

## **The Pottery from 26-27 Staple Gardens, Winchester**

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### **Summary**

The excavations at 26-27 Staple Gardens produced 1883 sherds of pottery, representing no more than 1711 different vessels and weighing in total 19.839 Kg. The pottery ranges in date from the Roman period to the 19<sup>th</sup> century and within this range includes a group of late Roman pottery, most of which is residual, and a collection of 11<sup>th</sup> to 13<sup>th</sup>-century date. The latter is mostly well-stratified and several phases of deposition can be recognised. From these it is possible to reconstruct the pottery supply to the site from the pre-conquest 11<sup>th</sup> century through to the middle of the 13<sup>th</sup> century. Later pottery comes mainly from garden soils and no material dating between the late 13<sup>th</sup> and the 15<sup>th</sup> centuries was recognised in the collection.

### **Methodology**

The analysis of the Staple Gardens pottery was undertaken in several stages. In the first stage, the pottery was quickly examined (AGV) and a rough *terminus post quem* for each context was established. On the basis of these spot dates the site stratigraphy was phased and six or seven stratigraphically unrelated strands of stratigraphy were established (the Cranebase, the Petrol interceptor tank trench, the Soakaway excavation, Units D and E, Units F and G and Unit K).

Meanwhile, the pottery was recorded in detail. Initially, all of the featured sherds were extracted, given drawing numbers and examined at x20 magnification using a binocular microscope (AGV). This enabled a number of broad ware groups to be established. However, in order to test the integrity of these groups samples were taken for thin section and chemical analysis (see Appendix 1). On the basis of these studies some further samples were taken and studied and then a modified ware group classification was used to record the entire collection (KS). This created a digital archive, a copy of which is deposited with the site archive.

The digital record was then analysed stratigraphic strand by stratigraphic strand and in most cases it was possible to date these sequences using the introduction of new types and, to a lesser extent, the decline and then absence of earlier types. This data was then combined to provide a chronological overview of pottery supply and use on the site.

## Wares and fabrics

### **Roman**

Two hundred and forty six sherds of Romano-British pottery were recovered from the Staple Gardens excavations. The majority of these were residual in post-Roman deposits but include a small quantity which may be stratified in Roman levels. The average sherd weight is 8.9gm.

The most common ware present is greyware, which probably includes a large proportion of Alice Holt greyware (118 sherds). This was followed by grog-tempered ware (46 sherds), and New Forest colour-coated wares (40 sherds, including overfired sherds). Oxfordshire Colour-coated wares were next most common (17 sherds).

Other wares were present, being limited to a handful of sherds of any one time. They include Portchester D ware (6 sherds), Dorset Black Burnished ware (5 sherds), South Gaulish Samian ware (5 sherds), Miscellaneous oxidized wares (3 sherds), New Forest coarse whiteware (3 sherds), a sherd from a Gauloise amphora, a northern Gaulish mortaria, a sherd of Harrold-type shell-tempered ware and a sherd of New Forest parchment ware.

Most of the sherds could be assigned to a form group. The majority came from jars, some of which had been used for boiling water and had sooted exteriors and kettle furred interiors. Beakers were the next most common form, 26 sherds in total, of which 3 came from folded forms. Bowls were the next most common form (23 sherds, of which 5 come from flanged vessels), followed by mortaria (8 sherds), dishes (5 sherds), jugs (2 sherds), an amphora, and three Samian cup and bowl forms (DR27, DR33 and DR35).

### **Early to Mid Anglo-Saxon**

A small number of sherds of chaff-tempered ware (ECHAF in archive and tables) was present on the site. They amount to 5 sherds weighing 14 gm in total. All the sherds were extremely abraded and coated with off-white concretions. No example was large enough or well-enough preserved for fabric analysis. Nevertheless, it is clear that these sherds are not simply small fragments of the chaff-tempered bronze-casting moulds, which were also found in some quantities on the site (see report by Salter, p.00). Chaff-tempering is a widespread tradition in the early to mid Anglo-Saxon period in south central England. However, it is not found in the 5<sup>th</sup>-century assemblage from the Lower Brook Street excavations (pers comm K Barclay) and had fallen out of use early in the life of the *wic* at Hamwic, perhaps early in the 8<sup>th</sup> century (Timby 1988). These sherds therefore probably date between the later 5<sup>th</sup> and the early 8<sup>th</sup> centuries.

## **Late Saxon**

Three wares dating between the later 9<sup>th</sup> and the mid 11<sup>th</sup> centuries were present on the site.

### **Gravel-tempered ware**

The most frequent late Saxon type consists of gravel-tempered ware jars with bag-shaped bodies, everted rims and a thickened neck. Samples of these vessels were examined in thin section and through chemical analysis but it was not possible to find any distinction in fabric between them and the later, squat, sagging based jars (see appendix 1). Thus, only a minimum figure for the presence of these vessels is possible, based on the identification of rim or neck sherds. The vessels have a distinct basal angle with thicker walls than the later vessels and a more pronounced sag to the base and therefore it is possible to identify the later vessels from their rims, necks and bases. However, small featureless sherds of gravel-tempered ware could come from vessels of either tradition.

Eight vessels had rims with measurable diameters and these range from 100mm to 250mm (DR15, Dr18, DR22, DR44, DR55, DR80, DR84, DR92). Most show signs of sooting, including on the inside of the rims (indicating that the vessels were used without lids).

### **Late Saxon Wheelthrown**

Forty-one sherds of Late Saxon Wheelthrown ware vessels (Biddle and Collis 1978) were identified. They came from no more than 36 vessels and weighed in total 391 gm. Six samples were examined in thin section and by chemical analysis and compared with six samples from Michelmersh (Appendix 1). This study indicated that the two groups were clearly distinguishable and that it is unlikely that the Winchester vessels were made at Michelmersh. In contrast, it was not possible to distinguish the fabric of these vessels from that of the South Hampshire Redware jars. Therefore, featureless body sherds with no clear sign of throwing might well have been missed. However, this type is quite distinctive in form, since the walls tend to be thicker than Roman greywares and of the later, handmade jars and have a corrugated interior as a result of the throwing. It is probably only sagging base sherds which could have been missed.

Five rim sherds were found, all from vessels with rounded, everted rims (DR45, DR61 and DR95). Four of these had measureable diameters, ranging from 100 mm to 140 mm. Similarly, five base sherds were found, all from sagging bases, with diameters ranging from 100 mm to 150mm. One body sherd had external rilling whilst the remainder were smooth.

Collis and Biddle demonstrated that this type was of pre-conquest date but had to leave the precise date range fairly wide, later 9<sup>th</sup> to mid 11<sup>th</sup> centuries. Little subsequent work has changed this view, although it is now thought that most wheelthrown wares present in late Saxon Wessex have a later inception than those found in the Danelaw and that a late 10<sup>th</sup> to

mid 11<sup>th</sup>-century date range is more likely. Archaeomagnetic dating of a kiln making typologically similar pottery at Michelmersh to the late 10<sup>th</sup> century is consistent with this view (L Mephram pers comm).

### Winchester Ware

Nineteen sherds of Winchester Ware were present, representing no more than 17 vessels (probably considerably less) and weighing in total 159 gm (Biddle and Barclay 1974). All have a glossy olive green external glaze (probably a lead glaze coloured by slight iron contamination and a reduced firing) with a few instances of iron-rich inclusions bleeding into the glaze. These indicate that the vessels were fired inverted.

The sherds all come from pitchers with a sagging base and wide, everted rim but cannot be assigned with certainty to either of Biddle and Barclay's pitcher types. Decoration consists of horizontal and wavy combed lines, sometimes combined with applied curvilinear strips (DR52 and DR53) and individually-applied stamps (DR65).

Five samples were taken for thin section and chemical analysis (Appendix 1). At least one of these is unlike other southern English whitewares but similar in chemical composition to early glazed wares from Rouen, which date to the 10<sup>th</sup> and 11<sup>th</sup> centuries. This suggests that some or all of these vessels may not be Winchester Ware (and none have the distinctive line-bounded applied and stamped strips of the classic examples). Nevertheless, they are probably similar in date, being likely to be of later 10<sup>th</sup> and 11<sup>th</sup>-century date and preceding the use of Wiltshire and locally-made glazed wares.

### Medieval

The majority of the pottery recovered from the site dates to the later 11<sup>th</sup> to mid 13<sup>th</sup> centuries.

### Gravel-tempered ware

Gravel-tempered ware jars form the main vessel type in use in the earlier part of the period, being progressively replaced by South Hampshire Redware examples. Most have the same black core, oxidized margins and usually a deliberately blackened surface as the Late Saxon vessels, although a few have a grey core and oxidized margins and surfaces which suggest a longer and more controlled firing, perhaps in a kiln as opposed to a bonfire or clamp. A sample of gravel-tempered ware vessels was examined in thin section and by chemical analysis and two of the five samples were found to be probably Northern Hampshire or Kennet valley products (Newbury A), leaving three examples of the local gravel-tempered ware. No difference could be found between these vessels and those of the Late Saxon period, suggesting that the same centre was producing vessels of both traditions.

The majority of the sherds come from squat jars with sagging bases and everted rims. Most of the rims are simple, rounded everted examples (DR3, DR8, DR20, DR25, DR43, DR48, DR54, DR63, DR66, DR69, DR81 and DR85). A few of these are thumbled (DR32, DR57, DR96). A smaller number have external beading or thickening (DR6, DR9, DR28, DR37, DR41, DR42, DR72, DR82). Several vessels have an everted rim with a flattened top (DR11, DR33, and DR86). These jars have slightly sagging bases with a sharp basal angle. Most have traces of sooting.

Other forms are present but uncommon. They consist of four sherds from spouted bowls (DR1, DR30 and DR73) and two from spouted pitchers (DR38 and DR39). In addition, a number of body sherds (24 in total) come from one or more extremely large, thick-walled vessels. DR98 is possibly the rim from one of these vessels, which are likely to be either storage jars or large spouted pitchers.

These medieval-style vessels are known to occur before the conquest (for example, a spouted bowl from Wedmore in Somerset contained a coin hoard of Edward the Confessor) but seem to have been introduced in the early to middle 11<sup>th</sup> century. This is certainly the pattern found in the City of London, where the transition from 'late Saxon' to early medieval forms was underway by 1039/40 and complete by c.1055 (based on the dendrochronological dating of the Thames waterfront at Billingsgate Lorry Park, Vince and Jenner 1991). The end date for the industry is uncertain. In some parts of the country such handmade coarsewares, especially those which might have been bonfire-fired, seem to have ceased production by the middle of the 12<sup>th</sup> century, whilst in others they continued to be made into the 13<sup>th</sup> century (as in the Vale of Gloucester, at Haresfield) whilst in the Kennet Valley they continued to be made well into the 14<sup>th</sup>, if not the 15<sup>th</sup> century. The spouted pitcher and spouted bowl forms, however, are likely to be of later 11<sup>th</sup> to mid 12<sup>th</sup>-century date, since this seems to be their period of currency throughout southern England.

### South Hampshire Redware

The second-most common ware found in the medieval period on the site is South Hampshire Redware. This is a fine sandy fabric, although occasional calcareous inclusions and flint fragments occur and typically has visible muscovite flakes visible at x20 magnification. A sample of eight sherds was thin sectioned and analysed chemically (Appendix 1). This sample included four unglazed jars, three glazed jugs and a glazed dripping dish. No distinction could be found between the glazed and unglazed vessels, nor between the South Hampshire Redwares and the Late Saxon Wheelthrown ware and it is concluded that a single source supplied the city with redware in the medieval period and that probably the same source supplied the city in the Late Saxon period.

Typically, the vessels have a grey core and either grey or light brown oxidized surfaces. The jugs and dripping dish have a plain splashed lead glaze covering the exterior with splashes on the interior and on the inside of jug rims.

Four hundred and fifty one sherds of jars were recorded, coming from no more than 390 vessels and weighing in total 3955 gm. The jars have a globular body, sagging base and everted rim (DR2, DR4, DR5, DR7, DR13, DR27, DR46, DR59, DR71, DR78, DR79 and DR94). The rim itself is usually rounded, and sometimes thickened on both sides. In rare cases the rim is rolled out from the body without a sharp neck angle (DR12). The body of the vessel is sometimes, on later vessels, scratch-marked but in the main is smooth.

Glazed jugs are the next most common form. Fifty sherds of these vessels were recorded, coming from no more than 44 vessels and weighing in total 503 gm. The vessels are probably all handmade but with the top half of the body finished on a turntable. Only one rim sherd was present, a flat-topped rim with a devolved collar (DR77). Several sherds come from decorated vessels, including several sherds, possibly from one vessel, with diagonal brown painted lines, about 10mm wide. The shoulder of this pot is corrugated in the manner of late 12<sup>th</sup>-century London-type ware vessels (DR90). A single sherd, decorated with a horizontal groove, comes from a wheelthrown jug.

These handmade, splash glazed jugs are reminiscent of those made in the London area, London-type ware, from the middle of the 12<sup>th</sup> century. By the end of the century the same forms were made entirely on the wheel (1985). Whether this chronology holds true for southern Hampshire is debatable, but these Winchester vessels are certainly in the main typologically less-advanced than those found in Southampton in association with mid 13<sup>th</sup>-century imports.

Bowls or pancheons were also found. The pancheons have flaring, rounded rims and are large diameter vessels (DR100). One sherd might be a residual Late Roman "dog dish" but is identical in fabric to the South Hampshire Redware (Dr101) and one sherd comes from a vessel of lamp or crucible form but which has certainly been used for cooking food, since it is sooted on the exterior (DR102).

Two sherds of dripping dishes were found. These are shallow, slab-built vessels with internal glaze (DR36 and DR58). The sherds are not large enough to establish the shape in plan, but they are likely to be from oval vessels. Dripping dishes were used to catch the fat from a spit roast and first appear in English assemblages in the early 13<sup>th</sup> century.

### South Hampshire Whiteware

Thirty two sherds of South Hampshire Whiteware were recorded from the site, all from glazed vessels. The fabric of the majority of the sherds is not white but a light brown or pink and they contain a similar fine sand to that of the South Hampshire Redware. Samples of

four vessels were selected for thin section and chemical analysis (Appendix 1) and these studies suggest that the South Hampshire Whiteware fabric is probably made from a Tertiary white-firing clay of which the pipeclay facies of the Reading Beds outcrops to the south of Winchester, between Otterbourne and Hursley (Hodson 1964).

In contrast to the redware, no definite examples of jars or other unglazed forms were found and all the vessels appear to have been thrown on the wheel. The glaze is applied either as splashes or as a glossy coating and in both cases the glaze is mainly coloured with copper.

No rim sherds were found but there are two bases, both of which have thumbled decoration (DR68). Two handles were found. One is a very wide strap handle, with broad knife-cut slashes down the back and the other is an oval handle decorated with two vertical incised lines. Decoration consists of rectangular-toothed roller-stamping (DR26, DR75, DR88), and cross-hatched combing on the globular body of a jug with a cylindrical neck, separated from the body by a cordon (DR70).

The typological features on these sherds suggest at the earliest a late 12<sup>th</sup>-century date whilst some of the vessels are clearly of early 13<sup>th</sup>-century or later date.

#### South-East Wiltshire ware

Thirty-five sherds of South East Wiltshire ware were recorded. They represent no more than 33 vessels and weigh 384 gm in total. The fabric had abundant subangular and rounded quartz sand, up to 1.0mm across, in an inclusionless, light-firing groundmass. As a result of clay shrinkage, the quartz sand usually stands proud of the surface, giving a distinctive texture.

Two vessel forms were recognised, both of which were handmade. Fifteen sherds came from globular jars, five of which have sooted exteriors. These vessels have a thick everted rim and scratch-marked treatment on the body (noted on three sherds). The fabric is usually black as a result of incomplete burning of the organic matter present in the clay.

Twenty sherds come from glazed vessels, probably tripod pitchers. Four of the sherds were decorated, with combing, applied strips (DR29) and roller stamping (DR31).

These vessels were made in the Salisbury area of south east Wiltshire from the late 11<sup>th</sup> century through to the early 13<sup>th</sup> century. Their presence in Winchester in the late 11<sup>th</sup> century is indicated by the discovery of a tripod pitcher at the Old Minster site dated earlier than the 1090s (Biddle and Quirk 1962) whilst in the west of England they seem to have been exported through Bristol and occur alongside other 12<sup>th</sup>-century glazed wares in the period immediately preceding the setting-up of more local glazed ware industries, in the later 12<sup>th</sup> century (1984).

### Laverstock ware

Four sherds of Laverstock ware were recorded, representing only two vessels, both wheelthrown jugs. Two samples were taken for thin section and chemical analysis (Appendix 1) and these indicate that the fabric is distinguishable from the South Hampshire Whiteware by the relative paucity of iron-rich inclusions and by the chemical composition.

The three sherds from context 83 come from a baluster jug decorated with areas of applied fine red slip, self-coloured pellets and ring and dot stamps (in which the stamp is a circular impression with a freehand dot added afterwards). The original decorative scheme is lost but was probably figurative (DR14). The sherd from context 291 appears to come from a waisted jug decorated with triangular-sectioned fine red slip pellets (DR50).

It is likely that the Laverstock fineware production was stimulated by the presence of Clarendon Palace, which received a large amount of royal patronage in the 1240s to 1260s although similar developments were taking place throughout southern England at this time (for example, Kingston-type ware, produced at Kingston-upon-Thames, Pearce & Vince 1988/1988) and in the preceding 40 years in the London-type ware industry.

### Newbury A ware

A few gravel-tempered sherds contain a high proportion of angular flint and a low proportion of calcareous algae fragments. In addition, the range of forms and rim forms present is different from that of the majority of gravel-tempered wares.

Samples of five vessels were taken for thin section and chemical analysis (Appendix 1) which confirmed the differences in fabric between these sherds and the local gravel-tempered vessels.

Vessels recognised at Staple Gardens include jars, included everted rimmed vessels with a triangular rim (DR57, DR72, DR74 and 91) and spouted bowls with inturned rims (DR1 and DR30).

It is likely that these vessels originated in northern Hampshire or the Kennet valley since similar vessels are found in quantity at Faccombe Netherton and Newbury. At Newbury, a distinction was drawn between Group A fabrics and Group B. Group A formed the majority of the vessels used in the later 11<sup>th</sup> to mid 12<sup>th</sup> centuries whereas Group B first appeared in the mid 12<sup>th</sup> century and rapidly replaced Group A. Most of the Staple Gardens sherds, however, were recovered from later 12<sup>th</sup>-century or later deposits and are either residual or perhaps from a different source from the northern Hampshire or Kennet valley examples.

### Newbury C / Oxford AG ware



Twenty-six sherds of Newbury Group C vessels were recovered. They represent no more than 18 vessels and weigh 192 gm in total. This ware (also known as Oxford Fabric AG, 1994) was produced at sites in eastern Berkshire (amongst them, Ashampstead, Mepham & Heaton 1994) from the later 12<sup>th</sup> century onwards. Excavations at Newbury indicate that the earliest glazed wares were decorated with roller stamping and applied strips whilst highly decorated vessels, with plastic decoration, occurred in the early to mid 13<sup>th</sup> centuries. A vessel of this ware from Alton was recently identified in thin section (Fabric 12/AL 20). Later in the 13<sup>th</sup> century, wheelthrown vessels, often with white external slip and decorated with combing or stamping, replaced the earlier types. At Staple Gardens, all the identified sherds were of the earliest type, dating to the later 12<sup>th</sup> or early 13<sup>th</sup> centuries. They include a tripod pitcher or jug rim with roller-stamped decoration around the rim (DR76) and sherds decorated with applied thumbled strips (DR21).

### **Post-medieval and Early Modern**

No large groups of post-medieval or early modern pottery were excavated at Staple Gardens. However, a scatter of later 16<sup>th</sup>-century and later wares were recovered, mainly from the upper garden soil.

#### **Tudor Green ware**

The handle from a Tudor Green jug was recovered from context 353. Such vessels were produced from the late 14<sup>th</sup> to the late 16<sup>th</sup> centuries in the Surrey/Hampshire border, for example at Farnborough (1988).

#### **Hampshire-Surrey Border ware**

Two sherds of Surrey-Hampshire Border ware were recovered, a bowl from context 196 and a pipkin from context 353 (1992).

#### **Red Hampshire-Surrey Border ware**

A sherd from a Red Border ware costrel was recovered from context 353. These vessels were produced alongside the previously-described whitewares in the later 16<sup>th</sup> and 17<sup>th</sup> centuries.

#### **Glazed Red Earthenware**

Fifteen sherds of miscellaneous later 16<sup>th</sup> to 19<sup>th</sup>-century glazed red earthenware were recovered. All were from large internally-glazed bowls.

#### **Horticultural products**

A single sherd of flower pot, of local but unprovenanced redware, was recovered from context 354.

### Bristol Stoneware

A sherd of Bristol stoneware was recovered from context 353. Such vessels were produced from the later 18<sup>th</sup> century onwards and from the middle of the 19<sup>th</sup> century usually have a distinctive honey-coloured feldspathic glaze replacing the earlier salt glaze.

### Unprovenanced English stoneware

Two fragments of salt-glazed stoneware drain pipe were recovered, from contexts 291 and 353.

### The Stratigraphic sequence

No single stratigraphic sequence covered the entire site. Instead, seven separate sequences were excavated and it is mainly through the analysis of the pottery finds that tentative correlations between these areas can be made.

### Cranebase

The lowest levels excavated produced only Roman potsherds and are probably of Roman date (C1). The sherds include Portchester D and grog-tempered wares and are probably of 4<sup>th</sup>-century date.

Above were a horizontal layer, 188, and possible road surfaces, 179, 250, 162 and 183, which produced sherds of Late Saxon date (C2A). Subsequent activity in this area consisting of pit digging, which has been divided into horizons based on the associated pottery and stratigraphy (C2B, C3, C4).

*Table 1*

phase	SEW	SOUTH HANTS RED	SOUTH HANTS WW	WINC	WINC GT	WINC LS WT	Grand Total
C2A					3		3
C2B	1	8		1	79	3	92
C3	3	5			13		21
C4	1	21	1		10		33
US					5		5
Grand Total	5	34	1	1	110	3	154

The pottery from Phase C2A consists of a small assemblage of gravel-tempered jar sherds with no datable typological features. It can only be broadly dated later than the later 9<sup>th</sup> century. Phase C2B produced 92 sherds of pottery, of which 9 sherds are of fabrics which were probably introduced in the later 11<sup>th</sup> century and a further 5 sherds are of gravel-

tempered jars of medieval style, probably also introduced in the 11<sup>th</sup> century, but possible before the conquest. These sherds come from the following contexts: 88, 89, 98, 152, 154, 161, 167, 175 and 181. In some cases it is suggested that these late sherds are intrusive, for example context 88 and 98 whilst the remainder might actually date the phase to the later 11<sup>th</sup> century. In the case of a number of sherds of South Hampshire Redware jars there is also the possibility that the sherds include parts of Late Saxon wheelthrown vessels not showing evidence for wheelthrowing but even there, two sherds have scratch marked decoration, which is most likely to post-date the conquest.

Phase C3 produced 21 sherds of medieval pottery, from three pits (22, 24 and 36). All three of these assemblages contain sherds which are of post-conquest date, and in the case of Pit 36 one of these is a putative Newbury C tripod pitcher, of mid 12<sup>th</sup>- to early 13<sup>th</sup>-century date.

Phase C4 produced 33 sherds of medieval pottery, from context 91 and Pit 25. Both produced sherds of glazed South Hampshire Redware vessels, probably jugs, whilst context 91 also produced a sherd of South Hampshire Whiteware. A late 12<sup>th</sup> or early 13<sup>th</sup>-century date is likely.

### **Petrol Interceptor Tank Trench**

Six hundred and fifty-eight sherds of medieval pottery were recovered from stratified contexts in the Petrol Interceptor Tank trench. The stratigraphic sequence was divided into five horizons, based on the provisional dating of the pottery and stratigraphic relationships (Table 00).

The earliest excavated phase, PITTA, consisted mainly of superimposed floors and occupation deposits. The earliest of these, 475, produced featureless sherds of gravel-tempered jars, which might be of any date from the late 9<sup>th</sup> century onwards. However, the immediately succeeding layer, 474, produced sherds of Late Saxon wheelthrown jars and a sherd of a medieval-style, everted rim jar (DR06) as well as a small sherd from a South Hampshire Redware jar. These characteristics indicate an 11<sup>th</sup>-century or later deposition date. One of these redware jar sherds, from context 465, has a crossfit with a vessel in context 354 (DR13) but this is more likely to indicate that the latter layer contained residual pottery than that context 465 contains intrusive pottery.

Phase PITTB produced a single sherd, from the filling of posthole 202. This sherd comes from a South Hampshire Redware tripod pitcher or jug decorated with a diagonal applied strip and a plain glaze and is likely to be of 12<sup>th</sup>-century or later date (DR15).

Phase PITTC produced 82 sherds of medieval pottery all of which came from four fills of pit 214. Each context produced sherds of glazed South Hampshire Redware tripod pitchers or jugs and a 12<sup>th</sup>-century or later date is likely. A sherd of possible Newbury A ware, dating to

the later 11<sup>th</sup> or early 12<sup>th</sup> century, was present (DR01) together with a large gravel-tempered vessel (DR98).

Phase PITTD produced 86 sherds of medieval pottery. These came from the backfills of 10 pits. In general, the pottery assemblages are similar in character to those from the earlier horizons with the addition of sherds of South Hampshire Whiteware from four of the pits. One of these sherds comes from a jug with a thumbed base, probably of 13<sup>th</sup>-century or later date and one comes from a vessel with rectangular-toothed roller stamping (DR88). Some of the pottery is demonstrably residual, such as the rim of a late Saxon gravel-tempered jar (DR22).

Three hundred and sixty-five sherds were recovered from phase PITTE. These too came from pit fills, from 9 separate pits. South Hampshire Redware was recovered from all but one of the pits and all but two of the pits produced sherds of glazed tripod pitchers or jugs. Three of the pits produced sherds of possible Newbury C ware (included under South Hampshire Redware in Table 00). Residual pottery is clearly present in the assemblages (for example, a spouted gravel-tempered bowl from Pit 137, DR73) but it is likely that at least some of the gravel-tempered ware sherds are contemporary.

*Table 2*

phase	ECHAF	LPMLOC	SEW	SOUTH HANTS RED	SOUTH HANTS WW	WINC	WINC GT	WINC LS WT	Grand Total
PITTA	1			8		5	95	15	124
PITTB				1					1
PITTC			3	29			48	2	82
PITTD			3	39	6		38		86
PITTE	3	1	9	198	7	2	143	2	365
Grand Total	4	1	15	275	13	7	324	19	658

### **Soakaway Excavation**

One hundred and thirty seven sherds of medieval pottery were recovered from stratified contexts in the Soakway excavation. The stratigraphic sequence was divided into two main horizons, of which the lower, Phase S1, produced only Roman pottery and is probably of Roman date.

The sherds include Oxfordshire colour-coated bowls and mortaria and grog-tempered vessels. They are probably of 4<sup>th</sup> century date.

The upper horizon was subdivided into three on the basis of pottery and stratigraphic relationships (Table 00).

The earliest of these subdivisions consists of pits and a post hole sealed by the makeup for a building, context 497 (S2A). Posthole 234 produced 9 medieval sherds, and a *terminus post quem* is provided by a sherd of Late Saxon Wheelthrown ware and a sherd of a Winchester ware vessel with stamped decoration. These probably date the fill to the later 10<sup>th</sup> century or later. Pit 236 is dated by a single sherd of gravel-tempered ware to the later 9<sup>th</sup> century or later.

Deposits associated with the timber building which seals S2A (S2B) produced 9 sherds of medieval pottery of which two sherds can probably be dated to the 11<sup>th</sup> century or later: a sherd of South Hampshire Redware jar and the everted, thumbbed rim of a medieval-style gravel-tempered ware jar. Both came from context 491, the floor of the structure.

The subsequent deposits (S2C) produced 118 sherds, most of which are from gravel-tempered jars. Two of these are of late Saxon type but examples from medieval-style jars are also present in contexts 477, 481, 482, 483 and 486. In addition, 10 sherds of South Hampshire Redware jars were recovered, from contexts 477, 478, 479, 480, 481, 482, 486 and 490. Context 481 also produced a possible South Hampshire Redware lid (DR97). The lack of glazed wares or of South East Wiltshire jars and scratch marked decoration might indicate that these deposits are earlier than the 12<sup>th</sup> century, by which time one might expect an assemblage of 118 sherds to include sherds from vessels with these characteristics.

**Table 3**

phase	ECHAF	SOUTH HANTS RED	WINC	WINC GT	WINC LS WT	Grand Total
S2A	1		1	7	1	10
S2B		1		8		9
S2C		9		104	5	118
Grand Total	1	10	1	119	6	137

**Units D and E**

Ninety four sherds of medieval and post-medieval pottery were recovered from stratified deposits in Units D and E. They were grouped into two horizons; medieval pit fills cutting through the lower garden soil (DE1) and the upper garden soil and features later than that soil (DE2).

Thirty sherds came from DE1 (Table 00). The lower garden soil produced 22 sherds including South Hampshire Redware and Whiteware jugs, a putative Newbury C tripod pitcher or jug, as well as an intrusive post-medieval glazed red earthenware. The pits cutting this soil contained similar glazed jug sherds. Both the garden soil and the pits are likely to date to the late 12<sup>th</sup> or early 13<sup>th</sup> centuries whilst one of the sherds from the pits is probably of early 13<sup>th</sup>-century date (DR70).

Sixty four medieval and post-medieval sherds were recovered from DE2, all of which came from the upper garden soil. Most are of exactly the same types that are present in the underlying strata but there are also six sherds of post-medieval glazed red earthenware bowls and a sherd from a stoneware drainpipe of later 19<sup>th</sup>-century or later date.

*Table 4*

phase	ENGS	GRE	LAVERSTOCK	SEW	SOUTH HANTS RED	SOUTH HANTS WW	WINC GT	WINC LS WT	Grand Total
DE1		1		2	17	5	2	3	30
DE2	1	6	1	1	33	5	16	1	64
Grand Total	1	7	1	3	50	10	18	4	94

### Units F and G

Units F and G produced two separate stratigraphic sequence, here distinguished as FG1 and FG2.

Sixty three sherds of medieval pottery were recovered from FG1. These were divided into three horizons on the basis of the pottery and stratigraphic relationships. A sequence of pits cutting a floor surface produced no medieval pottery and the earliest feature to produce pottery, the fill of pit 256, produced three medieval sherds, one of which was of late Saxon wheelthrown ware. This pit was sealed by building levels which included sherds of Winchester ware. The later part of this horizon, FGA, therefore dates to the later 10<sup>th</sup> century or later.

Subsequent occupation and pitting, FGB, produced 26 medieval sherds from six contexts. Most of these contained a mixture of gravel-tempered and South Hampshire Redware jar sherds whilst context 269 produced sherds of South Hampshire Whiteware jugs. The ratio of redware to gravel-tempered ware jars and the presence of the whiteware jugs suggest that this horizon dates to the later 12<sup>th</sup> to early 13<sup>th</sup> centuries.

The latest horizon, FGC, produced 63 medieval sherds from four contexts. The lowest of these are contexts 77 and 83 which produced three sherds from a highly decorated Laverstock jug (DR14). Later layers produced large fragments of gravel-tempered ware vessels, including spouted pitchers (DR38 and DR39). These sherds are similar in size and condition to the South Hampshire Redwares from the same contexts and may be contemporary, although conventional dating would suggest that these unglazed coarseware spouted pitchers are of later 11<sup>th</sup> to early 12<sup>th</sup> century date. In any case, the date of the horizon is given by the Laverstock vessel to the mid 13<sup>th</sup> century or later.

**Table 5**

phase	LAVERSTOCK	SOUTH HANTS RED	SOUTH HANTS WW	WINC LS WT	WINC GT	Grand Total	
FGA				5	1	4	10
FGB		15	2	3		7	27
FGC	3	18	1			4	26
Grand Total	3	33	3	8	1	15	63

The second block of stratigraphy in Units F and G could also be divided into four horizons on the basis of the pottery and stratigraphy. A total of 483 medieval and post-medieval sherds were recovered from stratified deposits (Table 00).

The earliest horizon, FG2A, produced 220 sherds. The lowest excavated layer, 286, produced six gravel-tempered sherds, all from one vessel. In the absence of typological features this pot could date to any time after the later 9<sup>th</sup> century. Two contexts can be given *termini post quem* of the later 10<sup>th</sup> century on the basis of sherds of Late Saxon wheelthrown ware (contexts 80 and 285). All other contexts produced sherds of 11<sup>th</sup>-century or later date although only one of these, context 251, the latest context in the horizon, produced a sherd of South Hampshire Whiteware of later 12<sup>th</sup> to 13<sup>th</sup>-century date. No sherds of glazed South Hampshire Redware were present in this horizon and only one sherd of South East Wiltshire tripod pitcher, from context 272, whose stratigraphic position is suspect.

The succeeding horizon is associated with a timber building (FG2B) and produced 154 sherds, from three contexts. All three have similar characteristics to the assemblage from context 251 and probably date to the later 12<sup>th</sup> or early 13<sup>th</sup> centuries.

The building was succeeded by made ground and a cobbled surface or roadway which was itself cut by pits (FG2C). With the exception of a single, intrusive, sherd of glazed red earthenware the 106 potsherds from this horizon are of similar types to those in the preceding horizon and occur in similar relative frequencies.

Finally, the fill of posthole 48 produced three sherds, one of which is medieval and the other two of post-medieval date.

**Table 6**

phase	BORDG	GRE	MISC	SEW	SOUTH HANTS RED	SOUTH HANTS WW	WINC GT	WINC LS WT	Grand Total	
FG2A			3	1	34	1		174	7	220
FG2B				9	55	1	1	88		154
FG2C		1		2	33	2	1	66	1	106
FG2D	1	1			1					3

Grand Total	1	2	3	12	123	4	2	328	8	483
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## Unit K

A single context, 353, in Unit K produced pottery, a collection of post-medieval sherds which include a later 19<sup>th</sup>-century or later stoneware drainpipe fragment. No residual medieval sherds were present and only a single Roman sherd. The post-medieval pottery includes 16<sup>th</sup>-century material.

## Stratigraphic summary

The pottery suggests that there is stratigraphy of Roman date in two areas: the Cranebase and the Soakaway Excavation, containing a total of 32 sherds. There is no evidence for surviving early to mid Anglo-Saxon stratigraphy on the site, despite the presence of residual sherds of this date in the Petrol Interceptor Tank Trench and the Soakaway Excavation. The evidence for stratigraphy of later 9<sup>th</sup> to mid 10<sup>th</sup>-century date is extremely thin, consisting of four sherds from the Cranebase. Given that the immediately overlying strata date to the later 11<sup>th</sup> century, it is likely that horizon C2A actually dates to the later 10<sup>th</sup> to 11<sup>th</sup> century. Other evidence for later 10<sup>th</sup> to early 11<sup>th</sup>-century stratigraphy on the site comes from Units F and G and the Soakaway excavation but only 28 sherds were present in these deposits.

There is a sudden intensification of activity on the site in the late 11<sup>th</sup> century. Deposits of this date were found in the Cranebase, Units F and G, the Petrol Interceptor Tanks and the Soakaway excavation. The total quantity of pottery found leaps to 563 sherds. Similar quantities of pottery were recovered from later 12<sup>th</sup> to 13<sup>th</sup>-century deposits, 421 sherds in total. Deposits of this date are only absent in one area, the Soakaway Excavation.

Activity starts to decline on the site in the early 13<sup>th</sup> century, although 451 sherds were recovered from deposits of this date in the Petrol Interceptor Tank trench. The only other area where deposits of this date were present was the Cranebase. Finally, only one area produced pottery of mid 13<sup>th</sup>-century or later date, Units F and G, which produced a total of 26 sherds of this date.

Clearly, there is a high quantity of residual pottery in these deposits. This is illustrated by the incidence of residual Roman pottery (Table 00) but can also be seen in the incidence of gravel-tempered vessels with thickened necks and of Late Saxon Wheelthrown vessels, both of which occur throughout the sequence but in decreasing quantities (Table 00, LS and WT respectively). Because of this inevitable, but generally unrecognisable, residuality, it is only possible to recognise trends in the pattern of pottery use, rather than say for certain when certain types ceased to be used. Nevertheless, using the pottery and stratigraphy from the Staple Gardens site we can reconstruct in outline the major patterns in the pottery sequence from the later 10<sup>th</sup> to the early 13<sup>th</sup> centuries.



*Table 7*

strat date	Cranebase	FG1	FG2	Petrol Trench	Soakaway	Units D&E
1.2	14 R				18 R	
9.2	1 R	1 WT			1 WT	
10.2		2 R			6 R	
11.2	41 R		3 R	7 R	71 R	
	3 LS		5 LS	3 LS	4 LS	
	3 WT		7 WT	15 WT	5 WT	
12.2	8 R	2 R	7 R	14 R		2 R
			2 LS	0 LS		0 LS
			1 WT	2 WT		3 WT
13.1	4 R			30		
				1 LS		
				2 WT		

## The Pottery

The pottery can not only be used to provide a rough chronology for the sequence of activity found at Staple Gardens but can also say something about the supply of pottery to Winchester.

### **Roman pottery**

Almost all of the Roman pottery from the site was residual but there is no reason to believe that it did not all originate on the site and has merely been disturbed from earlier levels. Much of the material cannot be closely dated without detailed study but it is clear that the majority is of late Roman date, including examples of Harrold-type shelly ware and Portchester D ware, both of which were only traded on a wide scale in the later 4<sup>th</sup> century. Examples of everted rim jars, in grey ware and grog-tempered ware, in which the rim is probably a similar diameter to the shoulder were noted. These too point to a later 4<sup>th</sup>-century date.

There are, however, definitely earlier wares present, and in particular there is a small group of Samian ware cups and bowls, all of which appear to be in South Gaulish fabrics and therefore of later 1<sup>st</sup> to early 2<sup>nd</sup>-century date.

### **Early to mid Saxon pottery**

There is too little pottery of early to mid Anglo-Saxon date present at the site for comment.

### **Late Saxon pottery**

The pottery sequence starts in the later 10<sup>th</sup> or 11<sup>th</sup> century and both Gravel Tempered and Late Saxon Wheelthrown wares appear to be present from the start of occupation, with the gravel-tempered ware outnumbering the wheelthrown ware. Thin section and chemical analysis suggests that both these wares were 'local', which probably means that they were made within 10 km of the city. Winchester ware, also probably present in pre-conquest levels, comes from a different source from either of these two wares.

### **Saxo-Norman and medieval pottery**

In the later 11<sup>th</sup> to early/mid 13<sup>th</sup> centuries the site was supplied with coarseware from the same source(s) as were used in the pre-conquest period. Gravel-tempered wares continued to be used and cannot be distinguished from their pre-conquest predecessors in fabric whilst the same is true of some of the South Hampshire Redwares, which have a similar fabric to that of the Late Saxon Wheelthrown ware. However, new sources are represented in the sampled South Hampshire Redwares (together with South Hampshire Whiteware and Laverstock ware) and these indicate a wider and more varied source of pottery. The overall quantity of redwares to gravel tempered wares undoubtedly increased during the period covered by the Staple Gardens occupation but the fabric analysis suggests that this is a technological change rather than a change in supply.

Similarly, there are a number of vessels found at Staple Gardens which were made in a northern tradition, whose centre lies to the north of the chalk, in the Kennet and Thames valleys. However, fabric analysis of these wares (Newbury A and Newbury C ware) suggests that they too may be locally-made, and therefore more likely to indicate the movement of one or more potters from Berkshire to the Winchester area than a trade in pottery.

Definite regional imports are, however, found in the collection. All of them come from south-east Wiltshire, in the area around Salisbury, and all are probably post-conquest in date. They form only a small fraction of the total collection. There are no continental imports present, which contrasts strongly with the situation at Southampton (1975;2002).

### **Post-medieval pottery**

By contrast, there is little sign of a local pottery industry in the small collection of late/post-medieval pottery from the site and a reliance on the Surrey/Hampshire border region for finewares.

### **Conclusions**

The pottery suggests that there is activity on the site in the Roman and in the early to mid Anglo-Saxon periods but the excavated occupation sequence really starts in the late 10<sup>th</sup> or

early 11<sup>th</sup> centuries. Most of the excavated strata, however, are probably of post-conquest date and show no sign of a break in activity from the later 11<sup>th</sup> to the early 13<sup>th</sup> century. At this point, occupation on the site ceases, with just a few deposits producing South Hampshire Whitewares and Laverstock ware. The site is then not used for occupation until the late or post-medieval period, and even this material comes in the main from a garden soil overlying the medieval occupation sequence.

Detailed study of the pottery indicates that much of it probably came from very local sources and the similarity in both thin section and chemical analysis of the majority of the sampled sherds suggests that only a handful of medieval sherds from the site were not made within a few miles of Winchester. These regional imports include Laverstock ware and glauconitic and silty micaceous redwares which require further study. This preliminary work certainly indicates that Winchester area pottery is identifiable and that it should be possible, for example, to compare local pottery supply to Winchester with that found in collections from Alton and Southampton.

## Appendix 1. Petrological and chemical analyses

### **Alan Vince**

Forty-five sherds from Staple Gardens were selected for characterisation using thin sections and chemical analysis.

The thin sections were produced at the Department of Earth Sciences, University of Manchester, and stained using Dickson's method in order to distinguish between dolomite, ferroan and non-ferroan calcite (Dickson 1965). Each section was examined systematically to produce a semi-quantitative list of the inclusion types present and any other distinguishing characteristics. The sections have been added to the AVAC Reference Collection with the codes V2302 to V2332, V2350 and V2358 to V2370 (Table 1).

The chemical analyses were undertaken using Inductively-Coupled Plasma Spectroscopy at the Department of Geology, Royal Holloway College, London. A range of major, minor and trace elements were measured. The major elements were measured as percent oxide weights (Table 8) and the remainder as parts per million (Table 9). The frequency of silica in the samples was estimated, by subtracting the total major element count from 100%. The data were then normalised to Al<sub>2</sub>O<sub>3</sub> to minimise the effect of quartz tempering, which would otherwise dilute most element counts, except for those which are present as a result of tempering such as Calcium (CaO) and potentially Phosphorus (P<sub>2</sub>O<sub>5</sub>).

### Gravel Tempered ware

Ten samples of gravel-tempered ware were analysed of which 5 were thin sectioned and all chemically analysed. They include six of late Saxon type, from vessels with thickened necks

and tall everted rims (DR17, DR18, DR44, DR80, DR84 and DR87), and four of Saxo-Norman type: two from spouted pitchers (DR38, DR39) and two from spouted bowls (DR23 and DR73).

The following inclusions were noted in the Late Saxon type samples:

- *Calcareous algae*. Abundant fragments up to 2.0mm across. These fragments show that the algae formed domed layers and mostly show no evidence for the substrate on which they grew. In one case, however, a large rounded fragment is present with an angular flint fragment at its core. Some fragments had an organic content at the time of firing and are surrounded by a carbon-rich halo whereas others have no halo. Where the fragments have been sectioned at right angles to the direction of growth they contain numerous round voids which would have housed the algae themselves.
- *Rounded opaque grains*. Moderately common grains, often with a well-rounded, ovoid cross-section, ranging from c.0.1mm to 0.5mm across. Some have a dark red halo or are slightly translucent and dark red throughout.
- *Mudstone*. A single large rounded grain (in V2317) appears to be a dense mudstone with a high organic content but it is possible that some of the rounded opaque grains described above are smaller fragments of the same kind.
- *Slug Pellets*. Sparse oval grains of sparry non-ferroan calcite c.1.0mm long. These are interpreted as the internal skeletons of slugs.
- *Phosphate*. Sparse brown-stained fragments up to 0.5mm long, interpreted as fish or amphibian bone.
- *Angular colourless flint*. Sparse fragments up to 1.0mm long.
- *Subangular brown-stained flint*. Sparse fragments up to 1.0mm long.
- *Rounded chalk*. Sparse rounded fragments of non-ferroan micrite with abundant spherical microfossils. In one section (V2316) the fragments contain a wider range of microfossils and are composed of ferroan calcite.
- *Freshwater and/or land mollusca*. Sparse, thin-walled non-ferroan calcite shell. These include bivalve shell up to 1.0mm long and c.0.1mm thick.
- *Rounded and subangular quartz*. Sparse monocrystalline grains up to 0.5mm across.
- *Organic inclusions*. Sparse, long thin organic inclusions, perhaps roots or leaves, were present. In one case a single sinuous fragment was probably over 4.0mm long.

The groundmass consists of optically anisotropic dark brown baked clay minerals and abundant angular quartz grains which vary in texture and size from section to section, ranging up to c.0.05mm across in some cases and up to 0.2mm across in others.

The three thin sections suggest that the ware was produced from a silty to fine-sandy clay, mixed with a detrital gravel originating in a chalk stream. Calcareous blue-green algae live in clean, flowing water containing dissolved calcium and can be found, for example, around spring heads (giving rise to so-called 'tufa' deposits). The remaining gravel inclusions are chalk, flint, Tertiary flint and rounded quartz and are consistent with a Hampshire source but not diagnostic of any particular deposits. The rounded opaque grains, from their size range, were probably present in the clay rather than the gravel.

The two thin sections of gravel-tempered ware from Saxo-Norman vessels have a very similar range of inclusions. The only difference being that both sections contain single fragments of lower Cretaceous chert, probably not a significant point. The groundmass of the two vessels varies, however. One of the samples has a variegated, silt-free matrix, containing abundant rounded opaque grains (V2322) whilst the other is similar to the finer examples of the late Saxon type. The untempered groundmass of V2322 is very similar to that of Iron Age flint-tempered pottery from various sites in Hampshire for which a Winchester area clay-with-flints origin has been proposed (Vince 2003).

In summary, therefore, the thin section analysis suggests that there may be three distinct fabrics present in the gravel-tempered wares: one with a very fine groundmass, one with a fine sandy groundmass and the remainder with a silty groundmass. The second of these groups is also distinguished by the presence of rounded fragments of ferroan calcite micrite, interpreted here as a chalk. However, there is no correlation between these three sub-fabrics and the chronological division.

The chemical analyses indicate that the fine sandy fabric has a silica content of 72.2% compared with 60.5-67.3% for the silty fabric and 60.5% for the fine groundmass. Extrapolating from the sectioned samples to the others, it is possible that four of the ten samples have the fine sandy groundmass, two have the fine groundmass and four have the silty groundmass. There is no correlation with supposed date (Table 8).

**Table 8**

Date	COAR	FINE	SILTY	Grand Total
LS	3	1	2	6
SN	1	1	2	4
Grand Total	4	2	4	10

Although no strong correlation was noted between the frequency of the various measured elements and either date or groundmass type, it was observed that Titanium (TiO) was

highest in the sample with the coarse groundmass whilst the sample with a fine groundmass had a lower Zircon (Zr) and Titanium content than remaining samples (Fig 1).

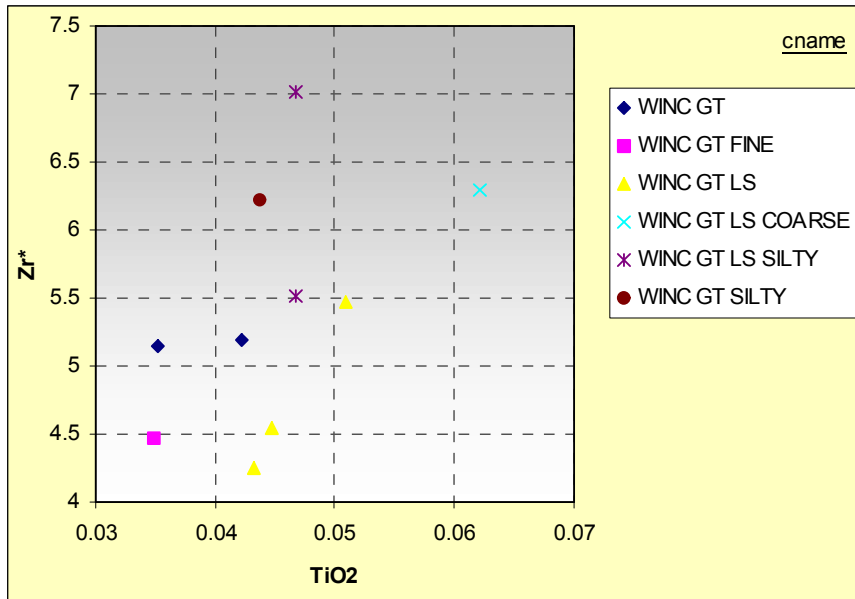


Figure 1

### Newbury A ware

Five samples of Newbury A ware were examined (four in thin section and all by chemical analysis). All come from vessels with typologically distinct forms, including a spouted bowl or frying pan and four everted rimmed jars. In thin section, however, the spouted bowl or frying pan fabric was seen to be identical to the gravel-tempered ware with the fine textured groundmass whilst the others have a distinct fabric.

The thin sections revealed the following inclusion types:

- *Rounded opaque grains.* Abundant grains, often with a well-rounded, ovoid cross-section, ranging from c.0.1mm to 0.5mm across. Identical to those in the gravel-tempered ware.
- *Angular colourless flint.* Abundant fragments up to 1.0mm long.
- *Subangular brown-stained flint.* Abundant fragments up to 1.0mm long.
- *Rounded and subangular quartz.* Sparse monocrystalline grains up to 0.5mm across.
- *Calcareous algae.* Sparse rounded grains up to 0.5mm, otherwise similar to those in the Gravel-tempered ware.

The groundmass consists of optically anisotropic dark brown baked clay minerals with few quartz inclusions.

The fabric therefore contains very few calcareous inclusions, and those that are present are smaller and more rounded than in the gravel-tempered ware. The groundmass, however is identical to that of sample V2322 and all contain the abundant rounded opaque grains found in all the gravel-tempered ware sections.

The chemical analyses show no strong differences in composition, either within the group or between the group and the gravel-tempered wares (except for a lower CaO content, which might be expected). In a factor analysis the samples are very similar to the gravel-tempered wares.

The thin-section analysis suggests that the 'Newbury A' vessels have a different temper to the gravel-tempered ware but were made from similar clay, characterised by abundant rounded opaque grains. No chemical analyses of the Berkshire and Northern Hampshire vessels of this ware have been made but at present it seems more likely that the ware was produced in the Winchester area but by potters following a northern tradition.

### **Late Saxon Wheelthrown ware**

Three samples of the Late Saxon Wheelthrown ware were examined, all by both thin section and chemical analysis. The following inclusion types were noted:

- *Subangular and rounded quartz.* Abundant grains up to 0.5mm across. Mostly monocrystalline and unstrained but includes strained polycrystalline grains with sutured boundaries of metamorphic origin.
- *Angular unstained flint.* Moderate grains up to 0.5mm across.
- *Rounded chert.* Sparse grains of well-rounded chert or altered rhyolite up to 0.5mm across.
- *Rounded opaque grains.* Moderated grains up to 1.0mm across, mostly opaque but some with a dark red halo and some dark red throughout.

The groundmass consists of optically anisotropic baked clay minerals with little or no quartz inclusions. The clay matrix appears lighter than in the gravel-tempered and Newbury A ware samples but this is probably due to the complete combustion of organic matter in the clay.

The chemical analyses of the three samples shows a similar composition to the gravel-tempered and Newbury A ware samples. The only obvious differences are in the calcium content and those elements which are associated with calcium. Otherwise, the main differences are in the Potassium and Magnesium contents, both of which are lower than the

majority of the other wares (Fig 2). There is a correlation of both of these elements with CaO in the gravel-tempered and Newbury A wares and it is possible that this is the explanation for the lower quantities in this ware. Even so, as Fig 2 indicates, the differences are slight.

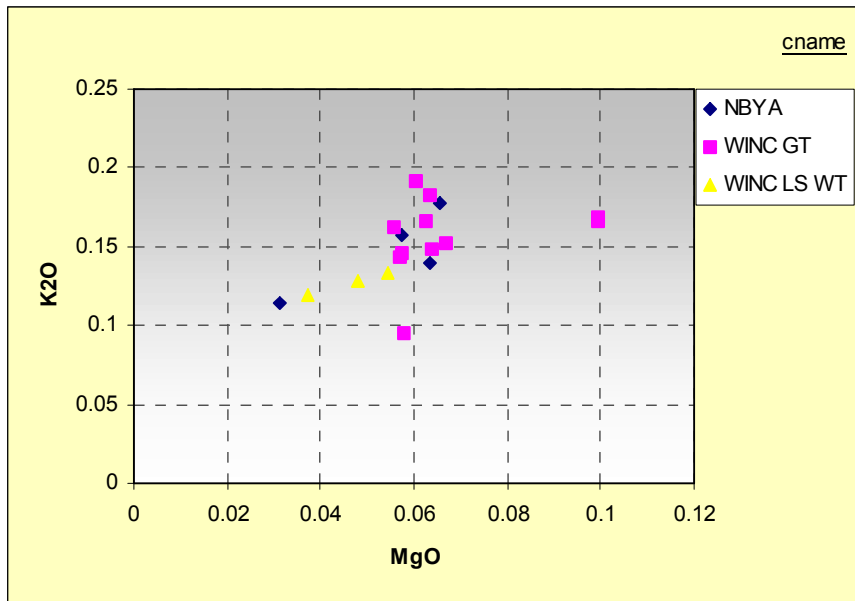


Figure 2

### South Hampshire Redware

Ten samples of South Hampshire Redware were studied, six in thin section and all by chemical analysis. In thin section three distinct fabric groups were identified: F – a unimodal sand with a quartz-free groundmass (three sections), M - a bimodal sand containing moderate muscovite laths (two sections) and G – a glauconitic sand (one section).

#### Subfabric F

The three thin-sectioned samples were from a jar (DR24, V2329) and two jugs (DR70 and DR90, V2309 and V2311 respectively). The following inclusion types were noted:

- *Rounded quartz.* Subangular and rounded quartz grains up to 0.5mm across. Most are monocrystalline and unstrained but a small proportion are strained, and some of these are polycrystalline with sutured grain boundaries.
- *Rounded chert.* Grains up to 0.5mm across. The texture is coarser than that of flint and is not chalcedonic, unlike lower Cretaceous chert.
- *Rounded opaque grains.* Ill-sorted grains ranging up to 1.0mm across. Some have a brown/dark red halo



The groundmass consists of inclusionless optically anisotropic baked clay minerals with a light colour. Lenses and pellets of untempered clay, of identical colour to the groundmass and containing some rounded opaque grains, are present, indicating poor mixture of the sand. This strongly suggest that the parent clay contained no quartz sand but may have included most of the opaque inclusions.

#### Subfabric M

The two thin sectioned samples were from a dripping dish (DR36, V2308) and a jar (DR71, V2328). The following inclusion types were noted:

- *Rounded quartz and Rounded chert.* As in Subfabric F
- *Organic inclusions.* Sparse voids up to 1.0mm long with a carbon-rich halo.

The groundmass consists of optically anisotropic baked clay minerals, abundant angular quartz grains up to 0.1mm across, moderate glauconite grains up to 0.2mm across and moderate muscovite laths up to 0.1mm long.

#### Subfabric G

The following inclusion types were noted:

- *Rounded quartz.* Abundant grains up to 1.0mm across. Less well-sorted than in subfabrics F and M but otherwise similar.
- *Glauconite and altered glauconite.* Moderate to abundant grains, mostly altered to a dark brown colour but including some fresh green grains, up to 0.5mm across but mostly smaller.
- *Glauconitic mudstone.* A single large rounded fragment of red-firing mudstone, 2.0mm across, with numerous altered glauconite inclusions c.0.2mm across.

The groundmass consists of light-firing, optically anisotropic baked clay minerals with few quartz inclusions and abundant glauconite and altered glauconite inclusions.

The petrological evidence suggests that there are three distinct sources represented. Two of these are glauconitic but differ considerably in texture. The silty, micaceous clay (subfabric M) is probably Gault clay, which outcrops to the northeast of Winchester. The alteration of the glauconite to haematite is a feature of the Gault clay of the southeast of England. The light colour and lack of quartz inclusions suggest that the parent clay for subfabric F may be a Tertiary paleosol, examples of which occur in the Reading Beds, and in the Bagshot Beds of the Thames basin. The groundmass of subfabric F is similar to that found in the Gravel-tempered, Newbury A ware and Late Saxon Wheelthrown wares, and from its ubiquity

probably outcrops close to Winchester, in which case a Reading Beds origin, or clay-with-flints derived from the reworking of the Reading Beds is likely. The source of the parent clay for subfabric G is unknown although the presence of glauconite suggests a lower Cretaceous or Tertiary origin.

By re-examining the fabric of the un-sectioned samples it was possible to assign them to subfabric groups giving in total four subfabric F samples, five subfabric M samples and a single sample of subfabric G. A factor analysis of the data indicates three significant factors, accounting for 50% of the variation in the dataset. Fig 3 shows a plot of Factor 1 against Factor 2 and indicates that the subfabric G sample has a much high F1 score and that the subfabric M samples have higher F2 scores than the others. High F1 scores depend on strong weighting for Iron, Chromium, Potassium, and Magnesium and High F2 scores have high weightings for Cobalt, Lithium and Nickel. Factor 3 separates subfabric M from the others and relies on high weightings for Titanium, Copper and Sodium.

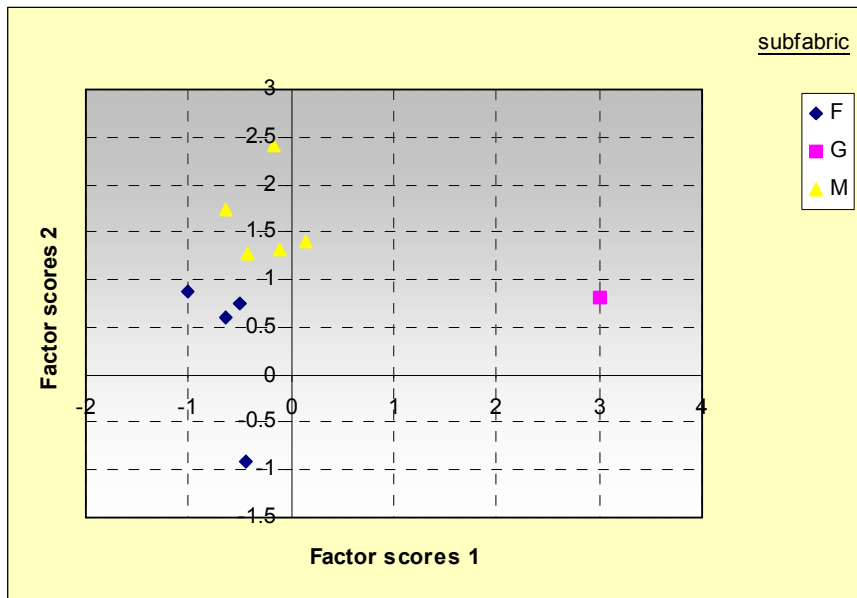


Figure 3

The factor analysis also shows that the three jug samples in subfabric F consistently plot closer together than they do to the jar sample, V2329.

### South Hampshire Whiteware

Three samples of South Hampshire Whiteware were studied, of which one was thin-sectioned (V2304).

The thin section revealed a similar range of inclusions to those found in the South Hampshire Redware (subfabric F). The groundmass was also similar to the redware matrix but with a lighter colour and streaks of red-firing clay

The chemical analyses indicate a similar composition to the redware (subfabric F) although the whiteware samples have lower F1 and F2 scores and higher F3 scores.

### **Newbury C /Oxford AG Ware**

Five samples of Newbury C/Oxford AG ware were sampled and all were thin-sectioned. Four were very similar to the South Hampshire Redware (subfabric F fabric) whilst the fifth sample, DR21 V2366, lacks the iron-rich inclusions in the groundmass, which contains sparse to moderate very fine quartz silt (Subfabric S). A single rounded mudstone fragment showing clear bedding distinguished by variations in the quartz silt was present. This fragment has a similar colour and texture to the groundmass and lacks quartz sand inclusions. It is also possible that the sand in subfabric S has a higher proportion of chert and metamorphic quartz than the remainder.

The chemical analyses indicate that the subfabric S sample has a slightly higher Titanium, Chromium, Strontium, Vanadium, Cerium, Ytterbium, and Zinc content, and a lower Manganese, Barium, Copper, Yttrium, Lanthanum, Neodymium, and Samarium content than the remaining Newbury C samples.

A factor analysis indicates that the samples (including subfabric S) have similar compositions to the South Hampshire Redware (subfabric F) samples.

As with the Newbury A Ware samples, the thin section and chemical analyses of the Newbury C wares either indicate that the vessels are made from very similar raw materials to those available in the Winchester area or that the samples come from locally-made vessels.

### **Laverstock Ware**

Two samples of Laverstock Ware were examined, one of which was thin-sectioned (DR14 V2302).

The following inclusions were noted:

- *Rounded and subangular quartz.* Abundant grains up to 0.5mm across. Most are unstrained, monocrystalline grains but strained grains are present, some of which are polycrystalline with sutured grain boundaries. Some grains have thin haematite coating.
- *Rounded chert.* Sparse grains up to 0.5mm across. The grains do not appear to be of lower Cretaceous chert or flint.
- *Rounded red clay pellets.* Sparse grains up to 0.5mm across. They have a dark red colour and contain moderate quartz grains c.0.1mm across.

The groundmass consists of light-coloured optically anisotropic baked clay minerals with moderate quartz silt up to 0.1mm across.

The chemical data show that the Laverstock ware samples have a higher Titanium and Zirconium and lower Manganese, Cobalt, Copper and Strontium content than the South Hampshire Whiteware samples.

Factor analysis of the South Hampshire Whiteware and Laverstock samples found three significant factors, accounting for 95% of the variation in the dataset. Of these, only one, F2, distinguished the Laverstock from the South Hampshire Redware samples.

### **Crucible Fabric**

A single sample of a crucible was examined (DR103, V2350).

The thin section revealed a similar quartzose sand to those seen in the South Hampshire Whiteware and Laverstock samples and an inclusionless light-coloured groundmass similar to that of the Laverstock thin section.

A factor analysis of the chemical data for this sample, together with that from the Laverstock and South Hampshire Whiteware samples indicates that the composition of the crucible fabric is similar to that of the South Hampshire Whiteware.

The thin section and chemical data therefore come to different conclusions about the raw materials used to make the crucible but agree that it is likely to have been made from a white-firing Tertiary paleosol, probably obtained from an outcrop of the Reading Beds and tempered with a quartzose sand similar to those found in other sand-tempered wares from Winchester.

### **Winchester Ware**

Six samples of Winchester ware were examined, both using thin section and chemical analysis. The thin section analysis reveals very few inclusions over 0.1mm across:

- *Rounded quartz.* Rare monocrystalline, unstrained grains up to 0.3mm
- *Rounded clay pellets.* Rare grains, some with a partial brown stain, some with a lighter colour than the groundmass. Otherwise similar in colour and texture to the groundmass.

The groundmass consists of light-coloured or light brown, optically anisotropic baked clay minerals with abundant angular quartz grains, and some probable feldspar laths, up to 0.1mm long. Sparse to moderate subangular opaque grains up to 0.1mm and rare muscovite and altered biotite laths of similar size are present.

The fabric, therefore, has a completely different texture to that of either South Hampshire Whiteware or Laverstock ware. Instead it is more similar to the fine whiteware clays used at Stamford, at various localities in France, the Surrey/Hampshire border and the various Ball Clays (such as those found in Isle of Wight, in Dorset and Devon). Such clays all have a very similar mineralogical composition in thin section, although there are differences in texture and in the quantity and type of micas present. In the case of Winchester ware, however, there is no difference in thin section between these sections and those of Stamford ware, Tudor Green ware, and Border ware although the samples tend to have a browner colour.

The chemical analyses show that the Winchester ware samples have a very different composition to that of any of the other Winchester samples, including the crucible and the Laverstock samples, which have a similar mineralogical composition.

Factor analysis was carried out on a dataset consisting of Winchester ware, various wares produced in the lower Seine valley (La Londe ware, early Rouen glazed ware, Rouen ware), and various wares from Farnborough Hill (Tudor Green and Border wares). It also included samples of unglazed Michelmersh ware. This factor analysis, which omitted both calcite and phosphate-related elements and all the rare earth elements, found a clear separation between the Farnborough and Michelmersh samples and the rest. Within the residual group, the Winchester ware samples form a discrete cluster, but with very similar scores to those of the lower Seine valley samples (Fig 4). In Fig 4, a plot of the two principal factors shows that the Winchester ware samples are close in composition to a sample from the Carolingian kiln site at La Londe, although the remainder of the La Londe and Rouen samples have lower F1 scores.

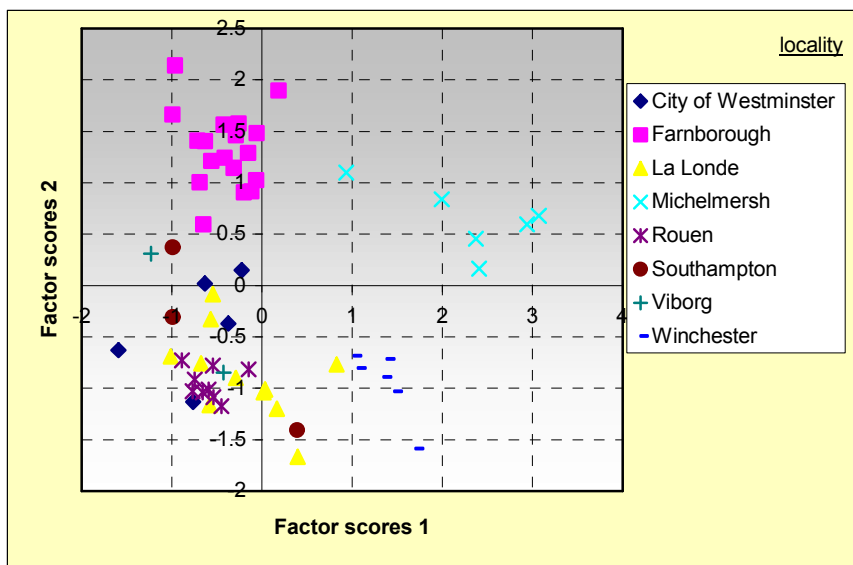
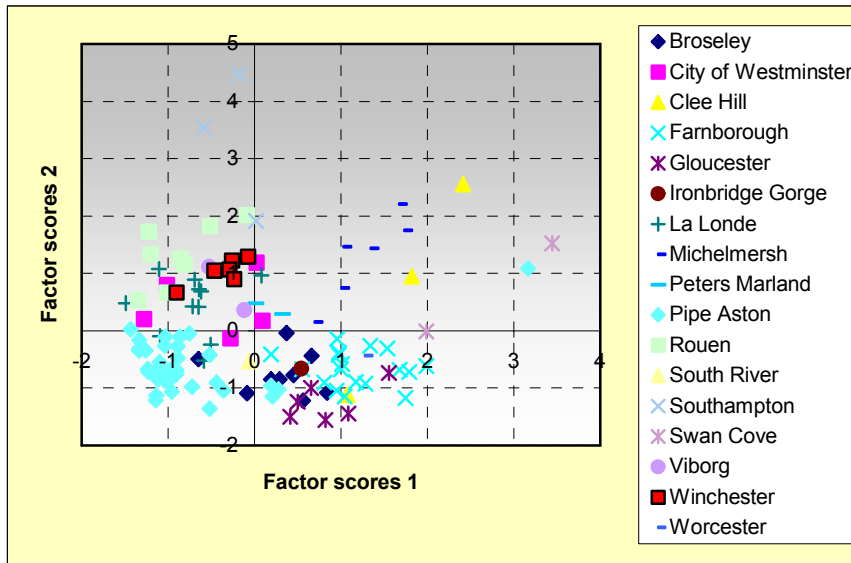


Figure 4

A second analysis, which included a wider range of pipeclay samples, indicates that the Winchester ware samples are more similar to those from the Seine valley than they are to samples of Devon Ball Clay or to pipes made from Coal Measure whiteware clays.



*Figure 5*

The Lower Seine wares were produced from deposits of Tertiary white-firing clays reworked during the Quaternary period (i.e. probably Seine valley alluvial clays). The factors which distinguish Winchester ware from the Michelmersh and Farnborough Hill fabrics are lower Titanium, Chromium and Zirconium whilst they are distinguished from the Lower Seine valley wares through their Nickel, Vanadium, Scandium and Iron contents. Whilst neither the thin section nor the chemical data can pinpoint the source of the ware, both indicate a different composition from locally-made whitewares from southeast Wiltshire, South Hampshire and northeast Hampshire/Surrey. A factor analysis which includes just these elements shows that Winchester ware can be distinguished from all other analysed whitewares and pipeclays (Fig 6). No examples of Isle of Wight or Dorset Ball Clays were analysed, nor have any of the New Forest white-firing clays been included (for example, those used at Verwood in the late and post-medieval period, or in the New Forest colour-coat industry in the Roman period). We cannot therefore rule out a Hampshire origin for the ware.

### **Michelmersh Ware**

Six samples of Michelmersh ware from a late 10<sup>th</sup>-century production site excavated by Wessex Archaeology were analysed, by thin section and chemical analysis. Three of these were thin-sectioned and the following inclusion types noted:

- *Rounded and subangular quartz.* Abundant grains up to 0.5mm across. Most are monocrystalline and unstrained but a minority are strained, and some of these are polycrystalline with sutured grain boundaries.
- *Rounded opaques.* Sparse rounded grains up to 0.5mm across, but mainly up to 0.2mm across.
- *Rounded chert.* Sparse grains, too coarse-textured for flint and without the chalcedonic texture of lower Cretaceous chert.

All three sections have a groundmass of optically anisotropic baked clay minerals with few visible inclusions but in two cases the clay has a light brown colour whilst in the third it is lighter in colour.

The sand temper seen in these Michelmersh samples is very similar to that found in the sandy Winchester samples but the quantity of iron-rich, opaque and near-opaque inclusions is much lower. The Michelmersh pottery is located on or close to the outcrop of the Reading Beds and this is almost certainly the source of the clay, some of which is light-firing whilst some has a noticeably higher iron content.

As demonstrated in the study of Winchester ware, above, there is a distinct chemical difference between the Michelmersh and Winchester ware samples and a similar difference can be seen between the other Winchester samples and those from Michelmersh. It is therefore unlikely that any of the sampled sherds from Staple Gardens come from Michelmersh.

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