

EXCAVATIONS ON THE SITE OF THE FLEET PRISON AT LUDGATE WEST, 14 FARRINGDON STREET IN THE CITY OF LONDON, EC4

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INTRODUCTION

This online supplement has been published in support of an article in *LAMAS Transactions* Volume 74 (2023), 179–256 (Haslam 2024). These reports were completed in 2011 and have not been revised, therefore they use the 2007 version of the Museum of London codes of ceramics and building materials. Complete lists of a revised version of these codes, their expansions and date ranges are available online.¹ Context numbers are denoted by square brackets: [1].

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THE ROMAN POTTERY

James Gerrard

The excavations at 14 Farringdon Street (hereafter 'Caroone House' or 'the site') produced 413 sherds (8.936kg) of Roman pottery of 1st- to late 4th-century date. Much of this material was heavily abraded and displayed signs of being rolled in a riverine environment and less than half of the sherds were from stratified Roman deposits. Where relevant to the site phasing the pottery has been discussed in the appropriate sections (above). For these reasons no detailed report on the pottery is presented here, although a full listing and quantification of the fabrics present by context can be found in the archive (Lyne 2006). One noteworthy aspect of the assemblage is the presence of very late Roman fabric, such as Portchester D ware, so-called calcite gritted wares and Mayen ware, which was imported from Germany. All of this material was residual but points to activity in the period after AD 350.

The only sherd of intrinsic interest was a fragment from a La Graufesenque Samian Dr. 33 drinking vessel from Trench 28, context [2407]. It had been inscribed in good capitals post-firing with a partially surviving graffito reading FRON[...]. Dr Mark Hassall has suggested that the most likely expansion should be FRONTINVS or FRONTINI meaning 'the property of Frontinus'. Frontinus was a common personal name in the Roman period (Tomlin & Hassall 2007, 359).

THE POST ROMAN POTTERY

Chris Jarrett

Introduction

The site produced a total of 2809 sherds of post-Roman pottery dating mostly to between the 11th and 18th centuries. The pottery types present are coded according to that of the Museum of London Archaeology (MOLA) and are shown in Tables 2 and 3 with their quantification by sherd count. Other methods of quantification were used where appropriate, for example minimum number of vessels, weight and estimated vessel equivalents (EVEs), the latter calculated from the percentage of the surviving rims. The pottery was derived from contexts associated with properties that were mostly extramural to the Fleet Prison, the exception being a large assemblage discussed separately and recovered from a masonry drain, probably associated with the tap room of a drinking establishment. The pottery is discussed by phase; illustrations of selected forms referred to below (Figs 34, 35) are included in the published report.

Phase 3: Saxo-Norman (850–1150)

A total of 42 sherds of pottery were recovered from this phase and early medieval shelly ware (EMSH) as 14 sherds and Early Surrey ware (ESUR) as nine sherds are the most frequent types of pottery and are both dated c.1050–1150. Smaller amounts of other types of pottery from a Thames Valley source (Vince & Jenner 1991) occur as mostly single sherds (see Table 4) and all of these coarsewares are in the form of jar-shaped vessels, some used as cooking pots. There are a small number of glazed jug sherds in coarse London-type ware (LCOAR), dated c.1080–1200 and Stamford-type ware (STAM), c.1050–1150, which also produced a carinated lid rim. Three sherds of imported pottery are present (7.2%) and occur as Rhenish greyware (RHGR) and red

Table 4. Distribution of medieval pottery types in phases 3–12 by sherd count and ordered by date

Code	Expansion	Date range	Phase										Total
			3	4	5	6	7	8	9	10	11	12	
RHGR	Rhenish Tiel-type greyware	900–1100	1										1
REDP	red-painted ware	900–1200	2										2
EMFL	early medieval flint-tempered ware	970–1100		34	1								35
EMS	early medieval sandy ware	970–1100	1	26	6					1			34
EMSS	early medieval sand- and shell-tempered ware	1000–1150	14	4	13								31
EMGR	early medieval grog-tempered ware	1050–1100	3	1	1								5
EMCH	early medieval chalk-tempered ware	1050–1150	1	22	2								25
EMIS	early medieval Surrey iron-rich sandy ware	1050–1150	1										1
EMSH	early medieval shell-tempered ware	1050–1150	1	7									8
ESUR	early Surrey ware	1050–1150	9	5									14
LOGR	London-area greyware	1050–1150		10	1								11
STAM	Stamford-type ware	1050–1150	3										3
ESHER	early south Hertfordshire-type coarseware	1050–1200				4							4
LCOAR	coarse London-type ware	1080–1200	5	9	10	2							26
LOND	London-type ware	1080–1350+		14	98	42	4	7	3	1		1	170
SSW	shelly-sandy ware	1140–1220	1	9	1			1					11
SHER	south Hertfordshire-type greyware	1170–1350		3	35	13	6	1		1			59
EARL	Earlswood-type ware	1200–1400			5								5
KING	Kingston-type ware	1240–1400			69	12	9	5	1	3	1		100
SAIN	Saintonge ware	1250–1650			4		1	132	1	7			6
SPGR	Spanish green-glazed ware	1250–1650				1							1
CBW	coarse Surrey-Hampshire border ware	1270–1350			4	126	83	3	4	6	2	1	229
MG	Mill Green ware	1270–1350			14	7	6	1	1	1			30
SIEG	Siegburg stoneware	1300–1630					2	1					3
DUTR	Dutch red earthenware (includes slip and slip decorated wares)	1300–1650			1	1	2	8	3	1			16
LMHG	late medieval Hertfordshire glazed ware	1340–1450				32	2						34
CHEA	Cheam whiteware	1350–1500				18	23	2		2			45
TUDG	‘Tudor green’ ware	1350–1500					5			1			6
LLON	late London-type ware	1400–1500				8	5						13
LLSL	late London-type slipware	1400–1500				8	1	1					10
MPUR	Midlands purple ware	1400–1700					1	132	4	7			144
MORAN	Midlands orange ware	1400–1820						7					7
LARA	Langerwehe stoneware	1450–1500				1	1						2
Total			42	144	265	275	151	301	17	31	3	2	1091

Table 5. Distribution of post-medieval pottery types in phases 4–12 by sherd count and ordered by date

Code	Expansion	Date range	Phase									Total
			4	5	6	7	8	9	10	11	12	
ANDAL	Andalusian tin-glazed ware	1480–1550				1						1
CHEAR	Cheam redware	1480–1550				1						1
EBORD	early Surrey-Hampshire border whiteware	1480–1550				2						2
PMRE	London-area early post-medieval redware	1480–1600				45	8	1	1			55
PMREC	London-area early post-medieval calcareous redware	1480–1600					1					1
PMSL	London-area post-medieval slip-decorated redware	1480–1600				3						3
RAER	Raeren stoneware	1480–1610				4					1	5

Table 5. (contd)

MART	Martincamp-type ware	1480–1650			1	1				2	
PMSR	London-area post-medieval slipped redware	1480–1650	1	30	18		2			50	
PMCR	post-medieval crucible	1480–1900			1		8			9	
KOLS	Cologne stoneware	1500–1580			1					1	
KOLFREC	Cologne or Frechen stoneware	1550–1580			1					1	
BORD	Surrey-Hampshire border whiteware	1550–1700		14	607	7	11		7	646	
FREC	Frechen stoneware	1550–1700		4	115	1	18		7	145	
MY	Midlands yellow ware	1550–1700			4					4	
RBOR	Surrey-Hampshire border redware	1550–1900			97		2	2	18	119	
TGW	English tin-glazed ware	1570–1846	1		159	2	10	3	3	178	
WERR	Werra slipware	1580–1650			2					2	
PMBL	post-medieval Essex black-glazed redware	1580–1700			90		1		1	92	
PMFR	post-medieval fine redware	1580–1700		1	20	2	6			50	
CHPO	Chinese porcelain	1580–1900					9		6	15	
PMR	London-area post-medieval redware	1580–1900	1	3	163	4	13	1	5	190	
METS	Metropolitan slipware	1630–1700			20					20	
LONS	London stoneware	1670–1900					3			3	
SWSL	dipped white salt-glazed stoneware	1710–1760							1	1	
SWSG	white salt-glazed stoneware	1720–1780					5		11	16	
CREA	Creamware	1740–1830			3	0	28	1	6	38	
ENPO	English porcelain	1745–1900						2	5	7	
PEAR	Pearlware	1780–1840						1	1	3	
TPW	transfer-printed refined whiteware	1780–1900							1	1	
REFW	plain refined white earthenware	1805–1900					1			1	
XX	Unidentified		3	1	2	1				7	
Total			3	4	110	1312	36	118	10	73	1069

painted wares (REDP), all probably in the form of pitchers. Pottery in this phase was recovered from dump layers in the southern area of the excavation.

Phase 4: Medieval (1150–1250)

The main types of pottery in this phase are of a Thames Valley source and early medieval flint-tempered ware (EMFL) as 23%, early medieval sandy ware (EMS) as 17.7% and early medieval chalky ware (EMCH) as 15% are the main types of ware by sherd count, but the EMFL and EMCH high sherd count results from one or two highly fragmented jars. The latter are the main form in the handmade early medieval coarse wares but also occur in the following wheel-thrown or finished fabrics: coarse London-type ware and its calcareous variant (LCOAR CALC), sandy shelly ware (SSW), dated 1140–1220 and South Hertfordshire type ware (SHER), dated 1170–1350. There is a single bowl present in early medieval shelly ware (EMSH). Wheel-thrown jug fragments are in London-type wares: LOND and LCOAR. One unidentified fabric occurred, possibly made from brickearth and was reduced with very abundant fine quartz and burnt out organic inclusions and its form consists of a vessel with a simple rim and thick bead and is thick-walled. Its surfaces had been wiped and there were white slip splashes on the rim and

green-glaze drips internally and externally (Fig 34.1). A single fragment from a possible kiln wall was also recovered with a glazed surface. It may possibly relate to the South Hertfordshire-type greyware wasters found previously in the Fleet Valley (Blackmore & Pearce 2010). The pottery in this phase occurred as 147 sherds and was recovered from layers in the northern and southern ends of the site.

Phase 5: Medieval (1250–1400)

The main source of the pottery in this phase is from London as 40.5% of the 269 sherds and particularly as London-type ware (Pearce *et al* 1985) in the form of jugs that include balustre types and the tulip-necked variant (LOND TUL), dated 1270–1350, and rounded types. Decoration on the jugs can be in the North French style (LOND NFR), dated 1180–1270, highly decorative (LOND HD) and white-slip decorated (LOND WSD) styles, both dated 1240–1350. Other forms include a possible pipkin and bottles (LOND BOT), the latter dated c.1270–1350. Surrey whitewares (Pearce & Vince 1988) are also a notable component of the pottery in this phase and are more so from Kingston (KING) as 24.7%, which was marketing its wares to the capital between 1240 and 1400. The repertoire of forms in KING includes open forms, jars and a cauldron, but is

mostly present as jugs that can be in the highly decorated style (KING HD), dated 1240–1300, or with pellet decoration (KING PELL), dated 1270–1350, but there is also a tulip-necked balustre jug (KING TUL) dated 1340–1400. A smaller amount of Surrey-Hampshire border coarse whiteware was also found as 1.5% and it was traded to London from c.1270, whilst there are also a small number of sherds in Surrey Earlswood-type ware. The South Hertfordshire greyware industries (as 13%) provide mostly jars or cooking forms. Mill Green ware (MG) jugs from Essex are dated 1270–1350 and present in a small quantity as 5.2%. Imported pottery only accounts for 1.9% and consists of Dutch redware and jugs in French Saintonge ware. The one unidentified sherd in this phase may possibly be an Early Saxon sand-tempered ware.

Phase 6: Late Medieval (1400–80)

The 275 sherds in this phase show a different ceramic profile compared to the previous one and is typical for the late medieval period as seen on other London excavations (Pearce & Vince 1988, 16, fig 9; Blackmore 1999). The Surrey-Hampshire border coarse whiteware fabric is now the main pottery type and accounts for 45.8% of the sherds and it is in a wide range of forms for the table, but it is mostly as jug forms. Innovations within this industry occur as cisterns (CBW CIST), plain conical (CBW CONP) and large rounded (CBW LGR) jugs and flat-topped rim cooking pots (CBW FT), all dated c.1340–1500. The other Surrey whitewares are from Kingston (4.4%) and the later industry of Cheam (CHEA), dated 1350–1500 and present as 6.5% in the form of jugs, including those of a drinking size.

London-type wares account for 15.3% and their later development Late London ware and its slipped variant (LLON and LLSL) occur as 5.8%. Pottery production evidence from Woolwich (Cotter 2008) suggests that this was the area producing local pottery for medieval and post-medieval London and it now seems likely that there was a lull in late 14th-century local pottery production rather than a hiatus. Other pottery types found in this phase are late medieval Hertfordshire glazed ware (LMHG) as 11.6% and in the form of a frying pan (Fig 34.2), cauldron and jug. Other pottery types, such as SHER and MG, were probably residual in this phase.

Imported pottery is small in number as three sherds (1.1%) and consists of single sherds of Spanish green-glazed ware (SPGR), Dutch slipware (DUTSL) as a jug sherd and Langerwehe/Raeren stoneware (LARA).

Phase 7: Early Post-Medieval (1480–1600)

Much of the pottery (261 sherds) in this phase was residual or at the end of its production period, such as the 31.8% of the CBW, or the 8.8% Cheam whiteware (notable for the presence of industrial vessels as an alembic and industrial base) and ‘Tudor Green’ ware 1.9% and they were being superseded by new whiteware fabrics: Early Border ware, present in this phase as 0.8%. At the end of the 15th century the local coarse redware (PMRE) industry developed and flourished and is found

here as 17.2% of the material, while its slipped variant (PMSR) which can be green or clear/yellow glazed are 11.5% in total. These redwares are in the form of heavy duty bowls and dishes and other kitchenwares, besides jugs. Late 16th-century ceramic developments are also seen in this phase as Surrey-Hampshire border whitewares (BORD), dated 1550–1700 and the better fired and glazed local redware (PMR) dated from 1580. A very interesting non-local sandy redware bowl or dish sherd survives as a base, but it has unusual internal decoration of a reverse slip pattern where leaves (opposite in form with dentate edges, perhaps of an ash or rose species), were impressed into the clay and then the interior was white-slipped and the leaves carefully peeled off before a clear/yellow glaze was added (Fig 34.3). It equates to the local PMSRY pottery type and came from a demolition layer [3520] dated to the late 16th century. A similar vessel has been recovered from South Bridge House, Southwark, on the site of the Rose Theatre (site code SBH88) and a similar vessel, but found in a 14th-century dated context, on an excavation at Maidens Tye, High Easter, in Essex is believed to be of a Cambridgeshire source (Whittingham 2009; Sellers *et al* 1998). Imported wares increased to 5.8% in this phase and are largely as Rhenish stonewares (4.2%) from Siegburg (SIEG), Langerwehe (LANG), Raeren (RAER), Cologne (KOLS) and Frechen (FREC) and are as drinking forms. Additionally there are single sherds of a French Saintonge jug and a Spanish late Andalusian tin-glazed ware jar/albarello.

Phase 8: Early to Mid-17th Century (1600–66)

In this phase, of the 1613 sherds of pottery recovered the Surrey-Hampshire border whiteware (BORD) is the main type as 39.9% and is brown, green and olive glazed (BORDB, BORDG and BORDO), but the clear or yellow glazed ware (BORDY) is more frequent as 24.8%. The redware from this source (RBOR, RBORB and RBORG) only accounts for 6.4%. These wares provided a wide range of forms, but mostly either as kitchen, table or sanitary wares. The second main source of pottery is as the coarse local sandy redware (PMR) and includes slipped versions (PMSR, PMSRG and PMSRY) and together these wares account for 12.5%. The forms are largely heavy duty wares for the kitchen, such as the early 17th-century dated PMR skillet (Fig 34.4) or for serving food. Of note is the unusual occurrence of a mortar surviving as a base sherd with grits pressed into the internal surface, but it is in the 16th-century fabric PMRE and was probably residual at this time. The fine redwares from Essex are as 11.2% and consists of post-medieval black, clear and brown-glazed wares (PMBL, PMFR and PMFRB) and Metropolitan slipware (METS) and forms are largely associated with drinking functions, but kitchen and table wares occur to a lesser extent. The local delftware (TGW) account for 11.2% and are as forms mainly for the table, or hygiene related. Imported pottery accounts for 8.5% of the sherds in this phase, of which 7.9% comes from Germany and mostly as Frechen stoneware jugs and particularly as bartmanns, but there are also two dishes in Werra slipware and one has the central decoration of The

Temptation, depicting Adam and Eve, the serpent and the tree of knowledge. Low Countries wares (0.5%) are mostly as Dutch redware (DUTR), identified in the form of jugs, but there is a closed form in the slip-decorated ware (DUTSD), while a single sherd of a French Martincamp red earthenware (MART3) flask also occurs. Non-Local wares are also relatively well represented as 9.4% in this phase and are predominantly as Midlands orange or purple ware (MORAN and MPUR) in the form of butter pots, found in London from c.1580. None of these butter pots are marked and have rim diameter range of between 140–200mm and therefore indicate that they date to before an Act of 1662 when it was the law for makers' marks to denote an official capacity size and this was practiced until 1692 when the act was repealed and superseded by other legislation where the butter had to be marked (Egan 1992, 97–8).

Much of the pottery in this phase was recovered from the masonry drain [3105] located in Area B (within the precinct of the prison) and is discussed separately below, but other interesting groups of ceramics were found in the backfilled cellars of Buildings 7 and 8. Notable in fill [1230], deposited in the early 17th-century were three PMR chafing dishes (Fig 35.5), a BORDY carinated colander (Fig 35.6) and skillets in PMFR (Fig 35.7) and the only industrial vessel in this phase occurs here as a crucible sherd (PMCR). The exceptionally large number of butter pot fragments in MORAN (Fig 35.8) and MPUR also came from the fills of the cellars but were difficult to quantify by MNV's (an EVE value of 8.71 was recorded from 42 sherds in backfill [1221], the largest quantity found in one context). Ralph Treswell's 1612 survey of this area of London shows the properties here to be shops, so it may be that the butter pots came from a retail outlet selling dairy produce, and that once emptied these shouldered jars were stored or thrown away *en masse*. However, butter pots would have made useful containers for water or other commodities, once their original use had ceased.

Phase 9: Mid–Late 17th Century (1666–1700)

A small amount of pottery is assigned to this phase as 53 sherds and was fragmentary and had a similar ceramic profile to the previous phase with Surrey-Hampshire border wares most frequent (31.4%), followed by local wares (PMR and TGW). The small amount of pottery may be related to the aftermath of the Great Fire and the subsequent temporary abandonment of the area. The pottery showed no evidence for being burnt in high temperatures. Pottery was recovered from layers, the backfills of construction cuts and the final fill of the masonry drain [3105].

Phase 10: Early to Late 18th century (1700–80)

The main source of the pottery recovered from this phase noticeably changed when compared with the previous one, as 28.2% of the assemblage, (which comprised a total of 142 sherds) was derived from the Midlands. The most frequent the form of table wares

present in this phase were Creamwares, particularly the developed type (CREA DEV), c.1760–1830. There are also smaller amounts of white stoneware (SWSG) as tablewares and of a probable Midlands source. Local wares account for 20.4% of the pottery and this is as the redware (PMR) as 9.2%, delftware (7.7%); in a wide range of forms and London stoneware (LONS) as drinking forms is as 2.1%. The high count of Surrey-Hampshire border whitewares as CBW and BORD would have been residual by the 18th century, whilst the 19.7% of imported wares also include a notable quantity of residual pottery types, but 18th-century Chinese porcelains are present as 6.3%. The only industrial vessel was another crucible (PMCR) (Fig 35.9), but in a highly micaceous fabric found in a layer of dumped industrial waste in Trench 13. Pottery was mostly derived from dump layers, but did include the backfill of a culvert and a drain.

Phase 11: Late 18th–Early 19th Century (1780–1840)

Of the 14 sherds of pottery recovered in this phase Creamware, Pearl wares (PEAR) and English hard paste porcelain (ENPO HP) were notable as tablewares, as well as a tall rounded jar in RBOR and a TGW plate decorated with blue lines on white.

Phase 12: Modern (1840+)

The majority of the 75 sherds of pottery in this phase appeared to date to the 18th century or earlier and few sherds appeared to be contemporary, such as a sherd of black transfer-printed ware (TPW3), besides the porcelains, either of English or Chinese origin. The pottery was largely derived from dump layers.

Conclusions

Pottery from the site indicates that there was relatively limited activity on site prior the construction of the Fleet Prison. When this prison was constructed is not documented, but its existence is first recorded in 1130 (discussed earlier). However, relatively little of the ceramic assemblage comes from this establishment as most of it relates to adjacent activity. The post-Roman ceramic assemblage mirrors that of other nearby London sites (see below) and was largely domestic in nature with only a very small number of industrial vessels occurring from phase 7 the early post-medieval period, onwards and these vessels were mostly associated with non-ferrous, small scale metallurgical activity.

Sugar refining vessels were absent from this site, which is surprising as this industry was certainly active in the Fleet Valley by their occurrence on other excavations to the north and south of the site (Blackmore 1993). The 17th-century pottery does demonstrate activity within the prison: from a masonry drain probably associated with a drinking establishment and from shops outside the prison wall, and the cellar of Building 12 may indicate that dairy produce was being sold there or close by judging by the evidence of butterpots.

The Fleet Valley Project (VAL88) produced a very large quantity of pottery (Blackmore 1993) and the fieldwork in Zone E was carried out within the vicinity of the Fleet Prison. A single sherd of Saxon chaff-tempered ware was recovered from Zone E and with the possible sherd of Early Saxon sand-tempered ware from FAS02 indicates that there was a very low level of activity locally during this period. The medieval ceramic assemblage recovered from Zone E was similar to that from Carroone House, but contained a wider range of imported pottery (North French whiteware, Spanish lusterwares and a small Italian or Mediterranean albarelo) (Blackmore 1993). Unfortunately, no information is currently available on the post-medieval pottery recovered from Zone E.

THE CERAMIC AND STONE BUILDING MATERIALS

John Brown

A general discussion of all ceramic and stone fabrics and forms from the excavations at the Ludgate West site can be found in the archive assessment report produced by PCA (Brown 2007); while the different phases of the assemblage are summarised, discussion here is focussed upon those materials relating to the masonry features found on-site, and individual pieces worthy of note in themselves.

As to be expected on a central London site, evidence for the use of ceramic and stone for building was present from the Roman period onwards. However, few *in-situ* Roman features were found on-site, and while a significant amount of Roman material was recovered, much was residual and abraded in character. Better evidence for masonry features survived from the medieval and post-medieval periods, and can generally be associated with the various phases of the Fleet Prison, from the Saxo-Norman period to the late 18th century. A final group of material represents structures erected after the beginning of the 19th century, some of which are likely to post-date the demolition of the Prison.

The Roman Assemblage (Phase 2)

The Roman ceramic building material (CBM) analysed was largely characterised by abraded fragments of bricks and tiles from the local London fabric group 2815, and occasional examples of early Roman fabrics from Eccles in Kent (MoL fabrics not determined), and Radlett in Hertfordshire (MoL fabrics 3023 and 3060). Otherwise, two fragments of Roman brick from Hampshire (MoL fabric 3009), two from the North Kent/Weald (MoL fabric 3018), and one possible *tegula mammata* fragment in MoL fabric 3054 (thought to be from Sussex) represent the only variation in the examined assemblage. The fabric 3054 fragment had an unusually large *mammata*, with a hole, c.12mm in diameter, pierced through and off-centre. A scored/incised line of keying was noted on the reverse of the tile, and a faint signature mark on the top surface.

Discussion

The absence of later fabrics such as the silty 2453 groups indicate that there was sufficient reusable material to supply any buildings constructed in the vicinity during the 3rd century AD, or that they did not employ much use of ceramics in their construction. The recently published excavations, just to the north-east, of the Merrill Lynch Financial Centre, City of London (Lyon 2007), interpret the area as being on the periphery of the Roman settlement of Londinium during the 1st and 2nd centuries AD, to the south of the London–Silchester Road, which would explain the lack of built structures on-site. Lyon quotes observations by Norman and Reader in 1907–9 on the Merrill Lynch site, which noted evidence for brickearth quarrying and brick clamps in the form of scorched earth (Lyon 2007, 16). It is suggested by Lyon that these surfaces may have dated to the early 1st century AD. This is supported by the Roman assemblage at the present site, which contained a significantly high proportion of vitrified brick and tile waster fragments in the local 2815 fabric group. These wasters were generally spread out through the Roman deposits, arguing against any single deposition event, and they may indeed represent waste material from the nearby kiln site, used perhaps serendipitously as ground-raising material.

The Medieval Assemblage (Phases 4–6)

After some disastrous fires in the City of London during the reign of King Stephen (c.1135–6), and the latter half of the 12th century, it was stipulated that ceramic tiles or slates had to be used for roofing within the City of London. The first recorded legislation was passed by Henry FitzAilwin, the first Mayor of London, in the late 12th or early 13th century (Schofield 1993, 75f). The earliest roofing systems used thick, flanged tiles with overlapping curved tiles, similar to the Roman system, but these were soon superseded by simple rectangular tiles held in place by wooden pegs (and so known as peg tiles). Small fragments of pegged roof tile in locally produced fabrics almost exclusively represent the medieval assemblage, with only occasional examples of other forms such as floor tiles and brick. The assemblage can be characterised by a small amount of material dating to the 12th and 13th centuries, and material of 14th- to 16th-century date. The earlier group is typified by fragments of peg tile with coarse ‘moulding sand’ in local London fabrics (2271 and 2586), abraded fragments of lead-glazed ‘flanged’ roof tile, similar to the Roman *Tegula* form, in local coarse sandy MoL fabric 2273, and small numbers of local tile (MoL fabrics 2587 and 2537) that contain frequent inclusions of iron oxide. The peg tile included both glazed and unglazed examples.

Also prominent, particularly so in the medieval masonry features, were the three main building stones of the period, *ie* chalk, usually in the form of undressed lumps and used as core material, Reigate Stone from Surrey and Kentish Ragstone. The softer, more easily dressed Reigate was typically used as interior facing material and for moulded stonework, while the Kentish

Rag was used for foundations and core material, along with the chalk.

Pre-Fleet Prison Deposits 1150–1250 (Phase 4)

Tile dumps [1303] and [1804] contained both medieval roof tile in local fabrics, and significant amounts of residual Roman brick and tile, indicating that the local topography was being altered during the 12th or 13th century. No masonry features were ascribed to this phase, suggesting that the first (late 12th century) prison lay mainly to the east of the site. However, this dumping probably coincides with the construction of the first Fleet Prison in *c.*1080 (Schofield 1998, 285; discussed earlier).

The Fleet Prison 1250–1400 (Phase 5)

A number of masonry contexts have been assigned to the first phase of the Fleet Prison and are characterised by the use of chalk and Kentish Rag, with smaller quantities of Reigate Stone, fragments of locally produced medieval roof tile, and very occasionally reused Roman brick and tile fragments. In some instances, fragments of Kentish Rag were observed as having residual *opus signinum* type mortar in places and may have been reused from demolished or ruinous Roman structures. Five principal mortar types were noted during both the evaluation and excavation phases, but in reality the medieval mortars could probably be lumped into three groups – those with frequent lime lumps & iron oxide, those with charcoal

inclusions and those with horsehair and straw inclusions. With the exception of a pinkish sandy lime mortar (em01) which only seems to appear in the Fleet Prison Wall, the other mortar types appear to be in a number of associated contexts, suggesting they are contemporary.

Building 2: Rectilinear Stone Building

All of the foundations associated with this structure showed a similar construction technique, where a trench was dug, and the rubble and roughly squared blocks of chalk, Reigate stone and some Kentish ragstone ‘poured’ in with the mortar, rather than being set and laid in courses (Table 6). This technique is known in London from the beginning of the 12th century (Schofield 1995, 137) and would fit with the construction date of *c.*1230–61 for the rebuilding of the Fleet Prison walls by derived from dendrochronological dating from the Fleet Valley Project VAL88 (McCann 1993, 59). Also present were occasional fragments of residual Roman CBM, and medieval locally produced roof tile (MoL fabric 2271/2586 group). The presence of some post-medieval bricks (MoL fabrics 3032*near* 3033, 3032) has been explained as intrusive material by the excavator, but they are only present in the section of the structure thought to be on the line of the Fleet Prison perimeter wall, and could feasibly date to the 17th century, when the wall was rebuilt in brick following the Great Fire (McCann 1993, 183; Schofield 1998, 285).

Table 6. Building 2 construction and materials

Masonry contexts	Construction technique	Materials	Forms	Mortar types (cm = evaluation)
124, 1901, 1912, 2002, 2060, 2806, 3204, 3205, 3211, 3435, 1000	trench-built, uncoursed stone with ‘poured mortar technique’	primary: chalk secondary: Reigate stone (Surrey Greensand), Rag (Kent) inclusions: fragments of residual Roman brick, medieval roof tile and post-medieval brick fabrics 3032 <i>near</i> 3033, 3032	generally roughly squared or unfaced stone blocks; smaller amounts of roof tile fragments; unfrogged brick (no full dimensions)	m03– Light yellowish-grey lime-sand mortar with horsehair and straw inclusions m07 – Yellowish-white lime-sand mortar (1:3) with frequent lime inclusions and occasional iron oxide inclusions em01 – Pinkish lime-sand (1:3) with frequent lime lumps <12mm and occasional red iron oxide <2mm. (in line of Fleet Prison Wall)

Table 7. Fleet Prison perimeter wall construction and materials

Masonry contexts	Construction technique	Materials	Forms	Mortar types (cm = evaluation)
2, 2008, 2009, 2027, 2036, 2040, 3106, 3113, 3116, 3117, 3301, 3311, 3343, 3344	trench-built, uncoursed stone with ‘poured mortar technique’	primary: chalk secondary: Reigate stone (Surrey Greensand), Rag (Kent) inclusions: fragments of residual Roman brick, medieval roof tile	generally roughly squared or unfaced stone blocks. Smaller amounts of roof tile fragments	em01 em02 – Beige limey sand mortar (1:3) with frequent lime lumps & occasional charcoal flecks m03, m07 m12 – White lime/sandy mortar (possible later rebuild of context 3106)

Fleet Prison Perimeter Wall

The medieval Fleet Prison perimeter wall (Table 7) was identified in excavations along the Fleet Valley in 1988, where it was constructed of ragstone (McCann 1993, 59; Schofield 1998, 285). Some ragstone was noted in the foundation material, along with fragments of Reigate Stone, but the majority of the material was of chalk. Presumably the more hard-wearing rag was retained for the wall face itself, with the softer material being used in the foundations. Similar mortars were used to the rectilinear structure (Building 2), indicating they were constructed at the same time.

The Late Medieval Assemblage 1400–80 (Phase 6)

The late 15th century saw the introduction of brick as a common building material, and although no masonry structures were dated to this phase, late medieval activity may be suggested by the appearance of locally produced ‘Tudor’ type bricks (MoL fabrics 3033, 3046, 3039, 3065). However, all of the examples from these fabrics were seen to be in contexts assigned to the subsequent phase 7 (early post-medieval), indicating a hiatus in building activity during the late medieval period.

Discussion

The construction of the perimeter wall foundations is similar to that of Building 2, indicating that the two are contemporary, and it may be that the foundations represent a stone building incorporated into the corner angle of the prison wall. The widths of the north-south aligned foundation, and the northernmost east-west return, were of similar width to the Fleet Prison perimeter wall, the foundations of which were between 4ft and 5½ft. Legislation of the late 12th and early 13th centuries required party walls of stone to be 3ft thick (Schofield 1993, 75). Even allowing for a step-out in the foundations, this would indicate a substantial stone building in this vicinity, as the foundations seem far too massive for a building of timber construction. The internal division indicated by the east-west return was narrower, and at 0.9m (3ft) would seem to correspond with the legislation, and if it did originally continue, would have formed two bays each of approximately 13ft or 14ft each – not untypical for the period when compared to other excavated examples at Milk Street, Watling Court and New Fresh Wharf (*cf* Schofield 1995, 26f).

The Post-Medieval Assemblage (Phases 7–10)

The post-medieval fabrics and forms recorded in the assessment are fairly typical of a central London site of this period. Common forms include the post-medieval peg tile (MoL fabric 2276), and unfrogged bricks of the MoL fabric 3033 group, often with sunken margins and uneven bases. From the 17th century, the typical London ‘grey stock’ brick (MoL fabrics 3032, 3034) begins to appear. Also noted was a reddish variant of fabric 3032, and a variant the 3033 and 3032 fabric

(MoL fabric 3032*near*3033), thought to be a transitional type dating from the 17th century. Several examples of the 3033 fabric group were noted, with more voids than is usual. The presence of these fabric variants suggests a significant amount of rebuilding of the Prison in the 17th century, following the Great Fire of 1666, which was completed in 1671. No fragments of pan tile were noted in demolition dumps from the late 17th century, indicating that the buildings in the vicinity were roofed with peg tile type roofing systems. A number of masonry contexts contained reused worked stone fragments of probably medieval date, mainly in Reigate Stone, but with one example of oolitic limestone, possibly from the Jurassic Limestone belt.

A final phase of site activity following the demolition of the Fleet Prison is noted by the construction of several Victorian foundations, utilising ‘London Stock’ bricks (MoL fabric 3035). These features have been discussed in the evaluation report, and are not included here.

Post-Medieval Buildings by Phase

Early Post-Medieval Buildings 1480–1600 (Phase 7)

Several brick masonry contexts were assigned a late 15th- or 16th-century date, and represented a change in building materials on site, although it would appear that medieval stone material was also reused (Table 8). The brick fabrics were all seen to be of the local ‘Tudor’ brick (MoL fabric 3033 group), which are also observed in repairs to the City wall at this time (Smith 2004).

Table 8. Phase 7 building materials

Structure	Description	Masonry contexts	Fabrics, forms & dimensions (mm)
Buildings 5 & 6	brick walls and floor surface	3527, 3525, 3524,	unfrogged brick 3033, sunken margins 232 x 104–109 x 60mm; chalk rubble & Reigate stone; peg tile 2276
Building 2?	extension/alteration, possible external chimney breast foundation?	3202, 3203, 3236, 3238	peg tile fabrics 2586, 2276; unfaced ragstone & chalk blocks;
Culvert 1110	brick & tile drain	1110	peg tile fabric 2276, 268 x 150–152 x 10–12mm; unfrogged brick fabric 3032 <i>near</i> 3033, 235 x 108 x 55mm

DISCUSSION

Several foundations adjacent to the northeast corner medieval Building 2 utilised a combination of peg tile, rag and chalk rubble, suggesting alterations to the building during this period, possibly in the form of the addition of an external chimney. Demolition deposits dating to c.1580–1600 above the remains of Buildings 5 and 6 indicate the foundations are associated with a

precursor to the buildings on Fleet Lane shown on the Treswell Plan of 1612, rather than the buildings actually surveyed by Treswell. Interestingly, the notes accompanying the plan describe part of the house as ‘a little room newly built, with a chimney’ (Schofield 1987, 75), supporting the idea of alterations to the original structure just prior to the survey.

Pre-Great Fire 1600–66 (Phase 8)

A significant number of masonry features were attributed to this phase, mostly relating to extramural buildings along Fleet Lane and between the western perimeter wall and the Fleet ditch (Table 9). Many of the buildings showed a combination of ‘Tudor’ brick (MoL fabric group 3033), together with a transitional fabric 3032near30333, and occasional examples of the developed ‘grey stock’ brick (MoL fabric 3032), traditionally dated to just after the Great Fire of 1666 on the basis of documentary evidence (Hobhouse & Saunders 1988, 4).

DISCUSSION

Building 2 was subject to a substantial internal alteration with the creation of a large culvert or drain [3105], utilising bricks and in MoL fabrics 3033 and 3032near3033. Peg tiles in MoL fabric 2276 were also used, to create a springer course for the arch, while Kentish ragstone paving slabs were used in the base.

Buildings 7 and 8 probably represents at least two, and possibly three separate properties. Although [3009] was described as having similar mortar to [1266] to the north, its construction employed chalk and ragstone (probably reused medieval material), and a supposedly later 17th-century brick type (MoL fabric 3032near3033). In addition, the orientation of the bricks in the cellar floor is different to that of the floor in the north part of the building. The northern part of Building 7 may equate with the southern end of a building between the Fleet Ditch and the Fleet Prison wall, shown on the Treswell Survey of 1612 (discussed earlier; Fig 24).

Building 9 also appears to be later than the Treswell Survey, and the use of the later ‘grey stock’ brick (MoL fabric 3032) supports a construction date supposedly from post-1666. However, this fabric has been found the Salvation Army headquarters in contexts dating to before 1666 (Brown 2008, 94), and the presence of a clay tobacco pipe in [3500] dated to 1640–60 supports a mid-17th century date for its construction.

Building 10 appears to relate to the rear of the property belonging to John Hearne as marked on the Treswell Plan. This is supported by the fabric type, and by the fact that his building is recorded as being cellared. This location ties in with the gravel yard surface recorded in the previous phase, which is also indicated as a yard in 1612. A significant piece of carved stone <WSN05> (Fig 53), burnt and fragmented, was recovered from the demolition backfill of this building [3510]. Other fragments of carved stone were also found, usually reused, in phase 8 contexts, and are discussed below.

Table 9. Phase 8 building materials

Structure	Description	Masonry contexts	Fabrics, forms & dimensions (mm)
Building 7	brick-built cellar	79, 1250, 1251, 1238, 1239, 1237, 1243, 1267, 1266, 1265, 1264	unfrogged brick 3033, sunken margins & uneven bases 215–229 x 95–121 x 50–60mm; unfrogged brick 3039, sunken margins 220 x 105 x 50mm; unfrogged brick 3042, 115 x 50mm;
Building 8	brick-built cellar, with ragstone/chalk wall.	3008, 3009, 3012	unfrogged brick 3033, sunken margins & uneven bases 215–218 x 102–104 x 47–54mm; unfrogged brick 3032near3033, sunken margins 222 x 100–103 x 55–56mm; unfaced chalk & ragstone blocks
Building 9	brick-built cellar floor and wall	3501, 3500	unfrogged brick 3033, sunken margins, uneven base 225 x 105 x 60mm; unfrogged brick 3032near3033, uneven base 243 x 100 x 60mm; unfrogged brick 3032 (place), 250–285 x 110 x 60–63mm
Building 10	brick-built cellar floor and wall	3510, 3511	unfrogged brick 3033, sunken margins 228–230 x 105–108 x 50–53mm;
Building 11	brick-built cellar floor and wall	33, 47, 43, 2908, 2909, 2910, 2925, 2916, 2927, 2928	unfrogged brick 3033, uneven base 225–235 x 102–110 x 52–65mm; peg tile fabrics 2276, ? x 148–153 x 1–12mm; 2586; 2271; unfrogged brick 3032 (place), 250–285 x 110 x 60–63mm
Building 12	brick-built cellar floor and wall	2201, 2202, 2203, 2205, 2206	unfrogged brick 3033, sunken margins 225–230 x 104–110 x 50–65mm; unfrogged brick 3032near3033, uneven base 243 x 100 x 60mm; unfrogged brick 3032 (place), 250–285 x 110 x 60–63mm
Building 2	insertion of brick-built drain with brick/stone floor	3105, 3107, 3109, 3110, 3120, 3118, 3119	unfrogged brick 3033, 220 x 102–103 x 47–53mm; unfrogged brick 3032near3033, 218–235 x 95–110 x 52–59mm; unfrogged brick 3033 (variant with voids), ? x 102 x 67mm; Kentish rag

Buildings 11 and 12 appear to relate to two properties shown on the Treswell Plan leased by Davy Johnes and Richard Wrinch. There is evidence for a rebuild to the south wall of Building 11, the foundation of which was constructed of chalk rubble, with the wall above constructed of brick (MoL fabric 3033).

With regard to the phasing of the buildings depicted on the Treswell survey, it is possible that some elements

of their cellars were constructed earlier than 1600 and might be of 15th-century date.

Later 17th Century 1666–1700 (Phase 9)

Several masonry features were noted from phase 9 (Table 10). These included cellar walls and floors presumably relating to the rebuilding following the Great Fire of 1666. The most common bricks noted in samples were in MoL fabrics 3033, and the variant 3032near3033, suggesting that these features were constructed soon after the Great Fire and before the beginning of the 18th century.

DISCUSSION

The brick samples from Building 14 were all of the transitional fabric 3032near3033, and as such are a good fit for a post- Great Fire reconstruction along the property boundaries of the previous building. However this fabric type was also noticed in phase 8 contexts associated with this property. The drain included transitional fabric 3032near3033, suggesting construction in the second half of the 17th century, and probably represent the post-Great Fire reconstruction of the area.

Table 10. Phase 9 building materials

Structure	Description	Masonry contexts	Fabrics, forms & dimensions (mm)
Building 13	external brick and stone floor/yard surface with drain	1200, 1201, 1214, 1600, 3018,	unfrogged brick 3032, 218–235 x 98–103 x 60–63mm; Portland stone <WSN04>; paving slab (Purbeck Limestone)
Building 14	wall foundations, possibly a rebuild to Building 5	3514, 3523	unfrogged brick 3032near3033, 220–235 x 105–110 x 50–65mm
Cess pit	sub-circular wall possibly from a cess pit	3001	unfrogged brick 3033, 232 x 107 x 60mm
Drain	brick built drain run	1106	unfrogged brick 3032near3033, 222 x 105 x 65mm

18th Century 1700–80 (Phase 10)

Masonry features assigned to this phase (Table 11) relate principally to drainage and floor or yard surfaces laid down during the 18th century. The use of the ‘Tudor’ brick 3033 group declines, as one would expect, and the most common brick is the ‘grey stock’ fabric 3032. Purbeck Limestone paving slabs were also used for flooring.

DISCUSSION

All of the brick samples from Building 16 were from the local red ‘Tudor’ brick 3033, and could potentially have survived from pre-fire buildings. The dimensions of the bricks in the culvert and the drain suggest narrow date

range of the last quarter of the 18th century for construction. A major rebuilding of the Fleet Prison was undertaken in c.1770 and the remains may be associated with this phase. They would also coincide with the Gordon Riots of 1780, and may reflect building activity undertaken after the prison was damaged in this event. The increased use of ‘grey stocks’ with yellow surfaces supports this premise, as red brick was going out of fashion at this time.

Table 11. Phase 10 building materials

Structure	Description	Masonry contexts	Fabrics, forms & dimensions (mm)
Building 15	brick cellar floor	2900, 2901,	unfrogged brick 3033, 234–240 x 105–113 x 61–62mm; unfrogged brick 3032near3033, 235 x 108 x 65mm
Building 16	brick built walls and remains of cellar floor	2602, 2603, 30, 3303, 3304, 2031, 2033	unfrogged brick 3033, 220–236 x 95–110 x 58–65mm
Culvert	brick-built culvert	2053	unfrogged brick 3033 (voids), ? x 95 x 60mm; unfrogged brick 3032, 215–220 x 93–95 x 60mm; paving slab (Purbeck Limestone); peg tile 2271
Drain	brick-built drain in central west part of site	57, 3016	unfrogged brick 3032 (red variant), ? x 98–100 x 63–65mm;

Discussion of the Moulded Stone Fragments

Given the apparent reuse of the moulded stone fragments from the site, it is possible that they represent fragments from the medieval prison, reused in the foundations of the 17th-century rebuild. Most of the fragments were identified as being plain Ashlar blocks of Reigate Stone (Surrey Greensand), but also included a fragment of a window mullion [0] <WSN03>, in a light greyish-yellow oolitic limestone (Possibly Caen), a chamfered ashlar fragment from a plinth or string course [123] <WSN02> in a white, granular oolitic limestone that reacted only weakly to dilute hydrochloric acid (possibly a dolomite), and a possible coping in Portland stone [3018] <WSN04>, which was roughly triangular in section. The last had been upturned and reused in the cellar floor [3018], appearing flat in plan.

Of most interest are the fragmented remains of the low-relief carving of the ‘griffin-like’ beast [3210] <WSN05> found in the backfill demolition of Building 10 (Fig 53). Given the profile of the pieces, it is likely that the stone was probably from a frieze forming part of a stringcourse, perhaps a shorter element such as an architrave or lintel. The light relief indicates an internal, rather than external use. It has been subject to significant heat, which was assumed to be the result of destruction in the Great Fire. The fragment came from the remains of the building associated with the property

of John Hearne, which is indicated as having a large stone/brick hearth on the Treswell plan. It is possible that this is in fact the remnant of the mantelpiece from such a hearth.

The depiction of the beast, with a mastiff's head, claws, wings and serpent-like tail is not in concordance with the usual depiction of a griffin, which is usually shown as having the front quarters of an eagle and the hind quarters of a lion. Rather, it bears more resemblance to a creature of Persian origin known as a *Senmurv* (or *Simurgh*). This beast features in Sasanian Dynasty art of the 7th–10th centuries AD, usually depicted with the head of a dog, claws, and the wings and the tail of a peacock, and in Zoroastrian mythology guarded the Tree of Life, from which the seeds of life came. Following the development of trade between Persia and China via the Silk Road, later depictions confuse it with the Phoenix, and it becomes more bird-like in character.

A parallel for this carving exists in one of the various animals depicted on the late 12th-century south doorway of the nave of Barfreton Church in Kent:

On the West is a dog-faced dragon with his body and tail coiled in a circle, and ending just behind his ears. It is attacking a face or mask, which at the same time is being pierced by the lance of a centaur on the other side of the capital. The centaur has a neck guard as well as a nasal to his

helmet, and the lance has a divided pennon. (Collins 1933, 12).

Another parallel can be seen in the 12th-century Abbey at Cunault, France, although in both instances the carving is far deeper relief and less sophisticated in style. However, the lack of a stratigraphic context for the stone complicates its dating. The use of Reigate stone suggests a medieval or late medieval date, as the quarries at Reigate were largely worked out by the end of the medieval period. Stylistically, the border moulding at the base of the stone, and the fineness of the carving, may indicate a 14th- or 15th-century date. Parallels for the border moulding can be seen in several late 15th-century fireplaces, including examples at the Red Lion House, Burford in Oxfordshire and Bindon House, Axmouth in Devon (Wood 1965, 274–5), although these examples generally show quatrefoil designs.

Conclusions

Clearly, some of the masonry structures on site represent several phases of development of the Fleet Prison complex, from the medieval period onwards. However, the majority of the building remains on site appear to be represent suburban development outside the prison compound. Some of these buildings are apparently depicted on the Treswell Survey of Fleet Lane, undertaken in 1612. Certainly, some of these



Fig 53. Carved relief sculpture of a 'griffin-like' beast <WSN05> from the demolition of Building 10

features would appear to relate to buildings indicated in the plan, but it is also clear that property boundaries, already established in the medieval period, continued to define the positioning of new buildings on the site until the 18th century at least, despite the effects of the Great Fire.

THE CLAY TOBACCO PIPES

Chris Jarrett

Introduction

The site produced a total of 3635 fragments of clay tobacco pipes comprising 1169 bowls, 93 nibs (mouth parts) and 2373 stems. The bowl types were classified according to Atkinson and Oswald (1969) and prefixed AO, while the 18th-century bowls were further referenced to Adrian Oswald (1975) and prefixed OS. The bowl types range in dated between c.1580–1830 but are mostly 17th-century types and besides a wide range of types made in London there are also non-local English types, again referenced to Oswald (1975), and a single Dutch bowl and it was defined by Atkinson and Oswald (1972) and prefixed AT. The 17th-century bowls were also examined with regards to the degree of milling of the rim and the quality of their finish. Eighteen of the 17th-century bowls have stamps on their heels.

The Clay Tobacco Pipe Types

The 17th Century Assemblage

The site produced a notable amount of early 17th-century bowl types. There are six AO3 bowls dated 1580–1610 present, but they are all a taller variant, but typically with a heart-shaped heel, mostly with no milling but are very nicely finished (Fig 54.1). Clay tobacco pipes of this date are extremely rare archaeological finds and the fact that they occur this frequently here makes it more unusual. There are 34 bowls dating to between c.1610–40 and 24 are of the AO4 type with a sloping heel and twelve are stamped on the underside of their heels. Ten of these bowls are marked with incuse crowned **W B** initials but this stamp is often poorly impressed (Fig 54.2) and the possible makers for these are William Boreman and William Bankes both recorded in 1619, whilst William Batchelor is documented between 1619–35 and William Brooker is known at Ratcliffe, Stepney in 1635 (Oswald 1975, 132).

The only decorated stem fragment from the site is partially covered in diamond stamps with the initials **W B** incuse (Fig 54.3) and this has been previously recorded from Gateway House (site code: GM160) (Oswald 1975, 76–7, fig 13.1). A single bowl has an incuse **I R** stamp with a star between the initials (Fig 54.4) and the possible makers are John Rosse, 1619–34, John Robbins, 1621–38, John Robinson, 1634 and John Rogers, Ratcliffe, 1620 (Oswald 1975, 144). There is also a single bowl with a relief stamp of a face within a sunburst (Fig 54.5). There are three examples of the

AO5 bowls with flat heels and all are stamped. Firstly as a variant with an angled bowl profile and it is initialed **B C** in relief (Fig 54.6), but this pipe maker is not known in London and may represent a non-local pipe maker, further supported by the evidence of the unusual bowl shape. Another bowl has **W I** in relief (Fig 54.7) possibly for William Jeffes, 1619 and a single bowl has another example of the incuse **W B** stamp as found on the AO4 bowls, but poorly impressed. The AO5 bowls tend to be of a good quality finish with three quarters to full milling. There are seven examples of the spurred AO6 bowls (Fig 43.1). All the 1610–40 dated bowls tend to be of a good quality finish with three quarters to full milling, but the spurred types have more variability in their quality.

A total of 87 bowls date to between c.1640–60 and only seven are of the spurred AO9 type (Fig 43.2) and none are maker marked, while only one bowl of the 58 examples of the heeled AO10 type (Fig 43.3) is stamped with the initials **P C** in relief (Fig 54.8) and these are probably for Peter Cornish, who was documented in 1634. This pipe appears to have full rim milling but is covered in a cess deposit. A number of different di stamps are known for this maker (*MOLA Clay Pipes From London*) and this appears to be a different example. The heart-shaped heeled bowls that date to between c.1640–70 occur only as 22 examples of the larger AO12 bowl type (Fig 43.4). None of these bowls are marked and tend to have three quarters milling of the rim and are of a fair to good quality finish.

The number of bowls dated c.1660–80 dramatically increases in frequency to 956 examples, but most come from the masonry drain [3105]. The heeled and rounded profiled AO13 bowls (Fig 43.5) are as 36 examples and most bowls are either a quarter or fully milled and a heel probably of this type, has the incuse initials **I O** stamped on it (Fig 54.9), with no known pipe makers known at this time with these initials. Nine bowls are of the AO14 type (a spurless version of the AO15 bowl), whilst the AO15 bowl is the most numerous example on the site as 874 examples with variability in its quality of finish. Usually AO15 bowls are very rarely decorated or stamped, but one example (Fig 43.6) is present with an incuse stamp on the back of the bowl in the form of a cross and incuse decoration on the stem. It only has a quarter milling but is of a good finish and is nicely burnished. It is possible that this is a non-local bowl probably made elsewhere in south-east England.

The heeled, straight-sided AO18 bowls are present as 37 examples and tend to be of a fair finish, but ten are of a good quality such as the one illustrated (Fig 43.7) which is a slightly larger example, present as a single example. None of this type of bowl is maker marked. A further 68 bowls are represented by fragments that could not be assigned to type but date to the early to mid-17th century.

The 1680–90 dated types of pipe are poorly represented on the site as a single heeled, straight-sided AO22 bowl, but has its rim missing. The latter bowl is usually the most commonly bowl type found in London during this period.

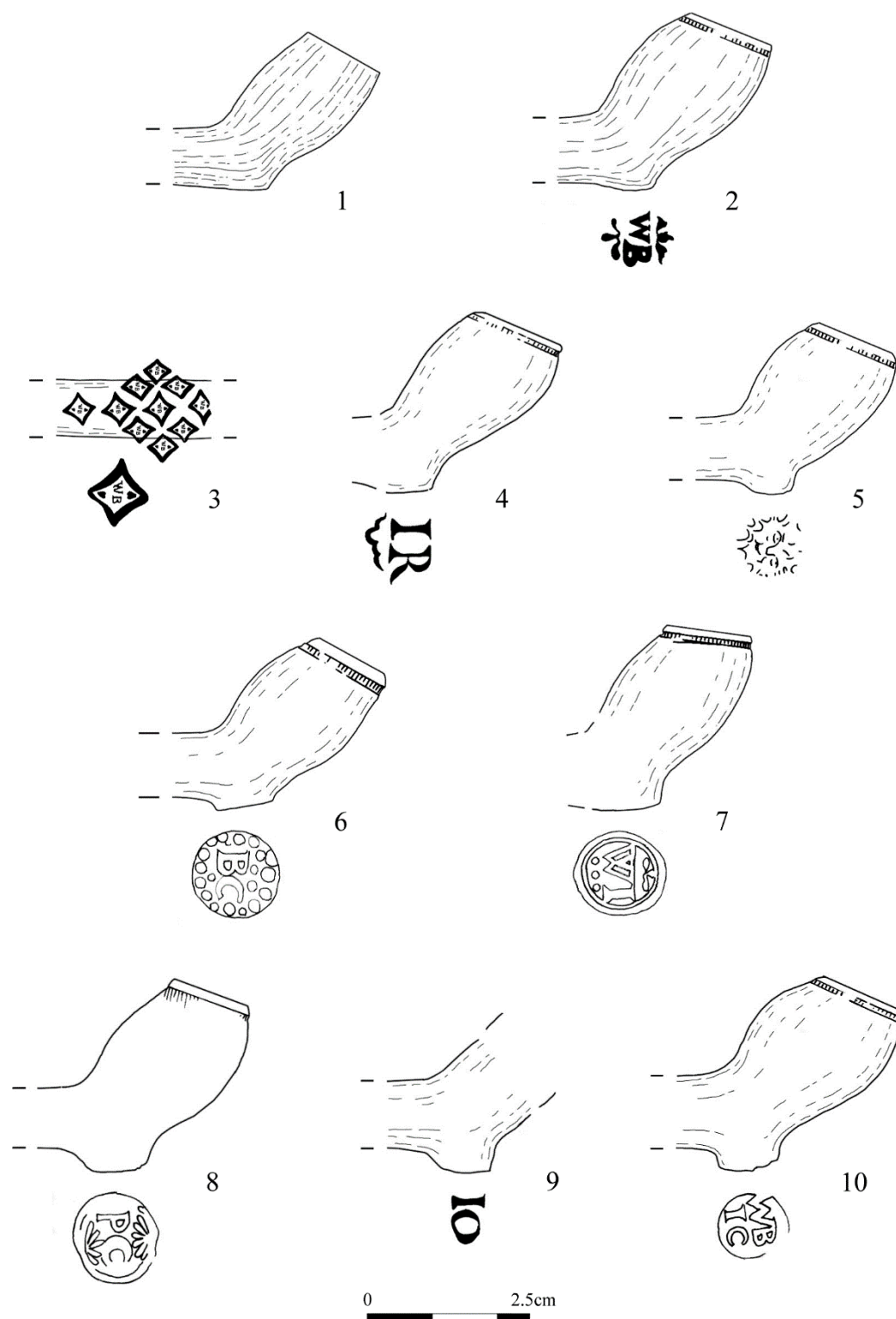


Fig 54. Clay tobacco pipes, scale 1:1. KEY to phase 8 bowl types: 1. AO3 [1221]; 2. AO4 stamp – incuse crowned initials **WB**; 3. Stem fragment with a stamped diamond decoration including the incuse initials **WB** [1212]; 4. AO4 stamp – incuse initials **IR** stamp with a star between the initials [59]; 5. AO5 – relief stamp of a face within a sunburst [59]; 6. AO5 – relief stamp **BC** [1206]; 7. AO5 – relief stamp initials **WI** [1210]; 8. AO9 – relief stamp initials **PC** [1233]; 9. AO13 – incuse stamp initials **IO**, masonry-lined drain [3105]; 10. AT6 Dutch – stamp double initials **WB** and **IC** [51]

The 18th to Early 19th Century Assemblage

Around c.1700 clay tobacco pipes in London started to become much more standardised and developed from

the rarely encountered AO21 type. The heeled, upright AO25 bowl became the norm, but its development is discussed here using Oswald's 1975 typology. The narrow bowled, thick stemmed OS10 bowl is present as

one unmarked example and is dated *c.*1700–40, whilst a single narrow stemmed OS12 bowl, dated 1730–80 has only the family name **R** legible. Spurred bowls appear to have temporarily stopped being made in London between *c.*1710–30, but the 18th-century resumption of these bowls survive here as a spur (classified broadly as an AO26 type) with the initials **T B** standing for either Thomas Bushey (Busley) 1737, Thomas Bell 1752, or Thomas Bickham 1781–4 and an OS23 bowl, dated 1760–1800, but its spur is missing.

Eighteen other bowls are represented by fragments and could only be dated to the 18th century. The latest clay tobacco pipes are of the AO27 type dated 1780–1830 and these are present as two examples. The first is plain and has the initials **B P** on the heel, but this maker is not yet known in London, whilst a second damaged bowl has the forename initial **E** or **F** and the family name **C**, besides part of a stamp on the back of the bowl and one possible maker could be Frederick Cant, Westminster 1805–37 (Oswald 1975, 133).

The Non-Local and Imported Pipes

There are a small number of obvious non-local bowls present, but others (discussed above and in the masonry drain [3105]) may fit into the London area typologies, but may be from elsewhere in the south-east as they are slightly atypical. There is also a single West Country bowl that can be classified as an AO16 type dated to the mid-17th century. It is nicely burnished and milled, besides being stamped on the underside of the heel with a poorly impressed gauntlet design (Fig 43.8). This type of stamp has often been associated with the Gauntlet family of pipe makers who were residing in Amesbury, Wiltshire, but this type of stamp design was also adopted elsewhere, such as at Bath, Much Wenlock, the Staffordshire/Cheshire area and possibly even in the Thames Valley (D Higgins, pers comm). However, West Country-type bowls (AO16 and AO17) are known to have been made in London and their distribution is mostly concentrated in the Strand area. A very large bulbous bowl dated to *c.*1660–90 is recognisable as a product of either Hull or Yorkshire and is classed as a NE2 type (Fig 43.9).

There is also the relatively rare London find of a single Dutch pipe as a type 6 bowl (AT6) and it is very nicely burnished with complete milling close to the rim edge and is dated *c.*1616 with a circular heel stamp on its underside with the double initials **W B** and **I C** (Fig 54.10). It is made in a softer clay than the usual British types and has fired to a dull pale yellow colour on the surface.

Distribution of the 17th-Century Bowls

An important factor in considering the distribution of the clay tobacco pipe assemblage from this excavation is their distribution in relation to the Fleet Prison and the extra mural domestic properties. It could be assumed that the imprisoned debtors, and their jailors, depending upon their economic circumstances, were less likely to afford more costly items and therefore lower quality clay tobacco pipes might be expected in

the area of the prison. Clay tobacco pipes can also inform upon the stress environment of communities, for example, evidence of the reuse of pipes may be indicated by the ends of stems being ground down to form new nibs when replacement pipes were not available or affordable. However, no such evidence was found amongst the clay tobacco pipes fragments. In fact very few clay tobacco pipes, except for the large assemblage from the masonry drain [3105], were recovered from within the area of the prison and single examples of an AO6 were recovered from Trench 10, [1602] and Trench 19, [1805] and were of a good quality with complete milling, whilst an AO10 bowl came from a dump layer [34] in Trench 6.

The vast majority of the stamped early 17th-century bowls and the Dutch bowl were recovered from Trenches 5 and 13 and deposits associated with Buildings 7 and 8 and particularly the back filling of the cellars. John Treswell's 1612 map shows this area as shops. Therefore if these pipes belonged to the inhabitants associated with this building they indicated a degree of affluence not seen on the other excavation areas of the site. If the 1580–1610 dated AO3 bowls represent a time when smoking tobacco was extremely expensive, then their recovery mostly from Buildings 7 and 8 indicates that merchants or the shop owners resident there were the wealthier sector of society that could afford to indulge in this habit. In the northern area of the site and in deposits associated with buildings and structures extra mural to the prison, the clay tobacco pipes are sparse, but when they do occur are not marked but are of a good quality.

Discussion

The 17th-century clay tobacco pipes from the excavations at Carroone House largely reflect the local pipe making industry with the occurrence of ten 1610–40 bowls marked **W B** indicating that this pipe maker was local. The singular occurrence of other makers' initials on the bowls might indicate that they were not local master pipe makers and may have been introduced on to the site by visitors to the area. By the mid-17th century there was a preference on the site for the spurred AO15 bowl and this fits in well with their distribution elsewhere in London, such as the City and Southwark where this bowl was more numerous.

The Fleet Valley excavation project undertaken between 1988 and 1992 produced a very large assemblage of clay tobacco pipes, but it was only Zone E that was concerned with the Fleet Valley Prison environs. That excavation produced clay tobacco pipes dating to between the 16th and 19th centuries, a wider range than that of FAS02, but a significant number of early pipes were recovered and many of them were marked. Clay tobacco pipes were also more forthcoming from the Fleet Prison and notable assemblages were derived from the prison drain and a backfilled cellar (Heard 1993).

THE GLASS

John Shepherd

Introduction

A total of 156 fragments of glass were recovered from this site. Six of these are Roman in date, and six are medieval or early post-medieval. The remaining 144 fragments are all post-medieval, especially of late 17th- to 19th-century date, and include 25 fragments of window glass.

Roman Glass

Six fragments of Roman glass could be identified, which included just a single vessel fragment from phase 2. Unfortunately the fragment was too small to be able to identify the form from which it came. The other five fragments are all glass working waste. One (residual in phase 5) is from a moil, the waste fragment of glass left on the blowing-iron once a completed vessel has been removed, another (phase 2) is a piece of waste from either the manufacture of a vessel handle, the application of a trail or waste from a cleaning process of the glass before blowing – *ie* to remove an impurity of some sort – and the rest are tank or pot-metal fragments – in effect, raw glass prior to working. The presence of this waste material, some residual as here, is not surprising considering the location nearby of the late 1st- or early 2nd-century glass working site, including possible furnaces, at the Old Bailey (OBA88) (Heyworth & Shepherd 1991, 14).

Medieval Glass

Only six identifiable fragments of medieval and early post-medieval were identified.

The earliest identifiable drinking vessel form recorded on this site is the tall, almost cylindrical beaker (Figs 55.1–3) fashioned with a pushed-in base forming a pedestal foot and are found on many sites with 15th to early 17th-century assemblages *eg* Rosedale and Hutton (Charleston 1972, 136–41, fig 61. 23–6; fig 64.64–82; fig 65.83–4 and 65.87–92), Woodchester (Daniels 1950, pl VII.48–53) and many Wealden sites (Kenyon 1967, pl xiv.a; pl xvi.i; pl xvii.g–h). They were probably designed for beer drinking (Charleston 1972, 136, fig 64.64). Many of these beakers have low relief decoration, usually vertical or diagonal ribs or diamonds/ovals in a diaper pattern, formed by the paraison being blown into a mould early in the fashioning process and subsequently reinflated (*eg* Fig 55.1).

Also represented is an unusual vessel with a bulbous neck from phase 7 (Fig 55.4). This vessel belongs to a small but distinctive range of late 15th or early 16th-century vessels, the precise origin of which is not clear. They have very close parallels in terms of form with Islamic vessels of the late medieval period and the general consensus amongst specialists is that they probably originated from Spain/Portugal. The Caroone House fragment is in a greenish colourless metal with a number of air bubbles. It matches closely a group of

eight bottle neck fragments in the Museum of London (MOL Acc nos. 2271, 2273 + 78.52/12, 2276, 2281, 2597, 12707, 14539 + 78.52/11, 17869, A13382). Three of these have at least two swellings; all, except one handleless vessel, have two handles and the surviving body fragments for two of these show that their forms were not simply bulbous but partially or totally flattened.

A urinal fragment from phase 5 (Fig 55.5) comes from a secure medieval context. Surprisingly such well-dated items are not common, the majority being found in post-dissolution residual contexts on monastic sites. The urinal is a type of medieval glassware that was often depicted in contemporary manuscripts and sculpture. Made with a rounded base, very thin walls and a wide mouth with a horizontal rim, they were used both as utensils in the science of uroscopy and, but perhaps less commonly, as simple *vases de nuit*. As Charleston points out, 'from carvings and manuscript illuminations of the 13th and 14th centuries to the graphic arts of the 15th, 16th and 17th centuries, the theme of the doctor holding up his urinal to the light is universal' (Charleston 1984, 32). The characteristic features of this type of vessel, namely the outplayed, horizontal rim and the thickened, rounded base, tend to be the parts which survive to be recorded in the archaeological record. The thin bodies seldom survive and hence the scarcity of complete or reconstructable examples. A virtually complete example comes from St Swithun's House, Walbrook, excavated in 1954, and dated to *c.*1500. Examples are numerous from the city in contexts dating from the mid-13th century (the earliest being from Milk Street 1976 – MLK76 – [25] <7>, unpublished) onwards.

Post-Medieval Glass

One hundred and forty-four fragments of post-medieval (*ie* 17th to 19th century) glass could be identified. These include 25 window glass fragments of the cylinder blown technique. The greater majority of the remaining fragments come from thick-walled bottles dating from the second half of the 17th century through to the 19th century. A single fragment of bright brown glass of late 19th- or early 20th-century date was noted.

The assemblage contains five fragments from drinking vessels of the 17th century (Fig 55.6–8). All of these appear to be soda glass examples, pre-dating the introduction of lead glass in the last quarter of the 17th century.

During the 17th century a new glass bottle in thick, dark glass was developed which from that point onwards, was to dominate the glass container industry. These are very common finds on sites with post-medieval occupation and are well-represented with eighty-two pieces here albeit in a very fragmentary state. Its sudden appearance and its radical design would suggest that it had not 'evolved' but was the product of invention. Documentary evidence shows that the true origins and inventor of a bottle design, almost certainly the type being discussed here, were the subject of litigation. In 1661, one John Colnett received letters patent from Charles II for the production of bottles to

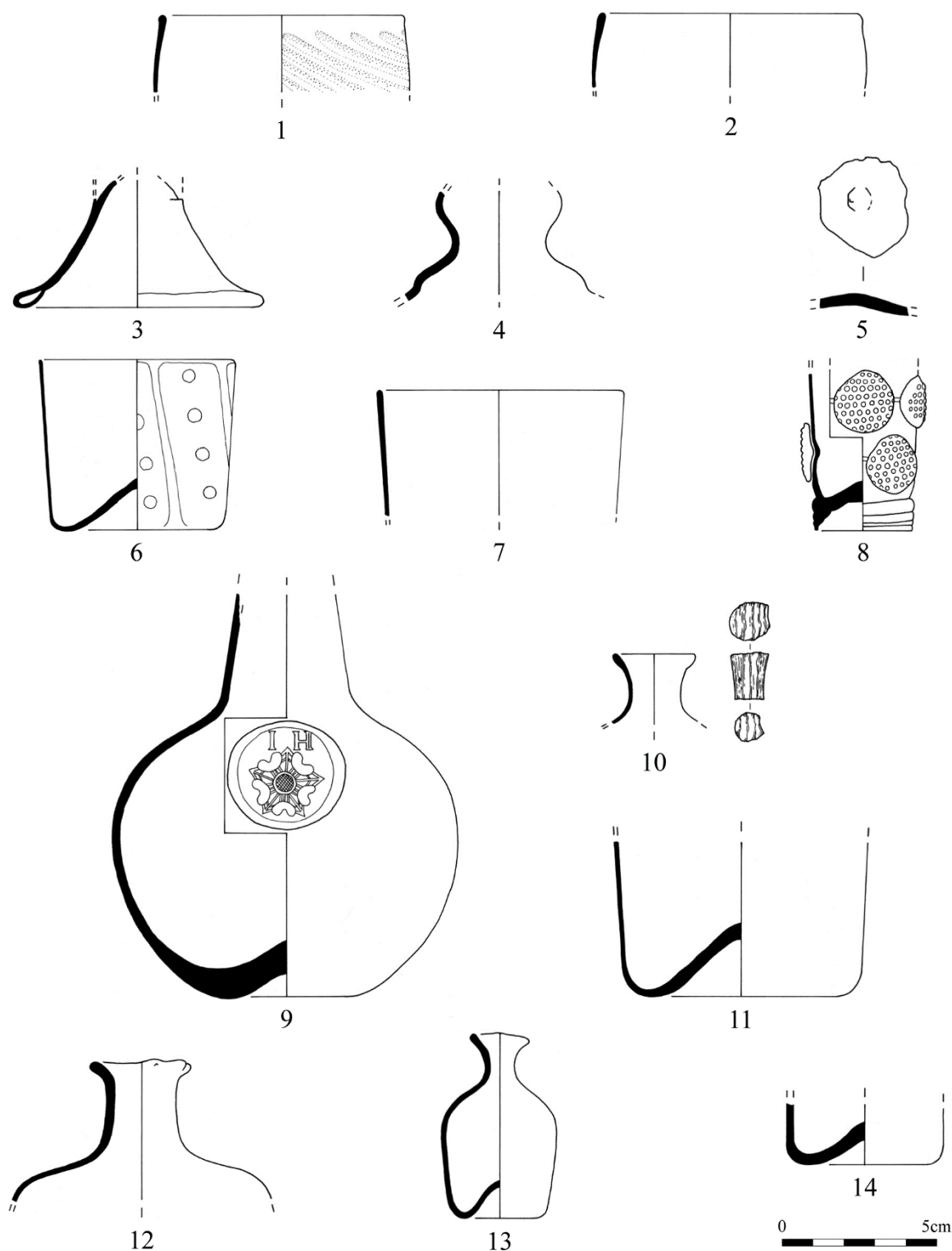


Fig 55. Medieval and post-medieval glass. KEY: 1. Tall cylindrical beaker decorated with diagonal ribs, phase 8 [1263]; 2. Plain tall cylindrical beaker, phase 8 [1227]; 3. Cylindrical beaker base with pedestal foot, phase 8 [1230]; 4. Unusual vessel with a bulbous neck, phase 7 [1113]; 5. Urinal fragment, phase 5 external dumping within the prison compound [1300]; 6. Squat beaker decorated with slanting overlaid trails, alternating with lines of raised dots, phase 8 [3102]; 7. Plain beaker, phase 8 [3102]; 8. Beaker, decorated with flattened prunts impressed with a tool to produce a spiked or raspberry pattern phase 8 [3102]; 9. Wine or spirits bottle with a seal containing a rose and the letters IH, phase 8 from masonry-lined drain [3105]; 10. Pharmaceutical phial neck, phase 8 [3104]; 11. Pharmaceutical phial base, phase 8 [3102]; 12. Pharmaceutical phial neck, phase 8 [3104]; 13. Small pharmaceutical phial, phase 8 [3102]; 14. Base of square or 'case' bottle, phase 8 [3102]

fixed volumes on the pretext that he had invented and perfected the making of glass bottles. However, the following year two petitions asked that the patent be cancelled. The second of these was signed by four glassworkers who claimed that, thirty years previously, Sir Kenelm Digby was the true inventor of the new bottle. They asserted that Digby had employed them, including John Colnett, to make these bottles but he had abandoned his interest in the venture. Since that time the glass industry had been aware of the design and method for the production of the new bottles and their manufacture had been undertaken in several glasshouses in England. In April 1662 the Attorney-General confirmed these facts, Colnett gave no defence and so lost his patent (Godfrey 1975, 228–30; Charleston 1984, 93–5).

These new bottles took over and expanded the role of the lighter, thin-blown medieval forms that cease being made during the earlier part of the 17th century. The new bottle was heavy and robust which permitted storing, crating and haulage; the glass was dark in colour which protected the contents from the destructive effects of light and they were made with a ring of glass around the lip (string-rim) thus allowing them to be securely stoppered. All of these features allowed for the transit and laying down of wine and other alcoholic beverages in the bottle - properties which were to ensure its development and exploitation.

This design proved to be very efficient and achieved considerable success on the international scene. The shape of the bottle varied and developed considerably during the one hundred and twenty-five years up to c.1750 (see Noël Hume 1961 for a summary of the development of this form). The earliest examples were globular in shape with long necks and the slightest of kicks in the base; 17 fragments of this type were recovered from site. Towards the end of the 17th-century squatter forms with short necks and very deep kicks were becoming the most common type in production; 5 fragments of this type were found. By the middle of the 18th century the range of designs was becoming restricted more towards the squat, straight-sided variety which, from that time on, developed into the familiar tall, cylindrical-bodied wine, beer and soft-drink bottle; nine bases and five rims and necks of these bottles were present.

A particular feature of these bottles is the application on the shoulder of the owner's or purveyor's seal (Fig 55.9 with a rose and the letters IH). These took a variety of forms but the owner's crest or coat-of-arms, a tavern's sign or an owner's monogram are the most common. Pepys tells of his visit to the Mitre Tavern to proudly view his five or six dozen crested bottles (Ruggles-Brise 1949, 26) although this number is easily surpassed. His contemporary, the Earl of Bedford, ordered up to seven hundred bottles per annum for 20 years from 1671 onwards (Thorpe 1938, 193). In some cases the seal also bears a date – the advantages of this phenomenon to the specialist being obvious. The earliest of such dated seals is a monogram (the initials R.M.P with the head of a king) with the date of 1657 (probably from the King's Head Tavern, now in the Northampton Museum. Noël Hume 1961, 91–117). It is interesting that this dated seal

pre-dates the letters patent received by John Colnett described above.

Another specially designed vessel type, equally numerous and ubiquitous as the bottle, was the pharmaceutical phial (Figs 55.10–11) (Noël Hume 1976, 72, fig 17, nos 10–14). As their common name implies, these small vessels performed as containers for medications, spirits, cosmetics and toilet preparations - fulfilling the function as container for numerous liquid or semi-viscous commodities which were transported, purchased or required in small measures. The form is very long-lived, from the late 16th to the 19th century but it was only during the period c.1580–1640 that there was any variation in form. And this was slight. Phials with round shoulders and also examples with pyriform bodies tend to be amongst the earliest (*ie* up to the middle of the 17th century). The examples from Carroone House date to the 17th and early 18th centuries.

A fragment from a mould-blown square-sectioned bottles ('case' or 'cellar') bottle was recorded (Fig 55.14). These bottles, in use especially during the late 16th and early 17th century, were produced to fit snugly into wooden cases. The shape and form eventually evolved into the tall square-sectioned bottle so often seen in Dutch genre paintings of the later 17th century (*eg* Charleston 1969, 87–9, fig 31, nos 5–8). Comparative examples are numerous, *eg* Waltham Abbey (pit dated to c.1639 or later) (Charleston 1969); Basing House (Charleston 1971, 70, nos 53–8, 65); Linacre Gardens, Canterbury (Shepherd 1990, 211, nos 251, 273–83). An example from Great St. Thomas Apostle, London (GTA89 [94] <3> - unpublished) had the name of the owner, M SAMUELL DAVIS, and the date 1642 scratched onto the side.

THE METAL AND SMALL FINDS

Märit Gaimster

With coins and tokens identified by Barrie Cook, British Museum

Around 240 metal and small finds were retrieved from the excavations, with the majority from phase 8 (c.1600–66). The material will be discussed here on the basis of different site areas and significant activities rather than strictly by phase or finds categories. Iron nails and unidentifiable metal have not been included; the full finds catalogue can be accessed through the finds archive and the site assessment report (Gaimster 2007). The leather descriptions are based on information provided by Quita Mould.

The Early Roman Period (Phase 2: AD 43–200)

Few finds were retrieved from phase 2 contexts, corresponding to the low level of activities recorded during the early Roman period. One of the channels in the south-east corner of the site produced a piece of bone-working waste (SF <203>), while from the north-east corner of site came a small rectangular copper-alloy

mount decorated with a simple incised line around the edge.

Finds Catalogue

Context [1033]; tertiary fill of channel [1041]

SF <203>: bone-working waste; cattle long bone with sawn-off end; now in two pieces

Context [1127]; interface between alluvial clay [1125] and alluvial layer [1119]

SF <141>

Rectangular copper-alloy mount with one side folded over for fastening; engraved line along all four edges of visible surface; 9 x 26mm.

Context [2407]; alluvial layer

Leather, bovine, one crescentic offcut with all edges cut.

The Saxo-Norman Period (Phase 3: AD 900–1150)

Besides a few iron nails and the fragment of a probable finger-ring in the form of a plain copper-alloy wire hoop (SF <134>) which was retrieved from a collapsed wicker fence, the only identifiable small find from phase 3 was a socketed bone point or tool from the south-west corner of site (SF <204>). The point belongs to a category of finds widely known from Saxo-Norman/Viking period sites in England and on the Continent. Common features are the use of cattle metatarsals where the articular surface has been hollowed out to form a socket and the shaft cut to form a point; sockets with remnants of a shaft or handle are known from other urban contexts at this time, including York and London (MacGregor *et al* 1999, 1989–90 and figs 946–7; *cf* Vince 1991, 208, fig 3.92). Unlike the majority of the Coppergate finds, however, the bone point from Caroone House is furnished with a double-pronged tip, with one of the prongs further shaped into two short points or teeth (Fig 56). Similar features were noted on two late medieval socketed bone points from The Bedern in York. Like one of the latter, the Caroone House point also has a transverse perforation just below the socketed articular end; however, the perforation is far smaller and more carefully drilled than on the Bedern point (MacGregor *et al* 1999, 1990). A similar feature is also represented in perforated long bones from Anglo-Scandinavian York (MacGregor *et al* 1999, 1991–2). The function of these bone points remains unknown, although interpretations such as tallow holders or points for skating poles have been put forward (*cf* MacGregor 1982, 96–7).

Finds Catalogue

Context [1641]; silt, sand and clay layer; pot date: 1000–1150

SF <204>: socketed bone point of cattle metatarsus with

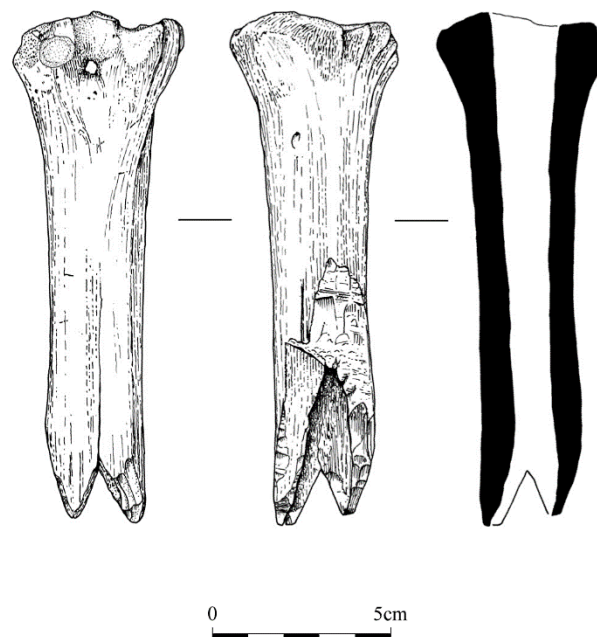


Fig 56. Socketed bone point (SF <204>) [1641], phase 3

double-pronged tip, one of which is further shaped into two short teeth or points; highly polished from use; L 140mm (Fig 56)

Context [1423]; wattle fence withies

SF <134>: ?finger ring of plain copper-alloy wire hoop; one part worn through; diam. 20mm

The Pre-1666 Fleet Prison Compound

Traces of the medieval and early modern Fleet Prison were identified on site in the form of stretches of the northern and western perimeter wall, and the foundations of a substantial building to the south. Very few metal and small finds were retrieved from inside the prison compound, as post-medieval layers here were completely destroyed with the construction of the cellared Caroone House in the 1960s; however, in addition, a group of early modern finds were retrieved from the fill of a brick-lined drain, likely to be associated with the pre-1666 compound.

A prison on the Fleet is first mentioned in the early 12th century, and previous excavations within the Fleet Valley Project located the foundations of the probable original prison building further to the north-east of the present site. The building could be dated to the late 12th century (McCann 1993, 55). A further building to the south, possibly part of the building identified at Caroone House, was also identified; a construction date around the 1260s was suggested for this (McCann 1993, 69–70). The Caroone House structure, on the basis of its wall construction, is thought to date from some time in the period 1250–1400. Finds, associated with pottery from the 13th and 14th centuries, came predominantly from the area around this building, in the south-east corner of site. An earlier find, from a made ground

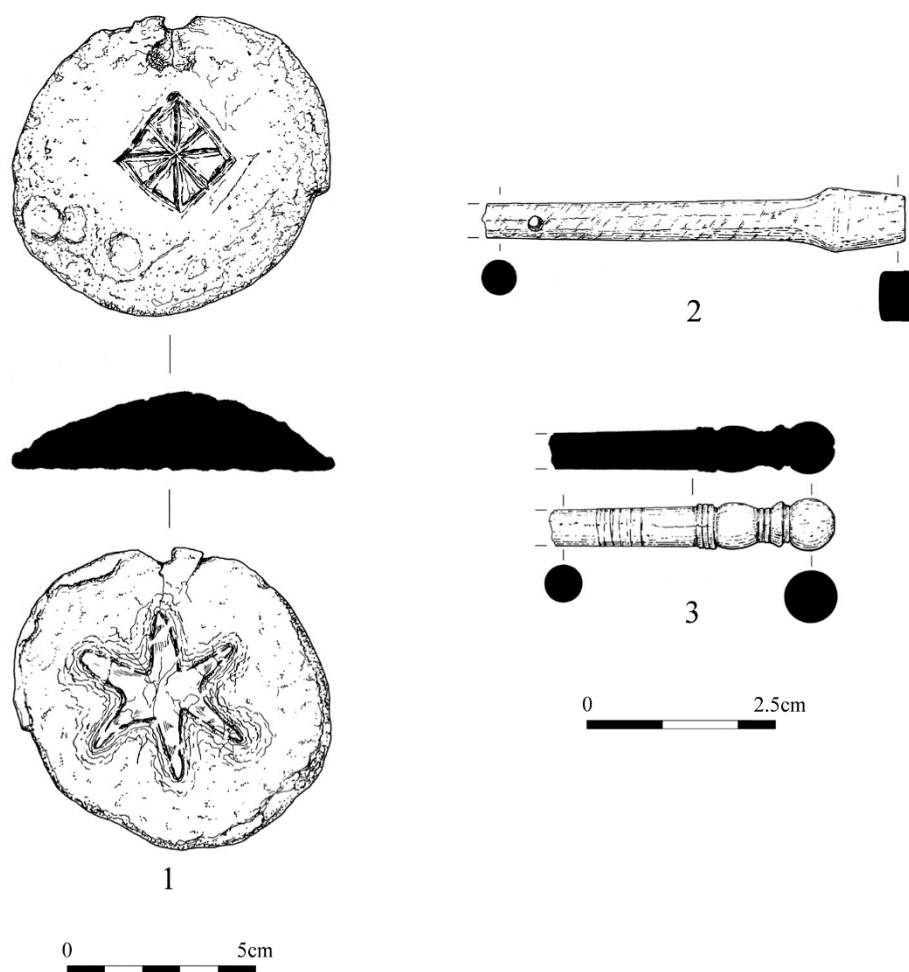


Fig 57. Medieval finds from the Fleet Prison compound phase 5, external dumping [1300]. KEY: 1. Ovoid lead weight decorated with an incuse cross-and-saltire design (SF <123>); 2. Bone tuning peg, (SF <124>); 3. Bone stylus (SF <125>)

deposit near the north-east corner of the building, is the fragment of an iron strap mount with a rounded terminal (SF <188>). Associated with pottery dating from 1170–1200, this is most likely a chest or casket mount (*cf* Egan 1998, 75–81; Ottaway & Rogers 2002, 2845 and figs 1424–5).

In phase 5 (1250–1400), a medieval dump layer yielded a complete copper-alloy pin with wound-wire head (SF <102>), the fragment of a copper-alloy rod or handle (SF <103>) and a large copper-alloy mount or vessel fragment with one rivet hole close to the single extant edge.

Also from the vicinity of the prison building came a probable Type 4 iron horse shoe (SF <187>). Medieval layer [1300], just to the east of the building, produced late 14th-century pottery and a stone hone (SF <197>), but also some more unusual finds in terms of ordinary household or personal objects. They include a large ovoid lead disc weight decorated with an incuse cross-and-saltire design, and with a cross-and-saltire shaped iron object embedded in its base (Fig 57.1). This large and unusual example is most likely a trading weight, used for measuring goods such as salt, bread or grains; the incised design is almost certainly a privy mark of the owner. Weighing 489g, it does not correspond well with any of the known weight systems employed in England

during the late medieval period; the closest parallel would be the 16oz mercantile pound at 466.6g, which was in use from the 13th century onwards. However, there is evidence for the use also of some Continental standards in ports and other entries for traded goods, and the Carroone House weight corresponds closely to the Paris pound of 489.9g (Egan 1998, table 14).

Other relatively rare finds from this context are the bone tuning peg for a musical instrument (Fig 57.2) and the elaborately lathe-turned bone stylus for writing on wax tablets (Fig 57.3).

Tuning pegs of this type, with a squared end for turning with a wrench or key, and a narrow cylindrical shaft with a hole for the string, may have been used for instruments such as harps, lyres or fiddles (Lawson 1990, 713); similar finds, corresponding well to the length of the Carroone House peg, are known from late medieval sites in both London and York (Egan 1998, 285–7; MacGregor *et al* 1999, 1978–9). The bone stylus, too, belongs to a well-known category of medieval finds. While particularly associated with scholastic and ecclesiastical contexts, styli are also recorded from secular and urban sites where writing and record-keeping would have taken place (*cf* MacGregor *et al* 1999, 1974–6).

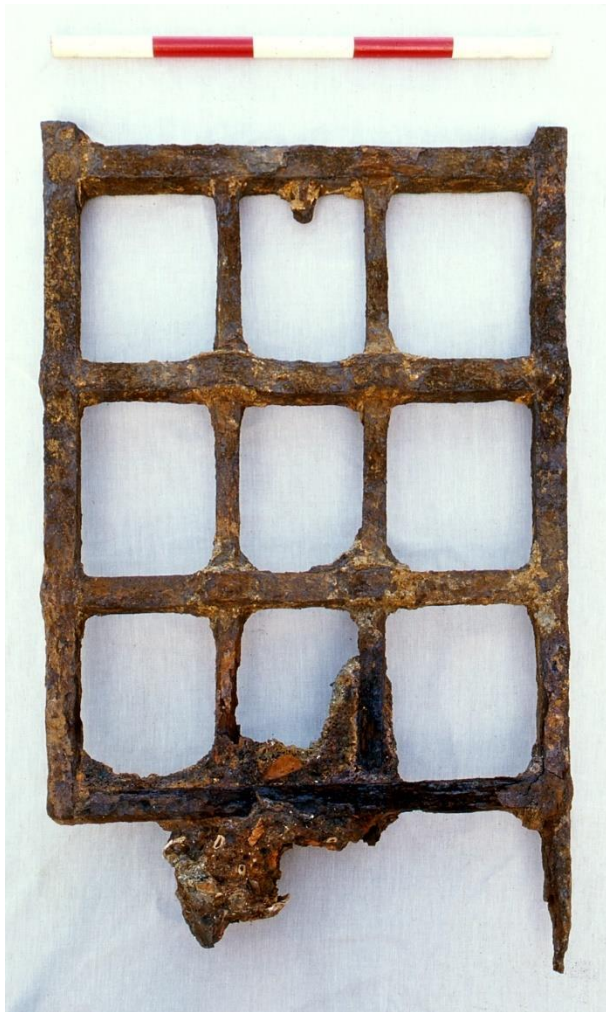


Fig 58. Complete iron window grate (SF <223>) [3122], apparently from the Fleet Prison found reused as a grille set into the brick-lined drain [3015] (phase 8)

Medieval finds were also retrieved from a cesspit situated further north, just inside the northern prison perimeter wall. They include incomplete iron shears (SF <177>) and a piece of bone bead-making waste (SF <178>), as well as several pieces of leather; both the bead-making waste and the leather are discussed separately in this report.

Some small finds associated with the pre-1666 Fleet Prison came from the fills of a post-medieval brick-lined drain or culvert in the south-west prison perimeter wall. A window grate apparently derived from the prison was set into the drain and reused as a grille (Fig 58). Finds from the fills included pottery, glass and clay tobacco pipes pre-dating the Great Fire. A bone knife handle recovered from the drain (Fig 59.1) is of very similar form and construction to the bone scale (SF <208>) of a handle retrieved from a late 16th-/17th-century context associated with Buildings 7 and 8, discussed below (cf Fig 61.2). There is also a copper-alloy counterfeit of a silver coin of Henri II, King of France 1547–57 (SF <168>). Interestingly, the assemblage includes a handful of lead shots, along with two crudely made gunflints (Fig 59.2, 59.3). Other finds from the

drain included a near-complete lathe-turned wooden bowl of beech (*Fagus sylvatica*) (Figs 59.4, 68a, 68b), a fragment of elephant ivory working waste (SF <215>) (Fig 63) (see Riddler below), a handful of copper-alloy pins and a lace-chape. The only piece of lead window came from the site was also retrieved from here.

Finds Catalogue

Phase 4

Context [1303]; made ground deposit; pot date: 1170–1200

SF <188>

Incomplete iron strap mount for a chest or casket; plain rounded terminal with central perforation for nail/rivet; L 50mm W 10mm.

Phase 5

Context [1001]; medieval dump layer; pot date: 1270–1350

SF <102>

Substantial copper-alloy pin with wound-wire head; Caple Type B; complete; L 60mm.

SF <103>

Copper-alloy pin or handle; incomplete; L 17mm diam. 3mm.

SF <104>

Copper-alloy mount; incomplete; 45 x 55mm; one rivet hole near extant edge.

Context [1300]; medieval layer; pot date: 1350–80

SF<123>

Crudely cast ovoid and slightly domed lead disc weight; on surface incuse cross and saltire design within a square; iron object with a similar design embedded in base; diam. 80–85mm wt. 489g (Fig 57.1).

SF <124>

Bone tuning peg for musical instrument; complete with perforation at narrow end; traces of wear from tuning key at the squared end; L 56mm (Fig 57.2).

SF <125>

Bone stylus with lathe-turned finial; incomplete; L 37mm (Fig 57.3).

SF <197>

Stone hone of possibly slate or flaggy sandstone; incomplete; L 37mm; source likely to be North Wales.

Context [1301]; deposit of made ground; pot date 1230–1350

SF <187>

Probable Type 4 iron horseshoe; incomplete; one square nail hole extant; L 55mm.

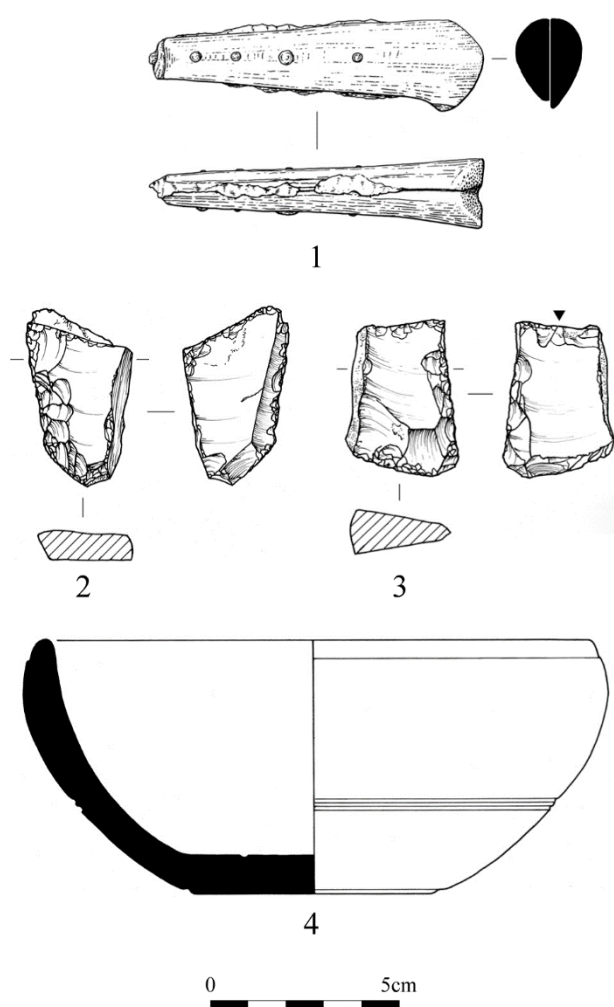


Fig 59. Small finds recovered from the fills of the brick-lined drain [3015] phase 8. KEY: 1. Bone knife handle (SF <199>) [3104]; 2. Gun flint (SF <233>) [3102]; 3. Gun flint (SF <234>) [3104]; lathe-turned wooden bowl (SF <170>) [3104]

Context [2313]; dump layer; pot date n/a

Leather; small fragment broken from heavily worn and abraded turnshoe sole; shoe rand fragments 5mm wide and secondary waste trimming of calfskin.

Context [3305]; fill of cesspit [3306]; pot date: 1230–1350

Leather, bovine, 12 pieces of primary waste hide edges.

SF <177>
One blade of iron shears; L 80mm; loop in two pieces.

SF <178>
One piece of bone bead-making waste; L 80mm; five drilled perforations extant diam. c.14mm.

Phase 8

Context [3102]; primary fill of post-medieval drain [3105]; pot date: 1630–50

Leather; a piece cut from a strap 33mm wide.

SF <174>
Lead shot; diam. 11mm.

SF <176>
Lead shot; diam. 11mm.

SF <221>
Two lead shots; diam. 11mm.

SF <233>
Crudely made gunflint; 45 x 27 x 9mm (Fig 59.2).

Context [3104]; primary fill of post-medieval drain [3105]; pot date: 1630–50

SF <168>
Copper-alloy core of counterfeit of a silver demi-teston in the name of Henri II, King of France 1547–57; the general type continued to be struck under Henri's sons Francis II and Charles IX until c.1574.

SF <169>
Lead shot; diam. 11mm.

SF <170>
Lathe-turned wooden bowl of beech (*Fagus sylvatica*); near-complete; plain beaded rim marked with a single groove; diam 150mm; ht 65mm; flat base diam. 65mm. (Figs 59.4, 71)

SF <171>
Two lead shots; diam. 11mm.

SF <199>
Bone knife scale handle with shaped terminal; complete; four iron rivets; L 82mm; almost identical to bone scale SF <208>, above (Fig 59.1).

SF <215>
Elephant ivory waste; one rectangular piece 15 x 87mm (Fig 63).

SF <222>
Copper-alloy lace chape; incomplete; L 17mm.

SF <225>
Lead window came; milled; two pieces; L 75 and 90mm.

SF <234>
Crudely made gunflint; 40 x 28 x 13mm (Fig 59.3).

Context [3122]; iron grille in post-medieval drain [3105]; pot date: 1630–80

SF <223>
Iron grille complete; 620 x 720mm; most likely re-used window grate (Fig 58).

SF <224>
Five copper-alloy pins; three complete Caple Type C; L c.25mm.

Fleet Lane Properties North of Prison Compound

To the north of the prison wall, properties fronting onto Fleet Lane yielded finds indicative of craft activity or small-scale industries. Phase 5 finds from this area include an iron awl or punch for leather working (SF <146>) (Fig 60.1), an incomplete iron knife (SF <195>) and a highly polished bone pin or handle of unknown function (SF <207>) (Fig 60.2). These finds were associated with pottery dating from the 13th–14th centuries.

Craft activity is evidenced in phase 6 (1400–80), with the assemblage of drilled bone panels for the manufacture of beads retrieved from a barrel well in Trench 17. This bone-bead industry is discussed separately below. The assemblage from the well also included a copper-alloy sewing needle (SF <216>), an unusually large stone hone (SF <217>) (Fig 60.3) and a wooden tuning peg for a musical instrument (Fig 60.4). The tuning peg differs from the bone peg retrieved from the prison compound, above (SF <124>), both in material and design. Rather than a squared end for turning with a wrench or key, it has a flattened carved head; this would act as a grip for turning with the fingers, although also tuning pegs of this type may have been turned by a wrench. This type of tuning peg is likely to have been used for a stringed instrument with a neck, such as a violin, a hurdy gurdy or a lute; a slightly smaller but very similar wooden example from London, dating from the 17th century, was possibly from a cittern (Palmer 2006, 120). Also from the well came a lathe-turned wooden bowl made from ash (*Fraxinus excelsior*) (SF <249> Fig 72a, 72b; see Goodburn below).

From phase 7 came an incomplete iron knife with a horseshoe-shaped maker's mark on the blade (Fig 56.5); this was retrieved from a demolition layer within Buildings 5 and 6. In phase 11 (c.1780–1840), the fill of the ragstone-and-brick culvert [2053] yielded a complete lead tea spoon (SF <201>) and the handle of a further lead spoon (SF <202>).

Further to the west, still along the old Fleet Lane, finds were retrieved from trenches 14 and 15. Phase 6 finds, from medieval made-ground layers, include a substantial copper-alloy lace-chape (SF <218>), a piece of antler-working waste (SF <213>) and an iron drop handle, most likely from a casket lid (SF <219>; cf Egan 1998, fig 62). The lace-chape corresponds well with examples known from both London and York, where finds suggest that these large chapes belong above all to the period before c.1350, indicating that the Caroone House find may be residual (Egan & Pritchard 1991, 290 and fig 188; Ottaway & Rogers 2002, 2921).

Phase 7 yielded a copper-alloy implement (SF <109>) (Fig 60.6). Consisting of a lancet-shaped point, this could have formed part of a cosmetic set with tweezers, ear scoop and nail cleaner (cf Egan & Pritchard 1991, 377–83). A problem with this interpretation is that the Caroone House implement has the perforation for riveting or suspension placed at an angle to the lancet-shaped blade, which would be impractical if it was part of a set. An alternative interpretation may be that this object functioned as a pendant. Two pieces of bone bead-making waste were

also retrieved (SF <142>; <179>). These finds all came from post-medieval levelling layers.

Finds Catalogue

Phase 5

Context [2217]; organic-rich dump layer; pot date: 1300–50

SF <146>

Iron awl or punch for leatherworking; complete; diamond-shaped cross section; L 70mm (Fig 60.1).

SF <207>

Bone pin or handle; incomplete; ?drilled hole at one end; highly polished from use; L 60mm diam. 8mm (Fig 60.2).

Context [3516]; medieval made ground; pot date: 1230–1400

SF <195>

Iron knife; tip of blade only; Type C1; L 70mm W 25mm.

Phase 6

Context [2301]; medieval made ground; pot date: 1400–1500.

SF <213>

Roe deer antler waste; one piece; L 130mm.

SF <219>

Iron drop handle of right-angled strip with slightly recurved ends; complete; probably from casket lid; W 80mm ht 30mm.

Context [2311]; made ground; pot date: 1400–50

SF <218>

Substantial copper-alloy lace-chape with folded tap at narrow end; L 70mm diam. top 5mm.

Context [2924]; fill of barrel well [2914]; pot date: 1400–1500

SF <216>: copper-alloy needle; incomplete; L 48mm.

SF <249>: lathe-turned wooden bowl of ash (*Fraxinus excelsior*) with flat base c.80mm diam; near-complete but in two pieces and crushed out of shape; diam. c.180mm; ht.c.45mm (Fig 72c).

Context [2944]; fill of barrel well [2945]; pot date: 1400–1500

SF <153>: wooden tuning peg for musical instrument; incomplete; L 80mm W of head 25mm (Fig 60.4).

SF <217>: large hone of fine red sandstone; one face only; rounded rectangular section 55 x 60mm; L 16mm+; possible source Devonian or Permian West

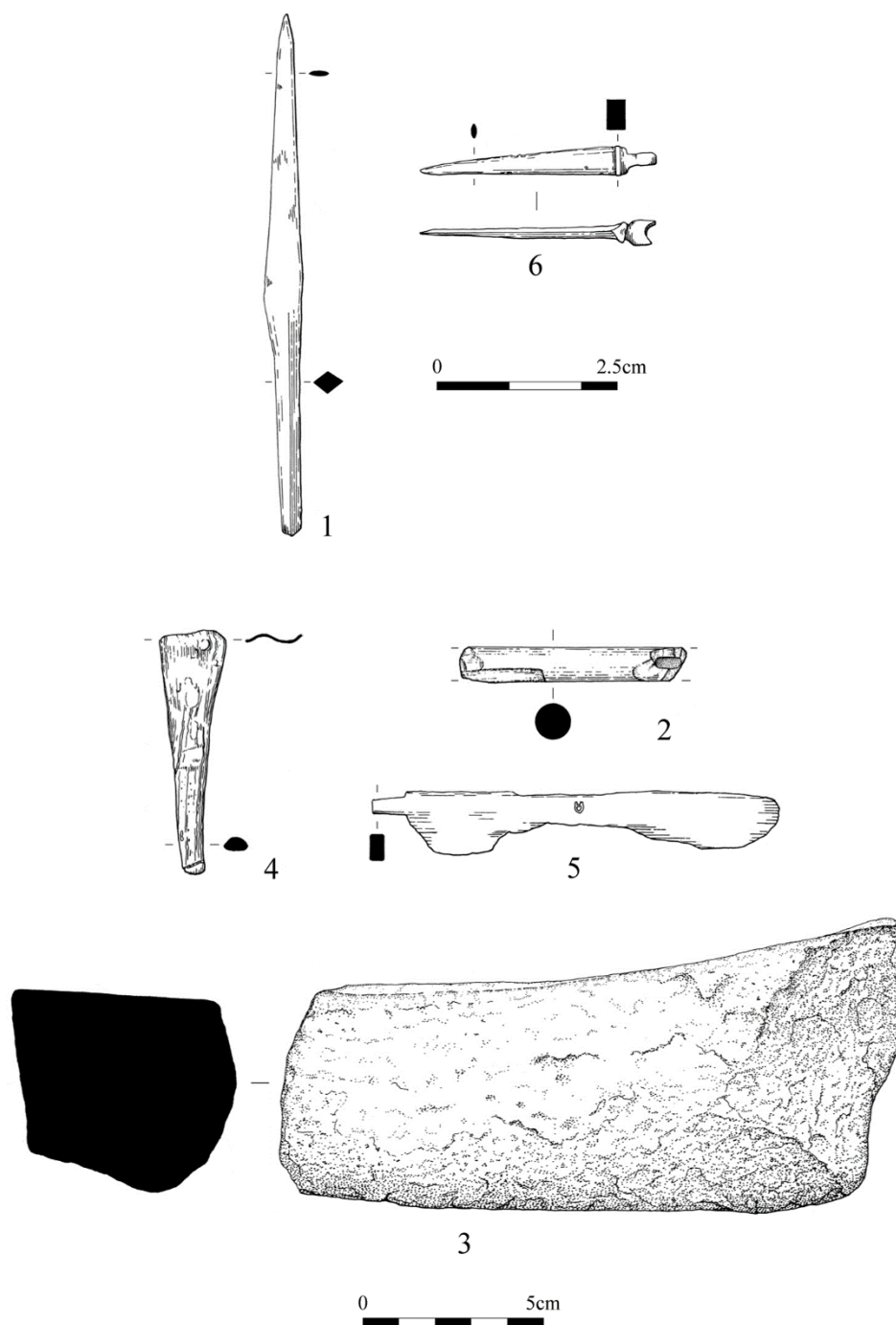


Fig 60. Objects from the Fleet Lane properties north of the Fleet Prison compound. KEY: 1. Iron awl or punch (SF <146>), dump [2217] phase 5; 2. Incomplete bone pin (SF <207>), dump [2217] phase 5; 3. Large sandstone hone (SF <217>) backfill [2944] of phase 6 barrel-lined well; 4. Wooden tuning peg (SF <153>), backfill (2944); 5. Incomplete iron knife blade with a horseshoe-shaped maker's mark (SF <195>), demolition dump in Building 5/6 [3516] phase 7; 6. Lancet-shaped copper-alloy implement (SF <109>), levelling dump [1113] phase 7

Country/West Midlands (Fig 60.3).

Phase 7

Context [1113]; levelling/dump; pot date: 1480–1500

SF <109>: lancet-shaped copper-alloy implement, possibly from toilet set; flattened pierced section for rivet/attachment to ring at an angle; L 28mm (Fig 60.6).

Context [2300]; post-medieval made ground

SF <142>: one piece of bone bead- or button-making waste with two drilled perforations; L 47mm; complete perforation diam. 15mm; broken-off perforation diam. 25mm.

Context [3515]; demolition layer; pot date: 1580–1600

SF <194>: iron knife; incomplete; L 115mm W 18mm+;

horseshoe-shaped maker's mark visible on x-ray (Fig 60.5).

Phase 11

Context [2054]; fill of culvert [2053]; pot date: 17901820

SF <201>: lead tea spoon; complete; rat-tail handle with punched decoration; L 125mm.

SF <202>: handle of lead spoon; L 140mm.

Buildings 7 & 8, West of the Prison Wall

To the west of the Fleet Prison curtain wall, Buildings 7 and 8 were identified in phase 8; this would have been located fronting onto the Fleet ditch. Previous work within the Fleet Valley Project suggested that, with the erection of the prison wall in the 12th or 13th centuries, the entrance to the prison gate would have been from the west (McCann 1993, 69). Buildings 7 and 8 may have been located on or near the entrance. The building, of which only the cellar remained, is likely to have perished in the Great Fire of 1666.

Buildings 7 and 8 yielded the largest concentration of metal and small finds from the excavation; most of these were retrieved from layers or backfill within the structure, but a portion was residual from later structures dug into the area of the building. The finds include remnants of household furnishings and cutlery but also some material suggesting activities beyond the domestic sphere. Objects relating to the household comprise three copper-alloy curtain rings and an iron bar finished with a simple curved loop (Fig 61.1); this is likely to be part of a pot hook, a vital hearth equipment for suspending pots over the fire (*cf* Margeson 1993, fig 55: 559–60). A substantial piece of red deer antler (SF <212>), with two tines extant, has an iron nail driven through the centre of the beam; this was possibly used as a wall hook.

A small group of knife handles are interesting representations of the different fashions and styles available in the late 16th and 17th centuries. A tapering bone scale with a shaped terminal (SF <208>) (Fig 61.2) has parallels in a group of late medieval and early modern handles from Norwich (Margeson 1993, fig 88), while an incomplete knife with solid iron handle (SF <193>) (Fig 61.3) belongs to well-known 16th-century type (Brown 2001, 75 fig 29; *cf* Egan 2005, fig 74). A fragmentary wooden handle (SF <200>) has a characteristic through-tang fitted with a ball-shaped metal finial (*cf* Brown 2001, 74–86). In addition, there is an incomplete ivory scale with bevelled edges and a wedge-shaped end (SF <161>).

An unusual find is a cylindrical ivory implement, partly hollow and with a short threaded nozzle (SF <156>) (Fig 61.4). The cavity and nozzle is suggestive of some form of flask or container, with the threading designed for a cylindrical lid. The function of this container is unknown, but parallels can be seen in later horn flasks; these were designed to hold, among other

substances, powder to facilitate the appliance of tight-fitting gloves (Schaverien 2006, 133–4).

Some of the finds from Buildings 7 and 8 are items suggestive of trade or business. They include three copper-alloy jetons (SF <16>, <17>, <20>), used for the calculating of sums, and a farthing token of Charles I (SF <113>) along with an Elizabeth I lead counter (SF <137>) and four further unofficial lead tokens. One of the jetons (SF <20>) is a 16th-century Nuremberg issue, while the other two date from the late 16th or early 17th centuries; both are inscribed with pious mottoes in German. Of the unofficial lead tokens, three are identical; the obverse carries the letters “R” and “L”, while the reverse shows a cockerel (SF <114>, <139>, <226>: Fig 62.1). These tokens are likely to date from the early to mid-17th century, when they may have been issued by merchant guilds, tradesmen and taverns (Mitchiner & Skinner 1985, 123–38). The emblems of similar initialled tokens as the Carroone House issues have been associated with individual taverns (*cf* Mitchiner & Skinner 1985, 131 and pl 19, nos 164–8). The fourth issue (SF <227>) is a smaller pellet-like token, cast with a lattice/chequered pattern on one side and an unidentifiable figural motif on the other (Fig 62.2); it is possibly of early Tudor date (early to mid-16th century: *cf* Mitchiner & Skinner 1985, pl 10 no. 89; Egan 2005, fig 164: 891–3).

An indication that some form of production or commercial activities may have taken place in the building is also the cache of copper-alloy pins – forty-seven in all – retrieved from between the bricks of floor [1281] in Building 7; one of the three identical lead tokens (SF <139>) was retrieved from here. Of further interest for the question of small-scale industries is the presence of several pieces of elephant ivory waste (Fig 62.3–5) (see Riddler, below). The finds from Buildings 7 and 8 may be compared with material from a 17th-century context at Putney Bridge Road in Wandsworth, where 34 copper-alloy pins were retrieved from or beneath a wooden floor surface together with five copper-alloy private farthings and a jeton. While there were no further indications of pin making, the many pins together with the farthings were interpreted as indications of some form of small-scale trade – perhaps dressmaking – in this building. Here, the proximity to a public house situated next door was a supporting factor behind the interpretation; in the early modern period, trade of various forms frequently took place at inns and public houses (Sayer *et al* 2007, 274). For the Carroone House finds, the situation of Buildings 7 and 8 just outside the prison walls, and possibly at the prison gate, may offer a similar scenario. It is possible that also the two bone gaming pieces (SF <111>, <155>) (Fig 61.5–6) fit into this picture.

Finds Catalogue

Phase 5 (?intrusive)

Context [1271]; ground-raising dump layer; pot date: 1240–1300

SF <226>: bifacial lead token; the letters R L between

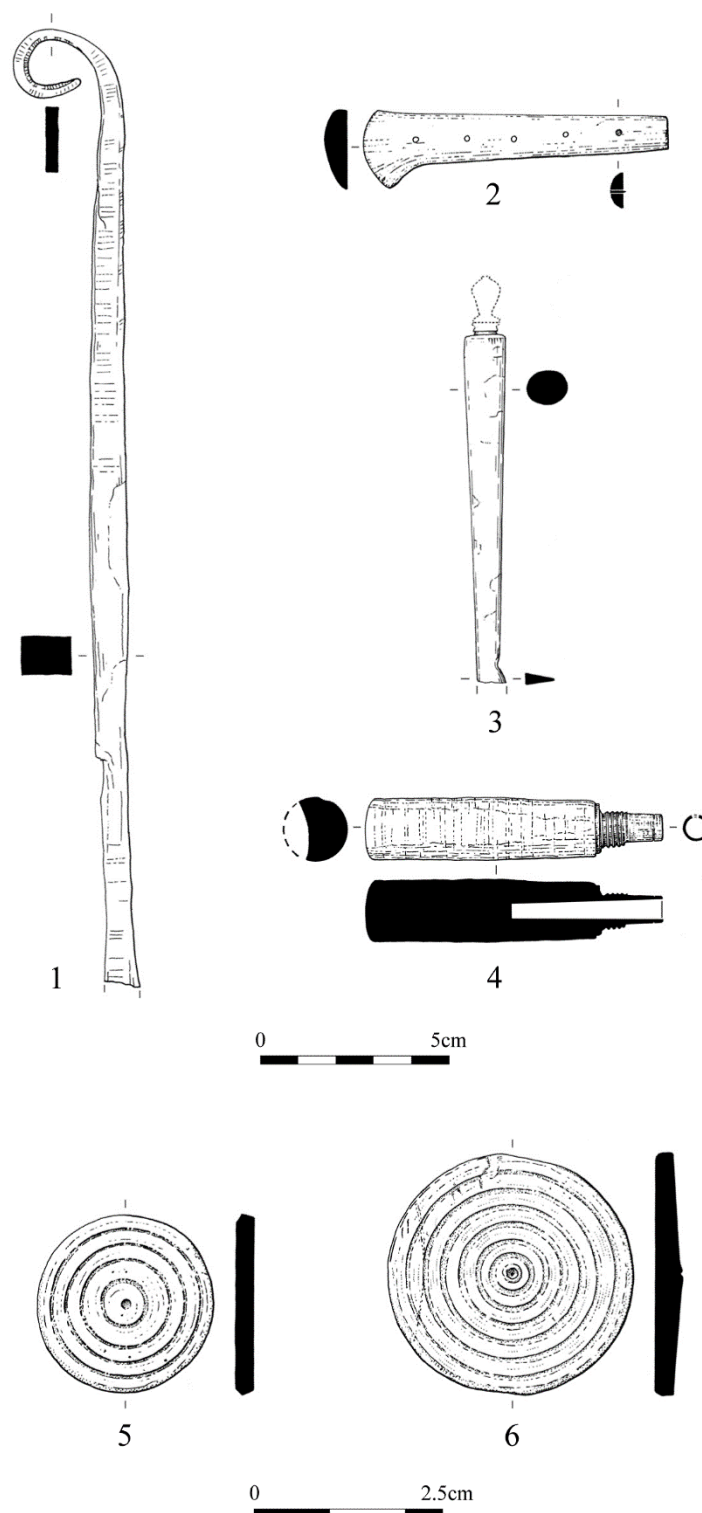


Fig 61. Objects from the backfill of the cellars of Buildings 7 and 8, phase 8 (except for No. 5). KEY: 1. iron bar with curved-up loop at one end, probably part of a pot hook (SF 220) [1208]; 2. complete bone scale from a knife handle with five rivet holes (SF 208) [1221]; 3. solid-iron knife handle (SF 193); 4. partly hollow cylindrical ivory implement with screw thread nozzle at one end (SF 156) [3000]; 5. circular bone gaming piece; decorated with concentric circles (SF 111), residual find [1202] phase 12; 6. circular bone gaming piece; decorated with concentric circles (SF 155) [3000]

horizontal lines, hatching above and below // cockerel;
diam. 20mm; identical to <114> and <139>.

SF <227>: bifacial lead token; chequered/lattice pattern
// ?figural motif; diam. 11mm; possibly early Tudor

(early to mid-16th century (Fig 62.2).

Phase 8

Context [59]; fill of Building 7/8; pot date:1550–1700

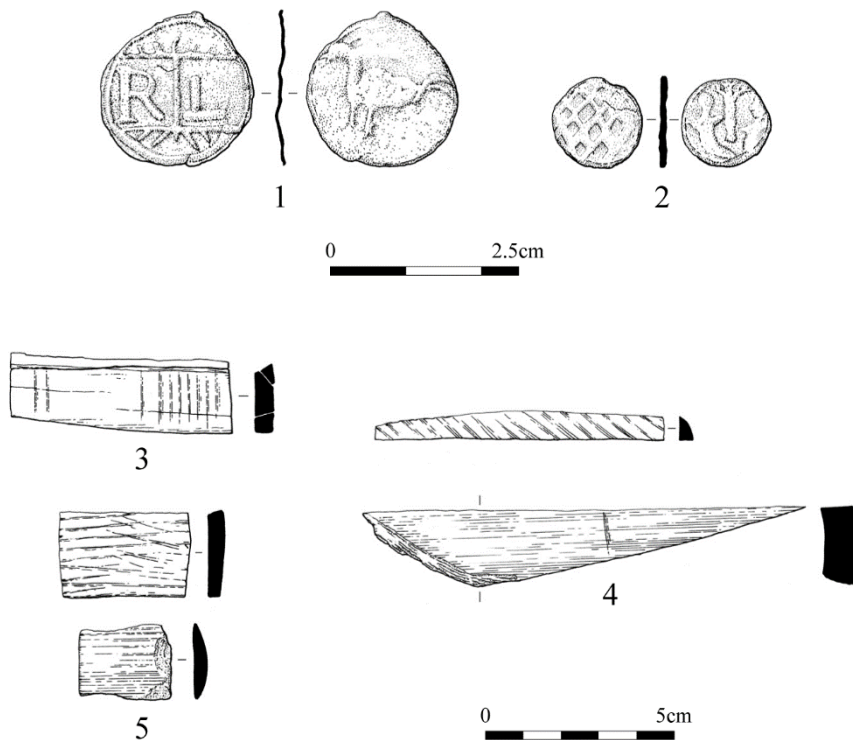


Fig 62. Post-medieval finds. KEY: 1. lead token (SF 139) obverse bears the letters or initials *RL*, while the reverse depicts a cockerel, intrusive find in phase 5 levelling dump [1271]; 2. small lead token (SF 227) with a lattice pattern on one side and an unidentifiable figurative motif on the other, ditto [1271]. Fragments of elephant ivory working waste: 3. one piece (SF 206), residual find in phase 10 culvert cut backfill [1215], 4. two pieces (SF 209), residual finds in phase 9 demolition deposit [1228]; 5. two pieces (SF 157), backfill of Building 7/8 cellar [3000] phase 8

SF <16>: copper-alloy Nuremberg jeton of Hans Krauwinckel II; rose/orb design with master's name around rose; HANNS.KRAUWINCKEL.IN.NVR // GOTES.SEGEN.MACHT.REICH; complete but most of edge worn down; pierced twice; cf Mitchiner 1988, 443 no.1553; attributed to 1586–1635

SF <17>: copper-alloy Nuremberg jeton of Hans Krauwinckel II; rose/orb design with master's name around rose; HANNS.KRAUWINCKEL.IN.N // HEIT.ROTT.MORGEN.DOTT; incomplete and heavily worn; pierced three times at centre; cf Mitchiner 1988, 445 nos. 1574–9; attributed to 1586–1635

Context [66]; fill of Building 7/8; pot date:1550–1700
SF <20>: copper-alloy Nuremberg jeton; 'Lion of Saint Mark' anonymous issue; complete but heavily worn cf Mitchiner 1988, 363 nos 1114–15; attributed to c.1500–70

SF <26>: stone hone of chlorite mica schist; incomplete; two faces; L 70mm W 35mm; source possibly in Scandinavia

Context [1208]; fill of Building 7/8; pot date: 1600–50

SF <220>: iron rectangular-section bar with simple curved-up loop; W 10mm L 260mm+; possibly hook for suspending pots over the hearth (Fig 61.1)

Context [1221]; fill of Building 7/8; pot date: 1580–1700

SF <126>: stone hone of chlorite mica schist; incomplete; two faces; L 100mm W 35mm; source possibly in Scandinavia

SF <208>: complete bone scale from knife handle; five holes with one copper-alloy rivet extant; L 80mm (Fig 61.2)

Context [1227]; dump layer; pot date: 1620–1700

SF <127>: bone back of composite button; four holes; discoloured from now missing copper-alloy facing; diam.15mm
Context [1233]; fill of Building 7/8; pot date: 1580–1650

SF <212>: wall hook of shed red deer antler; L c.290mm; two tines extant, but top of beam cut off; iron nail driven through centre of beam

Context [1275]; rubble make-up layer for brick floor [1238]; pot date 1580–1650

SF <136>: lead strap-end; one end rounded, the other with remains of rivet hole; L 42mm W 10mm

SF <137>: Elizabethan lead counter; double-headed eagle // crowned rose, GOD SAVE THE QVENE;

complete but heavily worn; cf Hawkins 1885, vol. I no. 68

Context [1281]; brick floor

SF <138>: 47 complete copper-alloy pins; Caple Type C; mostly L 25mm

SF <139>: bifacial lead token; the letters R L between horizontal lines, hatching above and below // cockerel; diam. 20mm; identical to <114> and <226> (Fig 62.1)

Context [3000]; burnt backfill of Building 7/8; pot date: 1580–1650

SF <154>: copper-alloy boss/mount; rounded edge; raised center with simple flat strap rivet at back for fixing; diam. 30mm

SF <155>: bone gaming piece; decorated with concentric circles; diam. 32mm (Fig 61.6)

SF <156>: cylindrical green-stained ivory implement with short threaded nozzle; body L 60mm diam. 10mm; nozzle L 12mm; c.20mm cavity inside solid body (Fig 61.4)

SF <157>: ivory-working waste; two pieces; one flat rectangular piece, 23 x 35mm, worked on all four edges; one flat irregular piece, 20 x 25mm, one edge worked (Fig 62.5)

SF <193>: iron knife with tapering solid iron handle; incomplete; L (handle) 85mm (Fig 61.3)

SF <198>: hone of micaceous greensand stone; incomplete; L 70mm W 25mm; source Maidstone area of Kent

SF <200>: fragmentary wooden handle with flat terminal; iron through-tang fitted with metal ball finial (visible on x-ray only); L 45mm

SF <214>: bone-working waste; one piece: square section 6 x 6mm; L 70mm

Context [3006]; burnt backfill of Building 7/8; pot date: 1570–1700

SF <160>: copper-alloy curtain ring; complete; irregular flat section; diam. 30mm

SF <161>: incomplete ivory scale from handle; incomplete; two rivet holes; L 50mm W 11mm

Context [3011]; rubble deposit above brick floor surface [3008]; pot date: 1550–80

SF <158>: large wooden vessel; diam. c.330mm

Phase 9 (Residual)

Context [1228]; demolition debris; pot date: 1620–

1700

SF <209>: ivory-working waste; two rough pieces; one piece pointed triangular, L 117mm; one long narrow flake/splinter L 78mm (Fig 62.4). Four segments of elephant ivory tusk, each sawn at one end and fractured at the other

Phase 10 (residual)

Context [1206]; backfill of construction cut for N.–S. brick wall [1203]; pot date: 1570–1700

SF <112>: copper-alloy farthing token of Charles I; Rose type (c. late 1630s); incomplete

SF <113>: copper-alloy farthing token of Charles I; Richmond 'round' type (c. 1625–34); incomplete

SF <114>: bifacial lead token; the letters R L between horizontal lines, hatching above and below // cockerel; diam. 20mm; identical to <139> and <226> but partly folded

Context [1215]; backfill of construction cut for brick culvert [1214]; pot date: 1580–1700

SF <120>: copper-alloy curtain ring; complete; diam. 30mm

SF <121>: copper-alloy curtain ring; complete; diam. 30mm

SF <122>: copper-alloy pin; Caple Type C; complete but in two pieces; L 25mm

SF <206>: ivory-working waste; one flat rectangular piece 20 x 57mm; both ends worked (Fig 62.3)

Context [1217]; demolition debris; pot date: 1480–1800
Six pieces and segments of elephant ivory tusk, each sawn at one end and fractured at the other

Phase 12 (Residual)

Context [1202]; fill of 19th-century construction cut; pot date: 1580–1700

SF <111>: bone gaming piece; decorated with concentric circles; diam. 23mm (Fig 61.5)

The Late 18th-Century Fleet Prison

The only finds – apart from various unidentified structural iron fittings – are four copper-alloy buttons. All are from the area in or by Trench 13, where they may be associated with the post-Great Fire prison, as the prison was extended to the west in 1793. Two buttons (SF <117>, <118>) are from phase 10 (c. 1700–80) and the other two are residual in phase 12.

Phase 10

Context [1210]; dumped industrial waste; pot date:

1760–1800

SF <117>: Winchester Type C domed, brazed copper-alloy button; incomplete; diam. 16mm

SF <118>: Winchester Type F copper-alloy livery button; tinned; diam. 14mm

Phase 12 (Residual)

Context [46]; 19th-century dump/leveling layer; pot date: 1770–1800

SF <6>: two complete Winchester Type F copper-alloy buttons; flat with integral loops; tinned; diam. 27mm

THE BONE BEAD-MAKING WASTE

Märit Gaimster

Perforated bone panels are a characteristic feature among late medieval and early modern finds. Conventionally described as button-making waste, those dating from before the 17th century are most likely to refer to bead manufacture. While the use of buttons became more widespread from the 13th century, reflecting the new fashion of close-fitting garments, they appear to be dominantly of a small and globular shape; parallels can be found in manuscripts and sculpture, but also in archaeological finds of metal buttons (Egan & Pritchard 1991, 272–80). The earliest finds of flat bone buttons date from the late 15th and early 16th centuries; these consist of bone discs with a central perforation, suggesting they were attached with a knot to leather or fabric fasteners (Spitzers 1997, 148, fig 4; *cf* Riddler 2001, 271–2, fig 207.13).

At least 15 perforated bone panels for bead making were retrieved from the current excavations; thirteen of these came from the 15th-century fills of a barrel well north of the prison wall. A further four fragments of drilled bone panels, along with a complete bone bead, were also retrieved from here. One bead-making panel came from a cesspit inside the northern prison perimeter wall; this was associated with pottery dating from 1230–1350. Previously, similar bead-making waste has been recovered from Ludgate Hill, just to the south-east of the Carroone House site. Here, the hitherto largest London assemblage of bead-making waste, consisting of fifteen perforated bone panels, were retrieved from late 13th/early 14th-century fills of the City ditch (Egan & Pritchard 1991, 312–14). However, large numbers of similar panels are also known from the Thames riverfront reclamation layers further west, outside the walled town (*cf* Egan & Pritchard 1991, 315; Gaimster & Yeomans in prep).

In the Middle Ages, bone beads would have been produced chiefly for rosaries; they represent the simplest version of such prayer chains. Both globular and disc-shaped beads were used, most notably seen in a recent find from Killeany, Co. Laois, in Ireland, where the rosary was composed entirely of flat bone discs (Riddler & Trzaska-Nartowski 2009). This variety is also reflected in the bone panels from Carroone House, with

the perforations ranging in width from 4.5 to 25mm (Table 12).

Table 12. Bone bead-making panels

SF	No. of perforations	Perforation diameter (mm)	Extant beads	Part of bone used
Context [2300]; Trench 15: post-medieval made ground				
142	2	16, 25	no	large mammal long bone
Context [2924]; Trench 17: fill of barrel [2914]; pot date: 1400–1500				
149	2+	14	1	large mammal long bone
235	13+	9	1	large mammal long bone
236	18+	6.5	no	large mammal long bone
237	13+	6	no	large mammal long bone
238	3+	6, 12.5	no	large mammal long bone
239	3+	13	no	large mammal long bone
240	5+	10	no	large mammal long bone
Context [2944]; Trench 17: fill of barrel [2945]; pot date: 1400–1500				
151	8	13.5	no	large mammal long bone
243	54+	4.5	no	large mammal long bone
244	23+	6.5	no	large mammal long bone
245	7	8	no	large mammal long bone
246	5+	13	no	large mammal long bone
247	2	22	no	large mammal long bone
Context [3305]; Area D: fill of cesspit [3306]; pot date: 1230–1350				
178	5+	14	no	large mammal long bone
Context [3345]; Area D: ground reduction				
179	26+	5.5, 11, 13	1	large mammal long bone

ELEPHANT IVORY WASTE

Ian Riddler

Thirteen fragments of ivory waste were recovered from four contexts located directly above the cellars of Buildings 7 and 8 destroyed in the Great Fire. All of the ivory is likely to have come from contexts dating to between 1600 and 1666, although some of the material was residual in later deposits. All of the waste can be identified as elephant ivory. It includes eight segments of the outer surface of tusks, each of which has been sawn at one end and fractured at the other. Most of

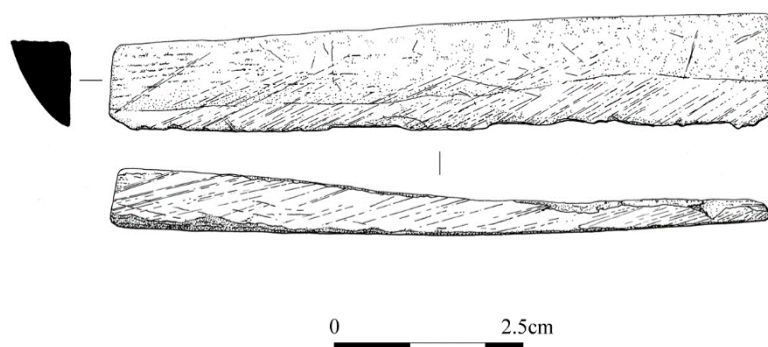


Fig 63. A Fragment of elephant ivory working waste (SF 215) from fill [3104] of brick-lined drain [3015] (phase 8)

them have fairly small diameters and have been sawn from the lower part of the tusk. A section of outer surface from context [1217], now in two pieces, has an estimated diameter of 145mm, suggesting that it came from the upper part of a tusk, whilst all of the remaining pieces have diameters of between 49 and 75mm. Each of the fragments is hollow and only the outer part of the tusk remains. This has a corrugated surface and can also include areas of damage or decay, and it was therefore discarded in an early stage of working. Elephant ivory has a tendency to laminate along the lines of its dentinal tubules, producing a characteristic 'cone-in-cone' effect (MacGregor 1985, 19) and allowing its outer surface to be separated from the remainder without too much difficulty.

The eight segments of tusk can be compared with a single fragment of elephant ivory waste from Canterbury, which was unstratified, unfortunately, but also consists of a section of the outer surface of a tusk, sawn at one end, precisely in the manner seen here (Blockley *et al* 1995, 1153, fig 508.1137 and pl CXLVI). The excavator hoped that the fragment was of Roman date but it clearly fits much better into an early post-medieval milieu. Similar waste has also been recovered from the Castle Meadow at Norwich, within contexts of the late 17th to early 18th century, as well as at Dublin Castle (Blockley *et al* 1995, 1153; Shepherd Popescu 2009; Ken Wiggins, pers comm), emphasising the urban nature of the craft at this time. At Canterbury, Dublin, London and Norwich the initial working of the elephant tusks involved the removal of the extraneous outer surface by sawing away segments of ivory that were already fractured at the other end. The outer layer of ivory was removed and discarded after the material had been sawn into segments, ready for further working. The sequence of working has been established for Amsterdam in particular, where contemporary illustrations show ivory workers sawing tusks into blocks, ready to produce combs and handles (Rijkeljkhuizen 2009, fig 10).

Five further pieces can be described as secondary offcuts, stemming from the cutting of the ivory into blocks (Fig 62.3–5). They include a long strip of triangular shape, cut from the outer surface and sawn on its two long sides (SF <209>). This represents a slightly later stage of working, although it is still waste from the preliminary division of the tusk. Four further pieces of ivory are rectangular in shape and have been sawn both along their upper and lower edges, and across

their inner surface. Two pieces (SF <206>, <209>) are long, narrow sections of ivory, 57.5 and 117.5mm in length, sawn along the tusk, whilst the third piece (SF <157>) has been sawn transversely and trimmed by knife along its sides. The fourth piece (SF <215>) is D-shaped in section and rectangular in shape with part of the outer surface surviving (Fig 63). The four pieces recall the rectangular 'billet' of ivory found in a post-medieval context at Winchester (Biddle 1990, 260 and 264 no 387). No waste from any subsequent stages of working was recovered and the nature of the final product is a little uncertain. It is clear, however, that sections of ivory were being cut into the tusk and along its length. They have been seen along the upper and lower edges, suggesting that the tusks were partitioned into segments of the appropriate size, and then sawn transversely, as seen at Amsterdam. At this point the blanks for the combs and handles could be sawn from the blocks and this would leave comparatively waste behind.

MacGregor has noted that the opening up of direct trade routes in the 17th and 18th centuries brought ivory to England 'in quantities sufficient to support manufacture of a wide range of utilitarian items' (MacGregor 1990, 378). This range included double-sided simple combs of ivory, which were produced in considerable numbers at this time (MacGregor 1985, 81–2).

Unfinished ivory combs from Exeter and York of 17th to 18th-century date indicate that they were being manufactured in urban centres (Allan 1984, 351 and fig 195.11; MacGregor *et al* 1999, 1873). The manufacturing stages outlined here would certainly have been appropriate for comb manufacture, with rectangular rough-outs for the combs sawn from prepared sections of tusk. At the same time, elephant ivory was being used for a range of implements, with knife handles also forming a prominent component of the worked material.

Catalogue

Context [3102], SF <215>; primary fill of post-medieval drain [3105]; pot date: 1630–50 (Fig 63)

Rectangular segment of elephant tusk, D-shaped in section with part of the outer surface surviving. Sawn at both ends and along the two long faces. Length 87mm, width 15mm, thickness 3–8mm, weight 8.2g.

FIRED CLAY OBJECTS

Chris Jarrett

Two very similar fired clay objects were recovered from fill [3102] of the masonry drain and both are square to rectangular in plan with bevelled sides: SF <157>, <250> (Fig 64). Both are made of a local brickearth clay, the fabric being micaceous, with sparse, sub angular, grey quartz, occasional fine calcareous inclusions and shell, while SF <250> additionally has sparse white flint up to 3mm in size. The heights of the objects vary between 67–68mm and the basal width is between 42–45mm, while the top width ranges between 30–37mm. Single sockets are found on the tops of both items with diameters ranging between 18–19mm and depths of 26–53mm.

The function of these items is uncertain but both are heat damaged. Suggested uses have been as candle holders, spit supports and moulds. The items are very similar to brickware candlesticks or spit, andiron (firedog) supports or feet made in the Low Countries, but dating to the 13th–early 16th century and are taller, very decorative with a raised socket (Evans & Verhaeghe 1998/99) and so contrast with the plain examples from the masonry drain. 17th-century roasting spits and firedogs also tend to have splayed feet and therefore not the type to fit into the sockets. If these fireclay objects were used as moulds in a small scale metallurgical industry then they were employed to form items of different sizes by the evidence of the socket dimensions. The contradictory evidence for these items being moulds are that the sockets are not heat damaged, but

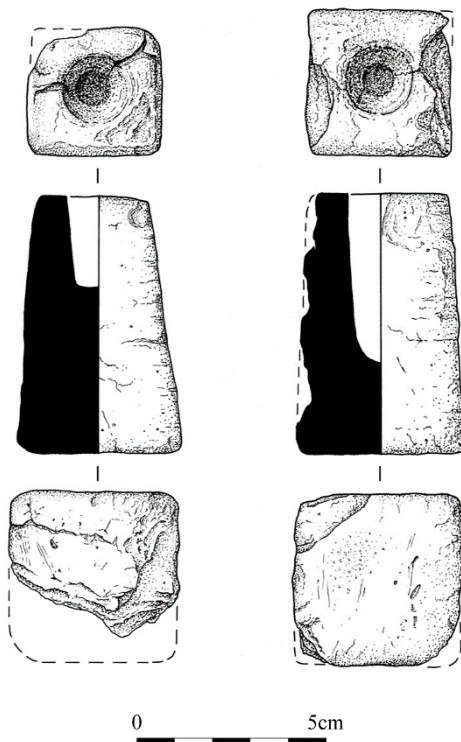


Fig 64. Two fired clay rectangular objects with bevelled sides and a socket at the top end (SF 167 and 250) from fill [3102] of the brick-lined drain [3105] phase 8

the exteriors are indicating that whatever they were used for then they sat in or close to a fire.

LEATHER ARCHER'S BRACER

Quita Mould

An archer's bracer (Fig 65) was found with 15th-century shoe parts in the fill [2944] of a cut for a barrel well or soakaway to the north of the site along with bone working and bead making waste and pottery dating to 1400–1500. The small, plain archer's bracer of cattle hide 3.67mm thick is 'tongue'-shaped with a pair of angular tabs, one now missing. It is comparable with another 'tongue'-shaped example from Carlisle (Millennium excavations SF8425; Mould 2009) that can be closely dated, coming from fill of a construction trench for a fence with a post with a felling date of spring/summer 1385.

Length 114mm, width 65mm (with surviving tab), 45mm (without tab).

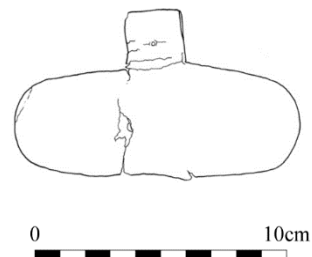


Fig 65. Leather archer's bracer from backfill [2944] of a barrel-lined well [2914]

THE WATERLOGGED WOODWORK

Damian Goodburn

Introduction

This analysis report is intended to provide a description of the key elements of woodworking attributes of the assemblage of waterlogged wood (mostly structural) encountered during the archaeological investigations carried out at Caroone House. The stratigraphic associations of the wooden structures are discussed within the site sequence report. This report principally discusses the waterlogged worked roundwood and other timbers examined on or off-site by the author.

The site lies on the east side of the valley of the now culverted River Fleet on the western side of the City of London. The lower levels on the site being very low lying (below 2m OD) were waterlogged, preserving the ancient woodwork. Excavations just to the east were carried out as part of the Fleet Valley Project, indicate that Caroone House actually lay on the western edge of the northernmost of two lost eyots close to the eastern bank of the tidal lower River Fleet (McCann 1993). Close by there may have been a Roman tidal mill (Spain 2002). The changing tidal regime of the River Fleet,

plus the history and topography of the site were discussed earlier.

Systematic excavation and recording of very large quantities of historic waterlogged woodwork has been carried on in central London since the early 1970s providing a vast comparative corpus of data with which to compare any recently excavated assemblage such as that from Caroone House. Trends in methods of working timbers and roundwood have been documented in a number of detailed published studies (eg Milne 1992; Bringham *et al* 1995 *etc*). A considerable number of other significant studies are also either close to publication or lodged in the Museum of London Archaeological Archive (eg the Fleet Valley Project archives) the comment, and interpretation offered here is provided from a position of close familiarity with the vast bulk of this material.

Methodology

This report is based on an onsite inspection of the wattle structures and examination of the lifted woodwork and records of other timbers made by the excavation team. Each substantial worked item was recorded with pro-forma timbers sheets and a full representative selection drawn to scale on gridded film (Goodburn 2007a). Thus, the approach to recording was commensurate with the procedures used in the Museum of London Archaeological Site Manual (2nd edition and the English Heritage Guidelines on Waterlogged Wood 2nd edition (Spence 1990; Brunning 1996).

The Quantity of Worked Wood Examined

A total of 137 items from individual timbers to multiple wattle withy sections bagged together, were examined. Although most of the items were structural there were also 9 items examined from wet deposits such as woodworking off-cuts and a turned bowl. In total this could be characterised as a medium to large sized assemblage for London. A total of 32 worked wood or timber items were drawn to scale off-site, in addition to measured sketches made on the timber sheets. Over 35 timber drawings were made on site and copies of these were reviewed and annotated in some cases.

The Quantities of Samples Taken

Unfortunately much of the woodwork was not suitable for tree-ring study and dating. The bulk was either of young fast grown stems with under 45 rings or of species unsuitable for tree-ring dating, or clearly reused and without sapwood, so that the total project wide number of tree-ring samples was only 19, of which only 3 provided dates (Tyers 2007). Six of the samples came from the same reused cask [2914], which could not be dated. Although mature timber of oak and some other common species can be easily identified by the experienced eye from its macro features, less diagnostic timber such as the softwoods and smaller roundwood have to be botanically identified (Austin 2008). A total of 81 species ID / and age samples were taken. The latter number includes representative samples of wattle

work weavers from several early wattle work structures. Later a total of 6 Species ID samples doubled as C14 dating samples (see Table 1).

The General Condition of the Assemblage

The tool mark survival on much of the lifted woodwork was rather poor due to the often abrasive nature of the deposits, ancient decay and sometimes modern concrete seepage. Many items were also truncated in the historic and recent periods.

Key Aspects of the Roman, Saxo-Norman, Medieval and Post-Medieval Woodwork Assemblage

The sides of ditches or channels which contain fast flowing water need to be lined or revetted to prevent the erosion and collapse of their sides, often in Saxo-Norman and medieval London this was done by wattle work linings. A key aspect of understanding and recording wattle work is to document the weave patterns, sizes and species of raw materials and whether the wattle work was woven *in situ* or as a portable lightweight 'hurdle' panel. Both forms were found in medieval contexts in the Fleet Valley Project just to the south and east of Caroone House (McCann 1993). For example, a general feature of much of the medieval wattle work on site was that much of it had larger diameter stakes than the examples found during the Fleet Valley Project.

The wood species identifications of P Austin have been drawn upon heavily here (Austin 2008).

Phase 2 Stake Structure [2103]

This structure was partially uncovered in the south-west part of the site and comprised a 90° or 'V' shaped arrangement of small stakes (Fig 5). Lifted example [2105] was 40mm in diameter, had a simple chisel point and appear to be oak or possibly hazel roundwood c.10 years old (Fig 66). The layout of these stakes is suggestive of a fish trap. The highest surviving stake had an OD level of +1.42 m, though it must have been driven from higher up.

Phase 3 Wattle Structure [1019]

This NE-SW structure appears to have been woven *in situ* with heavy roundwood stakes 100–120mm in diameter set at c.0.25–0.4m centres (Fig 7). The weave used was a plain weave in which the weavers or 'rods' were woven alternately round the stakes but not each other, one at a time. The weaver rods were c.30–40mm diameter and of fairly regular form possibly of coppiced or pollarded origin and have been identified as mainly willow, with some oak and some hazel. The stakes were of a cream coloured deciduous wood of the *prunus* group. It is likely that the wood for the stakes was locally cut hedging or orchard material. The willow may have been specially grown not far away but was perhaps most likely to have been from local pollarded willows growing on the banks of nearby watercourses. This pattern of use of

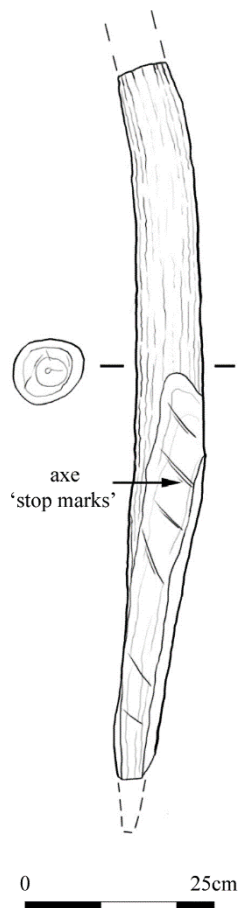


Fig 66. Fruit wood (*prunus*) stake [1018], with 2 faceted point and 70mm axe 'stop marks'

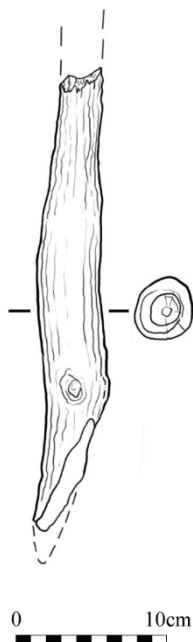


Fig 67. Roundwood stake with a chisel point from [2103]

apparently local mixed species roundwood for simply made, woven *in situ* wattle was also found in some wattle structures on the Fleet Valley Project, particularly site PWB88 c.10m south of Caroone House (Initial work by the late H. Hibberd, in Fleet Valley Archive). This type of wattlework could be made by any only slightly skilled adult or youth.

The stakes had both 'pencil type' and double faceted points cut with a small axe with a small fairly straight blade at least 70mm wide (Fig 67).

Phase 3 Wattle Structure [1326]

This N-S wattlework ditch revetment had stakes of c.90mm diameter of non-oak cream coloured deciduous wood of the *prunus* group. The tips were mainly axe cut pencil type points. The rods [1317] were c.15–40mm diameter, and were a mix of willow and oak. The appearance of this wattle work and its stratigraphic associations suggests it was a continuation of Structure [1019]. The species used for the stakes and rods was also the same distinctive range, confirming that it was very likely to be the same build as Structure [1019]. Again the weave was of simple plain weave type.

Phase 4 Wattle Structure [2710]

This E-W wattle structure was distinctive in that it had closely set, very large roundwood stakes mainly of oak poles, c.90–120mm diameter combined with some that have been identified as of the apple family (Austin 2008) but the weavers were very small diameter c.10 to 18mm in diameter of oak and willow (Fig 9). This structure looked strangely out of proportion in plan and elevation. The stakes mainly had pencil form points such as [2717] or [2719] cut with a small axe (Fig 68). The weavers had simple chisel type cut ends formed of one facet and no doubt cut with one or two blows of a billhook or small axe. It appears that at least some of the small weavers were woven in pairs rather than singly as shown in the elevation which is much more time efficient when using small rods. The pressure to beat an incoming tide may have been important here.

Other Examples of Phase 3 or 4 Wattle and Small Roundwood Material

Some of the concentrations of roundwood uncovered were less coherent than the key groups described above such as the probable disturbed remains of a wattle fence [1423]. In one case [1430] (also possibly [1023] 'withies no posts') the group of rods contained no uprights and were laid in the base of a drain or water channel. This is reminiscent of the traditional practice of lining field drains with brushwood or faggots. At the City waterfront site at Vintry House, Vintner's Place (VRY 89) large faggots or 'fascines' were incorporated into a late-Saxon earth and timber waterfront embankment (Goodburn 1990).

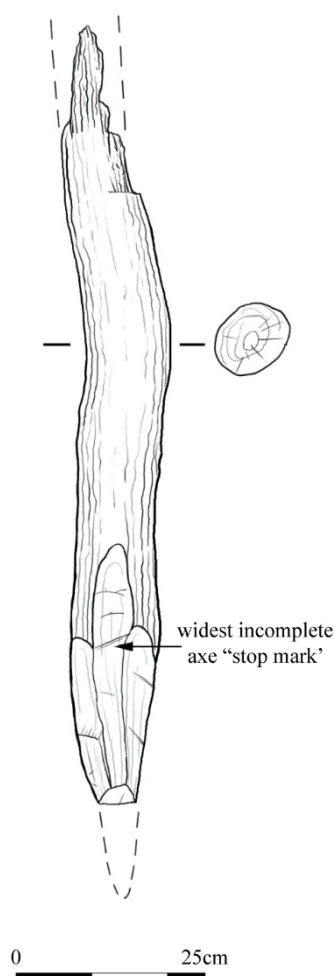


Fig 68. Oak roundwood stake [2719] with a pencil point

Phase 4 Building 1 piled foundations

Timber group [3434] represented part of the truncated piled foundation for a substantial masonry structure (Fig 10). The mass of fairly closely set piles seems to have been driven in relatively regular rows aligned north-south and east-west *c.*300–450mm apart. This technique was used from the Roman period to enable substantial masonry foundations to be constructed on wet ground. None of these timbers were suitable for tree-ring dating, but broader C14 dating of a pile with sapwood [3429] provided a date range of Norman or slightly later (cal AD 1020–1210) (Table 1).

The oak piles were not large and ranged in size between rectangular sections of *c.*180 x 170mm [3413] to *c.* 100mm diameter [3433]. They also varied from whole round logs only missing their bark to roughly square hewn boxed heart examples, and rectangular sections from cleft beams to plank-like cleft sections, *eg* [3401]. The majority seem to have been hewn from small oak logs to a boxed heart cross section using axes, *c.*60% with most of the rest being round whole logs, with a few examples cleft and hewn from much larger logs, *eg* [3406] and [3401], and one boxed halved example [3414]. None of the piles survived longer than 1.13m long, *eg* [3438], most were much more truncated by later activities presumably removing the masonry that

once lay above them. Due to their moderate size only a relatively small pile-driving ram would have been needed to drive in these piles and it could have been operated by quite a small team of less than five people.

The pile tips were hewn to a generally square cross section without arisssed corners with thin bladed axes well over 100mm wide. If the same type of axe was used to sharpen all pile tips it must have had a slightly curved thin blade *c.*130–150mm wide. The ridges left by nicks in the blades of the tools (signature marks) were preserved in some cases on the very tips, but no clear matches were found. Axe stop marks such as these are not wholly diagnostic as they have been found on both Roman and Norman to Angevin (late 11th–13th century) woodwork in London. The use of reasonably rectangular section timbers has so far been found to be common in London from the end of the Norman period around 1130s–40s onward but very rare in Saxon or early Norman work (Bowsher *et al* 2007, 307–13; Goodburn 1997; Goodburn 2007b, 307–9). Milne 1992).

The General Character of the Parent Trees

Most of the parent trees appear to have been fairly fast grown young oaks with under 35 annual rings. These trees probably grew in relatively open managed woodland, in one case [3436] a fairly straight branch from a larger tree was used. The radially cleft material was from much larger, older oaks growing more slowly and was probably derived from wildwood type woodland on a fairly fertile site. The last timbers from woodland of this type in the South-East of England have been found in London dating to the 12th to mid-13th centuries when managed woodland products and imported material dominates (Goodburn 1998). In the case of boxed heart pile [3438] the timber had a double heart showing that a Y crotch had been hewn away at one end indicating an attempt to maximise the production of timber from an irregular crown log. The general impression is of mixed origin materials being assembled with relatively little use of timber from large trees and an eye to economy. Some of the timber from large trees was probably reused.

A Selection of the Timbers from the Building 1 Piled Foundation [3434]

Round Log Pile [3400]

This pile was hewn from a small fast grown log only 110mm diameter under the bark, which seems to have been removed. It survived 0.63m long and was only hewn to form a square section tip leaving incomplete axe stop marks 80mm wide (Fig 69a). Many others in the group such as piles [3432] and [3404] were similar.

Boxed Heart Pile [3429]

This pile was roughly hewn to a sub square cross section with a square section tip. The tip had clear slightly curved axe stop marks 110mm wide which were not

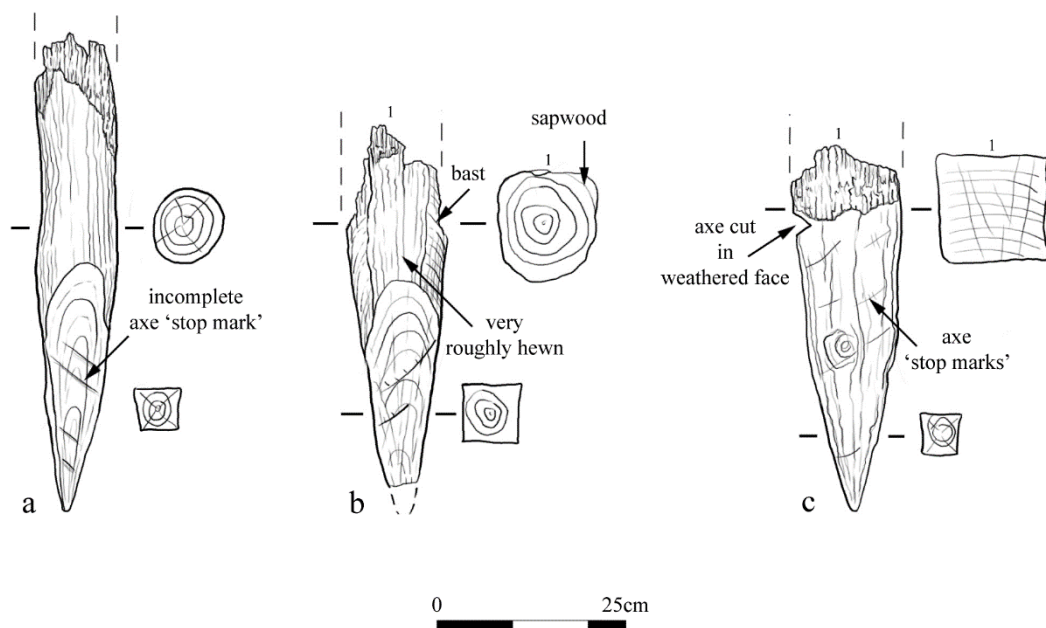


Fig 69. Sample piles from foundation [3434]: (a) round oak log pile [3400]; (b) boxed heart oak pile [3429]; (c) oak pile radially then tangentially cleft [3406]

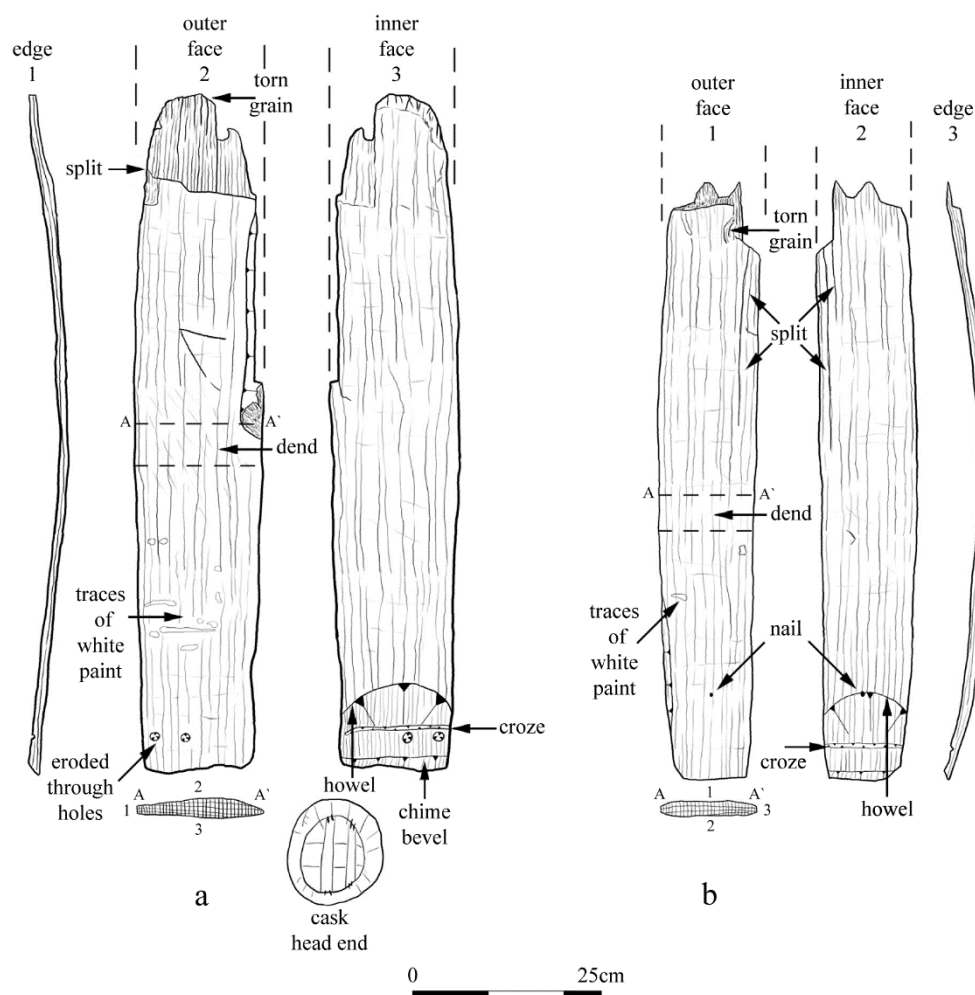


Fig 70. Two typical radially cleft oak staves from re-used coopered cask [2914]

quite complete. The parent tree was very fast grown and only 32 annual rings could be seen. The pile survived 0.48m long 150mm wide by 130mm thick with some machine damage (Fig 69b). This pile was sampled for Species ID as it had very faint medullary rays for oak and

was initially unidentified but it was botanically identified as oak and then the younger outside surface was used for C14 dating producing a Norman to early 13th-century date (see above).

Cleft Oak Pile [3406]

This pile was heavily truncated at only 0.48m long by 160mm wide by 150mm thick. It had a rectangular cross section achieved by splitting, 'cleaving' first radially then tangentially followed by a little axe trimming (Fig 65c). This was a common method of foundation pile production in Roman London and was also used again in the 12th and early 13th centuries (Goodburn 1992, 122; 2005). The weathered surfaces and small axe marks suggest that the timber may have been cleft and hewn out of a beam which had been used already. Similar weathering and a relict axe cut notch also occurs in the other cleft piles [3401] and [3413] which may also derive from reworking old straight grained timber.

Phase 6 Two Late Medieval Casks Reused as a Well Lining

This truncated well located along the southern side of Fleet Lane was lined with two superimposed reused casks or large barrels (Fig 13). Other examples of this practice were recorded during the Fleet Valley Project (Goodburn & Allen in the Fleet Valley Archive)

Upper Cask [2914]

Seven staves were lifted and tree-ring sampled and two of these were drawn in detail. The raw material was slow

grown radially cleft oak with some staves surviving up to 0.9m long. They were 20–25mm thick with a croze, howel and chime at the lower end (Kilby 1995). Although all the staves were washed off-site no clear cooper's marks were found. Some staves had traces of occasional iron nail holes, probably for securing secondary hoops for reuse, and peg holes at the ends which seem to have been used to retain cross pieces strengthening the heading (Fig 70) No heading boards or hoops remained *in situ*.

Lower Cask [2945]

Two staves were also lifted from a similar reused cask [2945] which survived 0.75m high. The oak staves were similar to the above but lighter and of fast grown oak. The radially cleft example was *c.* 11mm thick, and the other tangentially faced was *c.* 20mm thick. Both were rather abraded and had too few rings to warrant tree-ring sampling.

Phase 8 Timber Structures Within the Cellars of Building 7

Within these cellars were various timber structures including, stairs, partition type features, and support posts for ground floor framing (Fig 18). Much of this material was destroyed by the 1666 Great Fire.

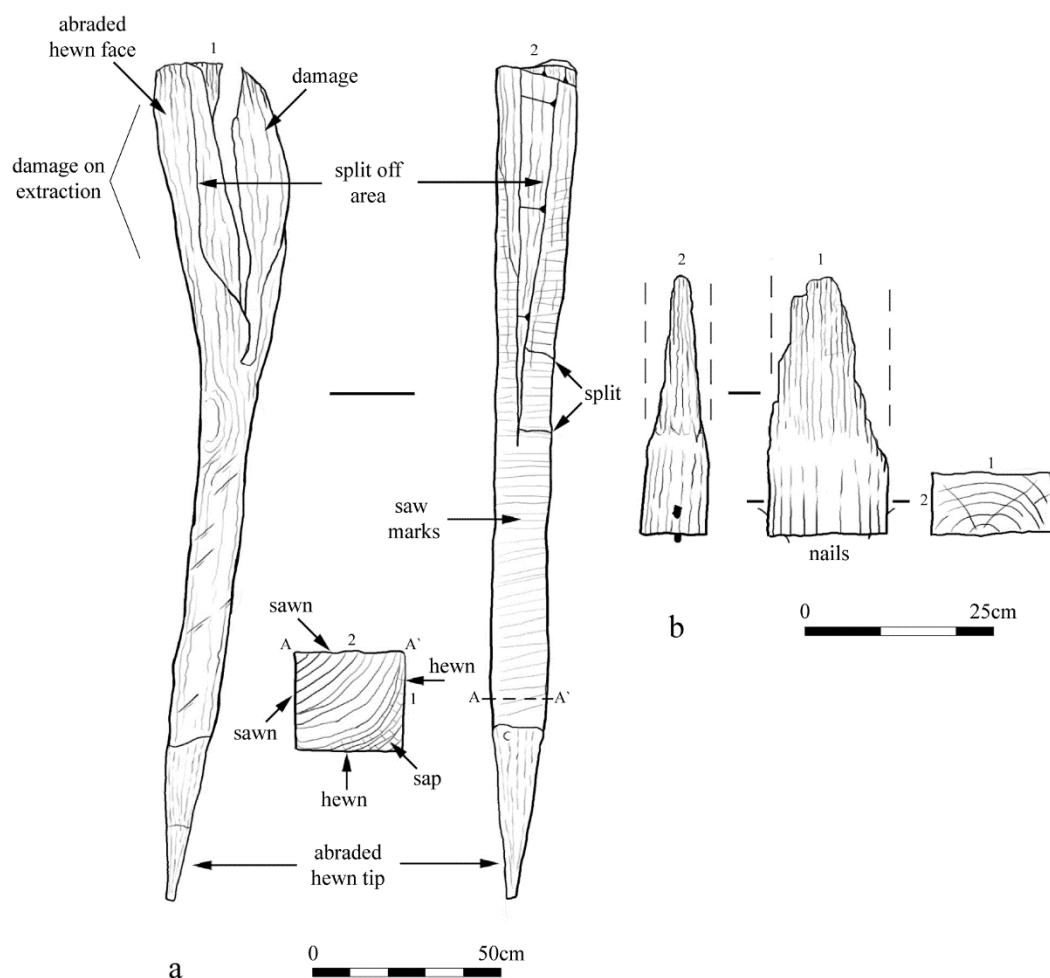


Fig 71. Post-medieval and recent timber wrights: (a) large 19th-century boxed hearted sawn pine pile [1646]; (b) small tosh nailed oak post [1244] from a 17th-century cellar



0 5cm

Fig 72. (above) turned wooden bowl SF <170> [3104]; (opposite) flattened turned bowl SF <249> [2924]



0 5cm



Ground Floor Support Structure [1243]

This structure was made of fast grown oak timber sawn from hewn baulks (timbers had too few rings for tree-ring work). The use of such fast grown oak derived from open grown farmland trees is common place in London in the 16th and 17th centuries. Structure [1264] principally comprised the decayed stubs of 2 rectangular posts [1244] and [1247] these were 'tosh nailed' to oak off-cut pads. The posts were c.160 x 90mm and survived c.0.34m tall (Fig 71b). Given time and decay ground floor frames often sag requiring localised propping up by such posts which was their likely function, although another might have been as supports for a stair out of the cellar.

Partition Structure [1264]

The oak posts of this partitioning structure were made from thick pit sawn slabs with some sapwood left *eg* [1254]. They were rectangular sections c.110 x 75mm and survived up to 0.3m high. Most of the boards used were light radially cleft oak, some with relict or in use nail holes *eg* [1253] and [1261]. It is likely that these were reused or stock weather boards which were later made by sawing rather than cleaving. Plank fragment [1260] was a sawn elm board. The slow grown oak

boards were sampled for tree-ring study but the fast grown posts had too few rings for such purposes.

Partitions like these in a cellar situation may well have been for storage bins and racks. The lack of use of cheap imported pine is typical of London construction before the end of the 17th century when the softwood timber trade became much larger with the exceptional demand for rebuilding after the fire.

Woodwork in the Backfill of the Cellars

A number of items of woodwork were found in cellar back-fill deposits such as [1233] most were non-structural off cuts *etc*, but one item numbered [1233] was a crudely tenoned and morticed oak beam end.

Phase 11 Softwood Piled Foundation

A group of softwood (probably 'Scots pine') piles were exposed which have been dated on stratigraphic grounds to the late 18th to earlier 19th centuries, Structure [1664]. One was lifted and recorded in detail [1646] it was 2.22m long and 150 x 145mm in scantling. The axe and saw marks clearly showed that it had been pit-sawn out of an axe hewn baulk, probably of Scandinavian or Baltic origin leaving a box ¼ section

(Fig 71a). This raw material contrasts with the oak used earlier.

A Turned Wooden Bowl [2924]

The remains of a squashed wooden bowl (SF <249>) were found within the backfill of a barrel well dated 1400–1500 (Fig 72). The bowl was *c.*190mm diameter as found flattened out. It appeared to be of ash although it was much stained. Ash was a wood commonly used in medieval bowl turning. The bowl was finely and very smoothly turned leaving walls *c.*5mm thick. The foot did not protrude and bore the mark of a small lathe centre. Together with the bowl a turned disk of similarly finished wood was found *c.*80mm diameter and 5mm thick. It is uncertain what it was, perhaps a broken of bowl foot, lathe core fragment or thin pot lid? Small wooden bowls were commonly used throughout the medieval and Tudor period and London has an unusually large corpus of them (Wood 2005).

THE ANIMAL BONES

Kevin Rielly with Lisa Yeomans

Introduction

The recovery of the faunal material during the excavation was principally by hand, although a number of bulk samples were taken from a variety of deposits (Yeomans 2007). With the exception of a selection of deposits from the earliest levels, most of the bone was well preserved and only minimally fragmented. The waterlogging of many medieval deposits provided an extremely good preservation medium. All the collected faunal material, with the exception of the fish bones (see below) were recorded onto an animal bone database using Microsoft Access. The tooth

eruption/wear uses the method devised by Grant (1975; 1982), while the measurements are essentially taken from von den Driesch (1976). Measurable bones essentially include the majority that can be classed as deriving from an adult individual. This includes complete limb bones, mandibles where the adult third molar is in wear and various limb bones with fused intermediate and/or late epiphyses *eg* distal tibia and proximal femur respectively. Approximate ages for the tooth eruption and epiphyses fusion sequences are taken from Schmid (1972, 75, 77) and Amorosi (1989, 98, 99). Recording was essentially limited to those bones that could be identified to species, excluding most vertebrae and ribs, although notes were taken of the presence of such parts if associated with a partial or complete skeleton.

The site provided a grand total of 3,397 bones by hand recovery and 77 from the soil samples (see Tables 13, 14).

Description of the Animal Bones

Roman

The Roman assemblage, all derived from alluvial deposits alongside the Fleet, is rather small and is certainly less well preserved in comparison to the later collections. This may account, at least in part, for the abundance of cattle relative to sheep and pig bones (see Table 13; Fig 73), where the bones of cattle tend to survive better than those of the smaller domesticates in adverse conditions. However, similar cattle dominated collections have been found at several contemporary sites within the Roman city (see Rielly 2006, 114), perhaps suggesting that the Carroone House domesticated abundance is merely following a general trend rather than illustrating a preservation bias.

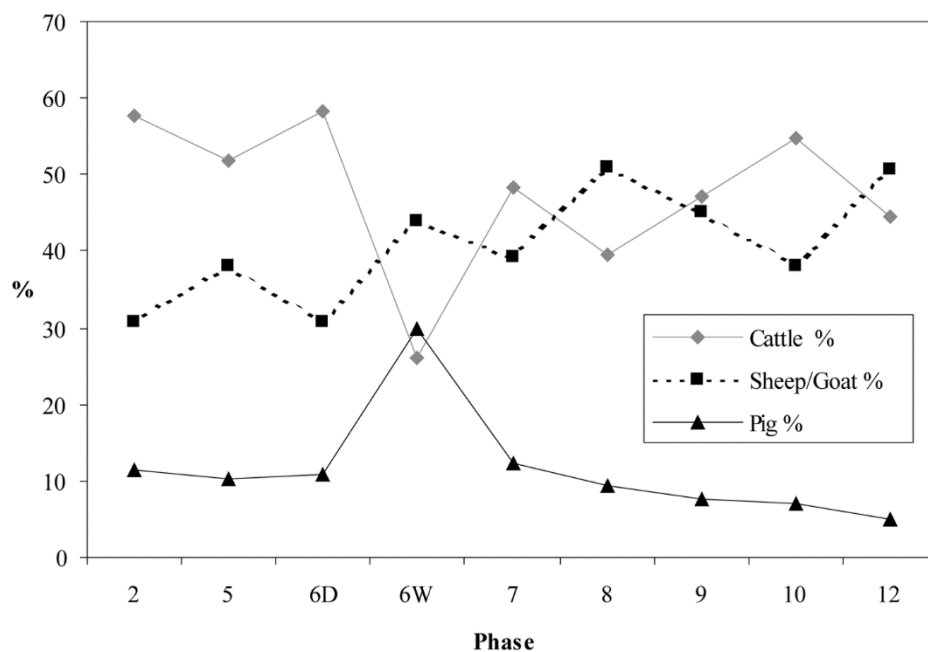


Fig 73. Percentage representation of the major domesticates throughout the occupation sequence

Table 12. Distribution of hand collected bones within the occupation phases using total number of fragments, with Phase 6 divided into dumps (6D) and well fills (6W)

Species/Species group	1	2	3	4	5	6D	6W	7	8	9	10	11	12
Cattle	2	60	43	4	178	76	13	117	277	74	78	1	64
Cattle-size	4	49	3	1	78	6	1	26	183	22	14		20
Equid	0	12	3	0	12	3		3	4	5	3	0	4
Sheep/Goat	3	21	10	4	75	27	10	32	217	29	28		44
Sheep	3	11	4		53	13	12	62	143	39	25		29
Goat			1		3			1	1	3	1		2
Pig	1	12	11	5	35	14	15	30	60	12	10		7
Sheep-size	2	11	3	0	40	5	13	12	301	8	20	0	17
Red deer					2			2	1	1			
Red/Fallow deer									1				1
Fallow deer								1	2				
Roe deer										2			
Hare					2	1	1	1	3	3	3		1
Rabbit									27				
Dog	4	3	5	4	18	1	1	3	27		21		2
Fox									1		5		
Cat		1			3			2	24	1	5		1
Small mammal					3				6		10		3
Rat									1				
Small rodent									1				
Chicken	1	1	1		7	4	30	7	29	9	2		2
Bantam					2					2			
Chicken-size					2	1	1		2				1
Goose			3		16		10	6	11		5		11
Duck							2		2	2	1		
Cormorant										1			
Teal							1						
Partridge					1				1				
Pheasant							1						
Lapwing									1				
Snipe						1							
Woodcock							1						
Spurdog			1										
Conger eel							1						
Large gadid							1		3				
Cod					1		1						
Mackerel									2				
Flounder							1						
Plaice									1				
Grand Total	20	181	88	18	531	152	116	305	1332	213	231	1	209

It can be supposed that this part of the Fleet was used for general waste disposal at this time. A noticeable concentration of head and foot bones amongst the sheep/goat assemblage would suggest that some of this waste was derived from a butcher's establishment or market.

Also of interest is the relatively good representation of horse remains, which can be compared to similar collections found at other peripheral sites, situated beyond the city boundaries, often associated with cemeteries (see Barber & Bowsher 2000, 79).

Medieval

Small collections of animal bones dating to the earliest medieval phases (3 and 4) are followed by more substantial quantities essentially arising from extensive dump levels in phase 5 and then from further dumps as well as the fills of a well in phase 6. Of major interest is the association of these various assemblages with the Fleet Prison. The phase 5 dumps represent consolidation of the area prior to the prison construction whilst the phase 6 dumps located outside the prison compound in the northwestern and northern parts of the site respectively, are clearly contemporary

Table 13. Distribution of sieved bones within phases 5, 6 and 8 using total number of fragments

Species/Species group	5	6	8
Cattle		2	
Cattle-size	1	1	3
Sheep/Goat		3	2
Pig			1
Sheep-size		5	4
Rabbit		1	
Small mammal	1	1	
Small rodent		1	
Chicken	1	1	1
Chicken-size		7	
Goose		2	
Teal	1		
Thrush	1		
Crow		1	
Freshwater eel	1	1	
Herring	9	2	
cf Twaite shad		1	
Pike	1		
Whiting	2	7	
Small gadid	3		
cf Gurnard		1	
Mackerel	2		
Plaice	2	3	
Flatfish cf plaice	1		
Grand Total	26	40	11
<i>No. of samples with bones</i>	<i>3</i>	<i>2</i>	<i>1</i>

with its early use. The possibility of the inclusion of food waste derived from the prison may be shown by differences in the constituent parts of the relevant collections. However, the identification of any changes in meat usage by phase 6 must also take into account notable differences between the dump and well fill assemblages in this later phase as well as a continuation of specialist waste disposal. The dump levels in each phase provided a wealth of cattle bones (Table 13), which were very largely composed of head and foot parts, with a considerable proportion of horncores (Table 15), suggesting the deposition of butchers as well as industrial waste within these levels (and see Hornworking industry). It is difficult to ascertain the contribution made by cattle food waste in these dump levels but it is certain that cattle provided a far smaller contribution to the meat diet than is suggested by their relative abundance based on fragment counts. The well fill assemblages can be described as typical domestic waste and here there is a greater proportion of sheep and pig (Table 13; Fig 73). However, these fills also provided a notably larger collection of poultry and a generally wider diversity of food species. This may also include fish, except that the phase 6 sieved collection is entirely derived from the well fills and the fact that fishbones were retrieved from the sieved phase 5 dumps (see Table 13). There is no obvious difference regarding the age groups of the major domesticates from the various phase 6 deposits (hence the combination of data in Table 14), however, there is undoubtedly a greater proportion of adult cattle and sheep in phase 5 relative to phase 6 (based on the proportion of fused intermediate epiphyses), as well as a more substantial survival of old adult cattle in phase 5

(the proportion of fused Late epiphyses). The pigs, on the other hand, are almost entirely represented by subadult individuals. As age is related to meat quality, it follows that the phase 6 dumps contained a better representation of good quality meat, referring to mutton and in particular of beef. It is difficult to relate any of this evidence to the noted change in site usage, especially as it cannot be supposed that the prison diet contained good quality and diverse meats. A large part of the phase 5 and 6 assemblages clearly derived from some external source, butchers and industrial centres. It can be suggested that much of the domestic waste was also derived externally, with that from the wells possibly arising from some local high status household or eating-house.

Table 14. Distribution of cattle and sheep/goat age groups in the medieval phases

Species	Phase	Juvenile	Early		Intermediate		Late	
			%F	N	%F	N	%F	N
Cattle	5	1	85.7	21	70.0	20	65.2	23
	6	1	76.9	13	75.0	4	55.6	9
	7		81.8	11	86.7	15	61.5	13
	8 (B2+5)	9	78.1	32	47.4	19	43.8	32
	8	29	64.7	17	33.3	6	23.5	17
	(Drain)							
	9	2	100.0	10	62.5	8	61.5	13
	10	1	50.0	8	100.0	1	31.3	16
	12	1	93.3	15	66.7	3	85.7	7
	5		84.6	13	86.4	22	53.8	13
	6		84.8	33	66.7	6	54.5	11
	7		91.3	23	100.0	9	81.8	11
Sheep/Goat	8 (B2+5)		91.5	94	62.7	51	42.0	69
	8	13	96.6	29	82.6	23	39.3	28
	(Drain)							
	9		87.5	24	76.9	13	40.0	15
	10		94.7	19	77.8	9	42.9	7
	12		90.9	11	62.5	8	57.1	7

Post-Medieval

Substantial bone assemblages were recovered from dumping levels situated in the northwestern and midwestern parts of the site (phase 7), from the fills of a drain beneath the western Fleet Prison wall and from levels and fills associated with Buildings 7, 8 and 11 (phase 8) and Building 16 (phase 9). These buildings were situated to the northwest and northeast of the site respectively, each located beyond the confines of the prison grounds. Phase 9 represents the reuse of this area following the Great Fire of 1666, which destroyed a large number of buildings in this part of London including the prison. The earliest of these three phases provided further deposits of cattle butchers and industrial waste, with another concentration of horncores within the northwestern part of the site (Table 15). The continued use of horncore deposition in this area may be coincidental or it may suggest an accumulation of waste derived from the same workshop(s). There is a notable absence of specialist waste in the phase 8 and 9 assemblages, perhaps signifying a cessation of activity or the dumping of waste materials elsewhere (and see

Table 15. Distribution of features and phases with concentrations of cattle head and foot (H+F) parts using total fragment counts

Phase	Trench/Feature	Head and foot(H+F)	Horncores	N	%H+F
5	7,13	40	16	52	76.9
5	all	98	24	178	55
6	13,15/NW dumps	40	24	54	74
6	10/SW pit, ditch	9	7	10	90
7	14,15/NW dumps	51	22	74	68.9
7	all	78	24	117	66.7
10	5,13/drain, culvert	41	22	78	52.5

Hornworking Industry). The greater proportion of sheep and lesser quantity of cattle within these later two periods relative to phase 7 undoubtedly represent a truer reflection of the dietary contributions of the major domesticates during the early post-medieval period at this site (see Fig 73). There is some variation in domesticate abundance between the phase 8 and 9 assemblages and, within phase 8, between the Buildings 7 and 8 and prison wall drain collections. Each of the latter assemblages provided a similar percentage abundance of the major domesticates (data in Table 16 and combined percentages in Fig 73), although with noticeable differences in the age structures and skeletal representations of the two major dietary components - cattle and sheep/goat. While there is a majority of adult cattle and sheep throughout the phase 8 collections, as noted by the proportion of fused Intermediate and Late epiphyses (see Table 14), younger animals tend to be mainly represented by juveniles from the drain fills and by subadults (unfused Intermediate epiphyses, probably late 1st to 2nd year individuals) from the buildings. The cattle data, and in particular from the drain, may appear to contradict these conclusions (Table 14), however, this can be explained by the widespread distribution of juvenile bones. Subtracting these from the Intermediate and Late epiphyses data from the drain gives figures of 2 fused (N=2) and 4 fused (N=8) respectively. Similarly, the building data transforms to an Intermediate total of 9 (N=15) or 60.0% fused and a Late total of 14 (N=28) or 33.3% fused. Notably, the adult sheep are mainly represented by young adults (subtracting the fused Intermediate from the fused Late totals), with a greater abundance of this age group from the drain collections. The same applies to the adult cattle from the buildings, as suggested by the modified data (see above), while the drain data is too small to suggest any firm conclusions. In terms of food groups, therefore, the building assemblages include a majority of late 1st to 2nd year animals alongside prime beef and mutton (young adults) individuals with some juvenile cattle (probably veal calves), while the drain has mainly mutton and perhaps prime beef, alongside a large proportion of calves (veal) and lambs, with both assemblages featuring a significant quantity of older cattle and sheep.

The skeletal differences between these features include a larger proportion of cattle upper limb parts in the buildings as well as a lesser proportion of head and foot parts (see Table 17), perhaps signifying a greater

use of better quality meats in the buildings. Conversely, while the latter parts are again better represented in the sheep assemblage from the drain, the buildings provided a larger proportion of lower limb parts *ie* lower quality cuts. It is noticeable, in the drain collections, that juvenile bones form the greater proportion of the cattle head and foot parts (discounting phalanges). This may suggest some difference concerning the processing of juvenile as against older animals and/or the relative completeness of the carcasses supplied to the local households/kitchens. It is also possible that the cattle phalanges in the drain may signify something other than processing waste. The jelly provided by cows' feet was a basic ingredient of several recipes at this time, including various savoury and sweet dishes (Wilson 1973, 106). This could have been processed in some of the larger household or eating house kitchens. Perhaps of greater importance is the clearly better representation of cattle- and sheep-size fragments from the drain fills. The great majority of these, 98 of the cattle-size and 255 of the sheep-size bones are vertebrae and ribs, a large proportion of which have been butchered.

Table 16. Distribution of hand collected bones within the major features in phase 8 using total fragment counts

Species/Species group	B7 & B8	B11	D [3105]
Cattle	122	24	99
Cattle-size	38	11	130
Equid	4		
Sheep	69	8	55
Goat	1		
Sheep/Goat	118	11	77
Pig	31	3	18
Sheep-size	19	19	260
Red deer	1		
Red/Fallow deer		1	
Fallow deer	1		1
Hare	3		
Rabbit			27
Dog	26	1	
Cat	8		16
Small mammal	3		3
Rat			1
Small rodent	1		
Chicken	6	2	20
Chicken-size	1	1	
Duck			2
Goose	3	6	2
Partridge			1
Lapwing			1
Small bird	1		
Large gadid	1		2
Mackerel			2
Plaice	1		
Homo	1		
Grand total	459	87	717

Table 17. Distribution of cattle and sheep/goat body parts in Period 8 Building 7 & 8 (B7 & B8) and drain [3105] (D) using total fragment counts

Species: Feature: Body parts	Cattle				Sheep/Goat			
	B7 & B8		D [3105]		B7 & B8		D [3105]	
	%	J	%	J	%	J	%	J
Head	9.0		10.1	6	5.9		18.2	9
Upper limb	36.1	1	23.2	14	40.6	1	40.2	11
Lower limb	22.1	1	16.2	5	32.6		19.7	
Metapodial	9.8	2	5.1	5	15.0		14.4	
Phalanges	8.2		24.2	1	3.2		1.5	
Other	14.8	2	21.2	5	2.7		6.1	1
Total	122	6	99	36	187	1	132	21
% head and feet	27		39.4		24		34	

The combined evidence concerning the age and skeletal distribution data from these phase 8 features is perhaps suggestive of meat preferences rather than any indication of relative wealth. It can be seen that both the buildings and the drain provided quality joints, which in the former is shown by a high proportion of upper limb parts and in the latter by an extensive array of parts from the axial skeleton (cattle- and sheep-size vertebrae and ribs). Otherwise, the age of the majority of the animals represented is clearly indicative of quality meats, which essentially includes all ages up to the older animals, represented by the fused Late epiphyses. The populace of this period had a particular fondness for mutton and prime beef, the city being supplied by cattle from much of England and Wales and sheep from the southern and eastern counties (Rixson 2000, 196–200). The greater proportion of veal calves in the drain may be significant. However, while veal was undoubtedly a quality product, it was probably not amongst the more expensive meats available at this time, as shown by the very large number of veal calves on sale at the London meat markets during the early post-medieval period (Rixson 2000, 172). The drain fills did produce a wider range of food species (see Table 15), including rabbit and a selection of game birds, as lapwing and partridge, as well as more poultry. Both sets of features have provided deer bones, all of which represent food waste, and this species has generally been regarded as food of the gentry, however, poached venison was readily available at this time at London meat markets and eating-houses (Wilson 1973, 108–9). It was mentioned (see above referring to the well from phase 6) that a wider range of meats might signify either high status or waste derived from an eating-house. It is far from conclusive, considering the general evidence, but it is possible that the drain waste derived from a kitchen supplying the inmates of the prison. If this is the case, then obviously the prisoners, or a portion of them, must have partaken of a variety of quality meats, which is perhaps a contradictory statement considering the status of the inmates.

The apparent decline in sheep and increase in cattle food usage by phase 9 could also relate to particular meat preferences of the occupants of the relevant buildings. Notably, these preferences follow the pattern described for the phase 8 buildings with a major usage

of good quality subadult and prime beef/mutton, as well as a continued use, if rather slight, of veal (Table 14). Further similarities to the phase 8 buildings include a relatively wide array of food species, again with the inclusion of deer. The age evidence from phase 7 is rather different, which, while showing some good quality beef, a large proportion of young adults, also displays a sheep mortality profile dominated by old adults. Notwithstanding the presence of deer in this phase, it can be surmised that the phase 7 collection represents food waste from a lower status community compared to that from phases 8 and 9. No obvious differences can be seen regarding the pig mortality patterns throughout these post-medieval phases, which tend to show a wealth of subadults.

Of interest amongst the non-food waste is a single fox foot bone, which may represent furriers waste, following the assumption that pelts were often transferred to the furrier with the feet still attached (see Serjeantson 1989, 130). This was found in a phase 8 deposit, a possible construction level just to the north of the prison building. This phase also provided a number of dog and cat bones, largely recovered from a dump deposit overlying Buildings 7 and 8, representing at least 3 adult dogs and 2 cats (1 juvenile and 1 adult). Both species include a major proportion of foot bones, but without any cut marks, they could just as easily represent redeposited carcasses rather than craft waste. The cormorant from phase 9, recovered from pit [37] associated with Building 11, could also be categorised as non-food waste and should perhaps be seen as an accidental inclusion.

The final phases, dating to the late post-medieval period, provided moderately large bone assemblages from various fills/dumps associated with drain [3016] and culvert [1214] in the northwestern part of the site (Phase 10), as well as from a series of construction cuts including the culvert [119] in the southeastern corner and the cut for a concrete base [21] in the northeastern part (Phase 12). The abundance of cattle in phase 10 and then of sheep in phase 12 are clearly biased by concentrations of butchers' waste, the earlier phase following the previously described cattle assemblages from phases 5, 6 and 7 (Table 15), while phase 12 provided a collection of sheep head and foot parts (48 fragments out of a total of 73 bones). Notably, the phase

10 cattle specialist waste again featured a large proportion of horncores while that representing a large part of the phase 12 sheep assemblage was widely distributed rather than located in specific areas.

In comparison to the previous post-medieval phases, the range of quality meats is again evident from the presence of young adult cattle and sheep, although the former is limited to phase 10, while there is an approximately similar range of food species, including some game and poultry. Clear differences, however, include the presence of far less veal and venison. This evidence could relate to an overall diminishment in the status of the local population, particularly marked by the apparent concentration of beef taken from old adults in phase 12.

Finally, there may be further evidence for furrier activity, with another array of dog and cat bones, although again without cut marks, plus five bones representing the partial remains of a fox. However, the presence of internal parts of the skeleton as well as extremities would perhaps suggest something other than craft waste.

Hornworking Industry

The concentrations of cattle head and foot bones described in the previous sections essentially contained a selection of skull parts including horncores, several clearly cut from the skull, mandibles, metapodials and phalanges (Fig 74). This selection of parts could be interpreted as waste derived from one or more sources, most probably including a butcher's shop/market or some industrial process. Where the entire skull and foot bones are represented, as here, they are more likely to represent butchers' waste *ie* those parts remaining following the dressing of the carcass. However, the large proportion of horncores recovered from most of these specialist waste deposits, the great majority separate from the skull, clearly suggest the admixture of

industrial waste, most probably from a hornworking establishment. Historical evidence based on the Lay Subsidy Rolls dated to the late medieval period, demonstrates that the hornworking industry was largely based within those parishes outside the western wall, with Farringdon clearly of some importance (Yeomans 2006). The industry was largely transferred to the eastern parishes, centred on Petticoat Lane, by the mid-17th century. However, a few hornworkers did remain in this western area. According to the list of the 1641 Horners Company, three horners are mentioned as residing in 'Fleete Streete', two in 'Holbournbridge' and another in 'East Smythfield' (Fisher 1936, 118–19). However, it follows that the movement of the industry may account for the lack of horncore deposits in phases 8 and 9. Their reappearance in phase 10 could relate to the varying fortunes of this industry in the 17th and 18th centuries. This industry underwent a dramatic improvement towards the latter part of the 17th century following the instigation of a scheme to provide the city with street lighting, all of which required horn lantern panes (Fisher 1936; Yeomans 2006). There is a clear increase in the number of horners dating to this period, as shown by parish baptism registers noting father's employment, with particular expansion of the industry from Petticoat Lane into Spitalfields (Yeomans 2006). However, the decline in London's hornworking industry seems to have set in from the mid-18th century, as shown for example in the once thriving Spitalfields area where there isn't a single mention of a horner in the baptism records following 1758 (Yeomans 2006). It can perhaps be assumed that the Farringdon horners may have benefited from the increase in trade related to lantern pane manufacture and then suffered the same level of decline as dramatically illustrated by the Spitalfields parish registers.

The horns used by the Farringdon hornworkers could have been supplied by the various tanyards situated along the Fleete, which in turn were provided

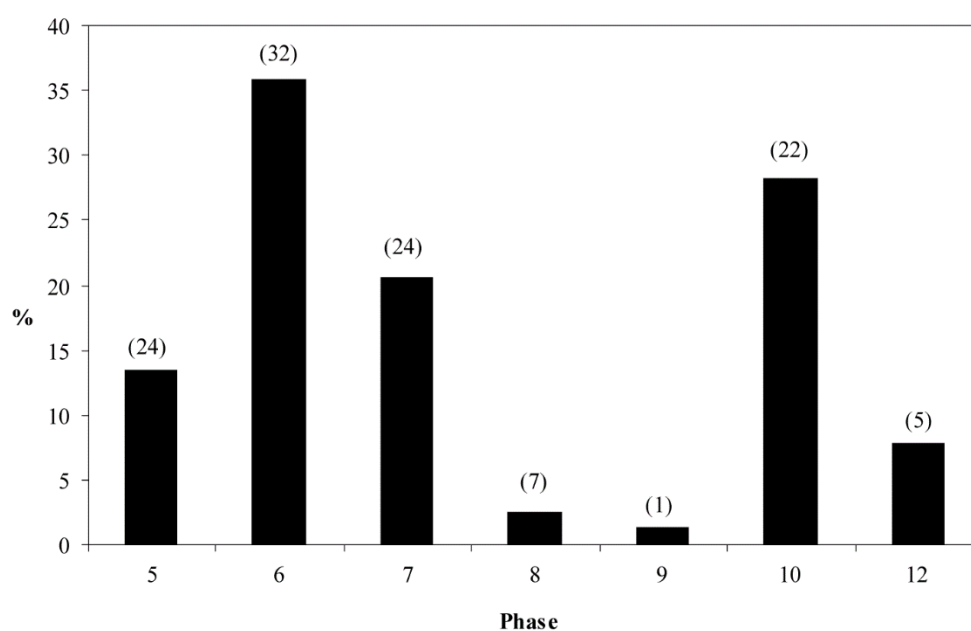


Fig 74. Percentage abundance of cattle horncores within the cattle assemblages from the medieval and post-medieval phases using total fragment counts, with horncore counts given in brackets

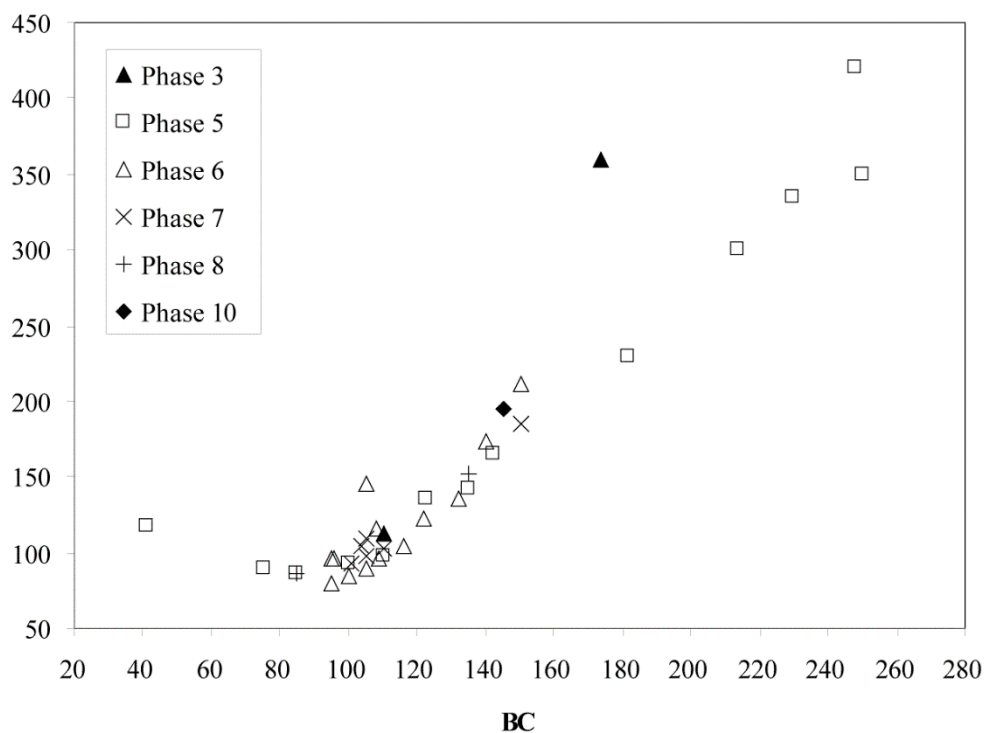


Fig 75. Cattle horncores: length of the outer curvature (LOC) against basal circumference (BC)

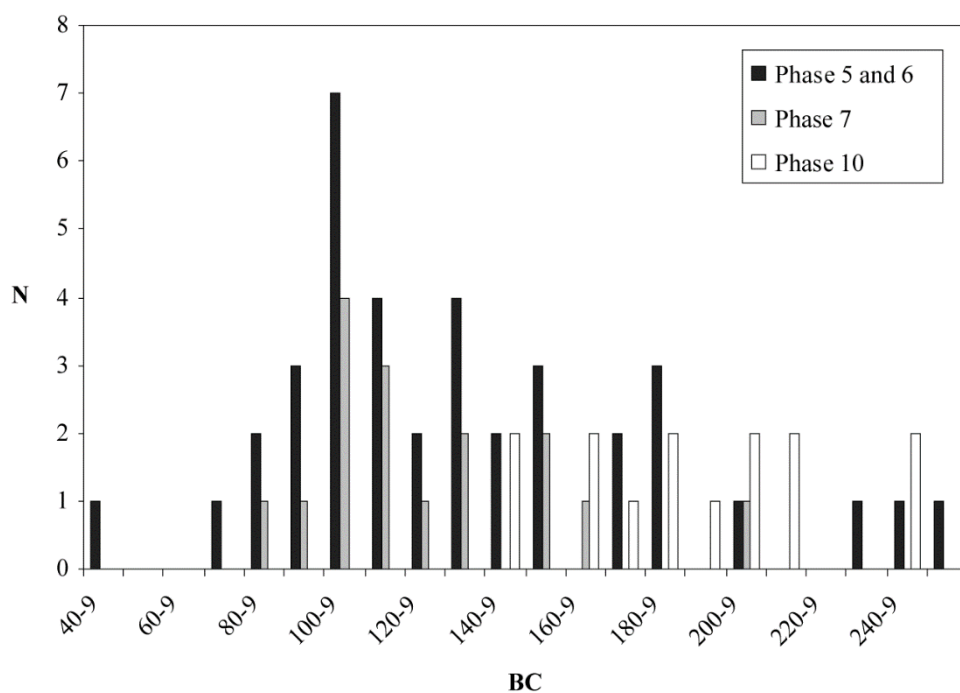


Fig 76. Cattle horncores: basal circumference (BC) in millimetres with N equal to the number of specimens

with skins (with horns still attached) via the various London butchers' establishments and/or slaughterhouses (Serjeantson 1989, 137; Yeomans 2004, 71). A more direct method of provision was undoubtedly enforced upon the hornworkers following the movement of the leather industry south of the river to Bermondsey from the 14th century, probably culminating in the early post-medieval period (Yeomans 2006, 72). It can be assumed that the horns found at this site were ultimately derived via the butchers and slaughterhouses within the northwestern part of the

city, based at St Nicholas Shambles since the early medieval period and continuing well into the post-medieval period alongside Newgate and Smithfield markets (Sabine 1933, 335; Yeomans 2004, 75; Rixson 2000, 210).

An interesting aspect of these horncores is the evidence they can impart concerning the 'types' of cattle exploited. Studies on Roman through to post-medieval horncores have resulted in the definition of general size categories (Armitage & Clutton-Brock 1976 for Roman and medieval; Armitage 1982 for the post-

medieval), based on the length of the outer curvature. Those from Carroone House are chiefly between 90 and 200mm in length (see Fig 75), which places them within the medieval Short and Medium Horned categories, or as post-medieval shorthorns. The remainder are all within the medieval Long Horn category or the post-medieval mediumhorn and longhorn (division at 360mm). It is noticeable that Long Horns appear to be limited to the earliest phases. However, there were also a number of incomplete cores, particularly in phase 10, which could nevertheless provide basal measurements. Comparing the distribution of the basal circumference of the complete and incomplete cores provided a rather different distribution (Fig 76). While the phase 5 to 7 cores tended to follow the length distribution pattern, those from phase 10 are clearly less well distributed and generally larger (phase 5 and 6 with an average of 132.7mm N=33, and phase 10 average of 189.5 N=13). There is the possibility that the phase 10 horncores may contain a higher proportion of oxen, which tend to be larger and which also possess relatively thin walls and thus tend towards a greater level of fragmentation (Armitage 1982). Otherwise, they may illustrate the greater use of Long Horn cattle in London by the 18th century. The evidence from a number of contemporary London sites does appear to show a wealth of the post-medieval medium and longhorn types (West 1995, 27).

ARCHAEOBOTANICAL ANALYSIS

Lisa Gray

INTRODUCTION

This report summarises the findings arising out of the archaeobotanical analysis (charred and waterlogged seeds and wood) undertaken by Quaternary Scientific (QUEST) in connection with the development at Ludgate West/Carroone House, 14 Farringdon Street, City of London (National Grid Reference: TQ 3164 8127; Site Code FAS02). Excavations by Pre-Construct Archaeology Ltd (PCA Ltd) permitted the collection of eighty-eight bulk samples from seven phases representing a variety of features and contexts:

1. Early Roman structures, gravel dumps, channel cuts, ditch cuts, pits, post holes, alluvial deposits, foreshore gravels and hearth waste (phase 2)
2. Saxo-Norman deposits, gravel, ditches, pits and dumps (phase 3)
3. Early Medieval dumps and layers (phase 4)
4. High medieval layers, demolition debris, dumps, ditches, alluvial layers, made ground, build up prior to wall foundation (phase 5)
5. Late medieval dumps and barrel fill (phase 6)
6. Early post-medieval dump layer, and ditch (phase 7)
7. Early-mid 17th century backfills, dump layers, pit fills ground levelling for floors (phase 8)

Utilising the revised research questions proposed by Haslam (2007), the following environmental

archaeological research questions were proposed for the analysis stage:

1. How have local depositional and post-depositional processes and events, natural and cultural, affected the preservation of archaeobotanical remains and hence the interpretation of the environmental archaeological evidence?
2. What was the nature of the economy and environment during the Early Roman period (phase 2) and how does it compare with evidence for cereal utilisation found in association with the milling complex discovered during the Fleet Valley Project?
3. What evidence is there for changing economy and diet during the later phases (phases 3–8)?
4. What evidence is there for wood and fuel wood utilisation?
5. What evidence is there for changing environmental conditions during phases 2–8?
6. What are the implications of the new data for our knowledge and understanding of economy and diet, and the environment, of the Fleet Valley?

Methodology

The bulk samples were processed either by flotation using 1mm and 300µm mesh sieves to recover charred plant remains and charcoal, or wet sieving using 1mm and 300µm mesh sieves to recover waterlogged plant remains. The non-wood plant macrofossils were examined using a binocular stereo-microscope with magnifications of between 10 and 40 times. They were identified as closely as their quality of preservation allowed. Mineralised and charred remains were counted. Waterlogged remains and fragments of unidentifiable grain fragments and flecks (<4mm²) of charcoal were given estimated levels of abundance as follows: + =1–10, ++ =11–50, +++ = 51–150, ++++ = 150–250 and +++++ = >250. Identifications were made using modern reference material (author's own and the European collection at Institute of Archaeology, University College London). Manuals were also used such as Beijerinck 1947; Charles 1984; Hillman *et al* 1996; Cappers *et al* 2006 and Jacomet 2006. Nomenclature has been taken from Stace (1997), and Zohary and Hopf (1994). Scientific names have been given once in brackets and the common name given thereafter. The term 'seed' refers to seeds, fruit stones, nutlets and achenes. Identifications were made to species level where possible and genus and family where diagnostic features were less clear. An identification prefixed 'cf' or '?' has been used where the plant macrofossil closely resembled the species named but the identification was not entirely certain. Most of the waterlogged and charred seeds were well preserved enough to allow full identifications to be made but the charred cereal remains were more difficult to identify due to the low number of grain and chaff fragments. Due to this identifications of the wheat grains and chaff have been made tentatively and mostly to genus.

All of the plant macrofossils here have been analysed using 'habitat and usage' classifications devised by Glynis Jones, Vanessa Straker and Anne Davis in their survey of early medieval plant use in London (Jones *et al* 1990):

A	Weeds of cultivated ground
B	Weeds of waste places and disturbed ground
C	Plants of woods, scrub and hedgerows
D	Grassland plants
E	Plants of damp or marshy land
F	Edible wild plants
G	Medicinal plants
H	Wild plants with other economic uses
I	Cultivated plants

These have formed an overall guide to the taxa in each sample and detailed habitat information has come from the sources cited.

Some identifications of the charcoal and waterlogged woods could only be made to genus because the diagnostic features that distinguish them to species are not visible microscopically. This affects oak (*Quercus* sp) and willow/poplar (*Salix/Populus* sp) (Hather 2000). The waterlogged wood and charcoal was examined using a transmitted light microscope and epiluminating metallurgical microscope both with magnifications ranging from 40x to 100x. Charcoal fragments larger than 4mm² were examined. Fragments larger than this size are easier to break to reveal the cross-sections necessary and allow more diagnostic features to survive (Smart & Hoffman 1988, 178–9). It has also been observed that fragments smaller than 4mm² have a greater chance of being windblown or reworked (Boardman 1995). Each selected fragment was examined under a binocular stereo microscope with magnifications of between 10 and 40 times. At this stage, fragments of oak were removed and remaining fragments were separated into groups based on the pattern of porosity of the transverse section. Identifications of non-oak fragments were made using an epiluminating metallurgical microscope. Charcoal and waterlogged wood were examined using methods outlined in (Hather 2000). Diagnostic features were noted and identifications were made using anatomical guides (Gale & Cutler 2000; Hather 2000; Schoch *et al* 2004) and modern reference material. Identifications were made to species where diagnostic features were clear in all three sections and given possible identifications (eg '?' or 'cf') where one section was not clear.

Full sample contents are listed in Tables 18–24. Waterlogged wood analysis results are listed in Table 25 and the results of the charcoal analysis in Table 26.

Results

Type and Quality of Preservation

Plant macrofossils were preserved by charring and waterlogging, with waterlogging being the most frequent mode in all samples. Preservation of these remains was mostly good with many identifications

made to species. Anoxic conditions such as those found in the bottom of a ditch or muddy riverbank, create conditions where organic material is preserved. This is because the normal processes of decay are inhibited due to the lack of aerobic conditions (Jones 2002). Charring occurs when plant material is exposed to fires with high temperatures but with little oxygen, which results in the organic material being charred rather than burnt to ash (Jones 2002). Stratigraphic integrity seems to have been good, with little evidence for bioturbation by root action or faunal activity. However, taphonomic processes may still have had an effect on the composition of the samples, including movement of plant macrofossils by water and human activity *eg* backfilling of later features with material from earlier periods. Differential preservation does not appear to be significant in these samples with fragile seeds having survived in most samples across all periods. Samples exhibiting apparent differential preservation are highlighted.

In an area so close to a tidal river, fluctuations in water level will occur and, as a result, levels of waterlogging, would have had a significant effect on the quality of survival of any plant macrofossils. During analysis of the plant macrofossils from Southwark and Lambeth, Tyers observed that if samples were dominated by seeds with hard testas, such as elderberry (*Sambucus nigra* L) and bramble (*Rubus fruticosus* sens lat) it was likely that they came from deposits close enough to the water table to allow them to survive but aerobic enough to mean that more fragile plant material had decayed (Tyers 1988). This was also observed in de Moulins' analysis of the plant macrofossils from the Upper Walbrook, east of the Fleet Valley, where she noted that repeated wetting and drying of sediments would destroy more fragile seeds (de Moulins 1990). Many episodes of flooding and tidal regression were observed during the excavation (Haslam 2007). The plant macrofossils do appear to show a general trend towards drier conditions from the Saxo-Norman to the medieval period onwards and the importance of this will be considered below.

Water flea eggs (*Daphnia*) were present in samples from phases 2, 3 and 5. Most were observed in samples from phase 2. These eggs tend to be produced at times of environmental stress (Sarmaja-Korjonen 2003), such as the drying up of a pond or ditch and would have been present in water and sediments associated with the River Fleet.

Phase 2: Early Roman (AD 43–200) (Tables 18, 19)

These samples were taken from deposits associated with the foreshore along the eastern bank of the River Fleet (Haslam 2006). Charred remains consisted of charcoal fragments and low numbers of chaff, grain fragments and seeds. Three wheat (*Triticum* sp) glumes were found in samples <272> and <293>. These resembled those found with spelt wheat (*Triticum spelta* L) but no grains resembling spelt were recovered so it was difficult to make a definite identification. More poorly preserved wheat glumes were observed in sample <225>. One fragment of oat (*Avena* sp) grain was present in sample <104>.

Table 18. Plant macrofossils in Phase 2: Early Roman (AD 43–200)

		Feature no.		[1024]	[1041]	[1041]	[2114]	[2731]	NA
		Feature description		gravel dump	tertiary fill of channel	secondary fill of channel	fill of channel	peat within channel fill ditch/channel cut	dark brownish grey layer
		Context no.		(1025)	(1033)	(1040)	(2108)	(2711)	(2115)
		Sample no.		<104>	<117>	<126>	<214>	<352>	<225>
		Flot volume (approximate)		100	100	450	50	900	2800
Scientific name	Common name	Item	Habitat & use codes						
Charred remains									
<i>Triticum</i> sp	wheat	grain	FI		-	-	-	-	-
<i>Avena</i> sp	oat	grain fragments	AFI		1	-	-	-	-
Poaceae indet.	grass	seed	ABCDEFHI		-	-	-	-	-
Indeterminate		wood flecks (<4mm ²)	-		++++	+++	-	+++	-
Waterlogged remains									
<i>Ranunculus/Acris/Bulbosus/Repens</i>	buttercup	seed	ABCDEG		+	+	-	+	-
<i>Ranunculus sardous</i> Crantz	hairy buttercup	seed	ABE		+	-	-	-	-
<i>Ranunculus flammula</i> L.	lesser spearwort	seed	EG		+	-	+	-	-
<i>Ranunculus sceleratus</i> L.	celery-leaved crowfoot	seed fragments	E		+	+	-	++	-
<i>Ranunculus</i> subgen. <i>Batrachium</i> (DC) A	crowfoot	seed	E		-	-	-	+	-
<i>Papaver</i> cf <i>somniferum</i> L.	opium poppy	seed	BGHI		-	+	-	-	-
cf <i>Rumex</i> sp	dock	seed	ABCDEFGF		-	+	-	-	-
<i>Rumex</i> sp	dock	seed	ABCDEFGF		+	-	+	-	-
<i>Cerastium</i> sp	mouse-ear chickweed	seed	ABD		-	+++	++	+	-
<i>Stellaria media</i> (L.) Vill	chickweed	seed	AB		-	+	-	-	-
<i>Stellaria graminea</i> L.	lesser stitchwort	seed	CD		+	-	+	-	-
<i>Chenopodium album</i> L.	fat hen	seed	ABFH		+	-	+	+	-
<i>Atriplex hastata/patula</i>	spearleaved/common orache	seed	ABFGH		-	+	-	-	-
<i>Atriplex patula</i> L.	common orache	seed	ABFGH		-	-	-	-	-
<i>Chenopodium/Atriplex</i> sp	goosefoots/orache	seed	ABFGH		++	-	-	-	-
<i>Rubus fruticosus</i> sens Lat	blackberry	seed	CFGH		+	++	-	-	+
<i>Rubus fruticosus</i> sens Lat	blackberry	seed fragments	CFGH		-	+	-	-	-
<i>Rosa</i> sp	rose	thorn	CGI		-	+	+	-	-
<i>Prunus spinosa</i> L.	sloe/blackthorn	seed	CFG		-	-	-	-	-
<i>Oenanthe pimpinelloides</i> L.	dropwort	seed	DE		-	+	-	-	-
<i>Conium maculatum</i> L.	hemlock	seed	CEG		+	-	-	-	+
<i>Conium maculatum</i> L.	hemlock	seed fragments	CEG		+	-	-	-	+
<i>Apium</i> cf <i>nodiflorum</i>	fool's watercress	seed	E		+	++	++	-	+
Apiaceae	carrot family indeterminate	seed	-		-	+	-	-	-
<i>Bryonia dioica</i> Jacq	bryony	seed	CG		-	-	-	-	-
<i>Polygonum aviculare</i> L.	knotgrass	seed	ABG		+	-	+	-	-
<i>Polygonum persicaria</i> L.	persicaria	seed	ABEH		+	+	-	-	-
<i>Polygonum hydropiper</i> L.	water pepper	seed	E		+	+	+	+	-
<i>Polygonum hydropiper</i> L.	water pepper	seed fragments	E		-	-	-	+	-
<i>Rumex acetosella</i> L.	sheep's sorrel	seed	AD		+	-	-	-	-
<i>Rumex obtusifolius</i> L.	broad-leaved dock	seed	BC		-	-	-	-	-
<i>Rumex crispus</i> L.	curled dock bract	seed	BC		-	-	++	-	-
<i>Rumex</i> cf <i>Crispus</i> L.	curled dock bract	seed	BC		-	-	-	-	-
<i>Rumex acetosa/crispus/obtusifolius</i>	dock	seed	ABCD		-	+	-	-	-
<i>Urtica urens</i> L.	small nettle	seed	AB		-	-	+	-	-
<i>Urtica dioica</i> L.	stinging nettle	seed	BCDEFGH		+	-	+	++	-
<i>Ficus carica</i> L.	fig	seed	FI		+	-	-	-	-
<i>Corylus avellana</i> L.	hazel	shell fragment/s	CF		+	-	-	-	-
<i>Solanum nigrum</i> L.	black nightshade	seed	BF		+	+	+	-	-
<i>Verbena officinalis</i> L.	vervain	seed	BG		-	-	-	-	-
<i>Lycopus europaeus</i> L.	gypsywort	seed	EH		-	++	+	-	-
<i>Lycopus europaeus</i> L.	gypsywort	seed fragments	EH		-	+	-	-	+
<i>Stachys</i> cf <i>palustris</i>	marsh woundwort	seed	AE		+	-	-	-	-
<i>Lamium</i> sp	dead-nettle	seed	ABC		-	-	-	-	-
<i>Sambucus nigra</i> L.	elder	seed	BCFGH		+	-	-	-	-
<i>Sambucus nigra</i> L.	elder	seed fragments	BCFGH		+	-	+	+	-
<i>Anthemis cotula</i> L.	stinking mayweed	seed	ABGH		+	-	-	-	-
<i>Anthemis cotula</i> L.	stinking mayweed	seed fragments	ABGH		+	-	-	-	-
<i>Chrysanthemum segetum</i> L.	corn marigold	seed	AHI		+	-	-	-	-

Table 18. (contd)

<i>Chrysanthemum segetum</i> L.	corn marigold	seed fragments	AHI	+	-	-	-	-	-	-
<i>Carduus/Cirsium</i> sp	thistle	seed	ABDEG	-	+	+	-	-	-	-
<i>Lapsana communis</i> L.	nipplewort	seed	BCF	+	-	-	-	-	-	-
<i>Sonchus</i> cf <i>Oleraceus</i>	milk/sow thistle	seed	AB	+	-	-	-	-	-	-
<i>Sonchus asper</i> (L.) Hill	prickly sow thistle	seed	AB	+	+	+	-	-	-	-
<i>Alisma</i> sp	water-plantain	seed	E	-	-	+	-	-	-	-
<i>Juncus</i> sp	rush	seed	ADEH	+	-	+	+	-	-	-
<i>Eleocharis palustris</i> (L.)	common spike-rush	seed	E	+	+	+	+	-	-	+
<i>Carex</i> sp	sedge	seed	CDEH	+	+	+	++	-	-	-
<i>Carex</i> spp	sedges	seed	CDEH	-	-	-	-	-	-	+
Indeterminate		stem/leaf fragments	-	++++	++++	++++	++++	++++	++++	++++
Indeterminate		wood flecks (<4mm ²)	-	++++	++++	++	++	+	+	++
Indeterminate		moss	-	+	-	-	-	-	-	-

Table 19. Plant macrofossils in Phase 2: Early Roman (AD 43–200)

Scientific name	Common name	Item	Habitat & use codes	Feature no.							
				Feature description							
				NA	NA	NA	NA	NA	NA	NA	NA
				Alluvial silts, sands and clays	Alluvial clay	Clay layer	Fluvial sand	Alluvial sand	Foreshore gravel	Roman sandy alluvial deposit	Layer of alluvial silk
				Context no.	(1644)	(1125)	(2122)	(1128)	(1298)	(1645)	(2407)
Sample no.	<251>	<252>	<256>	<257>	<272>	<275>	<293>	<298>			
Flot volume (approximate)	50	50	100	10	100	100	300	350			
Charred remains											
<i>Triticum</i> sp	wheat	glume	FI	-	-	-	-	2	-	1	-
<i>Triticum</i> sp	wheat	grain	FI	-	-	-	-	-	-	-	1
Indeterminate		wood flecks (<4mm ²)	-	++++	++++	-	-	++++	++	++++	+++
Waterlogged remains											
<i>Ranunculus/Acris/Bulbosus/Repens</i>	buttercup	seed	ABCDEG	+	+	-	+	+	+	+	+
<i>Ranunculus sardous</i> Crantz	hairy buttercup	seed	ABE	-	-	-	-	-	-	-	-
<i>Ranunculus</i> cf <i>flammula</i> L.	lesser spearwort	seed	EG	-	-	-	-	-	-	+	-
<i>Ranunculus flammula</i> L.	lesser spearwort	seed	EG	-	-	-	-	-	-	-	+
<i>Ranunculus sceleratus</i> L.	celery-leaved crowfoot	seed fragments	E	+	-	-	-	-	-	+	-
<i>Ranunculus sceleratus</i> L.	celery-leaved crowfoot	seed	E	-	-	+	+	+	+	-	++
<i>Ranunculus</i> subgen. <i>Batrachium</i> (DC)A	crowfoot	seed	E	+	+	-	++	-	-	-	-
<i>Papaver</i> cf <i>somniferum</i> L.	opium poppy	seed	BGHI	+	+	-	+	+	-	-	+
cf <i>Rumex</i> sp	dock	seed	ABCDEFG	-	-	-	-	-	-	-	-
<i>Rumex</i> sp	dock	seed	ABCDEFG	+	-	-	+	-	-	+	-
<i>Viola</i> sp	violet	seed	ABCDG	-	-	-	-	+	-	-	-
<i>Cerastium</i> sp	mouse-ear chickweed	Seed	ABD	-	+	-	-	-	-	-	-
<i>Stellaria graminea</i> L.	lesser stitchwort	seed	CD	-	-	-	+	+	-	-	-
<i>Chenopodium album</i> L.	fat hen	Seed	ABFH	-	+	+	+	+	-	+	-
<i>Chenopodium album</i> L.	fat hen	seed fragments	ABFH	-	-	-	+	-	-	+	-
<i>Chenopodium</i> sp	goosefoot <i>etc.</i>	seed	ABCDFH	-	-	-	-	-	+	-	-
<i>Atriplex hastata/patula</i>	spearleaved/common orache	seed	ABFGH	-	-	-	-	+	-	-	-
<i>Atriplex patula</i> L.	common orache	seed	ABFGH	-	-	-	-	-	-	-	-
<i>Chenopodium/Atriplex</i> sp	goosefoots/orache	seed	ABFGH	+	-	-	-	-	-	-	+
<i>Chenopodium/Atriplex</i> sp	goosefoots/orache	seed fragments	ABFGH	-	-	-	-	+	-	-	-
<i>Malva sylvestris</i> L.	mallow	testa fragment	BF	-	-	-	+	-	-	-	-
<i>Linum</i> sp	flax	seed	ADHI	-	-	-	-	+	-	-	-
<i>Rubus fruticosus</i> sens Lat	blackberry	seed	CFGH	-	+	-	-	+	-	-	-
<i>Rubus fruticosus</i> sens Lat	blackberry	seed fragments	CFGH	-	-	+	+	-	-	-	-
<i>Potentilla erecta</i> (L.) Rausch	tormentil	seed	CDEGH	-	-	-	-	+	-	+	-
<i>Rosa</i> sp	rose	thorn	CGI	-	-	+	+	-	-	-	-
<i>Prunus spinosa</i> L.	sloe/blackthorn	seed	CFG	-	-	-	-	+	-	-	-
<i>Prunus domestica</i> L.	plum/bullace	seed fragments	CFI	-	-	-	-	+	-	-	-
<i>Prunus domestica</i> L.	plum/bullace	seed	CFI	-	+	-	-	+	-	-	-
<i>Conium maculatum</i> L.	hemlock	seed	CEG	-	+	-	+	+	-	-	-
<i>Apium</i> cf <i>nodiflorum</i>	fool's watercress	seed	E	-	-	-	-	+	++	-	++
<i>Bryonia dioica</i> Jacq	bryony	seed	CG	+	-	-	-	-	-	-	-

Table 19. (contd)

<i>Polygonum aviculare</i> L.	knotgrass	seed	ABG	+	-	-	+	+	+	+	+
<i>Polygonum persicaria</i> L.	persicaria	seed	ABEH	-	-	-	-	-	-	-	+
<i>Polygonum hydropiper</i> L.	water pepper	seed	E	+	+	-	+	++	-	-	++
<i>Polygonum hydropiper</i> L.	water pepper	seed fragments	E	+	-	-	-	-	-	+	-
<i>Rumex acetosella</i> L.	sheep's sorrel	seed	AD	-	-	-	-	-	-	-	+
<i>Rumex cf crispus</i> L.	curled dock bract	seed	BC	-	-	-	+	-	-	-	+
<i>Rumex acetosa/crispus/obtusifolius</i>	dock	seed	ABCD	+	++	-	-	+	-	-	-
<i>Urtica urens</i> L.	small nettle	seed	AB	+	-	-	-	-	-	-	-
<i>Urtica dioica</i> L.	stinging nettle	seed	BCDEFGH	+	+	-	+	-	+	+	-
<i>Corylus avellana</i> L.	hazel	shell fragments	CF	-	-	-	-	-	+	-	-
<i>Olea europaea</i> L.	olive	seed	FGHI	-	-	-	-	+	-	-	-
<i>Hyoscyamus niger</i> L.	henbane	seed	BDG	-	-	-	+	+	-	-	-
<i>Solanum nigrum</i> L.	black nightshade	seed	BF	-	+	-	+	+	-	-	-
<i>Verbena officinalis</i> L.	vervain	seed	BG	-	+	-	+	-	-	-	-
<i>Mentha cf aquatica</i>	water mint	seed	E	-	++	+	-	-	-	-	-
<i>Lycopus europaeus</i> L.	gypsywort	seed	EH	-	+	-	+	-	+	+	+
<i>Lycopus europaeus</i>	gypsywort	seed fragments	EH	-	+	-	-	-	+	-	-
<i>Prunella vulgaris</i> L.	self-heal	seed	BCDG	-	-	-	+	-	-	+	+
<i>Stachys cf palustris</i>	marsh woundwort	seed	AE	-	+	-	-	-	-	+	-
<i>Lamium sp</i>	dead-nettle	seed	ABC	-	+	-	-	-	-	-	-
<i>Sambucus nigra</i> L.	elder	seed	BCFGH	+	+	++	+	+	-	-	-
<i>Sambucus nigra</i> L.	elder	seed fragments	BCFGH	+	-	+	-	-	-	-	-
<i>Anthemis cotula</i> L.	stinking mayweed	seed	ABGH	+	-	-	+	-	-	-	-
<i>Anthemis cotula</i> L.	stinking mayweed	seed fragments	ABGH	-	-	-	+	-	-	-	-
<i>Chrysanthemum segetum</i> L.	corn marigold	seed	AHI	+	-	-	-	-	-	-	-
<i>Carduus/Cirsium sp</i>	thistle	seed	ABDEG	-	+	-	-	-	-	-	-
<i>Lapsana communis</i> L.	nipplewort	seed	BCF	-	-	-	-	-	-	-	+
<i>Sonchus asper</i> (L.) Hill	prickly sow thistle	seed	AB	-	+	-	+	-	-	-	-
<i>cf Crepis</i> sp	hawk's beard	seed	BCE	+	-	-	-	-	-	-	-
<i>Alisma</i> sp	water-plantain	seed	E	-	+	-	-	+	-	+	+
<i>Potamogeton</i> sp	pondweed	seed	E	-	-	-	+	-	-	-	-
<i>Juncus</i> sp	rush	seed	ADEH	-	+	-	-	+	-	-	-
<i>Eleocharis palustris</i> (L.)	common spike-rush	seed	E	+	-	-	-	+	-	+	+
<i>Carex</i> sp	sedge	seed	CDEH	-	-	+	-	+	+	-	+
<i>Carex</i> spp	sedges	seed	CDEH	-	+++	-	-	+	-	+	-
Indeterminate	stem/leaf fragments			+++++	++++	+++++	-	+++++	+++++	+++++	+++++
Indeterminate	root/rhizome fragments			-	-		+++++	-	-	-	
Indeterminate	wood flecks (<4mm ²)			+	-	++++	-	-	-	-	+
Indeterminate	moss			-	-	-	-	+	-	+	-

The low quantity of non-charcoal charred plant macrofossils seems to indicate that these samples have not come from features or deposits directly associated with cereal processing or storage. They were found in situations such as layers of alluvial sand, dumps and channel silt. They were probably preserved along with un-charred plant macrofossils as ecofacts deposited by water or with the general accumulation of background plant waste associated with threshing or winnowing.

The charcoal fragments selected from a gravel dump [1024], and two fills from alluvial layers [1027] and [2406] (Table 26) were dominated by oak (*Quercus* sp) and hazel (*Corylus avellana* L.).

Indeterminate stem/leaf fragments were frequent in most samples, with the exception of sample <224> pit fill [2102] and sample <257> taken from fluvial sand. The identifiable waterlogged plant remains were dominated by seeds of buttercup (*Ranunculus acris/repens/bulbosus*), fat hen (*Chenopodium album* L.), stinging nettle (*Urtica dioica* L.), celery-leaved crowfoot (*Ranunculus sceleratus* L.), waterpepper (*Polygonum hydropiper* L.) and common spike-rush (*Eleocharis palustris* (L.)). Celery-leaved crowfoot frequents slow or standing 'mineral-rich water

with a muddy bottom' (Clapham *et al* 1952). Waterpepper and common spike-rush are found in shallow water and damp ground (*ibid*). Stinging nettle and fat hen tend to frequent waste/disturbed ground (Stace 1997). This mixture of terrestrial, damp ground and aquatic plant seeds would be expected in deposits in and beside a slow flowing river.

The olive (*Olea europaea* L.) stone from sample <272> taken from a deposit of alluvial sand [1298] is just as likely to have come from waste associated with shipping (for example, the find of an amphorae filled with olive stones in the Thames – Milne 1985) as from food waste associated with a building or terrestrial structure. The same could be said for the small quantity of fig (*Ficus carica* L.) seeds in sample <104> (gravel dump [1024]) and plum/bullace (*Prunus domestica* L.).

Gravel dump [1024], Sample <104> Context [1025]

Charred remains consisted of one fragment of oat grain and fragments of oak and hazel charcoal. The waterlogged seeds were dominated by taxa from disturbed/waste ground and damp ground.

Aquatic/damp ground plants were also present, as before, with the inclusion of seeds of lesser spearwort (*Ranunculus flammula* L.), sedge (*Carex* sp.), hairy buttercup (*Ranunculus sardous* Cranz), persicaria (*Polygonum persicaria* L.), rush (*Juncus* sp.), ?marsh woundwort (*Stachys* cf. *palustris*) and hemlock (*Conium maculatum* L.). Segetals were present and consisted of seeds of stinking mayweed, sheep's sorrel (*Rumex acetosella* L.) and corn marigold (*Chrysanthemum segetum* L.). Sheep's sorrel is common in poor arable peaty and sandy soils (Hanf 1983). Corn marigold is also an indication of acidic soils (Salisbury 1961). Edible exotic foods were also represented in sample <104> by a low number of fig (*Ficus carica* L.) seeds. Potential edible wild foods consisted of blackberry seeds and hazelnut shell fragments.

Secondary and Tertiary Fills of Channel [1041];
Secondary Fill, Sample <126> Context [1040] and
Tertiary Fill, Sample <117> Context [1033]

Microscopic flecks of charcoal in the tertiary fill, (sample <117>), were the only charred remains in this feature. Although from different fills, both samples appeared similar in content, with assemblages almost equally dominated by aquatic/damp ground plant seeds and those of drier segetal/ruderal species. Seeds of mouse-ears and ?fool's watercress (*Apium* cf. *nodiflorum*) were frequent finds. Species of mouse-ears tend to colonise dry, open, calcareous ground (Stace 1997). Fool's watercress frequents ditches and marshes (Stace 1997). The preceding aquatic/damp ground species were present with gypsywort (*Lycopus europaeus* L.) and water plantain (*Alisma* sp.). Gypsywort inhabits similar habitats to celery-leaved crowfoots *ie* on the banks of slow flowing water with muddy substrata (Clapham *et al* 1952). Four fragments of poorly preserved indeterminate hardwood were also examined from sample <126>.

Fill of Channel [2114], Sample <214> Context [2108]

Seeds of celery-leaved crowfoot, stinging nettle and sedge dominated this sample. Also present were fragments of wild cabbage/mustard (*Brassica/Sinapis* sp) testa and mouse ears. The species diversity was lower than previous samples, but the mixture of damp ground plants, segetals and ruderals was similar.

Peat Within Fill of Channel [2731], Sample <352> [2711]

This was a very unproductive sample producing only indeterminate stem/leaf fragments and root/rhizome fragments and occasional seeds of ?fools watercress and gypsywort.

Dark Brownish Grey Layer, Sample <225> Context [2115]

The plant macrofossil assemblage in this sample was dominated by waterlogged seeds of crowfoot (*Ranunculus* subgen. *batrachium* (DC) A) and celery leaved crowfoot. The remaining seeds came from a range of ruderal, segetal and damp ground habitats and included vervain, fool's watercress, sedge and fat hen. Potential edible plants included hazelnut and elderberry.

Alluvial Layers, Sample <116> Context [1027],
Sample <252> Context [1125], Sample <251>
Context [1644], Sample <272> Context [1298],
Sample <293> Context [2407], Sample <298>
Context [2406]

Two charred ?spelt glumes were recovered from sample <272> context [1298] 'alluvial sand' and one ?spelt glume was recovered from sample <293> context [2407] 'alluvial sandy deposit'. One wheat grain was recovered from sample <298> context [2406] 'layer of alluvial silt'. Sample <298> produced fragments of oak, hazel and beech (*Fagus sylvatica* L) charcoal. Sample <116> was selected for charcoal analysis and it produced six fragments of oak (Table 21). Quite a diverse range of waterlogged plant taxa was present in this phase. In addition to those already observed in samples from this phase were new taxa including vervain (*Verbena officinalis* L) and water mint (*Mentha aquatica* L) in sample <252>, and flax (*Linum* sp) and olive in sample <272>. These assemblages seem to indicate the gradual accumulation of material deposited by water.

Sample <272> context [1298] was selected for waterlogged wood analysis. It produced two fragments of cherry/sloe (*Prunus* sp.) roundwood. These were too poorly preserved to reveal ring counts but had diameters of c.10mm. One fragment of wood, which could only be identified to family - Betulaceae, was also present.

Fluvial Sand, Sample <257> Context [1128]

This sample contained an assemblage very similar to those from the alluvial deposits. This was the only sample in which a pondweed (*Potamogeton* sp) seed was found. This aquatic plant, along with the range of taxa in the sample, is a reflection of the deposition of sediment by slowly flowing water.

Clay Layer, Sample <256> Context [2122]

The seeds in this flot were dominated by those with woody testas, such as celery-leaved crowfoot, elder and sedge.

Foreshore Gravel, Sample <275> Context [1645]

This assemblage was dominated by waterlogged seeds of fool's watercress. The remaining seeds were from plants of damp and disturbed or cultivated ground and included gypsywort, stinging nettle, knotgrass and sedge.

Table 20. Plant macrofossils in Phase 3: Saxo-Norman (ad 850–1150)

				Feature no.	[1019]	NA	[1419]	NA	NA	NA	1809	NA	NA
				Feature description	primary fill of wattle fence structure	deposit of silty clay	silty clay fill of channel cut	layer of clayey silt	alluvial silty clay	fluvial gravel layer	pit	Clay silt	deposit of sandy silt within revetted channel
				Context no.	(1011)	(1311)	(1429)	(1521)	(1525)	(1643)	(1808)	(2501)	(1312)
				Sample no.	<102>	<139>	<158>	<204>	<210>	<250>	<316>	<323>	<148>
				Flot volume (approximate)	100	250	100	2	50	50	50	50	200
Scientific name	Common name	item	Habitat & use codes										
Charred remains													
<i>Triticum</i> sp	wheat	glume	FI	-	-	-	-	1	-	1	-	1	1
cf <i>Triticum aestivum/turgidum</i>	bread/club/rivet	wheat grain	FI	-	-	-	-	1	-	-	-	-	-
<i>Triticum aestivum/turgidum</i>	bread/club/rivet	wheat grain	FI	-	-	-	-	1	-	-	-	-	-
<i>Hordeum</i> cf <i>vulgare</i> L.	barley	hulled twisted grain	FI	-	1	-	-	-	-	-	-	-	-
<i>Avena/Hordeum/Secale/Triticum</i>	cereal indeterminate	stem fragment	FI	-	1	-	-	-	-	-	-	-	-
<i>Cerastium</i> sp	mouse-ear	seed	ABD	-	-	-	-	-	-	1	-	-	-
<i>Polygonum</i> sp	knotgrass	seed	ABCDEFGFG	-	1	-	-	-	-	-	-	-	-
Poaceae indeterminate	grass	seed	ABCDEFHI	2	2	-	-	2	-	-	-	-	-
Indeterminate		wood flecks (<4mm ²)		++++	++++	+++	-	+++	++++	++++	++++	++++	++
Waterlogged remains													
<i>Ranunculus/Acris/Bulbosus/Repens</i>	buttercup	seed	ABCDEG	+	++	+	-	-	-	-	-	+	+
<i>Ranunculus sardous</i> Crantz	hairy buttercup	seed	ABE	-	+	-	-	-	-	-	-	-	-
<i>Ranunculus</i> cf <i>Sardous</i>	hairy buttercup	seed	ABE	-	+	-	-	-	-	-	-	-	-
<i>Ranunculus flammula</i> L.	lesser spearwort	seed	EG	-	+	-	-	-	-	-	-	-	+
<i>Ranunculus sceleratus</i> L.	celery-leaved crowfoot	seed	E	-	++	-	-	++	+	-	-	++	-
<i>Ranunculus sceleratus</i> L.	celery-leaved crowfoot	seed fragments	E	++	-	++	-	-	-	-	-	-	++
<i>Ranunculus</i> subgen. <i>Batrachium</i> (DC) A	crowfoot	seed	E	-	+	-	-	-	+	+	-	+	-
<i>Papaver</i> cf <i>somniferum</i> L.	opium poppy	seed	BGHI	-	-	-	-	-	-	-	-	+	-
cf <i>Rumex</i> sp	dock	seed	ABCDEFGFG	-	+	-	-	-	-	-	-	-	-
<i>Chelidonium majus</i> L.	greater celandine	seed	BC	-	-	-	-	-	-	-	-	-	+
<i>Brassica/Sinapis</i> sp	wild cabbage/mustard	testa fragments	ABFGHI	-	-	-	-	-	-	+	-	-	-
cf <i>Brassica/Sinapis</i> sp	wild cabbage/mustard	seed fragments	ABFGHI	-	-	-	-	-	-	-	-	+	-
<i>Reseda luteola</i> L.	weld/dyer's rocket	seed	ABGHI	-	-	-	-	+	-	-	-	-	-
<i>Cerastium</i> sp	mouse-ear	seed	ABD	+	-	-	-	-	-	-	+	-	-
<i>Stellaria graminea</i> L.	lesser stitchwort	seed	CD	-	+	-	-	-	-	-	-	-	-
<i>Chenopodium album</i> L.	fat hen	seed	ABFH	-	+	+	+	+	+	+	-	-	+
<i>Chenopodium album</i> L.	fat hen	seed fragments	ABFH	-	-	-	-	-	+	-	-	-	-
<i>Atriplex hastata/patula</i>	spearleaved/common orache	seed	ABFGH	-	-	-	-	-	-	-	-	-	-
<i>Atriplex patula</i> L.	common orache	seed	ABFGH	-	-	-	-	-	-	-	-	+	+
<i>Chenopodium/Atriplex</i> sp	goosefoots/orache	seed	ABFGH	+	-	+	-	-	-	-	-	-	-
<i>Rubus fruticosus</i> sens Lat	blackberry	seed	CFGH	+	-	-	-	-	-	-	-	-	+
<i>Rubus fruticosus</i> sens Lat	blackberry	seed fragments	CFGH	-	-	-	-	-	+	-	-	-	-
<i>Rosa</i> sp	rose	thorn	CGI	-	-	-	-	-	-	-	-	-	+
<i>Prunus</i> sp	plum/bullace/sloe	seed fragment	CFG	-	+	-	-	-	-	-	-	-	-
<i>Prunus</i> sp	plum/bullace/sloe	thorn	CFG	-	+	-	-	-	-	-	-	-	-
<i>Prunus spinosa</i> L.	sloe/blackthorn	seed	CFG	-	-	-	-	-	-	-	-	-	+
<i>Apium</i> cf <i>nodiflorum</i>	fool's watercress	seed	E	-	-	+	-	-	-	+	-	+	-
Apiaceae	carrot	family seed	-	-	-	-	-	-	-	-	-	-	+
	indeterminate												
<i>Euphorbia</i> cf <i>helioscopia</i>	sun spurge	seed fragments	AGI	-	-	-	-	-	-	-	-	+	-
<i>Polygonum aviculare</i> L.	knotgrass	seed	ABG	-	+	-	-	-	-	-	-	+	-
<i>Polygonum hydropiper</i> L.	water pepper	seed	E	+	++	-	-	-	-	-	-	-	+++
<i>Polygonum hydropiper</i> L.	water pepper	seed fragments	E	-	-	+	-	+	+	-	-	-	+
<i>Rumex obtusifolius</i> L.	broad-leaved dock	seed	BC	-	-	-	-	-	-	-	-	-	+
<i>Rumex</i> cf <i>Crispus</i> L.	curled dock bract	seed	BC	-	+	-	-	-	-	-	-	-	++
<i>Urtica urens</i> L.	small nettle	seed	AB	-	-	-	-	-	-	-	-	-	+
<i>Urtica dioica</i> L.	stinging nettle	seed	BCDEFGH	-	++	+	+	+	+	++	++	+	+
<i>Hyoscyamus niger</i> L.	henbane	seed	BDG	-	-	-	-	-	-	-	-	+	-
Table 20. (contd)													
<i>Solanum nigrum</i> L.	black nightshade	seed	BF	-	-	+	-	+	-	-	-	+	-
<i>Verbena officinalis</i> L.	vervain	seed	BG	-	-	-	-	+	-	-	-	-	-
cf <i>Verbena officinalis</i> L.	vervain	seed	BG	-	-	-	-	-	+	-	-	-	-

<i>Lycopus europaeus</i>	gypsywort	seed	EH	-	+	-	-	+	-	-	+	-
<i>Prunella vulgaris</i> L.	self-heal	seed	BCDG	-	-	-	-	-	-	-	-	+
<i>Lamium</i> sp	dead-nettle	seed	ABC	+	+	-	+	-	+	-	-	+
cf <i>Ajuga reptans</i> L.	bugle	seed fragment	CDE	-	-	+	-	-	-	-	-	-
<i>Sambucus nigra</i> L.	elder	seed	BCFGH	-	-	+	+	-	+	-	-	-
<i>Sambucus nigra</i> L.	elder	seed fragments	BCFGH	-	-	+	-	-	-	-	-	-
<i>Corylus avellana</i> L.	hazel	shell fragment/s	CF	+	-	-	-	-	-	-	-	+
<i>Anthemis cotula</i> L.	stinking mayweed	seed	ABGH	+	-	-	-	-	+	-	-	+
<i>Anthemis cotula</i> L.	stinking mayweed	seed fragments	ABGH	+	+	-	-	-	+	-	-	-
<i>Chrysanthemum segetum</i> L.	corn marigold	seed	AHI	-	-	-	-	-	-	+	-	+
<i>Carduus/Cirsium</i> sp	thistle	seed	ABDEG	-	-	-	-	-	-	+	-	+
<i>Lapsana communis</i> L.	nipplewort	seed	BCF	-	-	-	-	-	-	-	-	+
<i>Sonchus oleraceus</i> L.	milk/sow thistle	seed	AB	-	-	-	-	-	-	-	-	+
<i>Juncus</i> sp	rush	seed	ADEH	-	+	-	-	-	-	-	-	-
<i>Eleocharis palustris</i> (L.)	common spike-rush	seed	E	-	+	+	-	-	-	-	+	+
<i>Carex</i> sp	sedge	seed	CDEH	-	+	-	-	-	+	+	-	+
Indeterminate	-	stem/leaf fragments	-	++++	++++	++++	-	++++	++++	-	++++	++++
Indeterminate	-	wood flecks (<4mm ²)	-	-	+++	-	++++	-	-	-	-	+++
Indeterminate	-	moss	-	-	-	+	-	-	-	-	-	+

Phase 3: Saxo-Norman (850–1150) (Table 20)

Six samples were taken from five layers and one pit and four samples were taken from wattle lined channels. The Saxo-Norman deposits consisted of gravel and silty layers possibly associated with the River Fleet and a series of wattle lined channels (Haslam 2006). The sample contents were similar to those from phase 2 but differed by producing low numbers of free-threshing type wheat grains (*Triticum aestivum/turgidum* L.) and a hulled twisted barley (*Hordeum* cf *vulgare*) grain. The most frequently occurring seeds were those of stinging nettle. Most of the seeds were ruderals or segetals but aquatic/semi aquatic plants were represented in similar quantities to those in phase 2.

Deposit of Silty Clay, Sample <139> Context [1311]

A small charred assemblage of one hulled twisted barely (*Hordeum* sp) grain, a cereal stem fragment, one knotgrass seed and two grass seeds were recovered. Due to the low number of barley grains in this phase with which to make comparisons and in the absence of barley chaff it was not possible to identify the barley to species. The waterlogged seeds consisted of frequent damp ground/semi-aquatic plant seeds such as waterpepper, celery-leaved crowfoot, gypsywort, common spike-rush, crowfoot and lesser spearwort. Ruderals and segetals were present and included seeds of knotgrass and stinking mayweed. Edible plants were present in the form of a fragment of plum/bullace/sloe stone.

Layer of Clayey Silt, Sample <204>, Context [1521]

This sample produced two charred grains resembling free-threshing type (cf *Triticum aestivum/turgidum*) wheat, one charred wheat glume and two charred indeterminate grass seeds. The grains differed morphologically from those identified as 'wheat'. These were rounder with steeper embryos than the 'wheat' grains. Apart from this, with no associated chaff or

larger numbers of grains it has not been possible to give any more definite an identification than 'cf'. Waterlogged seeds consisted of low numbers of fat hen, stinging nettle, dead-nettle and elderberry seeds.

Alluvial Silty Clay, Sample <210> Context [1525]

The only charred plant macrofossil in this sample were flecks of microscopic charcoal. The most frequent seeds were those of celery leaved crowfoot. Also present were seeds of open or disturbed ground including weld/dyer's rocket (*Reseda luteola* L), vervain and fat hen. Less frequent were seeds of damp ground.

Fluvial Gravel Layer, Sample <250> Context [1643]

Charred remains consisted of one charred ?spelt glume and a mouse-ear seed. Stinging nettle seeds were the most frequent type of waterlogged seed. The remaining seeds included damp and disturbed/open ground plants such as fool's watercress, celery leaved crowfoot and fat hen.

Pit [1809], Sample <316> Context [1808]

This sample produced one fragment of hazel charcoal (Table 26) and low numbers of waterlogged seeds of mouse-ear, stinging nettle, corn marigold, thistle (*Carduus/Cirsium* sp) and sedge.

Clay Silt, Sample <323> Context [2501]

This sample was similar in content to sample <250> but with the addition of identifiable charcoal fragments. This sample was selected for charcoal analysis and produced fifteen hazel fragments, two fragments of beech, one of cherry/plum/sloe and twenty-four oak fragments (Table 26). The only other identifiable charred plant macrofossil was a ?spelt glume. The waterlogged seeds contained an assemblage of seeds

from the range of ruderal, segetal and semi-aquatic plants already observed in phases 2 and 3.

Deposit Of Silt Clay Peat, Sample <329> Context [1917]

This sample was selected for charcoal identification and produced one fragment of hazel and three of ?oak (Table 21). All were too poorly preserved to reveal definite diagnostic criteria.

Dump Layer, Sample <314> Context [1915]

This sample was selected for charcoal analysis and produced only oak fragments.

Layer of Clay, Sample <318> Context [1810]

This sample was selected for charcoal analysis only and produced one fragment of oak.

Primary Fill of Wattle Fence Structure [1019], Sample <102> Context [1011]

The samples taken from the primary fill produced an assemblage dominated by seeds preserved by waterlogging. Two-charred grass seeds were the only charred plant macrofossils present other than microscopic flecks of charcoal. The most frequently occurring waterlogged seeds were those of celery-leaved crowfoot seeds (*Ranunculus sceleratus* L). The remaining seeds were from damp, disturbed and cultivated habitats. Seeds of waterpepper represented aquatic/damp ground plants. Stinking mayweed (*Anthemis cotula* L), an indicator of wet, nutrient rich loams and clay soils (Hanf 1983) represented the segetals. Plants of grassland and scrub consisted of mouse-ear chickweed (*Cerastium* sp), goosefoot/orache (*Chenopodium/Atriplex* sp), bramble, wild strawberry/cinquefoil/tormentil (*Potentilla/Fragaria* sp) and dead-nettle (*Lamium* sp). Fragments of hazelnut (*Corylus avellana* L) shell were also present.

Silty Clay Fill of Channel Cut [1419], Sample <158> Context [1429]

The seed assemblage is similar to those in the samples already mentioned. Aquatic/damp ground plants, such as celery-leaved crowfoot and ?fool's watercress were present along with seeds of plants that normally frequent drier cultivated and disturbed ground eg knotgrass (*Polygonum aviculare* L) and goosefoots/orache. Plants of grassland and scrub were represented by fragments of bugle (cf *Ajuga reptans* L) and black nightshade (*Solanum nigrum* L) seeds.

Peaty Silt Within Revetted Channel, Sample <148> Context [1312]

The most frequent seeds in this sample were those of water pepper and curled dock (*Rumex* cf *crispus* L). The

remaining seeds come from plants of grassland, disturbed ground and damp ground and included stinking mayweed, greater celandine (*Chelidonium majus* L) and fat hen (*Chenopodium album* L). Edible wild plants included sloe (*Prunus spinosa* L) and hazelnut. Fragments of waterlogged wood were selected for analysis. These were identified as oak and cherry/sloe. The cherry/sloe fragment was round wood, approximately c.10mm in diameter with unclear rings.

Deposit of Silty Sand Within Revetted Channel, Sample <174> Context [1313]

This sample was selected for waterlogged wood analysis. One fragment of oak stake/plank was identified (Table 25).

Phase 4: Early Medieval (1150–1250) (Table 21)

One sample was selected for analysis from this period (sample <334> context [2218]). It produced a moderately large and diverse charred assemblage consisting of free-threshing type wheat grains, one indeterminate wheat grain, two hulled straight barley (*Hordeum* cf *distichum* L) grains, oat/wheat (*Avena/Triticum* sp) grain fragments and two indeterminate pulse (Fabaceae) seeds. Oak fragments dominated the charcoal. Also present were four beech fragments and one fragment of indeterminate softwood. The un-charred seeds consisted of the range of semi-aquatic, ruderals and segetal plants already observed for the preceding phases. The most frequent seeds in this sample were those of the aquatic plant water plantain.

Phase 5: High Medieval (1250–1400) (Table 22)

In this phase, the number of seeds of semi-aquatic/aquatic plants has diminished significantly. Also diminished is the diversity of taxa. This could be due to drier conditions making organic preservation less likely.

Pit [1703], Sample <160> Context [1702]

This sample was the first to contain purely dry land or damp ground plants. The only semi-aquatics, as observed in previous samples, were common spike-rush and sedge. The seeds included the ruderals and segetals already mentioned (such as stinking mayweed, fat hen and hairy buttercup). Two grape (*Vitis vinifera* L) seeds and low numbers of seeds of plum/bullace, sloe and a fragment of cherry (*Prunus cerasus/avium*) seed represented edible plants.

Ground Raising Dump Layer, Sample <187> Context [1271]

This sample produced a similar assemblage of plant macrofossils as observed in previous samples. For example, seeds of damp ground plants such as sedge, segetals and ruderals including mouse ear.

Table 21. Plant macrofossils in Phase 4: Early Medieval (1150–1250)

		Context no.	(2218)
		Sample no.	<334>
		Flot volume (approximate)	350
Scientific name	Common name	Item	Habitat & use codes
Charred remains			
cf <i>Triticum aestivum/turgidum</i>	bread/club/rivet wheat	grain	FI 2
cf <i>Triticum</i> sp	wheat	grain	FI 1
<i>Hordeum</i> cf <i>distichum</i> L.	barley	hulled straight grain	FI 1
cf <i>Hordeum sativum</i>	barley	hulled straight grain	FI 1
<i>Avena/Triticum</i> sp	oat/wheat	grain fragments	FI 1
cf <i>Lathyrus</i> sp	vetch	seed	CD 1
<i>Lathyrus</i> sp	vetch	seed	CD 1
Indeterminate		wood flecks (<4mm ²)	5
Waterlogged remains			
<i>Ranunculus sardous</i> Crantz	hairy buttercup	seed	ABE +
<i>Ranunculus sceleratus</i> L.	celery-leaved crowfoot	seed	E +
<i>Rumex</i> sp	dock	seed	ABCDEFGF +
cf <i>Brassica/Sinapis</i> sp	wild cabbage/mustard	seed fragments	ABFGHI +
<i>Cerastium</i> sp	mouse-ear chickweed	seed fragment	+
<i>Chenopodium album</i> L.	fat hen	seed	ABFH +
<i>Atriplex patula</i> L.	common orache	seed	ABFGH +
<i>Chenopodium/Atriplex</i> sp	goosefoots/orache	seed	ABFGH +
<i>Chenopodium/Atriplex</i> sp	goosefoots/orache	seed fragments	ABFGH +
<i>Rubus fruticosus/idaeus</i>	blackberry/raspberry	seed fragments	CFGH +
<i>Polygonum aviculare</i> L.	knotgrass	seed	ABG +
<i>Polygonum persicaria/lapathifolium</i>	persicaria	seed fragment	ABEH +
<i>Polygonum hydropiper</i> L.	water pepper	seed	E +
<i>Polygonum hydropiper</i> L.	water pepper	seed fragments	E +
<i>Rumex acetosa/crispus/obtusifolius</i>	dock	seed	ABCD +
<i>Ficus carica</i> L.	fig	seed	FI +
cf <i>Corylus avellana</i> L.	hazel	shell fragment/s	CF +
<i>Solanum nigrum</i> L.	black nightshade	seed	BF +
<i>Lamium</i> sp	dead-nettle	seed	ABC +
<i>Sambucus nigra</i> L.	elder	seed	BCFGH +
<i>Chrysanthemum segetum</i> L.	corn marigold	seed	AHI +
<i>Centaurea</i> cf <i>nigra</i>	lesser knapweed	seed	BDG +
Apiaceae indeterminate		testa fragment	+
<i>Alisma</i> sp	water-plantain	seed fragments	E ++
<i>Alisma</i> sp	water-plantain	seed	E ++
<i>Eleocharis palustris</i> (L.)	common spike-rush	seed	E +
Indeterminate		stem/leaf fragments	++++

Table 22. Plant macrofossils in Phase 5: High Medieval (1250–1400)

		Feature no.	[2914]
		Feature description	fill of wooden barrel
		Context no.	(2924)
		Sample no.	<364>
		Flot volume (approximate)	1200
Scientific name	Common name	Item	Habitat & use codes
Charred remains			
Indeterminate		wood flecks (<4mm ²)	++++
Waterlogged remains			
<i>Ranunculus sceleratus</i> L.	celery-leaved crowfoot	seed	E ++
<i>Brassica/Sinapis</i> sp	wild cabbage/mustard	testa fragments	ABFGHI +
<i>Chenopodium album</i> L.	fat hen	seed	ABFH +
<i>Apium</i> cf <i>nodiflorum</i>	fool's watercress	seed	E +
<i>Urtica dioica</i> L.	stinging nettle	seed	BCDEFGH +
<i>Ficus carica</i> L.	fig	seed	FI +
<i>Anthemis cotula</i> L.	stinking mayweed	seed	ABGH +
Indeterminate	-	stem/leaf fragments	++++
Indeterminate	-	moss	++

Fill of Construction Cut [1905] for Wall [1901],
Build Up Prior to Wall Foundation, Sample <311>
Context [1913]

This sample was selected for charcoal analysis and produced five fragments of oak. Also present was one poorly preserved oat/wheat grain. The semi-aquatics celery-leaved crowfoot and crowfoot dominated the seeds. The range of taxa was low and less well preserved than other samples in this phase including seeds of elderberry, stinging nettle and dock (*Rumex* sp.).

Made Ground Sample <339> Context [2313]

This sample produced a small, relatively unproductive assemblage of un-charred, probably waterlogged macrofossils. Fragments of hazelnut shell were present along with seeds of buttercups (*Ranunculus/acris/repens/bulbosus*), stinging nettle, thistle (*Carduus/Cirsium*) and sedge. Differential preservation is a likely factor in the creation of this assemblage.

Made Ground, Sample <239> Context [2313]

This sample was selected for charcoal analysis. It produced five fragments of oak and one of willow/poplar (*Salix/Populus* sp.).

Layer, Sample <109> Context [1300]

This layer was selected for charcoal analysis and produced five fragments of hazel and six of beech.

Phase 6: Late Medieval (1400–80) (Table 23)

This was an archaeologically unproductive period (Haslam 2006) and one sample was analysed. This was

the fill of wooden barrel [2914] sample <364> context [2924]. It was selected for waterlogged wood identification and produced four oak fragments, one ?oak fragment and five hazel roundwood fragments (10mm diameter and rings unclear). The plant macrofossils were dominated by seeds of celery-leaved crowfoot and included a small diverse assemblage of segetal and aquatic plant seeds such as seeds of fool's watercress, stinking mayweed and fat hen. In addition, present, in low quantities, were fig seeds.

Phase 7: Early Post-Medieval (1480–1600) (Table 26)

This was a period of building and drainage (Haslam 2006) and archaeobotanically unproductive. One sample was selected for charcoal analysis. This dump layer (sample <140> context [1611]) produced six oak fragments and one young oak fragment.

Phase 8: Early–Mid-17th Century (1600–66) (Table 24)

Levelling for Brick Floor [2006], Sample <332>
Context [2213]

This sample produced a small but diverse charred assemblage consisting of wheat, barley, oat and rye (*Secale cereale*) grains, a spelt type rachis, legumes and seeds. The pulses consisted of a pea (*Pisum sativum* L), a detached hilum and seed fragment from a large legume, possibly pea or broadbean (*Pisum/Vicia faba*) and smaller sized seeds of vetch/tare/vetchling/pea (*Vicia/Lathyrus/Pisum* sp.). The wheat resembled free-threshing type and one of the barley grains was hulled and straight. The seeds were those of curled dock (*Rumex crispus* L) and cherry. The waterlogged seeds were a similar type and range to those in preceding samples. This time they included some poorly preserved pear/apple (*Pyrus/Malus* sp) seeds.

Table 23. Plant macrofossils in Phase 6: Late Medieval

		<i>Feature no.</i>	[2914]
		<i>Feature description</i>	fill of wooden barrel
		<i>Context no.</i>	(2924)
		<i>Sample no.</i>	<364>
		<i>Flot volume (approximate)</i>	1200
<i>Scientific name</i>	<i>Common name</i>	<i>Item</i>	<i>Habitat & use codes</i>
Charred remains			
<i>Indeterminate</i>		wood flecks (<4mm ²)	++++
Waterlogged remains			
<i>Ranunculus sceleratus</i> L.	celery-leaved crowfoot	seed	E ++
<i>Brassica/Sinapis</i> sp.	wild cabbage/mustard	testa fragments	ABFGHI +
<i>Chenopodium album</i> L.	fat hen	seed	ABFH +
<i>Apium cf nodiflorum</i>	fool's watercress	seed	E +
<i>Urtica dioica</i> L.	stinging nettle	seed	BCDEFGH +
<i>Ficus carica</i> L.	fig	seed	FI +
<i>Anthemis cotula</i> L.	stinking mayweed	seed	ABGH +
<i>Indeterminate</i>	-	stem/leaf fragments	- +++++
<i>Indeterminate</i>	-	moss	- ++

Table 24. Plant macrofossils in Phase 8: Early–Mid-17th Century

			Feature number	[2006]	NA
			Feature description	levelling layer for brick floor	clay silt deposit
			Context number	(2213)	(1290)
			Sample number	<332>	<268>
			Flot volume (approximate)	650	100
Scientific name	Common name	Item	Habitat & use codes		
Charred remains					
<i>Triticum spelta</i>	spelt	rachis	FI	-	1
cf <i>Triticum aestivum/turgidum</i>	bread/club/rivet wheat	grain	FI	-	4
<i>Triticum aestivum/turgidum</i>	bread/club/rivet wheat	grain	FI	-	9
cf <i>Triticum aestivum/turgidum</i>	bread/club/rivet wheat	grain fragments	FI	-	4
cf <i>Triticum</i> sp	wheat	grain	FI	-	1
cf <i>Triticum</i> sp	wheat	grain fragments	FI	-	3
<i>Triticum</i> sp	wheat	grain	FI	-	1
<i>Secale cereale</i> L.	rye	grain	FI	-	3
cf <i>Secale cereale</i> L.	rye	grain	FI	-	4
<i>Triticum/Secale</i> sp	wheat/rye	grain	FI	-	7
<i>Hordeum</i> cf <i>distichum</i> L.	barley	hulled straight grain	FI	-	1
cf <i>Hordeum</i> sp	barley	grain	FI	-	2
<i>Hordeum/Triticum</i> sp	barley/wheat	grain	FI	-	2
<i>Avena/Hordeum/Secale/Triticum</i>	indeterminate cereal	embryo?	FI	1	-
<i>Vicia faba</i> L.	celtic bean/ horse bean	detached hilum	FI	-	1
<i>Pisum sativum</i> L.	pea	seed	FI	-	2
<i>Vicia/Lathyrus/Pisum</i> sp	vetch/tare/vetchling/pea	seed	ACDEFI	-	2
<i>Vicia/Lathyrus/Pisum</i> sp	vetch/tare/vetchling/pea	seed fragments	ACDEFI	-	2
Fabaceae indet.	legume	very distorted seed	DI	-	1
<i>Prunus avium/cerasus</i>	sloe/cherry	seed	CFGJ	-	1
<i>Rumex Crispus</i> L.	curled dock bract	seed	BC	-	2
Indeterminate		wood flecks (<4mm²)		5	5
Waterlogged remains					
<i>Ranunculus</i> cf <i>Sardous</i> L.	hairy buttercup	seed	ABE	-	+
<i>Ranunculus sceleratus</i> L.	celery-leaved crowfoot	seed	E	+	-
<i>Ranunculus</i> subgen. <i>Batrachium</i> (DC) A	crowfoot	seed	E	+	-
cf <i>Rumex</i> sp	dock	seed	ABCDEFGF	-	+
<i>Chelidonium majus</i> L.	greater celandine	seed	BC	+	-
<i>Brassica/Sinapis</i> sp	wild cabbage/mustard	testa fragments	ABFGHI	-	+
<i>Silene</i> sp	campion/catchfly	seed	ABCDEF	+	-
<i>Cerastium</i> sp	mouse-ear chickweed	seed	ABD	+	-
<i>Stellaria media</i> (L.) Vill.	chickweed	seed	AB	-	+
<i>Chenopodium album</i> L.	fat hen	seed	ABFH	+	+
<i>Chenopodium album</i> L.	fat hen	seed fragments	ABFH	+	-
<i>Chenopodium</i> cf <i>Murale</i>	nettle-leaved goosefoot	seed	BD	+	-
<i>Atriplex hastata/patula</i>	spearleaved/common orache	seed	ABFGH	-	+
<i>Chenopodium/Atriplex</i> sp	goosefoots/orache	seed	ABFGH	++	-
<i>Chenopodium/Atriplex</i> sp	goosefoots/orache	seed fragments	ABFGH	+	-
<i>Rubus fruticosus</i> sens. Lat.	blackberry	seed	CFGH	+	+
<i>Rubus fruticosus</i> sens. Lat.	blackberry	seed fragments	CFGH	-	+
<i>Rosa</i> sp	rose	thorn	CGI	+	-
cf <i>Pyrus/Malus</i> spp	pear/apple	seed	CFI	-	+
<i>Conium maculatum</i> L.	hemlock	seed	CEG	-	+
<i>Conium maculatum</i> L.	hemlock	seed fragments	CEG	+	-
<i>Apium</i> cf <i>nodiflorum</i>	fool's watercress	seed	E	++	-
Apiaceae	carrot family indeterminate	seed		+	-
<i>Bryonia dioica</i> Jacq.	bryony	seed	CG	+	-
cf <i>Polygonum aviculare</i> L.	knotgrass	seed	ABG	-	+
<i>Polygonum persicaria</i> L.	persicaria	seed	ABEH	-	+
<i>Polygonum hydropiper</i> L.,	water pepper	seed	E	+	+
<i>Polygonum hydropiper</i> L.	water pepper	seed fragments	E	-	+
<i>Rumex acetosa/crispus/obtusifolius</i>	dock	seed	ABCD	+	-
<i>Urtica dioica</i> L.	stinging nettle	seed	BCDEFGH	+++	-
<i>Corylus avellana</i> L.	hazel	shell fragment/s	CF	+	-
<i>Hyoscyamus niger</i> L.	henbane	seed	BDG	+	-
<i>Solanum nigrum</i> L.	black nightshade	seed	BF	-	+
<i>Lycopus europaeus</i> L.	gypsywort	seed	EH	+	-
<i>Lamium</i> sp	dead-nettle	seed	ABC	-	+

Table 24. (contd)

<i>Ajuga reptans</i> L.	bugle	seed	CDE	-	+
<i>Sambucus nigra</i> L.	elder	seed	BCFGH	+	+
<i>Sambucus nigra</i> L.	elder	seed fragments	BCFGH	+	-
<i>Centaurea</i> cf <i>cyaneus</i>	cornflower	seed	ABGH	-	+
<i>Sonchus</i> cf <i>Oleraceus</i>	milk/sow thistle	seed	AB	-	+
<i>Carex</i> spp	sedges	seed	CDEH	+	-
cf <i>Onopordium</i> sp	cotton/reticulate thistle	seed	AB	-	+
indeterminate	-	stem/leaf fragments	-	+++++	+
indeterminate	-	wood flecks (<4mm ²)	-	+	-
indeterminate	-	moss	-	+	-

Table 25. Waterlogged wood analysis

			Feature no.	[2006]	NA
			Feature description	levelling layer for brick floor	clay silt deposit
			Context no.	(2213)	(1290)
			Sample no.	<332>	<268>
			Flot volume (approximate)	650	100
Scientific name	Common name	Item	Habitat & usecodes		
Charred remains					
<i>Triticum spelta</i>	spelt	rachis	FI	-	1
cf <i>Triticum aestivum/turgidum</i>	bread/club/rivet wheat	grain	FI	-	4
<i>Triticum aestivum/turgidum</i>	bread/club/rivet wheat	grain	FI	-	9
cf <i>Triticum aestivum/turgidum</i>	bread/club/rivet wheat	grain fragments	FI	-	4
cf <i>Triticum</i> sp	wheat	grain	FI	-	1
cf <i>Triticum</i> sp	wheat	grain fragments	FI	-	3
<i>Triticum</i> sp	wheat	grain	FI	-	1
<i>Secale cereale</i> L.	rye	grain	FI	-	3
cf <i>Secale cereale</i> L.	rye	grain	FI	-	4
<i>Triticum/Secale</i> sp	wheat/rye	grain	FI	-	7
<i>Hordeum</i> cf <i>distichum</i> L.	barley	hulled straight grain	FI	-	1
cf <i>Hordeum</i> sp	barley	grain	FI	-	2
<i>Hordeum/Triticum</i> sp	barley/wheat	grain	FI	-	2
<i>Avena/Hordeum/Secale/Triticum</i>	cereal indeterminate	embryo?	FI	1	-
<i>Vicia faba</i> L.	celtic bean/ horse bean	detached hilum	FI	-	1
<i>Pisum sativum</i> L.	pea	seed	FI	-	2
<i>Vicia/Lathyrus/Pisum</i> sp	vetch/tare/vetchling/pea	seed	ACDEFI	-	2
<i>Vicia/Lathyrus/Pisum</i> sp	vetch/tare/vetchling/pea	seed fragments	ACDEFI	-	2
Fabaceae indeterminate	legume	very distorted seed	DI	-	1
<i>Prunus avium/cerasus</i>	sloe/cherry	seed	CFGH	-	1
<i>Rumex crispus</i> L.	curled dock bract	seed	BC	-	2
Indeterminate	-	wood flecks (<4mm ²)		5	5
Waterlogged remains					
<i>Ranunculus</i> cf <i>Sardous</i> L.	hairy buttercup	seed	ABE	-	+
<i>Ranunculus sceleratus</i> L.	celery-leaved crowfoot	seed	E	+	-
<i>Ranunculus</i> subgen. <i>Batrachium</i> (DC) A	crowfoot	seed	E	+	-
cf <i>Rumex</i> sp	dock	seed	ABCDEF	-	+
<i>Chelidonium majus</i> L.	greater celandine	seed	BC	+	-
<i>Brassica/Sinapis</i> sp	wild cabbage/mustard	testa fragments	ABFGHI	-	+
<i>Silene</i> sp	campion/catchfly	seed	ABCDEF	+	-
<i>Cerastium</i> sp	mouse-ear chickweed	seed	ABD	+	-
<i>Stellaria media</i> (L.) Vill.	chickweed	seed	AB	-	+
<i>Chenopodium album</i> L.	fat hen	seed	ABFH	+	+
<i>Chenopodium album</i> L.	fat hen	seed fragments	ABFH	+	-
<i>Chenopodium</i> cf <i>Murale</i>	nettle-leaved goosefoot	seed	BD	+	-
<i>Atriplex hastata/patula</i>	spearleaved/common orache	seed	ABFGH	-	+
<i>Chenopodium/Atriplex</i> sp	goosefoots/orache	seed	ABFGH	++	-
<i>Chenopodium/Atriplex</i> sp	goosefoots/orache	seed fragments	ABFGH	+	-
<i>Rubus fruticosus</i> sens. Lat	blackberry	seed	CFGH	+	+
<i>Rubus fruticosus</i> sens. Lat	blackberry	seed fragments	CFGH	-	+
<i>Rosa</i> sp	rose	thorn	CGI	+	-
cf <i>Pyrus/Malus</i> spp	pear/apple	seed	CFI	-	+
<i>Conium maculatum</i> L.	hemlock	seed	CEG	-	

Table 25. (contd)

<i>Conium maculatum</i> L.	hemlock	seed fragments	CEG	+	-
<i>Apium</i> cf <i>nodiflorum</i>	fool's watercress	seed	E	++	-
Apiaceae	carrot family indeterminate	seed		+	-
<i>Bryonia dioica</i> Jacq.	bryony	seed	CG	+	-
cf <i>Polygonum aviculare</i> L.	knotgrass	seed	ABG	-	+
<i>Polygonum persicaria</i> L.	persicaria	seed	ABEH	-	+
<i>Polygonum hydropiper</i> L.,	water pepper	seed	E	+	+
<i>Polygonum hydropiper</i> L.	water pepper	seed fragments	E	-	+
<i>Rumex acetosa/crispus/obtusifolius</i>	dock	seed	ABCD	+	-
<i>Urtica dioica</i> L.	stinging nettle	seed	BCDEFGH	+++	-
<i>Corylus avellana</i> L.	hazel	shell fragment/s	CF	+	-
<i>Hyoscyamus niger</i> L.	Henbane	seed	BDG	+	-
<i>Solanum nigrum</i> L.	black nightshade	seed	BF	-	+
<i>Lycopus europaeus</i> L.	Gypsywort	seed	EH	+	-
<i>Lamium</i> sp	dead-nettle	seed	ABC	-	+
<i>Ajuga reptans</i> L.	bugle	seed	CDE	-	+
<i>Sambucus nigra</i> L.	elder	seed	BCFGH	+	+
<i>Sambucus nigra</i> L.	elder	seed fragments	BCFGH	+	-
<i>Centaurea</i> cf <i>cyaneus</i>	cornflower	seed	ABGH	-	+
<i>Sonchus</i> cf <i>Oleraceus</i>	milk/sow thistle	seed	AB	-	+
<i>Carex</i> spp	sedges	seed	CDEH	+	-
cf <i>Onopordium</i> sp	cotton/reticulate thistle	seed	AB	-	+
indeterminate	-	stem/leaf fragments	-	++++	+
indeterminate	-	wood flecks (<4mm ²)	-	+	-
indeterminate	-	moss	-	+	-

Table 26. Charcoal analysis

			Phase no.													
			Context no.													
			2	2	2	3	3	3	3	3	4	5	5	5	7	8
			(1025)	(1027)	(2406)	(1915)	(1808)	(1810)	(2501)	(1917)	(2218)	(1300)	(2313)	(1913)	(1611)	(1290)
Scientific name	Common name	sample/item	<104>	<116>	<298>	<314>	<316>	<318>	<323>	<329>	<334>	<109>	<239>	<331>	<140>	<268>
<i>Corylus avellana</i> L.	hazel	roundwood fragment	34	-	4	-	-	-	13	-	34	5	-	-	11	3
cf <i>Corylus avellana</i> L.	hazel	fragment	2	-	-	-	1	-	2	1	-	-	-	-	-	-
<i>Fagus sylvatica</i> L.	beech	fragment	2	-	4	-	-	-	1	-	4	6	-	-	-	-
cf <i>Fagus</i> sp	beech	fragment	-	-	-	-	-	-	1	-	-	-	-	-	-	-
cf <i>Prunus</i> sp	cherry/sloe	fragment	-	-	-	-	-	-	1	-	-	-	-	-	-	-
<i>Quercus robur/petraea</i>	oak	fragment	58	6	12	1	-	1	22	-	131	-	5	5	6	2
cf <i>Quercus robur/petraea</i>	oak	fragment	1	-	-	-	-	-	2	3	-	-	-	-	1	1
cf <i>Quercus robur/petraea</i>	oak	twigs	2	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Quercus robur/petraea</i>	young oak	fragment	4	-	-	-	-	-	2	-	-	-	-	-	-	-
cf <i>Salix/Populus</i>	willow/poplar	fragment	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Softwood indeterminate.		fragment	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Indeterminate		fragment	7	2	4	-	-	-	-	-	1	-	-	-	1	-

Clay Silt Deposit, Sample <268> Context [1290]

This sample was selected for charcoal identification. Three fragments of hazel and three of oak were recorded. Waterlogged seeds of stinging nettle, goosefoot/orache and fool's watercress dominated the sample. The taxa were the same as those observed in the preceding samples.

Discussion

Consideration of Taphonomic Factors Relating to the Interpretation of the Plant Macrofossils

Archaeobotanists working on material from complex urban environments, such as the one at Ludgate West,

have highlighted the main taphonomic factors influencing the creation of an archaeobotanical assemblage as being differential preservation and bioturbation (Green 1982; Tyers 1988; de Moulins 1990). Several samples at Ludgate West indicated differential preservation where robust seeds survive at the expense of more fragile plant macrofossils, in particular seeds of buttercups, bramble and elder were common in all of these samples. The following samples were observed having a composition of taxa suggesting the assemblages were the result of differential preservation:

Phase 2: Channel fill [2114] sample <214> context [2108]
Phase 3: All samples

Phase 5: Pit [1703] sample <160> context [1702], Build up prior to wall foundation [1905] sample <311> context [1913], Made ground sample <339> context [2313]

Each of these samples was dominated by seeds with tough testas and some also had very little diversity. The relationship between assemblage richness and level of preservation is just as likely to be due to the type of context from which these samples were taken (*eg* dumps, alluvial layers) rather than drier conditions due to tidal regression or land reclamation. If one compares the Roman Fleet Valley and Ludgate West plant macrofossil finds with those recovered during the study of the Upper Walbrook Valley it seems clear that the Upper Walbrook preservation conditions seem to have been far better for organic preservation with the Upper Walbrook producing a diverse range of plant macrofossils (de Moulins 1990).

The selection of contexts and samples for analysis in the Upper Walbrook Valley study conducted by de Moulins (1990) is also an important factor to consider when discussing the difference between the Ludgate West results and those of the Upper Walbrook. The main research aim for the Upper Walbrook study was to examine the topography and environment of the Upper Walbrook stream and marsh. Therefore, priority for analysis was given to samples from ditch, marsh, channel and natural valley deposits (*ibid*). For Ludgate West the samples analysed have come from a range of deposits, including those that although archaeobotanically unproductive have added to our knowledge of the environment and activities in the area by highlighting absences or clarifying areas of poor organic preservation.

Despite the richness of the Upper Walbrook Valley samples, it was stressed that in ‘...much disturbed, much trampled over and perpetually altered...’ environments it was difficult to determine where plant macrofossils would have originated from (de Moulins 1990). It was also noted that the plants that tolerate changing environmental conditions tend to be taxa that produce thousands of seeds per plant (*ibid*). In the case of Ludgate West this would include many of the taxa recorded, such as stinging nettle, the docks and elder.

At Ludgate West, the proximity of the samples to the River Fleet has meant that transportation of plant macrofossils by water needs to be considered. On examining the plant macrofossils in phases 2 and 3 it seemed clear that water transport could have been a major mode of arrival prior to tidal regression and during episodes of flooding (Haslam 2007). Many of the plant macrofossils in the Roman samples and for subsequent phases for Ludgate West could have been transported along by the River Fleet and accumulated in areas along its bank. Birks notes that ‘There is no macrofossil rain comparable to regional pollen rain’ meaning that seeds, even in aquatic environments, can reflect the local vegetation (Birks 2001). In this observation she was referring to lakes rather than rivers but it is possible that some seeds associated with plants growing near the foreshore of the eyots would have been deposited locally. During the analysis of

environmental archaeological remains from sites in Southwark and Lambeth on the banks of the River Thames, Tyers (1988) observed that plant and animal remains in waterlain deposits would have come from rubbish thrown from or washed off settlement areas as well as aquatic and marshland plants. He also observed that these items could be joined by ‘...similar items from the entire length of the Thames valley’ (Tyers 1988).

Cappers examined the dispersal of plant macrofossils among the shores of the River Rhine (Cappers 1993) and noted a similar pattern to that observed by Tyers for the River Thames. In his study of the dispersal of seeds by water, Cappers warns against assuming that seeds in a deposit reflect those that would have grown nearby (Cappers 1993). Cappers highlights the problems of interpreting assemblages of plant macrofossils suspected of being deposited by water and notes that a diverse range of wild, exotic, charred, uncharred and cultivated plant macrofossils can be present in a waterlain deposits due to activities such as throwing waste into water (*ibid*). Another factor related to samples taken from contexts believed to have been waterlain or on the foreshore of a watercourse is redeposition of macrofossils from older deposits (Wasylikowa 2001). Wasylikowa warns that if sediments are exposed to a ‘...fairly strong flow...’ of water older sediments can be eroded at one place and deposited downstream on top of younger sediments (*ibid*). In Spain’s examination of the possible silting up of a tide mill on the northern eyot he discussed the flow of the River Fleet and seems to suggest that the flow of water in the River Fleet was quite strong ‘...greatly in excess of the power needed to power the needs of one water-mill...’ (Spain 2002). This may have contributed large numbers of plant remains from local and extra-local sources, and from both contemporaneous and older deposits. However, a detailed discussion of this factor is not possible without a substantially larger database of geoarchaeological and archaeobotanical information for the Fleet Valley.

An example of waterlain deposition at Ludgate West was recorded in sample <272>, where an olive stone was recovered from a deposit of alluvial sand [1298]. In this riverside context, the olive remains may have come from multiple possible sources, namely waste associated with shipping *eg* amphorae filled with olive stones (Milne 1985) or food waste associated with domestic activities within a building that was deposited in the river. The same could be said for the small quantity of fig (*Ficus carica* L) seeds in sample <104> gravel dump [1024] and plum/bullace stones (*Prunus domestica* L). Dried figs could have been used as stoppers for casks (Haldane 1993). Casual disposal of finds such as large fragments of charcoal, hazelnuts and worked wood have been observed in the studies of the Upper Walbrook (de Moulins 1990) and the disposal of waste into the River Fleet is well-documented as it gained its polluted state (Thornbury 1878).

From phase 3 onwards construction projects like the Fleet prison and a possible rise in sea level in the 4th century AD (Haslam 2007) meant that building work, dumps for ground raising and the dredging of the River Fleet (Haslam 2007) will have added further

complexities to the interpretation of the plant macrofossil assemblages because of disturbance and redeposition of older and contemporaneous contexts. This significant problem has been emphasised by Brown (1997) in his study of floodplain palaeoecology and by Tyers for Southwark and Lambeth, where he states that ‘...problems of residuality and reworking of deposits has to be considered’ (Tyers 1988).

Discussion of the Archaeobotanical Assemblages at Ludgate West with Respect to the Economy and Diet, and Environment

Wood and Fuel Utilisation

Oak and hazel charcoal and wood were the most frequent woods found across all phases. There does not appear to be a clear trend in species type between phases other than the dominance of oak and hazel. The dominance of oak charcoal has been highlighted as possible factor more related to the durability of oak charcoal meaning it could be over-represented in charcoal assemblages (Goodburn 2005). Much of the hazel charcoal fragments were roundwood, possibly from coppice. Waterlogged hazel and cherry/sloe roundwood was also observed. The other taxa noted were beech, birch type, and willow/poplar. In the analysis of the charcoal from Roman kilns in the Walbrook Valley, a similar assemblage of species was identified and suggested that the roundwood would have served as kindling, giving a ‘...quick boost to the temperature...’ (Gale 2005). However, at Ludgate West, the charcoal and wood fragments were not associated with a specific feature and therefore the use of these woods is difficult to determine. Nevertheless, it is possible to derive a broad interpretation of fuel wood utilisation and woodland exploitation.

The use of oak and occasionally beech from wildwood has been noted from the Roman to 13th century in the London region (Goodburn 2000). The cherry/sloe and willow/poplar would have been present as scrub along the banks of the river. As noted by Gale (2005) these are the types of woods that may have been used as kindling. *Prunus* woods were used for turnery and carving (Gale & Cutler 2000). The two native species of oak prefer damp, non-calcareous soils and often grows with hazel and ash (Gale & Cutler 2000). As a firewood, if seasoned well, it burns slowly giving off a ‘...good lasting heat...’ (Skellern 2000). Oak had many uses, particularly as timber for building (Gale & Cutler 2000). Hazel needs to be seasoned and burns well and fast (Skellern 2000). It grows in wet but not waterlogged conditions in basic to moderately acid soils (O’Donnell 2007) among oak and ash (Gale & Cutler 2000). As roundwood hazel could have been used to make hurdles or trackways (Gale & Cutler 2000). Beech has a high water content so only burns well when seasoned well (Skellern 2000) and prefers well-drained soils on chalk or sometimes acid sandstone (Stace, 1997). Its uses have included furniture, boxes and roof shingles (Gale & Cutler 2000).

The two native birches cannot be distinguished microscopically (O’Donnell 2007). It is also associated

with oak, preferring non-calcareous soils (Gale & Cutler 2000). Birch can be used as firewood without seasoning and burns quickly (Skellern 2000). It makes good charcoal and is a hot short-lived fuel (Gale & Cutler 2000). It was used to make bowls, handles, ladles and paddles (*ibid*). Willow/Poplar are both less useful firewoods than the preceding types. Willow burns well only if seasoned (Skellern 2000). Willows are found in damp or marshy ground beside rivers or streams and have been used for basketry and cordage (Gale & Cutler 2000). Poplar also inhabits floodplains and meadow land and has been used for making veneer and arrows (*ibid*). At Ludgate West it is likely that the local woodland was being used as a resource for fuel and crafts throughout all phases. The frequency of trees that thrive on damp ground seems to reflect the wet local conditions even after the tidal regression at the end of the 2nd century AD. This was observed during the Fleet Valley Project where McCann noted a charter of AD 951 where the ‘London Fen’ was recorded as a marshy, low lying area to the south west of the River Fleet (McCann 1993).

Plant Foods: Cereals and Pulses

All of the cereal and pulse macrofossils were charred and none were recovered from features that might be associated with food processing such as a pit, corn drier or warehouse. No grains had germinated. The sample with the largest number of cereal and pulse macrofossils was from a 17th-century levelling layer (sample <332> context [2213]). It is possible that these plant macrofossils came from earlier deposits used to level the floor. For the Early Roman period at Ludgate West only hints of cereal processing have survived in the forms of indeterminate wheat grains, oat grain fragments and glumes resembling spelt but with no strong supporting evidence from a more abundant cereal assemblage. These were scattered across the samples in very low numbers. Wheat, especially spelt wheat was one of the major cereal crops in Roman Britain (Jones 1991) and a possible import as suggested by the Fleet Valley cereal deposits (McCann 1993) and recorded in the City of London from finds of exotic crop weeds within cereal assemblages analysed (Straker 1987). It is difficult to infer much more about cereal processing or consumption in the Early Roman period because the finds were so few and not related to a feature that might be associated with cereal processing. The fact that the cereal remains were charred could be due to them being fine sieving waste used as fuel, maybe for a corn drier as observed in other Romano-British sites, such as Tiddington in Warwickshire (van der Veen citing Moffett 1999) or charred during parching prior to milling (van der Veen 1989).

For the Saxo-Norman period, cereal remains were scarce and pulses were absent. None were associated with specific features. All came from silty clay layers and their origin is questionable due to the evidence for bioturbation noted in the archaeological assessment (Haslam 2007). A similar situation of robust seeds surviving in samples taken from dumps and make-up layers was observed for the following phases. In phases

4 and 5 cereal remains were scarce, and therefore little can be said about the economy and diet.

In phase 8, 1600–66, the most abundant and diverse cereal assemblage of all samples was recorded. This was from a levelling layer for a brick floor (sample <332> context [2213]), which means, unfortunately, that it is not possible to be sure of the origin of these charred remains. However, all of the cereals and pulses observed in this sample were common in the medieval period where they would have been grown as mixed crops such as ‘maslin’ (Greig 1988; Hammond 1993). They have also been observed in post-medieval samples (Internet Archaeology 1996) and would have been consumed in a variety of ways, such as ‘buttered cereals’ – bowls of barley or wheat served with butter or in cereal or pulse pottages (Wilson 1973).

Other Plants with Potential Culinary, Medicinal, Cosmetic, Domestic or Craft Uses

In the assessment of the plant macrofossils from the Fleet Valley Project, it was observed that one of the main problems of interpreting botanical remains is that one cannot be sure whether the seeds of other, non-cultivated, plants were being utilised or were present simply as weeds (McCann 1993). They note that ‘...virtually all the plants represented may have been used in one way or another, particularly as medicinal plants’ and that there were many ways plant remains could find their way into deposits including waste from stabling or flooring (*ibid*). This could be the case for the rush seeds at Ludgate West and seeds of other damp ground plants that might have been gathered with them.

When considering the relative abundance of seeds of a particular plant it is often better to note the presence or absence of taxa rather than become distracted by the relative abundance of seeds. This was noted in Willcox’s review of exotic plant macrofossils preserved by waterlogging in Roman London. Since the deposits are largely ‘artificial’ the components and relative abundance of cultivated plants will be a function of the archaeological feature(s) and not representative of the true economy in question (Willcox 1977). Therefore, when considering the non-cultivated and exotic plant macrofossils at Ludgate West only the presence or absence of taxa will be considered. The following native plants were present in most phases. The focus here will be on the seeds from plants identified to species and having clear economic uses. Those plants with edible leaves can only have this use inferred. The problem archaeobotanists have with potential leafy green vegetables, such as wild cabbage/mustard and fat hen, is that the leaves rarely survive (*ibid*).

Blackberry/bramble seeds were observed in phases 2–5 and 8. Blackberries produce an edible fruit palatable straight from the bush without preparation (Mabey 1972). Many folk remedies associated with the blackberry bush have been recorded, such as a charm against rheumatism and protection against evil (Grieve 1931) and from the 16th century onwards being recorded in herbals as being useful for piles, dropsy and ‘... restorative cordials ...’ (*ibid*). Elderberry seeds were

present in phases 2–5 and 8. They need to be cooked to become palatable (Mabey 1972). During the Roman phase they could have been consumed with eggs in a ‘...patinae..’ (Wilson 1973). The elder tree has had many medicinal and magical uses (Grieve 1931). The juice of the berries as a hair dye was recorded by post-medieval herbalists such as Culpeper, and Gerard notes that its use as a cordial for coughs and colds was a common folk remedy (*ibid*).

Common orache seeds were present in phases 2–5. Command orache has edible leaves that can be eaten as a replacement for spinach (Mabey 1972). Seeds of fat hen were present in phases 2–6 and 8. The leaves and seeds of fat hen are edible (*ibid*). The leaves are very nutritious producing more iron and protein than cabbage or spinach (*ibid*). They have been recorded as being eaten with bacon and meat in Ireland and the Western Highlands of Scotland (Lancaster 1983). Fat hen seeds have been found in caches in Iron Age Europe and experimental work has determined that gathering fat hen seeds would have provided a viable addition to the diet (Stokes & Rowley-Conwy 2002).

Fragments of hazelnut shell were present in phases 2, 4, 5 and 8. Hazelnuts are edible raw (Mabey 1972) and likely to have been gathered from surrounding scrub and woodland. Pear/apple was only present on one sample, <332>, context [2213], levelling layer for brick floor [2006] in phase 8. Cherry stones were observed, whole and fragmentary, in samples from phases 5 and 8. Sloe stones were observed in phases 2 and 5. Plum/bullace stones were observed in phase 2 and 5. These fruits would have been present in wild or cultivated form. Plum/bullace and cherry are edible fresh but sloe would probably need cooking as it is very sour eaten raw (*ibid*).

Seeds of stinging nettles were present in phases 2–6, and 8. The young leaves of stinging nettles, picked in spring, are edible when cooked (Mabey 1972). This is also one of the plants where the seeds themselves had medicinal value. The seeds are recorded as forming part of a remedy for ague, goitres and for ‘reducing excessive corpulency ...’ (Grieve 1931). Black bryony seeds were observed in phases 2 and 8. This plant contains the poison *Bryonin* in the roots and seeds (Woodward 1985). It causes vomiting, diarrhoea and severe abdominal pain, ‘... A handful of the berries can kill a child...’ (*ibid*). The roots were used in Roman and medieval medicine and the Elizabethan herbalist John Gerard noted the use of the root by tanners to thicken hides (Grieve 1931). Its medicinal uses would have been as a purgative (*ibid*).

Gipsywort seeds were present in phases 2, 3 and 8. It produces a black dye, permanent in wool and silk (Grieve 1931). Knotgrass seeds were observed in phases 2–4 and 8. The whole plant had medicinal uses and in his herbal, Gerard noted its use to cure pigs (*ibid*). Henbane seeds were present in phases 2, 3, 5 and 8. Henbane contains the poison *Hyoscyamine*, which can cause visual disturbances, delirium, palpitations, convulsions, coma and death (Woodward 1985). The narcotic nature of henbane would have been known to Roman physicians. Grieve cites Pliny’s observation that henbane ‘...was of the nature of wine and therefore

offensive to the understanding...' (Grieve 1931). Gerard notes its use as a painkiller if not taken internally. He described washing feet with a decoction of henbane to cause sleep and the activities of '...Mountebank tooth-drawers...' who fooled people into believing their toothache was being cured while they enjoyed a temporary respite from their pain by inhaling the fumes of henbane seeds held in a chafing dish (Woodward 1998).

Hemlock is another potential poison or medicine and was observed in phases 2, 5 and 8. Its medicinal uses included its use as a sedative (Grieve 1931). In extreme cases, it causes gradual paralysis from the feet upwards until death occur due to asphyxiation (Woodward 1985). Selfheal seeds were observed in phases 2 and 5. This plant was noted in the 'doctrine of signatures' as having physical features indicting it could help heal mouths and throats (Grieve 1931). Gerard recommends its use in a decoction of wine and water to 'join together and make whole and sound both inward and outward' (Woodward 1998). Stinking mayweed seeds were observed in phases 2, 3, 5 and 6. Its medicinal use seems to have been much akin to its poisonous effect; tonic, emetic and anti-spasmodic with the whole plant being used (Grieve 1931). Sun spurge seeds were only present in phase 3. Sun spurge produces a sap that has been used as a folk remedy for burning warts (Lancaster 1983).

Vervain seeds were present in samples from phases 2 and 3. Its Latin name *Verbena* comes from the Roman name for altar plants (Grieve 1931; Woodward 1998). It will have had, and still has, a wide range of medicinal uses, from being an anti-depressant, migraine cure and mouthwash (Mabey 1988) to a deceptive cure for the plague and associations with witchcraft (Woodward 1998).

Fig seeds were present in phases 2, 4 and 6. This robust seed is a common find in many periods in London. This is mainly due to the many seeds produced in one fruit, its import as an affordable dried fruit and survival in latrine fills (Willcox 1977; Greig 1982; 1996). Grape pips too are most likely to have come from dried fruits (Greig 1996). At Ludgate West grape pips were only observed in phase 5. This was a period when exotic Mediterranean fruits were imported and the sweetness of dried fruits was appreciated by the wealthy and by the poor on feast days (Wilson 1973).

Opium poppy is a species introduced into the British Isles, possibly by the Romans (Lancaster 1983). It was observed in phases 2 and 3. It is possible that these seeds were associated with imported grain. An olive stone was present in one sample from phase 2 and is among several plant foods imported from Spain during the Roman occupation (Parker cited in Willcox 1977). One flax seed was observed in a sample from phase 2. Very little can be inferred from one flax seed but flax was cultivated in Roman Europe for fibre (Willcox 1977). Low number of Weld/dyer's rocket seeds were present in a sample from phase 3 and all parts of the plant produce a yellow dye (Grieve 1931).

Environmental Change

Interpreting the ecological significance of botanical assemblages from urban deposits is as problematic as exploring the possible economic uses. Willcox observed how the ecological principles normally applied are disrupted by differential preservation, residuality and reworking (Willcox 1977). The archaeobotanical information has had to be interpreted in the absence of other ecofacts, since diatoms, pollen and Mollusca were poorly preserved or absent (Green *et al* 2007). In the Early Roman (phase 2) phase, nearly all of the samples came from contexts where the natural accumulation of the deposits would favour the survival for plant macrofossils from the surrounding environment. The most frequently occurring taxa were plants that inhabit shallow and muddy water, the edges of streams or ponds and disturbed, damp, nutrient rich ground. Water pepper and celery-leaved crowfoot were the most frequent. Water pepper was present in shallow water, ponds and ditches (Clapham *et al* 1952) that is often shaded (Stace 1997). Celery-leaved crowfoot frequents slow or standing 'mineral-rich water with a muddy bottom' (Clapham *et al* 1952). Common spike-rush, stinging nettles and elderberries were the next most frequent taxa. Common spike-rush is common in marshes, ditches and the edges of ponds (*ibid*). Stinging nettles flourish in phosphate rich soils, muddy silt-rich river valleys, refuse dumps and woodland glades (Mabey 1996). Elder is a common shrub of waste ground, preferring nitrogen and base rich soils (Clapham *et al* 1952). The next taxa in frequency were fat hen, fool's watercress, knotgrass and gypsywort. Gypsywort is common on banks of rivers and ditches and in marshes and fens (*ibid*). Fat hen prefers waste/cultivated ground and damp, nitrogen rich soils (Hanf 1983; Stace 1997). Fool's watercress frequents ditches, marshes (Stace 1997) and shallow ponds (Clapham *et al* 1952). Knotgrass tends to prefer drier ground and is found in nutrient rich disturbed and cultivated ground (Grime *et al* 1990). The remaining taxa in this phase were plants preferring cosmopolitan habitats but still with many favouring damp ground. These included stinking mayweed, lesser spearwort, water mint and celery-leaved crowfoot. Stinking mayweed prefers wet, nutrient rich loams and clay soils (Hanf 1983). Lesser spearwort is common in wet ground (Clapham *et al* 1952) and celery-leaved crowfoot is found in slow streams and ditches containing mineral rich water with a muddy bottom (*ibid*). Water mint is also found in marshes, fens and by rivers and ponds (*ibid*). Water flea eggs were observed in nearly half of the samples in this phase. As already mentioned they tend to be laid during times of environmental stress (Samaja-Korjonen 2003) and if the water level in these contexts changed significantly it could have created conditions leading to more egg production. The water flea is found in a range of fresh water bodies, mostly in standing water (Ebert 2005).

The Saxo-Norman deposits consisted of gravel and silty layers possibly associated with the River Fleet (Haslam 2006). The samples were dominated by seeds with robust testas, such as those of celery-leaved crowfoot, stinging nettle and sedge. The list of taxa

present in the phase 3 samples is also much less diverse than phase 2, differing only in the presence of weld/dyer's rocket in phase 3. An explanation for the aquatic/semi-aquatic taxa observed is the presence of pools of stagnant water (see Haslam 2007). The Early medieval (phase 4) sample was taken from a clay layer and the most frequent plant macrofossils were seeds of water-plantain. It was not possible to identify them to species but the genus inhabits damp ground and shallow water beside slow-flowing rivers (Clapham *et al* 1952). This seems to indicate that the stagnant pools of water might still have been present in phase 4. For the High medieval (phase 5) there seems to be a significant change to plants preferring drier conditions. Archaeological evidence for this phase describes, as for phase 3, material dredged from the Fleet being used to stabilize ground (Haslam 2007). Archaeobotanically, this means the deposits sampled could contain a mixture of plant macrofossils from any age. Nevertheless, the analysis indicates that from phase 5 onwards the number of seeds of aquatic/semi-aquatic plants declined. Pit [1703], sample<160> context [1702] was the first to contain purely drier disturbed ground plants. Also in decline was the diversity of the taxa. This could be due to drier conditions making preservation less likely, although given the likelihood of aeration of the deposits due to mixing occurring during dumping, differential preservation is likely to have been an important factor. For phases 6 and 8 the taxa observed were similar to those from previous phases but with more plants preferring nutrient rich, damp and disturbed ground.

Previous Archaeobotanical Work in the Area of Ludgate West

The main work in this area was the 'Fleet Valley Project'. Full archive reports remain unpublished at the time of writing but are referred to in the 1998 gazetteer of excavations in the City of London (Schofield 1998) and are available in the London Archaeological Archive and Research Centre. The Ludgate West excavation revealed Roman activity on the northern eyot near the eastern bank of the River Fleet immediately to the west the City of London. This area has been described as a '... site of suburban occupation ...' with foci of occupation northern and southern eyots (Haslam 2007).

The Fleet Valley Project revealed evidence for a tide mill on the northern eyot, which would have been in use during the 1st and 2nd centuries. Archaeobotanical material associated with this feature consisted of 'material associated with the advanced stages of crop processing' (Haslam 2007). The Project revealed a warehouse on the southern 'downstream eyot' where cereal grains were imported (Schofield 1998) and a jetty where deposits of spelt grains and chaff were recovered from beneath a jetty (Spain 2002). The northern 'upstream eyot' was where the remains of a tide mill was found (Schofield 1998; Spain 2002). The abandonment of both eyots in the 2nd century is believed to coincide with a tidal regression in the lower Thames (Schofield

1998). This regression reduced the tidal range to less than 1.0m OD (McCann 1993).

The Ludgate West site is in the same area as 'Zone E' of the Fleet Valley Project and the archaeobotanical assessment was reported in McCann (1993). Although the plant macrofossil assemblage from Zone E was not analysed it has been recorded in enough detail to allow general comparisons to be made between the 'Zone E' assemblages and the Ludgate West samples.

For the Fleet Valley Project most archaeobotanical work on Roman deposits seems to have been centred on finds from the southern eyot where a large charred cereal assemblage was found in association with a jetty (McCann 1993). This assemblage consisted of abundant spelt grains, spelt glumes and spikelet forks, barley rachis fragments and grains of barley, oats and brome (*Bromus* sp). It was unclear whether these cereal remains have floated downstream from the northern eyot because the assemblage appeared to be too rich to have arrived in the sampled context in this way (*ibid*). It was suggested that this rich assemblage was evidence of waste from a cargo of partially processed grain arriving at the jetty on the southern eyot (*ibid*).

For the Fleet Valley's examination of the northern eyot, archaeobotanical remains only appear to have become significant in the 'Early Plantagenet' phase, dated 1154–1270 (McCann 1993) corresponding to phase 4 'Early Medieval', 1150–1250 at Ludgate West. A range of waterlogged plant remains were recovered from a timber cut (*ibid*). These plants included evidence of edible fruits; elderberry, grape, blackberry, sloe, plum/bullace, cherry, fig and mulberry (*Morus nigra* L). This phase was also the first time figs and mulberries had been found in Zone E. Also present were seeds of opium poppy (*Papaver somniferum* L), hop (*Humulus lupulus* L) and a large number of cabbage/mustard seeds. The wild plant assemblage consisted of seeds of plants from damp, disturbed and cultivated ground and included those of duckweed (*Lemna* sp), rush, sedge, corn marigold and corncockle (*Agrostemma githago* L) (*ibid*).

At Ludgate West, the plant macrofossil assemblage of this period was much poorer, probably because the sample was taken from a clay layer where organic material might not have accumulated as readily as in a cut. Many of the seeds are from the same plants as those observed during the Fleet Valley analysis, with the addition of more plants of aquatic and damp ground in the Ludgate West sample than in the Zone E sample.

For the next Phase, 'English 1399 to 1485 AD' for the Fleet Valley Project and 'Late Medieval AD 1400 to 1480' for Ludgate West, the Fleet Valley Project recorded similarity of plant macrofossils between that and the preceding phase (McCann 1993). This was also observed in the samples for Ludgate West where the types of aquatic/semi-aquatic plants were similar between phase 2 and phase 3 and the range of semi-aquatic, ruderal and segetal plants for phase 4 were similar to those in the preceding phases. Possible reasons for this will be discussed below.

The Post-Medieval phase (phases 7 and 8) at Ludgate West were not as rich as those for Fleet Valley Project Zone E. This is probably due to the contexts

available for sampling being very different *eg* Ludgate West there was brick floor levelling and clay silt deposits, but for Zone E, wells and pits. Several common taxa were recorded in both projects and these included grains of rye, seeds of apple/pear, fig and of the wild plants, such as crowfoot and stinking mayweed.

Conclusions

While examining the samples for this analysis it became clear that the following taphonomic factors were significant: (1) Transportation of plant macrofossils by water; (2) Use of deposits from earlier phases to backfill features and build up layers, and (3) Differential preservation. Water transportation was clearly a major mode of arrival for plant macrofossils in phases 2 to 3 and from phase 4 onwards re-deposition of plant macrofossils occurred as backfill in later features. Cappers, in his study of the dispersal of seeds by water, warned against assuming that seeds in a deposit reflect those that would have grown nearby (Cappers 1993). Cappers highlights the problems of interpreting assemblages of plant macrofossils suspected of being deposited by water and notes that a diverse range of wild, exotic, charred, un-charred and cultivated plant macrofossils can be present in a waterlain deposits due to activities such as throwing waste into water. Therefore, the plant macrofossils at Ludgate West could have originated from anywhere along the banks of the River Fleet. Their most useful contribution to the understanding of the site, therefore, is that in the earlier phases, a slow moving, muddy body of water was flowing near the Romano-British and Saxo-Norman area of activity. By the Medieval phases, reclamation of land for building by raising ground, adding drains and canalising the River Fleet meant that plant macrofossils from earlier deposits were redistributed and in some areas changing preservation conditions meant that some components of the plant assemblages decayed.

Therefore, due to the likelihood of water-transportation and re-deposition of plant macrofossils in back fills, it is not possible to make anything other than general conclusions about modes of arrival and meaning. The River Fleet will have carried many seeds from the surrounding countryside and deposited them within sediment on the banks of the river. The waterlogged ruderal and segetal seeds are typical of those often found charred as crop weeds in grain assemblages in Romano-British and medieval samples in London and South East England. From phase 4 onwards ground rising appears to have taken place (Haslam 2006). This could have meant that sediment from the area was used and that within this sediment were seeds surviving from earlier phases. From this phase onwards, preservation seems to have been poorer with only rare, localised, finds of aquatic plant macrofossils.

What is most significant is that there is no direct evidence for the disposal of cess, refuse or of plant storage. Nevertheless, there is some evidence of cereal processing throughout phases 2–5 and 8. Unfortunately, these charred assemblages have not come from features associated with cereal processing, such as pits, buildings or possible corn driers. It is

tempting to link them with the deposits of spelt grain, chaff and brushwood found beneath a Romano-British jetty discovered in the lower Fleet valley (Spain 2002). Unfortunately, the evidence for movement of the waterlain Romano-British deposits at Ludgate West and for possible later use of the deposits as backfill or make-up layers means that this link is tenuous.

Coconut Shell (*Cocos Nucifera* L)

Nick Branch

The discovery of coconut shell (*Cocos nucifera* L – Coconut Palm; Arecaceae/Palm family) within early 17th-century deposits at Caroone House, City of London (site code: FAS02) is one of only three known records from archaeological excavations in London. The single fragment of coconut shell (endocarp) was recovered from beneath the floor of a cellar (<140>, context [1290]) dated to 1600–66, which was burnt down in the Great Fire. The remaining discoveries are from 283 Tooley Street, Southwark (J Giorgi & C Maloney, pers comm) and New Providence Wharf, Tower Hamlets (Allott & Green 2008). At 283 Tooley Street, the coconut shell fragments were associated with two late 18th-century brick cesspits, whilst at New Providence Wharf the fragments were from the primary fill of a brick structure attributed to phases III (1659–77)/IV (1678–1720). It is highly likely, therefore, that the remains from Caroone House represent the oldest known finds of coconut in London.

The global history of coconut, especially its dietary and non-dietary (*eg* wood, ornaments) uses, is fascinating. It is believed that Portuguese sailors, under the leadership of Vasco da Gama, first brought the coconut to Europe from India and East Africa, possibly in the late 15th – early 16th century (Foale 2003). However, it may have arrived later in Britain, with the voyages of notable British explorers. We know little, therefore, about when coconut first appeared in Britain, or its distribution and use. Although we can assume that in the absence of the mesocarp (composed of fibres called ‘coir’) from sites in London, that the nut was imported primarily for consumption of the coconut ‘meat’ (endosperm), which is the thick white edible part of the seed.

NOTES

¹ *Roman pottery fabric codes; Roman ceramic building material fabric codes; Medieval and Post-Medieval pottery fabric codes* (all 2014); MOLA Resource Library, www.mola.org.uk/resource-library (accessed 20 December 2023). The revisions to the 2007 version of these documents are quite limited.

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