. Brandon, Suffolk [Br 41]

Upper shoulder of medium jar (middle Saxon).

[132]. Brandon, Suffolk [Br 42]

Upper shoulder of small jar (middle Saxon).

[133]. Brandon, Suffolk [Br 43]

Rim from small jar [Type ID] (middle Saxon).

[134]. Brandon, Suffolk [Br 44]

Upper shoulder from large jar (middle Saxon).

[135]. Brandon, Suffolk [Br 46]

Upper shoulder of small jar (middle Saxon).

[136]. Brandon, Suffolk [Br 48]

Upper shoulder of medium jar (middle Saxon).

- [137]. Brandon, Suffolk [Br 50]
Upper shoulder from large jar (middle Saxon).
- [138]. Brandon, Suffolk [Br 55]
Upper shoulder from medium jar (middle Saxon).
- [139]. Brandon, Suffolk [Br 56]
Upper shoulder of medium jar (middle Saxon).
- [140]. Treasury, Whitehall, London [78-1]
Rim sherd (floor of Saxon hall dated c. A.D. 800-1000).
- [141]. Barking Abbey, Essex [Ba 2]
Sherd from shoulder of a medium-sized vessel (context 79).
- [142]. Barking Abbey, Essex [Ba 7]
Sherd from shoulder of small jar (unstratified).
- [143]. Canterbury, Kent [CY 7]
Shoulder sherd from medium-sized vessel.
- [144]. Castor, Cambridgeshire [73-L-101]
Bodysherd.
- [145]. Castor, Cambridgeshire [71-XLV-9]
Bodysherd.
- [146]. Castor, Cambridgeshire [73-L-21]
Bodysherd.
- [147]. Rickinghall, Suffolk [1946-213A]
Bodysherd.
- [148]. Rickinghall, Suffolk [1946-213B]
Bodysherd.
- [149]. Flixborough, Humberside [Fx 1]
Bodysherd from large vessel (unstratified).

- [150]. Flixborough, Humberside [FX 2]
Bodysherd from large vessel (unstratified).
- [151]. Flixborough, Humberside [FX 3]
Bodysherd from large vessel (unstratified).
- [152]. Flixborough, Humberside [FX 4]
Bodysherd from small to medium-sized vessel
(unstratified).
- [153]. Flixborough, Humberside [FX 5]
Bodysherd from large vessel with exterior
burnish.
- [154]. North Raunds, Northamptonshire [NR 2]
Bodysherd from large vessel.
- [155]. North Raunds, Northamptonshire [NR 4]
Bodysherd from medium-sized vessel.
- [156]. North Raunds, Northamptonshire [NR 6]
Bodysherd from medium-sized vessel.
- [157]. North Raunds, Northamptonshire [NR 7]
Bodysherd from medium-sized vessel.
- [158]. Terrington St. Clement, Norfolk [Te 1]
Rim from lugged Buttermarket-type jar
(unstratified).
- [159]. Terrington St. Clement, Norfolk [Te 2]
Bodysherd from a medium-sized vessel
(unstratified).
- [160]. Terrington St. Clement, Norfolk [Te 3]
Bodysherd (unstratified).
- [161]. Terrington St. Clement, Norfolk [Te 5]
Bodysherd from very large vessel (unstratified).

[162]. Terrington St. Clement, Norfolk [Te 6]

Bodysherd (unstratified).

[163]. Terrington St. Clement, Norfolk [Te 7]

Bodysherd, possibly from a Buttermarket-type vessel (unstratified).

GROUP 3

[164]. Waltham Abbey, Essex [B-28-16]

Bodysherd (foundation wall deposit dated *c.* A.D. 800-1000).

[165]. Blythburgh, Suffolk [1965-28-TM-451756]

Bodysherd.

[166]. Tattingstone, Suffolk [1970-26-TM-146377]

Bodysherd.

These three sherds, which formed part of the original petrological report on Ipswich Ware [Williams, 1976a and b], may well be a slightly finer-grained version of Group 1, as many of the quartz grains present appear to share the same degree of angularity as those in the latter group. Like both of the two main fabric groups above, quartz is once again the dominant inclusion type. However, the average grain size tends to be slightly larger than those in Group 2, excluding the sparse larger grains, while at the same time a little smaller than those in Group 1, indicating a slightly more finer-grained texture. Also present are moderately frequent flecks of mica, with a little chert, quartzite, clay pellets, small discrete grains of feldspar and iron oxides.

**PETROLOGY OF SAMPLE SHERDS FALLING OUTSIDE OF THE TWO
MAIN FABRIC GROUPINGS LISTED ABOVE**

IPSWICH, SUFFOLK

[167]. IP 1 [Buttermarket]

Shoulder sherd of Buttermarket-type bottle

[backfill of middle Saxon pottery kiln].

A relatively fine-textured fabric containing a moderate amount of quartz grains, generally under 0.30mm in size, flecks of mica, the odd small grain of felspar, quartzite, some small pieces of chert and a little iron oxide.

[168]. IP 2 [Foundation Street]

Bodysherd from ?Buttermarket-type bottle [backfill
of early ninth century A.D. pit].

A fairly clean clay matrix containing moderately frequent ill-sorted quartz grains ranging up to 1.20mm across, together with sparse shreds of mica, a large piece of chert, a few small fragments of limestone, an oolith and some iron oxides.

[169]. IP 16

Rim and spout from pitcher [Type IA].

Moderately frequent quartz grains generally under 0.20mm in size, flecks of mica, iron oxides and some small pieces of chert.

[170]. IP 1 [same No. on sample bag as [167]].

Rim sherd.

[171]. IP 4

Bodysherd from large jar.

[172]. IP 8

Small jar.

[173]. IP 23

Small jar.

Frequent, moderately ill-sorted grains of quartz generally below 0.60mm size, together with some flecks of mica, a little chert and quartzite.

[174]. IP DS1.1

Stamped sherd.

Frequent and moderately well-sorted grains of quartz, generally below 0.40mm in size, with shreds of mica, some small pieces of chert, ironstone and iron oxides.

Unfired clay sample from Crown Street, Ipswich

Frequent well-sorted quartz grains generally below 0.20mm in size, together with sparse mica, some green and brown glauconite, a little small chert and iron oxides.

BARKING ABBEY, ESSEX

[175]. Ba 1

Base sherd from a large vessel (unstratified).

Groundmass of silt-sized quartz grains with a moderately frequent scatter of larger grains up to 0.40mm across, flecks of mica, a little chert and iron oxides.

[176]. Ba 6

Sherd from the shoulder of a small jar
(unstratified).

A fairly clean clay matrix containing moderately frequent ill-sorted quartz grains ranging up to over 1mm in size, together with sparse flecks of mica and a fragment of quartz sandstone.

BRANDON, SUFFOLK

[177]. Br 1

Buttermarket-type bottle (unstratified).

Frequent subangular grains of quartz ranging up to 0.60mm in size, with flecks of mica, a little chert and some iron oxides.

[178]. Br 11

Upper shoulder of large jar (middle Saxon).

[179]. Br 17

Rim from small jar [Type IIIJ] (middle Saxon).

[180]. Br 45 Rim from small jar [Type IA] (middle Saxon).

Frequent moderately well-sorted quartz grains generally under 0.40mm in size, with sparse larger grains, flecks of mica, some small pieces of chert and iron oxides.

[181]. Br 9

Rim from small jar [Type IA] (middle Saxon).

[182]. Br 29

Upper shoulder of medium jar (middle Saxon).

[183]. Br 51

Upper shoulder of small jar (middle Saxon).

A fairly clean clay matrix containing moderately frequent quartz grains generally under 0.50mm in size but with a few larger grains, flecks of mica, chert and iron oxides.

CANTERBURY, KENT

[184]. CY 1

Bodysherd from large vessel.

[185]. Cy 6

Sherd from lower body and base of small vessel.

A fairly clean clay matrix containing frequent quartz grains ranging up to 0.60mm across, small pieces of chert, moderately sparse mica, a few large fragments of ironstone and some dark brown pellets of glauconite.

TERRINGTON ST. CLEMENT, NORFOLK

[186]. Te 4

Bodysherd from small jar (unstratified).

A groundmass of silt-sized quartz grains with a moderately frequent scatter of larger grains up to about 0.40mm across. Also present are some flecks of mica, chert and a little limestone.

COMMENTS

It is interesting to note that the vast majority of the Ipswich ware sherds analyzed in the present programme appear to fall quite comfortably within the two broad petrological groupings that were suggested 20 years ago with a much smaller sample base [HBMC Lab. Report, 1976]. Around the same time, a limited programme of neutron activation analysis also produced a division of Ipswich ware material from Ipswich into two broad groupings [Hawkin, 1979; Hunter, forthcoming]. Moreover, both of the major petrological groups described here can be distinguished by eye, or at least with the aid of a hand-lense, without too much difficulty [this seems to be at variance with the comments mentioned in the Ipswich Ware Project Research Design, 25/11/93, section 1.4.1].

There are, however, some 22 samples, out of a total of 186, which cannot easily be accommodated within the two main Ipswich Ware groups, including material from Ipswich itself, and these have been listed separately with brief petrological descriptions. This does not necessarily mean that we have to look for an additional source, or sources, outside of Ipswich for this material. Indeed, one of

these sherds is actually associated with the Buttermarket kiln in Ipswich [167]. However, this sherd is also texturally different to the other four Buttermarket-type bottles examined, which themselves show a certain fabric variation: one each from Foundation Street, Ipswich [168] and Brandon [177] and two from Terrington St. Clement [158] and [163]. Whether this reflects a variety of clays used, or some variety within a single deposit, is difficult to judge at present.

Due to the common nature of the range of inclusions found in the majority of Ipswich ware sherds examined, notably the high content of quartz grains which are invariably present, it is difficult to know if the fabric groupings listed here, which mostly rely on the nuances of quartz size and frequency, actually indicate pottery made at the same production centre. Both Groups 1 and 2, for example, include "waster" sherds from Ipswich, as well as many other sherds recovered from Ipswich itself. However, the small number of "wasters" is possibly not enough to sufficiently test the potential range of fabrics present at each kiln site. Alternatively, some of the sherds may have been made from generally similar raw materials at a number of different centres within a restricted region over a period of time, or merely reflect a similar tradition of pottery making, e.g. especially with Group 2, with its added large quartz grains.

Significantly, the latter group is made up of those Ipswich ware sherds that can be described in the hand-specimen as having a "pimply" fabric. In this case the petrological division seems merely to be reflecting the visual differences in the size-grades of quartz sand present in this material. This group also includes a "waster" from the Cox Lane kilns, but it is not clear if "pimply" Ipswich Ware may also have been made in the Carr Street kilns [Hurst and West, 1957].

There appears to be some exclusivity in the fabric range of the rim types examined. For example, Types IC and IIK, representing 12 vessels, only occur in

Group 2 fabric, while the remaining types are represented in Groups 1, 2 and "others" [except 1 case of Type 1D in Group 2]. Five of the six similarly stamped sherds fall into Group 1.

Glaucanite has been identified in a small number of sherds from Ipswich, and is also present in a sample of clay from Crown Street. Ipswich is situated on Gravel and Sand, Alluvium and patches of Tertiary clay [Reading Beds Thanet Beds and London Clay], with Boulder Clay just to the north of the city [Geological Survey 1" Map of England Sheet no. 207]. The local Reading and Thanet Beds both contain glauconite, with lesser amounts also present in the London Clay [Boswell, 1927]. The sample of clay from Crown Street may well have come from one of these formations.

Thetford-type pottery also seems to have been produced at the Cox Lane kilns [Smedley and Owles, 1963]. There are similarities in thin section to samples of Thetford-type ware and Ipswich ware from the Cox Lane kilns [Group 1]. Neutron activation analysis of a similar range of material from Ipswich also confirms the similarity in fabric between Ipswich ware and Thetford-type ware [Hawkin, 1978].

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