THE 'WESTERN STREAM' RECONSIDERED. EXCAVATIONS AT THE MEDIEVAL GREAT WARDROBE: WARDROBE PLACE, CITY OF LONDON

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SUMMARY

A major topographic feature, sometimes known as the 'Western Stream' in earlier literature, traversed the site from north to south, bowing out to the west. During the Roman period the floodplain gravels had been quarried. Later Roman consolidation layers overlay the truncated gravels. The archaeological observations demonstrate that by the early 13th century, and no earlier than the late 11th century, the stream was infilled. It is suggested here that the stream was a ditch, rather than a natural topographic feature, by the time of its backfilling. It was at least partially infilled by c.1114. The ditch was probably associated with Baynard's Castle, located to the west of the site and dating from c.1087. Medieval foundations cut into the ditch backfill were part of the building known from AD 1345–59 as Beauchamp's Inn, and later as the Great Wardrobe. The Wardrobe buildings were destroyed in the 1666 Great Fire.

INTRODUCTION

The Museum of London Archaeology Service (MoLAS) undertook an archaeological watching brief and excavation at the site of 53–57 Carter Lane, 6–10 Wardrobe Place, and 1–5 Addle Hill, London EC4 in the City of London (Fig 1). An evaluation took place from 2 October to 24 October 1997, while the excavation was undertaken between 20 July and 1 August 1998 (Fig 2).

The site was previously subject to three phases of archaeological investigation by the Department of Urban Archaeology (DUA) of the Museum of London. These works were conducted in relation to a proposed redevelopment scheme by Warnford Investments Ltd in partnership with Ranelagh Developments. The archaeological fieldwork was conducted under the site code WAP88.

The first phase of these works comprised a test pit survey undertaken in March 1988, where four pits were dug (see Fig 2: A, B, C, and D). An evaluation followed the test pit survey, during which two trenches were excavated in the basement of 2 Addle Hill (Trench A) and 4 Addle Hill (Trench B) during June and July 1988. The final DUA work on the site was the excavation of three trenches between February and March 1990. These were Trench C, in the basement of 55–56 Carter Lane; Trench D in the basement of 57 Carter Lane; and Trench E in the basement of 1 Addle Hill (see Fig 2).

The most recent work, under the site code WDC97, was commissioned by Wardrobe Court Limited in advance of their redevelopment of the site, which involved the demolition of all standing buildings, with the retention of some listed facades. The excavations took place in order to fulfil an archaeological condition attached to the (conditional) Planning Consent given to the redevelopment in October 1997. This condition

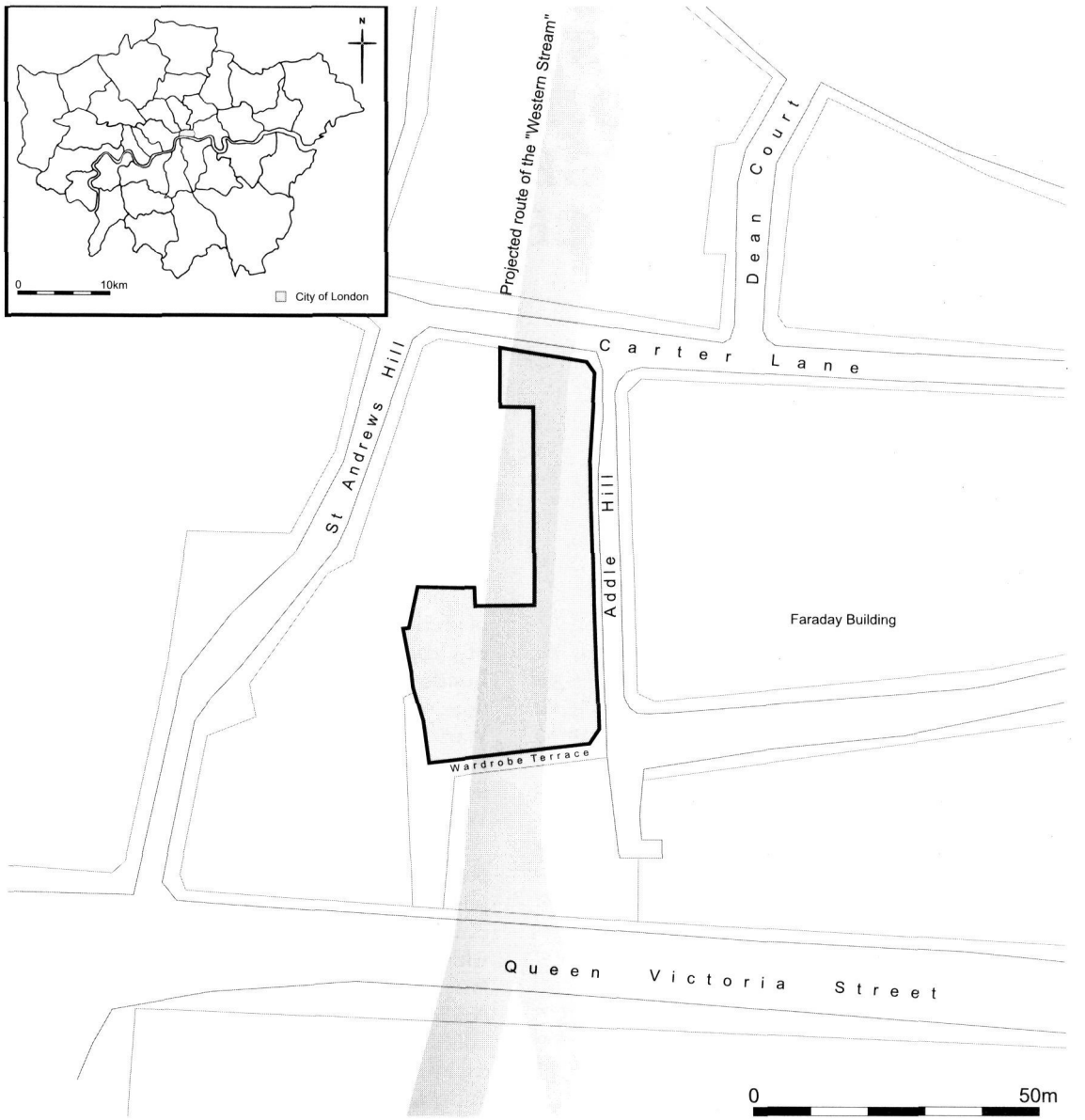

Fig 1. Site location with the projected route of the 'Western Stream' (after Bentley 1987)

required all groundworks to be subject to an 'archaeological watching brief'.

The evaluation and watching brief demonstrated that archaeological features were present at the site. Consequently a programme for archaeological excavation was formulated.

This report describes the results of this most recent archaeological work and integrates them

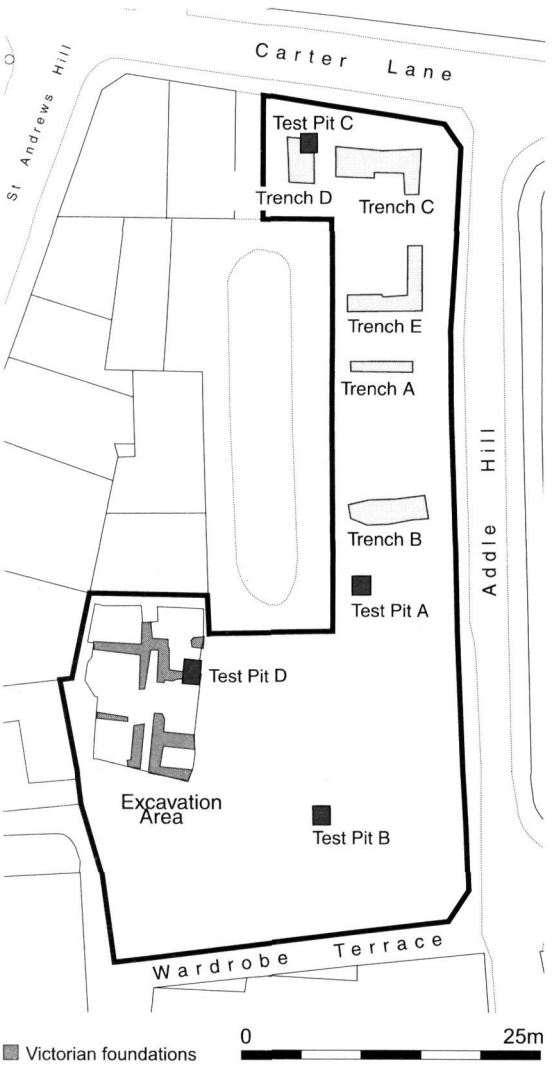

Fig 2. Trench location

with the findings of the 1988 and 1990 works, giving an overview of the developmental sequence at the site.

TOPOGRAPHICAL, HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

Topography

The site is located on a marked downward slope towards the river Thames to the south. The underlying geological deposit in the area is brickearth, underlain in turn by the gravels of the Second Thames Terrace. The east–west aligned southern edge of the brickearth was expected to cross the site (BGS 1999).

A watercourse, often referred to as the 'Western Stream', has been described as flowing from the north of the City to the Thames at Blackfriars and was projected to cross the site from north to south (Bentley 1987, fig 1) (see Fig 1).

The 'Western Stream' had its source in the spring line along the edge of the Thames Upper Terrace, north of the Roman city, which stretched between Aldersgate Street and the former river Fleet. At its source the stream had two parallel branches, originally presumed to have met within the Roman city, just south-east of the junction between Warwick Lane and Newgate Street, some 280m north of the site (Bentley 1987, 333–4).

Recent excavations have demonstrated that the northern branches of the stream were actually parallel channels. The westernmost channel turned west to drain into the river Fleet, while the eastern channel continued south (Pitt 2000, 12). The eastern channel extended through the site and then bifurcated, meeting the Thames south of modern Queen Victoria Street under the current Baynard House (see Fig 1).

Roman activity

The site is located within *Londinium*, *c.*110m east of the city wall and *c.*120m south of the Roman road aligned along Ludgate Hill, which left the city at Ludgate.

Evidence for Roman activity in the area is mainly confined to brickearth and gravel extraction. Quarrying has been recorded 200m east of the site, on the current site of Old Change Court south of Carter Lane, in trenches excavated by Grimes in 1962 (Shepherd 1998, 61). The quarrying of brickearth was also recorded closer to the site, 130m to the east, during excavations at 13–23 Carter Lane in 1988 (Schofield & Maloney 1998, 287). Excavations 80m directly to the north of the site in 1985, at 40 Carter Lane and 15 Creed Lane, found quarry pits post-dated by the remains of an early 2nd-century clay and timber building. Clearly some consolidation of the truncated ground surface had followed the quarrying.

The 'Western Stream'

Both upper branches of the 'Western Stream' were interrupted by the construction of the east–west aligned Roman city wall in *c.*AD 200, leading to the channel eventually silting up (Lakin 2000, 12). Materials dumped in the stream included pottery dated to the late 2nd to 4th centuries (Pitt 2000, 14; Lakin 2000, 21). Dumping may have coincided with the construction of the city wall and the stream appears to have ceased flowing and become marshy by the later Roman period (Pitt 2000, 14–15).

Medieval activity

Following the Roman withdrawal from Britain in the early 5th century, *Londinium* was abandoned, the city wall and other Roman structural remains began to crumble; the City of London was reoccupied after the establishment of a fortified settlement within the walls by King Alfred in AD 886.

The 'Western Stream'

Although localised attempts to widen and deepen the 'Western Stream' to the north of the site were made during the 11th and 12th centuries in the St Paul's Churchyard area, the final infilling dates from this time, when deposits dumped into it included leather shoes and pottery (Bentley 1987, 331). During the 12th century, rubbish and cess pits were being cut through the backfilled stream (Bentley 1987, 331; Pitt 2000, 15).

Medieval development in the area and the establishment of the street pattern

Areas close to the site, within the walled City, were developed during the 11th to 12th centuries. Castles built to control the City included Baynard's Castle, built near the Thames riverfront by 1087 to the west of the site, and Montfichet's Tower, built by 1136, west of the site along Carter Lane (Schofield 1993, 38–40). Immediately south of the site, the church of St Andrew by the Wardrobe was established by 1163–1180 west of the 'Western Stream' (Bentley 1987, fig 1; Harben 1918, 25; Lobel 1989, 85).

The 'Western Stream' may have become a ditch adjacent to Baynard's Castle by 1114. Schofield notes that parts of the ditch which surrounded the castle were granted to the Bishop of London in *c.*1114 and that 'the bishop destroyed the same ditch' and then suggests that the ditch was contiguous with the 'Western Stream'. In this case, according to Schofield 'the stream bed may have contributed to a defensive ditch of a castle which lay between St Andrew's Hill and the city wall to the west' (Schofield 1993, 38–9).

By the mid to late 13th century, after the 'Western Stream' was backfilled, streets bounded the plot of land which includes Wardrobe Place. Addle Hill, to the east, was known as *Athelyngstrete* by 1244 and Carter Lane, to the north, was known as *Carterestrate* in 1286 (Lobel 1989, 64–5, 68). St Andrew's Hill, formerly Puddle Dock Hill, to the west of the site, takes its name from the church of St Andrew by the Wardrobe. Addle Hill, Carter Lane, and St Andrew's Hill were, respectively, the east, north, and west boundaries of the parish of St Andrew (Dyson 1989, 11–12).

The 'Western Stream', passing through the area from north to south, was certainly infilled by at least 1286, the date by which Carter Lane was laid out.

Medieval development at the site

The early 14th century was the culmination of a period of population growth in England when the population reached *c.*5 million, but it was decimated by the Black Death of 1348 and recurrent outbreaks of plague and next reached this level in the mid-1600s. Grain prices reached a high during the early 14th century and began declining from the 1320s. Church building reached its medieval peak at the dawn of the 1300s (Dyer 1989, fig 1, 102).

By the early 14th century the land – including the site area – bounded by Carter Lane, Addle Hill, and St Andrew's Hill was fully built up. There were ten separate tenements on this plot, presumably constructed soon after Addle Hill, Carter Lane, and St Andrew's Hill were laid out (Dyson 1989, 11, fig 17).

During the 1340s the tenements were gradually bought up by Sir John Beauchamp, the former governor of Calais and a hero of Edward III's French wars (Ellis 1947, 247). In 1345 he purchased his first tenement, fronting onto Addle

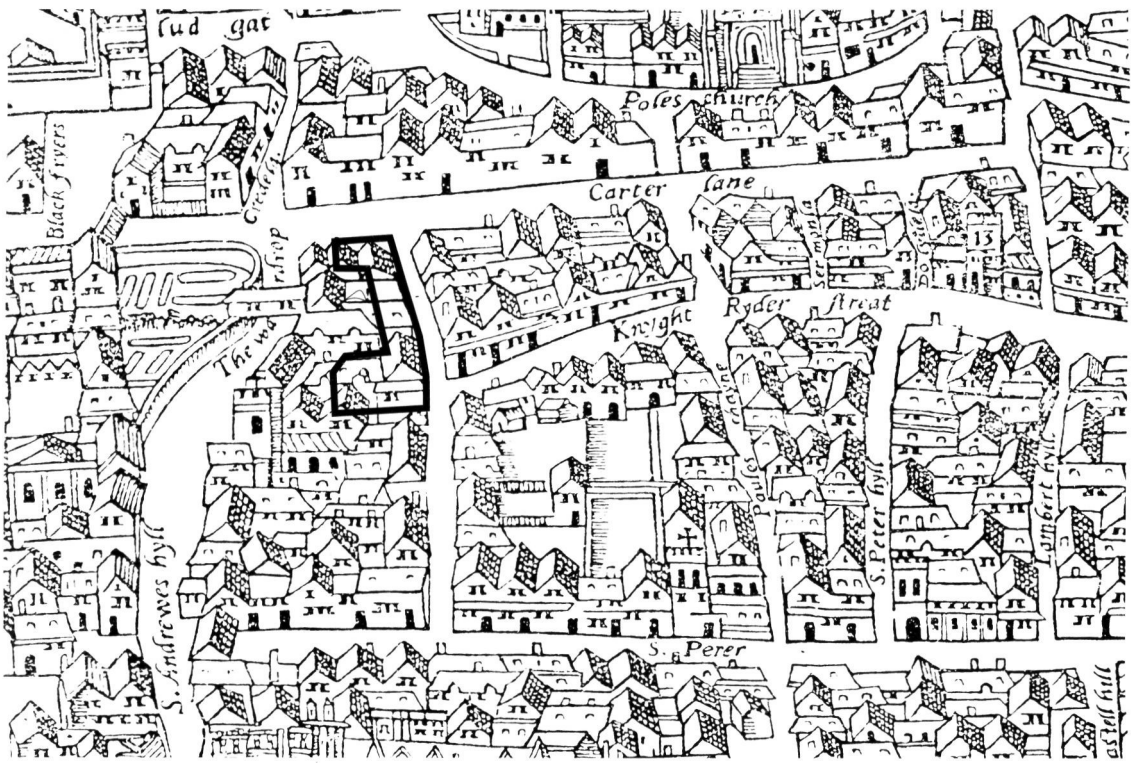

Fig 3. The Agas map, c.1562

Hill. He then bought another, larger tenement plot to the south in 1346, which stretched between St Andrew's Hill and Addle Hill. In 1348 he bought four more: three to the south of the 1346 purchase and one to its north, fronting onto St Andrew's Hill. He may also have purchased the remaining four of the ten tenements located to the north and fronting onto Carter Lane after 1336 (Dyson 1989, 11).

Beauchamp then began constructing the building which became known as Beauchamp's Inn and may have had all or some of the existing buildings demolished. The Inn was arranged around a small square and by 1360 included houses, a mansion, and shops (Tout 1928, 406).

Following Beauchamp's death in December 1360 his executors sold the Inn to King Edward III, who, by 1 October 1361, had moved the Great Wardrobe there. The Wardrobe had been temporarily located by the churchyard of St Michael's, Cheapside, since 1 November 1360 after vacating premises in Lombard Street (Tout 1928, 406).

The Great Wardrobe

The Great Wardrobe was the storehouse of the court. It housed canvas, clothing, furniture, furs, silk, tapestry, and wall hangings. The main entrance was on the east side, along Addle Hill, closer to Knightrider Street than Carter Lane.

The Wardrobe was originally based at the Tower of London and is first referred to in 1253. By the early 14th century its remit had enlarged to include making, purchasing, repairing, and storing armour, arms, harnesses, saddles, tents, *etc.* Other goods which passed through the Wardrobe included dried fruits (dates, figs, and raisins), spices, sugar, and wax for lighting and seals. In effect, the Wardrobe was a branch of the Exchequer which received and distributed goods for the sovereign. Indeed, it began accounting to the Exchequer from 1324 (Sutton and Hammond 1983, 67; Tout 1928, 348–52, 359, 386).

Although Beauchamp's Inn proved more than big enough to accommodate the Great Wardrobe,

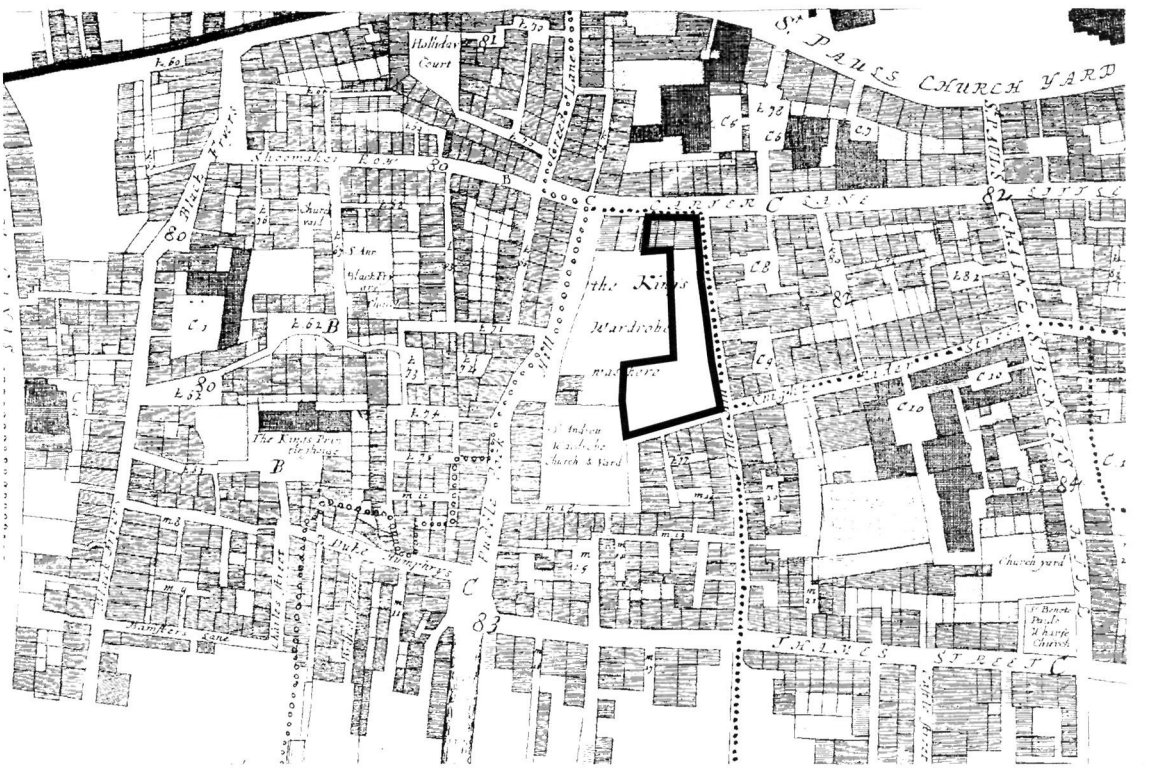

Fig 4. The Ogilby and Morgan map, 1676

alterations undertaken between 1361 and 1366 included glazing and paving the *taillorie*, the *skinnerchambre*, and the stairway in the winecellar in stone and tile. A new cistern was fitted in the tower, a spicery was constructed, and fireplaces and two ovens were also repaired. Repairs after 1366 were mainly concerned with retiling roofs, the maintenance of gutters, releading and glazing windows, as well as redaubing walls and gables (Sutton and Hammond 1983, 67–8). The use of daub implies a timber-framed superstructure.

Within the Wardrobe precinct were a number of buildings with separate functions, both residential and official. In 1483 the Royal apartments included a great hall (with glass windows) and porch, the King's chamber, the King's hall, his privy kitchen, a chapel, and a closet (each with altars). There was also the Queen's chamber, the Queen's hall and gallery, entry, and parlour. More closely related to the function of the Great Wardrobe were the Wardrobe itself (or storehouse), the nether storehouse, the Queen's storehouse, the spicery, the counting house, the treasury, the tower room, and the wardrober's room (the official residence of the keeper of the Wardrobe).

Artisans in the Wardrobe worked in the tailor's chamber and the skinner's chamber. There was also a forge in the precinct in addition to the larderhouse, the great tiled kitchen, and a little kitchen with a well. A latrine was built in 1444–5. Open spaces included the small and great garden (Sutton and Hammond 1983, 61–9).

Although the actual full layout of the buildings is undefined, both the counting house and the wardrober's room backed onto the rectory of St Andrew's, located to the south of the Wardrobe. The treasury was on the west side of the property (Sutton and Hammond 1983, 68–9).

In addition to the keeper, functionaries resident at the Wardrobe included the King's tailor and the clerk of the spicery (Tout 1928, 388). Other employees at the Wardrobe included a senior clerk (responsible to the keeper), clerks, a porter, a rent gatherer, gardeners, and labourers, who aired and beat the carpets. Craftsmen included

Fig 5. The Morgan map, 1682

armourers, carpenters, a cordwainer, goldsmiths, a mason, a painter, a pavilioner, a saddler, a shoemaker, and a tapicer (maker and mender of *arras* (wall hangings or tapestries)) (Sutton and Hammond 1983, 59–61).

Named craftsmen in 1385 included Walter Ralphs the tailor and his two assistants, Hans the embroiderer and two assistants, William Snell the armourer with two men-at-arms and six assistants, and John Ward the pavilioner with ten assistants. The tailors of the King's close relatives were also attached to the Wardrobe. In 1438 the King's skinner was in charge of 91 skinners, working from a paved chamber on the upper floor (Sutton and Hammond 1983, 63; Tout 1928, 353, 374, 378, 388, 391, 411).

The premises were occasionally used for official meetings of the privy council, while shops and houses on the perimeter of the precinct unoccupied by the Wardrobe were let out. In 1434–5 there were 21 tenancies paying rent to the Wardrobe (Sutton and Hammond 1983, 69).

The Wardrobe also served as a temporary royal residence: during the Peasants' Revolt in June 1381 Richard II took refuge there for at least two days; Richard III stayed there in November 1485. In 1398 the Wardrobe became a prison to house Thomas Mowbray, the Duke of Norfolk, and his twenty servants (Tout 1928, 405–11).

Post-medieval activity: the end of the Wardrobe and the impact of the Great Fire of 1666

By the 17th century the Great Wardrobe and the Exchequer were formally linked. Stow (published 1603) notes that Sir John Fortescue, master of the Wardrobe, was also chancellor and under-treasurer of the Exchequer (Kingsford 1908, 16). Following the Restoration of 1660, 800 people were employed in the Wardrobe (Tout 1928, 411). The first depiction of the Wardrobe and the surrounding buildings is the Agas map of *c.*1562 (Fig 3).

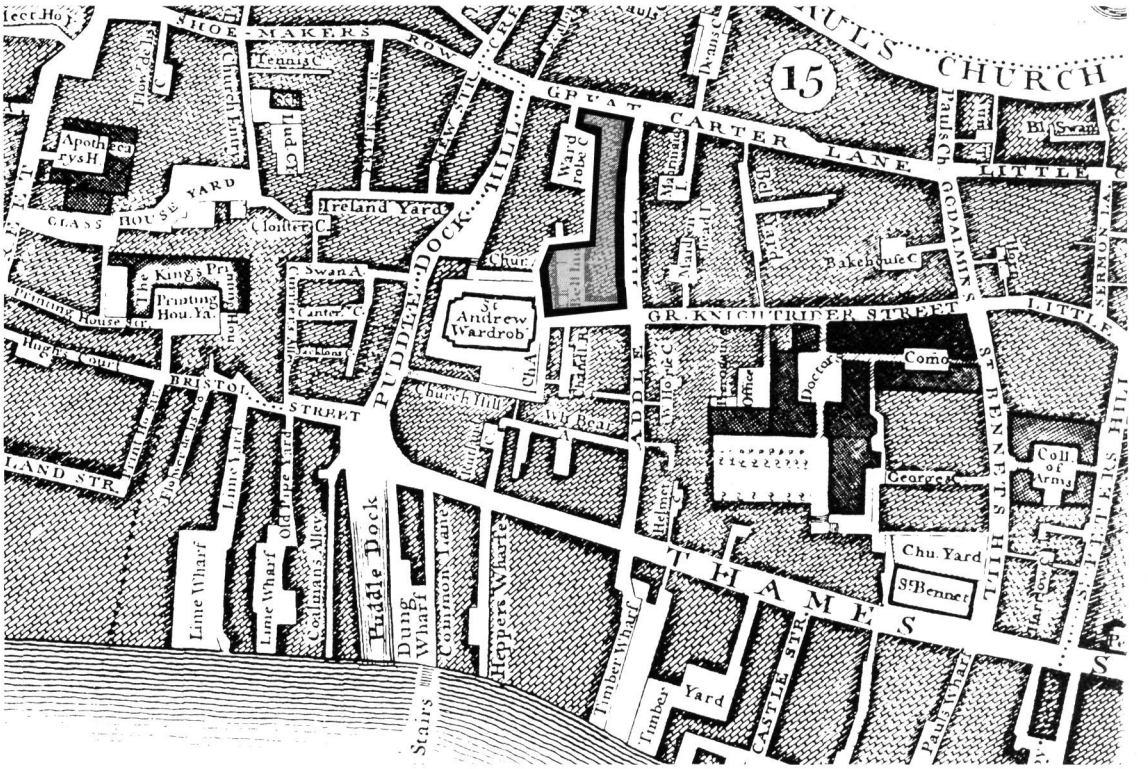

Fig 6. The John Rocque map, 1746

The Great Wardrobe was destroyed during the Great Fire of 1666 and not rebuilt. The office of the Wardrobe moved to Buckingham Street, near the Savoy, and then to Great Queen Street, where it was abolished in 1782 (Tout 1928, 411).

The land on which the Wardrobe stood was leased out after the Great Fire. Following a petition by Charles, Lord Buckhurst, in February 1671 the Commissioners of the Treasury valued the plot at £100 per annum for a 60-year lease. In late 1671 the plot was granted to Buckhurst on a 99-year lease, at the rate of 5 nobles a year (Ellis 1947, 247). With the noble worth 6s 8d, Buckhurst's rent of £1 13s 4d was a bargain.

Buckhurst's plot remained largely undeveloped for at least another ten years. The 1676 Ogilby and Morgan map shows only the frontage with Carter Lane as built up. Behind these buildings is a space marked 'the King's Wardrobe was here' (Fig 4). The Morgan map of 1682 shows an additional stretch of buildings along the eastern frontage onto Addle Hill (Fig 5). Otherwise the plot is in the same state as 1676. Carter Lane had been surveyed for post-Great Fire rebuilding between February 1667 and October 1672 (LTS 1967, 4), and presumably the buildings seen on the 1676 and 1682 maps were constructed soon after the fire, while the bulk of land occupied by the former Wardrobe remained unredeveloped.

By 1720 the garden of the Wardrobe had, according to Strype, been 'converted in to a large and square court, with good houses and called Wardrobe Court' (Strype 1720, 230). Numbers 3 5 Wardrobe Place, on the west side of the court, are dated to *c.*1714 (Bradley and Pevsner 1997, 621), and most probably date from the first post-Great Fire redevelopment of the plot. It is this enclosed square, depicted on the Rocque map of 1746, which defines the layout of current-day Wardrobe Place, shown on Fig 6 as Wardrobe C[ourt].

THE SITE SEQUENCE

With contributions by Ian M Betts, Lyn Blackmore, Louise Rayner and Kevin Rielly

The recommendations of the building materials and pottery specialists have been followed. Neither assemblage merited reporting on in individual sections and the results of the analysis of both the building materials and pottery are incorporated into this summary of the site sequence.

Period 1: natural topography

Alluvial gravels

The underlying geological deposit on the site was represented by alluvial gravels which comprised a compact mixture of pebbles and orange sand. Any brickearth capping had been removed in antiquity. In all areas of observation the gravels were truncated and had an uneven surface, the result of quarrying.

At the north-east of the site the gravel survived to *c.*10.00m OD. At the south-west it had a truncation level of between *c.*8.96m and 9.19m OD. In the excavation area, at the west of the site it survived up to 7.85m OD.

The 'Western Stream'

The archaeological work confirmed the supposition that the 'Western Stream' crossed the site, and the feature was recorded at the south and north of the site, but was absent from the central section of the site as it bowed out to the west (Fig 7).

The east side of the stream was recorded at the north of the site in Trenches C and D of the WAP88 excavations. The edge of the channel survived to 9.73m OD in Trench C and was recorded down to 5.92m OD in Trench D, giving a gradient of *c.*45° to the slope. Although the stream's west edge was beyond the limits of the site, it appeared to be aligned north-east/south-west.

Both sides of the stream were observed at the south of the site during the most recent works. The west side survived to 8.75m OD and continued to below a level of 7.45m OD. The edge of the feature was stepped, perhaps recut,

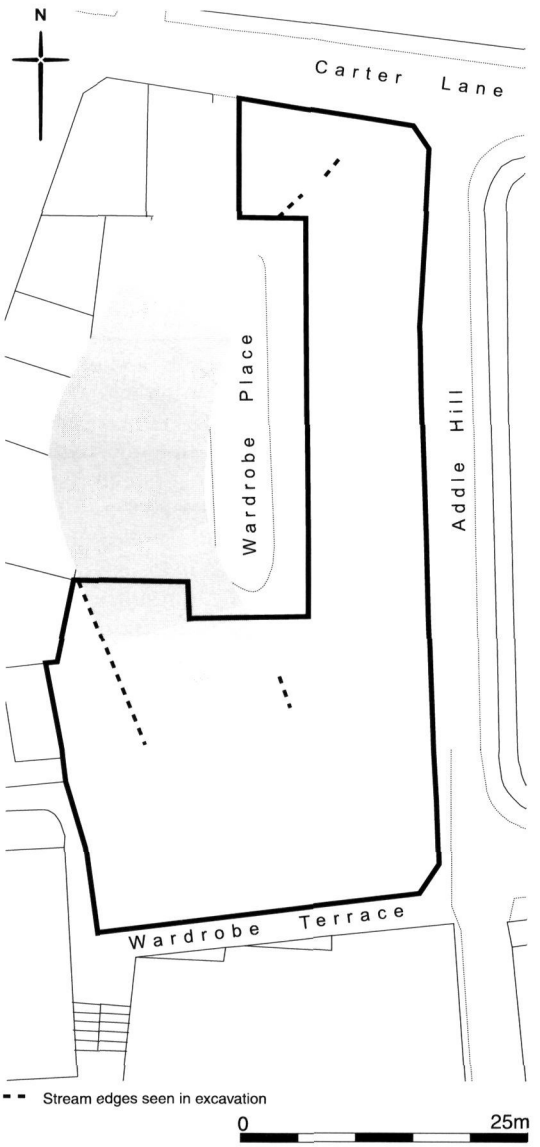

Fig 7. The course of the 'Western Stream' across the site

though at what date before it was backfilled in Period 3 is unknown (Fig 8). Twelve metres to the east of this edge the east side of the stream was observed, sloping down to a base level of *c.*6.08m OD.

Although these observations confirm that the 'Western Stream' was present on the site, it did not pass across the whole site. The alignment of the channel at the south of the site demonstrates that the stream bowed out to the west, then

curved east, parallel to St Andrew's Hill, to re-enter the site.

The levels of the base of the stream show no slope or fall downwards to the south. At the north of the site base level was below 5.92m OD, but at the south of the site it was 6.08m OD, at least 0.16m higher. At observations along Addle Hill, immediately east of the church of St Andrew by the Wardrobe, base level of the stream was below 6.2m OD. To the north of the site at St Paul's Churchyard the stream had a base level of 7.1m OD (Bentley 1987, 330–1).

Although these measurements suggest the base of the stream was virtually horizontal south of Carter Lane on its approach to the Thames, there must have been a marked drop in its base beyond the limits of the site.

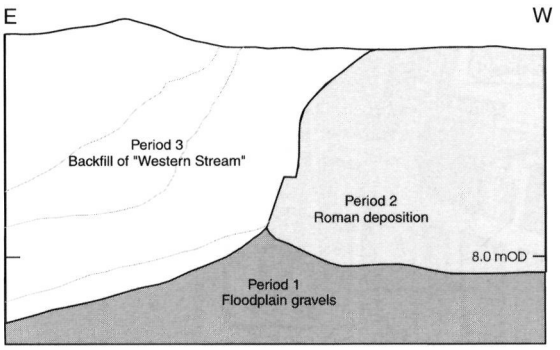

Fig 8. North-facing elevation through the west side of the 'Western Stream' (located on Fig 7)

Period 2: Roman activity

The truncated Period 1 gravels were sealed by a compact, uniform layer of redeposited brickearth (mottled tan with pebble, fragments of tile and charcoal, and flecks of charcoal). This consolidation layer was deposited to raise the ground level. The brickearth layer survived to between 8.84m and 9.95m OD, and in many areas of the site directly underlay the modern basement floor slabs.

Although pottery recovered from the consolidation layer should be regarded with caution, as this was a redeposited dump, deposition clearly

Fig 9. View of the west edge of the backfilled stream cutting through floodplain gravels in the excavation area, looking south

took place during the Roman period. Pottery included grog-tempered wares, the local Highgate Wood product (Highgate Wood B ware), early Roman micaceous sandy ware, a Colchester early colour-coated ware beaker with rouletted decoration, and two South Gaulish samian vessels which all point to a date from the mid to late 1st century. This, taken with the absence of any typical Flavian or later material, refines the period for this redeposited pottery to *c.*AD 50–70 – early in the life of the Roman city, implying that the quarrying was undertaken soon after the beginning of Roman settlement.

The pottery assemblage is exceptional as 113 of the 126 sherds belong to amphorae, including vessels from south Spain which originally contained both fish sauce from Cadiz (Camulodunum 186c) and olive oil from Baetica (Dressel 20). Other types included South Gaulish flat-bottomed wine amphorae (Gauloise 4) and cylindrical olive amphorae (London 555).

The importance of the trade in fish sauce is shown by the common recovery of similar amphorae from 1st-century deposits within Roman London (Davies, Richardson and Tomber 1994, 252). In addition, an inscribed amphora detailing its contents as fish sauce from Antibes, southern France, was recovered at Winchester Palace, Southwark (Yule, in prep).

The brickearth layer also contained a small quantity of ceramic roofing tile (*tegula* and *imbrex*) and daub, probably the remains of an early Roman earth and timber building with a tiled roof. Most of the tiles are fired red (fabric 2815), the normal colour of Roman tiles used in London and manufactured at kilns situated along Watling Street between London and St Albans. There is, however, one yellow-coloured tile (roofing tile or brick) from north-west Kent (fabric 2454). Roman fabric types are described in Crowley (1995, 154–5).

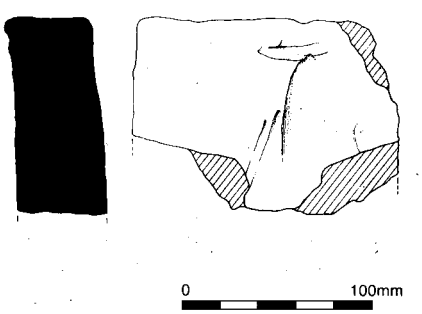

Fig 10. Roman brick with possible signature mark on its upper surface

Period 3: early medieval activity

Backfill of the 'Western Stream'

The Period 1 stream was backfilled by the early 13th century, and no earlier than the late 11th century.

The backfill deposits were strikingly uniform across the whole of the site. At the north of the excavation area they comprised a grey/black laminated clay/silt. Pottery recovered from this material included London coarse ware dated 1080–1200. Daub was also found. The backfill was also observed at the north of the site sealing the east edge of the stream. At the west of the site, within the limits of the excavation area, the stream feature retained four successive deposits (see Figs 8–9). Of these, only the next to bottom one included finds. These were Roman sandy ware dated to AD 50–400 and Roman ceramic building material dated to the 1st to mid 2nd century which included a brick (fabric 3006) with a number of marks in its upper surface, possibly including a signature mark (Fig 10). The deposit was not laminated and contained pebble, implying that it was not a primary stream fill and that the Roman finds were redeposited during the backfilling of the stream.

Other stream backfills recorded also included residual Roman finds (amphora sherds) and pottery dated to 1080–1150 (early medieval Chalky ware and coarse London-type ware).

Finds from the backfill of the stream in Trench D of the WAP88 excavations were similar. Local grey ware was recovered along with sherds in a glazed fine sandy buff ware, probably of Andenne ware. Taken together these sherds date the context to 1050–1150, although most of the pottery in the group is of Roman date, showing that the stream was filled in no earlier than 1080–1200 overall, and possibly during the period 1150–1200.

Plant remains from the lowest layers of the stream backfill included the remains of refuse, with little evidence for food plants (see below, The plant remains). The presence of animal bone and mollusc shell supported the conclusion that the stream backfill was the result of infilling (see below, The faunal remains). The botanical

Fig 11. Photograph of medieval chalk foundations, from the south

remains provided little definite evidence for flowing water. The high number of plants characteristic of nitrogen-rich soils suggests that the area was used for dumping rubbish.

Cuts into Roman consolidation layers

Successive cut features post-dated the brickearth consolidation layer. A curved cut, of which only the north-west edge survived, was backfilled with a compact mixture of brickearth and pebble. The fill included Roman roofing tile and brick, mainly 1st- to mid 2nd-century red tile and small fragments of medieval peg roofing tile (fabric types 2586, 2587) as well as fragments of Roman pottery, particularly amphorae and a lamp holder in Verulamium white ware. The backfill was cut through by another pit, of which only the curved south-east edge survived. This was filled with a dark grey sandy clay which included no finds. The badly truncated cut features probably represent the bases of backfilled rubbish pits.

Period 4: later medieval

Construction across the infilled stream

A series of mainly chalk-built foundations were recorded on the west part of the site in the area of the infilled stream (Figs 11–12).

Five trench-built foundations formed a group arranged roughly at right-angles to each other. The foundations were constructed from irregularly lain, roughly hewn chalk blocks and an off-white/yellow bonding material of sand. The southernmost sat upon a pier base with a yellower mortar. The pier base was built up against the western edge of the backfilled stream and cut through the Period 3 backfill.

Presumably, deeper, more sturdy foundations were needed in the areas where construction took place across backfill rather than solid ground. The northern foundation, constructed completely within the limits of the Period 3 backfill, was deeper than those to its south-west constructed on the Period 2 consolidation layers.

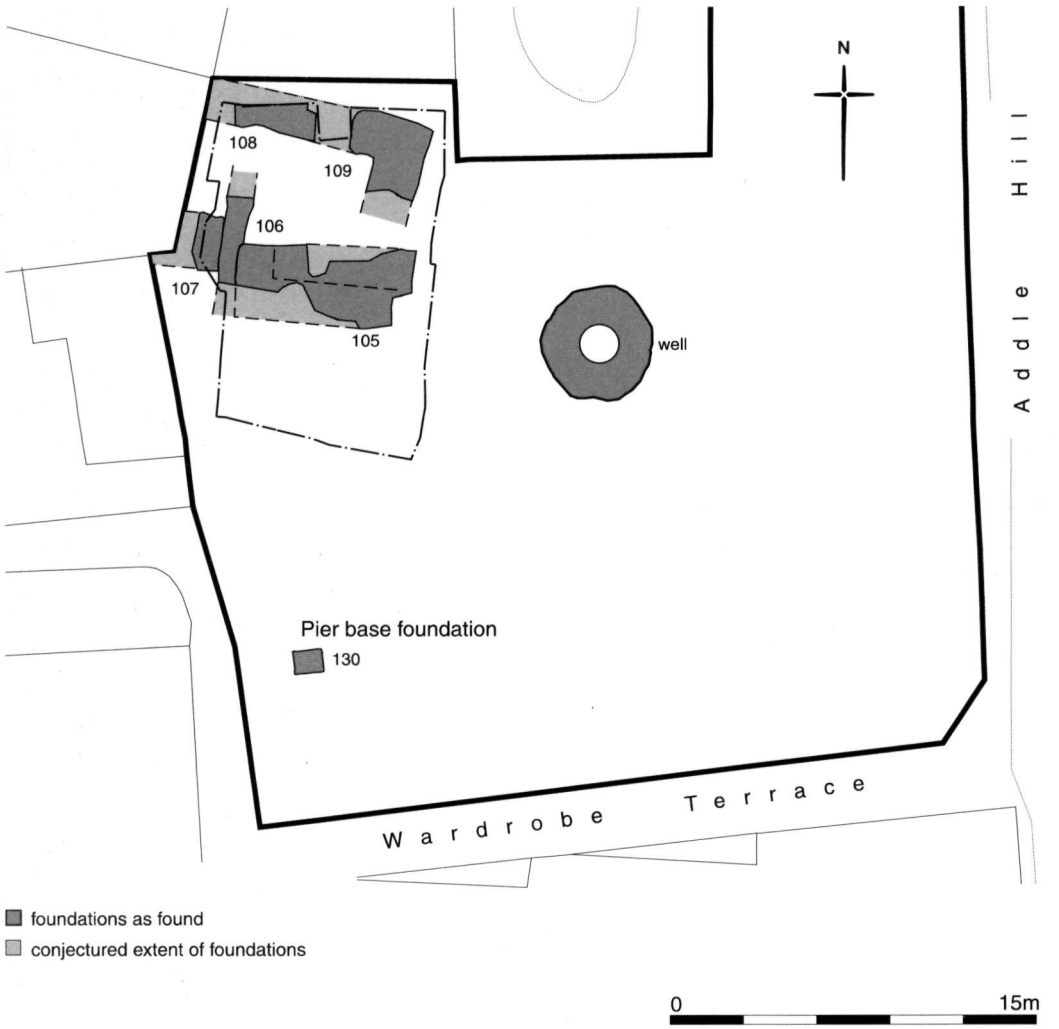

Fig 12. The medieval foundations

Of course this implies that those who constructed the foundations were aware of the nature of the underlying ground. As no other medieval foundations survived on the site it is clear that these were cut to a greater depth than other contemporary foundations.

Although the fabric of the foundations included no artefacts, their dating to the 14th, or possibly 13th, century is suggested by a number of factors. They clearly post-date the infilling of the stream and any layers which seal the stream, probably 1150–1200. Chalk was certainly the most common foundation fabric in medieval London, mixed with flint from the second half of the 13th century (Schofield 1995, 135).

To the south of the main group of foundations was one isolated pier base, located on Fig 12. The pier base (Fig 13) would have supported an arched foundation, a type of structure known from the 13th century (Schofield 1995, 137). This foundation suggests that the building extended, or had been extended, southwards.

To the east of the foundations was a chalk-lined well, located on Fig 12, which had been cut into the backfill of the 'Western Stream' (Fig 14). The base of the well was at 6.12m OD and it

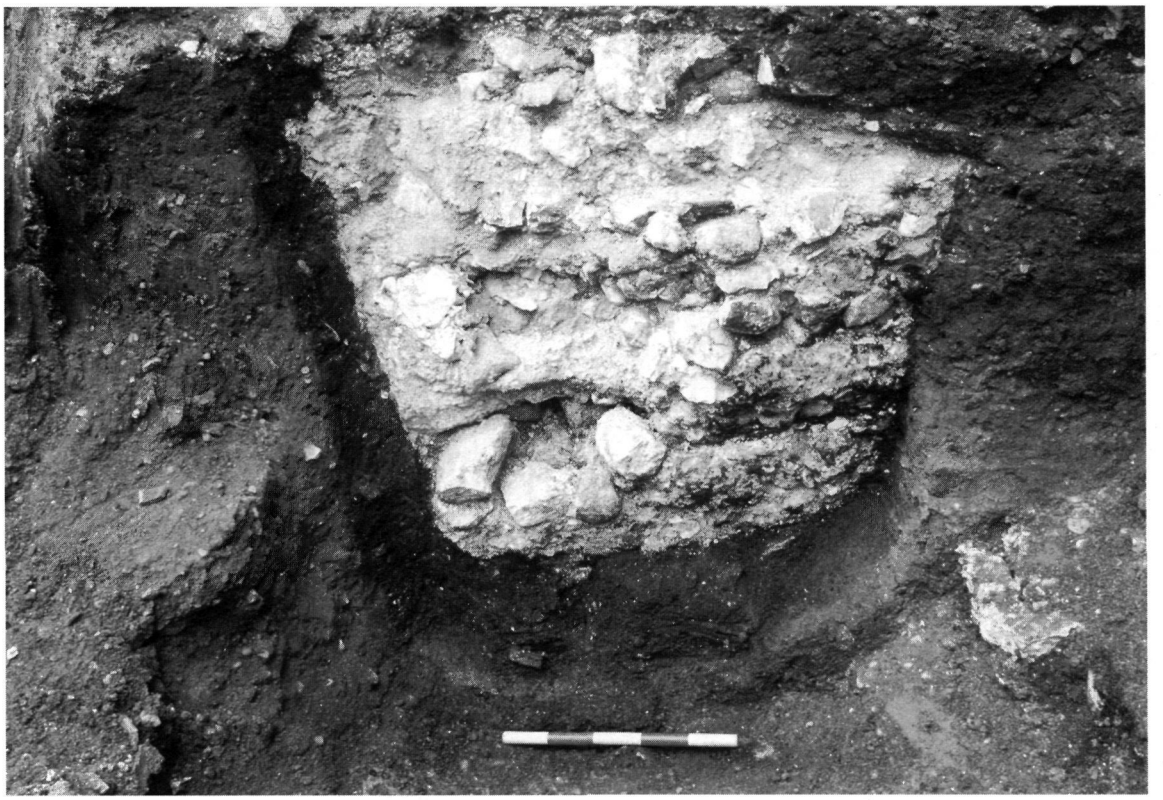

Fig 13. View to the south of pier base foundation. Scale 5 × 100mm

survived to 6.92m OD. Depth restrictions prevented its full excavation, but machine excavation revealed that no primary fill remained. The well must date from the same period as the medieval foundations, the 14th, or possibly the 13th, century.

Period 5: post-medieval activity

The basements of the recently-demolished Victorian buildings had truncated most of the post-medieval, post-Great Wardrobe sequence. Surviving evidence included a backfilled cut feature against the southern edge of the northernmost Period 4 foundation, the backfill of the Period 4 well, and some ash deposits sealing the truncated Period 4 pier base.

The cut against the medieval foundation was backfilled with building material including peg roofing tile and a fragment of ceramic ridge tile (fabrics 2271, 2273, 2586). Although there is no indication where these tiles came from, the Great Wardrobe did have a tiled roof and demolition took place after the 1666 Great Fire. Medieval fabric types are described in Betts (1990, 228).

The peg tiles included a variety of widths (141mm, 152mm, 163mm), which may represent separate batches. Larger tiles may have been set on the lower part of roofs with progressively smaller tiles towards the crest. The tiles are mainly splash glazed, although a few have a more uniform glaze covering. One tile had what may be a batch mark, added prior to firing, on the surface (Fig 15).

The backfill also included medieval pottery. Six vessels were represented, with thirteen sherds from a single vessel in South Herts greyware. This group contains sherds from a London-type ware baluster jug decorated in the North French style, which came into fashion *c.*1180. Although

Fig 14. View to the west of chalk-lined well under excavation

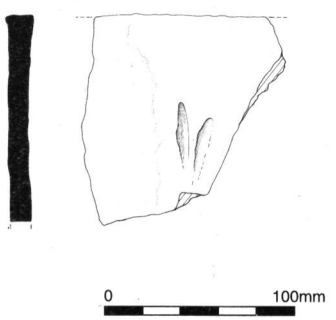

Fig 15. Medieval peg tile with a possible batch mark

redeposited, the combination of ware types suggests a late 12th-century date.

A layer of ash covered the truncated pier base and can be interpreted as debris from the 1666 Great Fire.

The medieval well associated with the Great Wardrobe structures was backfilled with a mixed deposit which included sherds of Border Ware and Frechen stoneware dated to 1550–1700. The well appeared to have been backfilled after the Great Fire. The backfill contained two fragments of peg roofing tile, one of which is of a type which is no earlier in date that the late 15th century (fabric 2276). Medieval fabric types are described in Betts (1990, 228).

CONCLUSIONS

Analysis of the results of the excavations at Wardrobe Place allows a number of conclusions to be reached, some contrary to the expectations for the site.

There was no evidence for brickearth capping the alluvial gravels, and the early Roman quarrying known from excavations in the neighbourhood must also have taken place at Wardrobe Place. In the later Roman period the ground was consolidated through the deposition of a uniform layer of brickearth containing finds dating from the 1st century AD.

The 'Western Stream' was expected to cross the site, and whilst there was certainly a substantial ditch-like feature present, its base was higher at the south than to the north, and it was un-streamlike.

Environmental study of the lowest fills within the feature demonstrated little evidence for flowing water and indicated that the fills were dumped. The recutting of the sides of this feature, both at this site and to the north at St Paul's Churchyard, is further evidence that it was a man-made ditch, possibly created from a natural stream channel.

In summary, although the 'Western Stream' may have been a natural water course during the Roman period, by the time of its backfilling it was almost certainly a ditch, probably the ditch along the east side of Baynard's Castle 'destroyed' *c.*1114.

The medieval foundations observed at the site were certainly typical of types known from the 13th century and later. Beauchamp's Inn and the Great Wardrobe are the only known documented buildings on the site between the 14th century and the Great Fire, and the foundations must be from the Wardrobe. Although the foundations were truncated, they did indicate building alignments. The foundations continued westwards, beyond the limits of the site, and the potential for survival of medieval buildings beneath existing basements along St Andrew's Hill must be recognised.

The historic record indicates that the Great Wardrobe had a tile roof and a timber superstructure with daub walls. The roof tiles recovered from the site probably derive from the Great Wardrobe and were deposited at the time of its demolition. The well was the only surviving feature which might have contained evidence for activities at the Wardrobe, but no primary fills were found.

After the Great Fire of 1666 the Great Wardrobe was pulled down and the plot remained partially unredeveloped until at least 1681, with only the frontage onto Carter Lane being developed by that date. The buildings which remain standing along the west side of the current Wardrobe Place were constructed *c.*1714 and it is probable that behind the Carter Lane frontage the site remained open between 1666 and *c.*1714. Beyond the backfill of the medieval well and some ash deposits there was no archaeological evidence for the Great Fire and its aftermath at the site.

Despite the extensive truncation by basements the excavations at Wardrobe Place were a valuable exercise. The evidence that the 'Western Stream' was a ditch immediately prior to its backfilling and the evidence for the structure and location of the medieval Great Wardrobe are both significant for the understanding of the development of this area of the City of London.

THE FAUNAL REMAINS

Kevin Rielly and Alan Pipe (Environmental Archaeology Section, Museum of London Specialist Services)

Introduction

A small collection of animal bones and terrestrial/marine molluscs was looked at from WDC97 and WAP88. The bones were limited to the Roman and early medieval phases – Periods 2 and 3, corresponding to the mid 1st-century expansion of the city following the Boudican revolt, and to the backfilling of the 'Western Stream'.

Roman: Period 2

This period is represented by a series of consolidation deposits overlying truncated river terrace gravels. A single fragment of pig was recovered from one of these deposits (see Table 1).

Medieval: Period 3

Samples from the Period 3 stream backfills (in WAP88) provided small collections of animal bones and freshwater/marine molluscs (see Tables 1–2). Although it is unclear how long the stream remained open, these fills are likely to date its infilling. The fills appear homogeneous and unlike water-lain deposits.

A small collection of freshwater molluscs, each with a preference for clean, flowing water, was recovered from these fills. These, alongside the small collection of Roman pottery from this backfill, are residual. The freshwater shells are accompanied by small quantities of food waste, composed of a variety of marine molluscs, major mammalian and bird domesticates, and a relatively diverse range of fish species. The latter include both freshwater and marine species, with a clear bias towards estuarine exploitation. Of interest is the presence of sturgeon, represented by a dermal scute, which is a high-status food item.

Although the quantities of bones are small, it can be seen that these backfills contain a mixture

Table 1. The animal bones: species representation

Species	Period		
	2	3	3
	HC N	HC N	S N
Cattle		1	2
Cattle-size		4	3
Sheep/Goat		1	4
Pig	1	2	3
Sheep-size		2	8
Chicken			2
?Domestic duck			1
Unidentified bird			4
Herring/Sprat			21
Herring			2
Cyprinidae			5
Smelt			3
Sturgeon			1
Eel			3
Gadidae			3
Small gadid			1
Plaice/Flounder			6
Thornback ray			1
Unidentified fish			1
Unidentified			200
Total	**1**	**10**	**274**

N: the total number of fragments; HC: hand-collected, all from WDC97; S: sieved bones, from the WAP88 stream fills.

of processing and consumer waste. Clearly these waste dumps were derived from a number of different sources, assuming that the larger animals, if not the fish, were purchased as joints, or at least as dressed carcasses, rather than whole.

Relatively few bones could be aged and these included the mandible of a young adult pig and an adult and a juvenile chicken.

Bones from the stream backfills in WDC97 (dated to AD 1080–1150) included just ten fragments (context [122], see Table 1), entirely composed of the major mammalian domesticates. This small collection, in common with the stream fills, also represents the remains of a mixed dump of preparation and food waste. Noticeably the pig bones are both from young animals, coinciding with the typical age at which pigs are culled for their meat. Age evidence is also available for the cattle fragment; this is from a sub-adult individual, again representing an animal specifically reared for meat. The cattle-size vertebrae are clearly from somewhat older animals, which, it can be assumed, were initially used for some secondary production prior to slaughter for their meat.

Conclusions

The medieval assemblage from the backfills of the 'Western Stream' suggests that much of the general food waste incorporated into these deposits came from nearby households. There is some evidence to suggest that pigs and chickens may have been kept or reared locally and there is positive confirmation of this practice within the City of London throughout the medieval period (Hammond 1995, 41).

The range of species represented is very similar to that of other medieval assemblages found within the City. The quantities of bones are too small to afford any spatial or temporal comparisons. It can be seen, however, that the fish bone follows a similar pattern to other contemporary assemblages, with good representation of estuarine species, in particular herring/sprat.

Table 2. The marine and freshwater molluscs: species representation

Species		Habitat	N
Common name	**Scientific name**		
Swollen river mussel	*Unio tumidus*	Slow moving streams/canals. Clean water	2
River nerite	*Theodoxus fluviatilis*	Slow or fast moving clean water rich in lime	1
Common Oyster	*Ostrea edulis*	Marine	3
Common Whelk	*Buccinum undatum*	Marine	2
Common Cockle	*Cardium edule*	Marine	1
Common Mussel	*Mytilus edulis*	Marine	9

All from samples taken from Period 3 fills within western stream in WAP88. Habitat data taken from Kerney (1999).
N number of shells.

THE PLANT REMAINS

John Giorgi (Environmental Archaeology Section, Museum of London Specialist Services)

Introduction

This report outlines the results of the analysis of plant remains recovered from selected environmental soil samples taken from the WAP88 Period 3 stream backfills. It was hoped that the plant remains from these deposits could provide information on the local environment and possibly shed some light on the nature of any human activities taking place close-by. The faunal remains from these samples were also scanned for additional habitat and economic data (see above: The faunal remains).

Six samples were selected from deposits from the base of the sequence of fills within the 'Western Stream' in Trench D of the WAP88 excavation. The samples were of the bottom six deposits within the stream channel. These were, successively: dark grey peaty silty clays; a layer of dark grey peat; a layer of dark bluish grey silty clay peat; and a layer of dark blue-black peat. These had been interpreted in 1990 as waterlain.

Each sample consisted of a volume of eight litres, entirely processed by flotation using a 0.25mm and 1mm mesh for the recovery of the flot and residue respectively. The flots were kept wet to prevent the decay of organic remains while the residues were dried and scanned for both environmental and artefactual evidence.

The plant remains were separated into different size fractions for ease of sorting and scanning and identified using a binocular microscope, the seed reference collection housed in the Environmental Section, MOLSS, and seed reference manuals (Berggren 1981; Beijerinck 1947). The rich organic samples were scanned wet. The only material that was extracted was plant material that was not readily identifiable or charred plant remains (not charcoal) which were sorted and quantified in absolute numbers. Waterlogged material was only scanned and approximate abundance of individual species recorded.

Identifications were entered onto the MoLAS Oracle database system and tables of results generated by site and edited in Excel. Ecological information is based mainly on Clapham *et al* (1987) and Stace (1991).

Results

The results are presented in Table 3. The general quality of preservation was exceptionally good with a wide range of plant remains preserved by waterlogging. This consisted of fruits and seeds virtually entirely from wild plants, wood fragments, moss fragments, and fragmented cereal bran in two samples. Charred material was restricted to flecks and small fragments of charcoal in all the samples and a few charred cereal grains in five of the six samples.

The following discussion summarises the main habitat groups represented by the plant material and then compares the samples to highlight any potential variation between the individual botanical assemblages. Other biological and artefactual material in the samples is also considered to facilitate interpretation of the plant remains and additionally to provide information on environmental and economic activities in this area. Finally, comparisons are drawn with any similar previous environmental work within the City.

Wild plants: habitat groups

The division of the different plants in the assemblages into habitat types is difficult on several accounts. Many species may grow in more than one habitat and few are exclusive to just one habitat. A further problem concerns the level of identification. Many of the species could only be reduced to genus which causes difficulties in interpretation as species within a genus may grow in more than one habitat. For example docks (*Rumex* spp.) and rushes (*Juncus* spp.), all of which were well represented in the samples.

Wetland plants

Wetland plants were represented by aquatic and bankside/marshland species. The best represented species found in all the samples were rushes (*Juncus* spp.), spike-rush (*Eleocharis* spp.), sea club-rush (*Scirpus maritimus*), and, in virtually all the samples, celery-leaved crowfoot (*Ranunculus sceleratus*).

None of the wetland plants are exclusively aquatic species. While celery-leaved crowfoot is found both in and by slow streams and shallow ponds, it also grows in ditches and in marshy fields. Sea club-rush similarly grows in shallow

Table 3. The plant remains from Wardrobe Place

Latin name	English name	Plant part	Habitat/ use	context sample	157 9	154 8	144 7	134 6	127 4	121 2
Charred plant remains										
Triticum cf. *aestivum* type	Bread/Club Wheat		FI				1			1
Triticum spp.	Wheat		FI							2
Secale cereale L.	Rye		FI				3			
cf. *S. cereale*	Rye		FI				2			
cf. *Hordeum sativum*	Barley		FI			2				
Avena sp.	Oat		AFI			1		1		1
Cerealia	Indet. Cereal		FI			2	6		1	
Avena/Bromus sp.	Oat/Brome Grasses		ABCDFI							
indeterminate		char-coal			+++	+++	+++	+++	+++	+++
Waterlogged plant remains										
Cerealia	Indet. Cereal	bran	FI		++		++++			
Ranunculus acris/repens/ bulbosus	Buttercups		ABCDEG		++++	++	++	++++	++++	++++
R. sardous Crantz	Hairy Buttercup		ABE		++	++++	++	+++	+++	+++
R. parviflorus L.	Small-Flowered Buttercup		AD			+				
R. flammula L.	Lesser Spearwort		EG					+	+	+++
R. sceleratus L.	Celery-Leaved Crowfoot		E		+++	+++		+++	+++	++
Ranunculus spp.			ABCDEG			++				+
Brassica/Sinapis spp.	Wild Cabbage, Mustard etc.		ABFGHI		++	+	+	+	+	++
Raphanus raphanistrum L.	Wild Radish/ Charlock		A					+		+
Silene spp.	Campion/Catchfly		ABCDF		++			+	+	+
Agrostemma githago L.	Corn Cockle		AB		++++	++++	+++	++	++	++
Stellaria media gp.	Chickweeds		ABCDE		+	+	+	+	+	+
Stellaria graminea type	Lesser Stitchwort		CD		+	+		+		+
Caryophyllaceae indet.						+			+	++
Chenopodium spp.	Goosefoot Etc.		ABCDFH		+ ++			++	+	
Atriplex spp.	Orache		ABFGH		+++	++++	+++	+++	+++	+++
Linum sp.	Flax		ADHI		+			+		
Medicago sp.	Medick		BD							+
Rubus fruticosus/idaeus	Blackberry/Raspberry		CFGH		++	+	++		+	+
Potentilla spp.	Cinquefoil/Tormentil		BCDEFGH			+				1
Prunus spinosa L.	Sloe/Blackthorn		CFG				+			
P. domestica L.	Plum/Bullace		CFI				+			
Malus domestica/ sylvestris	Apple/Crab Apple		CFHI					+		+
Oenanthe fistulosa L.	Water Dropwort		E					+		
O. cf. *fistulosa*	Water Dropwort		E				+			+
Oenanthe spp.	Dropwort		DE					+		
Aethusa cynapium L.	Fool's Parsley		A				+	++	+	+
Torilis sp.	Hedge-Parsley		ACD		+++	++++	+	+	+	
Apiaceae indet.							+			+
Bryonia dioica Jacq.	Bryony		CG		+	+		+		
Polygonum aviculare agg.	Knotgrass		BG		++	3	++	+++	+	++
P. persicaria L.	Persicaria		ABEH			+			+	
P. lapathifolium L.	Pale Persicaria		ABE		++	+	+			
Fallopia convolvulus (L.) A. Love	Black Bindweed		ABF		+++	++		++		++
Polygonum spp.			ABCDEFG							+
Rumex acetosella agg.	Sheep's Sorrel		AD		+++		+	+	+	++
Rumex spp.	Dock		ABCDEFG		+++	+++	+	+++	++	+++
Urtica urens L.	Small Nettle		AB			++				
U. dioica L.	Stinging Nettle		BCDEFGH		+	+	+		+	+

Table 3. (Continued)

Latin name	English name	Plant part	Habitat/ use	context sample	157 9	154 8	144 7	134 6	127 4	121 2
Corylus avellana L.	Hazel		CF		+	+	+	+	++	+
Menyanthes trifoliata L.	Bogbean		EFG						+	+
Hyoscyamus niger L.	Henbane		BDG			+++				
Solanum nigrum L.	Black Nightshade		BF		++	++++	+	+		+
Euphrasia/Odontites sp.	Euphrasia/Red Bartsia		ABCDE					+		
Mentha sp.	Mint		ABCEFGI				+			
Lycopus europaeus L.	Gipsy-Wort		EH							+
Prunella vulgaris L.	Self-Heal		BCDG		+				+	
Labiatae indet.	#NAME?		ABCFEFI			+				
Plantago major L.	Great Plantain		ABC		++	++	+	++		
Sambucus nigra L.	Elder		BCFGH		+++	++	+++	+	+	++
Valerianella dentata (L.) Pollich	Corn Salad		A		+			+		
Anthemis cotula L.	Stinking Mayweed		ABGH		+++		+++	++++	+++	+++
Chrysanthemum segetum L.	Corn Marigold		AHI					+	+	+
Carduus/Cirsium spp.	Thistles		ABDEG			+		+	++	++
Centaurea sp.	Knapweed/Thistle		ABDGH		+			+	+	+
Lapsana communis L.	Nipplewort		ABCF		+		+	+	++	
Leontodon sp.	Hawkbit		BDF		+	+	+	++	+	+
Sonchus oleraceus L.	Milk-/Sow-Thistle		AB					+		
S. asper (L.) Hill	Spiny Milk-/ Sow-Thistle		AB		++	+		+		+
Compositae indet.					+					
Alisma spp.	Water-Plantain		E				+	+		
Juncus spp.	Rush		ABCDEH		+++	+++	+++	+++	++	++
Eleocharis palustris/ uniglumis	Spike-Rush		E		+++	+++	++	++++	+++	++++
Scirpus maritimus L.	Sea Club-Rush		E		+++	++++	+	++	++	+++
Carex spp.	Sedge		CDEH		++	++	++	+		++
Cyperaceae indet.			ABCDEFI		++	++	+	+++	++	+++
Poaceae indet.	Grasses		ABCDEFHI		++	++	+	+++	++	++
indeterminate					+	+	+	+	+	+
indeterminate		wood			++++	++++	++++	++++	++++	++++
Bryophyta indet.	Moss				++	+	+++	++	+++	+++

Key
Frequency: + = 1–10 items; ++ = 11–50 items; +++ = 51–100 items; ++++ = 100+ items.
Habitat codes
A = segetals;weeds of cultivated land; B = ruderals, weeds of disturbed ground; C = plants of woods, scrub, hedgerows; D = plants of grassy places; E = aquatic and damp ground plants; F = edible plants; G = medicinal and poisonous plants; H = other uses, eg. fibre, dyeing; I = cultivated plants.

water at the muddy margins of tidal rivers and ponds near the sea, but also in ditches.

The following wetland plants were represented by smaller amounts of seeds and were present in only a few samples: lesser spearwort (*Ranunculus flammula*), water dropwort (*Oenanthe fistulosa*), bogbean (*Menyanthes trifoliata*), gipsy-wort (*Lycopus europaeus*), and water plantain (*Alisma* spp.). Again, most of these plants can be found in water as well as in damp ground. Water dropwort grows in shallow water and marshy places, bogbean in ponds, the edges of lakes and the wetter parts of bogs and fens, and water plantain beside slow flowing rivers, ponds, ditches and canals, in damp ground or shallow water.

Plants of disturbed (including arable) ground and waste places

This category was represented by the widest range of species and by high seed frequencies partly because many of these plants are high seed producers. Plants that were found in all or virtually all the samples by high frequencies of seeds included hairy buttercup (*Ranunculus sardous*),

corncockle (*Agrostemma githago*), goosefoots/oraches (*Chenopodium/Atriplex* spp.), black nightshade (*Solanum nigrum*), and stinking mayweed (*Anthemis cotula*). Moderately well represented species appearing in at least four samples were fool's parsley (*Aethusa cynapium*), knotgrass (*Polygonum aviculare*), black bindweed (*Fallopia convulvulus*), stinging nettle (*Urtica dioica*), great plantain (*Plantago major*), and spiny milk-/sow-thistle (*Sonchus asper*).

As well as being weeds of gardens and waste places (including rubbish tips), many of these plants are potential arable weeds often found in association with grain deposits. Common arable weeds in the samples include wild radish (*Raphanus raphanistrum*), corncockle, fool's parsley, corn salad (*Valerinella dentata*), stinking mayweed, and corn marigold (*Chrysanthemum segetum*). Corncockle seed fragments often occur in grain deposits and bran because it is a difficult weed seed to separate from grain and was often ground up and digested as part of bread. Corncockle fragments were found in association with cereal bran in two samples.

Shrub/hedgerow plants

These were not particularly well represented in the assemblages and consisted mainly of wild fruits. Elder (*Sambucus nigra*) and blackberry/raspberry (*Rubus fruticosus/idaeus*) were the best represented of these species, although both are fairly robust seeds and therefore are frequently well represented in archaeobotanical assemblages from London sites. A few shell fragments of hazelnut (*Corylus avellana*) appeared in all of the samples, mainly from the sorted residues, while occasional fruit stones of plum/bullace (*Prunus dometica*), sloe/blackthorn (*P. spinosa*) and seeds of apple/crab apple (*Malus domestica/sylvestris*) were identified in single samples.

These fruits are all potential sources of food and the paucity of these remains together with few other typical hedgerow plants (*eg* bryony (*Bryonia dioica*) in one sample) could suggest that these remains represent residues of food preparation rather than a hedgerow environment.

Grassland/hay meadow plants

A moderate number of the plants in the assemblages are characteristic of grassland habitats. These were generally poorly represented in terms of seed numbers, although grassland plants are mainly low seed producers. None of these plants, however, are exclusive to a grassland environment.

Several of the species in the assemblages are potential hay meadow plants (Greig 1984). These include buttercups (*Ranunculus acris/repens bulbosus*), self-heal (*Prunella vulgaris*), thistles (*Carduus/Cirsium* spp.), knapweed/thistle (*Centuarea* spp.), hawkbit (*Leontodon* spp.), rushes, sedges, and grasses. Virtually all of these species are poor rather than good indicators of hay meadows because they may be found in other habitats.

The same problem exists for other potential grassland species, for instance sheep's sorrel (*Rumex acetosella*), represented in five of the six samples but which may be found in arable as well as dry meadow environments. Another species, lesser stitchwort (*Stellaria gramineae*) (in four samples), grows in open meadows but also in thickets and arable land.

Economic plants

There were few definite economic plants represented in the samples. A small assemblage of cereal grains (23 in total) was collected from five samples which included free-threshing wheat (*Triticum aestivum* s.l.), rye (*Secale cereale*), barley (*Hordeum sativum*), and oats (*Avena* spp.). These are the four main cereals represented in archaeobotanical samples from this period and they are ubiquitous in London. Wheat and rye were used almost exclusively for bread, while barley and oats were used both for human and animal consumption. Evidence for cereals was also represented by very fragmented bran in two samples; some of this bran was from wheat/rye, which suggests a human origin. The presence of bran could indicate faecal remains.

Many of the wild plants may also have had potential uses as food or for medicinal, industrial, and other purposes. The wild fruits, plum/bullace, sloe/blackthorn, apple/crab apple, elder, blackberry/raspberry, and hazel, may have been gathered while in season and used for food and drink. The leaves of wild plants such as goosefoots/oraches, docks, and nettles, may also have been collected and added to pottage or eaten as green vegetables. Similarly, a small number of seeds of the *Brassica/Sinapis* group, which includes several common vegetables such as cabbage, swede, and turnip, were present in

all the samples, although these could be from wild rather than cultivated species.

A small number of flax (*Linus* sp.) seeds were present in two samples but these were not identified to species and therefore it was not possible to establish whether these were from wild or cultivated flax.

Moreover, most plants, including many in the sample assemblages, have potential medicinal uses, for example, henbane (*Hyoscyamus niger*) and black nightshade. Indeed, the mixed nature of the deposits means that it is not possible to do other than speculate on whether or not the wild plants were exploited.

Soils

The wild plants in these assemblages grow in a range of soil types although many are characteristic of sandy and loam soils, *eg* wild radish, lesser stitchwort, knotgrass, persicaria, pale persicaria, sheep's sorrel, milk-/sow-thistle (*Sonchus oleraceus*), and spiny milk-/sow-thistle.

Some are strong indicators of acidic soils, eg wild radish, lesser stitchwort, sheep's sorrel, and corn marigold. Others indicate moderately acidic/neutral soils, *eg* corncockle, neutral/alkaline soils, *eg* fool's parsley, and weakly acidic to alkaline soils *eg* chickweeds and black nightshade. Many of these plants grow in nutrient-rich soils typical of rubbish tips and dumps associated with human habitation. Others are typical of damp soils, for example, hairy buttercup, persicaria, pale persicaria, and stinking mayweed an indicator of waterlogged loams and clay soils.

The range of soil types that these plants may grow in may indicate that there were a number of origins for these plants that may have arrived on site as weeds of economic plants rather than growing on the site itself.

Other biological and artefactual remains in the samples

The presence of other environmental material in the samples may provide useful supporting evidence on the possible character of the local environment, and, together with the artefactual remains, may also provide information on the nature of human activities nearby.

Large quantities of beetle remains and pupae were found. Moderate amounts of large mammal and fish bone were present in most of the samples, with occasional small mammal and bird bones in several samples. Freshwater molluscs and marine shell including mussel were found in a few residues while a small amount of eggshell was noted in one residue.

The only potential environmental indicator from this evidence was the small number of freshwater molluscs indicative of clean flowing water, although it is possible that this material was residual.

Other material in the residues points to a number of different sources for its origin with occasional to moderate quantities of glass, metal, leather, and pot fragments in the residues suggesting domestic and possibly industrial/commercial activities.

Comparisons between samples within the sequence

All the plant assemblages were found to be fairly consistent with little variation in the number of species within each assemblage. There were some differences in the range and/or frequency of represented plants within each sample. For example, there were high seed frequencies of hedge parsley (*Torilis* spp.) seeds in the lowest two samples while there was a concentration of henbane and black nightshade seeds in Sample 8 (see Table 3). These seeds, however, were in very mixed plant assemblages and none of these differences can be considered significant in terms of the habitat that the plant remains represented in each individual sample.

The best represented plants tended to appear in all or virtually all the samples: buttercups, hairy buttercup, celery-leaved crowfoot, corncockle, oraches, knotgrass, docks, elder, stinking mayweed, rushes, spike-rush, sea club-rush, sedges, and grasses. Large quantities of charcoal, wood, both represented by small fragments, and mosses were also found in all the samples.

Comparison with similar sites in the City of London

The range of plant remains in the samples is very similar to that found in other studies of archaeobotanical remains from medieval City sites. Weeds of disturbed ground and waste places

together with wetland plants are usually the most commonly represented wild plants together with fruit species and occasional charred grains.

Conclusions

Collectively the botanical evidence indicates damp, disturbed, waste ground with the exception of the corncockle seed fragments and stinking mayweed seeds (which may have been imported with cereals).

The high number of plants characteristic of nitrogen-rich soils suggests that the area was used for dumping rubbish. Many of the plants also suggest that these soils were mainly acidic sandy loams.

There was very little evidence for the residues of food plants except for a few grains and fruit seeds plus cereal bran fragments in two samples, which may be indicative of faecal remains. The botanical remains in these samples provided little definite evidence for flowing water, although some of the species do suggest damp conditions where there may have been occasional standing bodies of water. The predominance and nature of the plants of disturbed ground and waste places suggests that the fills represent episodes of dumping/infill.

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