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PRE-CONSTRUCT ARCHAEOLOGY

MONOGRAPH 6

RECLAIMING THE MARSH

ARCHAEOLOGICAL EXCAVATIONS AT MOOR HOUSE, CITY OF LONDON

BY JONATHAN BUTLER

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AT MOOR HOUSE, CITY OF LONDON
1998–2004

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Archaeological Excavations at Moor House, City of London, 1998–2004

Jonathan Butler

Pre-Construct Archaeology Limited, Monograph No. 6

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Front cover: skating on the frozen lake, by Jake Lunt

Back cover: bone skates, post-medieval slip-trailed redware dish, Roman copper alloy animal figurine

Contents

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Post-medieval redware production	Berni Sudds with Alan Vince
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Clay tobacco pipe	Chris Jarrett
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Tuning peg	Frances Palmer and Damian Goodburn
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Human bone	Natasha Dodwell
Animal gnawing of human bone	Philip Armitage
Animal bone	Philip Armitage
Environmental analysis	Nick Branch, Alys Vaughan-Williams, Barbara Silva, Chris Green and Alan Williams
Geochemical & plant macrofossil analysis	Nick Branch and Alys Vaughan-Williams
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Figures

Tables

Summary

The archaeological investigations at Moor House lasted some six years from initial monitoring of geotechnical test pits in 1998, through an evaluation and several phases of excavation between 2000 and 2002, finally finishing with a watching brief phase culminating in the monitoring of the excavation of a sewer connection in 2004. During this time, despite the relatively limited survival of archaeological remains measuring approximately one metre in thickness within the footprint of the standing buildings, a wealth of information was recovered about an archaeologically little-known part of the City of London. This area consisted of the northern part of the City defensive ditch and the land immediately beyond it, which came to be occupied from the later Roman period until the 16th century by a marsh, known from the medieval period as the Moor or Moorfields.

The history of the site until the 17th century is dominated by the presence of water and most notably the river Walbrook to the east. The earliest features on site were the remains of small streamlets and channels which criss-crossed the site until linking with the main Walbrook to the east. The infill of one of the channels suggested at least limited activity in the late Iron Age to the end of the 1st century AD. The earliest human activity occurred during the first three quarters of the 2nd century AD and consisted of widespread quarrying of the sands and gravels and most likely the brickearths which had once covered the site. This further contributed to the low lying and marginal nature of the area. A thin deposit of brickearth was then washed into the area and filled and covered the earlier quarry pits around AD 160 to 170.

A number of features were revealed cut into the brickearth, which seemed to represent a period of sustained activity during the period from the last third of the 2nd century AD to AD 200/220 in the area. The activity consisted of the excavation of quarry pits and drainage ditches and a quantity of stakeholes and postholes, which together with gravel surfaces and possible structural remains may suggest occupation of the site. The end date for this phase of activity is significant as it coincides with the construction of the City wall at the end of the 2nd century AD. The construction of the City wall had a devastating effect on the area. The wall prevented the free flow of the Walbrook towards the Thames and led to a build up of waterlogged land in the region of the upper Walbrook valley. The widespread quarrying of this locality in the previous century as Londinium had expanded would also have been a contributary factor as the area would have been even more low lying than before. A series of bad winters and heavy rainfalls may also have accelerated the process.

Thereafter the area was occupied by a marsh and man's attempts to utilise it were witnessed during the next 1400 years until the reclamation of the marsh was initiated in the 16th century. A grey silt deposit which covered the entire site could have been the product of bioturbation caused by the trampling of animals and men across a wet environment and the growth of aquatic and other plantlife. Limited 3rd and 4th century activity was confined to the digging of ditches in attempts to drain and manage the land. Possible evidence of the enlarged 4th century Roman City ditch was provided by exclusively Roman finds from the lowest fills of the City ditch, however these finds may have been washed in from the eroding northern edge of the cut.

An assemblage of human bone consisting of over 100 pieces, almost all of which were long bones and fragments of skull were recovered from all phases of activity on the site from the early Roman to the post-medieval. The largest concentration was recovered from within the vicinity of a large east-west aligned water feature running along the northern part of the site. Carbon dating of sample bones from three different phases confirmed a Roman date for the remains which had been disturbed by later activity on the site. Although they may represent the disturbed remains of the Roman cemetery known to

be present to the northeast of the site, the make-up of the assemblage suggests a degree of ritual activity and may represent the remains of ritual placement of certain parts of the human skeleton, possibly following exposure and excarnation, within the sacred waters of the upper Walbrook tributaries.

No artefacts or features were revealed dating to the period between the 5th and 11th centuries AD and it would appear that from the end of the Roman era to the early medieval period or little activity was taking place in Moorfields and that the marsh had taken hold. The earliest medieval activity occurred towards the west of the site in the 12th and 13th centuries where evidence of leather making was revealed, consisting of tawing attested by the recovery of a large assemblage of roe deer antlers and possible tanning with the discovery of a quantity of cattle horn cores. Later in the 13th and 14th centuries two large east-west aligned drainage ditches were linked into a network by a series of north-south aligned smaller ditches. This system was designed to regulate the water flow across the site and may have been designed to protect early crops of grass and hay for animals in much the same way as the watermeadows of the southwest of England.

The major medieval feature which in turn largely determined the alignment of the other ditches on the site was the City ditch which was revealed to have undergone a series of recuts from the 13th to the 16th centuries and would appear to have at last been backfilled at the end of the 16th century.

The post-medieval features on site were largely confined to deep cuts such as pits, wells and cess pits, which were associated with the buildings constructed in the area from the late 16th and 17th centuries. However, a major north-south ditch revealed along the eastern periphery of the site may represent the parish boundary between St. Giles without Cripplegate and St. Stephen's Coleman Street. From this ditch was recovered the rare find of an inscribed slate depicting a latin cross composed of swastikas and a 'Solomon's cross' which may have been part of a reliquary. From one of the barrel wells a large assemblage of wasters and kiln furniture represented the waste from a previously unrecorded redware pottery production site. This kiln may have been located in the near vicinity and may have been associated with a pot-maker's house mentioned by Stow and possibly linked to the potter, Richard Dyer, who was documented as working ouside Moor Gate from 1568.

This volume begins with the background of the archaeological excavations. The archaeological sequence is then described in detail with a chapter focusing on the Roman activity. A series of specialist reports discussing the importance of the Roman assemblage follows, and then a general discussion of the evidence. Thereafter the medieval and post-medieval sequence is described, with reports on the assemblages of that date by relevant specialists and a discussion of the period. The importance of the site is then discussed in a concluding chapter, which highlights the significance of a little-understood area immediately outside the City walls on the edge of the marsh of Moorfields.

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Thanks are especially extended to James Taylor who with the assistance of Chris Mayo and Jim Leary supervised the excavation of Areas 2 and 3, Fiona Keith-Lucas who conducted the watching brief on Area 4 and Jim Leary and Peter Boyer who monitored the excavation of a sewer connection. Gratitude is also expressed to all those who worked on site in often trying conditions, but whose hard work and dedication enabled each phase of the site to be accomplished on schedule: Richard Archer, Mark Bagwell, Tony Baxter, Hayley Baxter, Ken Bazley, Tim Bradley, John Brown, Rob Burns, Tim Carew, Ben Crossley, Mary Ellen Crothers, Toby Cuthbertson, Lorraine Darton, David Divers, Alistair Douglas, Gary Evans, Colin Forcey, Jack Green, Ireneo Grosso, Samantha Hatrick, Fiona Keith-Lucas, Dougie Killock, James Langthorne, Richard Lee, Adam Lord, Shane Maher, Roddy Mattinson, Dominic McLellan, Natasha Muldur, Denise Mulligan, Victoria Osborn, Chris Pickard, Ashley Pooley, Chris Rees, Ben Savine, Duncan Stirk, Jo Taylor, Aidan Turner, Will Valentine, Ann Marie Vandendriessche, Tiziana Vitali, Justin Wiles, Hanne Wooldridge, Kevin Wooldridge and Eliott Wragg. Additional thanks are recorded to Giles Hammond, the site surveyor, and David Dobson for logistical support.

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Chapter 1 Introduction

CIRCUMSTANCES OF THE FIELDWORK

An archaeological evaluation, excavation and watching brief were conducted by Pre-Construct Archaeology Limited at Moor House, 119 London Wall, London EC2, between September 1998 and May 2004 (Fig. 1). The development area consisted of a large tower building with an underground car park adjoining to the east (Fig. 2). It was located at National Grid Reference TQ 3265 8161 on the north side of London Wall, to the west of historic Moorgate and was bounded to the west and north by Fore Street Avenue and to the east by Moorfields. The site was recognised as having a high archaeological potential, lying just to the north of the City wall on the projected line of the City ditch, which had previously been observed by Professor Grimes to the west at St. Alphage to extend at least 28.95m north of the City wall (Grimes 1968, 86–89). The site was expected to provide further evidence of the extent of the City ditch and the nature of the land use just outside the City walls in the low-lying Walbrook valley, an area documented as being marshland for much of its history until land reclamation in the 16th century.

The archaeological investigations consisted of several phases of work, under one site code: MRL 98. Monitoring of geotechnical work within the underground car park in September 1998 (Butler 1998), revealed the survival of at least 1m of archaeological deposits. The excavation phase was divided into six areas: Areas 1–6 (Fig. 3). Area 1 consisted of a 43m long evaluation trench located in the underground car park to the east of Moor House tower which was excavated in June 2000 and confirmed the survival of archaeological deposits across the car park (Butler 2000a). The survival of remains beneath the tower was determined by the excavation of test pits and augering also in June 2000 (Butler 2000b).

Both the excavation of Area 5 within the underground car park, which took place between September and November 2000, and that of Area 6 located beneath the

Fig. 1 The site location (scale 1:16,000)

Fig. 2 Moor House tower, before redevelopment, looking northeast

tower of Moor House undertaken in October 2001, were within basement areas under artificial lighting (Fig. 5). The remaining areas of the site were excavated following demolition of the underground car park (*see* Fig. 3). These consisted of Area 3, in February 2002, outside the footprint of the underground car park (Fig. 4); Area 2 outside the footprint of the standing buildings, excavated during February and March 2002 (Fig. 6); and the last remaining part of Area 5 under the site access ramp which was completed in March 2002. Area 4 consisted of the watching brief on the periphery of the site between October and November 2002. A final watching brief on a sewer connection immediately to the east of Area 3 was undertaken in May 2004.

The work was project managed by Gary Brown and the archaeological fieldwork was directed and later project managed by the author. James Taylor supervised Areas 2 and 3 with the assistance of Jim Leary and Chris Mayo, Fiona Keith-Lucas conducted the watching brief on Area 4 and Jim Leary and Pete Boyer monitored the watching brief on the sewer connection.

THIS REPORT AND THE ARCHIVE

This report provides an account of this interesting area on the western periphery of the upper Walbrook valley immediately outside the Roman and medieval defences which enclosed the historic core of the City of London. The utilisation of the area in the Roman period, followed

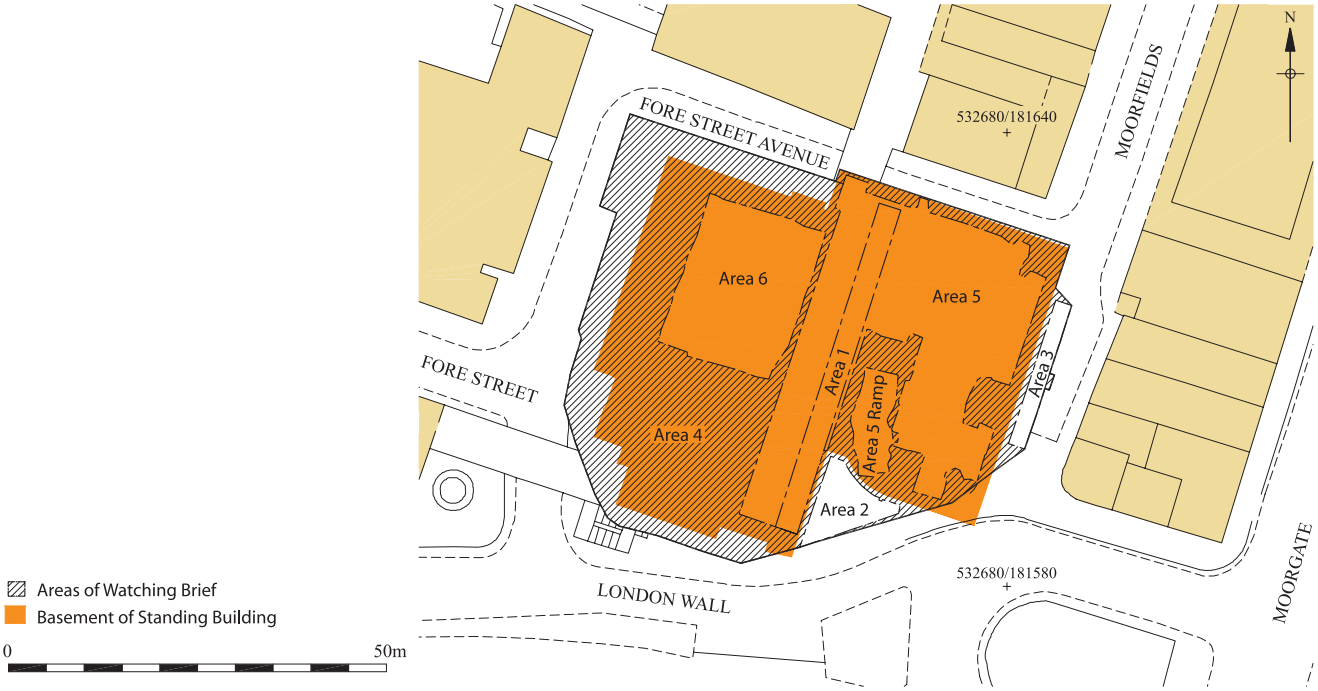


Fig. 3 Areas of excavation, showing impact of previous building and outline footprint of new development (scale 1:1,000)

by the land use within the medieval marsh and later post-medieval reclamation and occupation is chronicled.

The full specialist reports with catalogues and methodologies used will be lodged with the project archive at the Museum of London's London Archaeological Archive Resource Centre (LAARC), Eagle Wharf Road, under the site code MRL 98 where it can be consulted by prior arrangement.

During the post-excavation analysis the stratigraphic information was organised into chronological periods based on stratigraphic and dating evidence. In this text individual context/feature numbers appear in square brackets (eg [100]) and registered finds and environmental samples are shown as <15>.

GEOLOGY AND TOPOGRAPHY

The site lies within the London (or Thames) Basin, which consists of a bed of chalk covered by marine sands, gravels and clays (ie Thanet Sands and Woolwich and Reading Beds), over which London Clay formed (Merriman 1990, 4). The drift geology of the site itself is shown on the British Geological Survey North London map as Floodplain River Terrace gravels overlying the London Clay. Substantial changes in sea level occurred between cold glacial (low water) and warm inter-glacial (high water) phases. These changes produced a series of gravel terraces in the Thames Valley, which were separated by deep cuts caused by the scouring of the river. The site lies on the second terrace consisting of Mucking Gravel (Gibbard *et al* 1988, 3).

Fig. 5 Area 6 during excavation, looking north

Fig. 4 Area 3 during excavation, looking south

Fig. 6 Area 2 during excavation, looking west

The terrace gravels are covered in the City by a sandy silt (brickearth), which is considered to be a combination of loess and waterlain deposits (Gibbard 1985, 57).

The site lies 900m north of the River Thames in the upper valley of the River Walbrook. The main stream of the Walbrook flowed through Hoxton and Shoreditch and then altered course to a southwesterly direction when it met the second terrace of Mucking Gravel. It then followed the spring line formed by the near exposure of London Clay on the southern edge of the third terrace (Corbets Tey Gravel). It is likely that the main stream of the Walbrook was fed by this stream line, which led into the many western tributaries of the river (Maloney with de Moulins 1990, 1).

The excavation area lies *c.* 90m to the west of the projected line of one of the western tributaries of the Walbrook (Marsden 1980, 16, 18; Merrifield 1983, fig. 4). Attempts have been made to update the mapping of the course of the various tributaries (Maloney with de Moulins 1990, 1–5, fig. 2; Leary 2003; Seeley & Drummond-Murray 2005). Excavations at 55–61 Moorgate in 1929 and 1987 (Dunning 1929, 199; Schofield with Maloney 1998, 72, 252–253) have shown the most westerly tributary observed previously was revetted and aligned north–south. If projected this tributary would continue towards the area of Moor House.

Natural river terrace gravels consisting of fine yellow sand with occasional pebbles were observed across the site. In many places the sand had been truncated by quarry pits, stream channels and to the south the City ditch, however, where it appeared largely untruncated the levels were fairly constant across the site. The levels of the sand were generally between 8.60m and 8.70m OD across the site with maximum heights of 8.74m OD in the west, 8.74m OD in the north and 8.87m OD in the centre of the site. The sand was encountered at a top level of 8.65m OD to the south and 8.60m OD to the southeast, but these areas had been truncated by the City ditch and had a greater incidence of scouring by stream channels and quarrying. To the extreme east in Area 3 lower levels of 8.40m OD to the north and 8.32m OD may represent further stream channel activity but alternatively could represent the beginnings of a slope down to one of the tributaries of the upper Walbrook valley. However, because of the large scale quarrying of the area and the absence of any 'natural' brickearth (*see* below) it is very difficult to determine if the levels of natural sand encountered on the site are indeed real or truncated heights of the terrace gravels.

ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

The following is a brief summary of the archaeological and historical background of the site in relation to the rest of the City of London. A more detailed description is presented within the main text.

The available evidence suggests that the Roman City of *Londinium* was founded about AD 50 around a crossing point of the River Thames in the area of present day London Bridge which made a 'T' junction with a main east–west road. After being destroyed in the Boudiccan revolt of AD 60–61 the settlement was rebuilt and grew in size (Milne 1995, 42–48). Between AD 90–120 reclamation of land within the upper Walbrook valley, to the east of the present site, began on a large scale. This led to the valley being more intensively exploited and settled with roads being laid out and buildings constructed (Maloney with de Moulins 1990). The western of the two roads established to the west of the Walbrook valley, just to the east of present

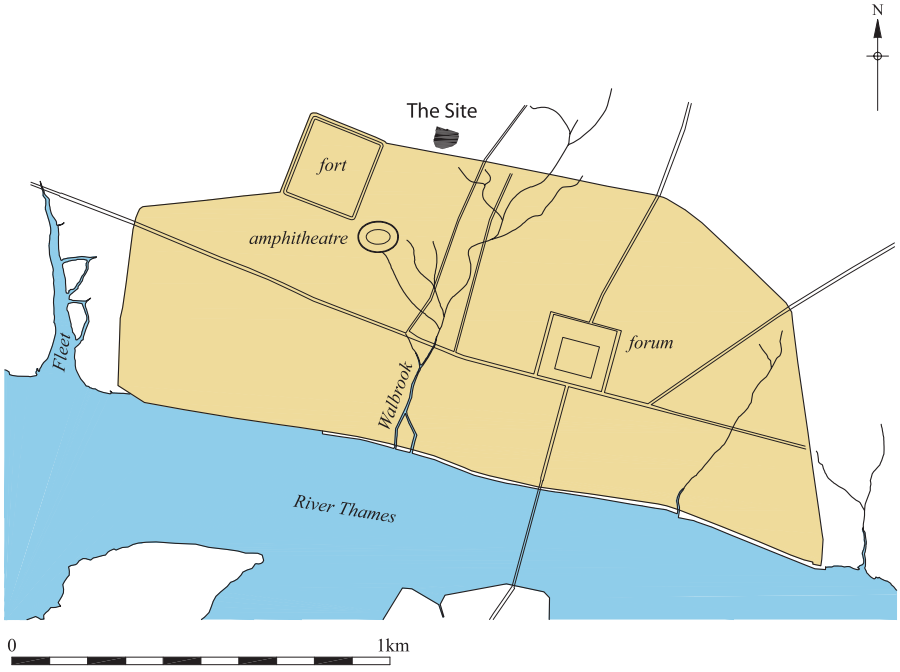


Fig. 7 The site in relation to the Roman City and the currently accepted location of tributaries of the Walbrook (scale 1:20,000)

day Moorgate, may have been a continuation of a north–south aligned road probably established after AD 61 which was revealed during excavations at No. 1 Poultry (Burch *et al* 1997, 129–131 & figs. 13, 14 & 17; Rowsome 1998, 41 & fn. 19).

The site at Moor House appears to have always been just outside the City limits (Fig. 7). It is probable that the boundaries of *Londinium* in the late 1st century AD were defined by a ditch marking the Flavian *pomerium*. Where evidence of the feature has been found it appears to roughly follow the area defined by the later City wall.

The fort at Cripplegate was established in *c.* AD 125 to the west of the site, probably during a reorganisation after a fire in the Hadrianic period which, although it did not reach the northern limits of the town, nevertheless had a devastating effect (Howe & Lakin 2004, 50). There has, however, been speculation that the area may have been the focus of military activity or even that there was an earlier predecessor to the fort (Perring 1991, 39–40; Howe & Lakin 2004, 48–50). The establishment of the fort was part of the expansion of the settlement during the first half of the 2nd century AD. There is some evidence that *Londinium* suffered a serious decline in the later 2nd century AD with evidence of dark earth and no remains of buildings of that date in certain areas of the City (Perring 1991, 76–89). However, although the fort may have become disused by the end of the 2nd century AD (Howe & Lakin 2004, 51) there is evidence of continued building and settlement on some sites such as No. 1 Poultry (Burch *et al* 1997, 133–136) and later truncation and soil formation processes may be distorting the evidence for the later Roman period.

Between AD 190 and 225 a defensive wall 2.4m thick and two miles long, encircling the landward side of the City, was constructed from ragstone and mortar with tile bonding courses at regular intervals and a red sandstone plinth at ground level on its external face. The western and northern sides of Cripplegate fort were incorporated into the City wall by adding a 1.2m thickness of masonry internally to strengthen the existing walls. The wall was defended by a roughly 'V' shaped ditch about 4.5m wide and 1.8m deep, the upcast of which was piled up inside the wall to form a rampart about 4.9m wide and 1.8m high (Marsden 1980, 120–121). There is no evidence that a gate was constructed in the City wall in the area of later Moorgate during the Roman period. However, it has been suggested that the area may have been served by a postern (Perring 1991, 92). During the 4th century bastions were added to the eastern circuit of the wall and the ditch was greatly enlarged to accommodate them (Maloney 1983, 105–111). The site lies outside the City walls which were located some 20m to the south of Moor House and a fragment of the wall still survives within the car park beneath London Wall. The later Roman City ditch crossed the southern part of the site.

As the Romans were forbidden to bury their dead within the City limits, from the earliest days burials were placed along the main roads leading from the settlement. The cemeteries became formalised with the construction of the City wall and were grouped into three main areas outside the City walls, to the west, north and east (Barber & Hall 2000, 102–120). The northern cemetery occupied an area from Bishopsgate in the east to Finsbury Circus in the west, extending just to the east of the site on the east side of present day Moorgate (*see* Fig. 30).

The construction of the City wall impeded the flow of the Walbrook down to the Thames and from the 3rd century AD the area to the north of the City between Cripplegate and Bishopsgate became waterlogged. The abandonment of the walled City in the early part of the 5th century AD probably exacerbated the process as any drainage ditches that were in place were neglected. The Anglo-Saxons established their town along the Thames to the west as the trading settlement of *Lundenwic*, in the Strand/Covent Garden area (Malcolm *et al* 2003; Leary *et al* 2004). By the time that Alfred in 886 re-occupied the old Roman walled City, which had been re-established as a fortified town (burgh) in response to Viking raids on London in 841, 851 and 871, a great marsh had formed to the north of the City walls. It appears that by *c.* 890 the Saxons had to a large extent moved from *Lundenwic* back within the former Roman walled City (Vince 1990, 20). There is evidence from sites at Cripplegate (Milne 2001) and Aldercastle (Butler 2001, 52) that as part of the re-fortification the old City ditch was redug with the upcast earth piled up against the crumbling City walls to block gaps in the defences.

During the medieval period the walls and ditch were continually repaired and maintained (Grimes 1968, 80–81, 86; Maloney & Harding 1979, 350–353) and bastions were added to the western circuit at this time. Stow, in his Survey of London written in 1598, records repairs to the walls and re-excavation of the ditch between the 13th and 16th centuries. From at least the 15th century it is known that the area was provided with a gate, known as Moorgate, which was situated immediately to the southeast of the present site. It is possible that this gate was only the enlargement of a postern that had occupied this location since Roman times.

Throughout this period, the site lay within the great marsh known as Moorfields. During the medieval period the area was largely unsettled but was occupied by certain trades such as tanners and brick makers, which could exploit the natural resources of the region. The expansion of London led gradually to the marsh being drained from the late 16th century and the area being built upon, until by the middle of the 17th century it was part of the spreading northern suburbs of the metropolis of London.

Chapter 2 The Roman Archaeological Sequence

Although no structural evidence for activity pre-dating the Roman period was found, a small assemblage of prehistoric material was recovered during the excavation. Four fragments of burnt flint, weighing 62g, and four struck flints, one of which was retouched, were found residually within later features. The small quantity of burnt flint may be the product of accidental burning rather than evidence of prehistoric activity. The flints were undiagnostic although the pieces were most characteristic of Neolithic or Bronze Age industries (Bishop 2003). A small quantity of prehistoric pottery was also recovered residually from the site. One fragment was undiagnostic, however four fragments were attributed to the late Iron Age (Lyne 2003).

Several finds of prehistoric date have been found, mostly residually, in the area. It is documented that a Mesolithic antler mattock was found in Moorfields (SMR 041114) and that some residual Neolithic flint flakes were found at London Wall and Finsbury Circus (SMR 041134). A 'Neolithic flint axe head and a deer-horn axe or hoe' were found at 12–26 Finsbury Circus in 1920 (Lambert 1921, 94). More recently, at 6–8 Tokenhouse Yard a Mesolithic flint core and flake were recovered from within the gravel fill of a stream which may represent an early tributary of the main Walbrook channel (Leary 2003) and a possible Neolithic flint blade was recovered from the fill of a palaeochannel at 6 Broad Street Place (Harward 2004, 4). Middle Bronze Age pottery has been recovered residually from two sites within the City walls at Cannon Street (Rayner 2002, 6–7) and Wood Street (Howe & Lakin 2004, 13), whilst several prehistoric cut features together with pottery and struck flints have been found within the Cripplegate area to the west, which is suggestive of limited, mainly agricultural activity (Howe & Lakin 2004, 11–14). In addition, within the City walls to the southeast of the site at Northgate House, a single abraded sherd of flint tempered pottery dating to the late Bronze Age/early Iron Age was found residually together with a few flint flakes (Seeley & Drummond-Murray 2005, 10). Forty-three sherds of late Bronze Age/early Iron Age pottery together with nine flints and fifty-one fire cracked stones were found at the Honourable Artillery Ground some 300m north of the present site (Philp 1996, 78–80). A piece of Iron Age horse equipment was found somewhere in Moorfields (SMR 041174) and residual Iron Age pottery was recovered from sites at 129–139 Finsbury Pavement (Greenwood *et al* 1997, 47–48) and River Plate House, 7–11 Finsbury Circus (Schofield with Maloney 1998, 257) to the northeast of the site.

Taken together the residual prehistoric material from Moor House is a very small assemblage from a large site and suggests only limited transient activity on the site which is reflected in the limited number of prehistoric finds from the area as a whole. A high proportion of the finds that have been discovered would seem to be associated with water and stream channels as, for example, at Tokenhouse Yard (Leary 2003) and at the Honourable Artillery Ground, where the artefacts were interpreted as being part of a settlement associated with a hollow channelling water towards the River Walbrook (Philp 1996, 86). Occupation within the Walbrook valley would not be entirely surprising as the river would have made an ideal settlement location and may have also had a ritual significance similar to that attested at other sites of the period associated with water, most notably the River Thames where a quantity of Bronze Age metalwork and such major Iron Age items as the Waterloo ceremonial helmet and the Battersea shield have been recovered (Merriman 1990, 42, 47). It is possible that the stripping of the area for gravel and possible brickearth

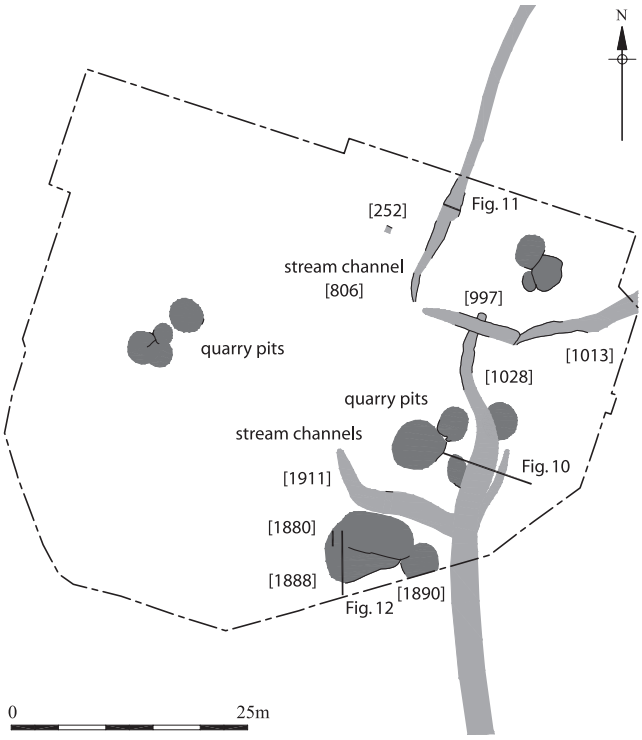


Fig. 8 Phase 2, 1st and 2nd century stream channels and quarrying (scale 1:800)

quarrying during the Roman period (*see* below) may have destroyed any more substantial evidence of prehistoric activity in the area.

PHASE 2: STREAM CHANNELS AND QUARRYING (1ST CENTURY TO FIRST HALF OF 2ND CENTURY AD)

Stream channels

A number of probable stream channels were observed in the eastern part of the site (Fig. 8). A meandering feature [1028] measuring 1.30m wide by 0.40m deep and backfilled with cleanish brickearth and mixed gravel and clay was excavated for a length of 9.60m. It was roughly aligned north–south and continued beyond the limit of excavation in an apparent southerly direction, to the southeast of the site. It was recorded in section as cut [1277]. A small tributary to this channel was also observed in section on its eastern side as cut [1275] (Figs. 9, 10). No datable artefacts were recovered from this stream channel.

To the west another apparent stream channel [1911] filled with brickearth was observed and recorded mainly in section. This stream contained two sherds of Late Iron Age pottery together with two sherds of Roman 1st-century AD pottery, which suggests it may be the earliest surviving dated feature on site. It appeared to continue yet again towards the southeast part of the site where it is probable that it joined the main channel.

To the north of the main channel was an east–west aligned shallow feature [997] measuring 6.64m by 1.46m by 0.20m deep filled with waterlain clays sands and silts. This may be another shallow channel cutting across the earlier north–south feature or possibly the remains of a shallow quarry pit. It contained a struck flint which was most likely residually deposited. To the east of this feature with an indeterminate relationship to it was a northeast–southwest aligned channel [1013], measuring 8.70m by 1.20m by 0.26m deep, which contained pottery dating to the first half of the 2nd century AD together with a human fibula, seven horse bones and a pig bone.

Fig. 9 Section through Phase 2 stream channels and quarry pits, looking southwest

In the northern central part of the site a north–south aligned 'V' shaped cut [806] with very steep sides was observed filled with clean brickearth sealing sands and gravels (Fig. 11). It measured up to 1.80m wide and extended at least 13.80m to the north where it was seen to continue beyond the limits of the excavation. The base of the feature dropped away steeply to the north (away from the Walbrook valley), where it was recorded at a depth of at least 1.80m. The very steep sides of the feature, which were cut through the natural sands, suggest that it may have had a natural origin. However, it is just possible that the feature was deliberately dug and not open for very long as the sides would have slumped in. It may well represent an attempt to drain the area.

The close proximity of the Walbrook valley to the site makes the observation of possible channels unsurprising. The closest tributary of the Walbrook was observed at 55–61 Moorgate (Dunning 1929, 199; Schofield with Maloney 1998, 72, 252–253) some 40m to the south of the site. It is entirely probable that this recorded tributary had its origin to the northwest as it has been observed that the spring line on the southern edge of the third river terrace appears to feed the western tributaries of the Walbrook (Maloney with de Moulins 1990, 1). However, are these features small tributaries of the Walbrook or are they of some other derivation? It is possible that many of these channels are

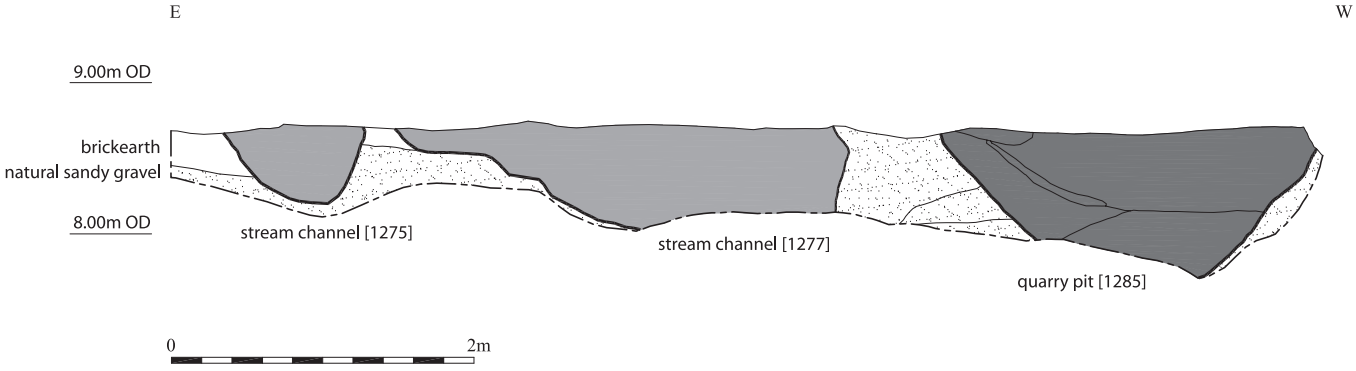


Fig. 10 Section 1, through Phase 2 stream channels and quarry pits (scale 1:50)

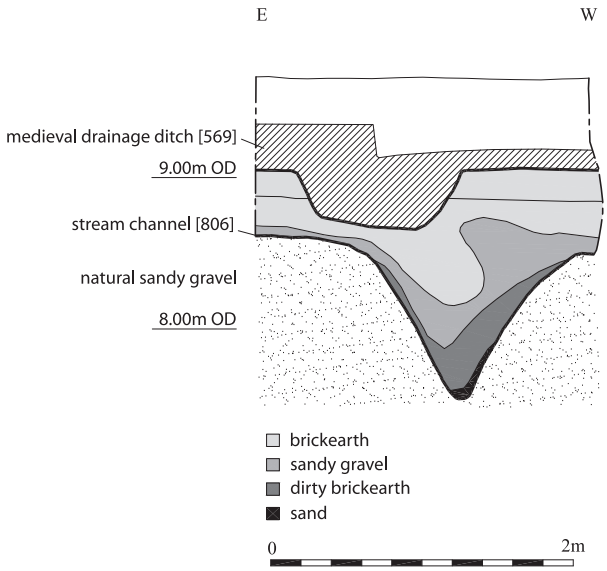


Fig. 11 Section 2, through stream channel [806] (scale 1:50)

partially artificial or are natural streams formed by heavy rainfall in an area that had been greatly reduced in level by quarrying (*see* below). The 'V' shaped feature and two east–west features appear to be running in the wrong direction to be associated with the Walbrook. These streams may represent attempts to drain quarry pits or natural channels fed by the spring line to the north leading to and filling quarry pits with washed in brickearth once the natural stream pattern across the site had been disturbed by the widespread quarrying. Feature [1911] which contained Late Iron Age and early Roman pottery and the main north–south aligned channel to the east [1028] may be a surviving remnant of the streams which once flowed through the site to form western tributaries of the Walbrook.

Quarrying (first half of 2nd century AD)

A series of cuts were observed across the site varying in shape and size, the largest measuring 6.50m by 4.00m by 0.68m as excavated [1888] and mostly filled with cleanish brickearth with occasional gravel deposits (Fig. 12). The features were observed in clusters with the largest concentration in this phase located on the eastern side of the site in three distinct groups to the north, centre and south of the area. There were a few incidences of the pits intercutting but the edges of many of the features were immediately adjacent to that of their neighbour, suggesting that the quarrying was carried out as an organised activity with the pits perhaps left open. A further cluster of pits, which exhibited signs of intercutting, was observed to the west of the site. Several of these pits were cut well into the natural sands and gravels suggesting that they were quarry pits for these materials. Pottery recovered from pits suggest a first half of the 2nd century AD date for this quarrying.

Environmental analysis of the fills of one of the large quarry pits [1880] to the south of the site revealed that the pit had not been backfilled immediately but had been left partially open on two occasions with stagnant or foul water filling the feature, as evidenced by the presence of root channels with dark and glossy humic coatings. The evidence of water on the site is also provided by the presence of species such as creeping buttercup, celery-leaved buttercup, sedge and blinks which are typical of a damp habitat. The pollen evidence also suggests a rather mixed environment with damp woodland and open deciduous coniferous woodland consisting of pine, oak, yew and ash, together with open grassland and possible cultivated ground.

Quarrying, by its very nature, is an activity which occurs on the periphery of settlements. Elsewhere outside the later Roman City walls quarrying has been observed in the areas of the western and eastern cemeteries (Bentley

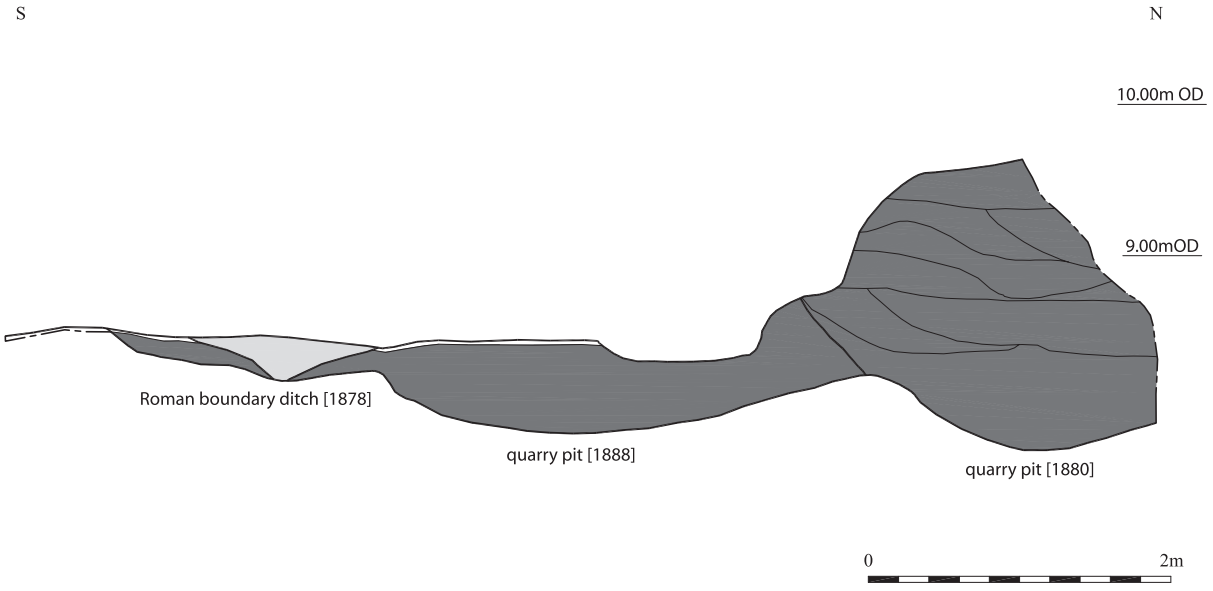


Fig. 12 Section 3, through quarry pits [1880], [1888] and Roman boundary ditch [1878] (scale 1:50)

& Pritchard 1982, 135–136; Schofield with Maloney 1998, 299; Barber & Bowsher 2000, 53). At the eastern cemetery the quarry pits were filled as on the present site with clean brickearth which led to the suggestion that the brickearth had been stripped off in order to extract the underlying sands and gravels (Barber & Bowsher 2000, 53). This may well have been the case at Moor House as no evidence of apparent natural brickearth was observed on site. The brickearth filling the pits is most likely to have washed in from surviving deposits in the immediate vicinity rather than to have been laid as part of deliberate levelling and dumping. The backfilling of the quarries suggests a date in the first half of the 2nd century AD for the activity. By this time the fort at Cripplegate had been established (Merrifield 1983, 82; Perring 1991, 39–40; Milne 1995, 59; Howe & Lakin 2004, 39) and the City was expanding dramatically. A planned programme of reclamation and drainage in the upper Walbrook valley in the late 1st/early 2nd century AD was undertaken and two north–south roads were constructed to the west of the main channel of the Walbrook (Maloney with de Moulins 1990, x). Large amounts of sand, gravel and brickearth were needed for the roads and the reclamation and it is probable that the quarrying at Moor House was related to these activities. Quarrying, backfilled in the early 2nd century AD, was also revealed to the south within the area later enclosed by the City walls at 48–53 Moorgate (Schofield with Maloney 1998, 231) and possibly at 12–18 Moorgate (AOC 2002, 42) and 19–31 Moorgate (Maloney & Holroyd 2001, 8). The quarrying along the east of the site seems to have been organised and carried out along a north–south axis, This may represent the extraction of gravel locally for a north–south orientated Roman road to the east just beyond the limits of the site, possibly the continuation of a road found at No. 1 Poultry (Burch *et al* 1997, 129–130 & fn. 30), leading to the north as the western of the two roads (Road 1) constructed in the upper Walbrook valley in the early 2nd century (Maloney with de Moulins 1990, 45, fig.

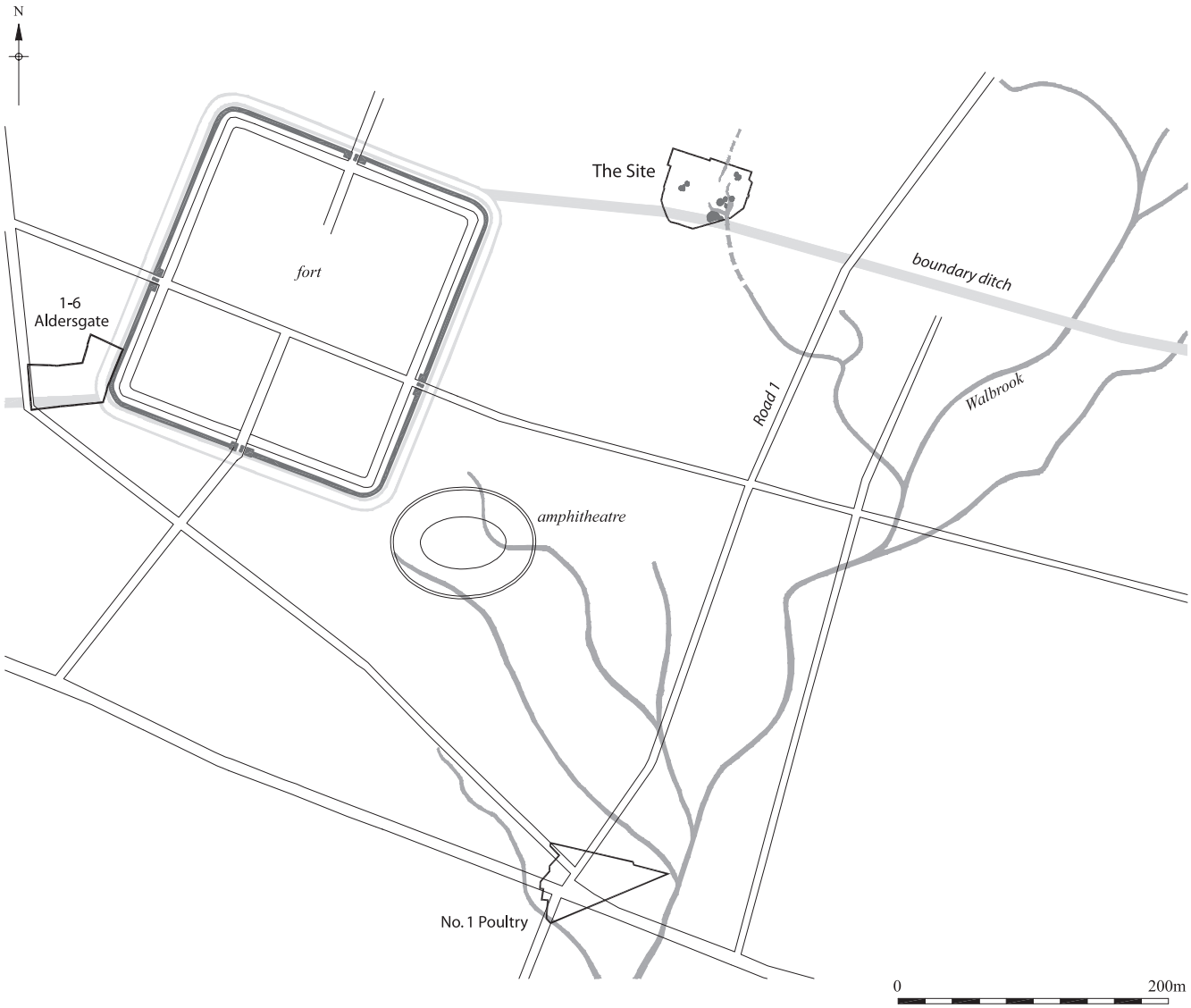


Fig. 13 Phase 2 stream channels and quarrying and Phase 4 boundary ditch, in relation to the Walbrook, a projected continuation of Road 1 and Cripplegate Fort (scale 1:5,000)

68; Greenwood *et al* 1997, 36; Maloney & Gostick 1998, 81; AOC 2002, 43), out beyond the boundaries of the Roman City (Fig. 13).

PHASE 3: BRICKEARTH (*C.* AD 160+)

A rather dirty redeposited brickearth *c.* 0.25m thick covered the site. The deposit contained fragments of Roman brick and tile, animal bone and pottery suggesting that the brickearth had been reworked just after the middle of the 2nd century AD. In places it sealed quarry pits and features, in other areas quarry pits cut through it. But how was this brickearth deposited? It may represent deliberate dumping after the sand and gravel quarrying had finished when the remaining brickearth, which was of little use, was spread across the site. However, it may have been washed in by water action and filled the first quarry pits, which had been left open. Investigation of the brickearth and sands indicate deposition of suspended sediments on the margins of a slow moving water body within an area prone to intermittent flooding. Thus it is probable that the brickearth was deposited by water action caused by the flooding of the stream channels. It is probable that more than one deposition of brickearth occurred in the area, perhaps every time there was a particularly heavy winter rainfall.

PHASE 4: OCCUPATION ACTIVITY (*C.* AD 160–200/220)

A number of features were observed cut into the brickearth representing activity and possible limited settlement in the area of the site in the second half of the 2nd century AD (Fig. 14). These consisted of quarry pits, ditches, stakeholes, postholes, gravel surfaces and possible beamslots associated with structures. These features represent various activities occurring on the site at different times during the second half of the 2nd century up to the period of the construction of the City wall. However, frequently only scanty remains of the features survived later truncation and the finds that were recovered from this phase of activity contained a large amount of apparently residual pottery dating to the 1st century and the first half of the 2nd century AD.

At the extreme south of the site a gully [1878] measuring 1.8m wide and heavily truncated from above by the later medieval City ditch, was traced for 16m on an east–west alignment. It may be the scanty remains of a deeper part of the 4th-century City ditch which had survived beneath the medieval City ditch (Figs. 12, 14). However, the finds from the feature were dated to the second half of the 2nd century AD and it may represent the remains of a deep 2nd-century ditch which defined the boundaries of the City before the construction of the City walls at the end of the 2nd century. Evidence for such a boundary has been found previously, following roughly the line of the later wall, at 1–6 Aldersgate Street (Butler 2001, 45–46), Crosswall (Egan *et al* 1981), Dukes Place (Maloney 1979, 293–294; 1983, 97), 1 Crutched Friars (Merrifield 1965, 291), 85 London Wall (Sankey & Stephenson 1991, 117–118) and opposite 57 London Wall (Pye 1985). Evidence of other possible early boundary ditches was found at Baltic House (Howe 2002, 7–9) and beneath the southern wall of Cripplegate Fort (Howe & Lakin 2004, 48). Unlike in other parts of the City where this possible early boundary ditch has been observed very close to or on the same line as the later City walls, at Moor House it is some distance away, over 20m to the north of the later defensive circuit. This may be because the low-lying wet ground conditions within this part of the Walbrook valley, exacerbated by quarrying, were felt to be unsuitable for the construction of the City walls in the immediate area of the earlier City boundary. However, it is possible that the ditch is no more than a drainage ditch on the same alignment as the 2nd-century boundary ditch, which may lie further to the south, designed to drain water away from it.

A large east–west aligned feature [770] was revealed meandering along the northern part of the site. It was observed for a length of 38.50m and measured up to 4.00m wide. The earliest phase of the feature was filled with reddish brown sandy gravel. It appeared to have been recut on several occasions with brickearth and silty clay filling these later phases. Many of the finds recovered from the fills were abraded and showed signs of having been moved by water; the presence of sand and gravel fills at the base suggests a fast flowing channel which later became slower moving with the deposition of clays and silts. It is probable that this was originally a natural stream channel, which may have been subject to attempts to canalise and revet it; four postholes along the northern edge of the feature were possibly the remains of such a revetment.

A quantity of human bone was found either within or in the immediate vicinity of this large east–west aligned feature. This included the remains of a possible badly truncated skeleton, consisting of just a few long bones: a right femur, humerus and ulna and a left tibia which were associated with 29 sherds of a fragmented everted-rim jar dating to AD 120–160, apparently within a cut within the backfilled channel. This may be the heavily truncated remains of a grave or possibly represents the remains of the ritual burial of just those long bones together with a pot. This may be the only evidence of the remains of a Roman cemetery on the site, the main centre of which has been revealed to the east in the Finsbury Circus area and towards Bishopsgate.

Apparently leading into the northern side of this channel was a north–south ditch/channel [963] 2.2m long by 1.3m wide filled with grey brown waterlain silt clay which also had a cluster of postholes on its western edge. This may well be a small streamlet or man-made ditch which slowly flowed into and fed the main channel. The postholes are enigmatic and may represent the remains of a small bridge crossing the water feature.

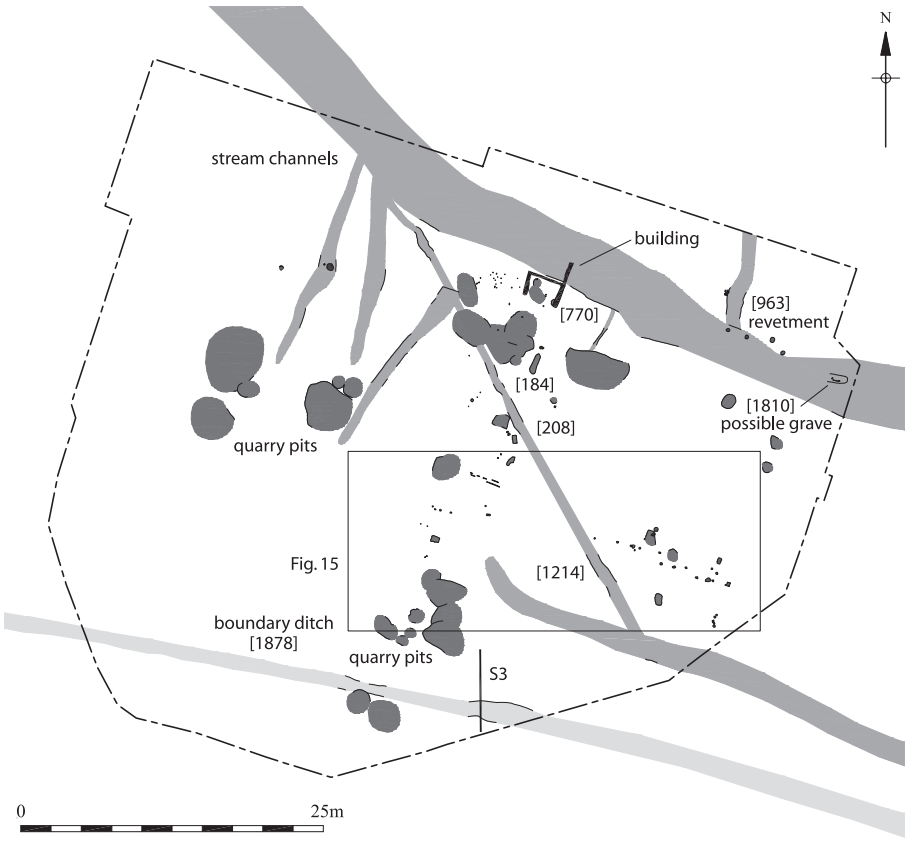


Fig. 14 Phase 4, 2nd century features (scale 1:625)

The feature which dominated the central part of the site was a shallow northwest to southeast aligned cut [208]. It measured at least 34m long by 1.00m at is widest point. Its fill was very similar to the brickearth it was cut through and it was largely devoid of finds. It may have been the heavily truncated remains of a ditch which was subsequently filled with brickearth after a flooding episode. A northeast–southwest return was revealed on its western side. Both were on very different alignments to the other ditches observed on site and may be part of an earlier field system outside the City precincts before the City wall came to dominate the alignments in this area or may be a shortlived attempt to manage the flow of water between the channels to the north and south of the site, where to the southeast of the site the truncated remains of an east–west aligned ditch was observed. This may be similar to, but a smaller version of, the large east–west feature to the north, which may have been a natural stream, later converted to a managed ditch.

Two heavily truncated narrow trenches that cut into the brickearth were revealed to the south of the east–west channel (Fig. 14). They were aligned north–south, 2.40m apart, with the remains of an east–west division between the two. A posthole was present at the southern end of the eastern slot. Two shallow pits within the enclosed area may have been associated. The layout of these features suggests that they formed part of a typical Roman clay and timber strip building. The building encroached on the earliest phase of the east–west ditch/channel and suggests that it was built on top of the infilled feature once its flow had been managed by the digging of a ditch further to the north. The structure may represent nothing more than a small outbuilding associated with agricultural or quarrying activities taking place on the site, since this area was on the periphery of the Roman City outside the City limits.

Within and concentrated to the west of this building were a multitude of stakeholes. Most were very shallow, suggesting that the ground had been truncated, perhaps by widespread quarrying, or else that the stakeholes had been driven in from higher, but the cuts were not recognised as the fill was very similar to the overlying layer. No discernible pattern was observed in the cluster of stakes and it is probable that they were used to tether animals or for some other agricultural use.

To the south of the northwest–southeast aligned ditch another cluster of features was recorded. Two sets of stake/postholes set perpendicular to the ditch on a northeast–southwest alignment *c.* 4.00m apart were observed. A series of possibly associated shallow pits was also revealed. The shallowness of the features, sometimes only 2–3 centimetres deep, seems to suggest either that widespread truncation of the area had occurred or else the top parts of the features were impossible to define because of later changes to the soil caused by the action of flooding and bioturbation resulting from the build up of the later marsh. These features appear to represent fence lines defining another area of occupation, the structural remains for which did not survive within the archaeological record.

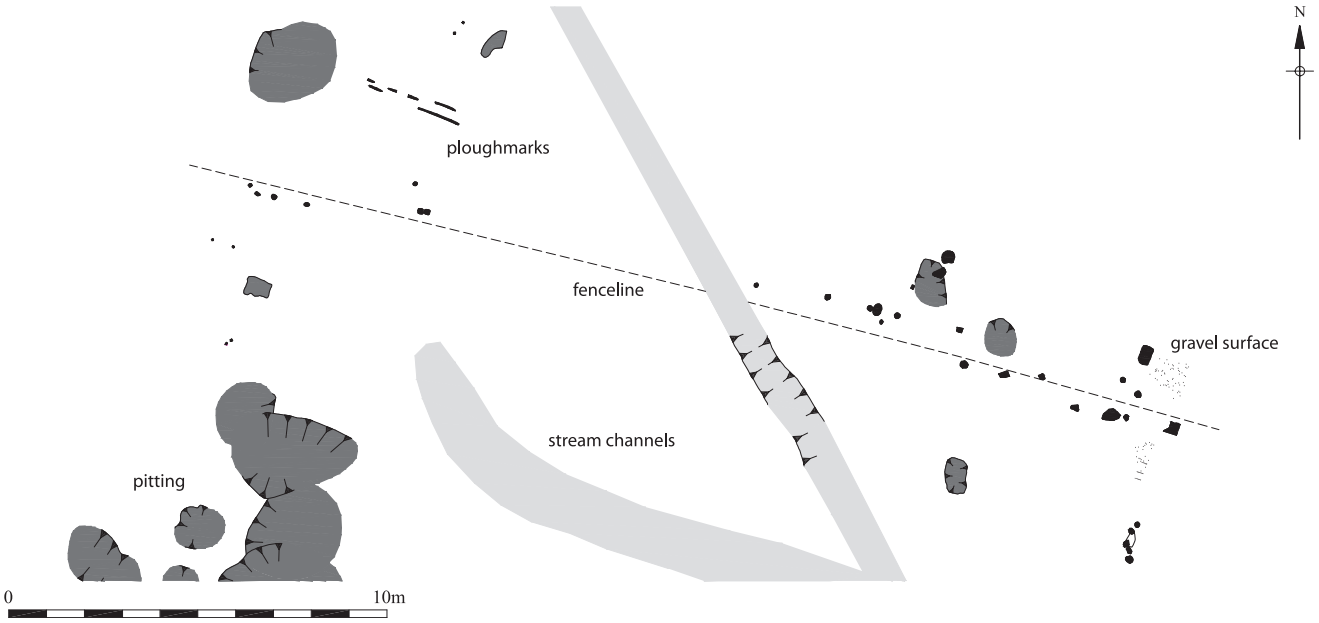


Fig. 15 Phase 4, detail of fenceline and occupation in the southeast area of site (scale 1:200)

Immediately to the south were shallow parallel indentations aligned east–west in the brickearth. They may represent the remains of possible ard- or plough-marks, however, they were very fragmentary and could be nothing more than marks caused by something having been dragged across the brickearth.

To the south and east of these marks a further series of postholes and stakeholes was observed aligned east–west across *c.* 28m of the central part of the site (Fig. 15). These appear to be the remains of a fence line. It is on exactly the same alignment as a later Roman and medieval ditch (*see* below and Chapter 5) and it is possible that it is in fact part of a fence/palisade associated with that feature, with the postholes only becoming visible in the underlying brickearth. However, to the southeast of the fence line a further concentration of six stake- and postholes was revealed, which were apparently associated with a heavily truncated sequence of gravel and silty clay deposits to the north. A quantity of pottery was recovered from this sequence suggesting that the area represents a series of gravel surfaces with associated occupation debris on each. This might again suggest the scanty remains of possible structures and areas of more concentrated settlement.

In the northwest corner of site another small cluster of features was revealed cut into the brickearth. A series of three phases of north–south aligned ditch, a stakehole and a small pit were observed towards the north in an area of relatively untruncated brickearth.

Further evidence of quarrying on the site was also observed in this phase of activity. The quarry pits, some of which were very shallow, were concentrated in the central, western and the southern parts of the site. The pits were a maximum of 4m in width and may represent the limited small scale attempts to excavate the remaining resource.

PHASE 5: CONSTRUCTION OF THE CITY WALL, OVERALL GREY DEPOSIT (AD 200/220–250)

Between AD 190 and 225 *Londinium*'s City wall was constructed. This wall was located *c.* 22m to the south of the present site (Fig. 16). A large stretch of the Roman City wall, 64m in length, was recorded immediately to the south and southwest of the site in London Wall in 1957 (Grimes 1968, 82–84) and a fragment of this masonry still survives within the underground car park beneath London Wall. A further stretch of the wall was observed during the demolition of 122 London Wall, to the north of Armourers' Hall in 1920 (Lambert 1921, 73–75). A postern may also have been constructed in the wall at this time to maintain access to this area for the road, leading north from Number 1 Poultry and along the western side of the Walbrook (*see* above).

The earlier cut features were covered by a light grey clayey silt deposit *c.* 100–200mm thick, which covered the entire site. A considerable quantity of Roman pottery dating to the 1st and 2nd centuries was recovered from this deposit. The deposit showed evidence of heavy bioturbation, which may have been caused by the trampling of humans and animals across the site. In certain areas the top of this deposit was covered by small semi-circular depressions, which may represent poaching (cattle hoof prints), suggesting that the area may have been used to graze cattle and other livestock during periods when the water had receded. The presence of the organic marsh deposits immediately above this layer indicate that this deposit might also have been formed by the action of roots penetrating into the underlying brickearth from plants growing in the wetlands of the marsh above.

It has been suggested that the construction of the City wall led to this area becoming inundated with water, and

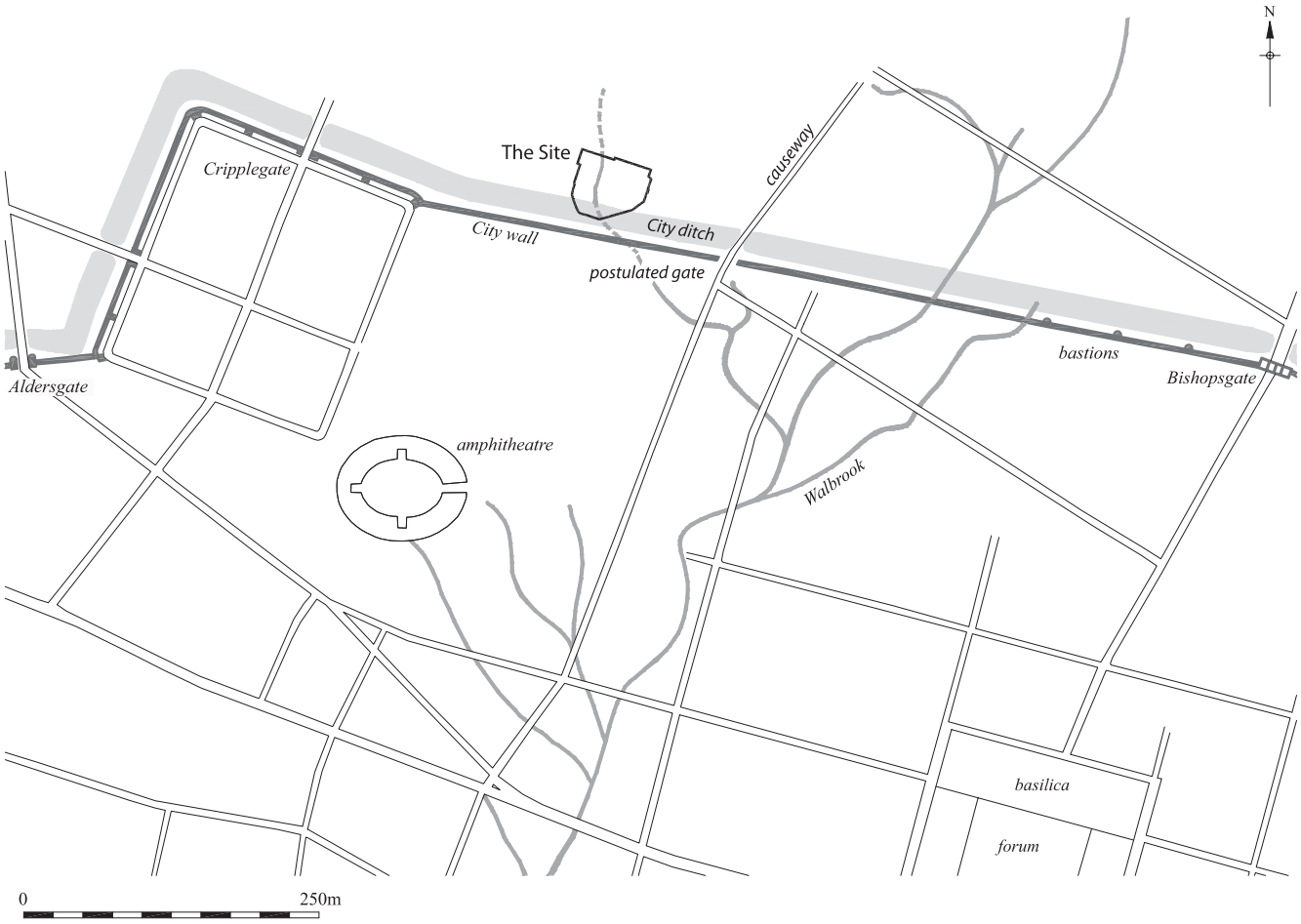


Fig. 16 Phase 7 ditches in relation to the 4th-century Roman City and City Wall (scale 1:6,250)

forming a marshland because not enough access points were allowed for the river Walbrook to penetrate through (Merrifield 1983, 160). The overall grey layer may be evidence of the beginnings of the formation of the marsh, with the area becoming damper as the Walbrook found its flow to the south towards the Thames interrupted by the City wall. The grey layer appears to be the product of perhaps both animals and humans trampling across a wet environment and also bioturbation caused by the plants within the marsh spreading their roots into the underlying deposits.

PHASE 6: ROMAN CUT FEATURES (C. AD 250–270)

Activity in the second half of the 3rd century was represented by features cutting through the grey deposit which covered the site (Fig. 17), although again most of the pottery recovered from the features was 1st and 2nd century residual material with only a few sherds dating to this phase of activity. This suggests that only very limited activity was taking place at this time with no sustained

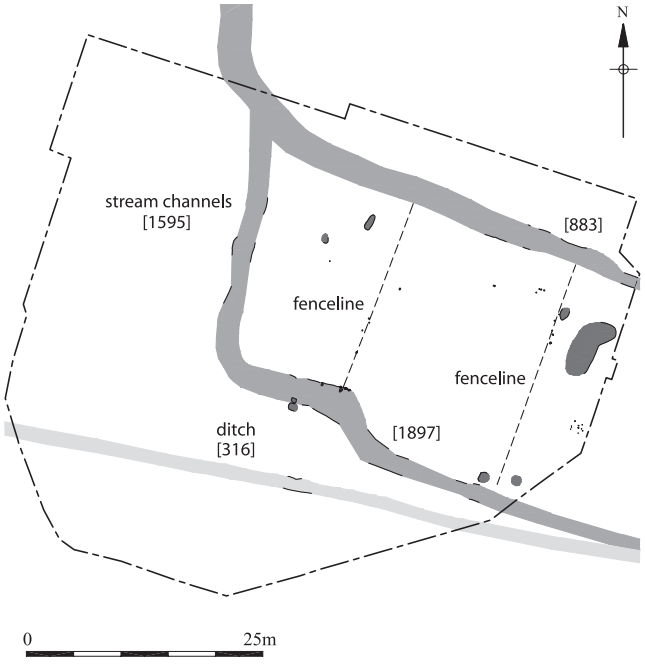


Fig. 17 Phase 6, 3rd century channels, ditch and fencelines (scale 1:800)

occupation which would have led to the deposition of pottery and other artefacts of that date.

An east–west aligned feature [1897] filled with waterlain silts extended across the southern part of the site for *c.* 24m. It measured up to 3.60m in width and meandered towards the southeast part of the site; although it appeared to follow closely the course of a later medieval ditch it contained exclusively Roman finds and was sealed by the marsh deposits. Five postholes and a stakehole along the northern edge of the ditch may represent a fence line. The cut feature may have once continued across the site to the west, however, it may also have continued as a north–south aligned ditch [1595] which was traced across the site for *c.* 12m. However, the north–south ditch, which showed evidence of at least one recut, was heavily truncated by the sub-basement of the 20th-century building in the area to the south where the two features were projected to meet. It is thus impossible to determine with any certainty whether the two features are part of a drainage system consisting of east–west and north–south orientated ditches or are indeed one meandering stream subject to channelling and periodic cleaning-out.

To the north of the site there was some evidence of recutting of the large east–west aligned channel/ditch [833], which may have had its origins in a natural stream (*see* above) towards the eastern end of its observed length. The majority of the features dating to this period had been truncated by the excavation and maintenance of an east–west medieval ditch, occupying the same position and orientation (*see* below). It appears that this water-carrying channel continued to flow naturally until it was in effect canalised in medieval times by the excavation of the network of drainage ditches (*see* below).

Across the rest of the site the limited activity which took place was confined to the heavily truncated remains of an east–west aligned drainage ditch [316] at the south of the site and very occasional pits and clusters of stakeholes in the southeastern, eastern and central areas. Those in the central and eastern parts of the site may represent fence lines, which with the north–south aligned ditch to the west were positioned to roughly divide the territory into parcels of land measuring *c.* 21m by 21m and 19m by 25m. The stakeholes in the southeast of the site appear random and may be the product of continued placement of fish or eel traps in one location.

Most of the pottery recovered from the features was 2nd century in date, which suggests that the earlier occupation levels were being disturbed by the action of the streams eroding their edges and the maintenance of the ditches. The feature at the south contained a large fresh fragment from an everted-rim jar in sandy Essex greyware which is dated to *c.* AD 190–270. The lack of pottery dating to beyond the 2nd century implies that very little activity was occurring in the area after the construction of the wall, with no dumping of material and only the very occasional accidental loss of objects.

These features certainly show some attempts to manage the area, but they may represent at least initially the re-emergence of natural streams and tributaries of the

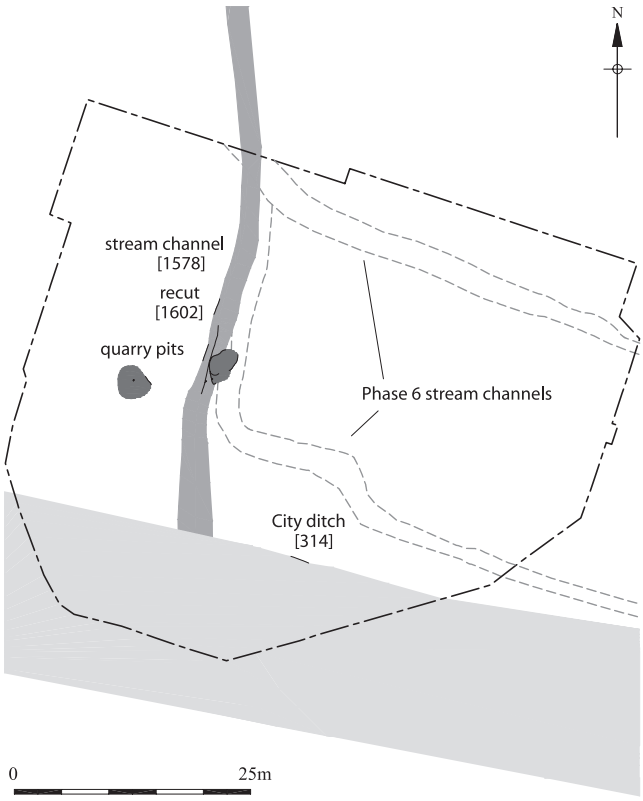


Fig. 18 Phase 7, 3rd/4th century channels, ditch and pitting (scale 1:800)

Walbrook, which had previously been channelled into ditches. With the construction of the City wall and the development of the area into marshland caused by the lack of routes through the defences for the Walbrook the natural streams took over the land again. The meandering course of the large feature towards the southeast part of the site, together with the continued existence of the feature to the north of the site, suggests that these were stream channels, later partially excavated as drainage ditches together with the north–south linking feature in an attempt to manage the rising waters into a system of east–west and north–south ditches. The presence of possible fence lines and attempts to parcel the land into areas might suggest that the land was not always completely submerged and that there may have periods when it partially dried out and could be utilised by the population.

PHASE 7: ROMAN CUT FEATURES (*C.* AD 270–400)

The northern edge of an east–west aligned ditch [314] was observed to the south of the site. It was sealed by a gravel layer interpreted as being part of the foundation of a later road (*see* below) and was heavily truncated to the south by the later medieval City ditch (Fig. 18). It could represent an earlier phase of the medieval City ditch, however the finds recovered from the feature were exclusively of 2nd century

date, and so it probably represents the scanty remains of the edge of the 4th-century Roman City ditch, eroding the 2nd-century Roman deposits to the north. The Roman City ditch dug at the time of the construction of the City walls in the early 3rd century, measured typically 3.05m to 4.88m in width and up to 2.00m in depth (Perring 1991, 91). It was replaced in the 4th century by a much wider ditch, required when external towers were added to the walls (Marsden 1980, 170). This ditch has been observed on a number of sites on the defensive circuit including Ludgate Hill (Hill 1977, 45), Aldgate/Dukes Place (Marsden 1969, 20–26), west side of Aldersgate Street (RCHM 1928, 94), 7–12 Aldersgate Street (Egan 1985) and possibly at 1–6 Aldersgate Street (Butler 2001, 50–51), Houndsditch and Dukes Place (Maloney 1983, 111). Evidence from the two sites at 1–6 and 7–12 Aldersgate suggests that the later Roman ditch extended some 25m from the City wall. This is entirely consistent with the evidence presented here and supports the theory that this forms the northern edge of the 4th-century City ditch, almost completely truncated to the south by the later medieval ditch.

To the west of the site a few sherds of late 3rd to 4th century pottery were recovered from two large north–south ditches [1578] and [1602] and three quarry pits. The western ditch [1578], which was dug first, measured 11m in length by 1m wide; however, it had been truncated on its eastern side by the later recut which was traced for 14.7m across the site and measured 1.8m in width. Both ditches were truncated by modern features at both the north and the south of the site, which prevented their relationship with the large east–west channels/ditches being determined. The ditches probably represent a large drainage or boundary ditch with a recut. They are on the same alignment and just to the west of the north–south ditch previously discussed (*see* above) and probably represent a more concerted attempt to maintain this feature which most likely continued to link the two channels/ ditches to the the north and south. However, it is possible that these ditches continued to the south to link with the large City ditch. A human skull and a horse skull were recovered from the base of the westerly ditch, which may suggest ritual placement within a feature which had significance to the local population, continuing the prehistoric tradition of human and animal remains, together with offerings of complete pottery vessels, being deposited in important boundary ditches (as discussed further in Chapter 4, below). The quarry pits which were apparently dug into the later recut ditch contained only Roman pottery and may be Roman in date as they were apparently sealed by the organic marsh deposits. However, it is possible that they may have been much later in date, possibly even medieval, as the bioturbation caused by the plant roots from the marsh often made the exact relationship between the cut features and the marsh deposits difficult to determine.

These few features again suggest that there was periodic and limited intervention in the Roman period after the City wall was built and the area began to flood and form a marsh, perhaps during periods which were relatively dry when greater access could be made. It appears that there were efforts to maintain a system of drainage in the area in an attempt to manage the ever-expanding marsh.

Chapter 3 Roman Specialist Reports

THE ROMAN POTTERY

Malcolm Lyne

The site produced a total of 6,921 sherds (93,998g) of Roman pottery. The overwhelming bulk of this material is of early- to mid-2nd-century date with just a little earlier and later material. A large amount (2,738 sherds, 33,107g) of the Roman pottery was residual in medieval and later contexts and much of that in the later Roman features was clearly derived from earlier deposits.

The assemblages

Phase 2. Late Iron Age – c. AD 100 stream channel

Assemblage 1: from the fill of stream channel [1911]. The four sherds from this context comprise one fragment of South Gaulish Samian, a fragment from a lid in Highgate Wood B fabric and two pieces in flint and sand tempered Late Iron Age fabric. This appears to be the earliest pottery assemblage from the site and has a broad Late Iron Age to *c.* AD 100 date-range.

Phase 2. c. AD 100–160/170 stream channels and quarrying

The fills of the other stream channels yielded a mere 67 sherds of pottery between them.

Assemblage 2: from the fill of Palaeochannel [252]. This produced just two large, fresh sherds from a Class 2F everted-rim jar in grey Highgate Wood C fabric with black slip on its shoulder extending over its rim (Fig. 19.1), ext. rim diameter 160mm *c.* AD 120–160.

Assemblage 3: from the fills of channel cut [997]. The 39 sherds from these fills include rim fragments from two further Class 2F jars in Highgate Wood C fabric, nineteen joining sherds from the lower part of a flagon in Verulamium Region Whiteware and a large lid fragment in LOMI fabric.

Assemblage 4: from the fill of channel cut [1013]. The four fragments from this context include an acute-latticed BB2 cooking-pot sherd (*c.* AD 110–200+), a Verulamium Region Whiteware flagon rim sherd similar in profile to Frere type 405 (1972, 1984, *c.* AD 100–120) and a fresh rim sherd from a poppyhead beaker in Highgate Wood C fabric (*c.* AD 140–160). These small amounts of pottery suggest that the palaeochannels remained open until at least AD 140.

Assemblage 5: from the fills of quarry pit [1880]. The 61 sherds (920g) of pottery from this quarry include several Central Gaulish Samian Dr.18/31 platter fragments (*c.* AD 120–150), two sherds from a BB2 bowl of Monaghan (1987) type 5D2–4 (*c.* AD 110–180), a fragment from a flask in Highgate Wood C fabric (*c.* AD 140–160), a Class 4A bowl in Verulamium Region Whiteware (*c.* AD 130–170). Additionally, an unguentarium in Verulamium Region Whiteware fired white with grey patches (Fig. 19.2), ext. rim diameter 140mm and tazza of Frere type 923 (1972) in similar fabric fired cream (Fig. 19.3), ext. rim diameter 110mm *c.* AD 150–200, were recovered.

The other quarry pits yielded very little pottery.

Phase 3. c. AD 160+ brickearth

Assemblage 6: from the dirty brickearth and gravel deposits sealing the quarry-pits and stream channels. These dumps yielded a total of 337 sherds (5,343g) of pottery. This material had a high residual element but also included fragments from a jar in Verulamium Region Whiteware (*c.* AD 150–200), a Class 1B flagon in Verulamium Coarse White-slipped ware (*c.* AD 140–250) and Central Gaulish Samian Dr.31 platters (*c.* AD 150–200). Sherds from a plain Class 4H5–7 BB2 bowl (*c.* AD 150/170–250) are also present as are fragments from a rouletted Dr.37 bowl in buff-pink East Gaulish Samian fabric with matt orange-red colour-coat (Fig. 19.4), ext. rim diameter 140mm *c.* AD 140–200; and a flanged bowl of Gillam type 35 (1976) in black BB1 fabric (Fig. 19.5), *c.* AD 120–160.

There seems little doubt that this material was deposited around AD 160/170.

Phase 4. c. AD 160/170–200/220 Roman occupation activity

The overwhelming bulk of the 1,133 sherds (19,321g) of pottery associated with the various features attributed to this phase are earlier 2nd century in date and are either residual or derived from the Phase 3 brickearth dumps beneath. Some features did, however, yield contemporary material.

Assemblage 7: from the fill of pit [184]. The eleven sherds (174g) of pottery from this feature include fragments from a straight-sided dish in BB1 fabric (*c.* AD 200–270) and an everted-rim jar in sandy Essex greyware (*c.* AD 180–270).

Assemblage 8: from dirty brickearth deposit [321]. The five sherds

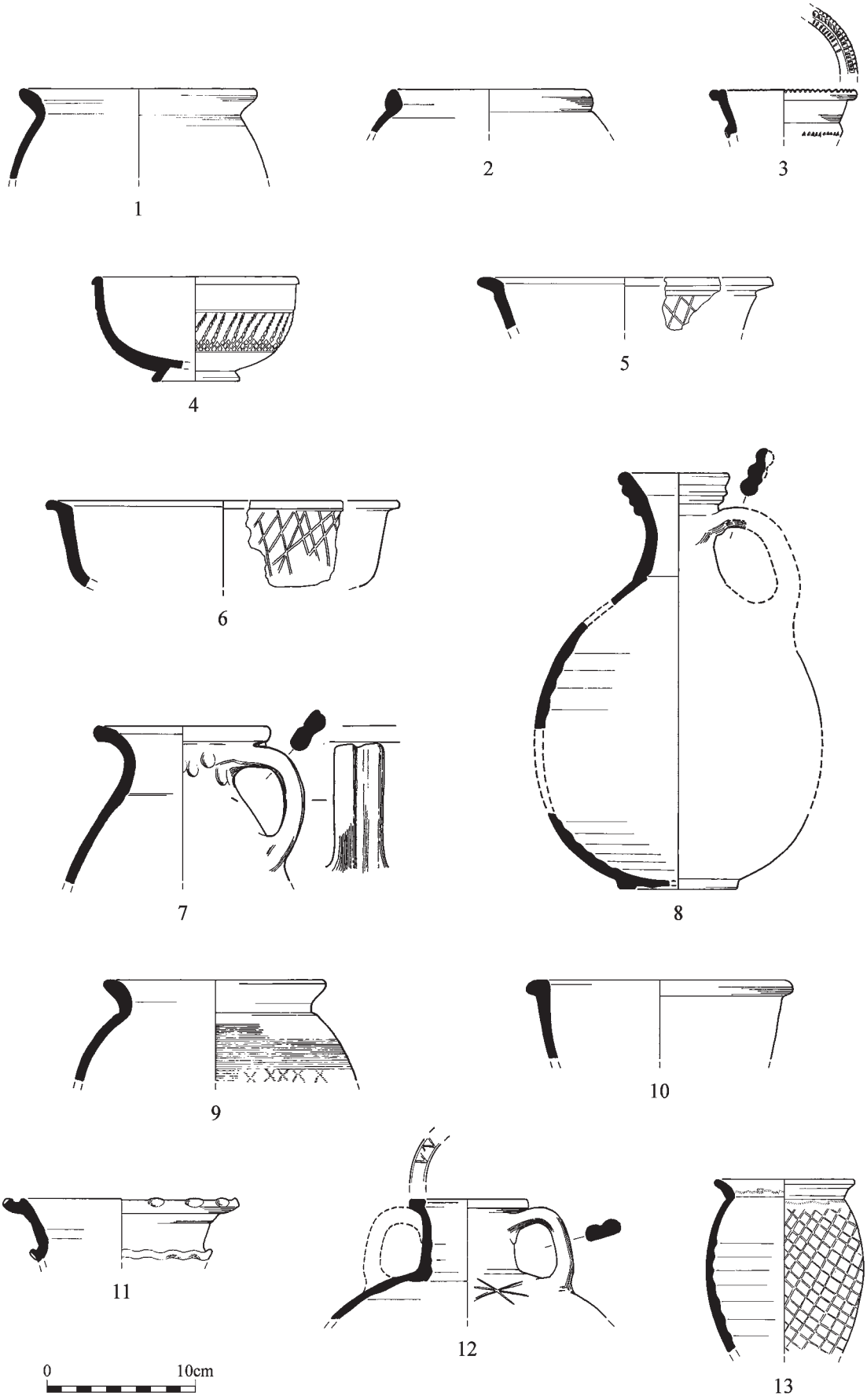


Fig. 19 Roman pottery from Phases 2 to 4 (scale 1:4)

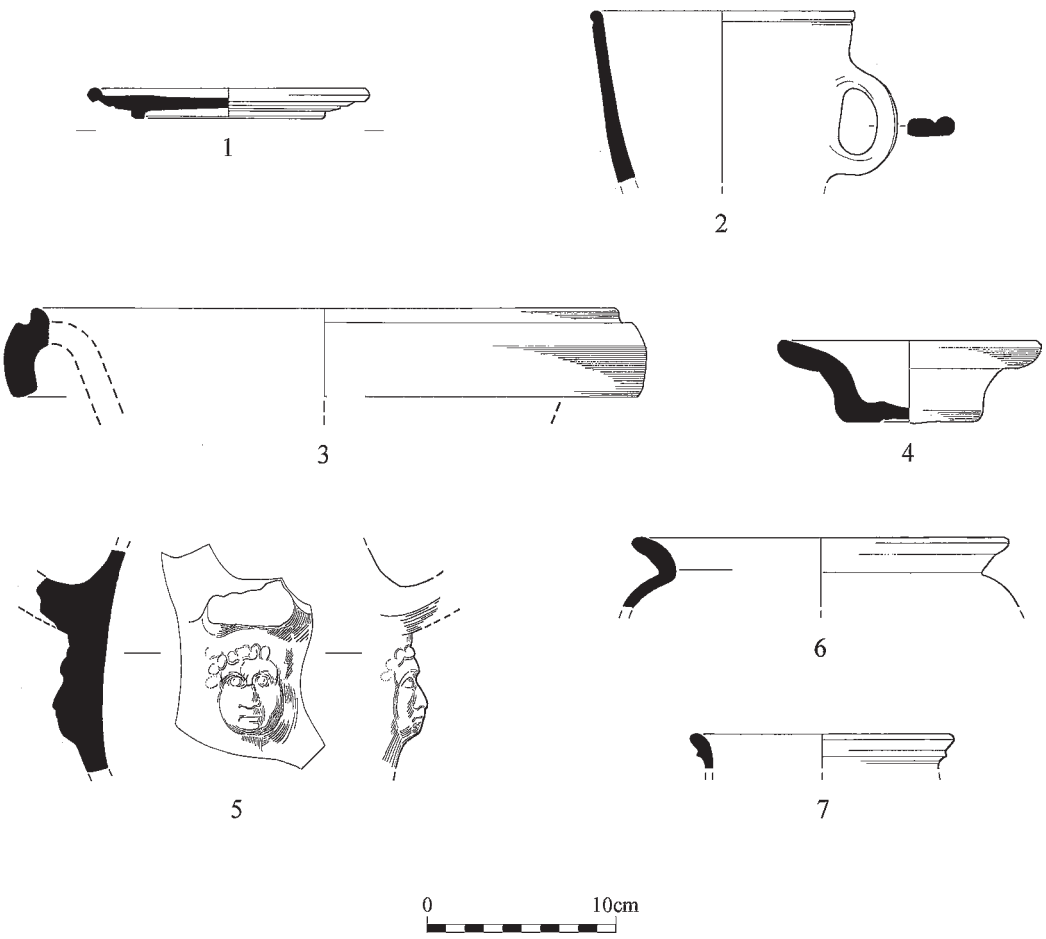


Fig. 20 Roman pottery from Phases 5 to 6 (scale 1:4)

from this deposit comprise four Gauloise 4 amphora fragments and a large fresh fragment from a flanged bowl in BB1 fabric with burnished acute-lattice decoration (Fig. 19.6), ext. rim diameter 240mm, *c.* AD 120–180.

Assemblage 9: from the fill of channel cut [770]. The 176 sherds (3,976g) of pottery from this feature include a high residual element, as well as large, fresh sherds from: the complete top of a jug of Frere (1984) type 1958 in buff Verulamium Region Whiteware fabric (Fig. 19.7), ext. rim diameter 120mm, *c.* AD 130–160; a complete upper part of Type 1B7 ring necked flagon of Frere (1984) type 1942 in Verulamium Coarse White-Slipped ware (Fig. 19.8), ext. rim diameter 75mm, *c.* AD 140–170; an everted-rim cooking-pot in Highgate Wood C+ fabric with acute-lattice decoration on its body (Fig. 19.9), ext. rim diameter 150mm, *c.* AD 120–160; a 'pie-dish' of Monaghan (1987) type 5C1–1 in BB2 fabric (Fig. 19.10), ext. rim diameter 180mm, *c.* AD 150/170–240; and a tazza with indented decoration on the rim in cream-buff Verulamium Region Whiteware with blackened patches (Fig. 19.11), ext. rim diameter 160mm, one of two similar vessels. This assemblage also includes fragments from Central Gaulish Samian forms Dr.18/31 (*c.* AD 120–150), Dr.31 (*c.* AD 150–200) and Dr.36 (*c.* AD 120–200). An early Dr.31 platter bears the stamp LOLLI.M (*c.* AD 150–170).

The 188 sherds (3,540g) of pottery from the fill of channel cut [767] also include large numbers of residual fragments. More contemporary fragments include a BB2 bowl of Monaghan (1987) type 5C9–1 (*c.* AD 150–250) and a sherd from a Colchester rough-cast beaker (*c.* AD 130–250).

Assemblage 10: from the brickearth fill of ditch cut [798]. Ditch [798] yielded 44 sherds (836g) of pottery including 26 large fresh fragments from the upper part of a Class 1E flagon in off-white Verulamium Region Whiteware fired buff-brown with a star graffito on the side (Fig. 19.12), ext. rim diameter 80mm. This vessel was probably old when discarded as the type was out of production by AD 150. The same fill also yielded ten fresh sherds from a flagon of Class 1B7 of Frere Type 800 (1972) in similar fabric (*c.* AD 140–190).

Assemblage 11: from the fills of ditch [208]. The 46 sherds (482g) of pottery from the various excavated slots across this ditch include very broken up fragments from BB2 cooking-pots (*c.* AD 120–200) and open forms, as well as a fragment from an undecorated open form in the late very-fine BB2–2238 fabric (*c.* AD 150/170–250).

Assemblage 12: from the fill of possible grave [1810]. The fill of this feature yielded 78 sherds including 29 fresh sherds from a Class 2F everted-rim jar in grey-black Highgate Wood C fabric with white/black slip over its upper half (Fig. 19.13), ext. rim diameter 95mm, *c.* AD 120–160. This vessel may have been deposited as grave goods, as nearly all of it is present. Other sherds include much of the top of a ring-necked flagon of Frere type 1739 (1983, *c.* AD 115–150) in Verulamium Region Coarse White-Slipped ware.

It appears from this material that Phase 4 activities in this extramural area were not in the nature of full-time occupation but ephemeral with minimal deposition of contemporary rubbish.

Phase 5. c. AD 200/220–250

Assemblage 13: from the grey flood silts. These various flood contexts produced a total of 1,706 sherds (21,202g) of pottery between them, nearly all of which was derived from the underlying layers through erosion. A small fragment of a Lower Nene Valley Colour-coat beaker could conceivably be contemporary with this phase but such vessels were already circulating in London during the final decades of the 2nd century. Sherds from the following vessels may, however, be contemporary with this phase: East Gaulish Samian Tc platter (Fig. 20.1), ext. rim diameter 150mm (this is a very rare form and is probably early 3rd century in date, seven fresh sherds are present); a large fresh sherd from a tankard with handle in sand-free greyware fired orange-brown (Fig. 20.2), vessels of this type with oxidized finish are characteristic of the Severn Valley industry and other pottery producers in the west of Britain and this tankard may well be from the Gloucester area, *c.* AD 150–250. Also recovered were a wall-sided mortarium in rough sandy orange-brown fabric (Fig. 20.3), ext. rim diameter 340mm *c.* AD 170–250 and a very unusual platter in very-fine greyware fabric similar to Highgate Wood C ware, but probably not from that source (Fig. 20.4), ext. rim diameter 140mm. The sherds also include a fragment from a huge handmade strapped storage-jar similar to examples from St. Magnus House (Green 1986, fig. 1.30) and there dated to the early-mid 3rd century. A wall-sided mortarium sherd in burnt Colchester Whiteware (*c.* AD 170–250) and an unusual flagon fragment in blue-grey LOXI fabric fired rough orange-brown with face stamped on neck below handle stub (Fig. 20.5) are also present. Four fresh sherds from a Central Gaulish Samian Dr.31 platter include a basal fragment with a partial stamp of Verecundus (*c.* AD 160–190).

Phase 6. c. AD 250–270

The various pits and other features relating to this phase produced 526 sherds (7,799g) of pottery between them. Once again, however, the bulk of this material is 2nd century in date and therefore residual.

Assemblage 14: from the silty fills of ditch [277]/[1897]. The 67 sherds (661g) of pottery recovered from this feature consist almost entirely of residual 2nd-century sherds but also include a large fresh fragment from an everted-rim jar in sandy Essex greyware (Fig. 20.6), ext. rim diameter 200mm, *c.* AD 190–270, which may be contemporary.

Assemblage 15: from gravel layer [254]. The 49 sherds (982g) of pottery from this layer are largely residual but include sherds from a jar with moulded rim in blackened Thameside greyware (Fig. 20.7), ext. rim diameter 140mm, *c.* AD 250–370.

Phase 7. c. AD 270–400

Assemblage 16: from the fill of ditch [1578]. The 78 sherds (1,264g) of pottery from this feature include appreciable amounts of residual material, seven sherds from an Alice Holt/Farnham greyware everted-rim cooking pot with black slip decoration (*c.* AD 270–400+) are also present, however, as are rim sherds from two Verulamium Region Whiteware jars of Frere type 1475 (Frere 1983, *c.* AD 240–300).

Assemblage 17: From the fills of ditch [1602]. This feature produced 45 sherds (612g) of pottery, nearly all of which are residual and derived from earlier features. There was, however, another rim sherd from one of the Verulamium Region Whiteware jars present in ditch [1578] and a fragment from an Oxfordshire Whiteware mortarium (*c.* AD 240–400+).

The 23 sherds from pit [1519] cutting ditch [1602] are almost entirely residual but include a fragment from a vessel in Alice Holt/Farnham greyware (*c.* AD 270–400).

Discussion of the Roman pottery assemblage

The pottery assemblages from the site are for the most part small, with 40% of the sherds being either unstratified or residual from medieval and later contexts. The sherds from late Roman contexts also tend to be residual and derived from earlier features. The biggest single group of such sherds (25% of all of the material) comes from the early 3rd century Phase 5 grey trample layer; it is almost all entirely abraded and derived from Phases 2 to 4 deposits below.

Very little of the stratified material can be dated to earlier than AD 100; that which can is almost entirely from the fill of stream channel [1911] (Assemblage 1). This indicates that the site lay on the extreme periphery of *Londinium* at this time, with activity limited to the occasional deposition of small amounts of rubbish from the City in what was a marshy waterlogged area.

Somewhat larger, but still small, assemblages of pottery continued to be dumped in stream channels and gravel extraction pits during the early 2nd century. None of these assemblages are large enough for any form of meaningful quantification, but the lower part of a Verulamium Region Whiteware flagon and a large lid fragment in LOMI fabric (*c.* AD 60–160) from the fill of Ditch [997] may represent either ritual activities associated with the ditch or be from a disturbed burial. The near complete everted-rim cooking-pot in Highgate Wood C fabric from brickearth context [941] (*c.* AD 120–160) is more likely to be from such a burial.

There is no reason to think that the fabric percentage shares of the early 2nd-century pottery from the Moor House site differ from contemporary pottery supply patterns in the City (Davies *et al* 1994). This is not surprising, as most of the early 2nd-century pottery from the site probably originated in rubbish thrown out from the Roman City.

A substantial amount of the pottery from the site (21%) comes from the *c.* AD 160–220 dated Phase 3 brickearth and gravel dumps and Phase 4 occupation contexts above. There is a high residual early 2nd-century element in the material: including the complete tops of a Verulamium Region Whiteware jug and ring-necked flagon in similar fabric from the fill of channel cut [770] (Assemblage 9) and a BB1 flanged bowl from brickearth context [321] (Assemblage 8). These assemblages are both associated with human bone and may derive from disturbed burials.

Amounts of contemporary material in Phase 4 assemblages are too small for meaningful quantification but include early 3rd-century BB1 forms such as straight-sided dishes (*c.* AD 200–270), late BB2 pie-dishes (*c.* AD 170–250), a Verulamium Coarse White-Slipped ware flagon (*c.* AD 140–200) and Central Gaulish Samian forms Dr.31 (*c.* AD 150–200) and Dr.38 (*c.* AD 140–200).

The small amounts of pottery from the *c.* AD 250–400 dated late Roman Phases 6 and 7 reflect the effect of the construction of the City wall on activities immediately outside it. Only 151 sherds are attributable to the *c.* AD 270–400 dated Phase 7 and of these only nine can be said to be contemporary; this suggests that human activity had all but ceased here in front of the defences of the City. This interpretation is further confirmed by the fact that only four of the residual 2,799 Roman sherds from later features can be dated later than AD 270.

THE ROMAN BUILDING MATERIALS

John Brown

The majority of the recovered building material consisted of fragmented Roman ceramic building materials of various forms. However, the assemblage largely consisted of abraded, and often residual, pieces with little indication of provenance in relation to structures uncovered on site. Additionally, the range of materials was largely unremarkable for a London assemblage. Materials of different forms are discussed more generally in the assessment document (Brown 2003), only the more significant or unusual elements are commented upon here. Details of fabrics identified in these excavations are stored with the archive and examples of the fabrics can be found in the archives of the Museum of London and Pre-Construct Archaeology.

Roman brick and tile with impressions

The most common fabric types represent forms produced within the Greater London area, utilising local red-firing sandy clays (fabric group 2815). A major source for these tile products was the Brockley Hill group of tile kilns, although they are also produced in other areas around the Greater London area. Of the material examined and quantified, this group represents nearly all the ceramic building material of Roman date, with only minimal amounts of other fabrics (Brown 2003). It is probable that the quarrying of brickearth deposits on the site may represent in part the acquisition of raw material for the production of brick and tile, although there is no evidence to suggest production at the site itself.

Forms present in the recovered assemblage included standard types such as brick and roof tile (both *imbrices* and *tegulae*). Other types included individual *tesserae* and box flue tile fragments which are commonly associated with high status buildings. Apart from the individual *tesserae*, no forms showed complete dimensions. Several tile fragments showed signature marks, and most of the box flue fragments also showed impressions, generally being comb-scored or incised but occasionally roller-impressed (Fig. 21.1–21.3). Figures 1.1 (fabric 3028) and 1.2 (fabric 3006) represent roller-impressed tiles; the first is probably part of a miscellaneous die type 63, and the latter of chevron type 44, with overlapping impressions, as catalogued in the corpus of relief-patterned tiles (Betts *et al* 1997). Both designs have been found in association at Cheapside (Betts *et al* 1997, 113). One tile fragment, in fabric 2459a, showed an animal paw print, probably that of a dog (Fig. 21.4).

Two tile fragments, both in fabric 2459a, showed incomplete 'procuratorial' stamps. Such stamps are interpreted as coming from official government tileries under the control of the office of the procurator. Most procuratorial stamps have been found in London, and many are associated with or located near to public works dated to the late 1st and early 2nd century AD (Betts 1995, 209), at a period that coincides with large-scale construction projects undertaken in the Roman City (Milne 1995, 70).

The first reads 'P^P…' and the second reads 'P^PR…' (Figs. 22.1, 22.2). Comparisons with the corpus of procuratorial stamps produced by Betts (1995) suggests that both examples represent the shortened form 'P^PR^BR' (*procuratores provinciae Britanniae*). The two impressions were made from different dies; both show damage in different areas. The dies were most likely made from wood (Betts 1995, 207). A third tile fragment, fabric 2452, was also probably stamped, although only the corner of the stamp is visible and the legend is missing.

Conclusions

Much of the ceramic building material from the Roman period was in poor condition, often fragmented into small pieces and also frequently abraded. These factors suggest that a great proportion of the material was recovered from secondary deposits, having possibly been used as dumping or ground-making material in attempts to drain and raise marshy ground in the vicinity and to in-fill large ditch features. Alternatively some material may have been carried by water action, and this is suggested by the presence of abraded fragments in the grey alluvial layer that covered much of the site.

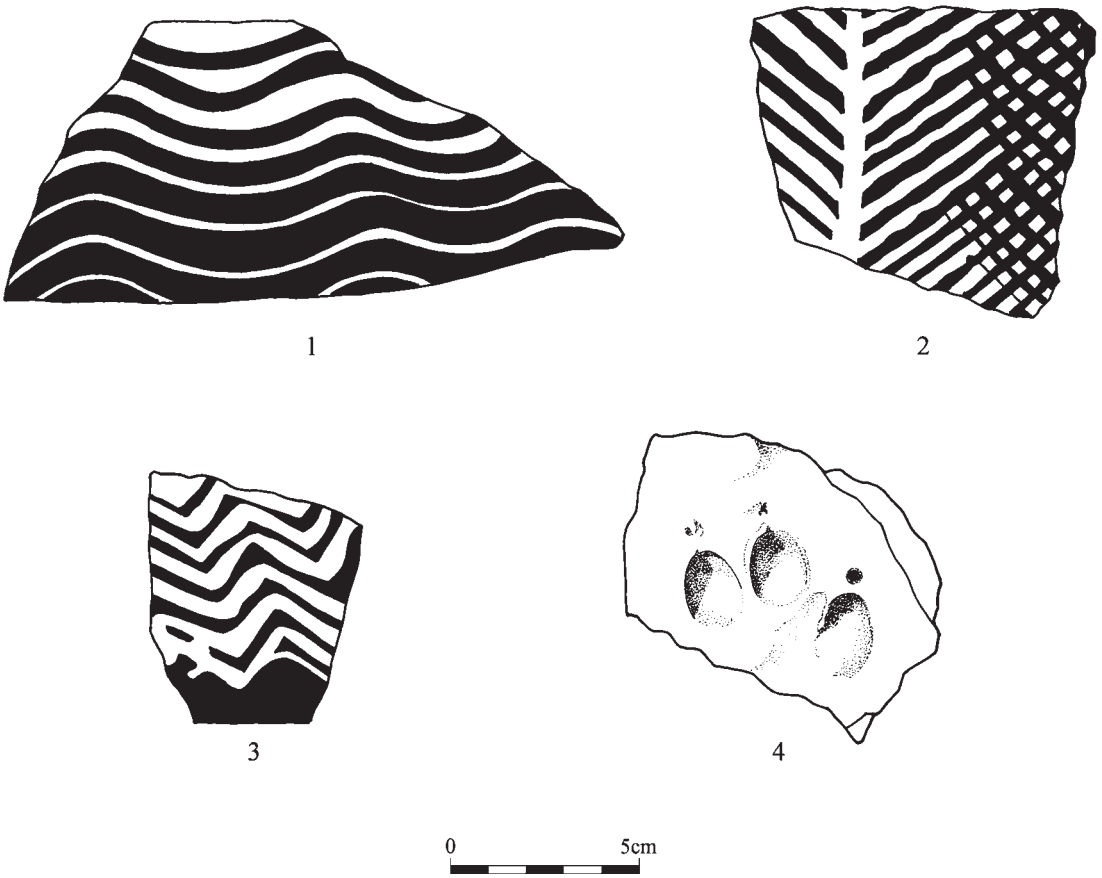


Fig. 21 Roman ceramic building materials: (1–3) roller impressed tiles; (4) animal paw print (scale 1:2)

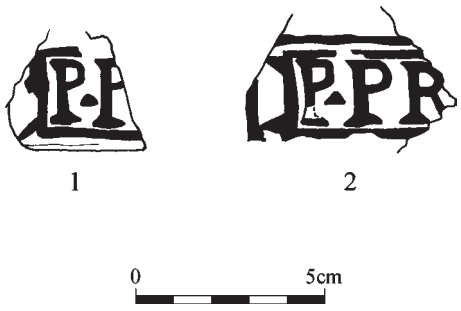


Fig. 22 Roman procuratorial stamps on ceramic tiles (scale 1:2)

The nature of the Roman material suggests the possible presence of high-status buildings in the vicinity. Cripplegate Fort or the City wall itself may have been the original source for most, if not all, of the Roman material. Alternatively the presence of two stamped procuratorial tile fragments may point to material having come from official or public buildings, such as the basilica forum, and box flue tiles may have come from the baths found near Cheapside, or perhaps further south at Huggin Hill. Of course, the material may have come from other high-status buildings nearer the site, as yet undiscovered.

THE ROMAN GLASS

Hilary Cool

The excavations produced 63 fragments of Roman vessel glass, which are summarised by colour in Table 1. A full catalogue of recovered glass is held with the archive; illustrated vessels (Fig. 23) and those discussed in the text are included in the catalogue below. Most were of blue/green glass, and the relative scarcity of strong colours is indicative that there is no mid 1st-century glass present. Only one dark yellow/brown jug handle fragment (no. 3) and an emerald green base fragment are indicative of a 1st-century date. The other fragments listed under strong colours are shades of yellow brown, which continued in use into the 2nd century. Where the fragments can be dated independently, they belong to the later 1st to mid 2nd century (nos. 2–3, 6–7, 8) or the 2nd century (nos. 1, 9). No. 11 might also be added to this later category but the identification though likely is not completely certain. Thus, whilst occupation in the area might have continued into the 3rd century and beyond, vessel glass was not reaching the site.

The functional profile of the assemblage is unusual as can be seen from Table 2, where two other contemporary urban assemblages are provided for comparison. It is only a very small assemblage and so caution has to be

exercised when interpreting it, but it is clearly dominated by containers, to a much greater extent than is normal. The container profile in itself is unusual in that there are so many flasks. This sort of profile is normally associated with specialised use, such as waste from a bath house.

Given the questions that have arisen as to whether there may have been a disturbed cemetery on the site, it is worth considering whether the unusual profile might be the result of broken grave goods being represented in the glass. There is some merit in this. Glass vessels are, in general, much more rarely deposited as grave goods than pottery vessels, but of those that are deposited, flasks are commonly encountered in the later 1st to 2nd centuries cemeteries. The contents were clearly important in the funeral ritual. Against this solution, however, is the fact that though some of the vessels are represented by relatively large pieces (nos. 6, 9 and 10), there is no indication that there are multiple pieces coming from the same vessel. Also it may be noted that none of the flask fragments show evidence of being heat-affected. Normal practice at that period would be that at least some of them would have been put on the pyre. Such heat-affected fragments as there are appear to be linked to the glass working for which there is some evidence on the site. So, the glass assemblage is unusual but it does not appear likely that this is due to vessels associated with funerals feeding into it.

If the human bone were associated with ritual deposition, another explanation might be that part of the rituals included the use of the contents of the flasks. It may be noted, for example, that in what appears to be a special foundation deposit below the temple at Wanborough there were many broken fragments of a bath flask (O'Connell & Bird 1994, 129 no. 3). Not all of the vessel was present and so clearly the contents had been used prior to deposition.

In addition to the vessel fragments there was also a fragment apparently from a glass furnace (no. 12) from a Phase 5 context. Melted fragments were also found in Phase 9 and 10 contexts. Though evidence of post-medieval glass manufacture was found on the site, fragments such as no. 13 give every indication of being of Roman date despite coming from the late contexts. The remains of glass working are regularly found on sites in London, most notably in recent years in harbour development at Regis House (Brigham 1998, 27). The amount of evidence from this site merely indicates glass working of some form was taking place in the vicinity. There are, for example, no fragments of the distinctive type of waste associated with blowing vessels.

Phase	*Blue/ green*	*Colourless*	*Strong Colours*	*Light Green*	*Total*
Phase 2	2	-	-	-	2
Phase 3	1	-	-	-	1
Phase 4	13	2	-	-	15
Phase 5	7	-	2	1	10
Phase 6	12	1	4	-	17
Phase 8	8	-	-	1	9
Phase 9	8	-	1	-	9
Total	**51**	**3**	**7**	**2**	**63**

Table 1 The Roman vessel glass from the site by colour, quantified by EVEs

Catalogue

NB All vessels are made of translucent blue/green glass unless otherwise stated.

Fig. 23.1 (1) Wide rimmed bowl; rim fragment. Colourless glass. Flat rim with fire-rounded rim edge and step forming a rib on underside; side sloping in. Rim diameter 130mm, present 11mm. EVE 0.4. Cool & Price 1995, 100 nos. 695–697.
(2) Tubular-rimmed bowl; base fragment. Light yellow/ brown. Flat base; applied true base ring with post technique scar. Base diameter 80mm. EVE 0.4. From fill of Phase 9 ditch [1098]. Price & Cottam 1998, 78.
(3) Jug handle fragment. Dark yellow/brown. Upper part of angular narrow ribbon handle with central rib. Section 27 x 5mm. EVE 0.14. From Phase 5 grey deposit [863]. Price & Cottam 1998, 150–56

Fig. 23.2 (4) Jar; rim fragment. Small bubbles. Rim bent out, edge rolled up and in. Rim diameter *c.* 70mm, present height 17mm, EVE 0.17. <61> . From fill of Phase 4 channel [767]. Typology as 5.

Fig. 23.3 (5) Hat-shaped unguent jar?; body and base fragment. Broken at curve to rim; convex-curved body broken at edge; reservoir cylindrical. Dimensions 23 x 22mm. <65> : From Phase 8 dump deposit [839]. Price & Cottam 1998, 145 fig. 63a

	Cup / beaker	*Bowl*	*Jug*	*Jar*	*Flask*	*Bottle*	*Total EVE*
Moor House	-	24	8	10	36	21	3.32
Colchester	34	21	11	7	6	21	26.84
Dorchester	27	9	11	11	22	19	13.11

Table 2 The functional profile of the glass recovered from the site compared to other urban assemblages, shown as percentages (for the source of the Colchester and Dorchester assemblages see Cool and Baxter 1999, Table 2).

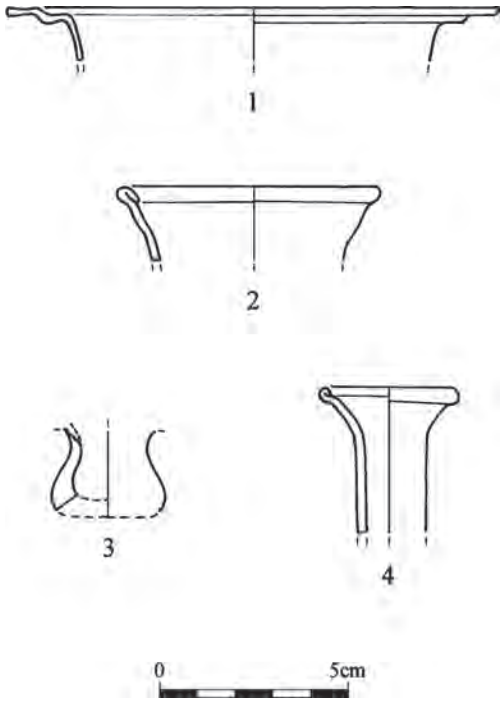


Fig. 23 Roman glass vessels (scale 1:2)

Fig. 23.4 (6) Funnel-mouthed flask; complete rim fragment. Funnel-mouth with rim edge rolled-in, cylindrical neck. Rim diameter 38mm, present height 37mm, EVE 0.4 <62>. From fill of Phase 4 channel [767]. Cool & Price 1995, 149.
(7) Funnel-mouthed flask; rim fragment. Yellow/green impurities. Funnel-mouth with fire-rounded rim edge. Rim diameter 45mm, present height 14mm. EVE 0.2mm. From Phase 6 dump deposit [1787] . Typology as no. 6.
(8) Tall conical unguent bottle; lower body and base fragment. Many bubbles. Straight side, concave base. Maximum body diameter *c.* 30mm, present height 26mm. EVE 0.2. <43> : From Phase 4 pit [673]. Price & Cottam 1998, 172.
(9) Conical unguent bottle; lower body and base fragment. Side curving into shallowly concave base; Maximum body diameter *c.* 55mm, present height 21mm. EVE 0.4. - : From Phase 8 marsh deposit [839]. Probably from the discoid form - Price & Cottam 1998, 175.
(10) Bottle; complete rim, neck and shoulder fragment. Many small bubbles. Rim bent out, up, in; cylindrical neck with scar from handle attachment; shoulder curving out. Rim diameter 39 x 38mm, present height 41mm. EVE 0.42. - : From fill of Phase 4 ditch [1844]. Price & Cottam 1998, 191-198.
(11) Bottle; neck fragment. Cylindrical neck with tooling marks at base. EVE 0.14. From Phase 6 dump deposit [1788]. (Typology as 10).
(12) Furnace fragment. Sandstone slab, with molten glass on either side. From Phase 5 grey deposit [1806].
(13) Molten lump. Weight 40g. From fill of Phase 9 ditch [970].

THE ROMAN SMALL FINDS

Märit Gaimster with Hilary Major

In addition to the finds recovered from Roman contexts there were also residual Roman finds from the medieval phase, some of which deserve mentioning (*see* catalogue), including a possible needle (Fig. 24.1) and bone hairpin (Fig. 24.2). A complete catalogue of all recovered Roman small finds may be found in the site archive and the assessment report (Keys 2003). This report focuses on the more significant items.

The finds from the pre-settlement phase, represented by channels and quarrying and including several pieces of undiagnostic iron, are fragmentary and inconclusive. Following this, numerous features reflect occupation in the second half of the 2nd century, indicated by the finds, such as bone hairpins and a gold wire earring (Figs 24.4, 25). Other finds of interest include a copper-alloy drop handle (Fig. 24.3), from a small box or casket, and copper-alloy sheet waste. Three coins were also retrieved from the settlement phase (*see* Stabler, below). Two of these fall within the late 1st/2nd-century date suggested by pottery and glass; the third coin, of Constantine, dates to AD 319–20.

The finds recovered from the period after the construction of the City wall again include dress accessories and personal objects such as a silver finger ring (Fig. 24.5), a ceramic gaming piece, bone hairpins, a bone spatula (Fig. 24.8) and a late 1st/2nd-century brooch (Fig. 24.9) that was residual in a medieval context. There was also a further fitting <311> from a box or casket. Of particular interest is the small animal figurine, possibly representing a lion (Figs. 24.6, 26) on a hollow base; this was clearly part of a larger object and so far there are no known parallels. The surface is in poor condition and little detail survives; the muzzle is rather elongated, but traces of a mane may be present; the tail is curled, and is perhaps more reminiscent of a pig.

Catalogue

Quarrying and stream channels (1st century to mid 2nd century)

<80> triangular sheet of lead with an elongated, rolled apex; L 50mm; probably scrap metal
<81> copper-alloy stud; head only; D 15mm
<76> fragment of copper-alloy ?brooch; L 16mm
<83> incomplete copper-alloy rod or pin; L 57mm
<136> flat iron bar, broken at one end; L 79mm; W 13mm; possibly smith's stock

Occupation (second half of 2nd century AD)

Fig. 24.1 <5> bone hairpin or needle shaft, polished; L 76mm; the shaft is beginning to flatten at the head end, suggesting that this was a needle. However, although this end is slightly irregular, the polish continues over the edge of the break, so it may have been a broken needle re-used as a hairpin
<12> bone hairpin or needle; incomplete; L 40mm

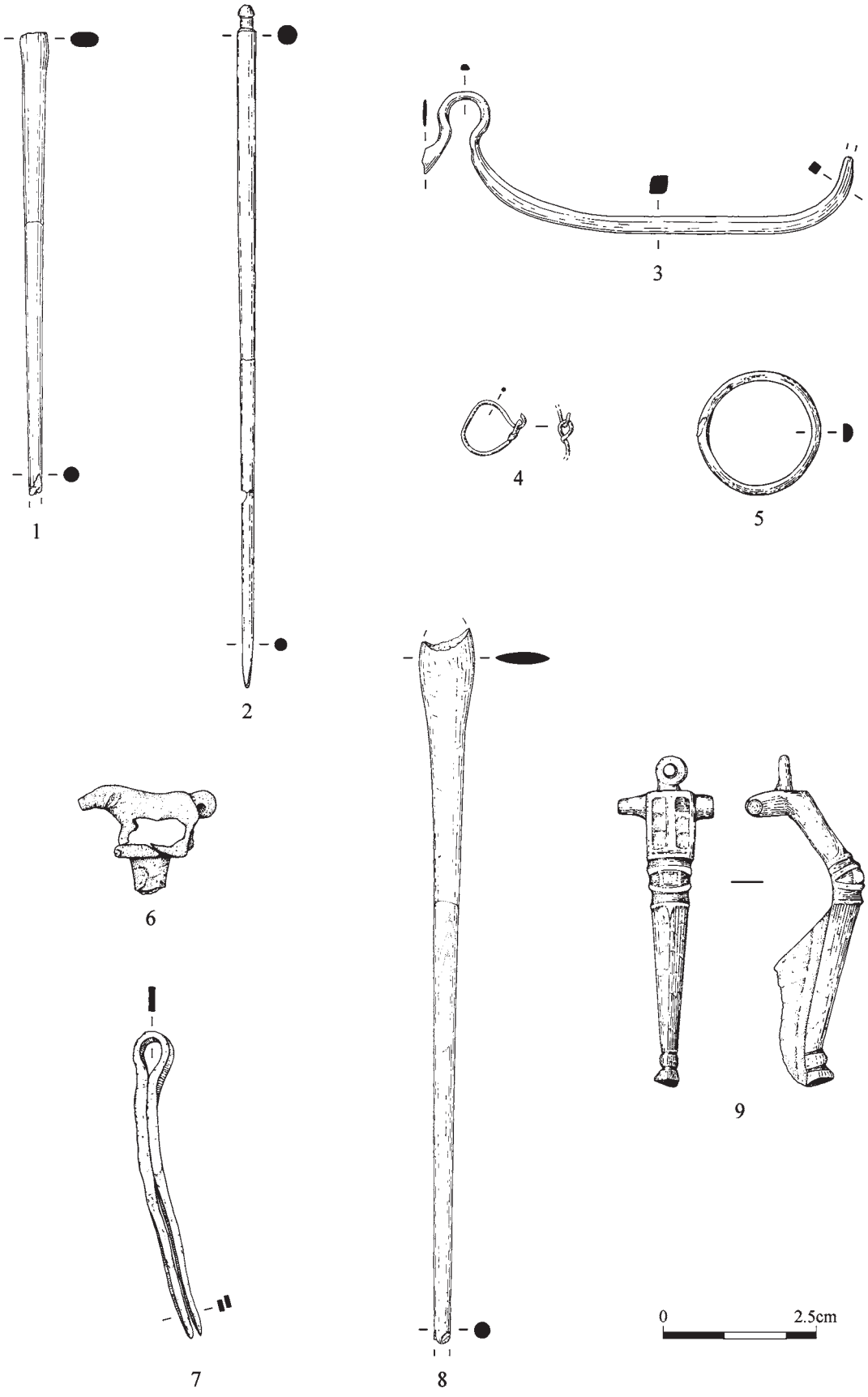


Fig. 24 Roman small finds (scale 1:1)

Fig. 25 The gold earring

Fig. 26 The animal figurine

Fig. 24.2 <53> bone hairpin; complete, in three pieces, with slight damage to the head and tip, and at the junction of two of the pieces; L 112mm; small conical head with two grooves below, and a straight shaft; Crummy Type 2, late 1st–2nd centuries (Crummy 1983, 21)
<54> bone hair pin; incomplete, in two pieces; L 90mm
<45> ceramic gaming piece; circular D 30mm
<98> bone hair pin; incomplete with tip present; L 38mm
<94> copper-alloy sheet waste from production of round cut outs; L 30mm

Fig. 24.3 <208> copper alloy drop handle; W 73mm; one loop is missing, the other possibly incomplete; the terminal is flattened and may be broken; probably from a small box or casket

Fig. 24.4 <322> gold wire earring; D 8mm; one end finished in a small hook which is attached to a loop twisted onto other end

Post-City wall construction (3rd to 4th centuries)

Fig. 24.5 <16> plain silver finger ring; thickness 2.5mm, D 20mm; Phase 6
<220> folded lead sheet; L 111mm W 60mm; ?waste or water pipe; Phase 5

Fig. 24.6 <46> copper alloy small animal figurine, possibly a lion; the animal is standing on a rectangular plate on top of a rod with a polygonal section, probably hexagonal; the end of the rod has broken off; the figurine is hollow underneath; this is clearly part of a larger object; figurine L 21mm, ht. 10.5mm; overall ht. 18mm; Phase 5

Fig. 24.7 <311> copper alloy double-spiked loop; L 51mm; this type of fastening is far more common in iron, with copper-alloy examples often used on caskets and small boxes to attach rings, or drop handles such as <208> above; Phase 5
<308> copper-alloy run; L 26mm; metalworking waste; Phase 5

Fig. 24.8 <314> bone spatula?; a well-made object with a very slightly swollen, circular sectioned shaft, with the head flattened in the same plane; both ends are broken; L 120mm, max. W 8.5mm; the edge of the head curves in just enough to suggest that it was tongue-shaped, and not triangular, as it would be on a needle; Phase 5. Bone spatulae of this form are rare; there are comparable examples from Wroxeter Baths (Mould 2000, 133, nos. 231-4) and Colchester (Crummy 1983, 172, no. 4756), and several from recent excavations at Tabard Square, Southwark (Killock forthcoming)
<319> bone needle; incomplete with only part of eye remaining; L 32mm; Phase 6
<330> ceramic gaming piece; circular D 50mm; Phase 6

Residual Roman finds

Fig. 24.9 <66> copper alloy T-shaped brooch with hinged pin; the pin is now missing; L 52mm; the surface is in poor condition, and some details may have been lost; the head loop is small, and one of the cylindrical side wings is now incomplete; the head is sharply angled into the upper bow, which has two longitudinal rectangular enamelled panels; the enamel appears green due to reaction with the copper alloy, but may have been red originally; the centre of the bow has transverse mouldings, possibly a very degraded acanthus moulding; the lower bow is ridged, with a transverse moulding next to the knobbed foot; the catchplate is large and incomplete. The brooch belongs to Hull's Type 109 (cf Hattatt 1985, 89, no. 387). The enamelling usually consists of lozenges, but rectangular panels sometimes occur. The type is found mainly in the South-West, and is particularly common in the lower Severn area, but is occasionally found elsewhere in Southern Britain, for example at Gadebridge, Herts. (Butcher 1974, 125, no. 16). The date is late 1st century to mid 2nd century AD
<93> bone hair pin; incomplete; L 28mm; shallow transverse groove beneath rounded head; second or 3rd century
<310> bone hairpin; incomplete; L 43mm

THE ROMAN COINS

Kim Stabler

A total of eight Roman coins were retrieved during the excavations. The coins range in date from the late 1st or early 2nd century through to the mid 4th century, but are clustered in the Trajanic through to Antonine periods, ie the mid 2nd century. The coins are generally in a very corroded condition, so much so that it is difficult to determine exact identification or degrees of wear (which are often used as a guideline to determining how long the coin remained in circulation), with the exception of <85>, from the fill of a medieval (Phase 9) ditch, which is a good example of a Hadrianic *dupondius*.

<85> [1029] AE, dup, Hadrian; Obv. HADRIANVS AVG PP; Rev. HILARITAS PR SC, COS III in exergue; (As RIC II, 974 SW 128 – 39)

Given the statistically small number of the sample, and the fact that all coins were retrieved from different archaeological contexts, further analysis based on coinage type and distribution is impossible here, and the coins do little more than provide a *terminus post quem* for their individual contexts. The exception is <38>, recovered from a Phase 4 (late 2nd-century) ditch, which dates to the Constantinian period and may therefore be intrusive. Interestingly, is it likely that this coin with the obverse portrait showing the emperor left facing and sporting a high-crested helmet, was minted in London. One example <99>, from a Phase 4 waterlain deposit, displays a nice portrait of an imperial woman, but is very worn and no legend remains. The hairstyle, however, suggests that it belongs in the Antonine period, and is likely either Faustina II (the wife of Marcus Aurelius) or Lucilla (the wife of Lucius Verus).

<38> [648] AE, Constantine; Obv. - ; Rev. - ; (As RIC VII, 158, 319 – 20)
<99> [1207] AE, *sest*, Faustina II or Lucilla; Obv. -; Rev. – EW mid 2nd century

All in all, however, the coin assemblage is typical of those recovered from similar City sites, and is not exceptional in any way. A full catalogue of the coins is held with the site archive and included in the assessment report.

THE ROMAN LEATHER

Quita Mould

Only a small assemblage of leather was recovered from Roman contexts on the site, with a few examples of Roman shoes of nailed construction also occurring residually within the fills of a medieval ditch.

Three pieces of secondary waste of cowhide were found in the fills of quarry pits [1880] and [1888] dating to the first half of the 2nd century AD. One has at least three impressions made by a hollow punch (diameter 6mm) on the grain surface. Similar marks were noted on waste leather associated with shoemaking from occupation of the second fort at Carlisle dated to the first half of the 2nd century AD (CAR MIL5 8198 SF 5816, Mould in prep). Small fragments from shoes of nailed construction were found within the fills of a 2nd-century quarry pit and a small rubbish pit respectively. Two intersectional cutting pieces from shoemaking were found in the fill of a 3rd-century AD east–west ditch [340].

THE HUMAN BONE

Natasha Dodwell

The excavations at Moor House produced 107 human skeletal elements from 66 contexts. The disarticulated human bone was recovered from features and deposits across the site dating from the 1st/2nd century to the 17th/18th century. Bones from three features of different dates (Phases 2, 5 and 9) were selected for C14 dating and the results suggest that most, if not all of the human material probably represents re-deposited and/or residual bone derived from disturbed 1st/2nd-century burials. A Roman cemetery is known to extend northwards and eastwards from just to the east of the site at Finsbury Circus and an inhumation was found in the late 1980's just to the north of the site at Moorgate Hall (Schofield with Maloney 1998, 276).

Methodology

Standard osteological texts were used to identify the bones (Bass 1992, Steele & Bramblett 1988) and the skeletal elements were recorded in accordance with the zonation method recently devised by Knüsel and Outram (2004) to deal with disarticulated human remains. Depending on the skeletal element, an assessment of age was based on the stage of epiphyseal union, dental eruption and on the degree of dental attrition (Brothwell 1981). The skull fragments were tentatively sexed by the robustness of the occipital protuberances and the morphology of the mandible. The details of these analyses are held with the site archive.

Results

The disarticulated remains derive from a minimum of fourteen individuals. All the skeletal elements are adult-sized and both males and females are represented. The majority of human bone came from features in Phases 4, 5 and 9. With the exception of three rib shafts and a fragment of pelvis all of the bones recovered were long bone shafts or cranial fragments (*see* Table 3). Whilst this could be

Phase	*skull frags*	*mandible*	*femur*	*tibia*	*fibula*	*pelvis*	*ribs*	*humerus*	*ulna*	*radius*	*total*
Phase 1	-	-	-	-	-	-	-	-	-	-	0
Phase 2	-	1	1	2	1	-	-	-	-	-	5
Phase 3	-	-	1	2	1	-	1	1	-	-	6
Phase 4	1	1	8	6	1	-	1	7	4	-	29
Phase 5	5	1	10	3	2	1	-	3	1	2	28
Phase 6	2	1	-	1	1	-	-	1	-	-	6
Phase 7	1	-	-	-	-	-	-	1	-	-	2
Phase 8	1	-	-	1	-	-		2	-	-	4
Phase 9	2	-	7	4	2	-	1	7	2	-	25
Phase 10	1	-	-	1	-	-	-	-	-	-	2
Total	**13**	**4**	**27**	**20**	**8**	**1**	**3**	**22**	**7**	**2**	**107**

Table 3 Human skeletal elements, showing the number of skeletal elements (left and right) recovered from each phase

viewed as the deliberate selection of particular skeletal elements, the survival of bone is not haphazard; the more porous and the less dense the bone is, the more susceptible it is to destruction. Waldron's analysis of the Romano-British cemetery at West Tenter Street, part of London's Eastern cemetery, found that heavy, dense bones were well represented whereas small or fragile bones were not (Waldron 1987).

The epiphyseal ends of the majority of long bones were missing; the shafts are the densest part of the bone. The breaks at the end of the shafts were old, post mortem breaks. Many of the ends of shafts had been gnawed by animals and several of the bones had abraded cortical bone and displayed post-mortem scratch marks (*see* Armitage, below). These taphonomic changes suggest that many of the bones had spent at least some time exposed on the ground surface. No *in situ* graves were recorded, though bones from [1810] may represent a heavily truncated 2nd-century grave. It is possible that the cemetery which is known to lie to the east may have encroached onto the site and that graves have been disturbed by subsequent quarrying for brickearth and gravel (several bones had ancient chop marks, similar to mattock marks, on them). The bones could also have been washed into the site by flooding.

Whilst it is probable that all of the disarticulated material recovered from the site is residual, it is possible that some of the elements may have been deliberately deposited. For example, a fragmentary but complete possibly female skull and a proximal right humerus were recovered from the base of a 3rd/4th-century ditch [1578] which also contained the skulls of a horse together with sizable fragments of one pot.

DOG GNAWING AND OTHER MARKS ON THE HUMAN BONE

Philip L. Armitage

Methodology

Evidence of dog gnawing (Table 4) was verified using modern comparative specimens of defleshed cattle long bones that had been repeatedly chewed and crunched by a domestic dog (Labrador and German Shepherd crossbred). Tooth scrape marks believed to have been made by a rodent were compared against the upper incisor teeth in modern crania of black rats (*Rattus rattus*).

General observations

In all the specimens submitted for examination, only the shaft remains, and both proximal and distal epiphyseal ends are missing, presumed destroyed by dog gnawing/crunching. It is well documented that the cancellous ends of long-bones are generally the first regions to be gnawed by carnivores (including dogs).

Even in those specimens where dog tooth marks appeared to be absent, the pattern of breakage/splintering of the ends of the shafts was consistent with that observed in modern comparative bones known to have been gnawed/crunched by carnivores. Rat gnawing was noted on the posterior surface of the shaft and the distal end of a single humerus.

All bones are stained brown. Apart from five specimens, preservation in the majority of specimens is remarkably good. Three specimens exhibit silt/sand tubules on the surface of the bone (Table 4). These small 'worm-like' tubular structures were probably made by the small larvae

Context	Element	Dog gnawing Presence [P]			Rodent gnawing	Knife cut marks [K] and chop/hack marks [C]		Weathering / erosion / abrasion	Presence of Chironomid larvae tubules
		prox. end	shaft	dist end					
Phase 4 ditches								–	–
911	femur	–	–	–	–	–	–	–	–
963	humerus	P	–	P	P	C	V-shaped post-mortem chop/hack mark mid shaft	Some weathering / erosion / abrasion of surface of shaft.	–
1214	femur	P	–	–	–	K	Very small post-mortem knife cut across the linea aspera, proximal end.	–	Shaft has a few tubules
Phase 5 grey deposit									
477	femur	–	P	P	–	K ? C	Post-mortem knife cut mark on the distal end of the shaft. Possible post-mortem chop mark on the distal end of the shaft.		
685	femur	P	P	P	–	–	–	–	–
685	femur L	P	–	–	–	–	–	–	–
685	femur R	P	P (medial)	–	–	–	–	–	–
685	tibia	–	–	–	–	–	–	–	–
966	humerus	–	–	–	–	–	–	–	–
1068	humerus	–	–	–	–	–	–	Dark area of iron staining/ mineralisation at the proximal end of the shaft.	Shaft has some tubules
1158	femur	–	–	–	–	–	–	–	Shaft encrusted with many tubules
Phase 8 Marsh deposit									
325	humerus	–	–	–	–	–	–	Surface of shaft exhibits erosion/abrasion	–
746	tibia	P	–	P	–	–	–	–	–
746	humerus	–	–	P	–	–	–	–	–
Phase 9 ditches									
City ditch	humerus	–	–	P	–	–	–	Surface of shaft has striation/"scratch" marks - evidence of post-deposition abrasion.	–
740	tibia	–	–	–	–	–	–	–	–
740	tibia	–	–	–	–	–	–	–	–
791	femur	P	–	–	–	–	–	Some erosion/abrasion of broken proximal end of shaft.	–

Table 4 Evidence of gnawing, cut marks, weathering and erosion and chironomid larvae on human bone

of *Chironomid* flies (midges) and are evidence the bones had lain for some time in silt or mud beneath flowing water.

The V-shaped chop/hack mark in the humerus from [930], the fill of a Phase 4 north–south linear [963], was probably made by a cleaver or axe. The very small knife cut mark on the femur from [1213], the fill of Phase 4 north–south linear [1214], appears to have been made by a very fine/very sharp blade.

THE ANIMAL BONE

Philip L. Armitage

A total of 1,653 Roman animal bone elements/fragments (NISP) were submitted for analyses and interpretation. Of these, 1,404 (84.9% of the total NISP) are identified to species/taxon and anatomy, and 249 (15.1%) remain as unidentified fragments. Table 5 provides an overview of the summary counts of the bones by species/taxon and site phase. Whilst the bulk of the bones submitted had been hand-collected, included among the data shown are skeletal elements of small faunal species recovered from sieved soil/environmental samples. Table 6 gives details of the eight frog bones from three of the sieved samples. Overall, thirteen species are represented (nine mammalian, three birds and one amphibian). These consisted of *Equus caballus* (domestic) horse, *Bos* (domestic) cattle, *Ovis* (domestic) sheep, *Sus* (domestic) pig, *Canis* (domestic) dog, *Cervus elaphus* red deer, *Capreolus capreolus* roe deer, *Vulpes vulpes* fox, *Lepus capensis* brown hare, *Anser anser* (domestic) grey-lag/domestic goose, *Gallus gallus* (domestic) domestic fowl, *Cygnus olor* mute swan and *Rana temporaria* common frog.

Methodology

Identification, measurement, recording and analyses of the bulk of the animal bones followed standard zooarchaeological methodological procedures, as detailed elsewhere by the author (Armitage 1999, 162–163). Aspects of the methodology used in this project not covered in the above reference are as follows:

Ageing and sexing horses by their dentition: for determining age, two methods were adopted: the first based on patterns of wear exhibited by the incisor teeth (criteria of the American Association of Equine Practitioners 1966), and the second based on crown height measurements taken on the upper and/or lower cheek teeth (method of Levine 1982). Sex was determined by the presence (male) or absence (female) of the canine tooth (criteria of Scott & Symons 1964, 380).

Results of the analyses

The bulk of the animal bones from the combined Roman deposits is identified as domestic food debris, indicating a diet dominated by beef, with mutton (and lamb) and pork comprising the other principal dietary staples (Table 7: in calculating the values for cattle, bone-working waste/products in the form of sawn distal ends of metatarsal bones and 'points' fashioned from proximal ends of metatarsal bones were excluded from the NISP data). This was supplemented by poultry (fowl and geese), the occasional hunted hare or roe deer (in Phases 4 & 5), and (in Phase 2) in wealthy households, by wild birds such as the swan. Domestic boars appear to have provided the principal source of the pork consumed in the Roman

Species/Phase	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Totals*
Horse (*Equus caballus)*		33	8	28	16	7	18	110
Cattle (*Bos*)	2	67	43	444	359	84	9	1008
Sheep (O*vis)*		7	5	54	40	18	2	126
Pig (*Sus*)	1	1	2	30	24	13	1	72
Dog (*Canis*)		5	3	35	7	3	1	54
Red deer (*Cervus elaphus*)				1				1
Roe deer (*Capreolus capreolus*)				1	2			3
Fox (*Vulpes vulpes*)				5				5
Hare (*Lepus capensis*)				1				1
Greylag/domestic goose (*Anser anser*)				4				4
Domestic fowl (*Gallus gallus*)		1		7	3			11
Swan (*Cygnus olor*)		1						1
Common frog (*Rana temporaria*)				3		5		8
Subtotals	3	115	61	613	451	130	31	1404
unidentified mammal		6	42	89	85	21	6	249
TOTALS	3	121	103	702	536	151	37	**1653**

Table 5 Summary counts of the identified Roman bone elements/fragments (NISP) by site phase and species/taxon

Phase	*sample number*	*deposit type*	*NISP*	*MNI*
4	<16>	Fill of quarry pit [146]	3	2?
6	<53>	Fill of ditch [545]	3	1
6	<27>	Fill of pit [422]	2	1
Totals			**8**	**4**

Table 6 Summary counts (NISP) of the frog bone elements recovered by means of environmental sampling from the Roman deposits

Phase/Period	*cattle*	*sheep*	*pig*	*Total NISP*
Phases 2, 3 & 4: 1st/2nd century	85%	10%	5%	645
Phases 5, 6 & 7: 3rd/4th century	82%	11%	7%	534
Overall	**83%**	**11%**	**6%**	**1179**

Table 7 Relative proportional frequencies of the main domesticates/meat-yielding species (based on NISP, food debris only)

Phase/Period	*Deposit type*	*Element*	*Sex*	*Estimated Age*
Phase 6 3rd century	Fill of ditch [1595]	Skull	Male	16 to 17 years
Phase 6: 3rd century	Layer [1788]	Mandible	Indeterminate	8 to 9 years
Phase 7: 3rd/4th century	Fill of ditch [1578]	Skull	Indeterminate	11 to 12 years

Table 8 Age at death in the horses

periods, as evidenced by the identification of all the canine teeth (tusks) found in Phase 3, 4, 5 and 6 as exclusively males, no sows are represented.

Intermixed with the food bones are the skeletal remains of pet (or feral) dogs, of horses' heads (represented by crania and lower jawbones) (detailed in Table 8), and of at least one adult fox (represented in Phase 4 context [768], one of the fills of east–west channel [198], by one right and one left femora, one tibia, and two lumbar vertebrae). This fox may have lived by scavenging among the discarded food debris thrown into the ditches and quarry pits. The skeletal remains of frogs are also represented among the Roman faunal samples (as listed in Table 6), as perhaps would be expected of a marshy area bisected by streams and man-made features (ditches and quarry pits) containing water, ideal habitats for this amphibian species.

There is no evidence for large-scale craft activity in the vicinity of the site that used animal bone as a raw material. However, several of the Roman deposits did yield small quantities of isolated examples of sawn distal ends of cattle metatarsal bones identified as bone-working waste, as well as the proximal ends of cattle metatarsal bones fashioned into points/spikes whose function is obscure. Evidence of the removal of a shaft of a horse long bone for the purposes of bone working is provided by a sawn distal end of a tibia from Phase 4 stakehole [240]. Antler-working waste is represented in Phase 4 context [769] fill of channel [770], by a broken/chopped basal portion of red deer antler with a fragment of frontal bone attached (indicating the source was a hunted deer rather than a shed antler).

Stature in one of the cattle from context [1589], fill of Phase 7 north–south ditch [1602], is calculated at 112.8cm from the length of its metatarsus (GL = 207mm) (method of Fock 1966). This value falls below the mean value of the size range documented by West (1983) for the cattle from the General Post Office site in the City of London (range 110.7 to 125.1cm, mean 115.2cm, N = 14) but falls into the upper range of the sample from Roman Southwark (Swan Street site) recorded by Armitage (forthcoming), where the mean was calculated at 107.4cm with an observed size-range 89.0 to 124.3cm (N = 9). The withers height in one of the sheep from Phase 7 fill of pit [1582], is calculated at 57.1cm from the length of its radius (GL = 142mm) (method of Teichert), which is slightly less than the mean of 60.8cm documented by West (1983) for the sheep from the General Post Office site (range 53.9 to 75.9cm, N = 16) and the mean of 58.8cm for the sample from Roman Southwark (Swan Street) documented by Armitage (range 52.9 to 66.7cm, N = 12). Shoulder height in the full grown (adult) dog from [1887], a 2nd-century fill of quarry pit [1888]) is calculated at 30.1cm from the length of its tibia (GL = 100mm, SD = 9.8mm) (after the method of Harcourt 1974). This value places the animal in the group of lapdogs or housedogs frequently found at Roman sites throughout Britain and Continental North Western Europe, and who according to Harcourt (1974, 164) were much too small to serve any useful purpose (guarding or in hunting) except as companions and household pets. In the case of the tibia from the present site it is important to record that this specimen has a distinctive bowed (curved) shaft, as does the humerus from the same context (presumably derived from the same animal). Both of these elements and another tibia of a small sized dog from [1908], fill of Phase 4 ditch [1909] that also exhibits a bowed/curved shaft, are morphologically similar to the leg bones found in the modern Dachshund. Dachshund-type (stumpy-legged) dogs were apparently kept by wealthy families in Ancient Egypt as evidenced by depictions of such animals in tomb paintings, and later (from the 1st century AD onwards) they became popular household pets throughout the North West Roman Provinces (including Britannia) as discussed by Luff (1982, 130 & 263) and Teichert (1988). In Britain their skeletal remains have been discovered in a *c.* AD 80 context at the Balkerne Lane site, Colchester (Luff 1982, 130) and in a late-Roman context at the General Post Office site, London (West 1983, 9). The two examples from Moor House provide further evidence of the extent of this

Dachshund-type in early Roman Britain. Another type of dog kept in Roman London is represented at the present site by a cranium from [769], one of the fills of a Phase 4 channel/ditch [770]. In this specimen, the overall size, the presence of a moderately developed sagittal crest, together with a cephalic index of 64.7, and snout index of 43.7 (calculated after the method of Harcourt 1974) all identify the dog as a terrier-type.

ENVIRONMENTAL ANALYSIS

Nick Branch, Alys Vaughan-Williams, Barbara Silva, Chris Green and Alan Williams

Environmental archaeological assessment of contexts from sampled features revealed the presence of well-preserved pollen grains and spores, and plant macrofossils (Branch *et al* 2002). These remains had the potential to provide information on the broad environmental history for each period and, in particular, evidence for economic and dietary practices. In order to achieve these aims, the features were subject to detailed laboratory analysis to quantify the environmental archaeological data. The analyses conducted were:

1. Sedimentological descriptions of the Roman alluvial sequence, channel fill (feature [806]) and a Roman quarry pit (feature [1880]).
2. Pollen analysis of the sedimentary sequence within the Roman alluvial sequence, channel fill (feature [806]) and a Roman quarry pit (feature [1880]).
3. Plant macrofossil analysis of the sedimentary sequence within the Roman quarry pit (feature [1880]).

Results of the analyses

Investigation of the Roman alluvial sequence

Silty sands represent the basal part of the sequence (8.61–8.83m OD; contexts [264] and [283], not illustrated), indicating deposition of suspended sediments on the margins of a slow moving (low energy) water body (river

			Sample	*316*	*336*	*337*	*338*	*311*	*310*
			Context	*1876*	*1885*	*1891*	*1892*	*1827*	*1806*
			Phase	*2*	*2*	*2*	*2*	*3*	*5*
Genus	*Species*	*English Name*			*Fills of quarry pit [1880]*			*Brick earth*	*Grey deposit*
Waterlogged plant macrofossils									
Weeds									
Ranunculus	*repens*	Creeping buttercup	seed	–	–	–	2	10	–
Ranunculus	*sceleratus*	Celery-leaved buttercup	seed	2	5	–	43	–	–
Ranunculus	*trichophyllus*	Thread-leaved water-crowfoot	seed	–	–	–	–	5	–
Urtica	*dioica*	Common nettle	seed	–	5	–	54	–	–
Chenopodium	*album*	Fat hen	seed	–	–	–	5	–	2
Atriplex	sp.1	Orache	seed	–	–	–	6	–	–
Montia	*alba*	Blinks	seed	–	–	–	45	–	–
Stellaria	*gramineae*	Lesser stitchwort	seed	–	–	–	60	–	–
Polygonum	Sect. *Avicularia*	Knotgrasses	seed	–	2	–	2	–	–
Rubus	*fructicosus*	Blackberry	seed	–	4	–	–	–	–
Sorbus	sp.	Whitebeam	seed	–	3	–	1	–	–
Impatiens	*parviflora*	Small balsam	seed	–	4	–	12	–	–
Stachys	*sylvatica*	Hedge woundwort	seed	1	–	–	–	–	–
Sonchus	*asper*	Prickly sow-thistle	seed	–	–	–	4	–	–
Cyperaceae	Indet	Sedges	seed	–	9	–	–	–	–
Asperula	*arvensis*	Blue woodruff	seed	–	–	–	–	8	–
Ulex	*europaeus*	Gorse	seed	–	–	–	–	–	2
Mineralised plant macrofossils									
Cereals									
		Straw fragments	chaff	3	2		1		

Table 9 Waterlogged and mineralised plant macrofossils from Roman features

channel) within an area prone to intermittent flooding (floodplain). Overlying these contexts, poorly sorted sands and clays mixed with anthropogenic materials (eg charcoal) indicate a heavily bioturbated series of 'occupation' surfaces at 8.83–9.33m OD; contexts [259] dirty brickearth, [237] grey deposit covering the site and [197] marsh deposit (these contexts not illustrated). The bioturbation was probably caused by human activities, such as trampling, and root penetration. During this period, the presence of heavy coatings on sediment pores and gypsum(?) crystals suggests that the sediment had been affected by contact with stagnant/foul water.

The pollen-stratigraphic analysis supports the above interpretation, indicating that above 8.90m OD (context [237]) the local environment consisted of wet ground with a body, or possibly bodies, of standing water supporting aquatic vegetation (*Nymphaea alba* – white water lily; *Nuphar lutea* – yellow water lily; 45%) and marginal aquatic vegetation (*Typha latifolia* – common reedmace; 1%). Woodland and shrubland commonly associated with wet land is also represented, such as *Alnus glutinosa* (alder; 1%) and *Salix* (eg *S. alba* – white willow; 3%), and it is possible that *Betula* (eg *B. pendula* – silver birch; 2%), *Pinus sylvestris* (Scots pine; 15%), *Quercus* (eg *Q. robur* – pedunculate oak; 1%) and *Hedera helix* (ivy; <1%) also colonised the site. The dominance of herbaceous vegetation indicates, however, that the woodland was sparse and open in character, and that the land surface was mainly composed of damp grassland (eg Poaceae; 16%) and waste ground. The presence of cereal pollen (*Cereale* type) provides the only direct indicator of human activity and may indicate localised cultivation. Unfortunately, due to the absence of pollen preservation in the basal part of the sequence, we can only surmise, based upon the sedimentary data, that the environment was broadly similar to the uppermost part of the sequence.

Investigation of the channel fill, feature [806]

This sequence is mainly composed of sandy deposits infilling a depression in the land surface (cut [806], Fig. 27). The gravelly sand forming the lowermost part of the sequence (context [905]) is likely to be the undisturbed natural deposits underlying the site. Overlying this context, the entire sequence (contexts [904] to [899]) is penetrated by root channels, which are iron-rich and humic-rich in the upper part, and with gleying on the root channel margins between 8.05m to 8.50m OD (contexts [904], [850] and [805]). Due to the absence of anthropogenic materials (except in the top 70mm), and the slight indication of a fining-upward sedimentary sequence (from poorly sorted gravelly sediment to sandier, less gravelly sediment), the feature is probably natural rather than anthropic in origin, and is interpreted as a natural gully cutting back from a stream margin within an area of low relief. The sedimentary infill of the gully therefore represents localised erosion of its edges accompanied by soil formation during the infilling process.

Investigation of the Roman quarry pit sedimentary sequence, feature [1880]

This sequence is mainly composed of poorly sorted sediments, with sandy silts in the lower part (7.91–8.79m OD; contexts [1892]), [1891], [1885]) and clayey sands in the upper part (8.79–9.64m OD; contexts [1884], [1883], [1882], [1876], [1860]), with stones throughout and individual contexts structureless (Table 9 and Fig. 28). The whole sequence has been interpreted as the artificial fill of a Roman quarry pit, with a series of horizontal 'dumping'

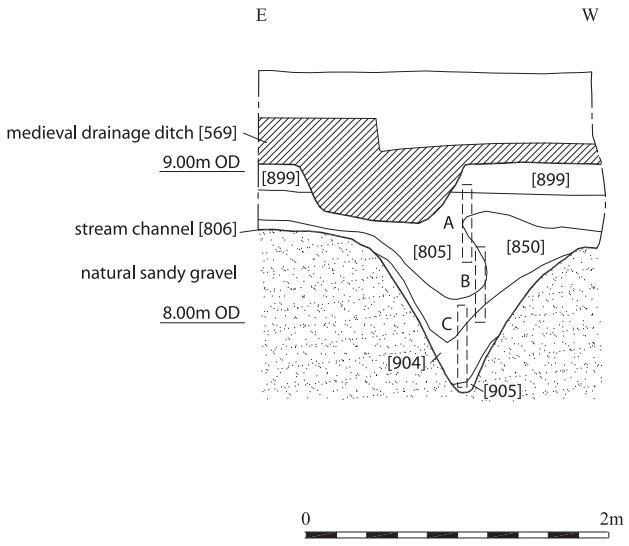


Fig. 27 Section 2, through stream channel [806] showing location of column sample <68> (A–C) (scale 1:50)

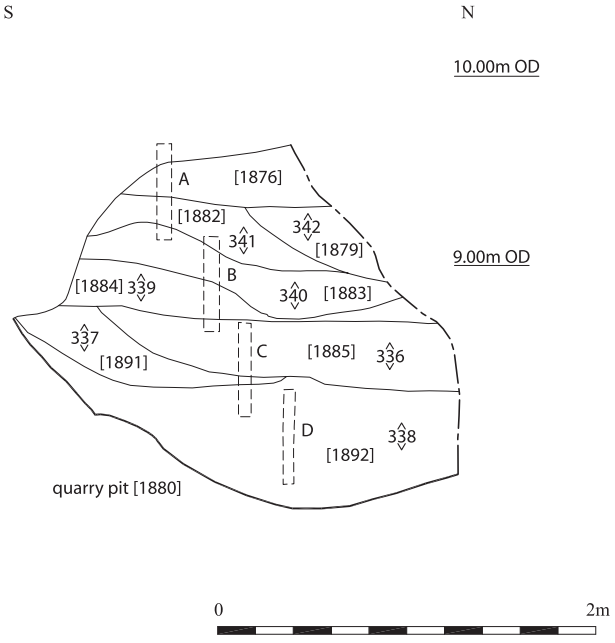


Fig. 28 Detail from section 3, through quarry pit [1880] showing location of column sample <334> (A–D) and spot samples (scale 1:40)

events indicated rather than natural, inclined 'slumping' of sediment from the sides of the feature. Two possible episodes of stabilisation are represented:

1. Between 9.14–9.64m OD (contexts [1883], [1882], [1876], [1860]) root channels are present with thick clay coatings, possibly indicating the former presence of stagnant/foul water in the feature
2. Between 7.91–8.79m OD (contexts [1892], [1891], [1885]) root channels are present with dark and glossy humic coatings indicating the possibility of stagnant/foul water in the feature.

The pollen-stratigraphic analysis of the sedimentary sequence within the Roman quarry pit indicates a dominance of non-arboreal taxa, for example Poaceae (grass, 30%) and species of the daisy family (Asteroideae/Cardueae, 20% and Lactuceae, 16%). However, detailed interpretation of pollen assemblages preserved within the sedimentary fills of archaeological archives such as pits is constrained by our understanding of the complex taphonomic processes governing the transportation and deposition of pollen. Although it is highly likely that some of the pollen would have been naturally transported to the pit (ie by wind, water or animals), and therefore provides some indication of the contemporaneous local vegetation cover, many of the taxa will also be derived from 'dumping' of anthropic materials within the pit. The latter may include a range of waste materials associated with domestic activities, including bedding (eg straw), fodder (eg hay) and waste from cereal processing (eg threshing and winnowing). These activities may account for the high proportion of non-arboreal pollen in the assemblage in feature [1880], in particular those taxa representing grassland (eg meadow and pasture), and crops and weeds of cultivated ground (eg cereals, plantain). Alternatively, these taxa, along with others recorded by the pollen analysis, may simply represent the main plant communities at the site. These include:

1. Aquatic plants indicating the presence of open water within the pit fill (eg *Potamogeton* – pondweed)
2. Damp woodland indicated by the presence of alder, willow and polypody ferns (*Polypodium vulgare*)
3. Open mixed deciduous – coniferous woodland indicated by the presence of pine, oak, yew and ash (*Fraxinus excelsior*)
4. Grassland
5. Cultivated ground

The plant macrofossil analysis of pit [1880] (Table 9) broadly supports the above interpretation (*see* below). However, many of the taphonomic problems associated with the pollen analysis of pit fills also apply to plant macrofossils. The seeds may be derived from both natural and cultural sources, and because these features often remain open for a prolonged period of time several depositional 'events' may be superimposed within one archaeological context. Furthermore, the edges of these features are continually being eroded, causing chronologically older plant remains to be 're-deposited' within younger fill, including remains that may have once formed part of the archaeological fill of the feature but were removed and 'dumped' during routine maintenance. Therefore, elucidating the taphonomic processes that have led to the formation of the 'death' assemblage is of considerable importance before an accurate interpretation of the sub-fossil data can be obtained.

In pit [1880], only the primary fill (context [1892]) produced an assemblage with a significant quantity of material. Species that are typical of damp habitats were frequent, with creeping buttercup (*Ranunculus repens*), celery-leaved buttercup (*R. sceleratus*) and blinks (*Montia alba*). Frequent seeds of common nettle (*Urtica dioica*) and common chickweed (*Stellaria media*) indicate nutrient-rich ground and/or cultivated land. Fat hen (*Chenopodium album*) and orache (*Atriplex* sp.) also colonise arable land. Occasional mineralised fragments of straw were also present. The tertiary fill (context [1885]) produced occasional seeds of celery-leaved buttercup, common nettle, and damp-habitat species of sedge (*Carex* sp.). Occasional seeds of blackberry (*Rubus fructicosus*), whitebeam (*Sorbus* sp.) and small balsam (*Impatiens parviflora*) were present, which can be found in woodland, hedgerows and near cultivated land. Mineralised straw fragments were also present. Layer [1876] presented just two waterlogged seeds of celery-leaved buttercup, a seed of hedge woundwort (*Stachys sylvatica*) and occasional fragments of mineralised straw. Unfortunately, plant macrofossils were not present in the remaining contexts from pit [1880].

Discussion

During the early Roman period, the site was located within an area prone to intermittent flooding from a nearby river and possibly also from tributary channels (eg cut [806]). The location of these channels is difficult to ascertain, although according to Lambert (1921) two main channels running north to south may have followed the line of present-day Finsbury Pavement and Blomfield Street. It seems possible, therefore, that feature [806] represents either a tributary of the western channel surmised by Lambert, or a new, previously unrecorded channel. The floodplain consisted of wet ground with a body, or possibly bodies, of standing water supporting aquatic and marginal aquatic vegetation, as well as isolated woodland and shrubland composed of alder, willow and possibly birch, pine, oak and ivy. In this largely treeless landscape, the ground surface consisted of grassland and waste ground, with some evidence for agricultural activities. This reconstruction is entirely consistent with the regional model proposed for the later prehistoric vegetation history of east and southeast England (Fowler 2002). During this period, only vestiges of 'wildwood' forest remained due to widespread clearance of the natural ecosystems and the creation of culturally managed ecosystems, namely pasture, meadow and cultivated land. On the present site,

this mosaic of vegetation communities is represented, although due to its proximity to the river channels and the evidence for flooding, it seems likely that land-use practices would have mainly involved animal husbandry, and the exploitation of pasture and possibly meadowland.

The plant macrofossil and pollen records from the Roman quarry pit (feature [1880]) indicate the presence of grassland and possibly cultivated ground, as well as damp woodland and open mixed deciduous – coniferous woodland consisting of pine, oak, yew and ash. Although the environmental archaeological evidence is limited to one feature, the data are consistent with the general model advocated for lowland areas of Britain during this period (Fowler 2002). The model suggests that by the beginning of the Roman period agricultural activities had developed a more complex economic structure, perhaps out of necessity to support population levels in excess of 2 million in Britain. Therefore, the landscape of Britain became a mosaic of farmland and isolated woodland, with food produced on a steadily increasing scale. Those communities living in proto-urban areas, such as Moor House, may well have been involved in trading ('buying' and 'selling') food products as part of the economic growth of the City rather than food production. Alternatively, due to the demands for increased food production, marginal agricultural areas like those that Moor House may have been drained and the land used, at least in part, for arable cultivation.

Chapter 4 Discussion of the Roman Activity

Dating of Roman activity and indeed the consigning of features and deposits to different phases of activity was often difficult to determine with certainty because of the problems caused by the flooding of the landscape, the washing in of finds from such events and the eroding of the banks of the stream channels. The majority of finds from the Roman phases were dated to the first half of the 2nd century AD as were the large quantity of residual Roman finds from within the medieval phases. The features and deposits on site were divided into the different phases of activity by their relationship to three distinct layers which covered the excavation area; a brickearth layer, a light grey silty clay deposit and a reddish brown organic deposit interpreted as the marsh. However, often the exact relationships between cuts and these layers were difficult to determine. The brickearth showed evidence of having been washed in and mixed on more than one occasion. The grey deposit showed obvious signs of disturbance by bioturbation caused by trampling and root action from the plants growing within the marsh. It was also often very difficult to define precisely the edges of features cut through the marsh as the marsh deposit and the waterlain fills of cut features were very similar if not identical. Additionally many features were filled with apparently entirely residual finds mostly of early 2nd century AD date. Often only very few sherds of pottery dated whole phases of activity. However, it was possible to determine the general sequence of activity.

The evidence from the site at Moor House is that in the early Roman period, even before the flooding of the Walbrook and the formation of the marsh after the construction of the City wall, this area was wet and subject to periods of flooding. The earliest activity on site was associated with the many streams which meandered acrosss the site forming to the south one of the tributaries of the western branch of the Walbrook. A handful of struck flints may hint at activity in the area from the Neolithic period. There is also tentative evidence of Late Iron Age and early 1st-century AD activity in the vicinity of one of the stream channels from the few sherds of pottery recovered within it.

This area on the western side of the upper Walbrook valley was outside the main focus of the Roman settlement, which during the 1st century AD was clustered around the bridgehead and the main east–west road perpendicular to it. Indeed throughout the Roman period it appears to have been outside the defined bounds of the City. The first apparent human activity on site was large scale quarrying, which appears to have involved the stripping of much of the entire area of its covering of brickearth. Gravel quarrying was also taking place at this time, and showed evidence of organised activity with a series of north–south aligned pits along the eastern part of the site. This activity was dated to the first half of the 2nd century AD and was a time of expansion of the Roman settlement outwards, with the construction of Cripplegate fort (Howe & Lakin 2004) and a programme of reclamation of the upper Walbrook valley to the southeast with the construction of at least two north–south aligned roads with buildings linked by alleys lining them (Maloney with de Moulins 1990). Such a reclamation and building programme would have required large resources of both brickearth, for use as dumped material to raise the ground and for clay and timber buildings, and gravel for the construction of the roads. Areas of previously marginal land outside the rapidly expanding settlement would have provided these materials. Some of the small channels and ditches excavated at this time may have been short term attempts to drain the area whilst the site was being quarried.

The alignment of the gravel quarry pits suggests that they were supplying material for a north–south aligned road most probably to the east. However, the quarry pits were some considerable distance, *c.* 100m to the west, from the most westerly road known in the Walbrook valley, which was projected to run north from the major junction found at No. 1 Poultry (Burch *et al* 1997, 129–130 & fn. 30) and continue onto 12–18 Moorgate (Greenwood *et al* 1997, 36; Maloney & Gostick 1998, 81; AOC 2002, 43) and 15–35 Copthall Avenue (Maloney with de Moulins 1990, 45, fig. 68) and then onwards out of the City. It may be that this was one of the nearest available resources at this time for that road with possible sites either inaccessible because of tributaries of the Walbrook, or else because the resource had previously been utilised. The area of Moor House may have been one of the drier areas on the western side of the Walbrook valley that was still available for exploitation. However, it is also possible that the gravel extraction may have been for an as yet undiscovered north–south road just to the east of the site, possibly occupying much the same location as the later medieval road running north from Moorgate.

THE LOCAL ENVIRONMENT

Environmental evidence from the fills of the quarry pits suggests that even in the first half of the 2nd century AD, the area was wet and subject to periodic flooding as the pits

may have been left at least partially open for some time and were filled with stagnant water on at least two occasions. The area was apparently a rather mixed one of grassland with possible cultivated land as well as damp woodland and open mixed deciduous-coniferous woodland consisting of pine, oak, yew and ash. The washing in of a covering of 'dirty' brickearth which contained fragments of animal bone, pottery and tile, dated to just after the middle of the 2nd century AD suggests that much of the brickearth may have been stripped off in the area by that time to furnish the growing City with raw material, perhaps to construct clay and timber buildings. There was little evidence of clean natural brickearth to be found anywhere on site with the possible exception of the northwest extremity.

The pottery evidence suggests that the first half of the 2nd century AD witnessed the most activity on the site during the Roman period. This phase of activity was characterised by further limited quarrying and apparent division of the land by two ditches, one aligned northwest–southeast the other northeast–southwest. These alignments were at variance with everything else on the site, including the putative boundary ditch to the south and the stream channel to the north. This period seemed to involve deliberate shaping of the environment, with continued recutting and management of the stream channel into a large ditch fenced on its northern side at its eastern end. Clusters of stakeholes and postholes together with possible plough marks suggest that the area was being used for agriculture with small structures to the north represented by a possible clay and timber building, pitting and stakeholes at the centre and towards the southeast by a fenceline and gravel occupation surfaces. To the south of the site, within the area later enclosed by the City walls, evidence for the management of tributaries of the Walbrook and drainage of the land during this period was revealed at 55–61 Moorgate both in 1929 and 1987 and at 80 Coleman Street (Schofield with Maloney 1998, 72, 245, 252–253). This may suggest that the pressure of growing population led to marginal areas such as the waterlogged areas in the upper Walbrook valley being drained and put into cultivation to feed the inhabitants of the City.

BOUNDARIES

The evidence from Dukes Place (Maloney 1983, 97) and Aldersgate (Butler 2001, 45–46) among other sites suggests that, by the beginning of the 2nd century, the City limits were defined by a large ditch at least 6m wide and 1.5m deep, generally on the same line as the later City walls. There is perhaps some evidence that the truncated east–west gully/ditch found in the southern extremity of the site beneath the medieval City ditch may represent such a feature. Although the ditch was some 20m to the north of the later City wall it is possible that the original boundary or *pomerium* of the City may have lain further to the north and that perhaps the low-lying and waterlogged nature of the ground was unsuitable for the construction of the City wall over the earlier ditch. Evidence suggestive of the wall being built on unsuitable foundations was revealed in 1920, at 122 London Wall on the east side of Coleman Street where part of the face was found to have fallen away and been repaired in Roman times by a battering plinth resting on a foundation laid in front of the original face of the wall (Lambert 1921, 73–75; RCHM 1928, 90; Merrifield 1965, 308).

However, the boundary ditch may have been further to the north than the wall because of the way it adjoined Cripplegate fort to the west. Whereas the City wall joined and indeed reused the northern wall of the fort, the boundary ditch may not have joined with the masonry walls of the fort itself but may have joined the network of ditches that protected the fort. There is tentative evidence from Aldersgate Street that the fort was protected by at least two ditches (Butler 2001, 45) the outer edge of the second ditch being at least 11m from the outer face of the fort wall. Perhaps the early 2nd-century boundary ditch of the City joined the outer of the two ditches and this would explain its divergence from the line of the later City wall (*see* Fig. 13).

Even if this feature was not the boundary ditch itself it may have been a drainage ditch which respected its alignment. This suggests that the area occupied by the site was always outside the City limits and that only limited peripheral activity would take place in this area. This is certainly borne out by the evidence from the site. The recovered pottery suggests that most activity was taking place in the area in the first half of the 2nd century AD, a time when the population was increasing and the City was expanding rapidly. However, the main phase of activity was that of Phase 4 which consisted of features cut into the redeposited brickearth layer. Although the bulk of the pottery from this phase of activity was dated to the first half of the 2nd century AD enough pottery was recovered to date this phase of activity to the second half of the 2nd century AD. It is possible then that the area was used for the quarrying of material resources, and then as a dump in the first half of the 2nd century, and subsequently exploited for farming with animal husbandry and crop growing in the latter part of the century. This may in some ways be at odds with the suggested picture of population loss and decline in London in the late 2nd century AD (Perring 1991, 76–89). However, perhaps the activity did not involve many people as only limited evidence for structural remains and small amounts of dumped material dating to the period after the middle of the 2nd century AD were found on site.

The majority of all Roman finds on site, both those from the stratified phases and the residual finds within later medieval and post-medieval contexts, are dated to the first two centuries of the Roman period. A total of 6,921 sherds of Roman pottery were recovered, over a third of which were residual finds. The vast majority of this pottery together with the glass was dated to the early to mid 2nd century AD, suggesting this was when occupation and activity in the area was at its peak. The evidence from the Roman coins also support this, as seven of the eight coins

recovered from the site are dated to the first half of the 2nd century. The one 4th-century coin suggests casual loss during the limited activity of that period in the area. The Roman ceramic building material consisted of a standard assemblage of Roman bricks and roofing tiles with some tesserae and box flue tile fragments together with two tiles with 'procuratorial' stamps, suggesting that the debris from important buildings was being dumped outside the City walls. However, the quantities of Roman building material recovered from the site do not indicate widespread or sustained dumping in the area. Dress accessories and personal objects such as bone hairpins, a gold earring, a silver ring, a bone spatula, fittings from a box or casket, gaming pieces, a brooch and a small decorative small animal figurine were also found. While not a large assemblage for such a site, these appear to represent the casual loss of personal items during periods of rather limited occupation and activity in the area. The animal bone assemblage comprised domestic food debris, which revealed a diet predominant in beef with mutton, lamb and pork making up the other staples. These meats were supplemented by fowl and geese and occasional hunted meat such as hare, roe deer and swan. Remains of domestic or feral dogs and a fox may reflect the largely uninhabited nature of the area with animals scavenging among the discarded waste, whilst the presence of frog bones bears evidence to the wet marshy nature of the land. The presence of two Dachshund-type dogs indicates that pet dogs were being disposed of in this area of relative wasteland, as were several horse carcasses.

Very few Roman leather objects were found on site although the waterlain conditions of much of the site would have led to good preservation of the material. Small fragments of shoes, two pieces from shoemaking and three pieces of secondary waste of cowhide represent small assemblage and provide no evidence of large scale leather working on site or even of the dumping of leather waste from such centres of leather working within the City, such as have been found in the Walbrook valley at 52–63 London Wall (Lees *et al* 1989, 119). Small quantities of bone-working waste consisting of sawn distal and proximal ends of cattle metatarsal bones, the latter fashioned into points or spikes, the sawn distal end of a horse tibia and antler working waste from a hunted red deer were present on site. However, the small quantities recovered do not suggest that any large scale craft activity utilising animal bone as a raw material was either taking place in the area or being dumped in the vicinity from craft centres within the City.

THE EFFECT OF WALL CONSTRUCTION

After the construction of the City wall sometime between AD 190-225 there was a profound change of activity on the site. Around the turn of the century the area was covered by a widespread grey silty clay deposit which may have been produced by a mixture of human and animal trampling, with further bioturbation caused by the roots of plants in the later marsh above. As long ago as 1906 it was suggested that the construction of the City wall may have been a direct cause of the formation of the marsh in the upper Walbrook valley, an area later to become known as Moorfields (Reader 1906, 183–184). Although culverts have been found within the fabric of the Roman City wall (Maloney with de Moulins 1990, 123) they were obviously not sufficiently large or regularly maintained to allow the waters of the Walbrook to proceed uninterrupted to the Thames. The constant dumping of waste and other material into the main Walbrook channel downstream within the City would not have helped to maintain an even flow. Evidence from a number of sites including those to the east outside the City walls at the southeast corner of Finsbury Circus (Reader 1906) and at 4–6 Finsbury Circus (Lambert 1921, 97–98) have suggested that the area became waterlogged in the later Roman period. A contributory factor may also be the contraction of the City and the probable decline in the population from the late 2nd century AD (Perring 1991, 76–89), although it has been seen that glass and leatherworking activity continued in the upper Walbrook valley into the 3rd century (Maloney 1990). There may have been no need to maintain the drainage systems as space was not at such a premium and the need to feed the population was not so pressing.

The evidence from Moor House supports this theory; animal hoof marks (poaching) suggest that gradually the area became too wet for crops and was turned over to husbandry. By the second half of the 3rd century AD former stream channels had re-established themselves meandering across the area at the north and south of the site, although there is some evidence of an attempt to drain the land with possible recutting of these features and the excavation of a north–south cut to form a network of large drainage ditches across the site. It is probable that these may have had some effect and that the area may not always have been waterlogged as there is evidence of land division and the construction of fence lines to form field boundaries at this time. Evidence of Roman activity into the 4th century is extremely limited and is confined to the recutting of the north–south drainage ditch. However, from the placement of a human and horse skull at the base of the ditch it is possible that continued ritual deposition was occurring on the site.

One reason, however, for the lack of material on the site dating to the last two centuries of the Roman period might be the lack of access for the populace of *Londinium* into the area. Once the City wall was built it appears that there was no access out into the area of the site. Six Roman gates are known: Cripplegate, originally the north gate of the fort; four apparently contemporary with the construction of the wall consisting of Ludgate, Newgate, Bishopsgate and Aldgate, with Aldersgate built some time later. The nearest access appears to have been obtained via Cripplegate *c.* 220m to the west or Bishopsgate over 500m to the east.

However, FitzStephen writing in the 1170s described the City of London as having seven double gates. A candidate for the enigmatic seventh gate might be the west

gate of Cripplegate fort, although this had been blocked sometime possibly in the later Roman period (Grimes 1968, 32), or one in the vicinity of the Tower Postern (Merrifield 1983, 157) in the stretch of City wall demolished by Henry III when the Tower of London was extended beyond the City wall in *c.* 1238 (D. Whipp, pers comm). Another possibility is the stone gate on the southern end of London Bridge, which was suggested by Stow to be the seventh of FitzStephen's gates (Stow 1994, 71; Watson *et al* 2001, 105). However, is it possible that there was a Roman predecessor to medieval Moorgate?

The evidence suggests that a north–south aligned road ran from the junction discovered at No. 1 Poultry (Burch *et al* 1997) up the western side of the Walbrook valley and possibly continued outside the City where evidence of a road was found at 7–11 Finsbury Circus (Schofield with Maloney 1998, 257). Evidence from the present site might even suggest that there was a road to the west of that. Metalled surfaces have previously been found to the south at 49–53 and 55–61 Moorgate (Schofield with Maloney 1998, 231, 252–253). It is probable that accommodation was made for one of the north–south aligned roads when the wall was constructed by the provision of a gate. If the area to the north of the walls did not become flooded until after the construction of the defences themselves there would have been a need to maintain access to the area, even though it may all too soon have become redundant because of the flooding of the area and the formation of the marsh. Although it may not have carried the traffic to require a major double gate, it has been suggested that it, together with Aldermanbury to the west, might have been provided with a postern gate (Perring 1991, 94). Indeed there are indications that medieval Moorgate itself was rebuilt in the 15th century on the site of or near an earlier postern (Riley 1869, 614). However, any Roman postern gate built to maintain access for the western of the two roads proceeding north through the Walbrook valley would have been at some distance, *c.* 40m to the east, from Moorgate rebuilt in the 15th century. In 1882 an excavation on the junction of Moorgate lane and London Wall uncovered 'a mass of the well-known salmon-coloured concrete, formed of pounded red brick, evidently from some other building, was built up in the wall as old material', which was suggested to be part of a Roman bastion (Loftus Brock 1882, 424; VCH 1909, 61; Lambert 1921, 74). This was considered by Wheeler to be another example of repair of the Roman City wall caused by collapse as revealed just to the west (RCHM 1928, 89). However, perhaps the masonry represented was part of a Roman postern on the same site of the later medieval and post-medieval Moorgate. If so it suggests that a north–south aligned Roman road would have passed just to the east of the site at Moor House, which would help to account for the gravel quarrying.

The possibility of a Roman postern gate might explain the attempts to maintain a system of drainage in the last two centuries of the Roman period and some evidence of land division in the area of the site as ready access could be maintained through this gate.

HUMAN REMAINS

A quantity of human bone was recovered from across the site and from all phases of activity. The deposition of human remains on the site occurred in a number of different features and phases: four pieces were retrieved from a quarry pit and a stream channel in Phase 2, six pieces from a brickearth deposit in Phase 3, four fragments from the marsh (Phase 8) and two fragments from post-medieval deposits in Phase 10. However, the vast majority were retrieved from Phase 4 2nd-century ditch deposits and a possible grave (29 pieces), a 3rd-century overall grey deposit (28 pieces) and medieval ditches and pitting (25 pieces). The dispersal of the human remains across such a number of phases of activity either suggests that the deposition of bone was occurring over a long period of time or more likely that a significant disturbance of the archaeological deposits was taking place on the site. However, in the Roman period there were concentrations in Phases 4 and 5, apparently representing the period *c.* AD 160–220/250.

The disarticulated remains derived from a minimum of fourteen individuals but may represent the remains of many more. The assemblage exhibited some interesting characteristics. All the bones were of adult size and were from both male and female individuals. From a total assemblage of 107 pieces, thirteen were skull fragments and four were mandibles, but the vast majority, 86, were long bones, consisting of 27 femurs, 20 tibias, eight fibulas, 22 humeri, seven ulnae and two radii. One fragment of pelvis and three ribs made up the rest of the assemblage. Where identification was possible there was a slight preponderance of long bones from the left hand side of the body, 42 as compared to 37 from the right.

Many of the long bone shafts exhibited signs of animal gnawing and several of the bones had abraded cortical bone and displayed post-mortem scratch marks. In these examples only the shaft remained and both proximal and distal epiphyseal ends were missing, presumed destroyed by dog gnawing/crunching. It is well documented that the cancellous ends of long-bones are generally the first regions to be gnawed by carnivores (including dogs). Even in those specimens where dog tooth marks appeared to be absent, the pattern of breakage/splintering of the ends of the shafts was consistent with that observed in modern comparative bones known to have been gnawed/crunched by carnivores. All the bones were stained brown and among the selected specimens, three exhibited silt/sand tubules on the surface of the bone. These small 'worm-like' tubular structures were probably made by the larvae of *Chironomid* flies (midges) and are evidence that the bones had lain for some time in silt or mud beneath flowing water. Four bones exhibited signs of post-mortem cuts probably made by a cleaver or axe and a very sharp blade.

The spread of the bones throughout the different phases suggests that a great deal of reworking of the deposits was occurring on site. Radiocarbon dating of three samples from two Roman phases (Phases 2 & 5) and one medieval phase (Phase 9) suggested all were from the Roman period

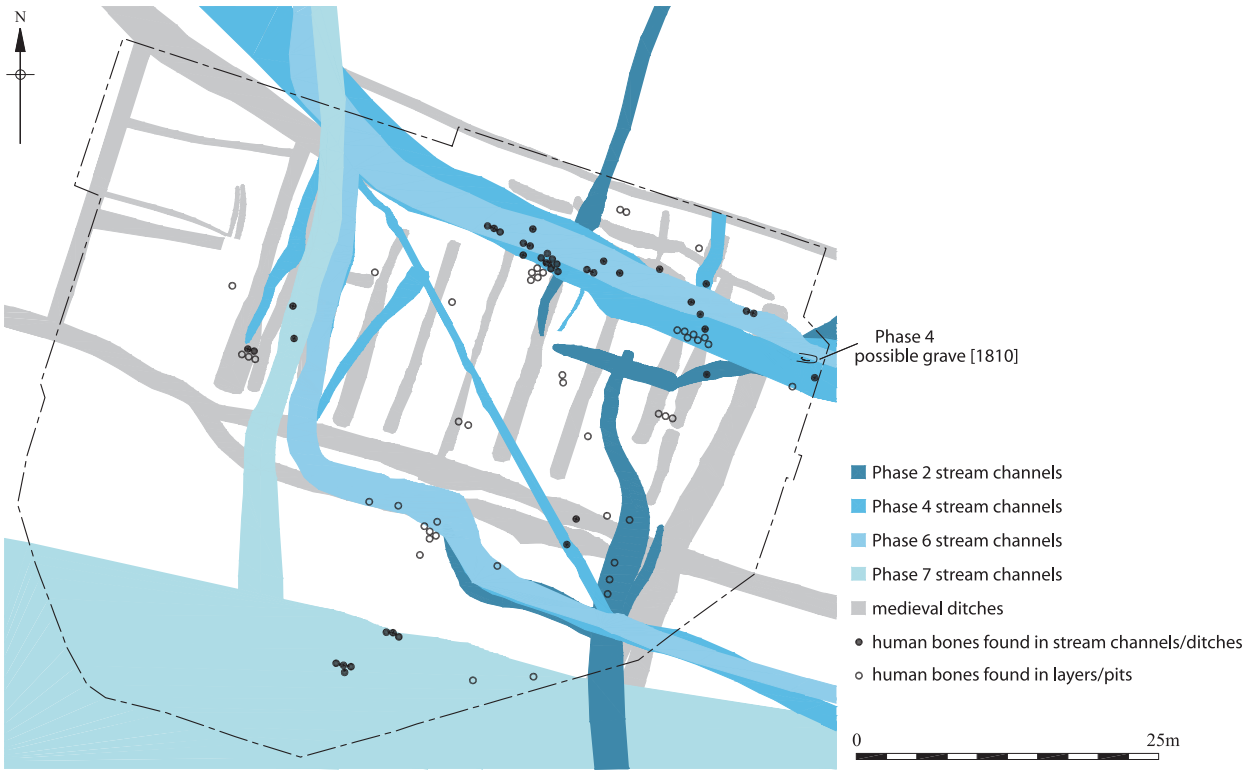


Fig. 29 Recovered human remains in relation to Roman and medieval stream channels and ditches (scale 1:625)

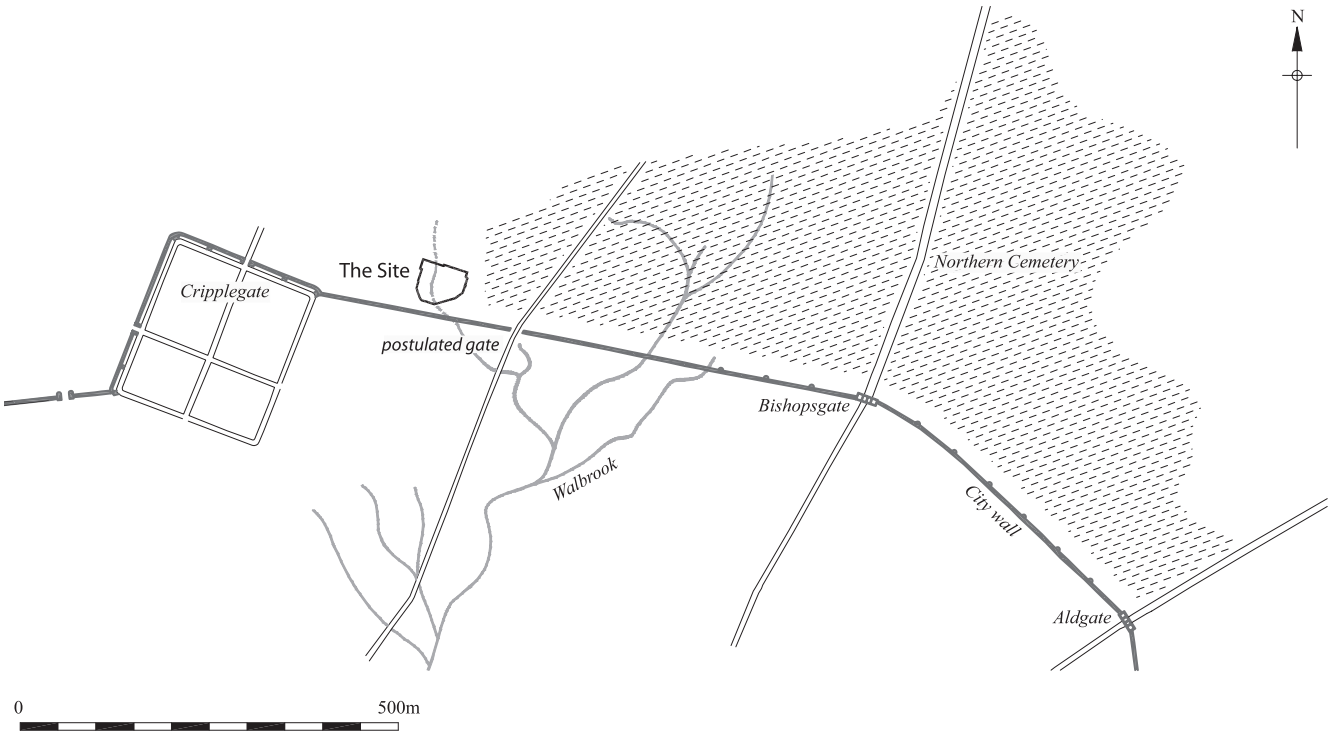


Fig. 30 The site in relation to the currently established extents of the Roman northern cemetery (scale 1:10,000)

with calibrated dates of AD 75–385, AD 45–250 and AD 135–425[1]. Although the bones were recovered from across the site there were concentrations found in the vicinity of or within stream channels or ditches and especially from within the large east–west aligned channel which ran across the northern part of the site (Fig. 29). This might suggest that part of a Roman cemetery had been washed into the area of the site.

The site is just outside the known margins of the Roman northern cemetery, *c.* 150m to the east (Fig. 30). Burials have been uncovered to the east at River Plate House, 7–11 Finsbury Circus, Blomfield Street, Eldon Street and Broad Street (Hall 1996, 65) and at 12–15 Finsbury Circus where, together with inhumations and cremations, disarticulated human bone of probable Roman date was found at the base of a later channel (Schofield with Maloney 1998, 267–268). A coffin containing the skeleton of a child and grave goods was found in Moorfields itself but the exact find spot was not recorded (RCHM 1928, 161). To the north of the site a cremation was found at a great depth at Moorgate station in 1902 (RCHM 1928, 161) and an inhumation and a quantity of disarticulated human bone was revealed at an excavation at Moorgate Hall, 143–171 Moorgate, in 1988 (Schofield with Maloney 1998, 276). The bones were associated with an imported Italian bronze mirror suggesting a disturbed high status burial. It is, therefore, possible that the human remains at Moor House represent disturbed burials from the northern cemetery. The disarticulated bones from Moorgate Hall may well be from this source. However, it also appears that the stream, from which many of the bones were recovered, flowed from the west to the east down towards the centre of the Walbrook valley and that any disturbed cemetery would, therefore, have had to be located to the northwest of the site. No evidence of burials in that area has been revealed to date.

Despite the lack of evidence for a cemetery to the northwest it is still possible that the remains may be those of disturbed burials; but when were these burials interred? The earliest human bones were recovered from the backfill of a large quarry pit and a possible stream channel dated to the first half of the 2nd century. This suggests that inhumations must have been present on the site from as early as the 1st century AD and that later quarrying in the early 2nd century had disturbed them. This is a very early date as cremation was the preferred burial rite in the first two centuries AD with inhumation gradually taking over between the mid 2nd century and mid 3rd century (Philpott 1991, 223). However, inhumations are known from as early as the 1st century AD from the eastern cemetery (Barber & Bowsher 2000, 299), from Southwark (Dean & Hammerson 1980, 17) and from the 1st and 2nd centuries in the western cemetery, within the City walls (Shepherd 1988, 11) and from *c.* 100 AD from the northern cemetery (Hall 1996, 66).

It is possible that an early inhumation cemetery was washed away by the flooded tributaries of the Walbrook, which deposited lighter material further down towards the main stream. Indeed, a recent excavation in the upper Walbrook valley at 6 Broad Street Place uncovered inhumations often placed in coffins buried on the edge of tributaries of the Walbrook that exhibited signs of being partially washed away (Harward 2004). At Moor House one possible highly disturbed burial was found to the east of the site and the presence of tazzae and glass vessel fragments amongst the Roman assemblages from the site might represent the scattered remains of grave goods.

Although it has been shown that the bones of the human body have varying survival rates and those which normally fare best are the dense relatively heavy bones such as the vertebrae, the sciatic notch of the pelvis, parts of the skull and long bones (Waldron 1986, 114; 1987, 62), the make-up of the assemblage from Moor House does not seem to match this in all areas, in that no vertebrae were recovered. It appears that there has been some deliberate selection of bones and that their survival is not the product of the vagaries of disturbance caused by quarrying or the action of streams.

However, one might expect at least some of the other parts of the human skeleton to be deposited in the area. Studies on the movement of human skeletal parts within a water current have shown that 'rounded, higher, poorly braced and less dense parts' travel the furthest whilst 'flat, low, well braced and dense skeletal parts' move little. Thus complete skulls, vertebrae, parts of the pelvis and some long bones such as the proximal humerus and proximal ulna were found to move the furthest whilst broken crania, ribs, femoral heads and distal humeri hardly moved (Boaz & Behrensmeyer 1976, 53–60). This might explain why a quantity of human skulls have been found within the length of the Walbrook but not why the human parts found at Moor House are made up almost completely of long bones and broken cranial pieces. If they were merely disturbed inhumations one would expect a more varied assemblage of body parts.

An alternative scenario may be proposed and the very presence of the streams on the site may hold the answer. Human skulls have been recovered from both the Walbrook and the Thames in large quantities (Marsh & West 1981, 86–102; Bradley & Gordon 1988, 503–509; Cotton 1996, 87–89). Although it has been suggested that they may be the result of drownings and suicides (Knüsel & Carr 1995, 162–169) or the result of the Boudiccan massacre (RCHM 1928, 16), there is an argument that they are part of a ritual deposition into the river after exposure has decomposed the flesh (Marsh & West 1981, 94; West 1996, 189–190). Sample skulls from the two rivers were carbon dated, which suggested that those from the Walbrook were dated to the Late Iron Age or Roman periods while those from the Thames were dated mainly to the Middle/Late Bronze Age.

1. The measured radiocarbon ages were Beta – 182673: 1720 +/-60 BP, Beta – 182674: 1810 +/-50 BP and Beta – 182675: 1650+/- 60 BP which when calibrated produced dates of AD 75-385, AD 45-250 and AD 135 to 425 obtained as 2 Sigma calibrated results representing a 95% probability and dates of AD 130-260, AD 80-225 and AD 235-390 as 1 Sigma calibrated results which represented a 68% probability (Beta Analytic Inc., Miami, Florida).

Excavations at 60 London Wall in 1988 recovered 20–30 skulls from stream deposits (Schofield with Maloney 1998, 273) securely dated to the Roman period. The 'cult of the head' among the Celts is well attested, as is the worship of all features filled with water especially springs, pools and rivers. The deposition of skulls within such features has been observed at Carrawburgh, Heywood in Wiltshire and Wookey Hole in Somerset and the ritual association of severed heads and water persisted in the traditions of Gaelic-speaking Scotland (Ross 1967, 140–149).

Ritual deposition of human remains in non-funerary contexts was prevalent prior to the Roman period. On Late Bronze Age sites single or fragmentary bones, especially skulls and long bones, are often found on settlement sites and especially in rivers, lakes and bogs, where the human remains are frequently associated with votive depositions of metalwork (Brück 1995, 249–250). It seems likely that after exposure of the dead, skulls and long bones were deliberately selected for deposition in certain places, especially those associated with liminality, such as tribal boundaries, enclosure ditches or the butt ends of ditches. It has been suggested that deposition in wet places such as rivers also exploits the liminal character as a meeting place between this world and the next (Brück 1995, 257–260). The great mystery of the Iron Age is the apparent relative lack of funerary sites (Whimster 1977, 317), and it seems likely that a tradition of excarnation continued into this period (Cunliffe 1974, 292). Wait, in his survey of human remains found on Iron Age sites, has commented on the presence of single bones displaying no traces of dismemberment which suggests a secondary manipulation of the remains after the flesh has decayed; a predominance of skull and long bones also indicated that a selection process was at work (Wait 1985, 117). However, the secondary deposition of bones would only appear to be the fate of a minority of the population, *c.* 5%. The vast majority appear to have been exposed and vanished without trace (Wait 1985, 120). The two-part funerary ritual, exposure followed by later deposition of certain bones may suggest a two part journey for the individual, initial death followed by the final arrival of the spirit in the other world (Wait 1985, 237). At Danebury many human remains were found apparently dismembered after decomposition of the flesh had set in, with several skeletons missing heads and arms. Isolated long bones, especially those of the femur and from the right side of the body, were recorded in over 200 contexts suggesting a deliberate selection of body parts was being made (Cunliffe 1993, 103–108). At Suddern Farm, together with an early Middle Iron Age inhumation cemetery, special deposits, including partially articulated human bones, were found placed in pits. These special deposits continued until there was a marked increase in the deposition of human bones in pits in the late Iron Age/ early Roman period (Cunliffe & Poole 2000, 143–144, 201–202).

It has been suggested that the perceived great continuity between the Late Iron Age and the Roman period was the product of the old aristocracy to a large extent keeping their power and influence (Millett 1990). Roman gods became linked to native gods such as *Mars Camulus* in Gaul (Derks 1998, 242) and as recently found on an inscription from Tabard Square in Southwark (Killock & Brown 2004), or Sulis Minerva in Bath. There is evidence of a continuity of observance with Romano-British temples overlying Iron Age predecessors as at Hayling Island in Hampshire (Esmonde Cleary 1999, 168). The ritual significance of wet places such as springs, rivers and lakes prevalent in the Bronze Age and Iron Age continued into the Roman period. Roman items such as weapons and sculptures were now deposited as well (Millett 1995, 113–114). At Folly Lane in Verulamium the presence of stray limb bones across the site and in the backfill of ritual shafts has been argued as a continuation of exposure rites into the 2nd century AD for at least a minority of the population (Niblett 1999, 404). The burying of the dead within partially backfilled wells has been attested at Dunstable (Matthews & Hutchings 1972, 21–34). The incidence of human remains, many with associated animal remains, recovered from non-funerary features such as pits, ditches, shafts, wells and beneath buildings across Roman Britain has been well documented (Fulford 2001; Esmonde Cleary 2001).

Although there was no pre-Roman settlement, it is probable that much of the population of London was made up of indigenous Britons who may have continued their pre-Roman traditions. The continuance of Late Iron Age ritual practices in London has been suggested by the deposition of skulls and pointed metal objects in the Walbrook (Merrifield 1995, 27–44; Haynes 2000, 97), and by the deposition of human remains and 'killed' pots in ditches and ritual shafts at Swan Street, Southwark (Beasley *et al* forthcoming). Other possible 'ritual' items have been recovered more recently from the Walbrook at Tokenhouse Yard; these included a pipe clay cockerel, two tiny unguentaria pots possibly associated with the inhalation of hallucinogenic fumes, a miniature leather shoe sole, a sheep cremation and bent styli (Leary *et al* forthcoming). The apparent 'decapitation' inhumations, where the skulls are either missing or have been removed either before or after decomposition and placed elsewhere in the grave, are well attested from the London cemeteries (Barber & Bowsher 2000, 89–90; Mackinder 2000, 15 & 26; Watson 2003, 16) and from elsewhere in Roman Britain in Chichester (Down 1988, 63), Poundbury (Farwell & Molleson 1993, 152), Cirencester (Wells 1982, 194), Lankhills, Ilchester and Radley (Woodward 1992, 94). It is possible that in some cases skulls and other bones were being deliberately removed for secondary rituals.

The population of Roman London has been estimated at between 20,000 (Evans & Pierpoint 1986, 202) and 30,000 (Werner 1998, 12) inhabitants, which suggests a cemetery population of up to 1 million individuals (Evans & Pierpoint 1986, 202; Barber & Hall 2000, 112). It has been estimated that the Eastern Cemetery would have contained somewhere between 13,536 and 180,480 individuals (Barber & Bowsher 2000, 59). The number of burials recorded up to 1996 was only 234 cremations and 1092 inhumations (Hall 1996, 83). Even allowing for the

widespread destruction of cemetery sites by construction of buildings, especially in the 19th and 20th centuries, there does seem to be a dearth of burials. On the cemetery sites themselves certain portions of the population such as infants and women are under-represented and it has been suggested that not all elements of the population were thought worthy of formal burial (Barber & Hall 2000, 113). Indeed, across the country, the lack of burials in proportion to the estimated population size has been noted. The relative absence of burials from rural areas, which probably accounted for over 90% of the population in Roman Britain is especially noteworthy (Millett 1995, 125). The fact that the human bones from Moor House exhibited signs of abrasion and animal gnawing suggest that they spent at least some of the time exposed on the ground. Perhaps the Bronze Age and Iron Age traditions of exposure were being continued into the Roman period. Skulls and limb bones have been recorded on other London sites at Regis House, the amphitheatre (Barber & Hall 2000, 113), at 145–6 Leadenhall Street, the Old Bailey site and Crosswall (Cotton 1996, 89) and of course from the Walbrook and the importance of these disarticulated remains has been stressed (Barber & Hall 2000, 113). To the north of the site at 143–171 Moorgate amongst the disarticulated human remains were found fragments of primarily skull bone within a redeposited brickearth deposit (Shotliff 1990, 19) and to the east at 12–15 Finsbury Circus disarticulated human bone was found at the bottom of a channel (Schofield with Maloney 1998, 268). However, at both these sites inhumations were also found which might suggest that these were the remains of burials that had been washed away by water action as at 6 Broad Street Place (Harward 2004). Yet the very act of burying these bodies on the very edge of the streams, and almost within them at 6 Broad Street Place, might be not only due to the limited space available but also with the deliberate intention of allowing the bones to wash away into the Walbrook. A recent excavation on the eastern edge of the Fleet Valley at Caroone House also found human bone within a channel of the River Fleet (A. Haslam, pers comm). The ritual deposition of certain body parts such as the skulls and long bones would account for the presence of the bones at Moor House. Whether these remains are being recovered from exposed bodies outside the settlement or are being removed from interred burials once decomposition has taken place is unknown but may be a mixture of the two. The presence of knife marks on some of the Moor House bones suggest that in some cases there was still flesh adhering to the bones, which had to be removed. A continuing tradition of exposure would explain the apparent lack of burials and the under-representation of certain elements of the population.

The tributaries and streamlets of the upper Walbrook may well have held a particular sacred connotation with some Roman Londoners (Merrifield 1987, 26–28) and the secondary placement or burial of certain bones may have been part of a final ritual marking the journey or arrival of the spirits of the dead to the other world, with the streams representing that journey to the other side. This would continue the prehistoric tradition of the importance of wet places, maintained into the Roman period with the leaving of a coin on the body to pay Charon to carry the dead across the river Styx. Indeed the placement of burials deliberately along the banks of streams as observed at Broad Street Place may represent a similar religious aspect represented by the water with the burials being placed with the express intention of the bodies being washed down the stream. It has also been suggested that the Walbrook may have been regarded as a symbolic boundary within the City (Millett 1994, 430, 433) and the votive objects found within it may be the expression of affirming that boundary between communities.

Human bone was associated with activity dating from the beginning of the 2nd century AD, suggesting that limited deposition was taking place at that time. However, it appears that the deposition of the greatest number was taking place in the second half of the 2nd century AD and into the stream channel/ditch at the north of the site and then immediately afterwards in the early 3rd century as part of the overall grey layer. The vast majority of the human bone from the grey deposit, 19 out of 28 fragments, was recovered from the northern part of the site in the same general vicinity as the large east–west aligned channel/ditch. It could suggest that the primary deposition of the human bone was into the stream/ditch or the backfill of it and that these bone elements had then been dispersed across the site when the feature flooded its banks and produced the grey deposit. Another possibility is that the fast flowing stream could have disturbed human bones outside the site possibly to the west and transported them into the site. The human bones from the medieval ditches and pits could represent the disturbance of the Roman material below by the digging of ditches and pits through those underlying deposits, as suggested by the Roman C14 date for the sampled bone from that phase of activity.

The Roman glass assemblage, which was exclusively dated to the first two centuries AD, exhibits certain interesting characteristics. Whilst it is a small assemblage, consisting of 63 fragments, it was dominated by containers and flasks which would normally suggest the waste from specialised use such as a bath house (*see* Cool, this volume, Chapter 3). It is possible that they represent the remains of disturbed grave goods, however the fragments are large and there is no evidence of burning as would be expected as some of the flasks were usually thrown on the funeral pyre. It may be that the fragments of glass represent part of the ritual involved in the deposition of the human remains into the streams. Perhaps the contents of the flasks were also offered to the gods at the same time as the bones were deposited and then the flasks were deliberately broken as well.

Other evidence of possible ritual activity on site was represented by the deposition of animal bone, in particular from horses. The horse bone represented between 2.9% and 7.7% of the bone from Roman phases of activity compared to the rest of the animal bone assemblage. However, the proportion of horse bone rose to 27.7% for the first phase of activity on site represented by quarrying and stream channels and hit a peak of 48.6% in the last phase of Roman

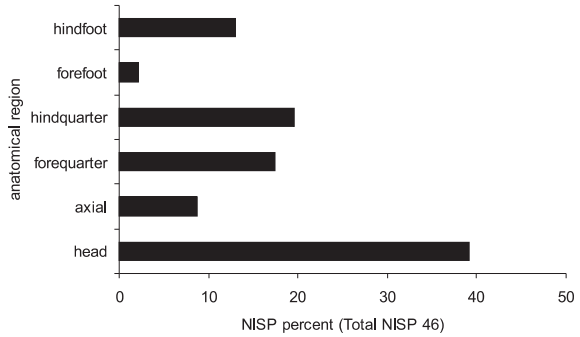


Fig. 31 Horse bones, from Phases 2–7, associated with human bones

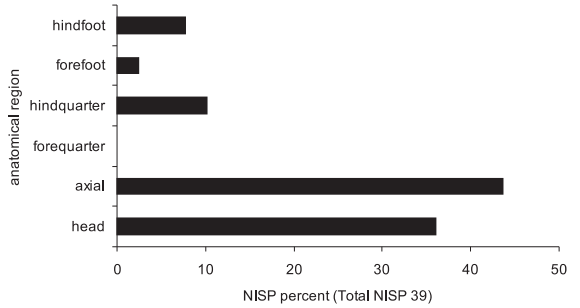


Fig. 32 Horse bones, from Phases 2–7, not associated with human bones

activity when fourteen parts of one skull were recovered amongst an admittedly small assemblage of animal bone. This might suggest that horse carcasses were being disposed of in an area of relative wasteland. However, why was so much more disposed of than other animals? Horse bone was found in a total of 22 different deposits with human bone in the Roman period and 31 in all periods. Generally amongst the horse bone found within the same features or deposits as human bone there was a preponderance of elements from the head making up nearly 40% of the total. This might suggest a degree of deliberate deposition of human bones and horse bones, particularly the head. The large amount of horse bone on cemetery sites compared to typical animal bone assemblages from the Roman settlement has been noted in Roman London (Barber & Bowsher 2000, 79; Rielly 2000, 64–65; Watson 2003, 36; Maloney & Holroyd 2005, 3). It has been suggested that the areas had been utilised to dump horse carcasses outside the City limits either before those areas were used to bury the dead or in periods of disuse of the cemeteries (Barber & Bowsher 2000, 79). Horses may have been disposed of in a different way to other large mammals as they often carried on living through to old age and were rarely eaten or dismembered. This may explain some of the horse bone recovered from Moor House as it would be an ideal area outside the settlement and the later City walls to dispose of unpleasant smelling animal carcasses. However, certain of the bones may have been placed deliberately in selected locations such as ditches. A human skull together with part of the skeleton of a horse was found in the gravel 0.60m from the plinth of the Roman City wall at 122 London Wall (Lambert 1921, 75). The apparent ritual placement of both horse and dog skeletons has been well attested. In the Eastern Cemetery, a large rectangular pit contained the carefully arranged skeletons of an adult horse, a dog and a juvenile red deer, and a ditch fill produced the remains of at least two disarticulated horses and 4–5 cattle skulls (Barber & Bowsher 200, 19). In Southwark the fill of a roadside ditch contained a quantity of horse bones although this was linked to the disposal of horse carcasses (Rielly 2000, 64–65). In Dunstable both human inhumations and horse burials were found together in the enclosure ditches of a Roman cemetery (Matthews 1981, 3). The continuity in belief was also attested in Roman Gaul where cremations in the Roman fashion were found alongside non-Roman inhumations and horse burials (Carroll 2001, 127). The deposition of selected animal parts, including that of a partially dismembered horse and dog, and other instances of skulls and articulated limbs of horses within former grain storage pits has been documented from a number of Iron Age sites (Hill 1995, 13–14, 54) especially at Danebury (Cunliffe 1993, 100–103).The horse bones together with other animal skulls placed in ditches could be part of that same ritual tradition of marking important features, in this case field and boundary ditches.

The human bone assemblage from Moor House may, therefore, be evidence of the continuance of Iron Age traditions and ritual well into the Roman period. The make-up of the human bone assemblage, consisting almost entirely of skull parts and long bones, suggests more than just taphonomic survival of these elements. There appears to have been a deliberate selection of these particular human bones for placement within this particular area outside the City walls. The prevalence of horse bones, particularly skulls, may merely represent the dumping of smelly carcasses outside the City limits. However, it is possible that they were deliberately chosen and deposited as part of the same rituals. There is a long tradition from the Bronze Age and Iron Age of the ritual placement of human bones and other objects in sacred water places such as wells, ditches, lakes and rivers. Perhaps the presence of the human bone on site within and near the stream channel, together with the frequent finds of whole human skulls from the main channels of the Walbrook, represents a continuance of such a tradition. It has long been observed that the Roman cemeteries discovered to date in London and especially across rural Britain do not have anywhere near enough burials within them to cater for the estimated population of Roman Britain. Perhaps a large proportion were still practising excarnation in the countryside and then depositing selected bones in sacred waters to speed their relatives' journey to the afterlife. The gnawing of many of the bones from Moor House suggest that many of the bodies had been exposed at some time and it is possible that this Iron Age tradition was carried on well into the Roman period in *Londinium*. The presence of tubules on the bones made by the larvae of midges suggest that the

bones had lain in mud or silt beneath flowing water and that they may have been deliberately put into such bodies of water. The practice of removing skulls and other bones, generally arm or leg, from graves may be a half-way house, a nod to both Roman and Celtic traditions. The fact that some burials were made on the very edge if not almost within the streams of the Walbrook (Harward 2004) may even suggest that they were located there with the intention of being washed down stream, perhaps to avoid the unpleasant task of choosing bones from those left to rot in the open or the dismembering of inhumations. It therefore appears that although the site at Moor House may have been outside the main settlement it was an area which many of the inhabitants visited for special rituals and was thus an important part of the Roman settlement.

Chapter 5 The Medieval and Post-Medieval Archaeological Sequence

LONDON AND THE MOOR IN THE SAXON PERIOD

Londinium was largely abandoned at the end of the Roman period, with the Anglo-Saxons preferring to live in the Strand/Covent Garden area in a new settlement named *Lundenwic* where trade could be carried out from boats drawn up on the foreshore of the Thames along the Strand. A number of excavations in that area since the 1980s have provided growing evidence of the layout of the settlement and the crafts and lifestyle that were practised within it (eg Cowie *et al* 1988; Whytehead *et al* 1989; Malcolm *et al* 2003; Leary *et al* 2004; Butler 2005). There is some evidence that a religious centre grew up in the area of St. Paul's in the old Roman City where king Ethelbert built a church for Mellitus, Bishop of London in AD 604 (Sherley-Price 1979, 104) and the occasional fragment of Middle Saxon pottery has been discovered in the general area. However, there is very little evidence of Saxon activity in Moorfields with the only Saxon finds in the vicinity being a supposed Saxon spur from 'Moorfields' (SMR 080134) and a residual sherd of chaff-tempered pot from Finsbury Island (Malcolm 1993).

In response to Viking raids on London in 841, 851 and 871 it appears that by *c.* 890 the Saxons had to a large extent moved from *Lundenwic* on the Strand back within the former Roman walled City (Vince 1990, 20). The Anglo-Saxon Chronicle for 886 states that:

> … the same year King Alfred occupied London and all the English, those of them that were free from the Danish bondage, turned to him, and he then entrusted the burgh (fortified place) to the keeping of the ealdorman Ethelred.
>
> (Garmonsway 1954)

It is more than likely that the City defences would have been repaired and the ditches maintained. The fact that the defences were probably in good order is suggested by the success of London in being able to hold off Danish attacks in 994, 1009 and 1013. Evidence for a late Saxon City ditch have been found at 1–6 Aldersgate Street (Butler 2001, 52) and at Cripplegate (Milne 2001, 10).

During the period from the end of the Roman occupation in the early 5th century until the Norman Conquest in 1066 the marsh continued to form in the upper Walbrook valley and there is no evidence of attempts to utilise the area. The earliest medieval pottery recovered from the site was a single sherd of early medieval sandy ware dated to 970–1100.

THE DEVELOPMENT OF MOORFIELDS: THE HISTORICAL BACKGROUND

By Jeremy Haslam & Jonathan Butler

The site of Moor House lies just within the extra-mural parish of St. Giles Cripplegate near its boundary with the extra-mural part of St. Stephen's parish to the east (Fig. 33). The general development of occupation and land use, and the layout of streets, lanes and houses, can largely be reconstructed from map evidence from the mid 16th century onwards, and inferred from street names, and other topographical and documentary evidence, from the 11th century.

The earliest documentary evidence relating to the area is the grant by William I in 1068 of part of his soke outside the walls of the City of London to the College of St. Martin le Grand (Stow 1994, 43; Stephenson 1896), which had been founded *c.* 1065 as a College of Secular Canons (Lobel 1989, Gazetteer; VCH 1909; Honeybourne 1932–3; Davis 1972). The boundaries of this soke, which included the wards of Aldersgate and Cripplegate, are described as stretching from Walbrook in the east to an uncertain line in the west, which may be represented by the Fleet River. It has been suggested that the western boundary lay approximately on a line with the western edge of Aldersgate ward (Page 1923, 144). The soke certainly included Aldersgate ward, since its extra-mural part comprises the parish of St. Botolph's Aldersgate, which the Canons of St. Martin le Grand held in 1139 (Davis 1972, 14). There is every reason to believe that it extended northwards as far as the northern boundary of the parish of St. Giles Cripplegate, which extends beyond the City boundary to the north of Old Street. It has been suggested that this soke goes back to the early 7th century (Page 1923, 129–130).

The church of St. Giles, immediately outside Cripplegate, was founded in 1102–15 (Lobel 1989, Gazetteer; Schofield 1994a, 103). It has been observed that the dedication to a French hermit-abbot betrays its Norman foundation (Harben 1918, 258). It seems probable that this church was built to serve the interests of a nascent extra-mural community which, there is no reason to doubt, had been developing from the later Saxon period. For the next century or so the number of inhabitants must have been few, living in houses built upon the higher ground in the northwest part of the ward. From a study of the wills and deeds enrolled in the Court of Husting it can be suggested that the population had increased and the area was fairly well covered with houses, although to the east of present

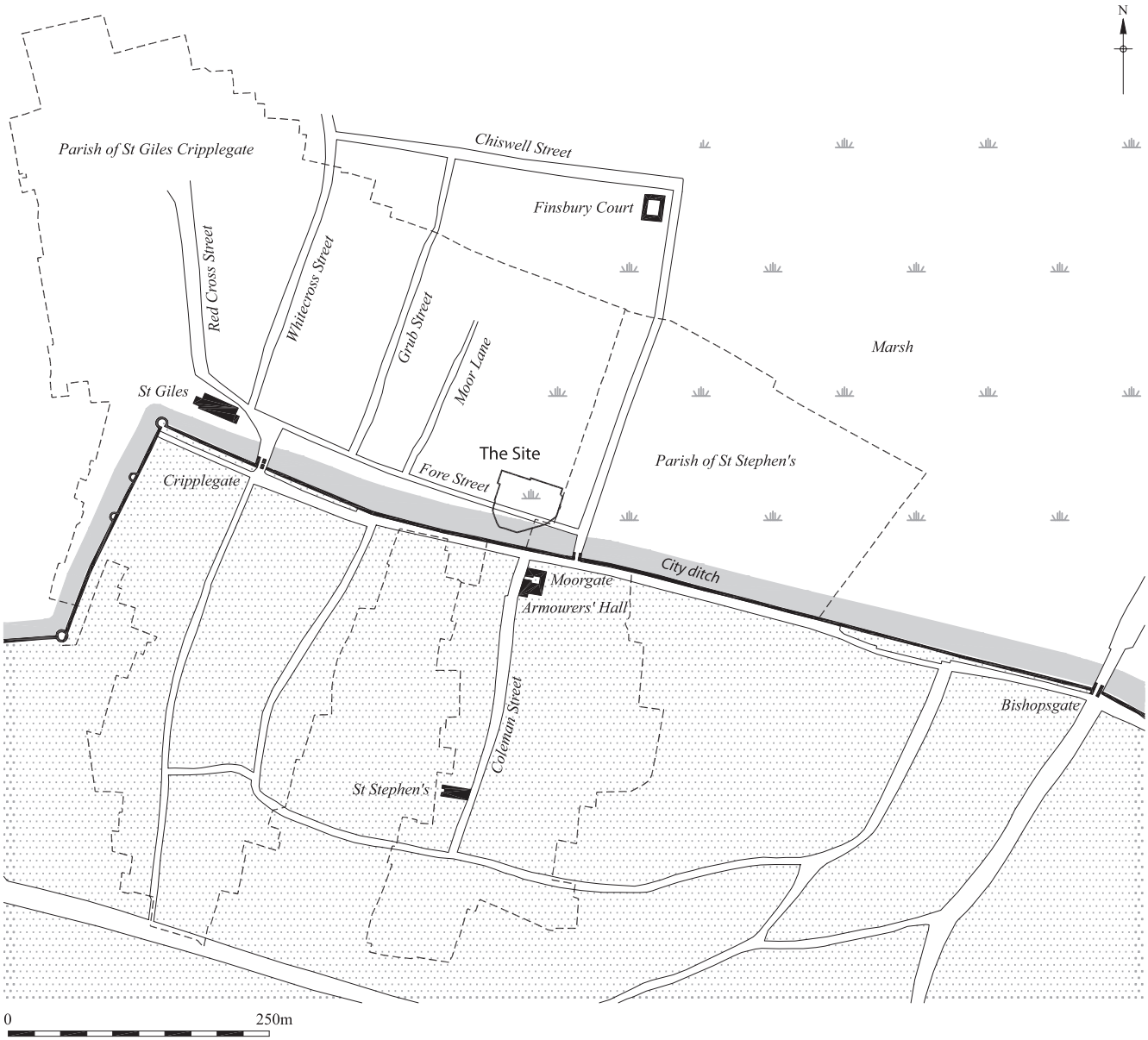


Fig. 33 The environs of the site in the medieval period showing the Parishes of St. Stephen and St. Giles (scale 1:6,250)

day Milton Street to the Moorfields and to the north to present day Beech Lane and Chiswell Street it was still swampy and relatively unoccupied with just the occasional isolated house (Baddeley 1921, 91). The foundation of this church must also mark the creation of its parish as a separate entity, the extent of which was entirely extra-mural. It thus follows a pattern common to other extra-mural churches near the gates of the City (the churches of St. Sepulchre outside Aldgate, and St. Botolph outside Aldersgate, Bishopsgate and Aldgate) (Page 1923, 162). It has been suggested that St. Botolph Aldgate was founded to serve the extra-mural parts of a larger minster *parochia* when this early minster was subsumed by the creation of the Priory of Holy Trinity in the early 12th century (Haslam 1988). Exactly the same process can be inferred as happening in the case of St Giles Cripplegate soon after the formation of the College of St. Martin le Grand, which also arguably subsumed an early minster. There are reasons for suggesting that this early minster *parochia* would have been more or less coterminous with King William's soke of 1087, and that, like the early *parochia* of Holy Trinity Aldgate, this *parochia* and the wards which comprised it were important elements in the process of the formation of minsters and wards in London by King Alfred as part of his programme of the restoration of London in the 880s and 890s (Haslam 1988).

The development of the parish of St. Stephen outside Moorgate is clearly secondary to this process. St. Stephen's church was itself a chapelry of St. Olave's Old Jewry (Page 1923, 147), and the extra-mural parts of this parish must have been carved out of the eastern part of St. Giles Cripplegate when Moorgate (the Gate) was constructed in the City wall, an event which must have taken place before the early 15th century (Harben 1918, 421). There

are early references to a postern in the northern circuit of the City walls. In January 1412 the Mayor and some aldermen rode through 'a certain postern in the north wall between Bishopsgate and Cripplegate' crossed the ditch and inspected the Moor (Lambert 1921, 79) and in 1415 it was ordered:

> … that the Little Postern, built of old in the wall of the said City, should be pulled down, and made larger on the south side thereof, so soon as it could conveniently be done, for increasing the common advantage, and also the special honour of the said City, by adding a gate thereto, the same to be shut at night and at all other fitting times.
>
> (Riley 1868, 614)

It was suggested by Riley that this postern was the Aldermanbury Postern in Cripplegate Ward or that of Little Moorgate, which was positioned at the end of Bromfield Street (Reader 1906, 150–151), but it is possible that it is referring to the gate at Moorgate itself. Stow suggests that the postern was Moorgate but claimed it was a new opening in the wall:

> Touching the next postern, called Moorgate, I find that Thomas Falconer, mayor, about the year 1415, the third of Henry V, caused the wall of the City to be broken near unto Coleman Street, and there built a postern, now called Moorgate, upon the moor side where was never gate before. This gate he made for ease of the citizens, that way to pass upon causeys into the field for their recreation.
>
> (Stow 1994, 62)

The gate was then 're-edified by William Hampton, fishmonger, mayor, in the year 1472' (Stow 1994, 62).

In view of the fact that the Moor and marshes outside this gate would from an early date have been a considerable natural resource for food, in particular fish and wildfowl, as well as for commodities such as reeds and willows, it would not be surprising if Moorgate was made to give access to these resources to the citizens of London from considerably earlier than the 15th century. Its existence by the early 13th century can be inferred from the fact that Fore Street, which runs parallel to the line of the City wall and ditch and connects Cripplegate with Moorgate, was in existence by 1210 (Harben 1918, 179–180; Lobel 1989, Gazetteer). William FitzStephen, writing in the 1170s, remarks on the common use of the Moor as a winter skating rink (Stenton 1934, 31), which implies the existence of the gate at this time, though it is possible that access to Moorfields could have been gained from either Bishopsgate or Cripplegate.

During much of the medieval period Moorfields was a great waterlogged, largely inaccessible marshland. FitzStephen describes Londoners skating on bone skates in winter on the ice which had formed on 'that great marsh which washes the Northern walls of the City' (Stenton 1934, 31). The area of Moorfields was part of the prebendal manor of Finsbury owned by St. Paul's. Finsbury manor house, Finsbury Court, lay at the junction of Chiswell Street and Finsbury Pavement on a natural raised ground within the marsh. The manor house was apparently reached from Aldersgate by a gravel causeway through the marsh, along Chiswell Street. A few houses were built west of the manor house in the 13th century including a tannery, *le Taninghus* (Baddeley 1921, 91). Moorfields was described by Stow as:

> This fen, or moorfield, stretching from the wall of the City betwixt Bishopsgate and the postern called Cripplegate, to Finsbury and to Holywell, continued a waste and unprofitable ground a long time, so that the same was letten for four marks the year, in the reign of Edward II.
>
> (Stow 1994, 387)

In 1301 it was recorded that that an inspection of Moorfields by the Lord Mayor's Court was undertaken by boat. This suggests that it was either a water meadow or that the marsh was crossed by ditches and watercourses large enough to take a boat carrying six passengers (Lambert 1921, 78–79). Evidence of the appearance of the marsh is provided by the fact that the City had in 1298 let to William Pointel the reeds growing on the moor, on condition that that he did not meddle with the grass. The case in 1301 concerned the Bishop of Bethlehem, a bishop *in partibus*, whose attorney was sued for carrying away grass from the City's meadow (Thomas 1924, 113 & note 1). The presence of tanners in Moorfields in the early 14th century is confirmed by the mention of two such individuals in the Mayor's Court Rolls of April 1304 (Thomas 1924, 161). Later in the century an ordinance of the Pelterers' guild in 1365 laid down that leather workers should live and work in the Walbrook area to the north of the City (Riley 1868, 614–616). Usage of the area thereafter increased.

Maintenance of the moor appears to have been a continuing concern of the City. In 1374 a lease of the moor was made for seven years by the Mayor to Thomas atte Ram without rent as long as 'the same Thomas shall keep the said moor well and properly, and shall have the Watercourse of Walbrok cleansed for the whole of the term' (Riley 1868, 379–380). In 1412 the mayor ordered rubbish to be cleared from the moor and drainage ditches to be dug. He also made an inspection of the moor and decreed that trees and hedges as well as rubbish and filth should be removed and that no one should establish gardens there in future (Sharpe 1909, 101; Levy 1990, 79). In 1415 it was stated that the area previously had been alternately cultivated and then left vacant but that the Moor was now to be divided into small parcels of land (allotments) divided by paths lengthwise and across by order of the Common Council (Riley 1868, 614–616; Lambert 1921, 79). This may have been an attempt to supervise the maintenance of the Moor and stop the dumping of rubbish (Levy 1990, 80). Moorgate itself may have been rebuilt at this time as a postern gate leading out to the marsh/fens presumably to provide access to these plots of land. This provision of gardens reflected

the expansion of the City and the need for more land. However, the stopping up of the drainage ditches remained a common problem. In 1422 a Plea and Memoranda Roll recorded:

> They further indict 4 privies in Westyard because they stop up the common watercourse running into the ditch of the Moor and the privies of Robert Brynkele goldsmith, and Thomas Lucas grocer, which stand above the common watercourse and stop the flow of water. Also they present that three ancient watercourses, two in Fore Street and third near the Moor are stopped up, which is a nuisance whenever there is an abundance of water or a flood of rainwater.
>
> (Thomas 1943, 154)

However, it appears that the City could do as much harm as good as in 1477 the mayor, Ralph Joceline, repaired the City wall between Aldgate and Aldersgate. The raw material for the bricks was quarried from Moorfields and chalk was burnt for lime in the same place although 'this field was made the worse for a long time' (Stow 1994, 388). Shakespeare over a century later was also led to describe the area as 'the melancholy of Moorditch' (Shakespeare, Henry IV Part I, Act 1 Scene 2).

The development of the Moor at Moor Fields can be viewed as a general process of reclamation, drainage works and canalisation of the flow of water from north to south, enclosure, the development of water meadows, and the more intensive use (and eventual destruction) of its resources as the nearby population grew. The suggestion by Harben (1918, 604–605) and Stenton (1934, 38) that the Moor was created by the obstruction of the flow of the Walbrook by the building of the Roman City wall seems to be borne out by the archaeological evidence described above. Its original natural area (in the late Roman to late Saxon periods) has been suggested by Marjorie Honeybourne in her map of Norman London (Stenton 1934) as having extended from Old Street in the north, Walbrook to the east and the road leading northwards from Cripplegate to the west. This suggested area is however probably too extensive. Chiswell Street to the south of Old Street appears to have been so named from the gravelly subsoil, suggesting that the original marsh did not reach as far to the northwest as this. The edge of the marsh to the west is unlikely to have extended as far as the gate at Cripplegate, but must have petered out at a distance to its east. The eastern boundary of the marsh must have extended further east than Walbrook itself, certainly to occupy the whole width of the Walbrook valley, and probably therefore reached as far as the line of the parish boundary of St. Botolph Bishopsgate. In its northern extent it probably extended beyond Old Street in the area of the Walbrook valley, occupying part of the manor of Finsbury (Harben 1918, 422).

The development of the settlement outside Cripplegate, and of much of the Moor throughout its later history, is likely to have been due in no small measure to the efforts of the Canons of St. Martin's. In a writ of 1139 they were permitted to enclose the land outside Cripplegate (Davis 1972, 14–15), ostensibly to prevent dumping of butchers' waste, but probably more realistically to begin a process which appears to have resulted in the planned development of the land outside the walls that they had acquired through the gift of this area by William I. This process was sufficiently far advanced in 1141–43 for the citizens to take violent offence and to destroy the walls and curtileges (Davies 1972, 14–15), which doubtless reflected their annoyance at being deprived of the use and enjoyment of the Moor as a resource for both food and recreation. The development of the area is likely to have taken place in all directions, and to the east across the area formerly occupied by the Moor. Lobel's map of the City of London in *c.* 1270 (Lobel 1989), which is based on documentary sources, shows several parallel lanes running northwards from Fore Street (which itself runs eastwards from Cripplegate parallel with the wall just outside the City ditch), to Chiswell Street/Old Street. Apart from Fore Street itself, in existence by 1210 (Harben 1918, 179–180; Lobel 1989, 74), the first and presumably the earliest of this planned street system was Whitecross Street, first named in 1226, in 1253 known as Everardes Wellestrata, Wytecroychstrate in 1285 and Whitecrosse Strete by 1502 (Harben 1918, 624; Ekwall 1954, 98; Lobel 1989, 98) which extends northwards to Old Street and is joined by Chiswell Street, named Chyselstrate in the early 13th century (Harben 1918, 139). Whitecross Street appears, on topographical grounds, to be secondary to Red Cross Street, which heads northwestwards from Cripplegate past St. Giles' church. To the east of Whitecross Street is Grub Street which is also first mentioned in the early 13th century (Harben 1918, 139; Ekwall 1954, 85). Another parallel lane to the east of this, Moor Lane, which is first mentioned in 1309–10 as le Morestrate and by 1502 was known as Morelane or Morestrete (Harben 1918, 422; Lobel 1989, 81) and appears on Lobel's map of *c.* 1520 (Lobel 1989). A fourth lane, the later Little Moor Fields or the modern Moorfields, along the line of the eastern parish boundary of St. Giles, first appears on maps in the early 17th century (*see* below). Together, these parallel streets, the little alleyways allowing access to properties and yards, and the property boundaries themselves, first shown clearly in Ogilby & Morgan's map of 1676 (Hyde 1992) show a marked rectilinear layout. This suggests that the area was systematically planned and developed with streets and properties from west to east to the eastern boundary of the parish, over a period which started in the early 12th century, and which was essentially completed (apart from infilling and colonisation) by the end of the 16th century. Much of the western part of the winter skating rink, described by FitzStephen in the 1170s, and the wildlife resources of earlier centuries, had therefore by this time become tamed and developed out of existence by a process of gradual encroachment from Cripplegate eastwards. It is natural to infer that this process was initiated and controlled by the Canons of St. Martin le Grand to augment their income by making the best use of the land they had acquired through the gift of the extra-mural soke by William I. This conclusion seems to be strengthened by

the fact that this development appears to have been taken in the post-medieval period to the eastern boundary of the parish of St. Giles and no further. The development of the extra-mural part of the parish of St. Stephen's was a separate and later process.

Various items are also recorded as being dumped in Moorfields, including horse dung beyond Finsbury Court, and 'some thousands of carrie [carriage] loads and more' of bones from the charnel house of St Pauls (Stow 1994, 282). These must have been isolated incidents in a general process which must have begun considerably earlier and which was varied, random and piecemeal in its extent, and was to continue into the 17th century and beyond. It is probable that some of the material for 'levelling' would have come from the sand, clay and gravel deposits on the fringes of Moorfields, but it would be surprising if this dumping did not also include a proportion of hardcore and non-organic waste (in addition to the doubtless many tons of organic waste dumped for instance into the City ditch) from general building works within the walls and from around the Cripplegate and Bishopsgate areas.

In 1498 all the gardens in the northern part of the moor 'about and beyond the lordship of Finsbury' were destroyed and the area turned over to a practice ground for archers (Stow 1994, 388). From the early 16th century attempts were made to drain the marsh. In 1512 the Mayor, Roger Acheley:

> … caused divers dikes to be cast and made to drain the waters of the said Moorfield, with bridges arched over them, and the grounds about to be levelled, whereby the said field was made somewhat more commodious, but yet it stood full of noisome waters.
>
> (Stow 1994, 388)

In 1527 the Mayor, Thomas Seymour, improved the sluices and ditches and drained the marsh, and 'made main and hard ground, which before being overgrown with flags, sedges and rushes served no use' (Stow 1994, 388).

The post-medieval development of Moorfields in St. Giles parish is shown clearly in successive maps of the area. The first is the detailed Copperplate map of *c.* 1559 (Procktor & Taylor 1979) (Fig. 34). This shows some streets and buildings, including a building and garden just to the northwest of Moorgate, within St. Stephen's parish, occupying the whole eastern area of the parish, leaving (significantly) an open area west of the modern Moorgate (leading northwards from the Gate) within St. Stephen's parish parallel to the causeway, which area is referred to as Little Moor Fields. However, even this area was said to have been developed with houses by 1561 (Harben 1918, 421), though it is shown as open space in subsequent maps (*see* below). The Copperplate map also shows a number of streams on either side of the road leading northwards from Finsbury Court (the north-bound continuation of Moorgate, leading from the gate, or Hog Lane), as well as along the northern side of Chiswell Street. It seems unlikely that these would have ended at Finsbury Court, or that the southern end of the stream of Walbrook would have

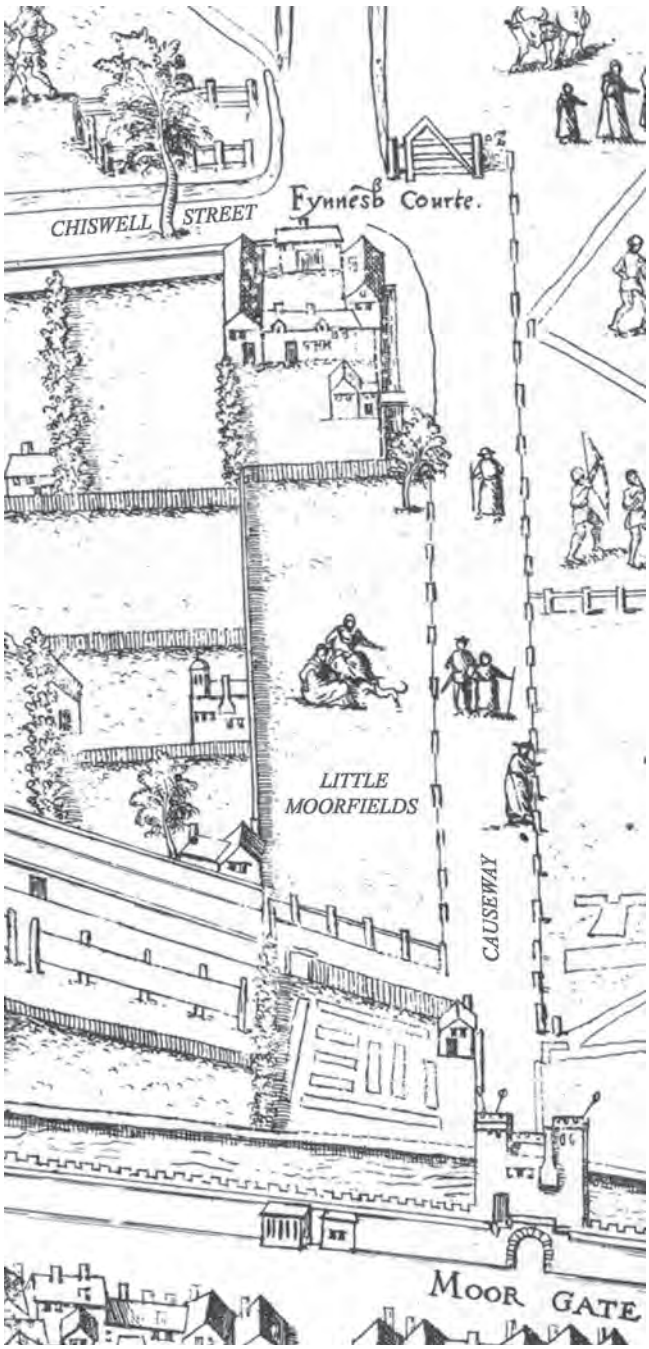


Fig. 34 Detail from the Copperplate map, 1559 (not to scale)

terminated at Moor Field itself, as shown on the map. There must, therefore, have been a number of streams, effectively canalised branches of the Walbrook, running southwards perhaps on both sides of the causeway of Moorgate itself, as well as in many channels, not marked on the map, in Little Moorfields and perhaps further to the west, which would have flowed southwards into the City ditch. The creation of the causeway of Moorgate across the Moor, as well as of the gate itself, both possibly as early as the 12th century (above), implies a considerable degree of water regulation and canalisation, with much consequent ditch-digging, from this time onwards. This terrain would have been ideal both for the creation of water meadows from the original

Fig. 35 Detail from the Norden map, 1593 (not to scale)

marshy fen, and for the development of water-based industries such as tanning and dyeing.

Having tried to drain the land and failed it was at last decided to raise the level of the land by dumping and from 1606 the process of converting the Moor into a public park was initiated with the construction of brick walls, the laying out of paths and the planting of trees. The work was undertaken in three phases. It was commenced in 'Lower Moorfields' which extended from London Wall to the line of South Place and Eldon Street and was completed in 1610. Thereafter the area of 'Middle Moorfields' between Eldon Street and Finsbury Square was transformed by 1612. Work was completed in 'Upper Moorfields' which occupied the site of Finsbury Square in *c.* 1617 (Lambert 1921, 81–87).

The subsequent development of the immediate area of the site is shown in both Norden's map of 1593 and Speed's map of 1611, which show a sporadic (and doubtless impressionistic) development of houses and gardens west of Moorgate (Fig. 35). However, an anonymous map of London of 1645 (Guildhall Library 30282) shows open space to the west of Moorgate with a lane to its west (the modern Moorfields), with development shown along Fore Street to Moorgate. This situation is clarified in Faithorne and Newcourt's map of 1658, which shows the whole area west of Moorgate developed with houses along the earlier streets and fronting onto Fore Street, though with an area of formal trees with no houses fronting onto Moorgate itself. In John Leake's map of 1667, however, there is a row of densely-packed houses fronting the west side of Moorgate, with a long orchard or garden behind, facing onto a back lane (the modern Moorfields) (Margary 1981). It is clear however that this arrangement is mistaken, and that earlier maps are correct in showing the survival of Little Moor Fields to the west of Moorgate (within the parish of St. Stephen). Ogilby and Morgan's map of 1676 (Hyde 1992) shows Little Moor Fields as an undeveloped strip of land between Moorgate and an un-named north–south lane to its west which marks the line of the parish boundary (the modern Moorfields). Westwards from this latter lane the whole area is developed with houses, with access yards and terraces along a series of east–west lanes or paths. To the south of Fore Street houses are packed together between the street and the City wall right up to Moorgate itself, a development of a situation which had already begun by the time of Stow at the end of the 16th century. It would not be unreasonable to suggest that this well-defined north–south and east–west alignment of streets, properties and lanes reflects a similar alignment of the enclosures, pastures and water meadows with their accompanying ditches of earlier periods (shown in sketchy form in the 16th- and early 17th-century maps), which alignment in turn must have reflected those established by the planners in the 12th century. This seems to be reflected in the general alignments of the excavated ditches and drainage channels from various periods.

PHASE 8: ROMAN TO MEDIEVAL MARSH

Sealing the Roman features was a reddish brown organic deposit, *c.* 0.20m thick (Fig. 36). The finds recovered from the deposit were sparse, though some medieval artefacts and a high proportion of Roman finds were recovered. The few fragments of medieval pottery and tile that were recovered dated to between the 11th and 14th centuries. A knife sheath with incised and stamped decoration of 13th or 14th-century date (*see* Fig. 100.1) was also found within this layer. This soil horizon is interpreted as being part of the peaty marsh deposits which built up from Roman times into the late medieval period.

At the extreme east of the site in Area 3 a dark black waterlain silty clay apparently separated into several distinct layers and lenses was observed. This material was located between a sequence of recut north–south aligned ditches to both east and west. It may represent the earliest phase of ditch fills which have been cut on both sides so that no evidence of edges was observed. However, it is possible that it represents the highest surviving marsh deposits on the site in an area between the two ditches. The basal deposit had a similar reddish brown organic appearance to that observed within the rest of the site to the west. Three thin fragments of radially cleft oak were recovered from the basal layer. One fragment had two

Fig. 36 North–south ditch and the marsh, during excavation, looking northeast

small nail holes set *c.* 0.50m apart which suggests that the fragments were fence pales and that they would have been fastened to a set of parallel rails. These deposits were dated to around the mid 14th century and would seem to be a little later than the marsh deposits within the site. However, this is probably explained by the greater surviving thickness of the marsh layers. Similar deposits were found at 4–6 and 12–26 Finsbury Circus where the marsh was described as being comprised of 4 feet 'of solid black mud with streaks of peat'. Dating material from those sites, which included an abundance of leather at the former, dated the marsh to the 15th century with some 16th-century artefacts at the latter site (Lambert 1921, 96–98).

Evidence that the marsh began to form from the later Roman period was provided at 6 Broad Street Place where a marsh soil covered the site; but this contained no pottery later than the 4th century (Harward 2004, 12). At 4–6 Finsbury Circus a 0.30m thick deposit consisting of reeds in dark grey clay which contained a few Roman artefacts dating to between the late 2nd century and the 4th century was revealed (Lambert 1921, 97–98). Environmental analysis of the *mollusca* at the Finsbury Circus site seemed to suggest that the area was not a permanent swamp in the Roman period but was swampy ground which was liable to periods of drying out (Kennard & Woodward 1921, 111). Analysis of the plant remains also suggest the presence of marshland and wasteland plants such as creeping and celery-leaved buttercup, stichwort, hemlock, elder, nipplewort, milfoil, prickly sow-thistle, orache, golden dock, small nettles, common spikerush, sedge, blackberry and fig (Reid 1921, 111–112).

Archaeological evidence for the marsh has been provided on a number of sites in the vicinity both within the City wall at such sites as 52–63 London Wall (Schofield with Maloney 1998, 273) and outside to the north of the site at 143–171 Moorgate where a series of waterlain deposits up to 0.40m thick were interpreted as the marsh (Shotliff 1990, 29; Heathcote 1990, 165). At the Honourable Artillery Company Sports Ground brown clay loam marsh deposits between 0.33m and 0.50m thick and dating to the 14th–16th centuries were observed (Philp 1996, 78). Similar deposits were observed elsewhere to the east within the upper Walbrook valley on sites at 15–17 Eldon St, 12–15 Finsbury Circus, 7–11 Finsbury Circus and 10–13 Dominion Street (Schofield with Maloney 1998, 257, 267–268; Thompson *et al* 1998, 108). Large numbers of wetland plants such as rush and sedge and wasteland plants such as docks and elder were found in the northern part of the marsh at Finsbury Island (Malcolm 1997, 39).

Analysis of a column sample taken through the organic marsh deposits and underlying grey silty site-wide deposit at Moor House show that the local environment consisted of wet ground with bodies of standing water supporting aquatic vegetation such as white water lily and yellow water lily and marginal aquatic plants such as common reedmace. The presence of stagnant and foul water on the site is borne out by the presence of heavy coatings of sediment pores and gypsum crystals. The land was mainly composed of damp grassland and waste ground with sparse woodland and shrubland associated with wet lands such as alder and white willow with silver birch, Scots pine and pendunculate oak and ivy also present in the area. The presence of cereal pollen suggests localised cultivation in the area.

Some of the fills of a 12th/13th-century pit (*see* below) were subjected to plant macrofossil analysis (Branch & Vaughan-Williams, this volume, Chapter 6) and provide evidence of the natural environment at that time. The samples contained taxa associated with a wide range of habitats from waste ground (orache and fat hen), damp ground (celery-leaved buttercup), cultivated fields (corn spurrey, pale persicaria) and woodland/shrubland (elder and small balsam) and suggests that at least some cultivated fields may have been present within the marshy environment.

PHASE 9: MEDIEVAL ACTIVITY

The Medieval City ditch

The most significant and largest medieval feature on the site was the City ditch [1875], which was recorded along the southern part of the site (Figs. 37, 38, 39). The earliest phase of the ditch was excavated to the east of the site in Areas 1, 2 and 5 and was found to survive for a length of 18m by 7m wide by 1.36m deep at its greatest extent. The eastern edge was steeply cut and the base was generally flat (Fig. 40). The watching brief in Area 4 on the periphery of the site recorded the same ditch along the western edge of the site and thus extended the recorded length of the feature to 41m. The ditch was found to extend *c.* 26m from the projected line of the surviving element of the City wall located in the underground car park beneath London Wall. The ditch was filled with dark grey waterlain clays and silts suggesting that it was filled with water for most of its life. Finds from the ditch were fairly sparse with no evidence of systematic dumping. Most of the fills indicate a natural silting-up process. The earliest fills contained primarily residual 1st- and 2nd-century AD Roman pottery but also a very few medieval finds dated from the 13th/14th century. The relative absence of finds, especially pottery, with the exception of the final medieval recut (*see* below) probably reflects the fact that the northern edge of the City ditch was not easily accessible because of the marsh. The Roman finds are probably due to the erosion of its northern edge and thus buried Roman deposits, by the action of water within the ditch.

In Areas 1 and 2, the City ditch was cut by a narrow gully which measured up to 1.26m wide by 0.45m deep and was observed at a distance of between 0.60m and 1.00m to the south of the edge of the earlier City ditch. In Area 1 it had a 'V' shaped profile but was more concave to the east in Area 2. This may represent an attempt to dig a drainage ditch along the edge of the infilled/silted up City ditch, perhaps to incorporate it into the drainage system operating to the north (*see* below). Pottery dated this activity to the 13th/14th century, contemporary with the

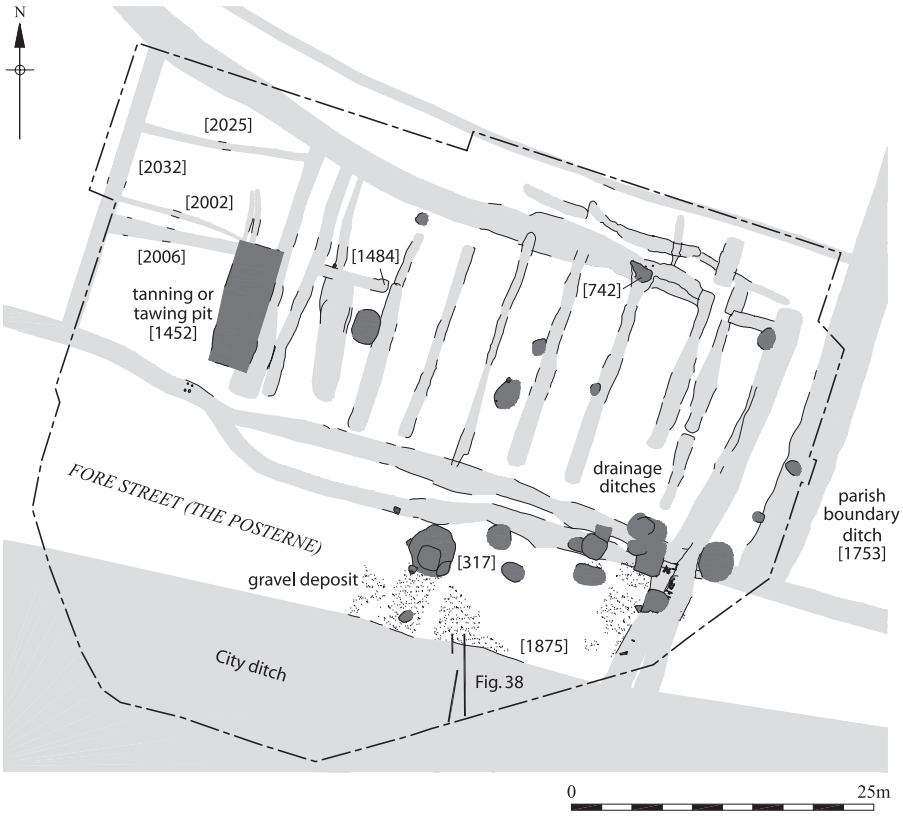


Fig. 37 Phase 9, showing the City ditch and evidence for leatherworking in relation to all medieval features (scale 1:625)

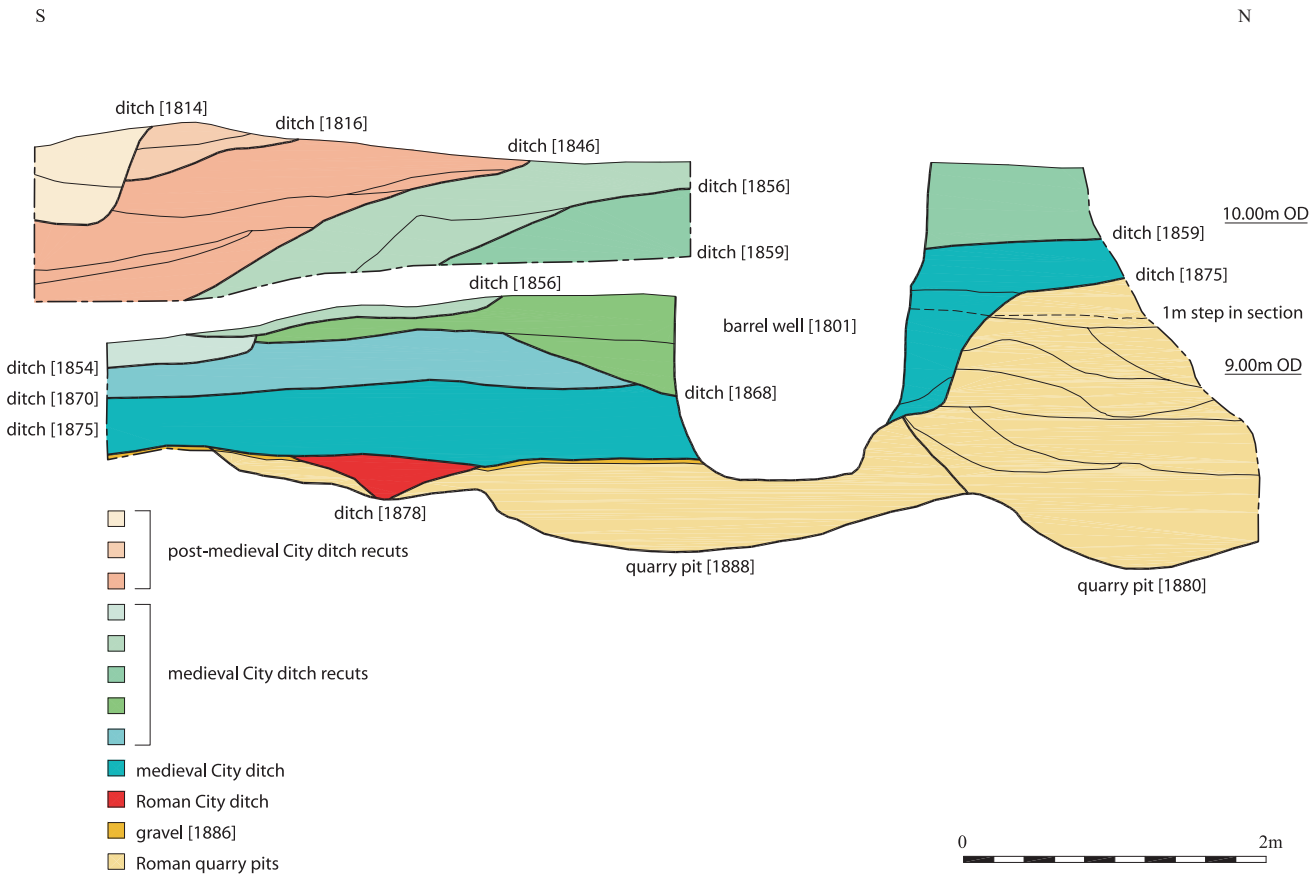


Fig. 38 Section 3, composite section through the City ditch (scale 1:50)

Fig. 39 The City ditch, during excavation, looking west

Fig. 40 Detail of the City ditch, during excavation, looking west

drainage system.

This gully was truncated from above by a more widespread recut of the ditch [1870] which extended to within 0.70m of its former northern edge and was some 0.50m shallower than the first medieval City ditch. This activity was again dated to the 13th/14th century. The recut in turn silted up and was recut in Area 2 by another narrow east–west aligned gully [1868] which measured at least 1.92m long by 1.92m wide by 0.54m deep. This was probably a similar feature to the gully above, within the same 13th/14th century period. This gully was cut by another medieval recut of the City ditch [1859], which was of similar width to the original ditch cut [1875]. In Area 2 a further recut of the City ditch [1854] was recorded some 4.30m to the south of earlier recut [1870]. This was up to 0.30m deep and was dated by one sherd of coarse Surrey/Hampshire border ware to the period 1270–1500.

One final medieval recut [1856] was observed up to 0.34m deep along the extreme southern edge of Areas 1 and 5 but surviving to a width of 3.40m in Area 2 to the east. This recut was backfilled with three deposits, which contained a large assemblage of pottery (175 sherds), from which a final infilling date of *c.* 1350 can be inferred reasonably confidently.

Leather manufacture

The earliest medieval activity was concentrated in the western part of the site and dated to the 12th and 13th centuries. It consisted of two apparent east–west ditches and a north–south aligned ditch which were only observed in section during the watching brief on the peripheral areas of the site, together with a large north–south aligned ditch at least 1.60m wide which was traced for at least 11.50m. It was truncated to the north and south by later medieval and modern features and in the west by a large rectangular pit [1452] measuring 10.40m by 4m by up to 0.70m deep (Fig. 37), which contained a large pottery assemblage of 245 sherds dating to 1230-1270 (eg Fig. 64.2). The feature had vertical sides and a flat base; its numerous fills included bands of degraded lime. The very regular nature of the pit with such straight edges suggests that it might have once have been lined with timber planks although no evidence of posts or impressions of timber were observed. Two parallel north–south aligned ditches containing only Roman finds may have fed water to the pit, and it is possible that it may also have been associated with an east–west aligned ditch seen in section to the west.

A quantity of roe deer antlers was found within the pit and in the vicinity (Fig. 41). With the exception of five complete antlers the majority were single, however, all were attached to fragments of the frontal bone, indicating that they derived from hunted or killed animals and not from naturally shed antlers. From the appearance of the

Fig. 41 A selection of the roe deer antlers found on site

antler development it appears that animals aged three years or older were hunted between June and September probably in the forests around London by licensed huntsmen and supplied by royal and noble households to the leatherworkers in London. The removal of the skins of the animals was indicated by the knife scoring marks on the frontal bone and the antlers had apparently been transported to the site in their skins which had been removed from the killed and butchered deer elsewhere. The practice of leaving cattle, sheep and goat horns in the skins when they were supplied to the tanners by the butchers was common practice and may have been required by the tanners who needed to determine the age of the animals in order that different qualities of leather could be produced. After removal from the skins, the antlers seem to have just been discarded as they exhibited no signs of working.

Possible evidence of the use of roe deer hides for the manufacture of leather is provided by the presence of roe deer bones from late Saxon and early medieval (1100–1350) phases of a site at Northampton, where a late medieval and early post-medieval tanning complex was also excavated (Shaw 1996, 90, table 3). Roe deer has occasionally been used for object manufacture in both England and on the Continent from the Roman period to the 12th century but generally the antlers were too small to be of much commercial use and red deer antler was the preferred skeletal material during this period (Riddler 2003, 74). This might explain why no attempt has been made to utilise the antlers for handles or other worked objects. Roe deer antlers were found near London Wall in 'the superficial earth, in which glazed pottery was also found' by General Pitt Rivers in 1866 (quoted in Reader 1903, 163), which might suggest that the tawing of roe deer hides was widespread in Moorfields in the medieval period.

Some of the fills of the feature were subjected to geochemical and plant macrofossil analysis (*see* Branch & Vaughan-Williams, below). The samples contained taxa associated with a wide range of habitats from waste ground represented by orache and fat hen, damp ground represented by celery-leaved buttercup, cultivated fields represented by corn spurrey and pale persicaria and woodland or shrubland represented by elder and small balsam. The analysis indicates that at least some cultivated fields may have been present within the marshy environment, however, it is possible that some plant taxa may have been introduced into the pit on animal skins or in the raw materials used in the tanning and tawing processes, and they may not be representative of the local environment.

The geochemical analysis showed enhanced levels of calcium and phosphorus but low levels for potassium and aluminium, elements that would have been used in the 'alum' process of tawing. The high levels for calcium and phosphorus could be due to the use of lime and organic matter such as manure, plant residues, human waste and domestic waste which would increase the pH of the water within the pit creating an alkaline solution. Although there was no evidence for plant materials typically associated with tanning such as oak and pine bark or acorns from the pit it appears that other substances were involved in the manufacture of leather at Moor House. These substances most likely included phosphate-rich organic material such as straw and faecal material and lime which were used in the removal of hair and fat from the hides and as tanning agents. Although there was no evidence for aluminium or potassium which would suggest tawing, the results of the analysis did not preclude tawing taking place on site as both these elements are highly soluble.

Other possible indirect evidence for the production of leather was also found on the western part of the site. Cattle horn cores were also found in some of the fills of the large rectangular pit with concentrations of 16 in one fill and 33 in another. The fills of a large north–south aligned ditch [2032] (Fig. 37), which was observed in section extending along the western periphery of the site, also contained a large assemblage (55 pieces) of cattle horn cores dating to the same period. Many of the cattle horn cores exhibited signs of knife cuts on the frontal bone fragments suggesting that they had been skinned. It would therefore appear likely that these horn cores are waste products for the leather making industry in much the same way as the roe deer antlers. However, it is also possible that they may be evidence of horn working, which was a prominent medieval industry in London, for example in Cowcross Street (Sidell 2004, 383) and in the City at Angel Court (Blurton & Rhodes 1977, 88–97) and Northgate House, Moorgate (Drummond-Murray & Liddle 2003, 90–92). Several parts of chopped sheep crania with paired horn cores attached and four female goat horn cores were also present on the site and probably represent tanning or tawing waste.

Ditch [2032] was at least 1.60m in width and survived to a depth of 1.27m. This was similar in many respects to the large series of north–south ditches on the eastern periphery of the site and both may represent large drainage ditches which defined boundaries and which may well have continued in use for some time. That on the east would seem to define the western limit of the road, Little Moorfields (present Moorfields). Possibly associated with the drainage system were three east–west aligned ditches [2002] [2006] [2025] to the east, which were also only observed in section.

Further possible evidence of leather making on site was provided by a large hexagonal pit [317], up to *c.* 3.85m across, which was observed to the southeast (Fig. 37). Like the large rectangular pit to the west the sides were near vertical and the base was flat. The unusual shape of the feature and its flat base suggests that it may once have been timber-lined and fulfilled some special function, perhaps in the tanning industry. The finds were exclusively Roman, but a medieval date is suggested as it appeared to be cut through the marsh deposits.

The large size of the rectangular pit may be compared with a 15th- to 17th-century tanning complex excavated at Northampton (Shaw 1996). Here the majority of pits were circular and smaller, measuring up to 1.5m in diameter at their bases. The rectangular ones were also smaller than the Moor House example varying in length between 1.75m

and 3.5m and in width from 0.8m to 2m. The maximum surviving depth of 0.85m is comparable with the truncated depth of 0.70m at Moor House (Shaw 1996, 80). Whilst those tanning pits from the late medieval and post-medieval periods at Northampton showed evidence of clay or timber lining (Shaw 1996, 81) there was no evidence of timber staining on any of the pits at Moor House. Although the rectangular pit was cut into the brickearth and, therefore, had a natural clay lining there was no obvious evidence of staining of the clay by whatever process was being carried out within the cut. However, the regularity in shape of both pits suggest that they may have been lined with timber planks which were removed when the tannery was abandoned. The large pit may even have been divided into a series of smaller compartments where different processes involved with leather manufacture were being carried out.

Two different forms of leather making industry were practised on site. The cattle horn cores suggest tanning, whilst the roe deer antlers indicate tawing. Both processes were initially similar, with the removal of the flesh by scraping and the immersion of the hides in solutions of quicklime and water, or sometimes wood ash, to loosen the hair for further scraping (Cherry 1991, 295–299; Drummond Murray *et al* 1994, 256; Shaw 1996, 107). Urine might be used to aid in the hair removal process. A second immersion in lime solution to open up the skin structure was followed by washing and then a further alkaline or acidic process. The former known as 'mastering', 'bating' or 'puering' which involved the immersion of the hides in a concoction of hen or pigeon droppings and cold water or dog faeces and warm water. The latter, acidic, process 'raising' or 'drenching', involved soaking the hides in solutions of barley, rye or ash bark in warm water and adding used tanning liquors and vegetable waste (Shaw 1996, 107; Steane 1984, 247–248). As established above there is some evidence at Moor House that the alkaline process was being used. The cattle hides were then subject to a process of tanning by being immersed in a solution of vegetable tannin, generally produced from oak bark, in timber lined pits for several months. This produced a heavy-duty leather for use by shoemakers and saddlers. Smaller animals such as sheep, goats, calves, pigs and deer were usually the subject of a quicker process known as tawing which involved the working into the skin of alum and other substances such as egg yolk, oil, butter or flour. This produced a much lighter leather for the manufacture of gloves, garments, laces and shoe uppers (Heard 2000, 139).

Archaeological evidence of tanning has been produced by excavations across the country in addition to the major excavations at Northampton, including late Saxon evidence at Chester, Winchester and York and medieval evidence at Exeter, Kingston-upon-Thames, Nottingham and York (Shaw 1996, 113). There is widespread evidence from archaeological sites in London of tanning, especially in Bermondsey, south of the river Thames, where tanning became a major industry from the late medieval into the 20th century (Drummond-Murray *et al* 1994, 256–257) and evidence of tawing was found at Tanner Street (Heard 2000, 137–143). Closer to the site tanning pits were found at Tokenhouse Yard (Reader 1903, 145) with possible tanning pits, leather waste and animal bone waste associated with tanning at Northgate House (Drummond-Murray & Liddle 2003, 90–93) and regular pits dating to the 11th/ 12th centuries at 15–35 Copthall Avenue (Maloney with de Moulins 1990, 81), all these sites being within the City walls in the Walbrook valley. Outside the walls dumps containing abundant leather waste and horn cores were found at 143–171 Moorgate (Shotliff 1990, 81; Heathcote 1990, 165) and most notably at 4–6 Finsbury Circus and 34–40 Finsbury Pavement where up to 0.60m of waste leather was dumped into the marsh (Lambert 1921, 98–104), whilst a possible tanning pit was observed to be cut through the marsh at 15–17 Eldon Street (Schofield with Maloney 1998, 267).

Historically tanning is documented from the general area in Cripplegate Outer Ward; in 1298 the Husting Rolls recorded a house called *le Taninghus* and later in 1358 a brewery and house was called *le Tanhous* (Baddeley 1921, 91). The Lay Subsidy Rolls of 1292 and 1319 both list tanners living in the Cripplegate ward with in excess of ten being present at the latter date (Ekwall 1951). From the Mayor's Court Rolls of the City of London in April 1304 a Richard de Houndeslowe, who had been

> … summoned to answer the Prior and Brothers of the Order of St Augustine for killing horses and burying their carcasses within the Walls of London, . . .was mainprised by John Baudry and John Note, tanners of the Moor, for his appearance on Friday to hear judgment.
>
> (Thomas 1924, 161)

The relatively unoccupied area of marshland to the north of the City wall would have been a perfect location for the tanners and tawyers to carry out their unpleasant-smelling processes. There was an ample supply of water for their needs and they were isolated enough not to bother any neighbours with their foul smelling industry. But was it usual for the two processes to be carried out together in one area. The two trades were carried out by different craft guilds, the White Tawyers and the Tanners and would probably have been jealous of each others' territory. It is possible that one was carrying out its trade in the area whilst the other was dumping its waste from a neighbouring production base. However, there is some evidence from Northampton that tawing and tanning were taking place on the same site in the medieval and post-medieval periods (Shaw 1996, 101) and it is possible that despite the Guilds' attempts to prevent such practices, there was some overspill in production practices between related crafts. As the initial processes for preparing the skins were similar for both tanning and tawing it is possible that the preparatory work may have been carried out here and then the processed hides dispatched to the relevant skilled workers depending on whether they needed to be tawed or tanned.

Fig. 42 Intersection of a north–south and an east–west ditch, looking southeast

Fig. 43 One of the north–south ditches, during excavation, looking north

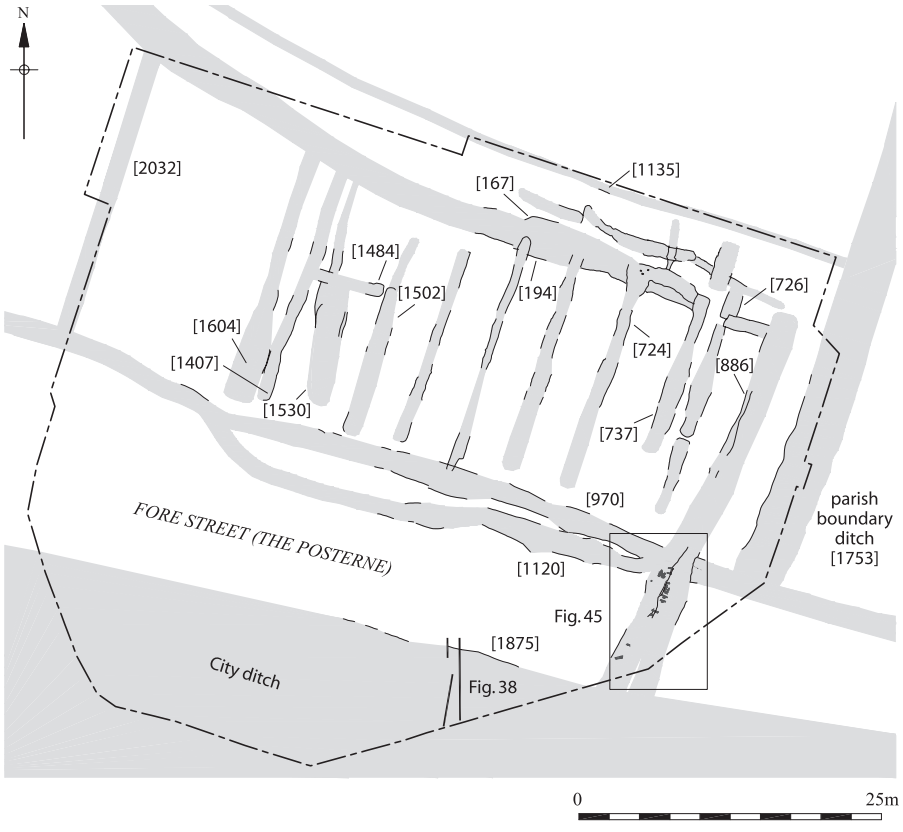


Fig. 44 Phase 9, medieval drainage ditches (scale 1:625)

North–south aligned ditches

A series of north–south aligned ditches was observed across the site (Figs 43 and 44). Seven ditches exhibited similar characteristics, suggesting that they were contemporary. They were filled with reddish brown organic silts or dark grey waterlain silt, and contained very sparse finds, suggesting that they had become infilled by natural silting. They varied in width from 1.60m to 0.60m reflecting to some extent the degree of horizontal truncation. They seemed to have been set out at fairly regular intervals; the centre of each ditch being *c.* 5m from the centre of the next. The four eastern ones led directly into an east–west ditch to the north (*see* below) (Fig. 42). The relationship of the other two with the northern east–west ditch was uncertain due to modern truncation. Only one of the ditches led directly into an east–west aligned ditch at the south and this survived to a greater length, 20.30m, than the rest. The others, where they could be traced, seemed to stop just short of the southern east–west ditch [970], perhaps suggesting that they were shallower at their southern end; although one ditch [737] apparently stopped some 8.00m from it. The levels of the bases of the ditches are to some extent irregular suggesting that they were designed to carry/drain water from the north to the south.

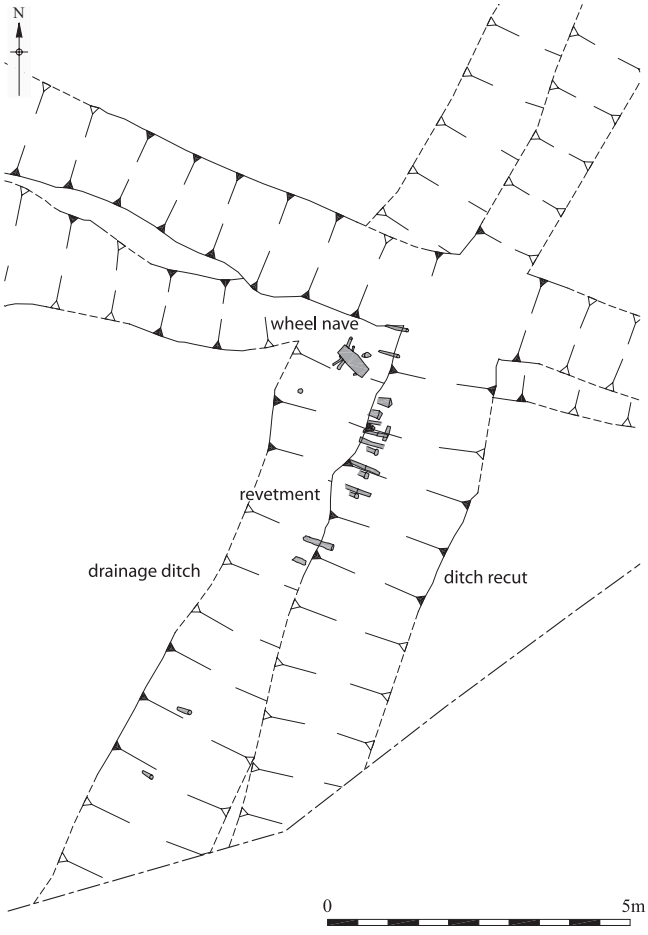


Fig. 45 Detail of Phase 9 ditches and revetments in the southeast of the site, showing the location of the timber wheel nave (scale 1:125)

There is some evidence that the north–south aligned ditches may have been cleaned out at intervals as they silted up. Ditch [724] exhibited such signs as a very distinct black waterlain fill being present within a recut. A similar sequence was observed in the ditch immediately to the west, together with ditch [1502] towards the west of the site.

Three stakeholes observed in the fill of the top end of ditch [724] where it joined with the northern east–west ditch may have been part of some fence, bridge or perhaps even sluice mechanism.

At the western end of the network one further contemporary feature appeared to be part of the same system. It comprised an east–west aligned ditch [1484], 5.50m in length, which despite not quite meeting them, appeared to link the two westernmost of the regular system of north–south aligned ditches.

In the northeast corner of the site two further north–south aligned ditches extended to the north of the main east–west ditch. The two ditches were not in alignment with each other and probably represent a different phase of the ditch system, but they may both have been intended to link the southern system of ditches with the east–west ditch observed at the extreme north of the site [1135]. To the south of the main east–west ditch the ditch [726] continued. It measured up to 1.8m wide and seemed to consist of two separate parts to the north and to the south. Its relatively large width and its close proximity to the ditch to the west suggests the two may not have been contemporary.

Along the eastern edge of the site in Areas 3 and 5 a series of large north–south aligned ditches, recut several times in their history and slightly moving to the east and west over time and each recut, were recorded. In Area 5 the northern part of the ditch [886] appeared to finish in a butt end. It measured up to 2.20m and was recut at least once. The ditch continued for 32.00m to the south and continued beyond the southern main east–west aligned ditch. It continued beyond the southern limit of excavation in the southeast part of the site and may have once joined with the City ditch to the south. In the southeast corner of the site up to five recuts of this main ditch were revealed, at least one of which exhibited signs of revetting, evidenced by a series of wooden stakes, which had collapsed to the west. Within the associated ditch the remains of a timber wheel hub or 'nave' with fragments of spokes from a lightly made wheel of a light cart or carriage was observed (Fig. 45). The wheel hub was constructed from beech wood and was in a rather battered condition having been weathered, squashed and split. However, reassembling the components, which included six mortices for the probable original twelve spokes, produced a length of 0.58m and a spoke diameter of *c.* 200mm. It was most likely a lightly made wheel from a lightweight cart or carriage rather than a heavy wagon. It is documented that a cartwheel was used as a kind of grid set into the lower Walbrook stream at Dowgate to prevent large pieces of debris moving down the channel:

> The next is Downgate, so called of the sudden descending or down-going of that way from St. John's Church upon Walbrook unto the river of Thames, whereby the water in the channel there hath such a swift course, that in the year 1574, on the fourth of September, after a strong shower of rain, a lad, of the age of eighteen years, minding to have leapt over the channel, was taken by the feet, and borne down with the violence of a violent swiftness, as no man could rescue or stay him, until he came against a cartwheel that stood in the water-gate, before which time he was drowned and stark dead.
>
> (Stow 1994, 70)

Perhaps this wheel was used in a similar way to stop large pieces of debris flowing into or out of the City ditch.

East–west aligned ditches

Across the north of the site a large east–west aligned ditch [194] was revealed which extended for 25.50m across the site and measured up to 3.20m wide. To the west it appeared to have a butt end, although the evidence for this was tentative as the northwestern part of the site was heavily truncated by modern disturbance and it is more likely that this feature represents part of a pit and that the main ditch continued to the west just to the north. To the east it joined with the most easterly of the narrow north–south ditches of the network system. It was filled with waterlain and organic fills suggesting that it had silted up naturally and after it had, it was recut to form a slightly narrower ditch measuring some 2.00m in width. To the east a further ditch continued on the same alignment, with a gap of 1.60m, to join with the large north–south ditch [886] that ran along the edge of the main area of excavation (Area 5). This break in the later phase of the ditch system may have been to allow access into the area to the south for both animals and humans.

Fig. 46 East–west ditch [970], looking east

To the south of the site a similarly east–west aligned ditch [970] was observed (Fig. 46). It could be traced for 53.60m across the site with a maximum width of 2.50m. It too had naturally silted up and had been subject to at least two recuts, most evident in the central part of its observed length, during its period of use. At the western extent of the excavated area (Area 6) four stakeholes were observed within the fill, which may again have been part of a small bridge, dam or sluice mechanism to control water flow. Several timber barrel staves were recovered from within the fill of the eastern part of the ditch, which may have been re-used as part of a fence lining the ditch which had subsequently collapsed into the feature. From the central part of the ditch the remains of a flap-closing purse of cowhide with a sheep/goatskin lining were discovered.

Just to the south of the main southern east–west ditch in Area 5 the remains of a further ditch/channel [1120] were observed. To the west it was very narrow, broadening out to 2.60m in width to the east. It continued to the eastern limit of excavation and may have been an earlier ditch on the same alignment, which had gradually moved to the north with successive recuts. Finds from this phase of ditch were remarkably few in number; no medieval pottery or other artefacts were recovered, and only thirteen sherds of Roman pottery and a few fragments of Roman tile were retrieved from the ditch, which extended for a length of at least 23m across the site.

To the north of the site beyond the northern east–west aligned ditch, the remnants of a further system of similarly aligned ditches was observed. At the extreme north of the site a ditch [1135] at least 0.60m wide, which continued beyond the northern limits of excavation, was revealed. To the south of this a rather meandering line of roughly east–west aligned cuts was observed for a length of 16.85m, which seemed to be subject to different phases of silting up and recutting. The meandering nature of the feature suggests that it was a natural stream channel that had been modified at the east and west. A narrow, shallow north–south aligned feature apparently feeding the large east–west ditch to the south may also be the remains of a natural stream.

Discussion of the ditch network

The system of ditches was laid out during the 13th and 14th centuries. A series of similarly dated east–west

aligned bedding trenches revealed to the north at Finsbury Pavement (Malcolm 1997, 37–38) shows that agricultural exploitation of the marshland was occurring at that time across large areas of Moorfields. However, the ditches identified at Moor House represent a very different exploitation of the land. The apparent original layout which is slightly complicated by earlier and later phases of ditch excavation, appear to consist of two large east–west aligned ditches to north and south with a regularly laid out series of north–south aligned narrow ditches between the two. The ditch to the north and to a lesser extent that at the south appears to utilise existing natural streams present on the site since Roman times (*see* above). To the east and west ends of the site it seems likely that the network was completed by two larger north–south ditches, although the evidence of that at the west is tentative. The large north–south ditch to the east linked the whole system to the City ditch to the south. The presence of a series of stakes suggests that at least one phase of this part of the ditch system was revetted. This may be associated with the wooden cart wheel hub which may originally have formed a primitive trap to prevent debris from the City ditch entering the system of ditches.

There is a degree of sophistication in the construction of the network and it appears to have had an agricultural purpose; the ditches which were in places cut into the natural sands below would have drained the land. The strips of land between the centre of each ditch were *c.* 5m (*c.* 16ft) wide which is the same as the standard parcel of land allotted in towns to properties: the rod or the pole. It is documented that in 1415 the Moor be 'allotted and divided into different gardens, as well as the common advantage' (Riley 1868, 614), although it would appear, albeit from the very limited dating material that was recovered from the network of trenches, that it was laid out a century or so earlier. The drainage ditches suggest that some crop was being grown in the strips of land between them. No evidence of bedding trenches was observed on the site, however only the lowest part of the marsh deposits survived on the site and any such trenches may have occurred at a higher level. However, the system as well as draining the land could also be a way of manipulating the natural water courses for other agricultural purposes. The system is very similar in appearance to the network of channels in the water meadows of Salisbury and the southwest of England (Fig. 47). There water was channelled by an artificially cut carrier from the river and into a series of ditches known as 'drawns' which artificially flooded the land, excess water was drained off in a similar system of ditches back to the river (Atwood 1963, 404–405). This system had the function of protecting the meadows during the winter and early spring from frost and provided insulation and sedimentary deposition from the river. This main purpose of the water meadows was to provide early crops of grass for sheep and greater production of hay (Cowan 1982b, 179; Atwood 1963, 405; Rackham 2000, 338–339). Although the main development of this system seemed to have occurred in the 17th century (Cowan

Fig. 47 The Salisbury water meadows, illustrating the type of water-management system in use at the site

1982a), there may be traces of water meadows dating from Roman times on the Hampshire Avon and Gloucestershire Churn (Atwood 1963, 410) and they are known from the medieval period.

The water meadows are largely confined to the chalk areas of southern Britain; however, the system of drainage at Moor House appears similar in many ways. The water was fed by the spring line to the north at the southern edge of the Third Gravel Terrace which also fed many of the smaller tributaries of the Walbrook (Maloney with de Moulins 1990, 1), probably flowing via a series of ditches into the main channel at the north of the site and from there to the smaller ditches. These ditches could then have flooded the land when the volume of water was sufficient. These ditches could also fulfil the purpose of removing excess water and draining it towards the east–west ditch to the south, which then channelled it towards the City ditch. If this manipulation of water was to be successfully engineered a system of sluices would be needed to control the flow of water. Only very tentative evidence for such management can be seen in the southeast corner with the stakes and wheel hub and with the concentration of postholes to the west and north. The network of ditches may therefore, as in Wiltshire, have been constructed to produce early crops of grass and hay for sheep.

Environmental analysis of the fills of the northern east–west aligned ditch [194] provided evidence for the presence of three broad plant habitats; damp ground or wetland which was attested by the presence of species such as alder, polypody fern, meadowsweet, bedstraw, sedge, reedmace, bur-reed, horsetail, water dropwort and *Botrycoccus* algae; cultivated ground supported by the presence of cereals such as wheat and barley, grass, ribwort plantain and cornflower; and waste land and grassland denoted by the presence of grass, cow wheat, docks, sorrels, clover, dandelion, species of the carrot family, mugwort, black knapweed, fat hen and thistle. The environmental evidence appears to support the hypothesis that the ditch network was utilised to produce early pasture (grassland) for animals and perhaps also to cultivate crops.

Evidence of similar large ditches on an east–west alignment were revealed to the north at 143–171 Moorgate. These ditches were of between 1.60m and 1.95m wide, had silted up naturally and had been recut on a number of occasions (Shotliff 1990). Collectively the evidence suggests that the entire marsh, or at least the western part of it, was crossed by a network of drainage ditches, which, as the documentary evidence attests, were subject to periodic bouts of maintenance (*see* above). There is also evidence of cultivation to the north at the Finsbury Island site where a series of bedding trenches dating to 1250–1450 suggest the cultivation of a crop (Malcolm 1997, 38).

Other evidence of utilisation of the area in the medieval period was scanty and consisted of a series of pits across the site apparently dug through the marsh or the gravel deposit into the brickearth and sand deposits below, which may represent very limited quarrying. Finds from these features were sparse and generally consisted of residual Roman artefacts. Quarrying for brickearth is known from the Moor in the medieval period. It is recorded that the City wall between Aldgate and Aldersgate was repaired by the mayor, Ralph Joceline, in 1477 utilising clay from Moorfields for the bricks (Stow 1994, 388). Archaeological evidence for brickearth quarrying has also been found during investigations at 25–32 Chiswell Street (Maloney & Holroyd 2000, 50), 10–13 Dominion Street (Thompson *et al* 1998, 108), 129–139 Finsbury Pavement (Greenwood *et al* 1997, 47–48) and the Finsbury Island site (Malcolm 1997, 39). Although there is evidence of very limited quarrying during the medieval period it appears that at least the brickearth resource had been used up just outside the City walls during the Roman period and thus quarrying was confined to areas further to the north which were still to be exploited.

Fore Street

A sandy gravel deposit was revealed to the north of the City ditch along the southern part of the site (Fig. 37). It was heavily truncated by later pitting and ditches but was observed for a length of at least 22.50m and a maximum width of 11.80m. The deposit was cut by the medieval City ditch in Areas 1, 2 and 5. Finds from this deposit were exclusively 1st and 2nd century Roman, however, it was difficult to determine if these finds were residual or not. The deposit appeared to be a mixture of marsh organic silt and sandy gravel, suggesting it was a deliberately dumped deposit. It may have been part of an attempt to consolidate the marshy land immediately on the northern edge of the City ditch. Alternatively it may have the base of a causeway or foundation of a road parallel to the City ditch. It is known that Fore Street occupied this situation from medieval times and it is possible that the gravel represents the base of a raised causeway for that road.

PHASE 10: POST-MEDIEVAL FEATURES

Post-medieval recuts of the City ditch

In Area 2 a series of three late medieval or possibly early post-medieval recuts of the City ditch were revealed to the south. The earliest ditch in this sequence [1846] survived to a width of 3.30m north–south and a length of 4.30m east–west and was 0.86m deep (Fig. 38). It had a series of stakeholes along its northern edge suggesting that the ditch may have been protected or delineated by a fence. The vast majority of the 77 sherds of pottery from this ditch was dated to the 14th century, whereas the small number of leather shoes which were recovered from the fills together with a circular panel of a leather ball, were of later medieval date. However, one sherd of Raeren pottery dated to 1480–1550 suggests an early post-medieval date for the recut, though this single sherd may be intrusive. A section of collapsed basketry consisting of fragments of a flat panel from a rectangular basket or pannier constructed from cleft

oak laths and small willow rods was found within the fills of this ditch. No finds were retrieved from ditch cut [1816], the eastern side of which was recorded just within the excavation area. It appears to have been orientated roughly northwest–southeast and may represent the remains of a drainage ditch draining water into the City ditch from the marsh to the north.

The apparently final recut of the City ditch in this area [1814] had a steeply cut southern side and a flat base. It was only observed at the southernmost point of Area 2 and measured a maximum of 1m wide by 1.5m long and up to 0.60m deep. It contained one sherd of green-glazed Surrey-Hampshire border ware dated 1550–1700 and two fragments of post-medieval redware, which suggest a date of 1580–1600 for the backfilling of the ditch.

The apparent last phase of the City ditch was sealed by up to 0.45m of dumped deposits, although since these deposits were only observed in an area almost entirely covered by the City ditch, it was not possible to determine with any degree of certainty whether these were indeed later dumping within the area or the backfill of a shallower wider ditch that extended further to the north than any previous ditch observed on the site. These deposits contained a great deal of residual medieval pottery of 14th- and 15th-century date, with six sherds dated to the late 16th to 17th century, and these might therefore represent the fill of a late 16th-century ditch or 16th- and 17th-century levelling and raising of the ground.

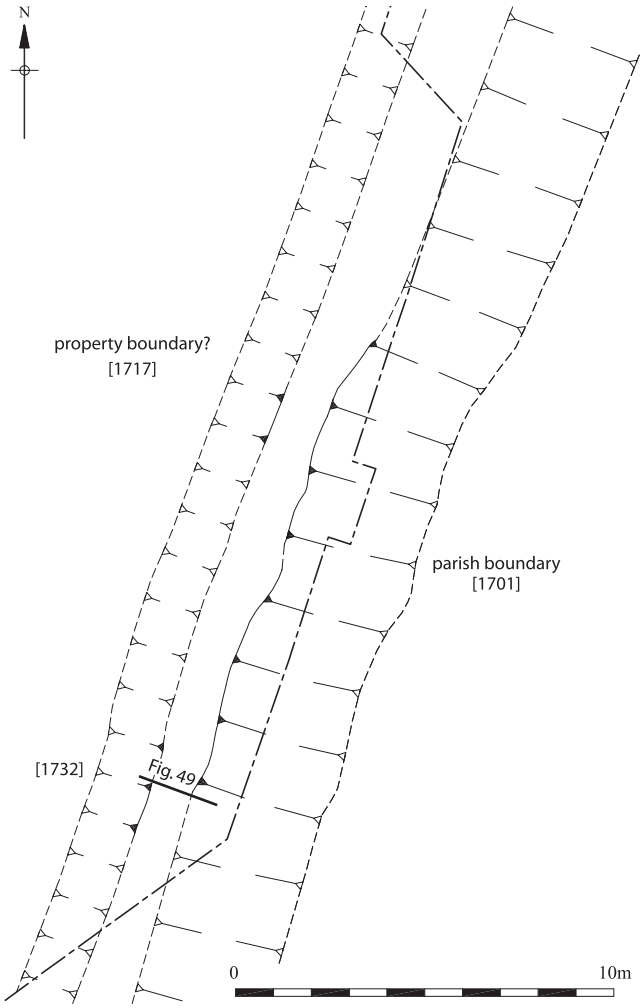


Fig. 48 Phase 9, the latest phases of the parish boundary ditch (scale 1:200)

Parish ditch

In Area 3, on the eastern periphery of the site, the archaeological deposits survived to a greater height than elsewhere (with the exception of Area 2 which was outside the footprint of the underground car park and thus suffered less truncation from above). In this area a series of post-medieval north–south aligned ditches were observed. The earliest ditch [1763] ran the length of the area and measured at least 17m long by 2.3m wide and survived to a depth of 0.57m. The western edge was truncated by the eastern wall of the underground car park and its eastern side showed a gradual slope with the base of the feature just observed on the eastern limit of excavation. This indicates that the ditch was a wide shallow feature measuring 4.50–5.00m in width. It was backfilled with a number of dark grey brown waterlain silt deposits, demonstrating that the ditch was filled with water and gradually silted up over time. Most of the pottery recovered from the fills was 15th century in date, however, two of the fills contained nine sherds of early post-medieval redware dating to 1480–1600 and a sherd of green glazed Surrey-Hampshire border ware which dates to after 1550. If the stray sherd of borderware is considered intrusive it may suggest that the ditch was originally dug in the 15th century and silted up in the late 15th/early 16th century.

The ditch was then recut on four occasions with the western edge of the cut moving a little to the east each time (Figs. 48, 49). The first recut was observed along the length

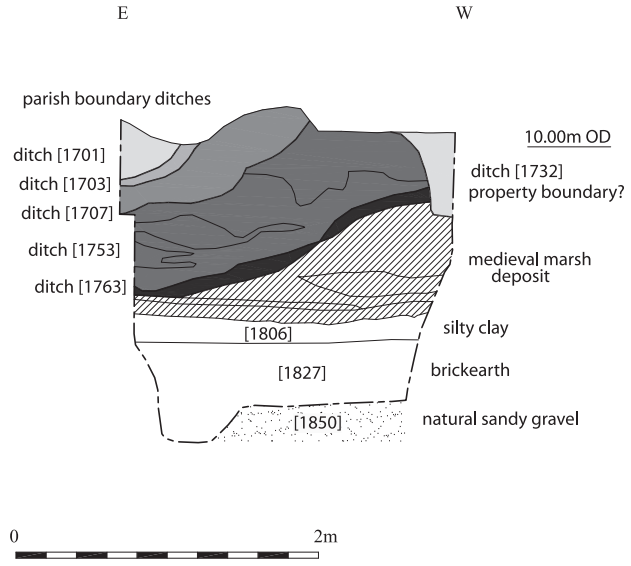


Fig. 49 Section 4, across the parish ditches (scale 1:50)

of the area, but the successive three were only revealed along the eastern edge in the southern part of the trench. The first recut was also filled with waterlain silt deposits, which contained lenses of twigs and pieces of sawn oak planks, which may have been parts of revetment planking which once lined the ditch. This ditch was filled with an interesting assemblage of finds. The animal bone indicated food waste of exceptional quality, variety and richness with a high proportion of calf and lamb as well as bones of fowl and goose, heron, swan, fallow deer, cod and ling. Swan and heron would have been expensive luxuries and together with the the other bones suggests a food waste from a wealthy table. It may represent the waste from a high class tavern in the vicinity of Moor Gate or may perhaps more likely be the waste from a wealthy guild establishment such as the Armourers' Hall, which had leased a plot in Coleman Street just to the south of the site within the City walls since at least 1346 (Weinreb & Hibbert 1983, 25). A quantity of leather shoes of turnshoe construction mostly dated to the first half of the 15th century and a smaller assemblage of leather waste was recovered from this ditch. A wooden shovel blade which had been repaired with iron staples was among the discarded items in this recut (Fig. 50). Also recovered from one of the fills of this first recut was a piece of slate, originally rectangular or square in shape, which had been inscribed with a 'Solomon's knot' formed of two multi-strand loops and a Latin cross formed of five two-strand 'swastikas' over a grid of compass points (*see* Figs. 95, 96). It could represent a Late Saxon/Viking period motif-piece, a medieval piece of graffito or perhaps even the lid of a reliquary (*see* Gaimster, this volume, Chapter 6). It is interesting to speculate that the early to mid 16th-century date for the recut ditch might suggest that the inscribed slate might be from a reliquary which was removed from a church or monastery and destroyed during the Reformation initiated by Thomas Cromwell in the reign of Henry VIII.

Further waterlain silt deposits were observed in a watching brief on a sewer connection immediately to the east of Area 3. They were also dated to the 16th century and contained a large assemblage of leather consisting of shoes and cobbling waste dating to the late 15th to early 16th century (Richardson 2004). A tablet-woven band made of silk which was probably used as a trim on furniture such as a bed or a carriage was also found within these fills (*see* Walton Rogers, this volume, Chapter 6). These deposits are most likely part of the latest recut of the ditch observed in Area 3 to the west.

Fig. 50 Excavating the timber shovel

The eastern edge of one final ditch was revealed in the southern and central parts of the area and the remains of timber stakes along its edge suggest that it had been revetted. No datable artefacts were recovered from the fills but a 16th-century date is probable. This may represent a post-medieval recut of the series of north–south aligned medieval ditches, which were observed along the eastern side of Area 5 (*see* above).

The original ditch and recuts were all dated to the 16th century with a possible mid 16th-century date for the ditch eventually falling into disuse. However, there was a great deal of apparently residual material within the ditch fills, both pottery dating to the 13th, 14th and 15th centuries (157 out of 231 sherds) and a large assemblage of 15th century leather. This might indicate that the recutting of the ditch was disturbing earlier fills and thus that the original ditch was medieval in date.

This system of large north–south ditches continually recut over time suggests that this was either a major hub of the network of drainage ditches or that it represented a major boundary. The parish boundary between St. Giles Cripplegate and St. Stephen's is shown on the Ogilby and Morgan map in this location (*see* Fig. 52). The large medieval ditch with its recuts which was observed on the eastern side of Area 5 immediately to the west of Area 3 might suggest that this boundary/drainage ditch had a long history and gradually migrated to the east over its life. However, the revetted ditch on the western side of Area 3 indicates that there may even have been a double ditch system at the end of its life. There is no sign of the ditch on the any of the mid 16th century maps of London (Copperplate, Agas or Braun and Hogenberg) which together with the pottery recovered from the latest fills of the ditch suggests it had gone out of use by the middle of the 16th century.

Dumping and consolidation of the ground

The last phase of the City ditch observed was sealed by up to 0.45m of dumped deposits. These deposits, which probably represent deliberate dumping to prepare the ground for development during the expansion of the City northwards once the marsh was drained from the 16th century, contained 119 sherds of residual medieval pottery, but six sherds were dated to the late 16th to 17th century.

During the watching brief on a sewer connection, immediately to the east of Area 3, a series of dumped deposits which sealed the top of the large north–south ditch was observed. They consisted of six alternating dumps of silt and demolition rubble, which raised the ground level by *c.* 2.10m. Dating material was scarce, but points to a 16th-century date for this activity and this suggests

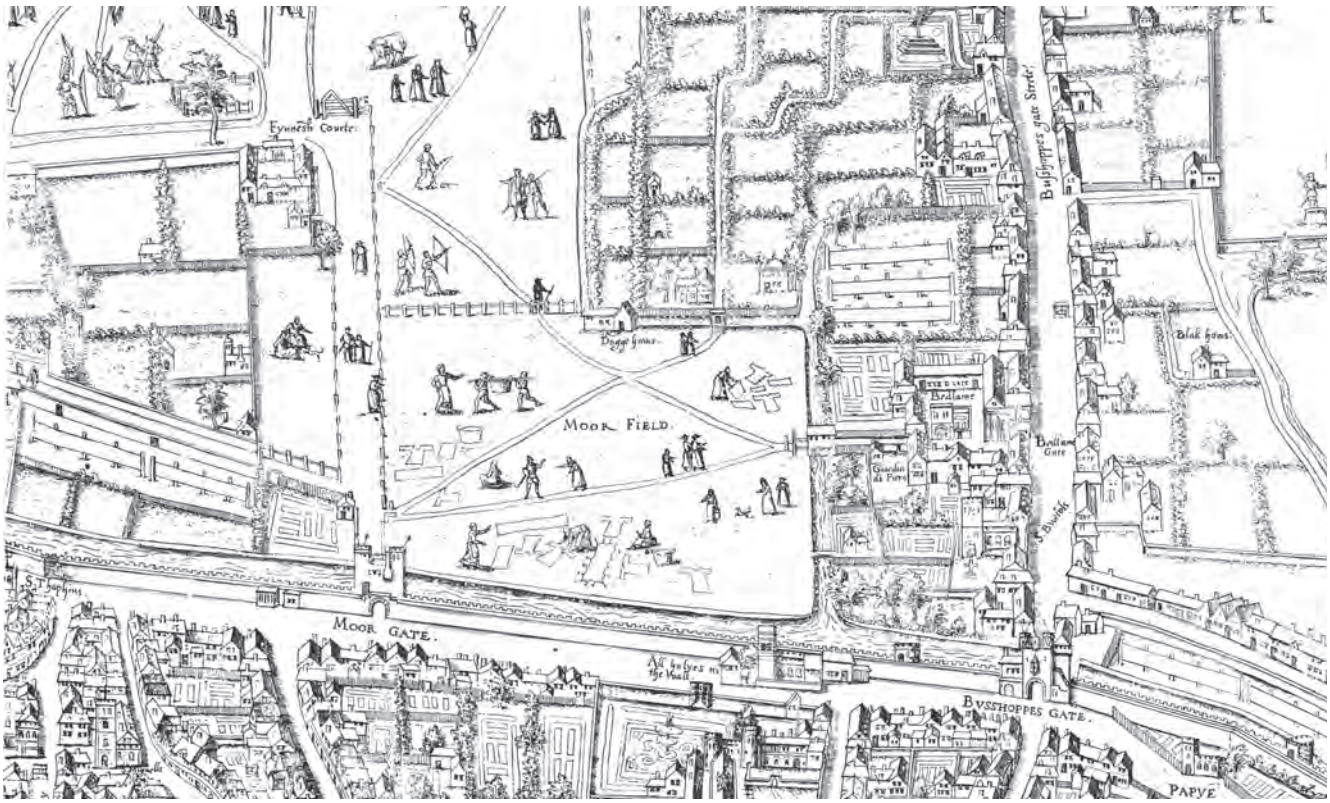


Fig. 51 The Copperplate map, 1559 (not to scale)

a slightly earlier levelling of the ground in this area than in the former location of the City ditch. The evidence of the dumped deposits at 143–171 Moorgate to the north demonstrates that the organised dumping of the area began on the western side of the marsh and continued across to the east (Shotliff 1990, 85).

The dumping and raising the level of the ground in order to mitigate the effects of the waterlogged marsh was a long and intermittent process. At the Finsbury Island site dumping of at least 0.30m of brickearth across the site was dated by a very few sherds of pottery to the period 1150–1350 and it was suggested that it was the product of the excavation of the medieval City ditch from 1211. Further brickearth dumping was dated to the late 14th–mid 15th century (Malcolm 1997, 37–38), and a final large scale dumping up to 4m thick was dated to the 16th–18th centuries (Malcolm 1997, 42). Later medieval dumping was revealed at 12–15 Finsbury Circus (Schofield with Maloney 1998, 268) and medieval and post-medieval dumps were observed at 7–11 Finsbury Circus (Schofield with Maloney 1998, 257). Post-medieval land reclamation was also observed at 10–13 Dominion Street (Thompson *et al* 1998, 108), 25–32 Chiswell Street (Maloney & Holroyd 2000, 50) and at the Honourable Artillery Company Sports Ground where up to 1m of 17th-century dumps were recorded (Philp 1996, 76–78).

Building development on the former Moor, 16th–17th century

Sixteenth-century maps such as the Coppergate map of *c.* 1559 (Fig. 51), the Agas map of *c.* 1562 and Braun & Hogenberg published in 1572 (based on a survey *c.* 1550) show the area as still largely unbuilt upon with the area laid out to gardens and used as tenter grounds. The surviving documentary evidence supports the cartographic evidence. Of the fourteen surviving 16th-century leases recorded for Moorfield, four are recorded for use as gardens whilst others are for pasture. One of 1534 mentions a parcel of common land between Moorgate and Cripplegate where 'tentors have been set', whilst one of 1585 mentions the use of land for the use of clothworkers and another lease granted to John Achley allowed him to let citizens to dry their clothes on his land. In the area to the west occupied by roads such as Grub Street and Whitecross Street a large proportion of the leases in the second half of the 16th century were for clothworkers and widows who may have used garden plots to supplement their income by cultivation of fruit, vegetables and medicinal herbs or the drying of washing (Levy 1990, 90–91). By the second half of the 17th century maps, such as Faithorne & Newcourt 1658, Leake & Hollar 1667 and Ogilby & Morgan 1676 (Fig. 52) show that the area has been completely built upon. At Moor House evidence of the widespread building upon the reclaimed area of the former Moor was largely represented by a series of seven barrel wells, two brick lined wells, a timber lined cesspit and rubbish pits which were observed

Fig. 52 The Ogilby and Morgan map 1676 (scale 1:2,000)

across the site.

In Area 1 a barrel well [119] was observed in the central part of the site. It measured 0.64m in diameter and survived to a depth of 0.75m (Fig. 53). The timber staves, which measured 100–110mm wide, were very poorly preserved and survived to a thickness of *c.* 10mm. The well was backfilled with a large quantity of pottery wasters dating to the late 16th century (*see* Sudds, this volume, Chapter 6). Barrel well [701] was observed in the central part of the site to the northeast of well [119] (Fig. 54). It survived to a height of 0.44m with a maximum diameter of 0.65m tapering to 0.58m at its base. The staves were better preserved, they varied in width between 70–105mm and in thickness between 10–15mm and were secured on the outside by *c.* 24 hoops of staved rods measuring 0.45m high secured together by 5mm thick binding. The well backfill was dated to the late 16th century by the presence of early post-medieval redware. Of the assemblage of 173 sherds (41 vessels) 122 sherds are from an early post-medieval redware watering pot, probably accidentally dropped down the well whilst it was being filled (Fig. 65.1).

In the southeast part of the site a barrel well [858] was observed which was heavily truncated from above and by modern services to the north and east. Only one stave survived measuring 310mm by 95mm by 5mm with the

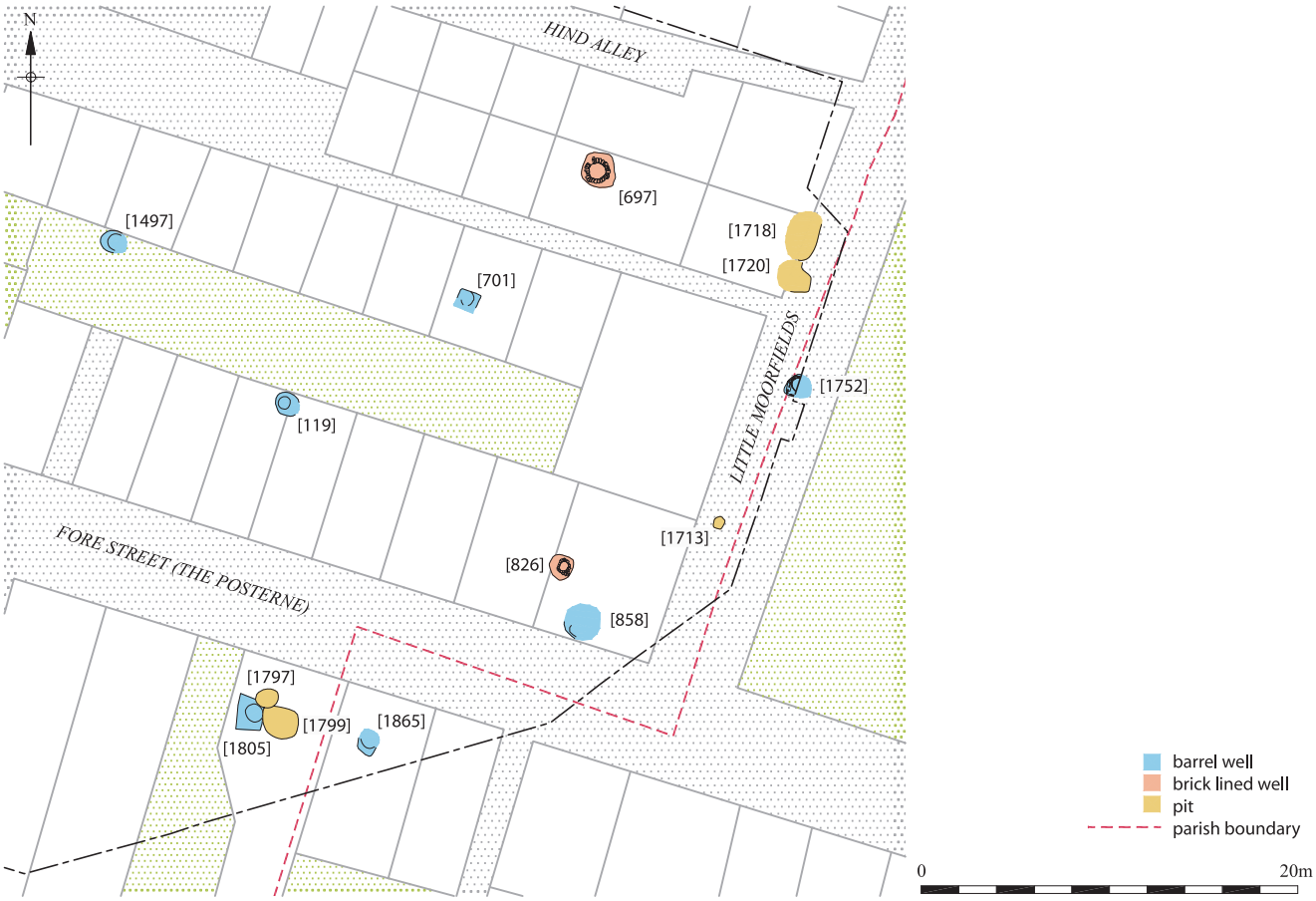


Fig. 53 Phase 10, post-medieval wells and pits in relation to buildings shown on Ogilby and Morgan, 1676 (scale 1:400)

Fig. 54 Barrel well [701]

Fig. 55 Barrel well [1805]

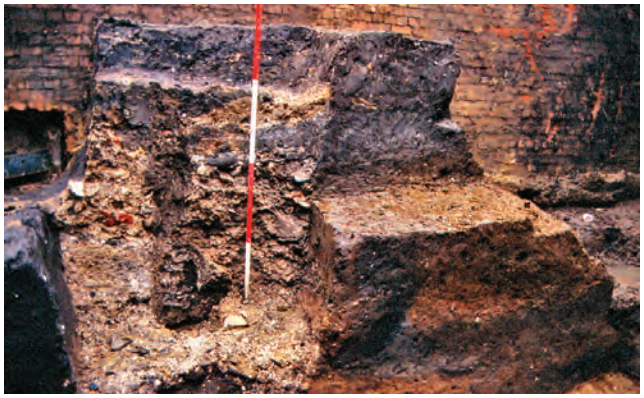


Fig. 56 Barrel well [1805], showing borehole penetrating through fills

Fig. 57 Brick-lined well [826]

Fig. 58 Timber base plate of well [826]

impression of others visible for a width of some 0.50m. Only residual Roman pottery was recovered from its construction cut. To the northeast of well [858] the vestiges of another barrel well [1750] was revealed in Area 2 on the extreme eastern edge of the site. The hoops of the barrel survived measuring 0.74m in diameter but the staves had either been removed or had decayed. The backfill was dated to the 16th century.

In Area 2 to the south of the site two further barrel wells were recorded. The impression of a barrel [1805] with no vestiges of wood surviving was observed within a rectangular cut (Figs. 55, 56). The impression of the barrel measured 1.00m in diameter by 2.18m deep. To the east another poorly preserved barrel well [1865] was revealed truncated to the north by a modern cut but surviving to a depth of 0.49m and measuring up to 0.84m in diameter. The chalk rubble, mortar and possible cessy backfills of well [1805] contained 164 sherds of pottery from 63 vessels (eg Figs. 65.2, 65.3, 65.5, 65.7, 65.12, 66, 72.2, 72.4) the latest dating to the first half of the 17th century (1630-1650), a similar date to the backfill of well [1865]. A final barrel well [1497] was excavated in the western part of the site in Area 6. Only staining remained of the barrel, which measured 0.92m in diameter by 0.32m high. The barrel originally rested on chalk packing in the base, which perhaps represented an attempt to filter the water. The backfill of the construction cut was dated to the first half of the 17th century.

Two brick-lined wells were recorded in the eastern part of the site in Area 5. The larger well to the north [671] measured 1.45m in diameter (0.84m internally) and survived to a depth of 0.59m. It was constructed from mainly re-used brick bats and rested on the remains of a timber base plate which had decayed to little more than dust. The pottery from the backfill of the well was dated to the second half of the 16th century, however a clay pipe bowl was dated to 1660–1680. In the southeast corner of the site a small brick-lined well [826], measuring 0.80m by 0.70m by 0.66m deep (0.55m by 0.46m internally), was revealed (Fig. 57). This too was constructed from re-used brick bats which rested on a timber base plate constructed from four crudely cut elm planks nailed together to form a rough oval (Fig. 58). The fill of this small structure contained 206 large fragments from nineteen mid 17th-century pottery vessels, three of which, including a dish with slip-trailed decoration (Figs. 68, 74) (see Sudds, this volume, Chapter 6), are wasters or seconds. The proportion of vessels associated with the storage and consumption of drink, both of glass (three) and pottery (eleven jugs, tygs, a tankard and a mug; eg Figs. 65.4, 65.8, 65.10, 65.11, 67, 72.1, 87.1) suggests that the well was associated with an inn. A wooden tuning peg and leather bucket were also found within the well fill; the latter, like the watering pot in well [701], may have been dropped down accidentally while trying to fill it.

In Area 2 to the south of the site and Area 3 to the east several other post-medieval features were observed in addition to the barrel wells. To the north of Area 2 two pits were revealed. The larger, shallow, pit [1799] measured 1.63m by 1.83m by 0.26m deep and had the remains of a wood lining, the smaller [1797] was filled with building rubble and measured 1.24m by 1.00m by 0.57m deep. The wood-lined pit may have been a cesspit although no obviously cessy fills were identified. Both these pits were dated to the first half of the 17th century. In Area 3 to the east two rubbish pits [1718] & [1720] were excavated to the north, whilst the truncated remains of a small pit [1713] was observed to the south. These three pits contained only residual medieval pottery.

Discussion

The Copperplate, Agas and Braun and Hogenberg maps show the area immediately outside the walls in the vicinity of the site as laid out to gardens and fields with only two buildings. One is depicted to the northwest of Moorgate, the other further northwest and immediately to the west of the open ground later known as Little Moorfields. Because of the truncation caused by the construction of the car park and tower only deeply cut post-medieval features survived. The only evidence of the building development in the area was provided by wells and cesspits. There was little dating evidence for the construction of any of these features as the majority of the finds were residual, however the two barrel wells to the south and west of the area were constructed at the earliest in the late 16th century. All the wells were backfilled and went into disuse between the end of the 16th century and the middle of the 17th century. The Norden map of 1593 (Fig. 35) shows the area to the south of Fore Street still occupied by tenter fields and the area to the north still only sparsely occupied with the occasional building. The area to the south of Fore Street is still open and appears to be within a walled garden on the Faithorne and Newcourt map of 1658 although the topographical accuracy of this map has been doubted (Barker & Jackson 1990, 29). Leake's map of 1667 shows the area south of Fore Street as occupied by houses fronting the road with gardens laid out behind and to the west in the immediate location of the site. The presence of field mouse bones from one of the wells to the north of Fore Street suggest that there were gardens with areas of grassland and vegetation present in the 17th century. However, the accuracy of this map may also be doubted as there is a discrepancy between it and the Ogilby and Morgan map of 1676 in their depiction of the strip of ground known as Little Moorfields on the west side of the road leading out from Moorgate. The earlier shows it occupied by houses and gardens on its eastern side, the later as still open land. In any case by 1676 the site is completely occupied by houses. The archaeological evidence largely supports the map evidence with the first houses, as represented by the wells, having been constructed in the late 16th and first half of the 17th century.

The pottery from wells [1805] and [826] in the southern part of the site, which contained a quantity of drinking vessels, the latter together with fragments of ale glasses (*see* Cool, this volume, Chapter 6) and a tuning peg from a

musical instrument, might suggest the presence of taverns or inns on the site. However, it is possible that these vessels could also be of domestic use or might derive from one of the Livery Halls nearby, such as the Armourers' to the south. The presence of finely made clay tobacco pipes from the former well dating to between 1610–1640, a period when tobacco was expensive, perhaps confirmed by the lack of such assemblages on sites, indicates that they derive either from a tavern with affluent clientele or from one of the Livery Halls. A wooden tuning peg recovered from well [826] may have come from a cittern, a wire-strung plucked instrument that may have been played in a place of entertainment, such as an inn, but was also associated with barber shops (*see* Palmer, this volume, Chapter 6). The presence of small alleys and courtyards is shown on the Ogilby and Morgan map of 1676, many of which are apparently named after inns within them. In the northern part of the site were two small alleyways one of which was named Hind Alley (e 34) with Half Moon Alley (d 24), Harts Horn Alley (d 22) and Angel Alley (d 23) lying immediately beyond the site to the north. Many of these same small lanes and courts are still present on the Rocque map of 1746 where they carry such names as White Horse Court, Half Moon Alley and Blue Boar Street which confirm the continued presence of inns in the area.

Pottery manufacture

Barrel well [119] was backfilled with over 1,200 sherds of pottery wasters. The wasters are in both earlier and later post-medieval redware fabrics and indicate a date of *c.* 1580–1600, representing a period of transition between the two traditions (*see* Sudds, this volume, Chapter 6). A large number of peg tile fragments recovered from the same barrel well exhibited signs of lead-glaze residue and stacking scars which provides evidence of their use as kiln spacers (*see* Brown, this volume, Chapter 6). These tile kiln spacers together with the presence of so many wasters within the backfill of the well and the rarity of any other material demonstrates that there was a pottery kiln operating in the near vicinity. Indeed several fragments of brick showed evidence of heating with vitrified faces and in a small number of cases fragments of tile spacers were vitrified and fused onto the bricks. These bricks may, therefore, represent part of the kiln structure itself.

In addition a small group of redware wasters and seconds (semi-complete jug, dish and jar forms) were recovered from the backfills of two wells and a pit dated to the first half of the 17th century. These show that pottery manufacture was still occurring on or near the site well into the 17th century. Chemical analysis of the seconds revealed that the same clay source had been used for both the earlier and later wasters. Furthermore as the clays contained organics that may have derived from rotting vegetation from the Moor and they both contain brickearth, they are likely to be local (*see* Vince, this volume, Chapter 6). The pottery forms recovered represent the production of drinking and kitchen wares together with a smaller proportion of industrial wares.

Another indication of pottery manufacture on site was provided by the results of chemical analysis of the fills of a large pit utilised for leather manufacture that demonstrated raised levels of copper (Cu) and lead (Pb) which may be residues associated with pottery glazes which have leeched through the earth into the earlier medieval feature.

Pottery-making at Moorfields

Jeremy Haslam

There is some documentary evidence for the existence of pottery-making at Moorfields which go some way to putting the archaeological evidence of the pottery wasters of the later 16th century from Moor House in their historical context. The Moor had long been used as a source of clay, since Stow records the manufacture of bricks for repairing the City wall in 1477, together with lime-burning with chalk brought from Kent (Stow 1994, 41–42).

A significant reference to pottery-making at Moorfields is that by Stow, who records at Postern Lane (the east end of Fore Street):

> at the east of which lane is a pot-maker's house, which house, with all the other gardens, houses, and alleys on that side of Moorfields, till ye come to a bridge and cow-house near unto Finsbury Court, is all of Criplegate Ward.
>
> (Stow 1994, 281)

This places the pot-house within the parish of St. Giles, rather than St. Stephen's. It is indeed marked on the plan accompanying Kingsford's edition of Stow as lying on the northern side of Fore Street in the corner and western side of a lane, which follows the parish boundary northwards. Although mentioned in the same sentence as a cowhouse, it was clearly distinctive enough in Stow's mind for him to refer to it as a marker on his descriptive tour around the ward (and parish) of Cripplegate, although of course it may well have been only recorded because it was at a corner in his perambulation. It is probable that this pottery establishment occupied a house fronting onto the west side of the north–south lane (modern Moorfields), which in the late 16th century was beginning to be developed with 'gardens, houses and alleys' (Stow 1994, 281). It is possible that this is the same detached house with a large garden that is marked on the Copperplate map of 1559, though from its position adjacent to the road leading northwards from Moor Gate (Moorgate), this would have been in St. Stephen's parish. It is also of some significance that the excavation on the site of Moor House, within the same corner of the modern parish as is shown on the medieval and early post-medieval parish boundaries, is also on the site of Stow's 'Pot-makers house'.

It can be reasonably suggested that Stow's 'Pot-makers house' was both the work place and dwelling of a potter named Richard Dyer, who came from Portugal (though from an English family) as a practising potter to 'London without Moregate' in 1568, a reference which at once places his work place at or very near the position of the house that Stow records. The choice of this area to set up a pottery must have been governed as much as any factor by the presence of clay nearby. In 1571 he was given an exclusive licence to make 'a kind of earthen pott to hold fyre', which licence was renewed in 1579 (Edwards 1974, 60). A Richard Dyer is recorded as living in Moore Lane in St. Giles Parish in the 1582 London Subsidy Roll (Lang 1993, 217). He died in 1586, though his residence was not stated. This must however have been in St. Giles parish, since the parish registers of St. Giles record not only the death of one of his servants in 1574, but also the successive baptism and burial of his son Richard under the 3rd and 4th of August 1577 (Edwards 1974, 60).

There is therefore good reason for suggesting that Richard Dyer, with his family as well as his 'servauntes and workemen', lived and worked at the Pot-makers house mentioned by Stow, which is possibly the house shown on the earlier Copperplate map (though the date of this is earlier than Richard's arrival in England). Furthermore, this identification seems to be strengthened by the dating of the waster group from the excavations to the same period in which he was working at Moorfields. Although Richard Dyer obtained a licence to make his 'fyre potts', there is no reason to suppose that that this was the only kind of pottery he made, and every reason for believing that the late 16th-century wasters found at Moor House are from Richard Dyer's pottery works, and that they are made from clay and sand that he must have dug from the Moorfields area.

Richard Dyer had spent some time in Spain and/or Portugal, where he learnt the craft of the potter, and the art of making 'earthen furnaces, earthen fire pots and earthen ovens, transportable'. When he came to London, however, his pottery production would undoubtedly have been influenced by the northern European traditions of ceramic styles, and like every commercial potter before and since he would probably have started to make wares in styles which were appropriate for the tastes of the local market. Although the fact of the renewal of his licence to make fire pots shows that this line of business was successful, it is doubtful whether this would have kept even a small commercial pottery going. As both a practical potter and an entrepreneur, there is therefore every probability that he would have hired assistants who were perhaps more experienced in making pottery in these styles than himself, while still reserving to himself his own speciality manufacture of fire pots and ovens. A number of Flemish potters are known to have been working in London at this time (Edwards 1974) and there must have been no shortage of skilled potters from amongst the many refugee craftsmen of the time. There is no indication as to whether this pot-house survived into the 17th century, after it was recorded by Stow. It seems most likely however that since the pottery-making concern was apparently started by Robert Dyer as a new business, it also probably died with him, though possibly kept on by his family for a while.

Post-medieval glass crucibles

Five crucible fragments were recovered from the backfill of an early 17th-century barrel well [1805] to the south of the site in Area 2. All the fragments were from very large crucibles with a diameter of *c.* 490–500mm and were 30mm thick. They all had green glassy deposits on both surfaces, with the base sherd having thick residues of greyish green glass (*see* Blackmore, this volume, Chapter 6). The evidence shows that they were used in the manufacture of glass and they might suggest that such activity was actually taking place on site. However, there are several other considerations which suggest not only that there was no glasshouse in the immediate vicinity, but also that the crucibles are likely to have been brought to the site as waste from the nearby glasshouse at Broad Street.

The presence of waste material from the putative Broad Street glasshouse on Moorfields would be hardly surprising. The disposal of the waste from a large glasshouse would have been a considerable problem. Each furnace at this period would have produced many tons of clinker and ash from burning some 450 tons of coal as fuel in a year (Godfrey 1975, 195). The operation of the furnaces, and here may have been more than one at Broad Street, would also have produced many tons of broken fire bricks from the sieges and other parts of the structure of the furnace, as well as broken or used crucibles, which had only a finite life. On-site disposal of all this material must after a time have become impossible. It would be surprising therefore if the problems of waste disposal from this glasshouse were not solved by the use of this material as hardcore, whether controlled or illicit, in the reclamation of the nearby marshy Moorfields, a process well documented since the 15th century (*see* above). It seems the most reasonable conclusion, therefore, that the crucibles from the excavated contexts in the Moor House site were derived from dumped deposits from the Broad Street glasshouse. These would have been turned over in the frequent land disturbances in the area, which in the early 17th century would have included much building work.

Building development of Moorfields

The City ditch appears on the three maps dating to the mid 16th century, the Copperplate of *c.* 1559, the Agas of *c.* 1562 and the Braun and Hogenberg of 1572. By 1553 the ditch between Newgate and Aldersgate had been vaulted over and in the next decades leases to properties in present day Fore Street and Houndsditch become more common suggesting that buildings were encroaching on the infilled City ditch. In 1576 William Boxe, an alderman, promised to maintain the banks of his garden beside the ditch between Cripplegate and Moorgate, and to skim the filth

off occasionally along its length. However, two years later he was found to be encroaching on it (Schofield 1993, 145); this indicates that by the second half of the 16th century the ditch was not as wide as it once had been with houses and gardens encroaching on its northern edge. Indeed on the Copperplate and Agas maps there seem to be gardens and tenter fields laid out between the ditch and Fore Street, which from the archaeological evidence appears to have run alongside the edge of the City ditch.

According to the map evidence the area outside Moorgate was still largely undeveloped by the mid 16th century. A few isolated buildings with gardens are shown to the west of the road leading from the gate. The Norden map of 1593 still appears to show the site largely unoccupied with the house and gardens on the junction of Fore Street and the main road leading from Moorgate (the gate) having disappeared. To the south of Fore Street tenter fields are still present and an open area by the wall suggests the continuing existence of the City ditch, although it is far from clear and the City ditch is much more clearly depicted between Cripplegate and Aldersgate. The buildings on Fore Street itself seem to have much the same layout as shown on previous maps with very little suggestion of urban expansion towards the east and the area of the site. Indeed, the only real difference between the Copperplate and the Norden map apart from the apparent greater detail and precision shown on the former, suggesting that the latter is no more than a poor copy in many respects, is the depiction of Moor Lane which seems little more than a hedgeline on the mid 16th-century maps but is taking shape on Norden's map with buildings fronting it. The London Subsidy Roll of 1582 records fourteen heads of household living in Moor Lane, twenty-one in Fore Street and fifteen in Grub Street suggesting that there was a similar density of buildings in each street by this time and that the urban expansion was spreading along Fore Street towards the site (Lang 1993, 216–217). This might lead one to doubt the accuracy of the depiction of the area by Norden as it does not seem to have changed much since the 1550s. Two maps of the 1640s, George Vertue's engraving of London's Civil War defences of *c.* 1643 and an anonymous map of *c.* 1645 show the area built up with houses either side of Fore Street but the later map shows an open area between the backs of the houses and the City wall and Little Moorfields is still unoccupied by buildings to the east of the site. By 1658 the Newcourt and Faithorne map shows the western side of the road leading from Moorgate to be completely developed with the exception of a small parcel of land between the road and the present site, bounded by later Little Moorfields (present day Moorfields). The area immediately outside the City wall is still shown to be open. The area survived the Great Fire of 1666 when refugees from the City camped out in the Moor and the fire is depicted in the Leake and Hollar map of 1667 as being halted by the City wall to the southwest of the site and just before the wall immediately to the south of the site where a few buildings survived on either side of the north end of Coleman Street. The area is completely built upon with no evidence of the former City ditch or even the large open space which occupied the area by the wall on previous maps and this picture is emphasised by the detailed Ogilby and Morgan map of 1676.

Late 17th/early 18th century building

To the south of the site in Area 2 the scanty remains of two brick floors one above the other with a bedding layer between were recorded (Fig. 59). No evidence of associated masonry walls was revealed. These represent evidence for the only surviving masonry buildings on site and were the remains of cellar floors. The bricks from the floor were in use between the late 17th century and early 19th century and the later floor's bedding layer contained a sherd of 17th- to 18th-century pottery and clay pipes dated to 1690–1710 and it is therefore possible that a rectangular brick lined cesspit [1794] measuring 1.70m by 1.30m by 0.15m deep, which was backfilled with material containing pottery dating to the period 1680–1720, may have been associated with one or both of them.

These cellar floors are the scanty remains of the buildings that covered the site by the last quarter of the 17th century, as depicted on the Ogilby and Morgan map of 1676. This building is shown to be located on the south side of Fore Street and to occupy an area immediately to the west of the parish boundary. To the west ran a narrow north–south aligned alley, which gave access to structures built against the outside of the City wall. The City defences were also modified at this time; Moorgate was rebuilt in 1672 with the gateway made higher so that the trained bands could march through it with their pikes upright (Fig. 60). By the time of Rocque's map of 1746 (Fig. 61) the alley

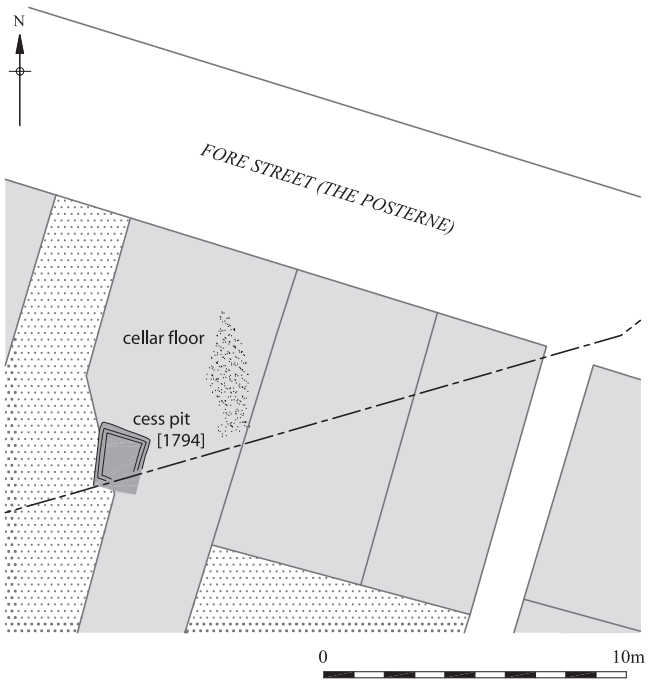


Fig. 59 Phase 10, detail of post-medieval building in relation to buildings shown on Ogilby and Morgan, 1674 (scale 1:250)

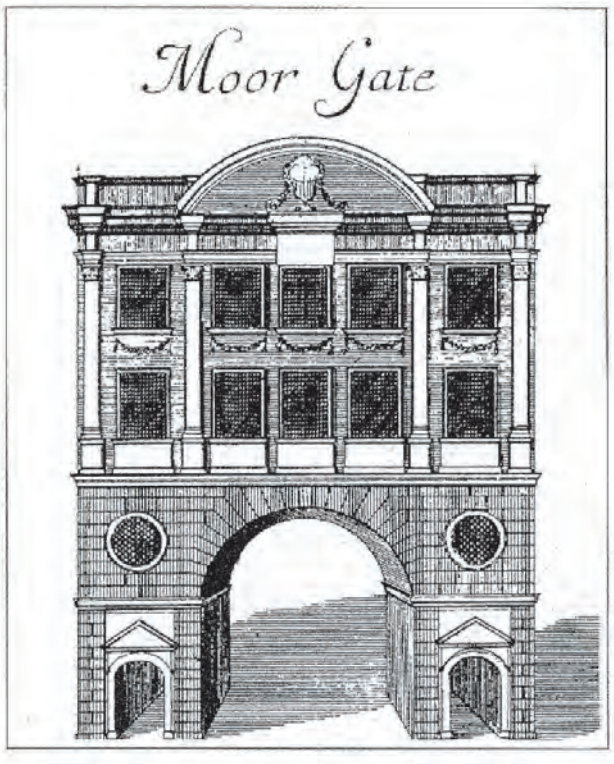


Fig. 60 Moorgate as rebuilt in 1672

to the west was known as Flamton Court and two alley ways to the north of Fore Street within the area of the site which were shown on the Ogilby and Morgan map were known as White Horse Court and Green Arbour Court. Moor Gate itself was demolished in 1762 and its stones used to prevent London Bridge being washed away by the tide (Weinreb & Hibbert 1983, 526–527).

19th/20th-century activity

The final phase of activity recorded on the site was a large 19th-century brick culvert which was revealed in Area 2 in the southeast corner of the site. It was truncated on its northern side by the construction cut for the underground car park. It measured 1.2m wide with an internal diameter of 0.75m and was traced for up to 10m in length aligned roughly east–west. To the east was an off-shoot aligned north–south measuring up to 3.4m in length, continuing beyond the southern limit of excavation. This culvert was part of the drainage/sewer system which previously underlay Fore Street with an off shoot leading towards Coleman Street. Fore Street originally continued eastwards to join with Moorgate (formerly Finsbury Pavement).

During the Victorian period the area was transformed (Fig. 62). Moorgate, the street, was laid out in the 1840s to give easier access to the new London Bridge (Weinreb & Hibbert 1983, 526–527). In 1865 the area to the north of the site changed drastically with the construction

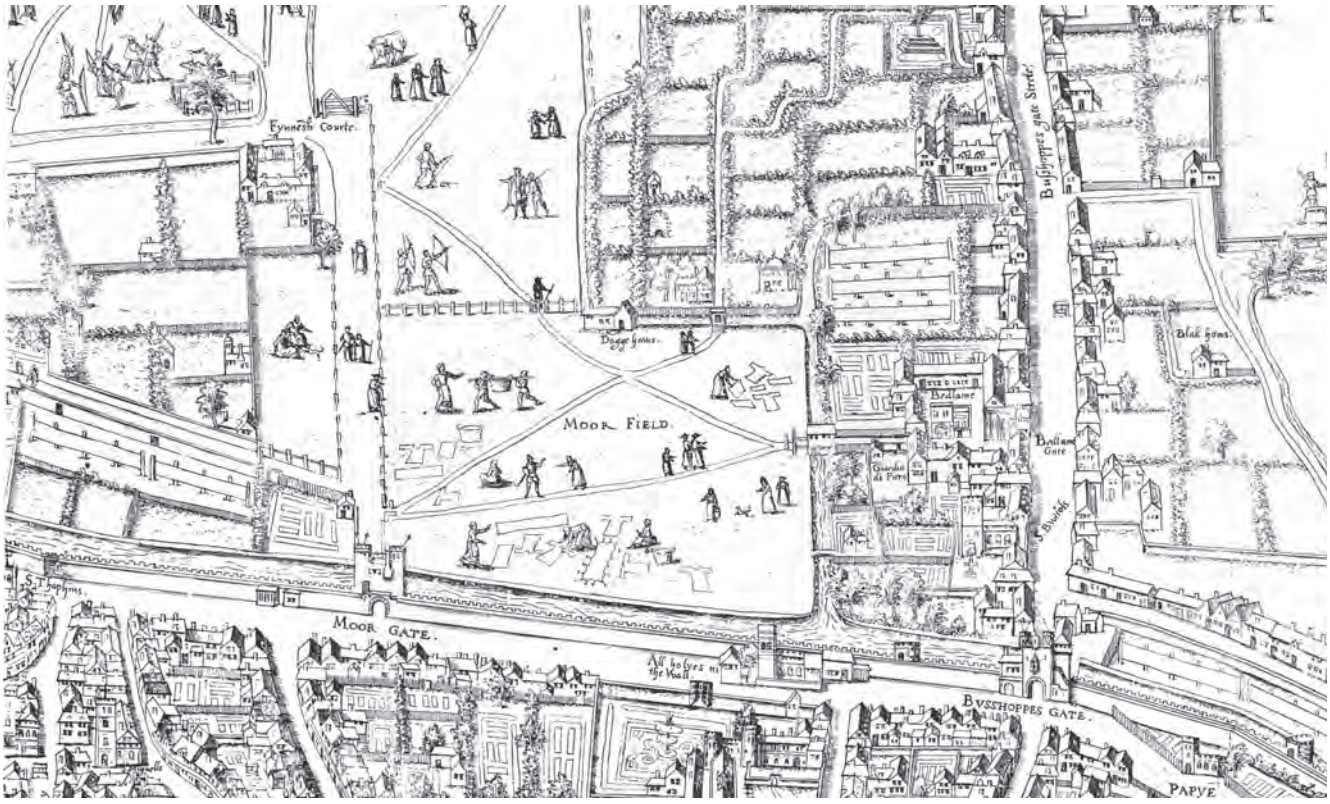


Fig. 61 The Rocque map, 1747 (not to scale)

of Moorgate Street Station as the terminus for the Metropolitan Line. The line was extended to Aldgate in 1876 (Weinreb & Hibbert 1983, 513). In 1885 there was a large scale clearance of the 'old wooden and disreputable looking houses' between Moorfields and Moor Lane, some of which may have been 16th or 17th century in origin. They were replaced by shops with office accommodation above. Following further slum clearance by the Corporation of London in 1888 Fore Street Avenue was constructed to replace Maidenhead Court and carry on to the south to join Fore Street (Baddeley 1921, 148).

During the Second World War this part of the City of London was heavily bombed with the area of the site being completely destroyed. The rebuilding of the area and the construction of the Barbican in the 1950s and 1960s led to a complete reorganisation of the road pattern with the enlargement of London Wall and the termination of Fore Street immediately to the west of the present site (*see* Fig. 3). Moor House itself was designed by Lewis Solomon, Kaye & Partners and, in 1961, was the first tall block to be constructed in the area. It consisted of an eighteen-storey tower with an underground car park and was 225 feet tall (*see* Fig. 2). However, its construction did not meet with architectural historian Nikolaus Pevsner's approval; he described it as 'a curtain-wall job, impressive chiefly because of its height – otherwise anonymous in design' (Pevsner 1973, 261). Its demolition in 2002 led to the opportunity for archaeological excavation.

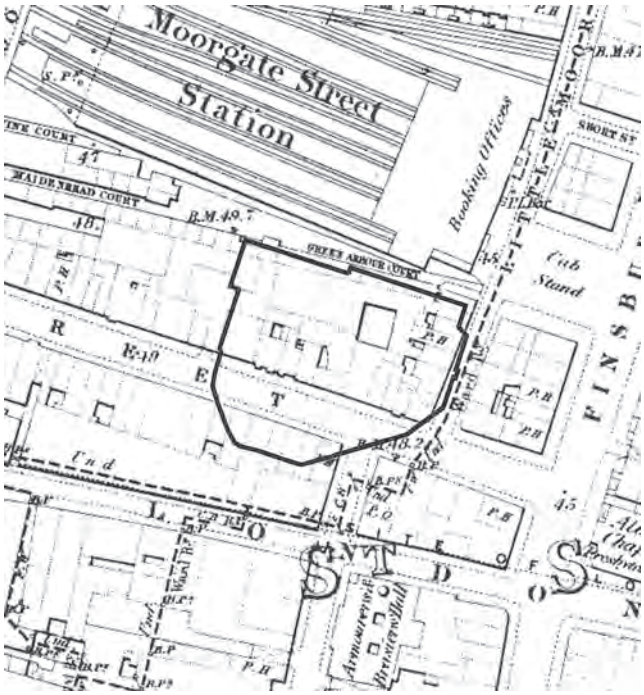


Fig. 62 The Ordnance Survey Map, 1873 (scale 1:2,000)

Fig. 63 Moorhouse, the new building

Chapter 6 Medieval and Post-Medieval Specialist Reports

THE MEDIEVAL AND POST-MEDIEVAL POTTERY

Lyn Blackmore

A large assemblage of pottery was recovered from the site (3,262 sherds, 1,373 ENV). Most sherds are in fairly good condition and medium to large in size, suggesting that they had not been subject to much redeposition. On the whole the individual context groups are small, but some of the feature groups are sizeable and that from barrel well [119] is exceptionally large. The pottery was examined macroscopically and using a binocular microscope (x20), and recorded using standard Museum of London codes (*see* Tables 10, 12). The bulk of the material was initially recorded by the author; additional sherds and the redwares from pit [119] were recorded by Berni Sudds. The database, which includes fabric, form, decoration, sherd count, estimated number of vessels (ENV) and stratigraphic information, is available for consultation in the site archive.

Medieval fabrics and forms

In all 1346 sherds (1050 ENV) were recorded as medieval (Table 10), of which the majority are from deposits assigned to Phase 9; however, a significant number are residual in Phase 10. The bulk of the collection falls into two groups dating to *c.* 1250–1350 and *c.* 1350–1500, the latter dominated by coarse Surrey-Hampshire border ware. The wares are summarised below in a broad chronological sequence and by industry.

Local and regional wares

Early medieval wares are only sparsely represented, amounting to 45 sherds of early medieval flint-tempered ware (EMFL), early medieval grog-tempered ware (EMGR), early medieval sandy ware (EMS), early medieval shell-tempered ware (EMSH), early medieval sand- and shell-tempered ware (EMSS), early Surrey ware (ESUR) and London-area greyware (LOGR) (Table 10; for fabric descriptions see Vince and Jenner 1991). Of these the most common is early Surrey ware (eighteen sherds). Most of these wares went out of use *c.* 1150, but the handmade local greyware may have continued in use until *c.* 1170. This ware is represented by up to fifteen sherds, among them a base sherd with rouletting just above the base angle from fill [1448] of the tanning pit [1452]. With the exception of one sherd from Phase 10, these finds are all from Phase 9.

London-type wares consisting of London-type ware (LOND), coarse London-type ware (LCOAR) and late London-type ware (LLON) (Pearce *et al* 1985) collectively total 298 sherds (242 ENV, *see* Table 10). These mainly range from the later 12th century to *c.* 1350 in date and are the second most common group after coarse Surrey-Hampshire border ware; London-type ware alone accounts for 272 sherds, or 20.2% of the total medieval sherds. Of these, less than 50 are from cooking vessels, including jars, four dripping dishes, two cauldrons, and the rim and handle of a pipkin [1848]. Jugs, by contrast, are common, with 207 sherds from up to 166 vessels. Early-style jugs, which went out of use *c.* 1200, are rare (eight sherds), and Rouen-style jugs, which came into use *c.* 1180, are represented by only ten sherds, but the contemporary North French-style jugs are more common (46 sherds, 31 ENV). Most are decorated with a white slip, green glaze, applied plain or rouletted strips and, in some cases, pellets (eg [1447]). The 13th-century forms include highly decorated and polychrome jugs (fourteen sherds, including Fig. 64.1), a possible pear-shaped jug decorated with rouletted strips and an applied scroll design ([1454], Fig. 64.2), and a spouted jug from [1857]. The latest forms comprise a range of plainer baluster jugs, one with a rilled neck ([1526], Fig. 64.3). Most of the London-type wares are from the Phase 9 east–west ditches (53 sherds), the tanning pit (66 sherds), and the different recuts of the City ditch (79 sherds).

South Hertfordshire-type greyware (SHER) and south Hertfordshire-type flint-tempered greyware (SHER FL) came into use *c.* 1170 and remained popular until *c.* 1350. They have been discussed elsewhere (Sheppard 1977; Havercroft & Turner-Rugg 1987; Salveson & Blackmore 1985; Turner-Rugg 1995) and have been the subject of a recent review (Pearce in prep, a). Here they amount to 225 sherds from 136 vessels (16.7% of the medieval sherds); most are from the large Phase 9 pit (141 sherds), and the best single group is from fill [1400], which contained 89 sherds from ten vessels. Of the sherds assigned a form type, only one is a jug. The others include two bowls (Fig. 64.4), a dish and two curfews. One of the latter, from fill [1400] of the tanning pit [1452] is represented by 33 sherds; the other, from the east–west ditch [970] has nicked decoration around the shoulder. Most sherds are from cooking pots/jars (107 ENV), one with a stabbed rim, another with a thumbed rim; many are sooted and/or contain residues. Ten have applied strips; they include a large jar with

				Phase 9		Phase 10		Grand total	
Fabric	*Expansion*	*Early date*	*Late date*	*Total sherds*	*% of sherds*	*Total sherds*	*% of sherds*	*Total sherds*	*% of sherds*
ALKG	Alkaline-glazed ware	1270	1450	-	-	-	-	1	0.1
ANDE	Andenne-type ware	1050	1200	-	-	1	0.3	1	0.1
CBW	Coarse Surrey-Hampshire border ware	1270	1500	86	9.7	206	51.5	308	22.9
CHEA	Cheam whiteware	1350	1500	10	1.1	34	8.5	45	3.3
DUTR	Dutch red earthenware	1300	1650	-	-	1	0.3	1	0.1
EARL	Earlswood-type ware	1200	1400	3	0.3	-	-	3	0.2
EGS	Early German stoneware	1250	1300	1	0.1	1	0.3	2	0.1
EMFL	Early medieval flint-tempered ware	970	1100	-	-	-	-	1	0.1
EMGR	Early medieval grog-tempered ware	1050	1150	2	0.2	-	-	2	0.1
EMS	Early medieval sandy ware	970	1100	-	-	-	-	1	0.1
EMSH	Early medieval shell-tempered ware	1050	1150	6	0.7	-	-	7	0.5
EMSS	Early medieval sand- and shell-tempered ware	1000	1150	1	0.1	-	-	1	0.1
ESUR	Early Surrey ware	1050	1150	18	2.0	-	-	18	1.3
HEDI	Hedingham-type ware	1150	1250	-		1	0.3	1	0.1
KING	Kingston-type ware	1240	1400	160	18.1	62	15.5	227	16.9
KINGSL	Kingston-type slipware	1250	1400	3	0.3	2	0.5	5	0.4
KINGSLX	?Rye ware			1	0.1	1	0.3	2	0.1
LANG	Langerwehe stoneware	1350	1500	-	-	1	0.3	1	0.1
LARA	Langerwehe/Raeren stoneware	1450	1500	-	-	1	0.3	1	0.1
LCOAR	Coarse London-type ware	1080	1200	14	1.6	1	0.3	15	1.1
LCOAR CALC	Coarse London-type ware with calcareous inclusions	1080	1200	3	0.3	-	-	3	0.2
LCOAR SHEL	Coarse London-type ware with shell inclusions	1080	1200	5	0.6	-	-	5	0.4
LIMP	Limspfield-type ware	1150	1300	6	0.7	-	-	6	0.4
LLON	Late London-type ware	1400	1500	-	-	3	0.8	3	0.2
LMHG	Late medieval Hertfordshire glazed ware	1340	1450	15	1.7	10	2.5	25	1.9
LOGR	London-area greyware	1050	1150	13	1.5	1	0.3	15	1.1
LOND	London-type ware	1080	1350	225	25.5	28	7.0	272	20.2
LSS	Late Saxon shelly ware	900	1050	-	-	1	0.3	1	0.1
MG	Mill Green ware	1270	1350	89	10.1	25	6.3	119	8.8
NFM	North French monochrome ware	1170	1300	3	0.3	1	0.3	4	0.3
ROUE	Early Rouen ware	1170	1300	1	0.1	-	-	1	0.1
SAIG	Saintonge ware with even green glaze	1280	1350	3	0.3	3	0.8	6	0.4
SAIM	Saintonge ware with mottled green glaze			-	-	1	0.3	1	0.1
SHER	South Hertfordshire-type greyware	1170	1350	203	23.0	10	2.5	224	16.6
SHER FL	South Hertfordshire-type flint-tempered greyware	1170	1350	1	0.1	-	-	1	0.1
SIEG	Siegburg stoneware	1300	1500	5	0.6	5	1.3	10	0.7
SSW	Shelly-sandy ware	1140	1220	3	0.3	-	-	4	0.3
STAM	Stamford-type ware	1050	1150	1	0.1	-	-	1	0.1
TUDG	'Tudor green' ware	1350	1500	1	0.1	-	-	1	0.1
VALE	Early Valencian lustreware	1380	1450	1	0.1	-	-	1	0.1
Grand Total				**883**	**100.0**	**400**	**100.0**	**1346**	**100.0**

Table 10 The broad distribution of the medieval pottery
Grand total includes pottery from all phases (including unstratified material)

Phase	*Feature*	*Context*	*Fabric*	*Form*	*Total*	*Second/ Waster*	*Comments*
9	City ditch [1856]	1847	KING	JUG	1	S?	GB (internal)
9	City ditch [1856]	1848	KINGSLX	JUG	1		CHT DIS, rim, joins 1808
10	North–south ditch [1816]	1817	CBW	JUGCIST	1	S?	SP, rim
10	Dump	1804	CBW	JUG	1	S?	EN, base
10	Dump	1804	CBW	JUG BICON	1	S?	SP, body
10	Dump	1811	KING	JUG	1	S?	SP, rim/handle
10	Dump	1808	KINGSLX	JUG	1	W	CHT DIS, rim, joins 1848; with different colours suggesting separation in the kiln
9	Parish ditch [1701]	1772	CBW	CAULPIP	2	S?	GB, rim
9	Parish ditch [1701]	1769	CHEA	?JUG	1	S?	EN, body
9	Parish ditch [1763]	1758	CBW	CP	1	S?	GB, body
10	Parish ditch [1763]	1758	CBW	JUG	1	S?	SP, body
10	Parish ditch [1763]	1757	CHEA	JUG	1	S?	SP, rim
9	East–west ditch [460]	459	CBW	CAUL	1	S?	GB, base/leg
9	East–west ditch [970]	925	KING	CAULPIP	1	S?	GB, rim (internal)
9	East–west ditch [927]	926	CBW	CP	1	S?	SP, base
9	East–west ditch [927]	926	KING	JUG	1	S?	GB, body
10	Barrel well [701]	585	CBW	?JUG	1	S?	SP, base
9	East–west ditch [1423]	1422	CBW	?JUG	1	S?	GB, EN; base
9	East–west ditch [1423]	1422	CHEA	JUG	3	S?	SP, base and body

Table 11 The distribution of the whiteware seconds
Key: S/W: second/waster; CHT: heating crack; DIS: distortion/warping; EN: encrusted; GB: blistered glaze; SP: stacking scar

external soot and a brown residue inside ([1400], Fig. 64.5). In addition there are six sherds from four jars/cooking pots that have been ascribed to Limpsfield rather than south Hertfordshire (Renn 1964; Prendergast 1973; 1974; Pearce in prep, a).

Kingston-type wares (KING), including Kingston-type slipware (KINGSL) (Pearce & Vince 1988, 19–52), have in the past been conventionally dated from 1230–1400, although recent research suggests a start date of 1240 (J. Pearce, pers comm). This is the third most common medieval group, amounting to 234 sherds (17.3% of the medieval assemblage, 201 ENV), of which five are of the slipped variety (*see* below). In addition there are three fragments of possible Earlswood ware (Turner 1974). Of the sherds that were assigned to a form type, some 56 are from cooking pots, one is from a dish and one from a lobed cup; the remainder are jugs, mostly of rounded form. The seven highly decorated jugs include two with floral motifs from recuts [1859] and [1856] of the City ditch (Fig. 64.6, 64.7); another, from recut [1846], has a fleur-de-lis stamp. Most finds are from the Phase 9 east–west ditches (76 sherds) and the recuts of the City ditch (77 sherds). A small group of twelve sherds found in fill [925] of east–west ditch [970] includes a handle from a metal copy jug and sherds from large rounded jugs, cooking pots and part of a cauldron. The latter has a blistered internal glaze and may be a second. This and other sub-standard pieces are listed in Table 11. They include two jugs from the east–west ditch [927] (fill [926]), one from recut [1846] of the City ditch also with a blistered internal glaze, and a jug from the Phase 10 dumped layer [1811] that has a kiln scar on the rim. Two sherds, originally thought to be of Kingston slipped ware (KINGSLX), are discussed with the minority wares.

Two fabrics came into use in London around 1270: coarse Surrey-Hampshire border ware and Mill Green ware. The latter, which ceased to be marketed in London *c.* 1350 (Pearce *et al* 1982), is the fifth most common type on this site (88% of the medieval assemblage), with 117 jug sherds of the fine variant (MG; 97 ENV), and two of Mill Green coarse ware (MG COAR).

Coarse Surrey/Hampshire border ware (CBW) (Pearce & Vince 1988, 52–68), which occurs in bulk after 1350 (283 sherds, *see* Table 10), is the most common fabric type at Moor House, amounting to 23% of the medieval assemblage (308 sherds, 247 ENV). Most of the 115 Phase

Fabric	Expansion	Early date	Late date	Phase 9		Phase 10		Grand total	
				Total sherds	% of sherds	Total sherds	% of sherds	Total sherds	% of sherds
BORDG	Surrey-Hampshire border whiteware with green glaze	1550	1700	-	-	11	0.6	11	0.6
BORDO	Surrey-Hampshire border whiteware with olive glaze	1550	1700	-	-	4	0.2	4	0.2
BORDY	Surrey-Hampshire border whiteware with clear (yellow) glaze	1550	1700	-	-	8	0.4	9	0.5
CHPO	Chinese porcelain	1580	1900	-	-	1	0.1	1	0.1
DUTR	Dutch red earthenware	1300	1650	-	-	6	0.3	6	0.3
DUTSL	Dutch slipped red earthenware	1500	1650	-	-	1	0.1	1	0.1
EBORD	Early Surrey-Hampshire border whiteware	1480	1550	-	-	5	0.3	5	0.3
ERBOR	Early Surrey-Hampshire border redware	1480	1550	-	-	3	0.2	3	0.2
FREC	Frechen stoneware	1550	1700	-	-	89	4.7	90	4.7
MART 2	Martincamp-type ware type II flask (dark brown stoneware)	1500	1600	-	-	1	0.1	1	0.1
METS	Metropolitan slipware	1630	1700	-	-	-	-	1	0.1
PMBL	Post-medieval black-glazed ware	1580	1700	-	-	90	4.8	90	4.7
PMBR	London-area post-medieval bichrome redware	1480	1600	-	-	10	0.5	10	0.5
PMFR	Post-medieval fine redware	1580	1700	-	-	36	1.9	37	1.9
PMR	London-area post-medieval redware	1580	1900	1	25.0	57	3.0	66	3.4
PMRE	London-area early post-medieval redware	1480	1600	-	-	384	20.3	386	20.1
PMRE/PMR/ PMSR	London-area redwares	1480	1900	-	-	340	18.0	340	17.7
PMREM	London-area early post-medieval redware with metallic glaze	1480	1600	-	-	1	0.1	1	0.1
PMRO	London-area post-medieval redware with organic inclusions	1580	1900	1	25.0	14	0.7	15	0.8
PMROSH	London-area post-medieval redware with organic and shell inclusions	1580	1900			1	0.1	1	0.1
PMRST	Post-medieval slip-trailed redware	1600	1800	-	-	29	1.5	29	1.5
PMSL	London-area post-medieval slip-decorated redware	1480	1600	-	-	2	0.1	2	0.1
PMSR	London-area post-medieval slipped redware	1480	1650	-	-	56	3.0	56	2.9
PMSRG	London-area post-medieval slipped redware with green glaze	1480	1650	-	-	340	18.0	341	17.8
PMSRY	London-area post-medieval slipped redware with clear (yellow) glaze	1480	1650	1	25.0	322	17.0	325	17.0
RAER	Raeren stoneware	1480	1610	-	-	5	0.3	5	0.3
RBOR	Surrey-Hampshire border redware with brown glaze	1580	1800	-	-	22	1.2	22	1.1
SAIN	Saintonge ware	1480	1650	-	-	-	-	1	0.1
SPOW	Miscellaneous Spanish wares	1480	1900	-	-	1	0.1	1	0.1
TGW	English tin-glazed ware	1570	1800	1	25.0	7	0.4	8	0.4
TGW A	Tin-glazed ware with external lead glaze/Wan Li/blue/yellow decoration (Orton type A)	1612	1650	-	-	1	0.1	1	0.1
TGW B	Tin-glazed ware with manganese-mottled glaze decoration (Orton type B)	1630	1680	-	-	2	0.1	5	0.3
TGW C	Tin-glazed ware with plain white glaze (Orton type C)	1630	1800	-	-	20	1.1	20	1.0
TGW D	Tin-glazed ware with external lead glaze/ polychrome painted (Orton type D)	1630	1680	-	-	19	1.0	19	1.0
TGW F	Tin-glazed ware with 'Chinamen in grasses' decoration (Orton type F)	1670	1690	-	-	3	0.2	3	0.2
Grand Total				**4**	**100.0**	**1891**	**100.0**	**1916**	**100.0**

Table 12 The broad distribution of the post-medieval pottery
Grand total includes pottery from all phases (including unstratified material)

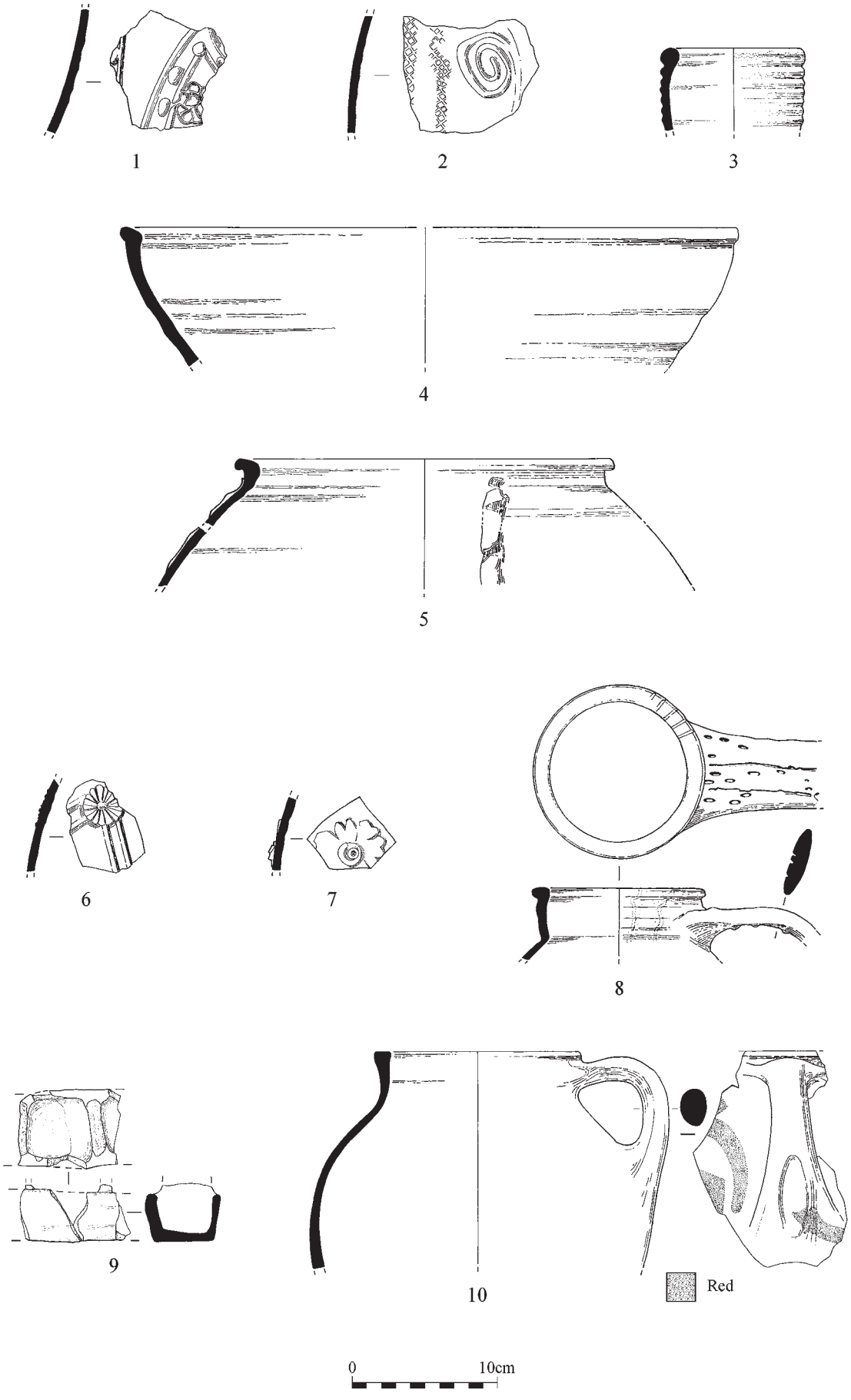


Fig. 64 Medieval pottery (scale 1:4)

9 sherds are from the east–west ditches (58 sherds), with some from the north–south ditch [1816] (29 sherds), few from the different fills of the City ditch and none from the tanning pit. The 177 sherds from Phase 10 deposits are mainly from the recuts of the parish ditch (86 sherds) and the dumped layers (64 sherds). A wide range of forms is represented, with some 51 jugs and *c.* 19 bunghole jugs/cisterns, one with at least four radial lines incised on the rim ([1708], Fig. 64.8). None are of anthropomorphic form, although these have been found elsewhere in the City ditch: one at Aldersgate (Jarrett 2001, fig. 23, no. 30) and several at King Edward Buildings, Giltspur Street (Whittingham in prep). Some 137 vessels were classed as jars or cooking pots; perhaps surprisingly, none has a bifid rim. Other forms comprise a pipkin, five bowls, nine dishes, a dripping dish, a frying pan and a rectangular condiment dish with at least three compartments (Fig. 64.9). Such dishes are uncommon, but part of a similar example was found at St. John Clerkenwell (Blackmore 2004, 343). As with the Kingston-type wares, a number of seconds or possible wasters were found (Table 11). These comprise sherds from ten jugs and cooking vessels that seem to be scattered across the site with no real clusters; most have a blistered glaze (some internally), but a few have kiln scars, while some sherds are encrusted (east–west ditch [1423], dump [1804]).

Cheam wares (CHEA), which came into use *c.* 1350, amount to 45 sherds (Pearce & Vince 1988, 68–77). Most are from jugs, including one of barrel-shaped form from the third recut [1753] of the parish ditch, but a dish, cooking pots and jars are also present, including one with bifid rim from the second recut [1763] of the parish ditch. Of note is a rounded jug with red slip decoration ([1757], Fig. 64.10). This form of decoration is quite rare in London (Pearce & Vince 1988, 75; fig. 123, no. 556), and apparently in Cheam itself (Marshall 1924, 89–90; figs. 12–14). No such decorated sherds were found in the Park Street kiln, and the tradition was not discussed by Orton, although he did consider the use of white slip decoration on Cheam redwares (Orton 1982, 83). Marshall dated it to the late 13th and 14th centuries, but current knowledge shows that this pre-dates the industry as a whole, and a date in the 15th century seems more likely, as a predecessor of, or counterpart to, the white slip decoration that was used on the post-medieval redwares from Cheam. Also of note are two finds from a fill of a Phase 9 ditch [1774]: a large, very thin-walled cooking pot with well-defined rim, and a body sherd encrusted with chips of clay that stuck to the pot prior to glazing. As shown in Table 11, two other jugs are possibly also seconds: a base with kiln scars on the body and at the base angle, from the east–west ditch [1423], and a rim (parish ditch recut [1763]).

Minority wares are listed in Table 10. The most common is late medieval Hertfordshire glazed ware (LMHG) (Jenner & Vince 1983), which amounts to 25 sherds, mainly from jugs; these include one sherd with bossed decoration from the sixth recut of the City ditch [1846]. Also present are a few cooking pots and sherds from a pipkin and a cauldron. Most other wares are represented by only one or two sherds; among them is a very micaceous ware that could be from Hedingham in Essex ([1749], HEDI) (Cotter 2000, 75–91). Of particular interest are two joining jug rims, from recut [1846] of the City ditch and the Phase 10 dumped layer [1808]. These have a pinkish-buff body, white external slip and green glaze, but have fired to different colours and also have glaze down the broken edges suggesting that they are from a waster. These sherds were recorded as an atypical Kingston slipped ware, but ICPS analysis by Alan Vince (Vince, this chapter, sample V2149) shows that although visually similar to the Kingston wares, they are chemically quite different. Of the Surrey wares they are closest to samples from Farnborough Hill, but comparison with a range of other material shows that they are chemically similar to samples from Rye, Sussex (A. Vince, pers comm). Rye ware has not previously been recognised in London, but similar sherds, although rare, occur sufficiently often in the City to suggest that there may have been some trade with the south coast, perhaps via Dover.

Imports

Very few medieval imports were found (30 sherds), but this is not unusual for a site away from the Thames. The most common group comprises Rhenish stonewares dating to after 1350, with ten sherds from Siegburg (SIEG), including a straight-sided jug and a Jakobakanne (cf Hurst *et al* 1986, 178–180, no. 262, no. 263), and two that are probably from Langerwehe (LANG, LARA). In addition there are two sherds of early German stoneware (EGS) and a few sherds of Andenne ware and Dutch redware from the Low Countries (ANDE, DUTR). French wares are less common; they comprise Rouen ware and north French monochrome glazed ware dating to the 12th or 13th centuries (ROUE, NFM), and late 13th- or 14th-century Saintonge ware (SAIG, SAIM). Among the latter is a very large pitcher rim in the pégau style from [1710]. Two sherds are from Spain/the Mediterranean area. One is of Valencian lustreware (VALE) (from the sixth recut [1846] of the City ditch, fill [1848]) while the other is a sherd of ?alkaline-glazed ware from the Mediterranean area (ALKG). The latter, which has a red oxide deposit on the inner wall, was found in a Roman quarry pit (Phase 2, [1887] <333>); it is not impossible that it is an intrusive post-medieval find.

Post-medieval fabrics and forms

Excluding the 1190 sherds from well [119], there are *c.* 726 sherds of post-medieval pottery from *c.* 260 pots (Table 12). Nine of these are intrusive in contexts assigned to Phase 4 (eight sherds) and Phase 5. Five are from Phase 9 and the others are all from Phase 10. Over 30 different fabric types and sub-types were recorded, but most of the assemblage falls into the broad categories of redwares, whitewares, tin-glazed wares and stonewares. The most important feature of the group is the presence of many sub-standard and wasted

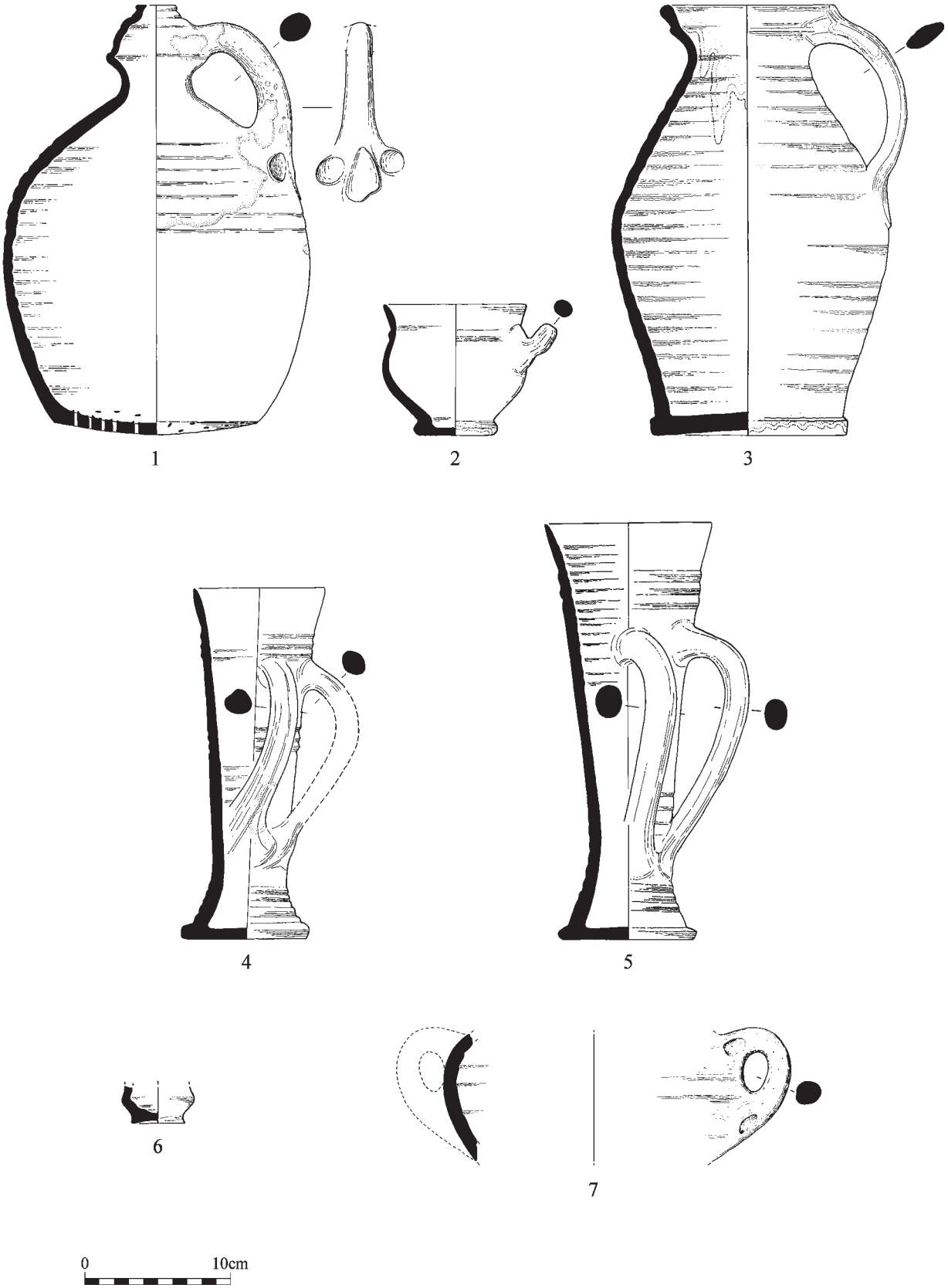
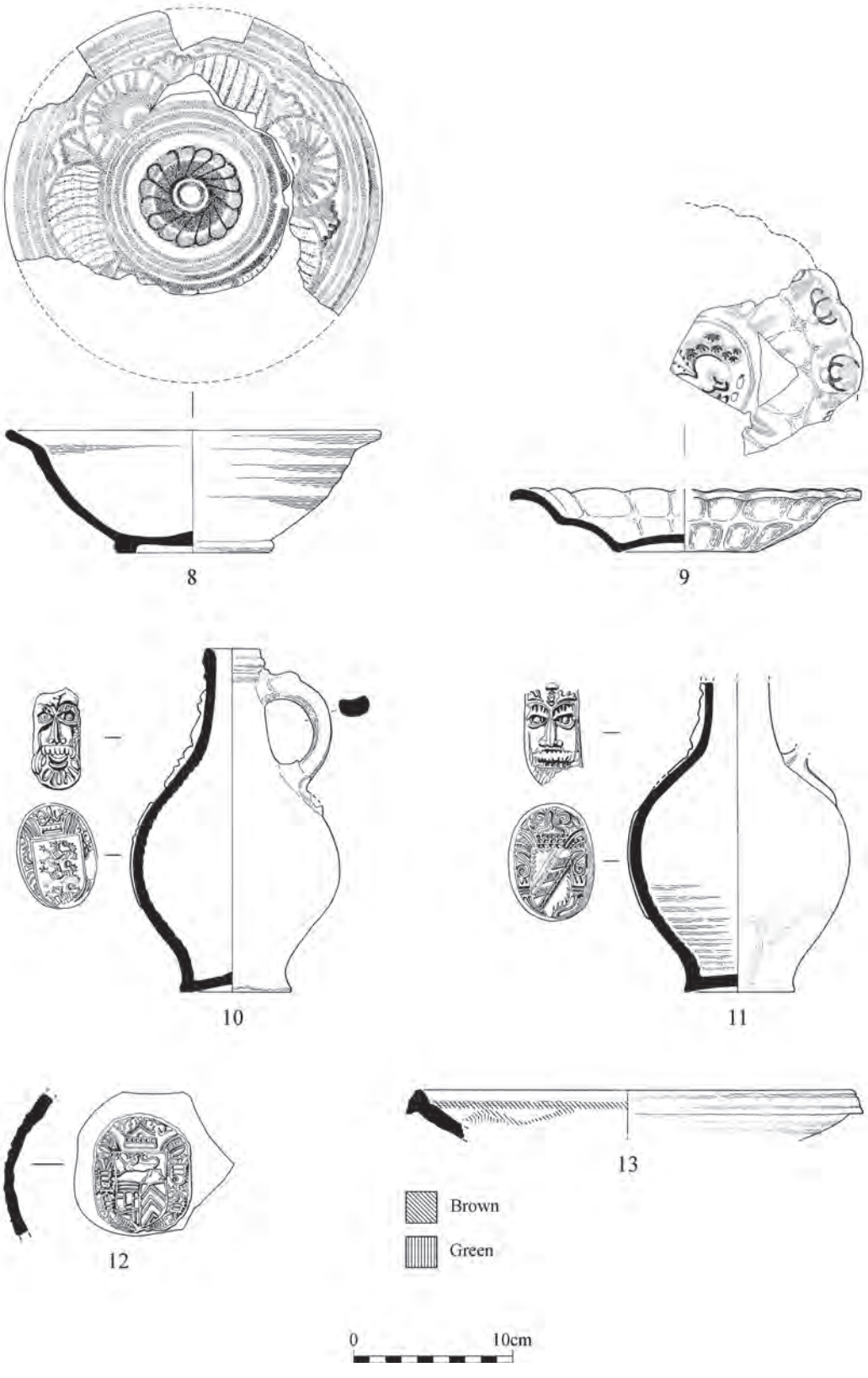


Fig. 65 Post-medieval pottery (scale 1:4)


8
9
10
11
12
13
Brown
Green
0
10cm

redwares from [119], which are discussed in their own right (*see* Sudds, this chapter).

Local and regional redwares

Redwares are by far the most common post-medieval fabrics on the site. The various industries of the London area have been outlined by Nenk (1999) and are being studied as part of a wider survey (Pearce in prep, b); they are also discussed here by Sudds, and so the following comments are brief. The dominant category is early post-medieval redware (PMRE); over half of these are from jars; most other sherds are from jugs and kitchen wares such as cauldrons/pipkins, bowls and dishes. A small bowl from [671], which has an unusually angular profile, was classed in this group but may be of Dutch origin. Slipped redwares (PMSR) are mainly concentrated in well [119], but also occur in well [671], barrel well [1805] and a few other contexts. Those from [119] are mainly jugs, but the other sherds are mainly from dishes and bowls. The most varied group is from barrel well [701], which contained a flowerpot, a largely complete watering pot (Fig. 65.1) and part of a cucurbit as well as sherds from jars and a jug. Other 16th-century redwares comprise variants with a metallic glaze (PMREM) and bichrome glazing (PMBR) which are represented by sherds from a few cauldrons or pipkins.

Redware fabrics that came into use *c.* 1580 comprise London-area post-medieval redware, both plain (PMR) and slip-trailed (PMRST), post-medieval fine redware (PMFR) and post-medieval blackware (PMBL), the latter two probably from Essex (Nenk 1999, 240). Of these, the fine redware (PMFR) (37 sherds, 6 ENV) includes sherds from two cauldrons/pipkins, a dish, a mug and a large jug (Fig. 65.2, 65.3). The black-glazed wares comprise a sherd from a mug and 89 sherds from up to eight or nine tygs; four of the latter, found in well/cesspit [826] and in barrel well [1803], are substantially complete (Fig. 65.4, 65.5). Four sherds from one or two other tygs were found in well [119] and give the dating for that group. The most common of the later redwares is PMR, which occurs in finer and coarser fabrics and in a range of forms. Most sherds are from jars and cooking vessels, including part of a dripping dish with incised decoration on the rim (*see* Sudds, this chapter). Barrel well [701] contained the complete base and part of the apparently waisted body of an unusual jar or miniature vessel which is green-glazed both inside and out in the manner of mercury jars, but appears from the fabric to be a local ware (Fig. 65.6). A large slip-trailed dish (Figs. 68, 74) is discussed below (Sudds, this chapter).

In addition to the conventional wares, there are fifteen sherds in a fabric similar to PMR that includes organic matter (PMRO). Eleven of these are from well group [119], while the others are from recut [1870] of the City ditch (fill [1369], intrusive), pit [1799] and barrel well [1805]). In addition there is one sherd that includes organic matter and shell (PMROSH: barrel well [1805], Fig. 65.7). The more substantial pieces appear to be from braziers or chafing dish-type vessels and support the documentary evidence for the production of earthen furnaces, fire-pots and ovens in the 1570s (*see* Haslam, Chapter 5 and Sudds, this chapter). Other pieces include a sherd with thumbed strips and another with a pinched ring foot. These may be associated with fire-pots but jars wih similar bases were found at Finsbury Avenue Square (FNB02) in a group of pottery associated with sugar-refining, which includes some seconds/wasters (Blackmore in prep b; *see* also discussion below and Sudds, this chapter).

Whitewares and other English earthenwares

By contrast with the redwares, pottery from the Surrey-Hampshire borders is very much in the minority. The first of these, which date to between *c.* 1480 and 1550 were classed as early Surrey-Hampshire border ware. The whitewares (EBORD) are represented by five sherds from Phase 10, while the redwares (ERBOR) comprise sherds from a corrugated cup (Pearce 1997; 1999, 258–9) and a jar. The main whiteware industry developed from *c.* 1550 (BORDG/O/Y; Pearce 1992; 1999); the wares are usually the second most common in post-medieval London, but here they are limited to 24 sherds (21 ENV). The forms include a bowl, nine dishes, a candlestick, a chamber pot and various cooking vessels but no jugs. The equivalent redware (RBOR) was introduced *c.* 1580 (Pearce 1999, 257–258); the forms present comprise one jug, one dish, two chamber pots and two jars, one of which seems to have been chipped away around the edge of the base (from the backfill [825] of well [826]).

Tin-glazed wares

Tin-glazed wares were imported to London from the late 15th century onwards, but none were made in the capital before *c.* 1570, when production started in Aldgate (Noël Hume 1977, 1, 3, 107; Britton 1987, 20, 27–29; Edwards & Stephenson 2002; Blackmore 2005). The 56 sherds (20 ENV) from Moor House include only one that could be from this early production period; this is from a small dish with crude, thin blue lines around the rim from well/cesspit [826] (recorded as TGW A**).** The others include two mugs in the manganese speckled ware (TGW B), and five vessels, a tankard, a mug and two plates, in the plain white ware (TGW C), which date to after 1630. These wares are from Southwark or Lambeth, which had become the centre of the London industry by *c.* 1618 (Noël Hume 1977; Britton 1987, 35; Stephenson 1999; Edwards & Stephenson 2002). The most important piece is a near complete bowl with flanged rim found in [826], which has blue and ochre decoration (TGW D, Fig. 65.8, 67). The design, which has a central pinwheel motif and six surrounding 'petals' is Netherlandish in origin, and dishes with similar decoration are illustrated by Korf (1981, eg no. 231), and Archer (1997, A43), but it is likely that the Moor House find was made in Southwark. It has a large lump in the fabric near the angle

of the body and the rim that has caused distortion and cracking of the surfaces, and would appear to be a second. The form is broadly similar to a polychrome bowl from 'the site of the town ditch', which also has a pinwheel design at the centre (Museum of London acc. 13609; Britton 1987, 106, no. 27). A small but interesting group of late 17th-/early 18th-century vessels was found in cesspit [1794]. These comprise three plates, two dishes (one lobed), a bowl/jar, and an albarello. The press-moulded dish (TGW F, Fig. 65.9) is unusual in that it has two rows of lobed panels; most plates and dishes of this type have only one row and are more fluted than lobed (Bloice 1971, 121, fig. 53, nos. 23, 32; Noël Hume 1977, 88). It is crudely painted in dark and light blue with a 'Chinaman in grasses' design similar to that on a simpler dish in the Victoria and Albert Museum dated to 1680–1690 and thought to be from Norfolk House (Archer 1997, 113, A64). As both colours are very bleached and the surface is matt rather than glossy it is possible that the piece is a second, but it may have suffered in the ground.

Imports

By far the most common import is Frechen stoneware (FREC), which amounts to 90 sherds (40 ENV); the main concentrations are in the backfills of wells [1805] (40 sherds) and [826] (33 sherds). The assemblage includes sherds from four rounded/globular jugs, two with inscribed bands, another with acanthus leaf decoration and six *Bartmann* jugs with applied heraldic medallions, one with three *lions passant* under a crown, one with one *lion passant* under a crown (Figs. 64.10–12). Other imports comprise five sherds of Raeren stoneware, two from a squat jug found in ditch [1793] (Hurst *et al* 1986, fig. 94, no. 304), Dutch redware (6 sherds, 5 ENV), one sherd of Dutch slipware (DUTSL) and one of Martincamp stoneware (MART 2, [1744]). Other imports comprise singe sherds from a Saintonge ware (SAIN) dish with green and brown decoration, a rare find in London (unstratified, Fig. 65.13), a Merida-type costrel (SPOW) and Chinese Ming porcelain teabowl (CHPO MING). The latter is an early import that probably dates to the 1620s (J. Martin, pers comm).

Discussion

Although the actual source of the material is unknown, the pottery assemblage reflects the ceramic trends within the City and in the area as a whole, and sheds new light on post-medieval industry in the capital.

Medieval

At Moor House there is virtually no ceramic evidence for late Saxon activity, and this is in keeping with other sites along the City wall. At Cripplegate a ditch was found that pre-dated the medieval City ditch (Milne 2001, 10–11). This contained a range of early medieval fabrics, but virtually no late Saxon shelly ware (Pearce 2001a, 19), suggesting that the fills (if not the construction) date to *c.* 1050 or later, when the northern part of the City was revived. The same was noted closer to Newgate, at the junction of Little Britain and King Edward Street, and at Aldersgate, where a Saxo-Norman ditch was found and the pottery includes a range of local and imported wares dating to the period 1050–1150 (Butler 2001, 52; Jarrett 2001, 65–67).

The bulk of the medieval pottery from the Moor House site dates to between 1230–1450 and most of the Phase 9 stratified material is from Areas 2, 5 and 6. In Phase 10, by contrast, the main concentrations are in Areas 2 and 3, which can be explained by these areas lying outside the footprint of the standing buildings and thus being less truncated. The finds from Phase 9 reflect an increase in activity following the construction of the new City ditch in 1211–1213, and especially after 1365, when the area of the Walbrook became a focus of leather-working. The general lack of pottery in the earlier fills of the City ditch probably reflects the fact that it was cleansed at intervals, notably in 1354, 1379, 1414 and *c.* 1477. The same was found at Cripplegate, where there was little pottery dating to before *c.* 1270 and most was residual in later deposits (Pearce 2001a, 20, 22). At Ludgate, however, the butt end of the ditch was found to contain a range of wares dating from the 13th to early 14th centuries in a dump dated to *c.* 1300–1320 (Vince 1985, 89). The later 14th- to 15th-century date of the pottery from the later recuts at Moor House also fits well with that of the material from Cripplegate, which dates to 1350–1500 (Milne 2001, 13; Pearce 2001a, 20). The pattern appears to apply to an excavated length of the City ditch at Newgate. The first phase of the fill contained a small amount of pottery dating to *c.* 1240–1270/1350, while the second phase contained a much larger assemblage of *c.* 4500 sherds dating to *c.* 1340–1400, a high proportion of which derives from jugs (L. Whittingham, pers comm). At Aldersgate there seems to be a hiatus in the pottery between the mid-12th and mid-13th centuries (Jarrett 2001, 67). After this there is a good ceramic sequence into the post-medieval period, and there are clear distinctions between the finds from the primary fills of the City ditch and recuts. These are dated to *c.* 1350–1400, 1400–1500/50, *c.* 1500 and the 16th and 17th centuries, although it is noted that the pottery of the latter two periods is under-represented (Butler 2001, 55–57).

Of potential significance are the whiteware seconds and/or wasters and other sub-standard pieces. Some are in buff fabrics that resemble both London and Kingston-type wares. These might suggest that there was a market for seconds in the area, which would reflect on the status of the local population. Possible whiteware seconds have also been found at 19–31 Moorgate, only a short distance to the south (L. Whittingham, pers comm). Since evidence for Roman pottery production has been found at Northgate House, 20–28 Moorgate (Seeley & Drummond-Murray 2005) and post-medieval production is evidenced at Moor House, it is not impossible that pottery was also made

Fig. 66 Pottery from well [1805]

Fig. 67 Pottery from well/cesspit [826]

in the area in the medieval period. The unusual slipped fabric, recorded as KINGSLX, however, is problematic. The sherds seem to be from a waster, yet chemical analysis (*see* above; Vince, this chapter, sample V2149) shows that the composition is quite unlike either the Roman sherds from Northgate House or the standard medieval Kingston wares. Further work is required on this fabric group to determine the significance of this find, which currently appears to have been imported from the south coast of England.

Post-medieval

The construction of the gateway at Moorgate *c.* 1477 does not seem to have caused an increase in the volume of pottery discarded on the site, but this may be due to the new agricultural use of the area. Excluding the wasters, the assemblage comprises domestic wares dating to the 16th and early 17th centuries, with a smaller amount of mid-to-later 17th-century material that is primarily of local and regional significance. Excluding the finds from barrel well [119], the pottery from Phase 10 is fairly evenly spread across Areas 2, 3 and 5.

Remarkably little post-medieval pottery was recovered from the upper fills of the ditch at Moor House. This is in keeping with Aldersgate, where it is noted that the pottery from the 16th- and 17th-century recuts of the City ditch is under-represented (Butler 2001, 55–57). It presents, however, a stark contrast to Cripplegate, where large dumps of post-medieval pottery were found in the 16th- and 17th-century recuts of the ditch (Milne 2001, 13–18; Pearce 2001a, 21–22). At both Aldersgate and Cripplegate industrial vessels such as distillation bottles were found in the ditch, but these are lacking at Moor House. There are, however, sherds from up to twelve 'industrial' vessels (*see* Sudds, this chapter). The ceramic evidence from Cripplegate points to the ditch having been backfilled by 1640 (Milne 2001, 18), while at Aldersgate it appears that the ditch was infilled and then recut in the 17th century (Butler 2001, 61). At Moor House the pottery is less helpful. Joining sherds of KINGSLX were found in the sixth recut of the City ditch and in dumped layer [1808], but the latter is residual. The fact that the dump contains 17th-century pottery cannot be used to argue that the ditch was still open in the late 16th or early 17th century, and the general lack of post-medieval pottery from the ditch makes it hard to draw any further conclusions.

It is possible that the pottery from well [1805] (Fig. 66) and well [826] (Fig. 67) derives from inns, but it could equally be of domestic origin. Alternatively, it could derive from one of the many Livery Company Halls in the City, the nearest of which to the site is the Armourers' and Braziers' Hall in Coleman Street (Schofield 1994b, 177). The same was noted in Grimes' excavation at Cripplegate, where large quantities of drinking vessels were found in the City ditch, amounting to 22% of the 16th-century pottery (Pearce 2001a, 22).

The range of post-medieval imports found at Moor House is a little disappointing, given the proximity of the site to the City. The same was noted at Cripplegate, although there a wider range of German stonewares, Dutch redwares and slipwares, North Netherlands maiolica and Beauvais ware was found in the 16th- and 17th-century recuts of the City ditch (Pearce 2001a, 22, 24). Few imports were found on sites to the north of Moor House, such as Chiswell Street and Finsbury Square (Blackmore in prep a), but at Finsbury Island a large assemblage of imports was found, mainly comprising Dutch and Spanish wares (Stephenson 1997; Malcolm 1997, 45). At Broad Street an unusually high proportion of German slipwares were found (Pearce 1994). This suggests that there were clusters of immigrants or merchants in different areas that had particular links with different parts of the continent.

The presence of a few sherds from industrial vessels is not surprising in an area that was on the northern fringe of the City, but it is significantly less than found at Cripplegate. This was the nearest gate to the northern part of Cripplegate ward, which was used by goldsmiths and

jewellers, and where large dumps of distillation flasks and crucibles dating to *c.* 1580–1630 have been found (Pearce 2001a, 22–23). The eastern side of Moorfields was also an area occupied by immigrant craftsmen. The area of Moorgate itself, however, may have been used for pottery production rather than metalworking, as discussed more fully by Sudds (this chapter). Possible redware production is also indicated by sherds of sugar-refining equipment that are clearly seconds, if not wasters, found at Finsbury Avenue Square, near Broadgate; the chemical data for these finds will be compared with that for the Moor House finds in a separate report (Blackmore in prep. b).

The pottery, therefore, adds to present knowledge of extramural activity in this area. A dating framework can be proposed for the medieval features that broadly fits with the trends noted on other extramural sites, while a sequence can be proposed for the post-medieval pits and wells. The earliest of these appears to be [1750], which dates to the late 15th or earlier 16th century, while the latest is cesspit [1794], which is dated to 1680–1720. Most of the other features date to the late 16th or early 17th century, and the pottery from well group [119] is broadly contemporary with two important assemblages that also reflect industrial activities. The first is from Cripplegate, while the second is a pit group at Holy Trinity Priory, which includes wasters from the first tin-glazed pottery in London (Blackmore 2005, 237–242; Pearce in prep, b). The post-medieval finds from Moor House, therefore, reflect the development of Moorfields as a residential and industrial area, and the larger pit groups add to a growing series from the City that can form the basis of future comparative studies.

POST-MEDIEVAL REDWARE PRODUCTION

Berni Sudds

The excavations produced a fairly large and chronologically significant group of redware wasters dating to the late 16th and early 17th century. A total of 1,254 sherds, representing 67 separate vessels (MNV – minimum number of vessels), were recovered. The majority date to the late 16th century, excavated from the fill of a single barrel well [119]. The remaining material comprises wasters and seconds recovered from well [826], wood-lined pit [1799] and barrel well [1805], all grouped to the south of [119] and dated to the second quarter of the 17th century.

The wasters indicate that the clay source and kiln are likely to have been located in the immediate vicinity, verified by both documentary evidence and chemical analysis. Unfortunately, the underground car park had severely truncated this area of site and no further evidence for production was identified. Nonetheless, the group is of particular importance for two reasons. Firstly, its location is away from archaeologically established areas of redware production to the south of the river Thames, and the first to the north of the Thames. Secondly, it encompasses a period of transition, including early post-medieval redware (PMRE) post-medieval slipped redware (PMSR) and post-medieval redware (PMR) products in a contemporary deposit. The range of forms recovered is fairly limited and dominated by domestic products, although a small number of industrial vessels were also identified. In addition, redware wasters and seconds possibly dated to the early decades of the 17th century were also recovered, including a single post-medieval slip-trailed redware dish (Figs. 68, 74).

The redwares have been examined using the same methodology as the remainder of the assemblage (*see* Blackmore, this chapter), and are recorded on the same spreadsheet held with the site archive. Where body sherds were too small to be identified a general fabric code was assigned (PMRE/PMR/PMSR)

Post-medieval redware production in London

Post-medieval redwares include a number of sub-groups divided on the basis of chronology, specifically upon developments in manufacturing technique and through decoration. Early post-medieval redware (PMRE), dating from *c.* 1480 to 1600, is a fine sandy fabric, unglazed or with a partial clear or green-glaze. Towards the end of the 16th century technological improvements led to the development of post-medieval redware (PMR). The latter usually has a coarser, more even red body and glossy, uniform clear-glaze; it continued to be produced in London until the mid 20th century.

The addition of slip painting, often in curvilinear designs, known as post-medieval slip-decorated redware (PMSL) occurred between *c.* 1480 to 1600. Other styles of decoration include vessels with different glazes (clear and green) inside and out, known as post-medieval bichrome redware (PMBR), and adding an area of underglaze slip to the redware body, termed post-medieval slipped redware (PMSR). The latter similarly date from *c.* 1480, to 1600 and 1650, respectively. Vessels, decorated with trailed slip designs, generally dating from *c.* 1600 to 1800, are known as post-medieval slip-trailed redware (PMRST).

Detailed accounts of redware production and supply in London can be found in Edwards (1974), Orton and Pearce (1984), Orton (1988) and Nenk (1999) but a list of production sites is included below. Documentary sources indicate that redwares were being produced from the mid 16th century at Greenwich, the late 16th century at Moorfields and Lambeth, and from the mid 17th century at Deptford (Edwards 1974).

The excavation of kiln sites and recovery of wasters has corroborated that production was indeed taking place at Lambeth from the late 16th to 17th century, and possibly in the late 18th century (Salamanca Place, Ashdown 1964; Lambeth Bridge House, Jarrett 2003), and at Deptford and Greenwich during the 17th century (Deptford Power Station, Jarrett 2004a; Greenwich Magistrates Court, Jarrett 1999). Cheam, Kingston and Woolwich can also be added to this list given the discovery of production dating to, or from, the late 15th to early 16th century (Orton

1982; Nelson 1981; Pryor & Blockley 1978). Moorfields is the only documented production site that has hitherto produced no physical evidence for pottery manufacture.

Of the production sites listed only Lambeth and Woolwich have revealed material contemporary with the wasters from Moor House, both producing early post-medieval redware, post-medieval slipped redware and post-medieval redware in a similar, but wider, range of domestic and industrial forms (Edwards 1974; Pryor & Blockley 1978).

Evidence for local clay exploitation and pottery production

Both archaeological and documentary evidence attest to the exploitation of clay sources local to the Moorgate area. To the south within the City walls, at Northgate House, there is evidence for Roman pottery production (20–28 Moorgate, Seeley & Drummond-Murray 2005) and to the west in the Fleet Valley, for medieval greyware production (J. Pearce, pers comm). Although no kilns have been identified, analysis of samples of clay dug from the City also indicates that London-type ware (LOND) and Late London-type ware (LLON and LLSL) are likely to have been produced in, or near to, the City from the late 11th to 15th centuries (Pearce *et al* 1985, 2–6).

The documentary evidence provides more detailed evidence of both clay exploitation and production in the immediate area. Clay taken from the Moor was evidently used during the late 15th century to make bricks for the repair of the City wall. More significantly, Stow also mentions the existence of a pot-maker's house that now appears to have been located within the limits of the site (*see* Haslam, this volume, Chapter 5). Other contemporary sources record the existence of a working potter named Richard Dyer, who came to the area outside of Moor Gate in 1568 (*see* Edwards 1974) having spent some time in Spain and/or Portugal.

Dyer is listed as making 'earthen furnaces, earthen fire-pots, and earthen Ovens, transportable' and obtained two consecutive patents for the production of 'fire-pots' in 1571 and 1579 (Edwards 1974; Public Record Office, Patent Rolls C66/1077, C66/1177). The exact form of these 'fire-pots' remains ambiguous (*see* discussion below), but the location and date may link Richard Dyer to the pot-maker's house mentioned by Stow (*see* Haslam this volume, Chapter 5) and consequently the wasters recovered from site. The use of local clay for the excavated redware wasters and seconds is discussed below (*see* Vince, this chapter).

Dating

The redware wasters from barrel well [119]

The waster group from barrel well [119] can be dated to the late 16th century by the combination of both early post-medieval redware (PMRE) and more developed post-medieval redware (PMR) which represent a period of transition between the two traditions *c.* 1580 to 1600. This is supported by the collared rims, cordoned necks and kicked bases, seen primarily on the jug forms at Moor House (J. Pearce, pers comm). Indeed, a number of form parallels can be drawn with both earlier and contemporary consumer groups in London, particularly for the jugs and pipkins. Similarities can be observed with the late 15th- and early 16th-century cauldrons and pipkins from the Sun and Toppings Wharves (Orton *et al* 1974) and Guy's Hospital (Dawson 1979), but closer parallels, both in fabric and form, can be found in 16th- and early 17th-century

Fabric	*Form*	*SC*	*%*	*MNVs*	*%*
Wasters					
PMRE	Cauldron	97	8.1	2	3.0
	Cauldron (type 2)	2	0.2	1	1.5
	Cauldron/ pipkin	18	1.5	4	6.1
	Fuming pot	1	0.1	1	1.5
	Jug	6	0.5	1	1.5
	Pipkin	3	0.3	2	3.1
	Miscellaneous	2	0.2	1	1.5
PMSR	Cauldron/ pipkin	4	0.3	0	0.0
	Chafing dish	1	0.1	1	1.5
	Jug	30	2.5	0	0.0
	Jug (RND2B)	4	0.4	3	4.5
PMSRG	Cauldron/ pipkin	2	0.2	0	0.0
	Jug	27	2.3	1	1.5
	Jug (RND2B)	303	25.4	19	29.3
	Miscellaneous	2	0.2	0	0.0
PMSRY	Cauldron/ pipkin	1	0.1	0	0.0
	Jug	86	7.2	0	0.0
	Jug (RND2B)	188	15.8	12	18.5
	Miscellaneous	16	1.3	0	0.0
PMRE/ PMSR	Jug	20	1.7	0	0.0
	Miscellaneous	317	26.6	0	0.0
PMRO	Industrial forms	11	0.9	8	12.3
PMR	Jug	24	2.0	3	4.6
PMR/ PMRE/ PMSR	Pipkin	3	0.3	0	0.0
Sub-totals		1168		59	
Non-wasters					
BORDG	Dish	1	0.1	1	1.5
CBW	Jar	3	0.3	2	3.1
PMBL	Tyg	2	0.2	1	1.5
PMBL	Miscellaneous	2	0.2	1	1.5
PMSR	Chafing dish	17	1.4	1	1.5
Totals		**1193**	**100**	**65**	**100**

Table 13 Forms by fabric from barrel well assemblage [119]

groups at Arundel House, The Strand (Haslam 1975) and Boston House, Broad Street (Pearce 1994). The Moor House jugs are virtually identical to two complete bibbed and glazed jugs recovered from Africa House, Leadenhall Street (Broady 1975, 264; broadly dated to the 15th or 16th century) and London Bridge Street (Knight 2002, 26) associated with pottery dated to 1580-1600 (L. Blackmore, pers comm).

Unfortunately, no other independent sources of dating were identified, although the additional presence of a few sherds of post-medieval black-glazed redware (PMBL) may verify a date post *c.* 1580. Similarly, a date pre *c.* 1600 could be indicated by the absence of clay pipes although the latter are relatively rare finds on any site of late 16th-century date. In fact, the waster group at Moor House contains very little material that is not related to manufacture, probably indicating that deposition occurred fairly soon after production.

Fig. 68 Post-medieval slip-trailed redware dish

Pottery production

The barrel well group may date to the late 16th century but pottery production at Moor House evidently occurred over a slightly broader period, indicated by both documentary sources and the recovery of additional wasters and seconds from site. The documentary evidence records that Richard Dyer was producing pottery from at least 1568 and patent rolls and parish registers testify that he continued to do so through the 1570s and into the 1580s (Edwards 1974). Establishing when production ceased is more problematic. Richard Dyer died in 1586 and it is not clear if anyone succeeded him, although Stow's mention of a pot-maker's house in 1603 would imply either that production was still taking place, or that evidence of production was still visible.

The identification of a small group of redware wasters and seconds in later features may verify that production was indeed occurring during the early part of the 17th century (wells [826] and [1805]; pit [1799]). The few sherds recovered from industrial forms appear to be residual but complete and semi-complete jug, dish and jar forms are also present that were probably discarded between *c.* 1620/30 and 1650. It is not always clear if these redware wasters and seconds are residual, were old when deposited or if they are actually early 17th-century products, but as they have few faults and obvious signs of wear it is likely that most are seconds. The proximity of their deposition to the late 16th-century wasters further suggests that they may have been retained for use or sold on cheaply within the immediate area.

Chemical analysis (sample V2148) of an unusual slip-trailed rounded dish (Figs. 68, 74) demonstrated that it shared the same clay source as the late 16th-century products. The dish appears to encompass a mixture of influences in both form and decoration (Figs. 68, 73). As with the late 16th-century products the dish has a kicked base. The rim of the vessel is thickened below and has a rounded outer edge that is paralleled by Surrey-Hampshire border ware vessels of late 16th- to early 17th-century date (Pearce 1992, fig. 19).

The decoration of the dish is fairly rare but can assist to some extent with dating. Regional slipware traditions of the 17th century emerged as part of a wider development of slipware across Europe, responding to the fashion for decorative earthenware for the table (Gaimster 1997, 129). The widespread importation of vessels with slip-trailed, polychrome painted and incised sgraffito decoration from the Low Countries, Germany, France and Italy during the 16th and 17th centuries, together with the rising demand for more sophisticated tableware, led to the appearance of a number of regional centres producing slip-trailed products. Foremost amongst these in supplying the London market was Harlow, producing the distinctively decorated Metropolitan slipwares.

It is, therefore, likely that the designs on Metropolitan slipware were influenced by the continental slip-decorated wares, primarily those from North Holland and Germany (Gaimster 1997). Indeed, it is possible that the earliest slipware potter at Harlow was an immigrant from the Low Countries and was probably responsible for bringing the technique to the area (Dean 1997, 192). More recent research, however, has found that it is quite difficult to establish any clear origin within the continental traditions for the designs observed (H. Walker, pers comm). In fact, tracing the origins of particular motifs on English slipwares in general becomes complicated precisely because the industries were borrowing designs from all manner of sources including pattern books and, importantly, from each other.

The decoration inside of the dish from Moor House closely resembles the characteristic radiating wavy lines seen on Weser imports from Germany, the latter coming into London from *c.* 1580 to 1630 (Hurst *et al* 1986, 253). In the central motif, and in the way the design has been executed to fill the surface without being restrained by borders it is also possible to see parallels to Metropolitan

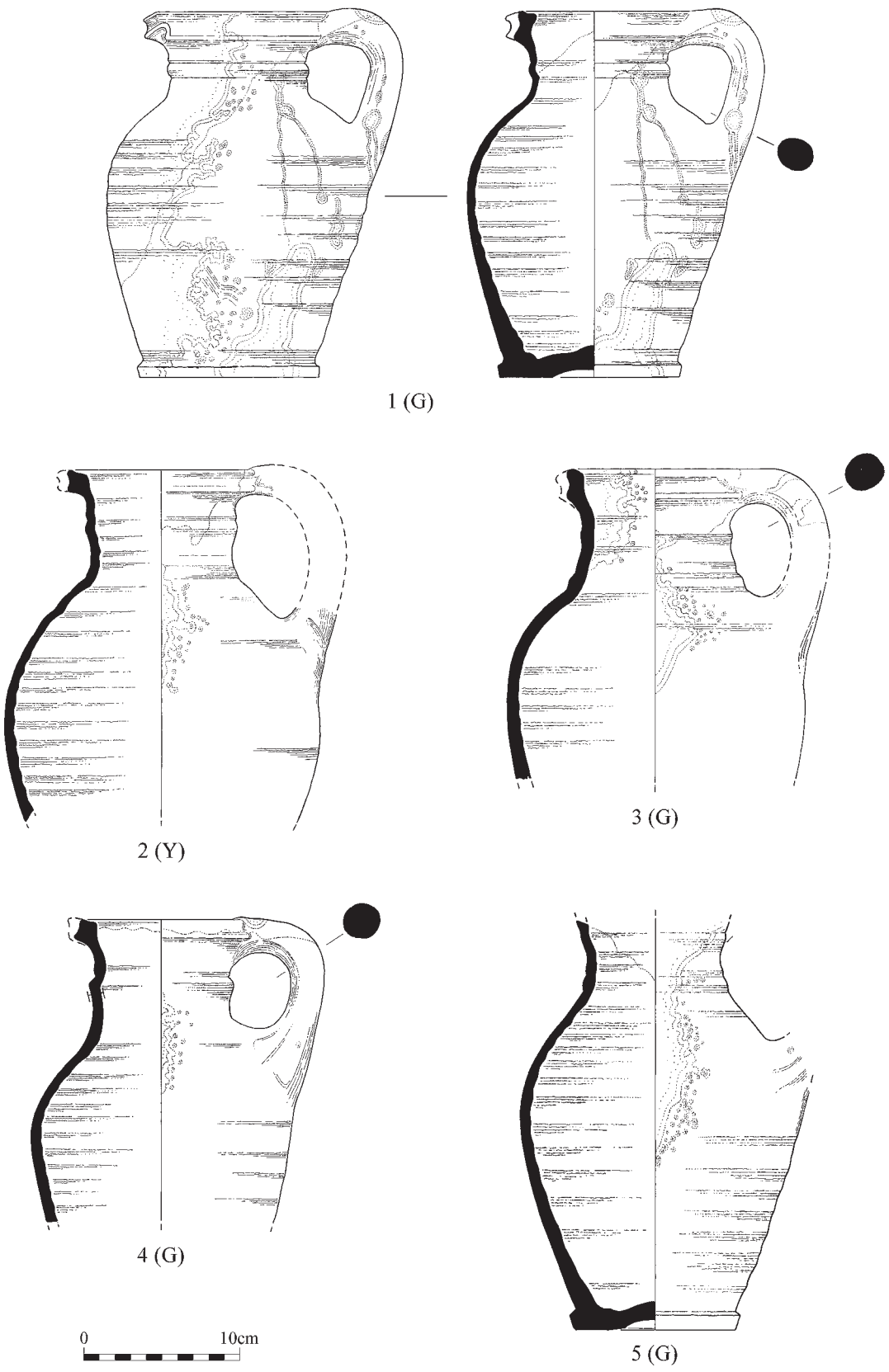


Fig. 69 Post-medieval slipped redware jugs from barrel well [119] (Y=yellow, G=green) (scale 1:4)

slipware. Although possibly produced from the late 16th century, the date at which the latter first appears in London, and could have begun to influence local products, is evidently a little later, at around *c.* 1630 (Cotter 2000, 222; Walker 1999, 71). Finally, the application of the slip itself, in being thickly applied, is reminiscent of Surrey-Hampshire border redware with slip-trailed decoration (RBORSL) dated from *c.* 1580 to 1800.

If influenced by Weser imports, therefore, the dish should date to between 1580–1630 or a little later, but if also simulating Metropolitan designs it is not likely to have been made until at least the second quarter of the 17th century. This uncertainty in influence means a date is difficult to pin down but one around 1630 is perhaps most likely. A date after 1600 is certain, however, tying in with the first appearance of the local slip-trailed tradition in London (PMRST).

Other forms also incorporate a combination of chronological elements. Two jug seconds were recovered from wells [826] and [1805] that may be of a transitional nature (Fig. 72). The most complete example (from well [826]) is close to the early redwares in technology, having a bib of green-glaze to the front, a corrugated neck and a collared rim. These features can be paralleled to the late 16th-century products, but other aspects of the form are more developed. In particular, the gently recessed base and smoothly rounded profile are closer to 17th-century post-medieval redware examples (Museum of London Specialist Service redware typology).

The Moor House vessel is distorted, has a kiln scar to the rim and a fissure in the neck but the base is heavily worn so the jug was evidently used. This example may have been made around the turn of the 17th century. A single post-medieval redware (PMR) jar and a dripping dish were also identified as seconds. The vessels are not diagnostic in terms of date, although the latter appears to be oval in shape, when most dated to the 16th or 17th centuries are rectangular.

If Richard Dyer is connected to the wasters at Moor House (*see* discussion below) the evidence so far recovered indicates that production may have taken place over at least a 35- to 60-year period although it is not possible to demonstrate if there was any continuity. This fairly short-lived period of production fits in with that of the contemporary tin-glaze production to the east at Holy Trinity Priory, Aldgate (Britton 1987; Edwards & Stephenson 2002; Blackmore 2005). Possible reasons for this are discussed in more detail below.

Fabric

As mentioned above the sand-tempered redware fabrics of London include a number of sub-categories divided not on fabric, but on decoration and chronological developments in technology. Variations are, however, evident between different clay sources used for redware production in the London region (Nenk 1999, 237; *see* Vince below).

At Moor House early post-medieval redware (PMRE), post-medieval slipped redware (PMSRY; with clear-glaze, PMSRG; with green-glaze), post-medieval slip-trailed redware (PMRST) and post-medieval redware (PMR) products have been identified in the wasters and seconds. Other post-medieval redware fabrics with the deliberate addition of organics have also been recorded. Similar redwares have been identified elsewhere in London, for example at Bermondsey (Jarrett in prep), but have not previously been allocated an individual fabric code. Common names and codes: post-medieval redware with organic inclusions (PMRO) and post-medieval redware with organics and shell (PMROSH, *see* Blackmore, this chapter), have thus been assigned to the fabrics (Table 12) that will form part of the Museum of London Specialist Service type series.

All vessels under the sub-groups listed above can each be divided into one of two distinct fabric groups. On visual examination it was not clear if the two fabric groups identified were derived from the same variable clay source, the same clay source that later underwent modification during clay preparation, or from two separate sources. In order to answer this question and to provide information on the origin of the clay a total of fourteen redware sherds were sent for analysis (*see* Vince below). A combination of thin section and chemical analysis confirmed the presence of two distinct fabrics groups, probably derived from two clay sources containing different quantities of sand. Furthermore, the analysis demonstrated that these clays are likely to be local and that both contain brickearth. The two fabric groups can largely be detected macroscopically, although of the samples sent for chemical analysis a couple had been categorised incorrectly on the basis of visual examination.

It is evident that the early redware (PMRE), slipped redware (PMSR) and organic tempered redware (PMRO) vessels were made from both the fine and sandy clay variants, whilst post-medieval redware (PMR) and slip-trailed redware (PMRST) examples are restricted to the fine clay (Table 14). Unfortunately, the group is too small to determine if this use of clay is intentional or significant. It is possible that the selection of the fine clay for the more developed post-medieval redware and slip-trailed redware

	PMRE	*PMSR*	*PMSRG*	*PMSRY*	*PMR*	*PMRO*
Fine fabric	9	1	15	10	3	7
Sandy fabric	3	2	5	2	-	1

Table 14 Fabric sub-divisions by clay source (by MNV) from barrel well assemblage [119]

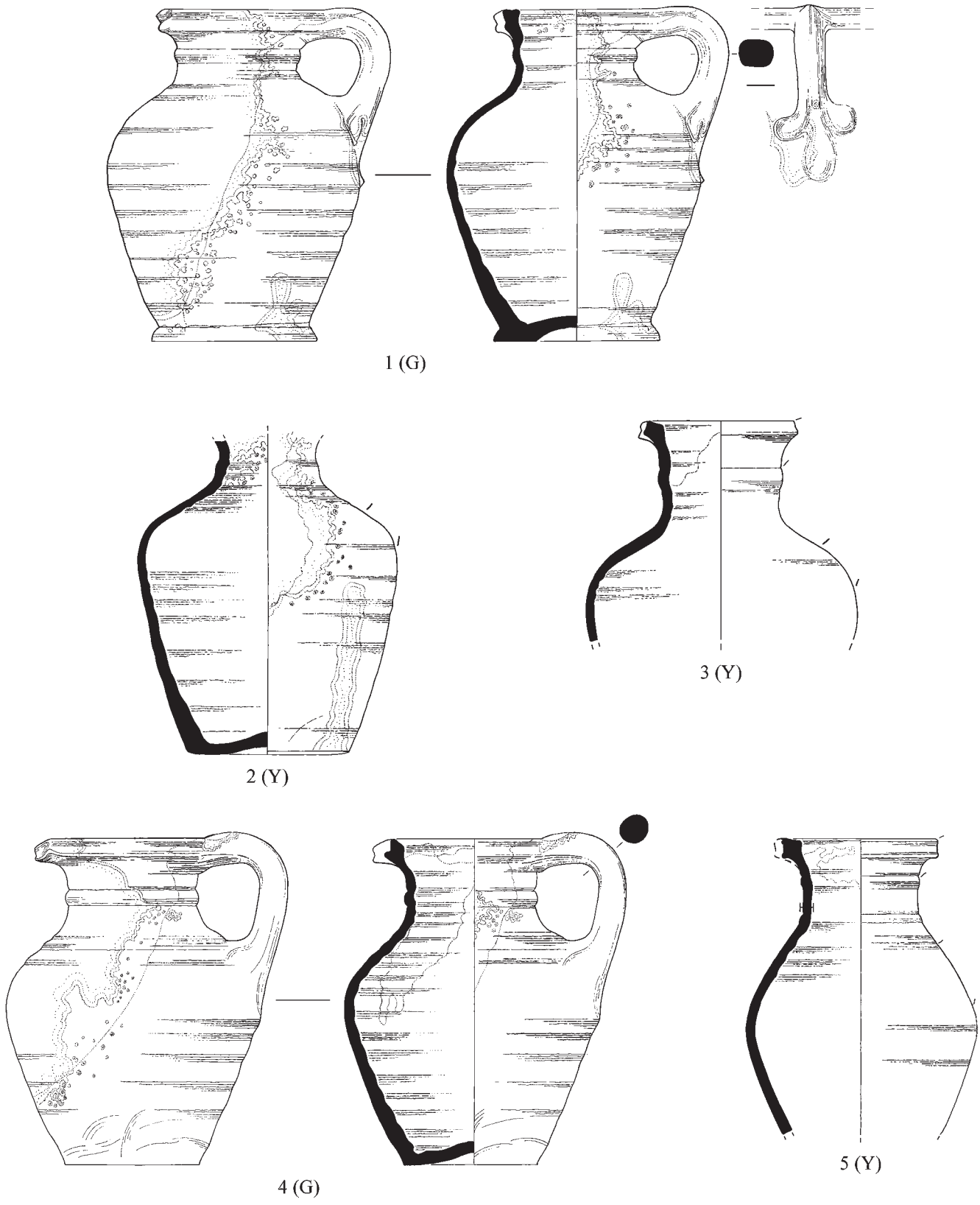
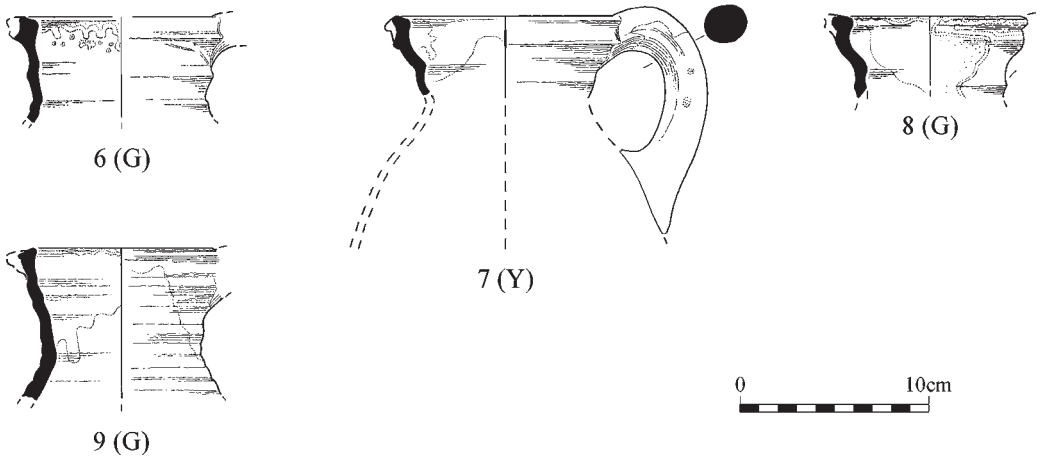


Fig. 70 Post-medieval slipped redware jugs from barrel well [119] (1–9)
(Y=yellow, G=green)
(scale 1:4)



vessels was deliberate but as primarily derived from one transitional group this cannot be demonstrated to be a chronological development.

It is also interesting to note that overall more vessels are made from the fine clay than the sandy variant. Again, any potential implication this may have cannot be clearly observed. One possibility is that vessels in the fine fabric are generally thinner walled with a finer finish and consequently that this clay was exploited more heavily. Of course, as wasters and seconds, the relative fabric quantities of the group may not reflect the output of the kiln but rather the products that failed more frequently.

Colour

A large variation in colour is observed within both fabric groups including reddish yellow (Munsell colour 5YR 6/8), light red (2.5YR 6/8), red (2.5YR 4/6, 5/6), reddish brown (2.5YR 4/4, 5/4; 5YR 5/3), brown (7.5YR 4/2), dark reddish grey (5YR 4/2) and dark grey (7.5YR 4/1; 10YR 4/1). Vessels are commonly oxidised throughout although reduced cores are evident, primarily in thicker parts of the vessels. Reduced margins and surfaces also occur, often, although not exclusively on over-fired examples. Of the two fabric groups the sandy variant demonstrates a greater proportion of deeper brown tones.

Fine fabric

The fine fabric (PMRE, PMSR/G/Y, PMR, PMRST) is hard, with a slightly rough feel and fine texture. Inclusions: Moderate, fairly sorted very fine to medium, sub-angular to well-rounded, clear, white, grey and iron-stained quartz (up to 0.5mm). Occasional to moderate rounded brown, grey and black clay pellets up to 1mm. Occasional, poorly sorted, very fine to fine, sub-angular to rounded black and red iron ore (up to 0.25mm). Rare angular to sub-rounded white flint up to 0.5mm, gravel pebbles up to 8mm, and white calcareous inclusions up to 0.5mm.

Sandy fabric

The sandy fabric (PMRE, PMSR/G/Y) is hard, with a rough feel and irregular texture. Inclusions: moderate to abundant, poorly sorted very fine to very coarse, sub-angular to well-rounded, clear, white, grey and iron-stained quartz (up to 1.5mm). Occasional poorly

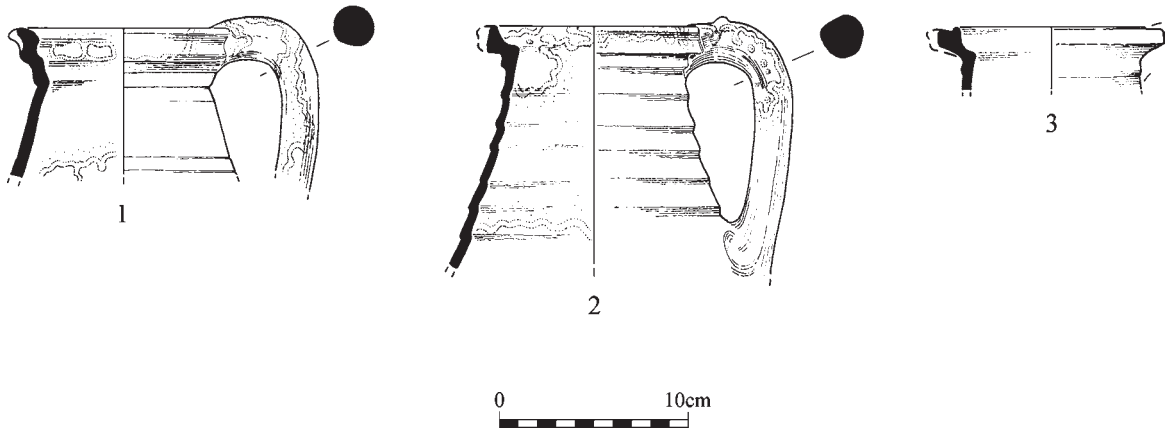


Fig. 71 (1) early post-medieval redware jug; (2–3) post-medieval redware jugs from barrel well [119] (scale 1:4)

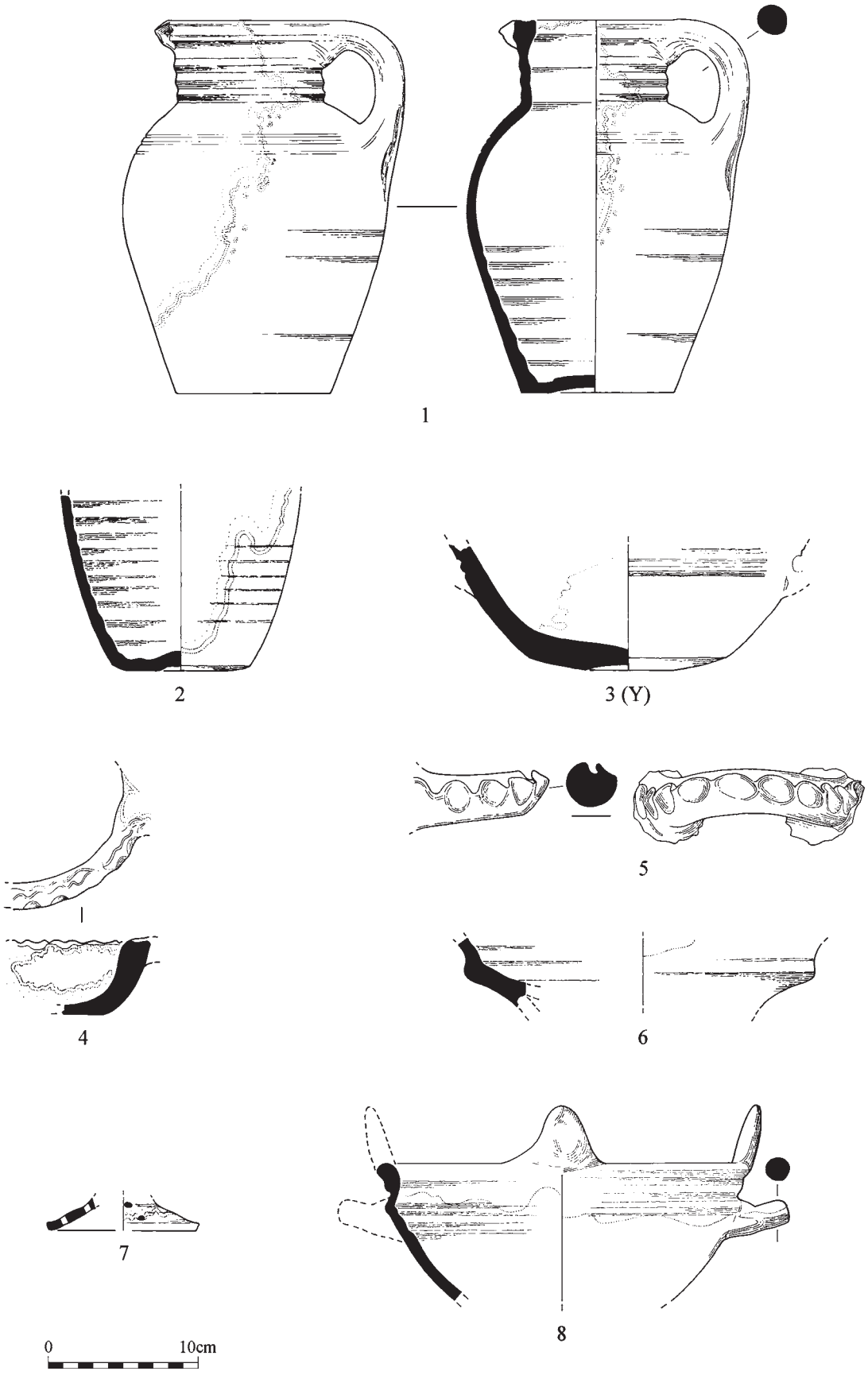


Fig. 72 (1–7) Redware seconds and wasters; (8) unprovenanced slipped redware chafing dish (scale 1:4)

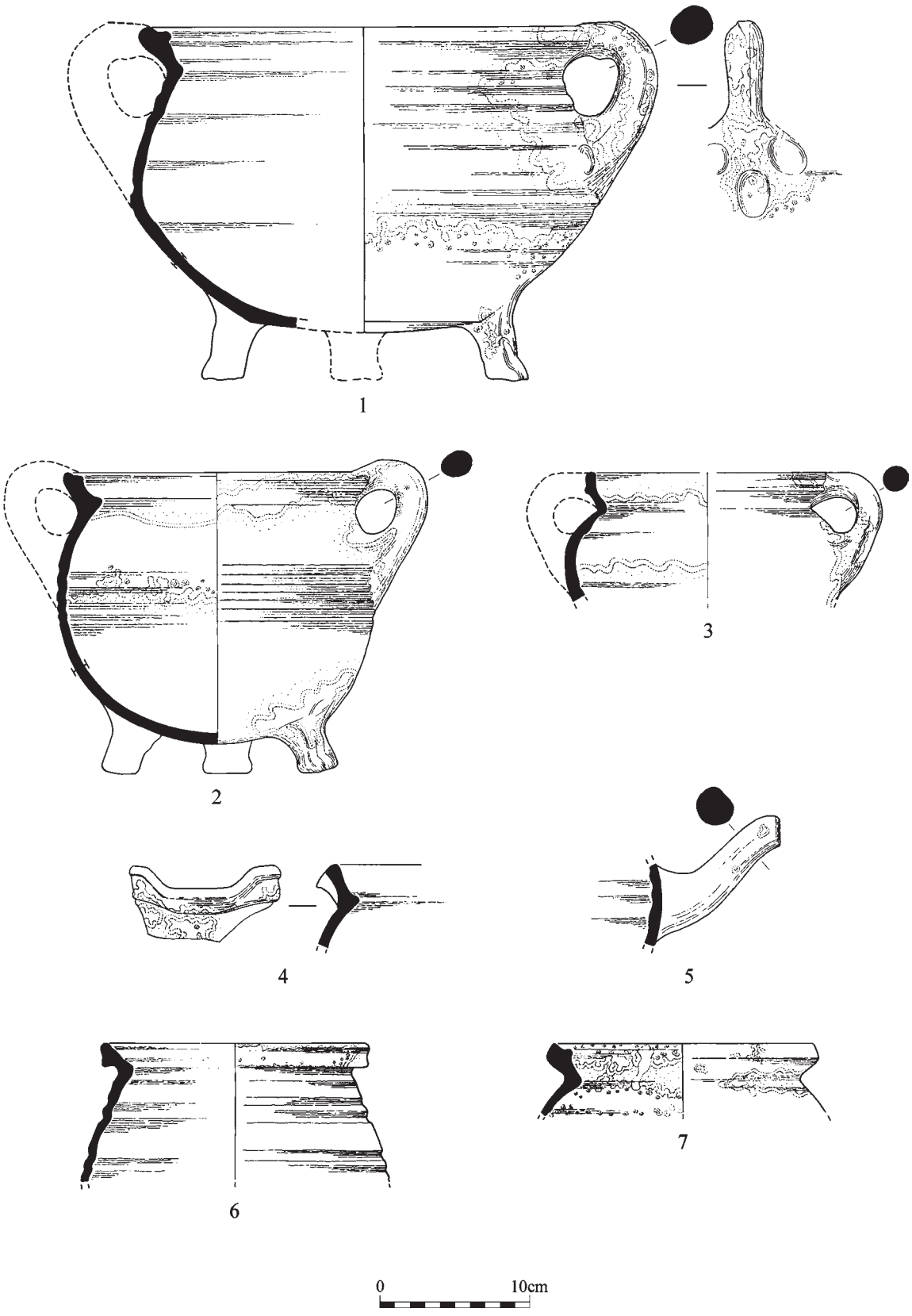


Fig. 73 Redware wasters from barrel well [119] (scale 1:4)

sorted, very fine to medium, sub-angular to well-rounded black and red iron ore (up to 0.4mm). Occasional rounded brown and grey clay pellets up to 1mm. Rare angular to sub-rounded white flint up to 0.5mm, gravel pebbles up to 10mm, and white calcareous inclusions up to 1mm.

Fine and sandy fabric plus organics

The small group of industrial vessels identified have a different fabric (PMRO)**.** Examples resemble either the fine or sandy variants listed above but also contain organics. The latter appear in section as dark elongated voids up to 3mm in length and 0.2mm in width, although carbonised organic material is still present in some cases. Larger, rounded voids were also detected in thin-section that may have contained calcareous inclusions. The presence of organics, likely rotting vegetable matter, may corroborate that the clay was derived from the Moorfields area (*see* Vince below and Appendix).

Decoration

Early post-medieval redware

The early post-medieval redware forms are decorated with a partial clear or green-glaze. Both are clear lead-glazes but appear reddish-brown on oxidised forms and olive-green on reduced examples. Coverage is patchy and can be very thin or pooled, although some examples have a more even glaze approaching later PMR examples. Cauldron and pipkin forms are glazed internally and partially externally (Fig. 73). The jugs are externally glazed, either in a bib to the front of the vessel, including the neck and rim (Fig. 72), or a partial glaze to the neck and upper body (Fig. 71).

The cauldrons and pipkins have a band of ribbing above the maximum girth of the body (Fig. 73). This may not be purely decorative but instead, as noted in the Border ware industry, a manufacturing aid in marking the level of handle attachment (Pearce 1992, 84). Most handles are plainly attached to the body although one vessel has three visible thumb marks at the base (Fig. 73.1). The corrugations on jug necks, as on the cauldrons and pipkins, result from throwing, although they appear to be enhanced in some examples, sometimes with the use of a tool. One jug also has four closely incised horizontal bands around the shoulder (Fig. 72.1).

Post-medieval slipped redware (with yellow and green-glaze)

The jugs are decorated with a slip and glaze bib covering the front rim, neck and upper three quarters of the body (Figs. 69, 70, 79). The slip and glaze do not evenly match up on most examples and either the white slip is visible or the glaze runs over unslipped areas of the body. The yellow-glazed examples (PMSRY) have a clear glaze that usually appears yellow over the white slip, although on reduced vessels the glaze can turn olive-green. The green-glazed examples (PMSRG) have copper added to the lead-glaze, usually giving a bright, rich green colour evenly covering the slip towards the centre of the bib but often appearing speckled at the margins.

Most jugs have a corrugated neck, comprised of just one or two distinct raised bands (Fig. 69.1, 69.3, 70.5). Although thrown, the corrugations are sometimes clearly defined, probably with the use of a tool (Fig. 69.1). All examples have a raised corrugation around the centre of the neck, but about half also have one at the join of the neck to the body. The majority of the jug handles are plainly smoothed onto the body at the lower end although one has three visible thumb impressions.

A small number of tripod bases from either cauldron or pipkin forms are also decorated with white slip and clear (yellow) or green-glaze. Complete profiles could not be identified but the slip and glaze appears on the inside, covering the base and lower body.

Post-medieval redware

The post-medieval redware forms are lead-glazed, although as with the early redwares, the final colour of the glaze depends on the surface colour of the body. The glaze therefore appears reddish-brown over oxidised surfaces and olive-green over reduced surfaces. In contrast to the early examples, however, the glaze is usually glossy, even and covers a greater area. The jug rims are glazed both inside and out, and although glaze is largely limited to the inside of the industrial forms and the dripping dish, this is likely to be related to function. Thrown corrugations are evident on two of the jug necks (Fig. 71.2) and a raised cordon and incised line on the third (Fig. 71.3). One example also has visible thumb marks at the base of the handle (Fig. 71.2). The dripping dish rim is decorated with thumb impressions and an incised wavy line (Fig. 72.4).

Post-medieval slip-trailed redware

A single dish is decorated internally with trailed slip and glaze (Fig. 68, 74). The design is loosely curvilinear and appears to have been influenced by patterns seen on Weser, and possibly Metropolitan slipware. As discussed earlier (*see* Dating) the radiating wavy lines are very similar to those on Weser examples (Hurst *et al* 1986, 253) whilst the style, method of application, and possibly the central motif may be paralleled to Metropolitan slipware and red border slipware (Jennings 1981, fig. 40/ 658). The lead-glaze is predominantly olive-green, with smaller areas of reddish-brown glaze, reflecting the variability in oxidisation of the underlying surface.

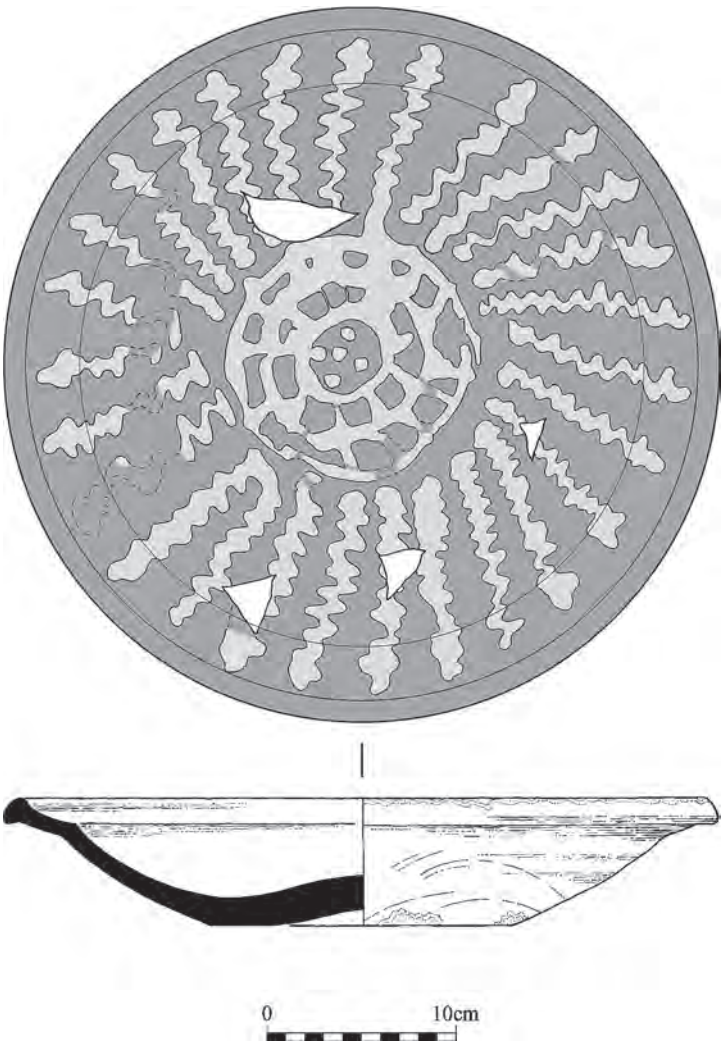


Fig. 74 Post-medieval slip-trailed redware dish (from context [825]) (scale 1:4)

Forms

Jugs

Post-medieval slipped redware with clear and green-glaze

The slipped redware jugs have a rounded profile (JUG RND2B, London redware form series). Most are distinctly rounded, or have a more gently rounded profile, with a maximum girth towards the centre of the body (Fig. 69). Less frequently the maximum diameter appears further up the body, or becomes more pronounced giving examples that appear shouldered or sub-biconical (Fig. 70). This variation is not likely to be intentional but a result of the non-standardised nature of production.

The rims are collared and have either a flat-top or are internally bevelled (Fig. 69.2; Fig. 70.1). The majority have a shallow collar (Fig. 69.2), although medium and deep collars are also evident (Fig. 69.1, 69.3; Fig. 70.1). A small number of rims display slight variations but as with the body profile and collar depth this may be unintentional (Fig. 70.7). Two examples are more obviously different having simple beaded (Fig. 70.8) or externally bevelled rims (Fig. 70.9).

The necks have either one or two pronounced corrugations, sometimes delineated with an incised line. A single corrugation is located around the centre of the neck and a second, if present, appears around the base. The sample is not large enough to determine if the number or placement of these has any significance. The jugs have short circular rod-type handles, extending from the rim to shoulder. They are slightly pinched at the top and thus extend above the level of the rim. The pouring lips are pulled and pinched out from the rim and the bases are either plain or thickened but are always kicked.

Rim diameters range from 100–120mm and bases from 105–115mm. On complete examples the bases are usually a little larger in diameter than the rims. Height, where measurable, ranges from 234–248mm.

Early post-medieval redware

Few early redware jugs were recovered but two very different profiles are evident. The first shares certain features in common with slipped jugs, in particular a collared rim, a cylindrical neck and a short rod-type handle. The early redware jug differs from the slip-decorated examples, however, in having a fairly smoothly rounded profile, multiple corrugations to the neck and a more gently recessed base (Fig. 72.1). In contrast to slipped examples, the rim also has a slightly greater diameter (102mm) than the base (95mm).

The second profile has no distinct neck, a simple collared rim and a long rod-type handle (Fig. 71.1). The form can be more closely paralleled to the PMR vessels identified (*see* below) although the glaze, despite covering the entire rim and neck area, is still only partial.

Post-medieval redware

The small quantity of post-medieval redware jug forms identified are of a very different character to the rest of the group (excluding a single PMRE vessel). The examples are incomplete but probably have a smoothly rounded or perhaps pear-shaped profile, with no obvious neck (J. Pearce, pers comm). The rims are either collared and lid-seated (Fig. 71.2) or thickened and beaded (Fig. 71.3). The jugs with collared rims have a corrugated upper body and a raised cordon where the rim meets the body. They also have a long circular rod-type handle. The jug with the thickened, beaded rim also has a raised cordon but this appears slightly below the join of rim to the body (Fig. 71.3). Rim diameters range from 111–120mm.

Jars and bowls

A few sherds were recovered that indicate that jars, and possibly bowls, were also being produced, although in the absence of diagnostic elements little can be concluded about their form. The small group includes one post-medieval redware jar second (not illustrated); a post-medieval slipped redware handled bowl base (Fig. 72.3); and a very thick, thumb decorated horizontal loop-handle (Fig. 72.5). The handled bowl base was recovered from pit [1799], is quite crudely made and unusual in form. It is possible that this vessel is unrelated to the rest of the waster group but the thick thumb-decorated loop-handle is evidently a failed product and may have formed part of a large early post-medieval redware handled bowl.

Cauldrons

A relatively small group of early redware cauldrons was identified (Fig. 73.1–73.3). More are likely to be represented in the assemblage but due to a number of shared characteristics, and in the absence of diagnostic elements (handles and pouring lips), it is not possible to classify certain vessels as either cauldrons or pipkins. Those identified as cauldrons include three basic profiles, although these also share features in common. Where diagnostic it is clear that all examples have a lid-seated rim, two vertical loop handles and three applied feet. The differences relate primarily to size and profile, although the rim detail also varies.

The smallest cauldron identified is incomplete but has a rounded profile, a collared, lid-seated rim and a small vertical loop handle (Fig. 73.3; CAUL2 London redware form series). Only the smoothed handle section was recovered so it is not possible to determine if the upper body is corrugated or ribbed in the same way as the remainder of the group. A medium sized, semi-complete rounded cauldron is also evident in the production waste. The latter has an everted, lid-seated rim, small vertical loop handles, upper body ribbing and a sagging base with three luted feet (Fig. 73.2).

In comparison to the rest of the group the largest example recovered has a fairly shallow and open profile, although the maximum girth is also at the centre of the body (Fig. 73.1). The vessel has an everted, thickened rim with an internal bead, a gently carinated profile, vertical loop handles and an angled sagging base with three luted feet. Two bands of horizontal ribbing appear, on and above the maximum girth, and there are three visible thumb marks where the handle joins the body at the shoulder.

The rim diameters vary greatly within the small assemblage of cauldrons from 180–300mm. The rim is usually slightly wider than the base, sometimes considerably so, but the maximum girth is always towards the centre of the vessel. The feet range in length from 34–48mm.

Pipkins

Pipkin forms are not well represented in the assemblage (Fig. 73.4–73.5). Where evident rims are collared and lid-seated and pouring lips rectangular (Fig. 73.4). The handles are solid and straight (Fig. 73.5), and appear to have been positioned over the maximum girth. The single measurable rim is 160mm in diameter and the only complete handle is 109mm in length.

Cauldron/ tripod pipkins

A small group of rims and bases remain incomplete and could not be classified, although they are either from cauldron or pipkin forms. Early redware forms are either collared and lid-seated with a ribbed body (Fig. 73.6), or have an everted, thickened rim with an internal bead (Fig. 73.7). Bases are sagging, sometimes slightly angled, but all are slipped and have three applied feet, these ranging in length from 29–40mm.

Dish

A single complete slip-trailed dish second can be linked to production at Moor House (Fig. 74). The example has a carinated profile, with a rounded lower body. The rim is thickened, largely below, and the base is kicked. The rim diameter is 360mm and the base 135mm.

Dripping dish

The single redware dripping dish identified is shallow with a rounded, thick walled profile (Fig. 72.4). The vessel is probably oval and has a simple continuously thumb impressed, incised rim and a handle scar.

Chafing dish

A single carinated body sherd represents the only chafing dish identified (Fig. 72.6). The sherd is fairly crudely made but the presence of slip decoration suggests that example is not likely to have been produced for industrial use (*see* below).

Fuming pot

The presence of a small pierced conical lid suggests that fuming vessels may have formed part of the Moor House repertoire (Fig. 72.7). The lid has a simple rim and has multiple, random, round perforations.

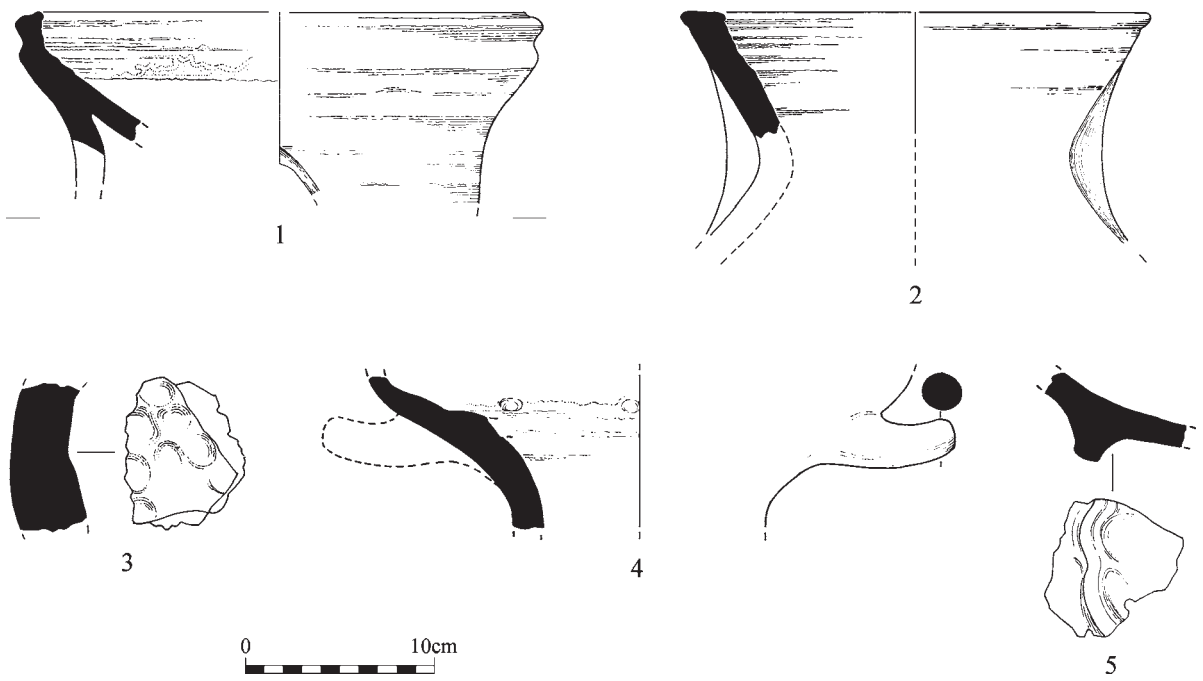


Fig. 75 Redware industrial forms (scale 1:4)

Industrial forms

The industrial forms are made from a post-medieval redware fabric that contains varying amounts of organic material (PMRO). The latter may have been deliberately selected as organic inclusions can enhance both the plasticity and thermal properties of the redware body. In particular this may have enabled fairly large, thick-walled forms, suitable for heavy use and exposure to high temperatures, to be made and fired with less chance of distortion or cracking. The majority of the vessels identified appear to be open, carinated forms for which no direct parallel can be sought (Fig. 75). The closest examples appear to be the distillation bases recovered from 17th century contexts at Lambeth Hill (Moorhouse 1972, fig. 33 no. 13) and Broad Street (Pearce 1994).

The majority of examples from Moor House include features usually seen on chafing dishes, namely pedestal bases, sometimes with cut-outs, separate discs of clay forming the base of the dish section and horizontal loop handles (Fig. 75.1, 75.2 and 75.4). In contrast to most chafing dishes, however, the dish section is very shallow on certain vessels (Fig. 75.1) and the crude manufacture and finish of the entire group would indicate that they were not made for use at the table. One example, in particular, is very thick walled and also differs from the remainder of the group by the addition of a large vertical triangular fillet or lug of clay extending from below the rim, down past the carination of the body (Fig. 75.2). This vessel could equally represent a pedestal base, perhaps designed to support a heavy weight.

With incomplete and often distorted profiles it is not easy to establish the true nature of these vessels, or in some cases, even the orientation. The most shallow example, with the cut-out to the base naturally takes on a steeper, more hourglass shaped profile than the other forms (Fig. 75.1), although with so little of the rim it is difficult to be certain. The rim diameters range from 272–280mm.

It is likely that these vessels were made with the function of heating in mind but whether they represent distillation bases, designed to hold cucurbits, must remain open to question (Moorhouse 1972, 104, 114). Residues found on similar forms from contemporary assemblages suggest they are primarily associated with precious metalworking (Cripplegate, Pearce undated; Aldersgate, Jarrett 2001).

Two other forms were identified that may have been made with a different function in mind. The first is a vessel with a thick base and pinched footring (Fig. 75.5). Similar examples have been recovered from a site at Finsbury Avenue Square where they were linked with sugar-refining (*see* Blackmore, this chapter). In this context it is possible that the sherd may represent the base of an early syrup-collecting jar but it is not possible to be certain. The very thick-walled sherd (illustrated in Fig. 75.3) may be a fragment of kiln furniture or perhaps part of a substantial vessel. The sherd has been compared to examples from portable bread ovens made at Bideford, north Devon during the 17th and 18th centuries (J. Haslam, pers comm). Furthermore, a connection has been made between these ovens and Dyer's own 'ovens transportable' but with such a small sherd it is impossible to verify this (Edwards 1974, 6).

Technology

The majority of vessels are wheel thrown. Collared, lid-seated rims dominate the assemblage and are generally made by folding the top of the vessel outward and shaping whilst still on the wheel. The post-medieval redware jugs and certain of the early post-medieval redware cauldrons are also folded but are finished with a shaping tool. The thickened and beaded rims are probably made in the same way. The jug lips are pinched and the single pipkin lip pulled, and shaped.

Handles and feet are luted onto the body and either smoothed or thumbed into position (Figs. 69.1, 70.1). Where a handle has broken away, it is possible to see that fillets of clay have been added to the underside of the handles at both the rim and on the body in order to secure them in place. A horizontal loop handle from one of the industrial forms is luted onto the body in this way but also has two deep thumb impressions on the internal face, penetrating the wall and extending into the handle (Fig. 75.4). The large, thumbed bowl handle, perhaps because of its size, also differs in having four small plugs of clay intended, but failing, to secure it to the body.

Only two vessels, namely the thick-walled industrial form (Fig. 75.3) and the dripping dish (Fig. 72.4), are handmade. The latter appears to have been slab built, with the wall constructed first and the base then internally overlapped and smoothed on.

Although not easy to detect, on some vessels the bases have been knife-trimmed or shaved in order to reduce the thickness of the clay. This mainly applies to the jug forms (Fig. 70.4), although is also evident on the dish (Fig. 74). On closed forms, primarily jugs, the outside surfaces are smoothed to disguise the throwing lines, although inside they remain visible. More care is taken to finish the inside and outside surfaces of open forms, excluding the industrial forms.

Glaze pooling and drips around the rim, and the direction of glaze runs, suggests that the jugs and at least some of the cauldrons were fired upside-down. Kiln scars frequently occur around the rim or on the base. Some appear to be impressions from other pots, indicating that they may have been stacked rim to base, but others are likely to have been caused by the use of spacers. Fragments of roof tile have been recovered, that were evidently used for this purpose. A number of the tiles have thick glaze pools, circular scars, or even fragments of jug rim adhering to them.

Faults

The combination of faults identified on individual forms, and frequency with which these occur throughout the wasters indicate that the group may have been derived from a single firing. Furthermore, the types of fault suggest that failure is likely to have resulted from firing occurring too rapidly or unevenly, and at too high a temperature.

Jugs failed most commonly at the junction of handle and body, probably due to differential shrinkage of these two elements. Many of the wasters are discoloured and distorted to some extent and some are semi-vitrified. The jugs are most commonly misshapen around the neck and rim and have often collapsed opposite the handle. Heating cracks are fairly common, usually in the surface or running down from rim. The glaze is frequently crazed or blistered but on some vessels appears matt, or is flaking away. Less frequently examples are blown out, where a fragment of the surface has spalled away, or are encrusted with debris, probably from the base of the kiln or from the explosion of another vessel. The dish and some of the cauldrons also have fine cracks along the lines of strain. These usually follow the throwing lines and are known as spiral cracking or dunting.

Few manufacturing faults were identified but include dented handles and rims. These probably result from handling, perhaps when the vessels were stacked into the kiln.

Discussion

Redware production at Moor House

The homogeneous nature of the wasters and paucity of other material recovered indicates that the group was not re-deposited, but that production was taking place on, or in the immediate vicinity of, the site. It can further be argued that the assemblage represents the failed products of a pottery set up by Richard Dyer during the late 16th century.

There is no clear description of the earthen fire-pot allegedly brought to Britain by Richard Dyer. It is known that the vessel was designed to 'holde fyre' and is recorded to have been used to 'seeth meate upon' or for the 'refresshing of houses in the heate of somer' (Public Record Office, Patent Roll C66/ 1077). In this context it may be reasonable to assume that these fire-pots are forms of chafing dish or fuming pot, wasted fragments of which were recovered from Moor House. It is also possible that the patent could be referring to braziers, a type of cauldron with pierced holes through the upper body; braziers, or firepots, are usually associated with Dutch immigrants and were used to hold hot embers (Cotter 2000, 215). None of the cauldron wasters from Moor House were pierced but at Broad Street, to the southeast, very similar contemporary carinated cauldrons were recovered, also unpierced, but evidently having been used as braziers (Pearce 1994).

The patent also states, however, that cooking food in this fashion had not been 'hitherto practiced within this our Realme' (Public Record Office, Patent Roll C66/ 1077) and yet chafing dishes are known from medieval contexts (medieval London-type ware). Whether this was shrewd marketing on the part of Dyer or the patent actually refers to another form, perhaps similar to the bread ovens from the southwest counties of Britain, is not certain. These individual forms may not prove a direct link between Dyer and the wasters but the fabric and form of the assemblage

can be dated to the late 16th century, at the exact time he was working. Contemporary documents also record that a pottery workshop, likely Dyer's, was located within the immediate area of excavation (Haslam, this volume, Chapter 5).

Together this evidence indicates that the wasters are likely to be associated with Richard Dyer and, although the documentary sources are unclear, that to remain in business the kiln is likely to have produced a broader repertoire of forms for different domestic and industrial purposes.

The products

As the wasters from Moor House represent failures they do not necessarily reflect the output of the kiln, particularly as only one dump was identified. Post-medieval slipped redware (PMSR/G/Y) vessels account for over half of the wasters recovered, representing 55% of the material from barrel well [119] (Fig. 75). Jug forms account for the majority of this group although three slipped cauldron or pipkin forms and a single chafing dish are also evident.

Early post-medieval redware (PMRE) represents the second largest group, including seconds recovered from other features. Forms identified include cauldrons, pipkins, jugs and a single fuming pot and possible jar.

The post-medieval redware with organic inclusions comprises the next largest group (PMRO) (Fig. 77). The form types identified in this fabric cannot be readily paralleled, although most are likely to be associated with specific industrial process, perhaps including metalworking and sugar-refining. Post-medieval redware accounts for less than 5% of barrel well [119] by MNV. A couple of jugs and single jar and dripping dish comprise the only identifiable forms. Finally, a single post-medieval slip-trailed dish (PMRST), recovered as a second from well/cesspit [826], can also be attributed to production. In terms of function, therefore, domestic vessels are proportionally well represented in the group, primarily drinking and kitchen forms, with industrial wares playing a secondary, if significant, role (Table 15).

Of the two clay sources used the fine variant occurs more frequently although it is not clear if this is because the finer, thinner walled vessels created were more advantageous or that they fired less successfully (Table 14).

Function	*SC*	*%*	*MNVs*	*%*
Drinking	688	57.7	39	60.0
Heating / lighting	1	0.1	1	1.5
Industrial	11	0.9	8	12.3
Kitchen	130	10.9	9	13.8
Table	1	0.1	1	1.5
Miscellaneous	337	28.2	1	1.5
Sub-total	1168		59	
Non wasters	25	2.1	6	9.2
Totals	**1193**	**100**	**65**	**100**

Table 15 Distribution by function of barrel well assemblage [119]

Feature	*Context*	*Fabric*	*Form*	*SC*	*MNV*
	0	PMR		4	1
Well [826]	825	PMR	Jar	6	1
Well [826]	825	PMRE	Jug	29	1
Well [826]	825	PMRST	Rounded dish	29	1
Well [1805]	1798	PMRO	Industrial form	1	1
Well [1805]	1800	PMRO	Industrial form	2	1
Well [1805]	1803	PMRE	Jug	12	1
Well [1805]	1803	PMR	Dripping dish	3	1
Total				**86**	**8**

Table 16 Seconds and possible kiln products recovered from other features

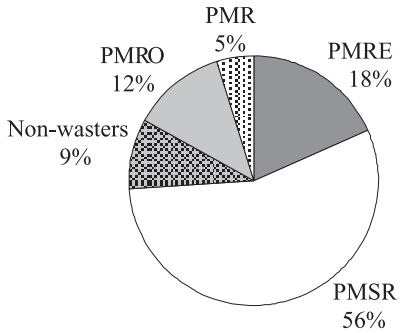


Fig. 76 Quantification of fabrics from barrel well [119] (by MNV)

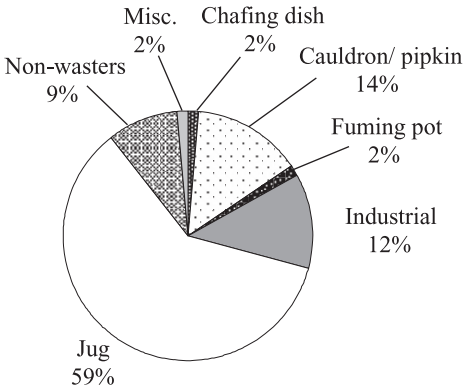


Fig. 77 Quantification of form types from barrel well [119] (by MNV)

The relative quantity of form types may not necessarily be representative, but it has been possible to establish that the potters were exploiting a localised clay source. Given the brickearth content this probably came from Moorfields and is likely to have been a deciding factor in the location of the kiln. It is also evident that production was taking place during the late 16th century and possibly early 17th century, encompassing a period of transition in redware production in London. The waster group includes both early post-medieval redware vessels alongside technically more advanced post-medieval redware examples providing an insight into the nature of transitional forms.

Origins, affinities and contemporary production

Fairly major changes began to take place in the production and supply of pottery to London during the late 16th century. In addition to developments in redware technology, tin-glazed earthenware began to be produced for the first time, and products from the Surrey-Hampshire borders, with an improved range of forms and attractive appearance, began to re-establish a place in the market (Pearce 2001, 203).

Of the known redware production sites in London only Lambeth and Woolwich were evidently operating during the late 16th century. The Moor House assemblage can be most closely paralleled by forms from Woolwich (Pryor & Blockley 1978, Phase 4; J. Pearce, pers comm). Few contemporary consumer groups have been published but those sites where parallels can be demonstrated for jug or cauldron forms include Broad Street (Pearce 1994), Leadenhall Street (Broady 1975, 264), both within a mile to the southeast of Moor House, and London Bridge Street (Knight 2002, 26). Parallels can also be observed in early 17th-century groups at Borough High Street (Orton 1988, fig. 127).

Certain similarities in rim and body profile, particularly with the cauldron forms, can also be detected in earlier assemblages. These include groups dated to sometime between the late 15th and mid 16th century, namely Guy's Hospital (Dawson 1979, figs. 6, 7 and 9), the Toppings and Sun Wharves (Orton *et al* 1974, figs 37–39), and Arundel House (Haslam 1975, figs 8, 9 and 10). Production at Moor House can, therefore, be seen as part of the developing London redware tradition. The origins of this tradition fall largely beyond the scope of this study but have some relevance in understanding the nature of late 16th-century production.

The earliest phases of production at Woolwich have been attributed to Dutch immigrants (Pryor & Blockley 1978). On a broader level, a Dutch influence, whether direct in the form of imports, or in the form of local copies manufactured by immigrant Dutch potters, was also thought to characterise late 15th- and early 16th-century consumer assemblages (Pryor & Blockley 1978; Orton *et al* 1974).

More recently it has been argued that this influence, although no doubt evident, has been overestimated (Orton 1982, 83). Dutch influences can be seen, but they are not central to the development of the redware industry in the late 15th century. Instead, it appears that change occurred more gradually and can be connected to a range of external pressures. At Cheam this resulted in a change of direction in an established industry, largely as a result of competition from German imports (Orton 1982, 82). At a more general level the development of the redware industry in the late 15th century can be related to increased contact with the continent, including the Low Countries and Gemany. This not only increased the demand for imports, but influenced local industries to produce a wider repertoire of forms to fulfil a greater number of functions as ceramics became increasingly integrated into domestic, social and industrial life (Gaimster & Nenk 1997, 177, 188; Orton 1982).

By the mid 16th century, however, London witnessed an influx of Dutch immigrants escaping from religious unrest and persecution (Edwards 1974; Edwards & Stephenson 2002, 174). Documentary evidence suggests that a group of Dutch potters were working for an English potter at Greenwich by the middle of the 16th century, probably producing redwares. Closer to Moor House a large Dutch community evidently settled at Finsbury Pavement, attested by large concentrations of Dutch pottery (Stephenson 1997). Furthermore, to the southeast of the site, at Aldgate, a Dutch potter named Jacob Jansen set up the first successful tin-glaze production in England in 1571, just a couple of years after Richard Dyer (Edwards 1974, 8; Edwards & Stephenson 2002; Blackmore 2005).

It is possible to see certain Dutch influences in the Moor House wasters, in particular the pinched handles, rounded profiles, ribbing, and everted or collared lid-seated rims, but as at Woolwich and on consumer sites, the style is predominantly English. Indeed, the Dutch influence on redware production is most evident during the mid 16th century, linking in to the documentary evidence for migration, but became increasingly diluted and adapted towards the end of the century. Furthermore, although Dyer may have been trained in Portugal it is not possible to see any Portuguese or Mediterranean influences in the group (J. Pearce, pers comm).

On balance, it is evident that the potter at Moor House produced redwares in accordance with the tastes of the local market. If Richard Dyer is responsible for the wasters it is clear that he adapted immediately to contemporary trends in form and decoration. There can be no doubt that the redware industry in London was partly influenced by continental wares from the beginning, and certainly by the Dutch in the mid-16th century, but they are ultimately native products, driven primarily by consumer demand. In this way the slip-trailed dish draws on Weser examples, and possibly Metropolitan slipware in design, but is evidently a London product in both form and style.

The recovery of a fairly unusual slipped chafing dish within the waster group (Fig. 72.8) is of some interest. It is not clear why the vessel is included when so little material unrelated to production was recovered, although it may have been used as a template. The fabric of the chafing dish was sampled (V2145; *see* Vince, Appendix 1),

demonstrating that the vessel is not a product of the kiln, but an alternative source is not immediately apparent.

Significance and distribution

By the time production commenced at Moor House at least two other redware kilns were operating in London. As discussed already these were located in close proximity to the south bank of the Thames at Lambeth and Woolwich. Although documented, the identification of physical evidence for production to the north of the City is a first and consequently of some importance. It is not possible to be certain why this location was chosen but a number of factors may have been influential. Covered by an extensive marsh, Moor Fields was one of last extra-mural areas to be developed in London, providing adequate space for pottery production and more importantly a source of clay, brickearth and water (Haslam, this volume, Chapter 5).

Interestingly, the contemporary tin-glazed earthenware production identified at Aldgate is also located on the City fringes and, as at Moor House, can only provide evidence for a short period of production (Edwards & Stephenson 2002; Blackmore 2005). This may be purely coincidental and from such small assemblages it is not possible to be certain about the scale or length of either industry. Nonetheless, the death of Richard Dyer in 1586, paucity of documentary evidence following 1603, and growing land pressure may indicate that production was short-lived and ceased sometime during the early 17th century (Haslam, this volume, Chapter 5).

The apparent success of contemporary redware, and indeed tin-glazed earthenware industries located on the south bank of the river may offer further insight into the apparent demise of production at Moor House. During the 17th century and 18th century redware production continued at Lambeth, Woolwich and Greenwich and started up for the first time at Deptford, evidently becoming focused to the immediate south of the river (Ashdown 1964; Pryor & Blockley 1978; Jarrett 1999). With the exception of Aldgate, evidence for extensive and long-lived tin-glaze production can also be demonstrated on the southern bank of the Thames (Edwards & Stephenson 2002). The choice of a riverside site was probably deliberate, linked primarily to the Thames as a major route way through London and beyond. The river greatly facilitated in the supply of raw materials required for production and in the distribution of the pottery produced (Orton 1982, 84; Jarrett 2004a, 120).

The site at Moor House did not have the same connections and it is this factor that is likely to have become a particular disadvantage in the event of competition from new industries in the late 16th and early 17th centuries. The broad range of attractive Surrey-Hampshire border ware and tin-glaze forms supplied and produced in London at this time led to a relative restriction in the market for redware. The competition made it necessary for redware producers to specialise in forms to which the clay was most suited, namely heavy utilitarian

Fig. 78 Redware production wasters and seconds

Fig. 79 Post-medieval slipped redware jug forms from barrel well [119]

cooking, storage, industrial and horticultural vessels (Pearce 2001, 203). Unlike Moor House, producers located close to the river were able to adapt more successfully to the large, heavy forms that required greater quantities of raw material and were more cumbersome to transport.

Contemporary redware kiln waste from Lambeth and Woolwich has also been chemically analysed, but comparison of this data to the Moor House redwares remains to be carried out (Pearce, in prep. b; *see* Vince, this chapter). Without chemical characterisation and with relatively few contemporary consumer sites it is difficult at present to determine the scope of the industry (Pearce, in prep, b; *see* Vince, this chapter). If, as suggested, production at Moor House was fairly short-lived, infiltration into the market place may have been fairly limited.

The distance over which the products were distributed is also difficult to observe. The identification of what is thought to be locally sourced redware pottery, serving a small area of the City at nearby Finsbury Pavement, may suggest the distribution was fairly limited (Stephenson 1997, 47). A number of post-medieval slipped redware jugs, very similar to the examples from Moor House, have been

found across the City but particularly just to the west of Moorgate (research from The Museum of London online Ceramics and Glass catalogue). It is possible that these vessels represent the localised distribution of products from the Moor House kiln but in the absence of chemical analysis they could equally have been produced at Lambeth or Woolwich. Although no direct link has been established, a notable exception to a localised distribution may be provided by the recovery of similar vessels (cauldrons and jugs) from early 17th century settler groups at Jamestown, Virginia (J. Pearce, pers comm).

The waster group also provides a further source for industrial redware vessels. Contemporary late 16th-and early 17th-century early post-medieval redware and post-medieval redware industrial vessels used for metalworking have been found nearby at Cripplegate, Aldersgate and Broad Street (Pearce undated; Jarrett 2001; Pearce 1994). No direct form parallels can be established with the large group of distillation flasks at Cripplegate, or the smaller group at Aldersgate but a similarity can be drawn with a distillation base from Broad Street (Pearce 1994).

Of course, the industrial wasters recovered at Moor House are not necessarily representative of the full repertoire produced but again, in the absence of chemical analysis, establishing any connection is problematic. This is particularly the case when it is considered that industrial forms, and specifically distillation vessels, were made at most redware production sites (Kingston, Nelson 1981; Lambeth, Ashdown 1964; Woolwich, Pryor & Blockley 1978; Deptford, Jarrett 2004a). The single thumbed footring base (Fig. 70.5), however, can be paralleled to a similar example from a group linked with sugar-refining excavated at nearby Finsbury Avenue Square (*see* Blackmore, this chapter). Interestingly, this group also included a quantity of seconds or wasters.

The wasters from Moor House are important, as they not only represent an additional datable supplier for consumer sites, but also add to the limited corpus of transitional late 16th century redwares. This contribution is particularly significant in verifying the date and nature of specific fabric and form developments, namely the origin and early appearance of post-medieval redware *c.* 1580 and post-medieval slip-trailed redware *c.* 1600.

CHARACTERISATION STUDIES OF THE EARLY POST-MEDIEVAL POTTERY

Alan Vince

As established above, binocular microscope study of the fabric of the pottery wasters recovered suggested that it was made in two main fabrics, one slightly coarser in texture than the other. In addition, a few unusual fabrics were noted, principally one containing organic temper and one light-bodied sand-tempered ware.

It was not certain visually whether these two fabric groups were the extreme members of a single clay with variable composition, or whether they were two separate clays, used as dug or whether they were produced using the same clay which had then undergone different preparatory treatments (such as levigation or tempering) before use. Samples were therefore taken from within the wasters to try and answer these questions.

A further set of questions concerned the origin of the raw materials used by the potter. To examine this question

TSNO	*Feature*	*Sample Number*	*Code*	*Form*	*Action*	*Description*	*Sub fabric*
V2133	Well [119]	01	PMSRG	JUG	TS;ICPS		Fine sandy group
V2134	Well [119]	02	PMSRY	JUG	ICPS		Fine sandy group
V2135	Well [119]	03	PMRE	?CAUL	ICPS		Fine sandy group
V2136	Well [119]	04	PMRE	CAUL	ICPS		Fine sandy group
V2137	Well [119]	05	PMR	JUG	ICPS		Fine sandy group
V2138	Well [119]	06	PMR	JUG	ICPS		Fine sandy group
V2139	Well [119]	07	PMSRG	JUG	TS;ICPS		Sandy group
V2140	Well [119]	08	PMSRG	JUG	ICPS		Sandy group
V2141	Well [119]	09	PMSRG	JUG	ICPS		Sandy group
V2142	Well [119]	10	PMSRY	JUG	ICPS		Sandy group
V2143	Well [119]	11	PMSRY	JUG	ICPS		Sandy group
V2144	Well [119]	12	PMSRY	JUG	ICPS		Sandy group
V2145	Well [119]	13	PMSR	CHAF	TS;ICPS	Unfinished vessel. Similar fabric to fine group	Fine plus silt/shell?
V2146	Well [119]	14	PMRE+ORG		TS;ICPS	Unusual form	Fine plus organics
V2147	Well [1805]	15	ORG+SHELL		ICPS	Unusual form	Fine plus organics+ shell
V2148	Well [826]	16	PMRST	DISH	ICPS		Essex/local?

Table 17 Thin section and chemical analysis samples

the data from Moorfields was compared with that from a variety of other wares produced in the locality, ranging in date from the early Roman period to the 12th or 13th centuries. For the same reason the data was also compared with samples of late 13th- to 14th-century Mill Green ware from a production site at Noak Hill, near Ingatestone (Meddens *et al* 2006).

Methodology

The samples were studied using thin sections and chemical analysis (Table 17). Because of the very fine texture of the fabric, with few inclusions over 0.3mm across and most less than 0.1mm, only four thin sections were made. They comprised a sample of the 'sandy' fabric (V2139), a sample of the 'fine sandy' fabric (V2133), a sample of a vessel with an organic temper (V2146) and a sample of a chafing dish with a 'fine sandy' fabric which appeared from visual examination to have additional inclusions (V2145). The thin sections were prepared by Steve Caldwell at the University of Manchester and were stained using Dickson's method (Dickson 1965, #44803), which distinguished between ferroan and non-ferroan calcite and between calcite and dolomite (irrelevant in this case since no calcareous inclusions were present).

Sub-samples of these four samples, plus samples of a further 13 vessels were submitted to Dr. J. N. Walsh at Royal Holloway College for chemical analysis using Inductively Coupled Plasma Spectroscopy (ICP-AES). The samples were analysed using the laboratory's standard routine which measures a range of major, minor and trace elements. Major elements are measured as percent oxides and the remainder as parts per million.

Results

Petrological analysis

Fine Fabric (V2133)

The thin section reveals a fine-textured, completely oxidized fabric in which a single rounded quartz grain, *c.* 0.5mm across, and rounded brown and black clay pellets of similar texture to the groundmass are the only inclusions over 0.2mm across. The groundmass consists of slightly anisotropic baked clay minerals and abundant angular quartz, moderate rounded pellets of altered glauconite, sparse biotite, sparse feldspar and sparse pleiochroic unidentified ferromagnesian minerals all up to 0.2mm across.

Sandy Fabric (V2139)

The thin section reveals a medium-textured, completely oxidized fabric containing moderate to abundant ill-sorted rounded quartz grains ranging from 0.3mm to 1.5mm across. In addition, sparse rounded brown clay pellets up to 1.0mm across and sparse angular flint up to 0.5mm long were noted. The groundmass is similar to that of the fine fabric but may contain a slightly higher density of inclusions.

Fine fabric with Silt/Shell inclusions (V2145)

The thin section reveals a fine-textured fabric, very similar to that of the fine fabric (V2133). There are two areas where the groundmass is black rather than oxidized and these are both optically isotropic. These patches might be due to higher firing or to the presence of unburnt carbon. There are, however, no signs of shell inclusions, nor the voids which burnt-out shell would leave, which must therefore imply that these inclusions are exceedingly rare.

Fine fabric plus organics (V2146)

The thin section reveals a fine-textured fabric, similar to that of the fine fabric, V2133. The core of the vessel is black, due to the presence of carbon. The sample contains moderate linear voids, up to 3.0mm long and 0.2mm wide, some of which have dark haloes surrounding them. In one case the void has been cut transversely and is ovoid in section with carbonised organic material in the centre. The shape of these inclusions shows that they are finer than the chaff found in Anglo-Saxon chaff-tempered wares with none of the structures seen in those wares. It is likely that they represent rotting vegetable matter, perhaps including roots. Larger, rounded voids give the impression of once containing calcareous inclusions, probably, from their irregular outline, calcareous septarian nodules which outcrop in the London Clay. Some of these voids contained phosphate, but this is likely to be post-burial concretion rather than phosphate nodules.

Source of the potting clay

The four thin sections show that the parent clay used in all four was the same, or similar. The nature of the inclusions suggests that they come from a deposit of glacial or more recent date. The texture is much coarser than that found in London Clay, which has a silty, micaceous facies as well as the more common silt-free clay which outcrops underneath the brickearth at the City of London. The mixed nature of the silt-sized inclusions in the groundmass is consistent with the finer fraction found in the brickearth and indeed the sandy fabric is very similar to that of brickearth samples from the London area. Most of the brickearth underlying the City of London contains too little clay to be used for potting although it is excellent, as the name implies, for brick-making. The presence of possible rotting vegetable matter in sample V2146 suggests possibly that the clay was obtained from the Moorfields area itself where the upper tributaries of the Walbrook were impeded in the Roman period, leading to the formation of a marshy area. It is possible that natural silting in this area might have produced a fabric similar to that observed in the sections. Another possibility is that the fabric was formed by the artificial mixture of London Clay and Brickearth by the potters. However, if so, this mixing was uncommonly effective as there are no lenses of varying texture seen in the sections. It does seem likely, however, that the sandy fabric

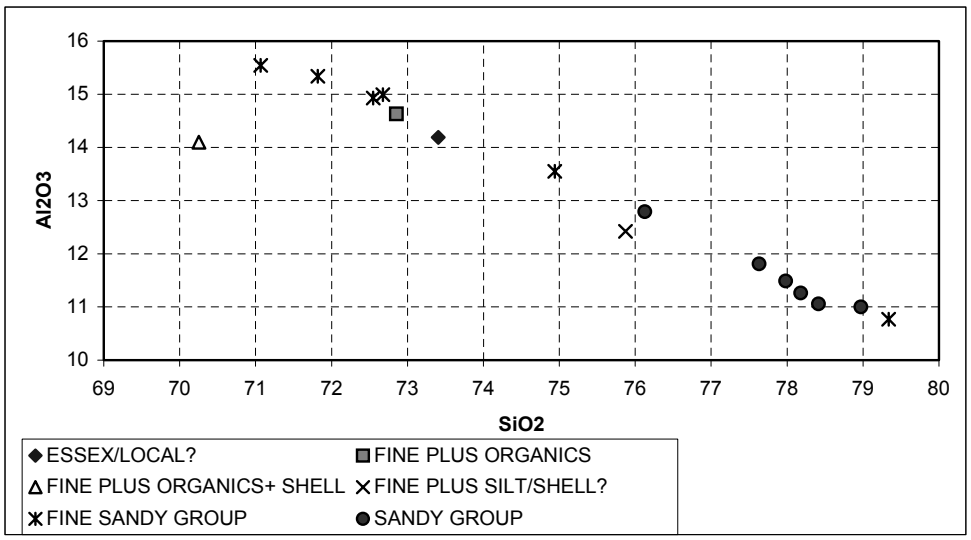


Fig. 80 Plot of 'silica' against aluminium oxide (Al_2O_3)

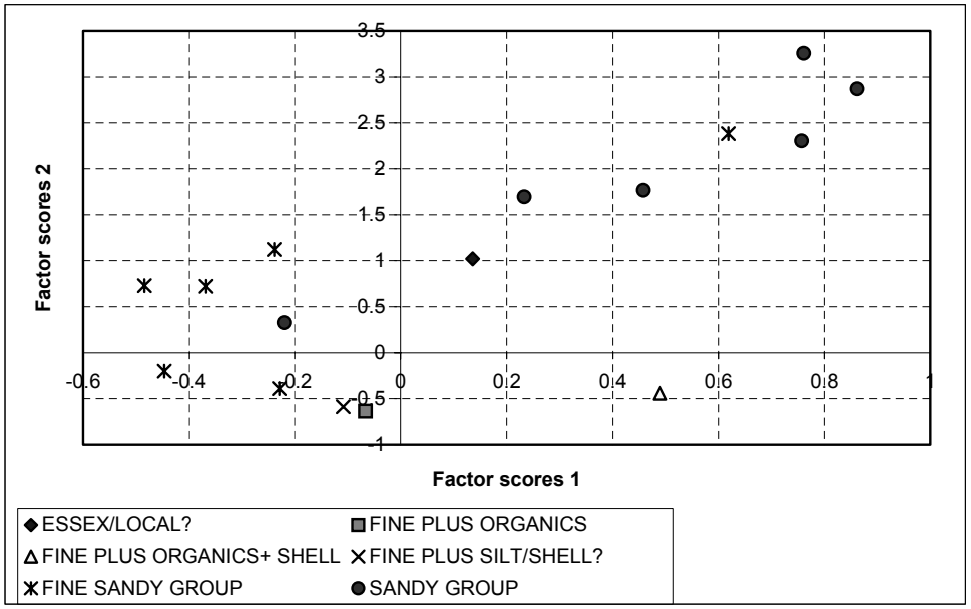


Fig. 81 A scatterplot of the two main factors (1 and 2)

was formed by adding quartz sand, quite possibly from the brickearth, to a silty/fine sandy clay.

Chemical analysis

The chemical data were examined using factor analysis and scatterplots to gain insight into the main areas of variation within the chemical composition of the samples and to look for groups of elements which co-vary, which may suggest that they entered the samples by the same mechanism.

To take account of variations in the overall quantity of sand, which is composed mainly of quartz and serves to dilute the frequency of other elements measured, the measurements were all divided by the value of the aluminium oxide (Al_2O_3) measurement for the sample concerned. Prior to this, however, the overall quantity of sand (and organic inclusions and chemically-combined water, none of which are measured in ICPS analysis) was calculated, by summing up all the measurements and subtracting from 100%. Fig. 80 shows a plot of 'silica' (as defined above) against Al_2O_3. It can be seen that there are indeed two clusters in this data, corresponding to the sandy and fine sandy fabrics. However, one of the fine sandy samples (V2136) actually has the highest silica context calculated. Sample V2145, classed visually and in thin section as a fine sandy fabric, has a similar silica content to the finest of the sandy fabrics. A sample thought possibly to be an Essex product by the pottery specialist has silica/Al_2O_3 values consistent with the fine sandy fabric

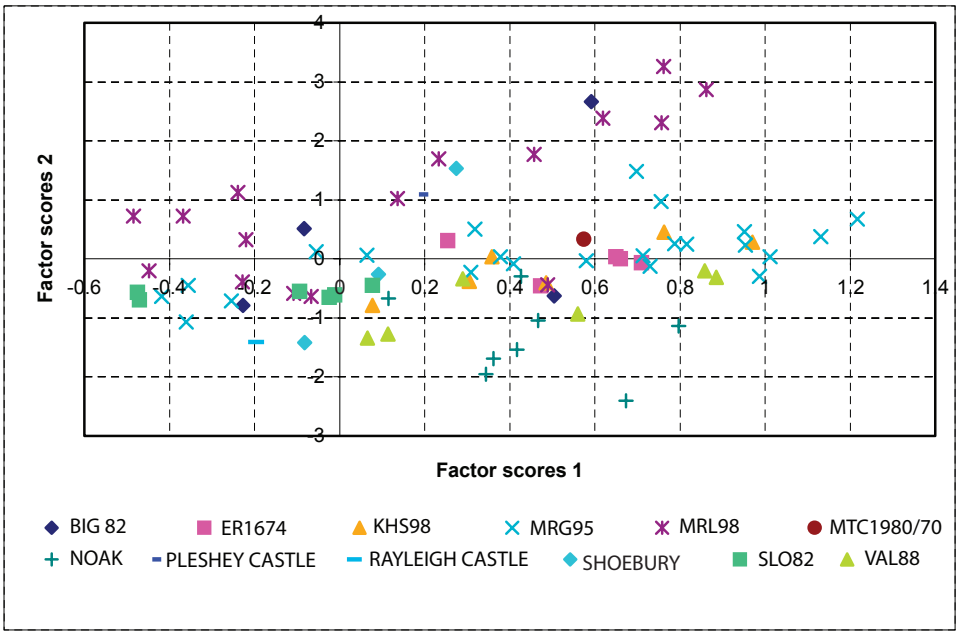


Fig. 82 The Moor House data compared with samples of other wares made from clays in the London area

group, as does V2146 (Fine fabric plus organics). The only anomalous sample is V2147, not examined in thin section. This sample was noted visually by Sudds as being very different (classed as ORG).

This analysis immediately suggests that there are indeed two distinct fabrics used at the site and that the sandier fabric contains about 5% extra silica.

When the transformed data were analysed using factor analysis it was decided to omit the calcium oxide (CaO) and Strontium (Sr) values from analysis, because of the evidence from V2147 to show that calcareous inclusions may have been leached from the samples. A scatterplot of the two main factors (Fig. 81) shows that sample V2146 again is chemically distinct from the remainder, which form an elongated cluster with the fine sandy samples at one end and the sandy ones at the other. The samples of the two unusual fabrics (V2145 and V2146) have similar compositions and both plot at the fine sandy end of the cluster. The putative Essex sample plots midway between the fine and sandy ends and there is one sandy sample with a composition more resembling the fine sandy samples and one fine sandy sample more resembling the sandy samples.

A study of the weightings given to the various elements to arrive at the Factor 1 and 2 scores shows that high Factor 1 scores depend on potassium iodide (K_2O), scandium (Sc), vanadium (V), iron oxide (Fe_2O_3) and titanium oxide (TiO_2). It is possible that all these scores depend on the quantity of sand: K-rich feldspars, Ironstone pellets and Titanium oxides such as Rutile. Factor 2 scores depend mainly on rare earth elements, which are most likely concentrated in the clay fraction of the samples. However, the sandy samples not only have high F1 scores but also high F2 scores. Since there is no correlation of the rare earth elements and those giving high F1 scores it is unlikely that they are present in the sand fraction. This suggests that there is indeed a difference in the clay composition between the sandy and the fine fabrics. This may be due to the inclusion of clay with the added sand and that clay having higher frequencies of rare earth elements than the parent clay. Another possibility, however, would be that the two groups are indeed taken from separate clay deposits which vary naturally in their chemical composition but not in their petrological characteristics as seen in thin section.

The next stage in analysis was to take the Moor House data and compare it with samples of other wares made from clays in the London area (Fig. 82). Factor analysis of this dataset showed that most of the vessels produced in the City of London area have a different composition, and most of these are definitely made from London Clay, sometimes with added sand temper and sometimes not. As shown in Fig. 82 the only samples to have similar compositions to the sandy Moor House fabric are of late 12th-century shelly-sandy and London-type wares (Billingsgate (BIG 82), Shoebury and Pleshey Castle on Fig. 82 (Blackmore & Pearce in prep.)), both of which wares have a similar texture to the sandy Moor House (MRL 98) fabric and have been assumed to have been produced from a clay containing brickearth.

The Moor House fine fabric overlaps in composition, again, with London-type and Shelly-sandy wares from Billingsgate (BIG 82) but also with some of the wares produced in the Roman period with the City: Northgate House (MRG 95) is in the upper Walbrook valley and Sugar Loaf Court (SLO 82) is in the lower Walbrook valley (Seeley & Drummond-Murray 2005). The latter site was definitely exploiting untempered London Clay. Both of these wares, however, have negative Factor 2 scores, which distinguish them from the majority of the fine fabric samples.

Samples from other production sites in the central London area have compositions which do not overlap with

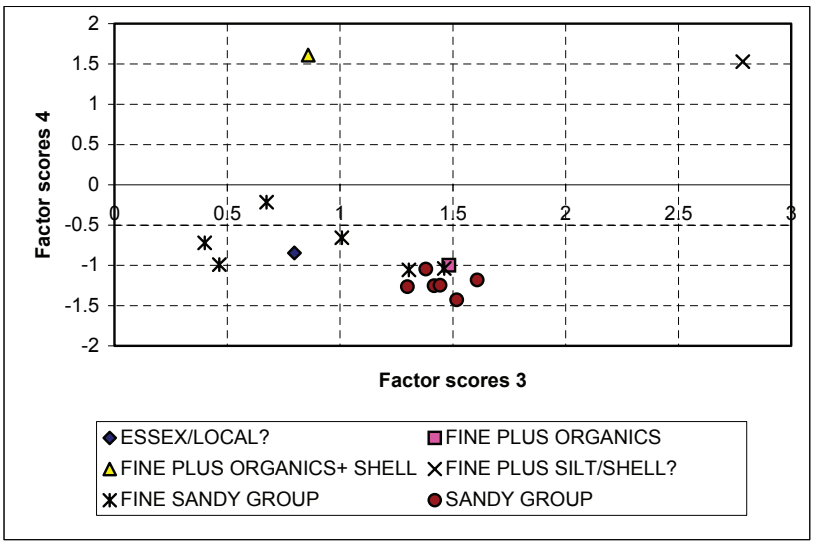


Fig. 83 A scatterplot of Factors 3 and 4 for the different fabric groups at Moor House

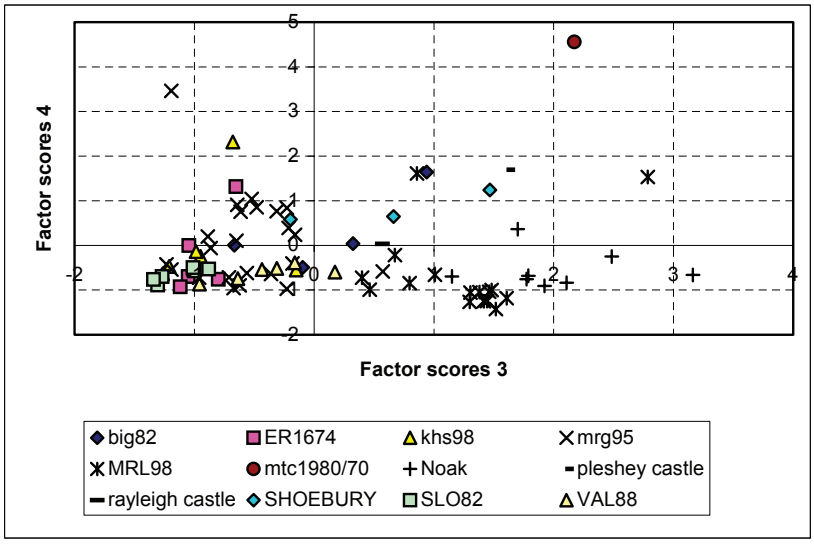


Fig. 84 Moor House samples compared with those from other kiln groups

Moor House. These include the majority of the samples from Northgate House (MRG 95), and all those from Copthall Close (ER 1674) and a second group of samples from Northgate House (KHS 98) (all three sites in the upper Walbrook valley) and a group of medieval sandy greyware wasters from the Fleet Valley (VAL 88) (Seeley & Drummond-Murray 2005, Blackmore & Pearce in prep).

Finally, the 13th/14th-century Mill Green ware samples from Noak Hill, which include both pottery and tile samples, form a clearly separate cluster from both the Moor House samples and the remaining City of London wares.

Two further Factors were calculated by the factor analysis and scatterplots of these which further elucidate the relationship of the various wares. Fig. 83 shows a scatterplot of Factors 3 and 4 for the different fabric groups at Moor House. It too finds two clusters, one composed mainly of the sandy samples and the other mainly of the fine ones. In this case, however, two of the fine samples plot with the sandy ones, together with sample V2146 (fine plus organics) whilst the ?Essex sample clearly belongs to the fine fabric cluster. There are two outliers, samples V2147 and V2145.

In Fig. 84 these Moor House samples are compared with those from other kiln groups. In this plot, the overlap with the Sugar Loaf Court samples seen in Fig. 82, is not present and the samples from that site plot with those from Copthall Close and the Fleet Valley whilst the Noak Hill samples form a group distinguished from Moor House by their higher Factor 3 scores. In this plot, only one Roman

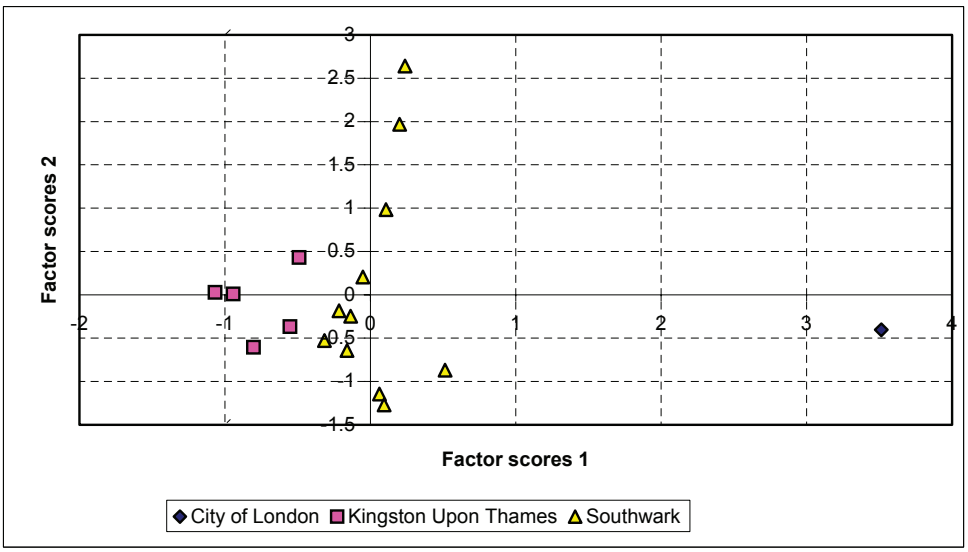


Fig. 85 Sample of white-slipped, light-bodied sandy ware compared with samples from the Eden Street kiln in Kingston and with Kingston-type ware wasters from the south bank of the Thames

sample, from Northgate House (MRG 95), has a similar composition to the fine Moor House samples.

The sample of white-slipped, light-bodied sandy ware was quite different in chemical composition to the remaining Moor House and comparative samples and was therefore omitted from the analysis above. It was then compared with samples from the Eden Street kiln in Kingston and with Kingston-type ware wasters from the south bank of the Thames (Fig. 85) (Ayre and Wroe-Brown 2002).

This analysis shows clearly that the fabric of the Moor House sample (marked 'City of London' in Fig. 85) is quite different from that of the Kingston-type wares too. Visually, the sample looks like a group of light-bodied, sandy glazed wares with a white slip and copper-stained lead glaze found in 13th and 14th-century deposits in the City. In the 1980s these were termed Kingston-type Slipped ware (KING SLIPPED) and assumed to be a Surrey whiteware product. The presence of two joining sherds which have been fired in different conditions is not sufficient evidence to prove that this group was actually made in the vicinity of the City of London but does suggest that the attribution to Surrey requires further proof.

Discussion

Combining the results from both analytical methods, it is clear that there are two distinct fabric groups present and on balance it seems likely that these represent different clay sources rather than the tempering of the fine ware with brickearth-derived sand, which would be more likely to produce a continuous range of compositions with fine samples at one end and coarse at the other. Nevertheless, both of these fabric groups are more similar to each other than to other groups of London or Essex manufacture. The thin section analysis makes it clear that both fabrics include the same mixture of Cretaceous-, Tertiary- and Erratic-derived rocks and minerals, which originated in the brickearth. It is probably the presence of brickearth, which causes the samples to have similar compositions to the shelly-sandy and London-type wares in Fig. 82 whilst further factors (Fig. 84) separate these groups.

Of the oddities, the putative Essex-made sherd is clearly a Moor House product. Sample V2146 has a slightly different chemical composition from the two main fabric groups and samples V2147 and V2145 have more markedly different compositions. No characteristics in the thin section of V2145 can explain this difference whilst there is no corresponding thin section of V2147 for comparison.

Conclusions

Thin section and chemical analysis of samples from the site shows that the 16th-century potter(s) probably used two distinct but local clays and that these clays both contain brickearth. The chemical analysis also demonstrates that the products are distinguishable from other wares produced in the vicinity of the City. They are, however, more similar to late 12th and 13th-century London-type and Shelly-sandy ware samples although these too can be distinguished from the Moor House samples using factor analysis. A greater test would be to compare the wares with those produced at a slightly later date to the south of the Thames, at places like Vauxhall (Guys ware) and those produced in the late 15th and earlier 16th century (Tudor Brown wares). If they can indeed be distinguished then this short-lived pottery could be a useful chronological indicator for sites in central London.

THE POST-MEDIEVAL CRUCIBLE FRAGMENTS

Lyn Blackmore

Fabrics, forms and distribution

Five fragments from three crucibles were recovered from two fills of barrel well [1805]. Two fabrics are represented, one a very hard granular buff ware similar to the medieval crucible fabric EMCW (four sherds); this is represented by one sherd from fill [1800] of the barrel well [1805], and three sherds from fill [1803]. The latter are from the base, body and rim of a very large crucible (diameter *c.* 490–500mm, thickness *c.* 30mm) and the sherd from [1800] is also from a large pot. The second fabric is a much denser stoneware, possibly a more highly fired version of the first fabric (one sherd), and is present in fill [1803] only (again from a very large pot). All sherds have glassy greenish deposits on both surfaces, which to some extent could be the result of exposure to intense heat. The base sherd from [1803], however, has thick residues of greyish green glass that must be derived from glass production, and this suggests that the others were used for the same purpose.

Discussion

The finds are all from barrel well [1805], of which fill [1800] contained pottery dating to 1500-1650, while [1803] was dated to 1620-1650; the latter also contained one or two redware sherds that could be wasters or seconds associated with the large dump from well [119] and other features on the site.

The first large-scale post-medieval glass production in London was set up by a Belgian, Jean Carré, who in 1567, with his partner Pierre Briet, obtained a licence to make Italian-style vessel glass in the former buildings of the Crutched Friars. On Carré's death in 1572 the workshop was taken over by Verzelini, an Italian formerly resident in Antwerp. Following the destruction of the Crutched Friars workshop by fire, Verzelini may have worked briefly at Newgate before returning to the Crutched Friars, but he was apparently still working at the Crutched Friars in 1586 (H. Forsyth, pers comm). It is unclear when the new factory on the site of the former Austin Friars in Broad Street was established; some authors believe it to have been started *c.* 1575 (Mehlman 1982, 66-67), but a date of *c.* 1617 seems more likely from the documentary sources (H. Wilmott, pers comm). It was operated until *c.* 1642 by Sir Robert Mansell, who soon became the dominant figure in English glass manufacture. In the 1660s Mansell's monopoly on English glass manufacture was taken over by the Duke of Buckingham, who produced Italian-style glass at Vauxhall. At this time glass technology was changing, and in 1674-5 George Ravenscroft was employed by the Glass Seller's Company to research new techniques. His London workshop was at the Savoy, not far from Trafalgar Square, and it was probably here that the new recipe of 'lead glass' or 'flint glass' was developed (Fryer & Shelley 1997, 185–188).

Significance of the collection

Taken together with the evidence for post-medieval pottery production on the site, the crucibles might suggest that a wider range of crafts was being carried out in the area than was initially thought. The absence of other glass waste, however, suggests that the industry was not on the site itself. Although the actual source of the material is unknown, the date of the context fits well with the known production period of the glasshouse at Broad Street, quite probably when operated by Mansell. Clearly, these finds provide important evidence for an early stage of the post-medieval glass industry in London.

THE MEDIEVAL AND POST-MEDIEVAL BUILDING MATERIALS

John Brown

The majority of the medieval and post-medieval building material consisted of medieval tile forms with the remainder of the material comprising post-medieval brick and tile forms, and some pieces (unfaced stone for instance) of uncertain date. The range of material was largely unremarkable for a London assemblage and has been discussed more generally in the assessment document (Brown 2003), only the more significant or unusual elements are commented upon here.

The ceramic building material was analysed using the system of classification employed in archaeological work in Greater London in which a fabric number specifies an object's form, composition and method of manufacture. Details of fabrics identified in these excavations are stored with the archive and examples of the fabrics can be found in the archives of Pre-Construct Archaeology and the Museum of London.

Phase 9: Early medieval curved and flanged roof tile

Examples of early medieval (mid-12th to 13th century) roof tile fabrics included fabric 2271 and particularly 2273 (both of these fabrics are produced from local, sandy clays, with fabric 2273 being a much sandier variant). Many of the fragments were undiagnostic, although occasional examples of flanged tiles were noted (in fabric 2273). In form they are similar and in function identical to Roman *tegula* roof tiles. Generally the early medieval roof tiles were 'splash-glazed' with an olive/brown lead glaze. Occasional 'imbrex' style curved thick tiles were also found, again with a splash lead glaze. The presence of such early roofing tiles may indicate the construction of high status 12th- or early

13th-century buildings within the vicinity of the site. This roofing system was suitable only for low-pitched roofs; the more common peg tile roofing system, especially from the latter half of the 13th century, replaced this tile form (Schofield 1994b, 96). At present it seems that medieval flanged tiles were associated with buildings of fairly high status (Smith 1999, 44).

Phase 9–10: Medieval/post-medieval decorated floor tile

Several fragments of medieval floor tiles were recovered. These were glazed and decorated or plain with a lead glaze. Coloured glazes were achieved by the addition of white clay slip to the main body, and with the addition of various metal oxides. Two decorated tiles were seen in Penn type fabric 1810. Penn in Buckinghamshire was a major production centre for floor tiles supplied to London during the 14th century (van Lemmen 2000, 28). One unusual fragment of a decorative, curved tile in Flemish fabric 1698 was recovered, with a plain green lead glaze and simple impressed cord decoration on the top edge of the curved face.

Phase 10: Kiln waste including early post-medieval brick & roof tile

A large number of peg tile fragments from the fill of a barrel well [119] showed evidence of use as kiln spacers, with lead-glaze residue and stacking scars from red-firing earthenware pottery. A sample of 32 sherds weighing 2,665g was recovered for analysis. The tile spacers were predominantly in fabric 2276, a fabric similar to 2271 and from the same clay sources, although generally more neatly produced and with finer moulding sand. The fabric has broad date range, from the late 15th century to the end of the 19th century. Where discernible the form was invariably peg tile, with five tiles showing round peg holes and four tiles showing square holes. The use of square nails for fixing roof tiles suggests a date after the late 16th century. There was one example in fabric 2586, a sandier variant probably from the same source, with a similarly broad date range. Occasionally such use was noted on tile fragments from other contexts; the material most probably represents one dump of contemporary kiln material.

Brick fragments found with the tile were thought to be from the kiln structure itself. A total of eighteen fragments (1,496g) were analysed, all of red-firing sandy fabric 3033, and all showed signs of heating. Where faces survived they were often vitrified and in a small number of cases fragments of tile spacers were vitrified and fused onto the brick. The presence of this demolition material indicates that the kiln was in close proximity to the site. The fabric type is typical of bricks produced locally in and around the London area from the late 14th to early 18th centuries. Examples of brick clamp wasters in this fabric came from the fill [585] of another barrel well [701], and also the fill [824] of a well/cesspit [826]. This coincides with the production of bricks observed at the Island site, Finsbury Pavement, to the northeast, between the late 15th and mid 16th centuries (Malcolm 1997, 39–40).

As the pottery wasters (*see* Sudds above) have been dated to the late 16th and early 17th centuries it is unlikely, although possible, that bricks produced near the Finsbury Pavement site were used for the construction of the pottery kiln itself.

One brick of local brickearth with notable dimensions of ?x134x63mm, was also mentioned at the Finsbury site (Malcolm 1997, 41). Bricks of similar fabric but smaller dimensions had also been observed at 2–7 Dukes Place within an arched foundation that formed part of the 15th century reinforcement of the City wall attributed to 1477 (Tyler 1990). A parallel was found at Moor House, this time complete, with dimensions 2031 x 132 x 64mm. The fabric was also local, orange-firing 3033, and the brick showed a mortar residue, a greenish/yellow lime and sand mortar with iron oxide inclusions. Its proximity to the City wall may also indicate its use in the repairs of this period, with subsequent deposition during the 17th century.

Phase 10: Brick from post-medieval masonry structures

Several ancillary structures from Phase 10 produced the majority of the masonry samples from the site. Examples from context [826], a brick-lined well or cesspit, were recognised as those of the fabric 3033 group, the construction of which utilised re-used brick bats. Another feature, a rectangular brick-lined pit [1794], of the same fabrics may have been contemporary.

Masonry samples from context [671], a brick-lined well, included fabrics from the 3032 fabric group. This fabric represents a development from the 3033 family, utilising clay from similar sources with the addition of organic domestic waste for a more even firing. The well lining again consisted largely of over-fired or warped bricks, possibly clamp wasters. This fabric was also visible in two masonry contexts, [1780] and [1784], both of which were interpreted as very fragmented remains of floors. These three contexts may represent a second phase of building activity.

A third phase of building is represented by the remains of a brick culvert [1783], constructed after the mid-19th century, and contained fabrics 3032 and 3035, the 'London Stock'. The latter fabric was produced around Greater London, particularly the Kent brickfields, from the late 18th century and from the middle of the 19th century it was used in increasing numbers, without fully replacing the earlier fabric 3032. The line of the culvert is roughly east to west, where it may well have joined one of the main sewers running north–south from City Road, along Moorfields, to London Bridge, thus linking Bazalgette's Middle level and Lower level intercepting sewers, indicated on the Thames Water plan of November 1930 (Halliday 2001, 80–81). The construction date for the main sewer is listed as between 1856 to 1888.

Tin-glazed wall/floor tiles

Small numbers of fragmented tin-glazed wall tiles (TGW) and one possible floor tile were recovered, all in poor condition. In all cases tiles were tin-glazed, with blue and white or occasionally polychrome designs.

Stone fabrics

Most of the stone recovered from the site was of unfaced rubblestone, generally of Kentish ragstone (3105). Occasionally stone chippings of Kentish rag indicated processing of stone on site, possibly for the construction and/or repair of the wall. One fragment of Carrara type marble (3114), in slab form, may represent imported Roman material. One complete worked stone of unusual shape was recovered, of Reigate stone (3107). Tool marks were clearly visible on at least two surfaces. One other fragment of Reigate, probably Ashlar, showed diagonally scored incisions that may represent a mason's mark.

Conclusions

As with the Roman material much of the ceramic building material from the medieval period was in poor condition, often fragmented into small pieces and also frequently abraded. These factors suggest that a great proportion of the material of both periods was recovered from secondary deposits, having possibly been used as dumping or ground-making material in attempts to drain marshy ground found in the vicinity and to in-fill large ditch features.

Evidence for the production of pottery near the site was provided by a large dump of roof tiles used as spacers from well [119], and this emphasises the fact that building materials were often used for purposes other than that for which they were apparently designed.

THE CLAY TOBACCO PIPES

Chris Jarrett

The site produced a small assemblage of clay tobacco pipes as 49 stratified fragments including twelve bowls classified according to Atkinson & Oswald (1969) and coded AO. All the pipe bowls date to the 17th century, are in a good condition and despite the small size of the assemblage, there are groups of interest dating to the 1610–1640 period.

Distribution

All the tobacco pipes are from Phase 10 and in Area 2 occur as a single stem in fill [1793] of the brick lined cesspit [1794] and two stems and a nib in fill [1796] of cut [1797].

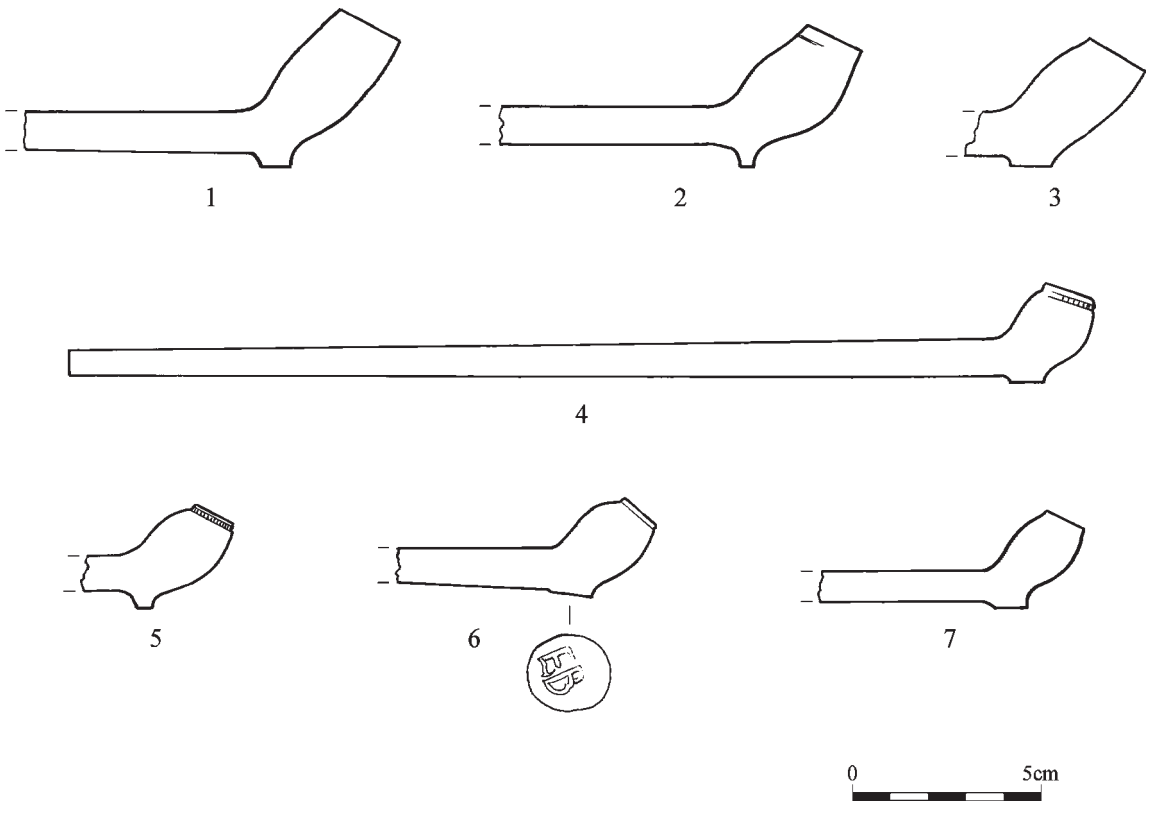


Fig. 86 Clay tobacco pipes (scale 1:2)

The wood-lined pit [1799] contained in its fill a single AO type 5 bowl (Fig. 86.7), dated 1610–1640 which is of good quality, being burnished and milled (rouletted) competently around the rim. An interesting group of clay tobacco pipes was recovered from fill [1803] of barrel well [1805]; all are burnished and milled and date to between 1610–1640, although variants were present. There are two AO type 4 bowls with a projecting foot and one of these with a more pronounced hump on the back of the bowl, is marked on the underside of the heel with a circular stamp (5mm in diameter) and initialled E B in relief (Fig. 86.6). The stamp is elusive in published literature and unfortunately no makers are known for these initials in the 1610–1640 period. The charters of the tobacco makers of Westminster, 1619 (36 signers or pipe makers) and 1639 (22 signers) do not include a maker with these initials. Therefore either the E B pipe represents one of the additional 20 or more pipemakers known from their stamps, who did not sign the charters, or this individual is one of the few pipemakers in business outside London (Atkins & Oswald 1969, 172; Oswald 1975, 8). There are also three examples of flat heel AO type 5 bowls and one, although broken, was complete and measured 272mm in length (Fig. 86.4). There is also a single example of a spurred AO type 6 bowl (Fig. 86.6). All the pipes appear to have been smoked and three examples have evidence for being thrown in a fire. Later pipes in this trench came from a bedding layer [1781] laid for a mortar floor [1780] and the three bowls recorded are an AO type 18 bowl (Fig. 86.3), dated 1660–1680, a shorter AO type 20 variant (Fig. 85.1) dated 1680–1710 and the spurred AO type 19 bowl (Fig. 86.2) dated 1690–1710.

In Area 5 clay pipe stems were only present in the possible road surface [604] and fill of the well or cesspit [826]. From the fill of well [671] was recovered a single AO type 18 bowl, dated 1660–1680.

Discussion

The majority of post-medieval sites excavated in London have stratified groups of clay tobacco pipes first dating to between 1640–1660 and if earlier pipes are present then they are usually residual with later examples. This appears to contradict the documentary evidence suggesting that tobacco smoking was a common habit, as observed by a German lawyer Hetzner in 1598 and a Venetian ambassador in 1618 who noted that 'Women as well as men smoke it day and night' (Oswald 1975, 5). Therefore, it is of interest that the site produced one group of early 17th-century tobacco pipes in the barrel well [1805] and a single bowl in the wood lined pit [1799]. The rarity of clay tobacco pipes on sites before *c.* 1620 and their scarcity continuing until *c.* 1640/50 has often been credited to economic factors; tobacco became cheaper and this is reflected in increases in pipe bowl sizes over time. Other early 17th-century groups of clay tobacco pipes found in London include a *c.* 1600–1620 dated collection of four bowls from a pit at The Old Sorting Office, Swan Street, Southwark (SWN 98) while at Tobacco Dock, Shadwell (Jarrett 2004b) and 43–53 Narrow Street, Limehouse (NHU 99), early 17th-century bowls occurred singly in deposits (Jarrett 2000a and b).

All the tobacco pipes found in the barrel well [1805] are finely made, being burnished and where milling is present it was mostly competently done, but as with many pipes from before 1640 they are well finished though not necessarily of the highest quality. Although the stamped AO type 5 bowl possibly represents a more costly item than the other pipes, taken together these items do infer for the time that their owners show some affluence in that they could afford to smoke tobacco.

THE 17TH-CENTURY VESSEL GLASS

Hilary Cool

Well [826] produced the remains of at least three vessels all connected with drinking. A substantial part of a cylindrical ale glass with optic blown ribbing (Fig. 87.1) can be dated to the first half of the 17th century (Willmott 2002, 38 type 1.4). This is likely to have been an import from the Low Countries. Small fragments decorated with horizontal self-coloured trails were also found; these probably come from another cylindrical beaker. Those with trails like these were in use throughout the 17th century (Willmott 2002, 39 type 1.7) but the vertical ribbing on the trails might suggest this was more likely to have been in use early in the period. The cesspit also contained body fragments from a wine bottle.

Cesspit [1794] by contrast contained an apothecary's bottle rather than tablewares (Fig. 87.2). These were in use during the second half of the 17th century and in the 18th

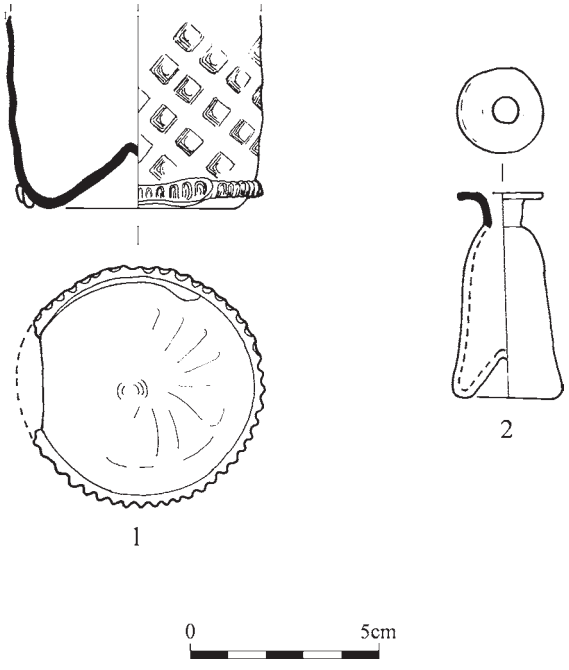


Fig. 87 Post-medieval glass (scale 1:2)

century and individual examples cannot be more closely dated (Wilmott 2002, 90 Type 26.2).

Catalogue of illustrated glass

Fig. 87.1 (1) Cylindrical beaker; lower body fragment and virtually complete base. Colourless with greyish tinge. Straight side sloping in slightly; concave base with pointed kick. Body and base optic blown with diamond shaped bosses in quincunx; trailed base ring with rigaree decoration. Base diameter 64mm, present height 45mm. Fill of well [826], Phase 10.

Fig. 87.2 (2) Cylindrical flask; complete. Light green. Horizontal rim with sheared edge; short cylindrical neck; slightly conical body; concave base with conical kicked base. Height 51mm, rim diameter 24mm, maximum body diameter 29mm. Fill of cesspit [1794], Phase 10.

THE MEDIEVAL AND POST-MEDIEVAL SMALL FINDS

Märit Gaimster

Metal and small finds were retrieved from most phases identified at Moor House. A fuller list of these may be found in the site archive and the assessment report (Keys 2003). In this report the finds, focusing on the more significant items, will be discussed with attention to the medieval and post-medieval periods and activities where relevant.

The medieval period (Phase 9)

Several distinct features and activities characterise the medieval period across the excavated area and they will be discussed here as individual areas. They comprise the marsh deposits, the tanning pit and other features in the western part of the excavated area, the system of north–south and east–west drainage ditches, the parish ditch and, finally, the City ditch.

In addition to four bone skates from medieval contexts, a single bone skate was retrieved in the area of the drainage ditch system from what appeared to be a Roman context, although as discussed below (*see* Chapter 7) bioturbation of the marsh deposits rendered edges of features difficult to determine in places and the context may be medieval; in any case, it is discussed and illustrated with the medieval examples recovered here.

Catalogue

Marsh deposits

Fig. 88.1 <10> iron horseshoe; one branch only; L 88mm; Clark's Type 2A, dated AD1050–1200 (Clark 1995, 86; figs. 62 and 63)

Fig. 88.2 <48> iron rotary key; complete; hollow shank; oval shouldered bow; asymmetrical clefts; L 77mm; bow D 19mm; cf Egan 1998 nos. 310 and 315, with dates in the late 13th and 14th centuries; from layer dated by associated pottery 1270–1300/50

Tanning pit

Fig. 88.3 <126> whittle tang and shoulder of a knife with cast gunmetal shoulder bolster; L 84mm W (shoulder bolster) 20mm; the shoulder has convex sides, finishing in a point at one end (cutting edge) while it is flattened at the other (back); There are no roves extant, but the shape of the bolster suggests the knife may have had a similar handle as the knife <25> below, furnished with decorative roves; sealed by [1453], dated by associated pottery 1180–1230

Fig. 88.4 <210> bone waste; animal scapula with small round cut outs in flat area; L129mm, holes D 8mm; for button or rosary bead manufacture; dated by associated pottery 1180–1230

Fig. 88.5 <229> bottom part of lathe-turned wooden dish; Acer sp (maple); slightly oval base, D 40–43mm; the base is considerably smaller than the shallow bottom preserved; dated by associated pottery 1180–1230

Drainage system of N–S and E–W ditches

Fig. 88.6 <8> bone tool; cattle metatarsal with sharpened end, possibly an awl or punch. L 128mm; from small oval cut [155] at centre of N–S ditches

Fig. 88.7 <30> iron horseshoe; one branch only; originally very large; L 112mm; Clark's Type 3, dated 1230–1330 (Clark 1995, 86–7; fig. 65); from sub-circular cut [484]

Fig. 88.8 <25> iron knife with a whittle tang, broken off at a length of 25mm, and a good part of the blade surviving; blade L 115mm W 25mm. The knife has a cast hexagonal shoulder bolster of gunmetal, L 17mm W 17mm; a series of 21 hexagonal roves of copper and brass/latten survive on the lower end of the handle, with a pattern of three thin copper roves followed by one thicker of brass/latten, the series finishing with three thin brass/latten roves; further metal or organic roves may have completed the handle decoration; from second recut [411] of main E–W ditch [410]; the context is sealed by [409], dated by associated pottery 1270–1350. <226> copper-alloy lace chape; incomplete; L 15mm; fill of E–W cut [567]; dated by associated pottery 1080–1350

Fig. 89.1 <35> bone needle; L 54mm; broken at pointed end; fill of E–W cut [567]; dated by associated pottery 1080–1350

Fig. 89.2 <41> copper-alloy stud; L 35mm, head D 22mm; flat head decorated with three crossed lines forming a star; decorative stud from furniture or chest; from fill of N–S channel/ditch [670]; dated by associated pottery 1270–1350

Fig. 89.3 <51> forked spacer plate of copper-alloy strap-end; L 32mm W 15mm; decorative moulded tip in the shape of a collared knop (cf Egan and Pritchard 1991, fig. 93 no. 680), possibly an unfinished piece

Fig. 97 <71> incomplete antler composite comb; L 60mm W 15mm; probably of 12th- or 13th-century date (*see* Riddler, this chapter); fill of main E–W ditch [970]; dated by associated pottery 1350–1500

Fig. 88.9 <72> incomplete iron trivet; L 140mm; (cf Egan 1998, fig. 121); fill of main E–W ditch [970]; dated by associated pottery 1350–1500

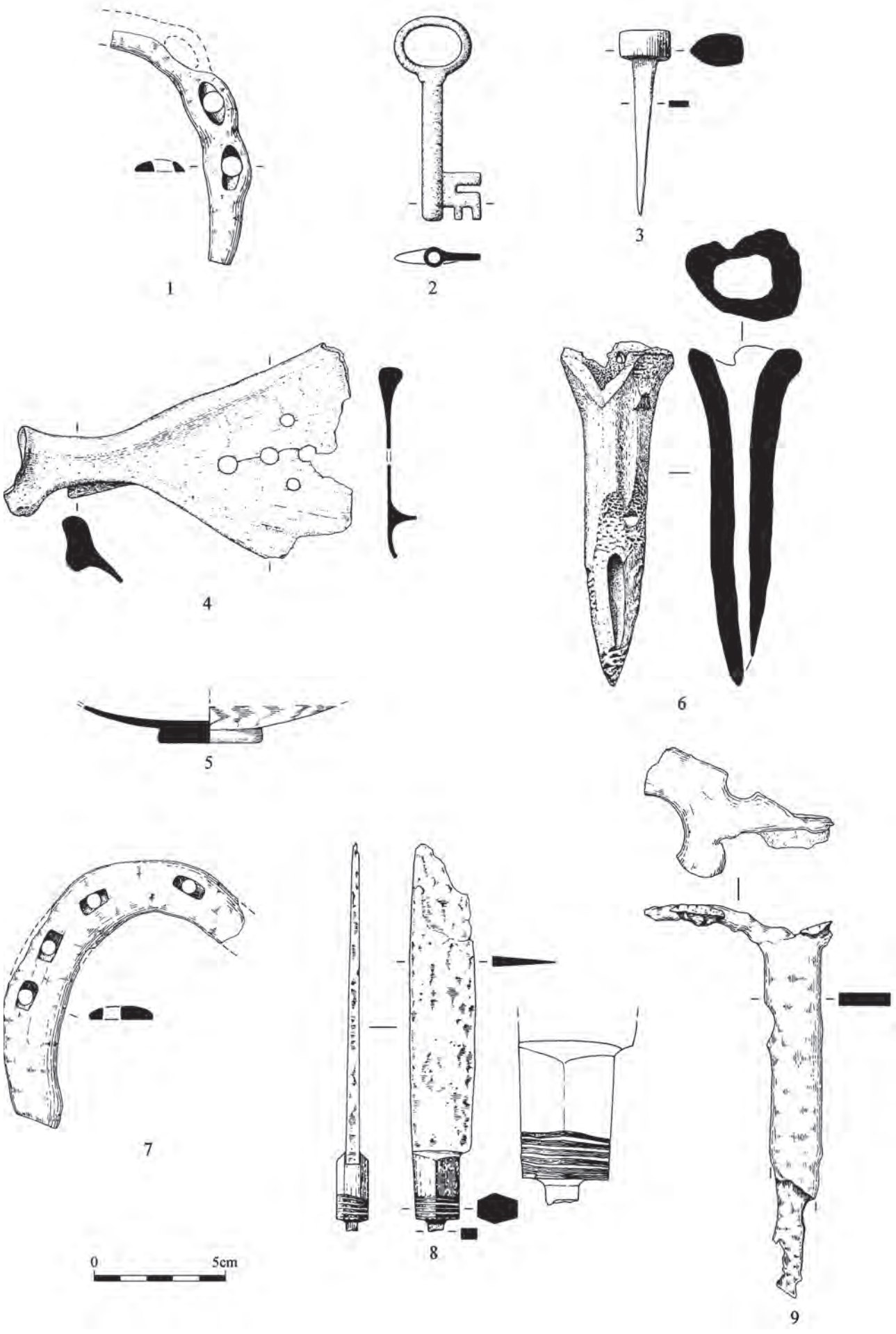


Fig. 88 Medieval small finds: objects of bone, wood and iron (scale 1:2)

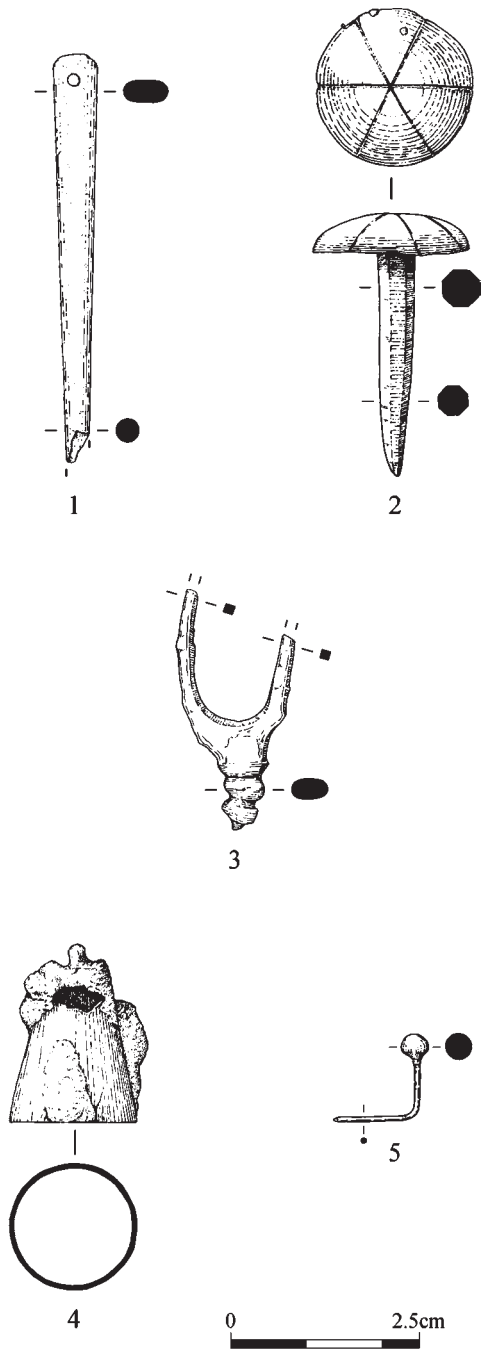


Fig. 89 Medieval small finds: bone needle and copper alloy objects (scale 1:1)

Fig. 90.1 <84> bone skate of horse metatarsal; L 201mm; sub-circular pit [1037] at edge of main E–W ditch [970]

Fig. 89.4 <205> copper-alloy thimble; L 21mm; from N–S ditch [1516]; dated by associated pottery 1170–1350

Fig. 90.2 <209> bone skate of horse metatarsal; L 229mm; from pit [1612]

Fig. 90.3 <19> bone skate of horse metatarsal; L 256mm; from fill of Phase 6 E-W cut [277]

St Giles Parish ditch

Figs 94, 95 <301> slate with graffiti; L 90mm W 100mm; Solomon's knot and cross composed of swastikas (separate report by Gaimster, this chapter, below); from recut [1753]; dated by associated pottery 1400–1500
<303> copper-alloy sheet; metalworking waste; L 71mm W 17mm; from recut [1753]; dated by associated pottery 1270–1500

Fig. 89.5 <306> copper-alloy pin with solid globular head; incomplete; L 21mm; from recut [1763]; dated by associated pottery 1350/1400–1500
<309> copper-alloy sheet; metalworking waste; L 52mm W 25mm; from original cut [1774]; dated by associated pottery 1350–1450

City ditch

Fig. 91.1 <1> iron shears; incomplete; single recess; L (blade) 48mm; from recut [127] of City ditch; dated by associated pottery 1240–1350

Fig. 90.4 <2> bone skate of horse metatarsal; L 259mm

Fig. 90.5 <3> bone skate of horse metatarsal; L 249mm

Fig. 91.2 <13> sandstone hone; L 60mm W 25mm, ht. 17mm

Fig. 91.3 <320> iron shears; one half only; single recess; L 75mm, handle L 40mm ; rectangular-section handles; from recut of City ditch [1846]; dated by associated pottery 1350–1400
<225> bone needle; incomplete with only part of eye remaining; L 22mm; from fill of City ditch [1875]
<335> part of copper-alloy ring or handle; D 33mm; from quarry pit [1888]

Finds were retrieved from all major medieval features at Moor House, comprising a wide range of personal and household objects but also some more unusual finds. No medieval buildings or building plots were recorded suggesting that the finds represent dumped waste and material from elsewhere, most likely from settlement within the City itself. Some finds, however, may be associated with tanning and other industrial activities. Other objects are consistent with accidental losses in the area.

The suburbs and extra-mural areas were regularly sites of medieval industries, in particular space-demanding or smelly activities such as tanning. At Moor House the presence of tanning in the form of a tanning pit is further supplemented with tan-yard waste in the form of cattle, sheep and goat horn cores, and deer antlers (Armitage, this chapter). In addition, leatherworking waste from the site indicates both cobbling and shoemaking in the vicinity (Mould, this chapter). Other industries are more sporadically reflected in bone-working waste and worked-bone points, (such as Fig. 88.6) from the system of drainage ditches (cf Armitage, this chapter) and the waste piece <210> (Figs. 88.4, 92) from button or rosary bead making from the fill of the tanning pit. The possibly unfinished strap-end <51> (Fig. 89.3) from the ditch system and the two pieces of copper-alloy sheet waste from the parish ditch, <303> and <309>, are too inconclusive to suggest

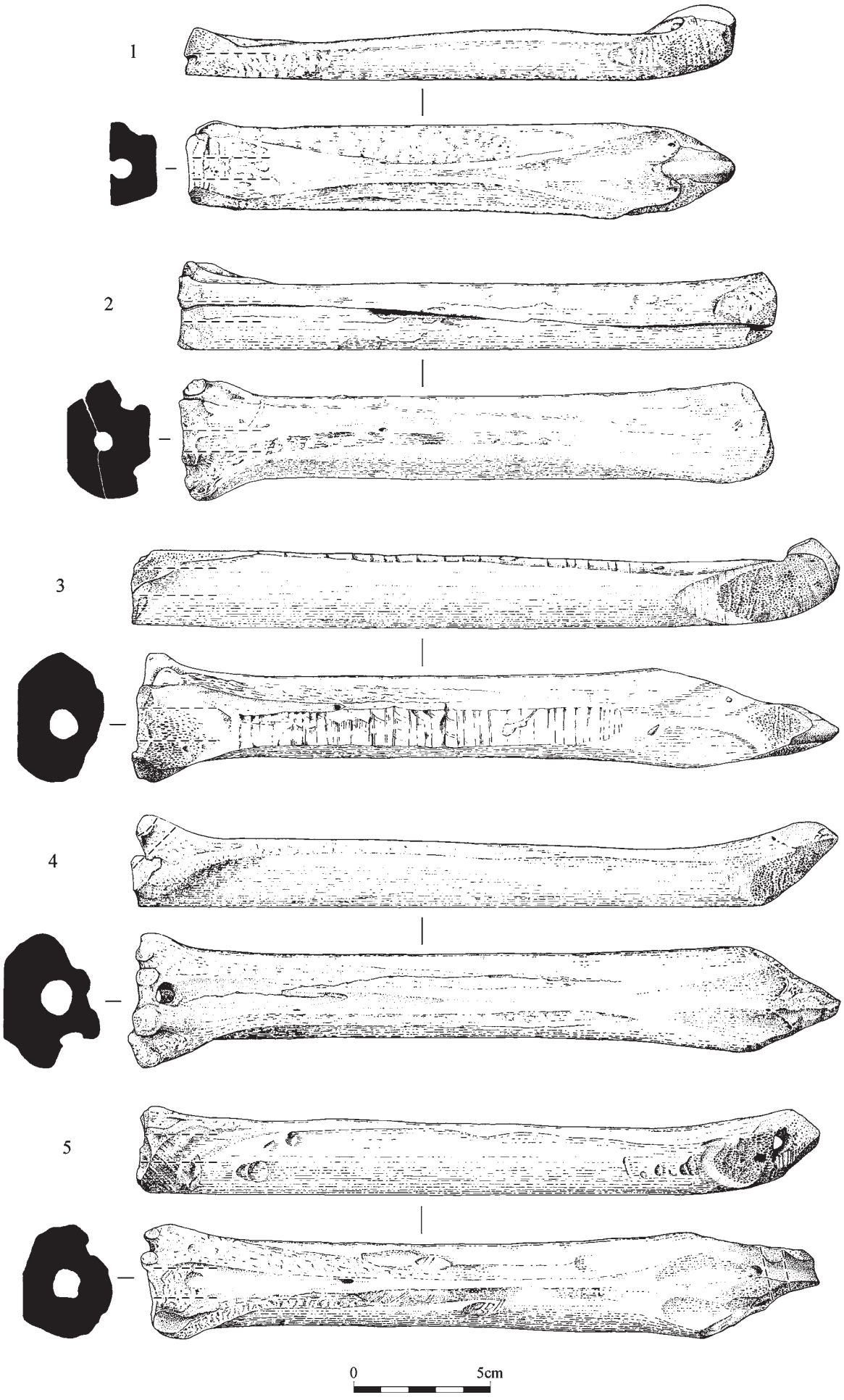


Fig. 90 Medieval bone skates (scale 1:2)

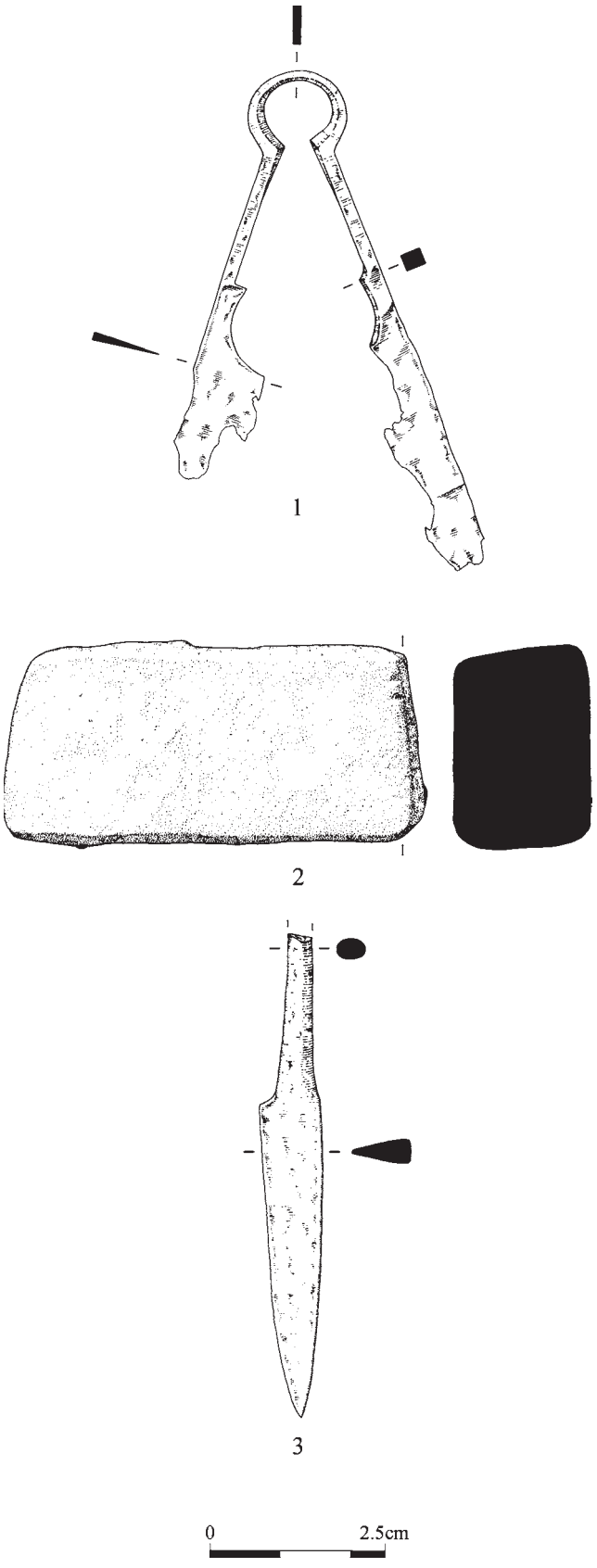


Fig. 91 Medieval small finds: (1–3) iron shears; (2) sandstone hone (scale 1:1)

Fig. 92 Bone waste: animal scapula with small round cut-outs from button or rosary bead making

Fig. 93 Iron knife with a whittle tang

metalworking on the site.

The two incomplete horseshoes along with five bone skates are likely to reflect accidental losses from activities in the Moor House area. The bone skates are all horse metatarsals (spec. id. L. Yeomans); Anglo-Saxon skates, common finds by the 8th century, tend to be more often of cattle bone (Riddler *et al* forthcoming). Their bottoms are flattened and smoothed, with characteristic wear patterns along the main axis of the smooth underside, supporting the interpretation, recently questioned by Continental scholars (Becker 1990), of these objects as skates.

Dress accessories from Moor House include the copper-alloy strap-end <51> (Fig. 89.3) and a copper-alloy pin <306> (Fig. 89.5) with a fine shank and solid, globular head; the latter is likely to have been used to pin the folds of a linen headdress or to secure a transparent veil to the hair or round the shoulders (Egan & Pritchard 1991, 297). The date of the context from which the forked strap end <51> was recovered (a shallow pond [742], *see* Fig. 37, dated by associated pottery 1270–1300) is earlier than that suggested for other forked spacer strap-ends from London and York.

This type has been allocated to the late 13th or early 14th centuries (Egan and Pritchard 1991, 145; Ottaway and Rogers 2002, 2900–2902); the moulded tip is rough and irregular, suggesting the Moor House strap-end may be an unfinished piece. The antler comb <71> (Fig. 97), probably dating from the 12th or 13th centuries, is particularly interesting with its parallels in combs from northern Europe (*see* Riddler below).

Other personal objects are the two knives with elaborately decorated handles, with <126> (Fig. 88.3) from a late 12th- to early 13th-century context and <25> (Figs. 88.8, 93) from a century later. Both the back and the cutting edge of this later example are slightly convex, with the broken end showing a slight tapering. Like <126> from the tanning pit above, this knife belongs to a type characterised by the use of numerous roves and sections of thin metal sheet and bone or horn to create an elaborately decorated handle. A parallel with rectangular shoulder plate and tin roves, dating from the early to mid-13th century, is known from London (Cowgill *et al* 1987, 80 no. 15), but loose metal roves are also known, for example from Meols near Liverpool (Griffiths *et al* forthcoming). This type of elaborate handle is also known from 16th-century contexts; a knife from Tooley Street, Southwark, has a handle furnished with nearly 300 metal and organic rove sheets (G. Egan, pers comm). The Moor House finds are highly significant as they confirm the long development and use of this technique of decoration throughout the Middle Ages and into the early modern period; it is likely to reflect the strong personal and individual character of knives before the development of table cutlery in the 15th and 16th centuries (Egan & Gaimster in prep).

The Moor House finds also include some household objects. An iron trivet <72> (Fig. 88.9) is an unusual find of a kitchen implement, representative of cooking; a shallow wooden dish <229> (Fig. 88.5) would have been for use at the table. Dated 1180–1230, the dish reflects the apparent preference for wooden vessels of maple in the Saxon and early post-Conquest periods, with ash becoming the most popular material by the later 14th century (Keys 1998, 196; cf Morris 2000, 2155–2157). This example may be compared with a late 13th-century birch vessel from Southampton (Platt & Coleman-Smith 1975, 228; fig. 228 no. 1631). Other household objects comprise an iron rotary key <48> (Fig. 88.2) and the decorative stud <41> (Fig. 89.2) from furniture or a chest. Household activities are also reflected in the two bone needles, a copper-alloy thimble and two small iron shears <1> and <320> (Figs. 90.1, 90.3), suitable for cutting thread and perhaps trimming hair (Cowgill *et al* 1987, 58).

An unusual find is the piece of roofing slate with graffiti, showing two different crosses or symbols, retrieved from the St. Giles parish ditch (*see* Gaimster, this chapter, below). Slate was not a common roofing material in medieval London, but fragments of probable roofing slate are known from several sites (Keily 1998, 31). Fragments of medieval roofing slate with graffiti are known from Exeter, but here include above all figurative representations (Allan 1984, fig. 171).

The post-medieval period (Phase 10)

Few finds were recovered from the post-medieval features and layers at Moor House, those that were mostly consisted of iron nails. Two objects, a two-pronged iron fork and a wooden tuning peg (Fig. 94.1), were however retrieved from a barrel well [826] in the western part of the site. A further, heavily corroded, lead object was retrieved from a dump layer in the southeast (Fig. 94.2). This was not identifiable, but may have been a seal.

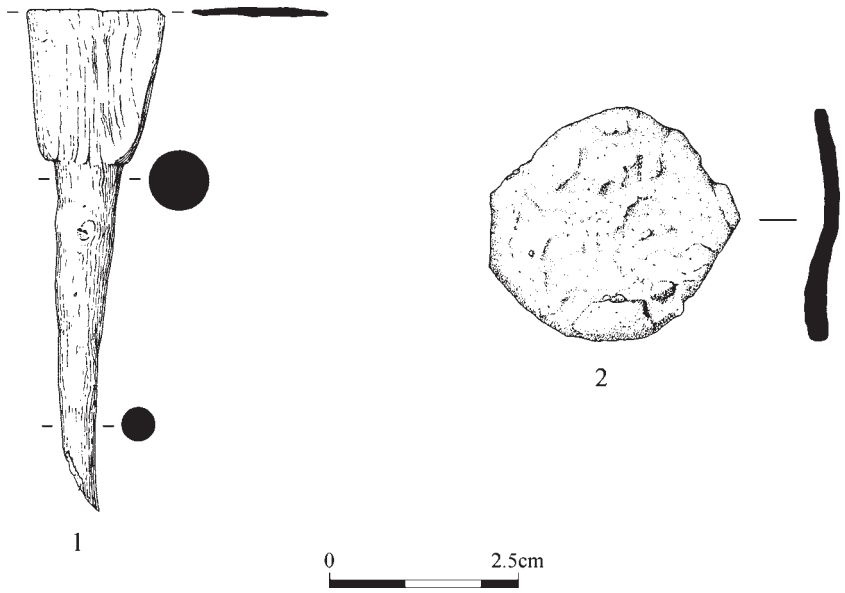


Fig. 94 Post-medieval small finds: tuning peg and lead disc (scale 1:1)

Numerous barrel and masonry wells indicate building development in the area from the late 16th century, the evidence of which is otherwise scarce due to the later construction of Moor House and its underground car park. Glass and ceramics from a brick well [826] may indicate an inn nearby. The tuning peg, if indeed from a cittern as suggested, may indicate also a barber's shop in the vicinity (*see* Palmer, this chapter).

Catalogue

<101> two-pronged iron fork; handle incomplete; most likely an agricultural or gardening tool; L 160mm W 55mm; pot dated 1630–1650 from barrel well [826]

Fig. 94.1 <219> wooden tuning peg; L 68mm W (head) 19mm; possibly from a cittern (*see* report by Palmer below); pot dated 1630–1650 [825] from barrel well [826]

Fig. 94.2 <138> lead disc; irregular and very corroded; unidentifiable but possibly a seal; D *c.*30mm; pot dated 1580–1700 from dump layer [1804]

THE INSCRIBED SLATE

Märit Gaimster

A piece of inscribed slate was retrieved from [1728], the fill of recut [1753] of the parish ditch; the context is dated to 1400–1500 by pottery, although other fills in the recut are dated to the first half of the 16th century. The slate, <301>, measures *c.* 90mm by 100mm by 9mm thick at maximum; two possible cut edges, at right-angles to each other, suggest the piece was originally cut to a square or rectangular shape. On one side the slate is inscribed with two symbolic motifs over a grid of compass points: a cross motif of two multi-strand loops, and a Latin cross formed of five two-strand swastikas. Additional lines as well as faint traces of possible writing may also be discerned above the Latin cross (Figs. 95, 96).

The shape and thickness of the Moor House slate may indicate a piece of roofing slate (cf Platt & Coleman-Smith 1975, fig. 271). Medieval roofing slates with graffiti are not unknown; inscriptions include gaming boards, doodles and figurative representations (Allan 1984, fig. 171 nos. 45–50). It is also possible that the Moor House slate is earlier than its finds context and represents a Late Saxon/Viking period motif-piece: a small portable piece of bone or stone, inscribed with patterns (cf O'Meadhra 1979, 13). Numerous motif-pieces with repeated designs carved into animal bone

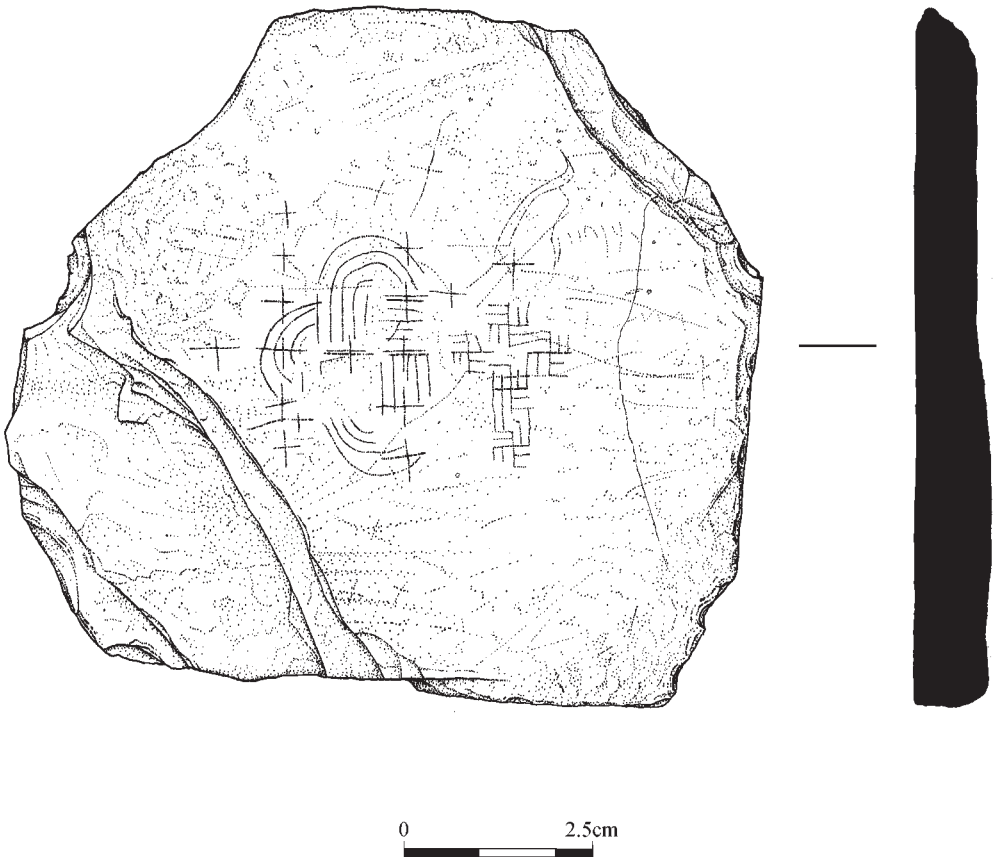


Fig. 95 The inscribed slate (scale 1:1)

are known from London; they generally date from the 10th and 11th centuries (Pritchard 1991, 178–184). In other parts of the British Isles, such as Ireland, Scotland and the Isle of Man, slate was more commonly used as a medium. At these locations, the material dates from the early Christian and Viking periods (*c.* AD 400–1050). The motifs often have parallels in contemporary metalwork, such as dress accessories, and also in manuscripts (Pritchard 1991, 180). However, on the motif-pieces designs are repeated, randomly placed in relation to each other and sometimes even overlapping. In this respect the Moor House slate differs substantially in its use of compass points to set out the designs.

The Moor House piece has some parallels in the repertoire known from motif-pieces in the upright duplex motif (Pritchard 1991, figs. 3.69.c and 3.70) and in the use of the swastika as a basis for designs (Pritchard 1991, figs. 3.72.b). On the motif-pieces, however, the most frequent duplex motif is diagonally inscribed in a square field (O'Meadhra 1979, 12). It is frequently carved in a repeated sequence and the loops are always plain, not filled with interlace or parallel lines. The closest parallel to the multi-strand looped cross, instead, can be found in medieval churches in the period *c.* 1200–1600. In her survey of graffiti from the eastern counties of England, Violet Pritchard found that this was the most frequently recurring motif (Pritchard 1967, 177–180). The design, also known as 'Solomon's knot', has a long history; it was used by the Romans, particularly in mosaics from the 2nd century AD onwards. However, along with the graffiti from churches, the appearance of this motif on fonts and in church wall painting suggests that in the Middle Ages it had a Christian meaning (Pritchard 1967, 33–37). The impact of Christianity is also generally reflected in the flourish of interlace and symbolic motifs in western Europe during the early Middle Ages, largely drawing inspiration from Coptic art (Holmquist 1939, 29–72; Gaimster forthcoming.)

Fig. 96 The inscribed slate

Besides the English medieval churches, Pritchard also noted the occurrence of the looped cross in some 10th-century manuscripts and on 9th-century stone sculpture in Wales (Pritchard 1967, 33–37). A recent find from St. Patrick's Isle, Isle of Man, can be added to the group. Here a piece of inscribed slate was recovered near the ruined St. German's Cathedral, showing a multi-strand looped cross over a faint grid pattern, resembling a gaming board (Freke 2002, fig. 5). The motif appears to be set out from a single cross or compass mark; a further single cross may have been intended for a second motif. The piece, recovered from a 14th-century context, may date from the 10th–12th centuries (Trench-Jellicoe 2002, no. 19 A and figs. 87.10 and 89.5).

While the looped cross motif fits well with medieval imagery, stretching back into the 9th and 10th centuries, parallels to the Latin cross from Moor House are less obvious. Alongside the looped cross and numerous other interlace motifs, the swastika has a long history; however, the flourish of these symbolic motifs, as already pointed out, is closely associated with Coptic art and the spread of Christianity in the West. The swastika, in particular, is a recurring motif on metalwork in northern and western Europe in the 7th and 8th centuries (Gaimster 1998, 108–131). Here, the parallels between Christian and pagan communities and between sacral and personal objects is striking; pure swastikas inscribed in squares appear on a slate motif-piece from the Early Christian settlement at Cathedral Hill, Co. Armagh (O'Meadhra 1979, pl. 1–2). More interesting, in terms of the Moor House cross, is the design on a larger piece of slate, excavated on the site of an early Christian monastery at the Isle of Inchmarnock in western Scotland. Here, the shape of an equal-armed cross is suggested by swastikas inscribed in squares; the other side of the piece has a compass-drawn cross-of-arcs. Numerous pieces of inscribed slate were recovered from this interesting site; these are well-stratified and C14-dated finds suggest a date in the 7th–8th centuries for the majority of this material (Lowe 2003; C. Lowe pers comm).

Unlike earlier metalwork, the swastika on motif-pieces and other medieval inscriptions rarely appears as a central motif. Similarities may be more incidental or reflect the use of the swastika as a basis for interlace designs and patterns. This can be seen on the Moor House slate, where the double lines added to the compass marks give the impression both of swastikas and of interlace or basketwork. The same method of design is reflected in the looped cross from the Isle of Man, where multiple lines were drawn from the central cross and a second set of lines added to form the looped-cross motif. These elements are also obvious in the

graffiti motif from the church at Duxford, Cambridgeshire, strongly suggesting that the central cross functioned both as a compass mark and a base for the design (Pritchard 1967, fig. 43). This method of design, however, was not used for the looped cross on the Moor House slate; here the motif is inscribed within a wider grid pattern instead of drawn from a central compass mark.

Looking at parallels to the Moor House slate, similarities with the conventional Late Saxon and Viking period motif-pieces are less convincing. There is a marked contrast between the repetitive designs on the motif-pieces and the use of a grid pattern to set up the two motifs on the Moor House slate. However, parallels to this design, in the use of compass points to set out an individual motif, can be seen in the probable Viking period design on a piece of slate from St. Patrick's Isle on the Isle of Man. The same motif of a multi-strand looped cross, set out on a compass point, is also one of the most frequent designs found among late medieval graffiti in English churches. This would not exclude a 15th-century date for the Moor House inscriptions, as suggested by the pottery, although the piece could also be several centuries earlier in date.

A further intriguing question is the choice of motifs on the Moor House slate, and the intentions behind the inscriptions. The corpus of medieval graffiti encompasses a wide range of inscriptions, ranging from signs and symbols to words and sentences and figural representations (Krack & Lingens 2001, 30). The medium for inscriptions varies, too, and here the Moor House piece may be compared with the earlier motif-pieces and other similar portable material. These inscriptions may represent a variety of intentions and meanings; they may be casual graffiti, practice pieces for artisans or even amulets (O'Meadhra 1979, 8). At the early Christian site at Inchmarnoch, numerous motif-pieces and gaming boards came predominantly from an area identified as a monastic 'craft zone'. There were also examples of inscriptions interpreted as lettering and practice writing (Lowe 2006). Late medieval portable graffiti, as represented for example on pieces of roofing slate, include gaming boards, figural motifs and casual doodles (cf Allan 1984, fig. 171 nos. 45–50; Freke 2002, 293–301). None of these pieces share any similarities with the cross motifs from Moor House. The main comparative material remains graffiti and decorations known from medieval churches, which may support a more explicit Christian meaning behind the Moor House inscription. From this perspective it is also significant that the looped cross from the Isle of Man, discussed above, was recovered from an ecclesiastic site, St. German's Cathedral on St. Patrick's Isle.

Whether the Moor House slate represents a personal expression of faith, a practice piece or perhaps a devotional object remains unknown. In this context the medium for the inscription is also interesting. While the shape of the piece may suggest a roofing slate, another possibility is that this is part of an object, for example the lid for a reliquary. Such an interpretation has been put forward for a piece of inscribed mudstone from Dunadd, an early medieval hillfort in western Scotland, featuring interlace and animal-style carvings. Measuring 193mm by 109mm by 8mm thick, the stone is a trapezoid shape furnished with a hole at the narrow end; patterns of wear and breakage suggested it was originally suspended from a cord, enabling it to be swung aside to view holy relics, perhaps in a house-shaped portable shrine (Lane & Campbell 2000, 186–189).

THE COMB

Ian Riddler

A fragment of a single-sided composite comb was recovered, consisting of three antler tooth segments, fastened to two connecting plates by four small iron rivets (Fig. 97). Both connecting plates are of D-shaped section with no appreciable taper to either end. They are decorated by a narrow band of single ring-and-dot patterning running along the centre, and the rivets are placed between the decorative motifs. There are saw marks from the cutting of the teeth on both sides. None of the teeth now survives, but there were originally seven per centimetre. The tooth segments are noticeably broad, at 4.3mm in width.

One of the connecting plates is now slightly displaced and misaligned against the other. It is also a little degraded on one edge. The comb has the proportions of a double-sided composite but the upper part is decorated by individual cross-like patterns, arranged in pairs on each tooth segment. Three of these survive and stubs of the other three remain. Measurable dimensions are as follows:

Tooth segment lengths:	19.5mm, 18.5mm, 18mm
Rivet spacing:	18.5mm, 18.5mm, 18.5mm
Connecting plate width:	14.5mm
Overall length:	61mm

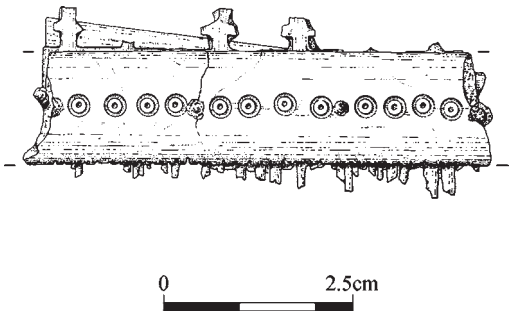


Fig. 97 The antler composite comb (scale 1:1)

Discussion

The central part of the comb survives and includes three tooth segments, which are fastened to two connecting plates of antler by four iron rivets. The connecting plates are decorated on both sides by a narrow band of single

ring-and-dot decoration arranged at the centre, with the riveting arranged to fit in the spaces of this design. The tooth segments are secured on each edge. The most unusual aspect of the comb, however, is the presence of a row of cross-shaped finials above the connecting plates. Three of these survive, out of six originally, spaced at two to each tooth segment. There were originally seven teeth per centimetre; only the stubs of these teeth now survive.

Comparatively few composite combs have been published from medieval London and none of them resemble this comb fragment closely (Egan & Pritchard 1991, 366–376). The proportions of the connecting plates and the evenly-spaced riveting are matched by numerous single-sided composite combs of 11th and 12th-century date; most of these are undecorated (Riddler & Trzaska-Nartowski forthcoming; Egan & Pritchard 1991, 368 and fig. 245.1720; Persson 1976, fig. 288.10a and 291.25A; Hilczerówna 1961, ryc 38; Ulbricht 1984, taf 29.5). Several combs from Lund include central designs, which rise above the connecting plates, as here. This type of central patterning has a long ancestry in Scandinavia (Persson 1976, fig. 288.9a and 11a; Brynja 1997). A more complicated patterning, closer to this design, can be seen on a comb from Lund (Blomqvist 1942, fig. 15). Several of the combs from Gdansk of 10th- and 11th-century date include perforated cresting above the connecting plates, either running continuously or confined to a few tooth segments. Similar decoration can be seen on contemporary combs from Schleswig and Dublin (Hilczerówna 1961, ryc 46 and 48; Ulbricht 1984, tafn 28.4–5, 63.1–2, 68.1, 2, 5 and 6 and 69.2 and 3; Riddler & Trzaska-Nartowski forthcoming). Decorative cresting in this manner occurs between the 10th and 12th centuries and from the 13th century onwards double-sided composite combs became increasing popular in northern Europe, to the detriment of single-sided forms. Thus, although this comb came from a late medieval deposit, it is likely to be of 12th or 13th-century date. At least one other medieval composite comb from London is thought to be residual in its context (Egan & Pritchard 1991, 367).

THE TUNING PEG

Damian Goodburn

A piece of worked timber was recovered from the early 17th-century fill of a brick lined well [826]. This object has the easily recognised form of a tuning peg from a stringed instrument and is 95mm long with a width of 21mm and a diameter of the round shank of 12mm (Fig. 94.1, 98). It was made of a dense, smooth-grained wood, probably box wood. The marks of a lathe centre and turning striations clearly show that it was lathe-turned and then the grip made by carving away part of the larger end to make two flat sides.

Discussion

Frances Palmer

A tuning peg is one of the component parts of a stringed instrument. The peg fits snugly into a hole or socket in the instrument where it is held firm by friction. One end of the string is wound around the peg, which can be turned to change the tension of the string and so to adjust the pitch. A peg is made with two distinct sections: a shank around which the string is wound and a head which is shaped to act as a grip for the fingers or (sometimes) to fit into a tuning wrench.

Tuning pegs are usually associated with instruments where a small number of strings can be 'stopped' with the fingers, or sometimes a bar or a key, to produce a large range of notes: violins, viols, hurdy gurdies, lutes, guitars etc. Instruments of this type are normally constructed with a distinct neck so that the player can reach the strings to stop them. Instruments with a large number of strings each sounding a single note normally have tuning pins, which are made without a shaped head and are always turned with a wrench. There are exceptions to this general rule but there is a high probability that this peg was made for a stringed instrument with a neck. There is no way of telling from the form of the peg whether its associated instrument was played by plucking or bowing.

There are two ways of inserting a tuning peg into an instrument. A peg box is an open-topped box which is fitted to the top end of the neck, there are holes bored in the

Fig. 98 The tuning peg

Fig. 99 'Woman with a cittern', Pieter van Slingeland, 1677

sides of the box and the pegs pass through laterally so that the head protrudes on one side and the tip of the shank on the other. Pegs which are mounted this way are normally drilled with a small hole somewhere in the middle third of the shank. The string is passed through the hole and then several loops are wound around the loose end to hold it in place. In other instruments, the neck ends in a pegboard with the pegs passing vertically through it. The pegs can be arranged so that the heads are at the back or at the front. If the pegs pass through from the back, then the pegboard is usually angled so that the strings are pulled back over the nut (the narrow bar which passes across the top of the neck and marks the top end of the sounding length). In this case, the strings either pass through a hole in the lowest third of the shank or through a groove in the tip. If the pegs pass through the pegboard with the heads at the front the strings can be attached at the top end of the shank. Alternatively, they are run over the nut and threaded through holes in the bottom end of the pegboard before they are attached to the tips of the shanks. Early guitars were usually made with pegboards while violins, viols and lutes regularly had pegboxes.

A tuning peg needs to be strong so that it can withstand the sustained tension of the tuned string, it also needs to be smooth so that it can be turned without jerking or snagging the string. Modern pegs are normally made of ebony or sometimes rosewood, before those timbers were generally available pegs were regularly made of boxwood.

The tuning peg from Moor House is 95mm long overall and does not have a hole drilled into it (Fig. 98). This seems too long to have been used with a pegboard. By way of comparison with instruments fitted with a pegbox, the shortest peg on a violin is about 55mm long overall with a shank of 30mm. The length of the shank is determined by the width of the pegbox which in turn reflects the number of strings. The violin family normally has four strings, viols have six while the basic lute has eleven strings divided into five pairs and one single string.

The tuning pegs of art instruments were often made in a fairly standardised form. The head is shaped into a rounded oblong with dished faces to make it more comfortable to grip; a collar is often turned into the wood at the junction between the head and the shank. There are examples of heart-shaped or decorated heads too, depending on the taste of the maker and the cost of the instrument. The head of the tuning peg from Moor House has flat faces tapered to form an oblong wedge and there is no collar at the top of the shank. The shape of the head suggests that this peg may have been intended to fit into a tuning wrench. Surviving 17th-century stringed instruments come mostly from the high art tradition and there are no obvious contemporary examples for comparison. However, an 18th-century *tambourin de Béarn* (a type of stringed drum from French popular musical traditions) in the collection of the Horniman Museum (28.4.56/300) has more massive tuning pegs with a similar shape to the head. That instrument was tuned with a wrench.

The tip of the shank is broken and there is no sign of a hole or groove for the string. It is possible that this represents damage while the peg was in use or after it had entered the well. On the other hand, it may be that the peg broke while it was being worked and the piece was discarded. The surface of the wood is eroded and it is not possible to see marks of use with the naked eye; pegs are normally worn where they pass through the sides of the pegbox and are sometimes scratched where fresh strings have been fitted to the instrument.

This peg seems to have been professionally made but perhaps intended for a cheaper instrument. The length of the shank is compatible with the stringing of a lute although the use of a tuning wrench suggests a more robust instrument, possibly one strung with wire. The cittern is a possible candidate; this was a wire-strung plucked instrument, which was used in both art and popular music. It was traditionally associated with barber's shops where an instrument might be provided to entertain customers while they waited:

> Is she a whore? A Barber's cittern for every man to play on?
>
> Thomas Dekker, *The Honest Whore*, 1604

> That cursed barber … I have married his cittern that's common to all men!
>
> Ben Jonson, *The Silent Woman*, 1609

THE MEDIEVAL AND POST-MEDIEVAL LEATHER

Quita Mould

Methodology

The leather was scanned when wet and later recorded following conservation by freeze-drying. Leather species were identified by hair follicle pattern using low powered magnification. Where the grain surface of the leather was heavily worn identification was not always possible. The grain patterns of sheep and goat skins are difficult to distinguish and have been grouped together as sheep/goat when the distinction could not be made. The distinction between immature (calfskin) and mature cowhide is not always easy to determine and the term bovine leather has been used when in doubt.

Shoe sizing has been calculated according to the modern English shoe-size scale with the sole measurement rounded up to the nearest size as necessary, continental sizing is provided in brackets. No provision has been made for shrinkage undergone since excavation and following conservation treatment by freeze-drying.

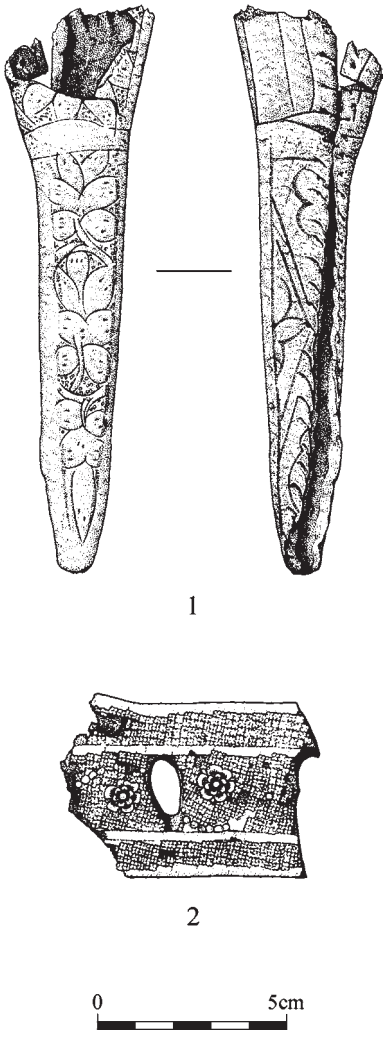


Fig. 100 Worked leather: (1) knife sheath; (2) fragment from a stamp-decorated belt (scale 1:2)

The medieval marsh

A knife sheath <312> (Fig. 100.1) with incised and stamped decoration was found in a marsh deposit [1777] with pottery dating between 1350–1500. The sheath is of a general type dating to 13th and 14th centuries (Cameron 2003, 3388). While not similar in all respects, the more crudely executed decorative motifs on an unstratified example from Billingsgate are comparable (Cowgill *et al* 1987, 160, no. 479).

Medieval cut features

A large assemblage of leather was recovered from 55 medieval contexts, principally from a series of recuts of the large north–south parish ditch in Area 3. The parish ditch sequence spanned the 14th into the 16th century, though the leather is unlikely to date much beyond the middle of the 15th century. The medieval features contained components from at least 125 shoes, along with a range of other items and a small quantity of waste leather.

The shoes

The shoes were of turnshoe construction. The high proportion of soles made in two, or occasionally more, parts was notable. Oval and short, pointed toe-shapes were most common, with a small number of longer toes extending to *c.* 40mm beyond the foot. The shoes were heavily worn and many had been repaired; clump sole repairs were common. More than 50 shoes were sufficiently preserved for their styles to be recognised: styles found are shown diagrammatically in Fig. 101. Shoes were made with one-piece uppers or with separate vamps and either one-piece quarters or two quarters: the latter a feature of early 15th-century footwear. The assemblage was dominated by closed ankle-shoes, with high-throated shoes also present; all were working wear, no high fashion shoes were represented.

Two shoes with drawstring fastening were found. A fragment of one-piece ankle shoe of cowhide with a drawstring fastening (Fig. 101.1) was found in fill [1857] of City ditch recut [1868] in Area 2 with pottery dating to 1270–1350. A taller example, of sheep/goatskin, extending above the ankle, with an open front (Fig. 101.2), came from fill [1529] of a north–south ditch [1530] in Area 6 with pottery of 1170–1230 date. At least five shoes with toggle (rolled leather button) and latchet fastening (Fig. 101.3) occurred, in sizes to fit children and adults. This style was popular in London during the late 13th and early 14th century (Grew & de Neergaard 1988, 21) and throughout Western Europe in the 14th century (Goubitz *et al* 2001,

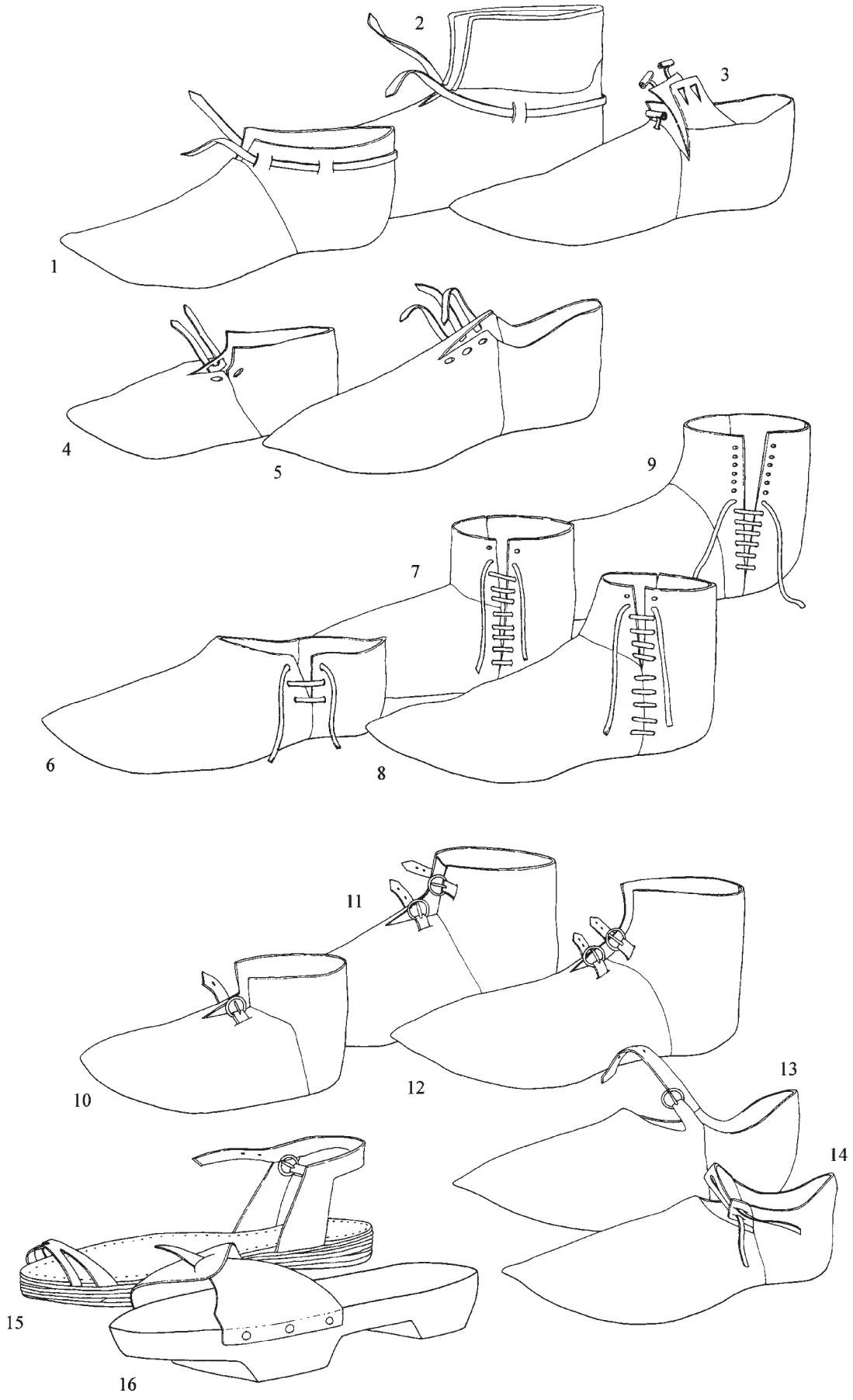


Fig. 101 Shoe styles found at Moor House

162–163). A calfskin example for an adult, found in fill [1894] of an east–west ditch [1895] in Area 5, had two long button holes to fasten over the instep to a pair of toggles. The remains of the other shoes are fragmentary and the number of toggles used is unknown. At Moor House they were found in contexts [1108] and [1760] associated with pottery dating no earlier than 1350.

Five front-lacing shoes were found. Two had one-piece uppers (Fig. 101.4) others were made with a separate vamp and quarters (Fig. 101.5). A number of one-piece quarters were found separately that are likely to come from shoes that laced across the instep also. Children's shoes fastening with a divided lace with a T-shaped terminal through two pairs of lace holes at the instep were found. The single example of adult size (English 4, continental 37) had three pairs of lace holes. These front-lacing shoes came from contexts dating from 1350 onward, the style was popular in London in the late 14th century.

At least twelve side-lacing shoes and boots were present, fastening with a series of small (2–4mm in diameter), closely-spaced, lace holes, lined on the interior. The majority extended above the ankle to below the calf in height, technically termed a very high shoe, but what we would understand today as a low boot. Side-lacing shoes below ankle height (Fig. 101.6) may be represented amongst the more fragmentary shoe remains. The tallest measured *c.* 160mm in height, fastening through fifteen pairs of lace holes. Different cutting patterns were found in this style: one-piece quarters (Fig. 101.7), two quarters seamed at centre back (Fig. 101.8), and quarters with the lace-hole opening cut in one side (Fig. 101.9). A single example had three large, awl-made, lace holes close to a side seam, and here the side-lacing appears to be a secondary modification. Side-lacing styles were found in deposits dating from the mid 14th to the 15th centuries.

Buckle fastening ankle shoes were equally common, usually made with a one-piece upper joining with a single side seam, a vertical opening at the centre front, fastened with a short strap to a small, circular, metal buckle across the instep (Fig. 101.10). An example with a vamp and two quarters was also noted (Fig. 101.12). The majority of these shoes were of ankle height, though examples rising above the ankle were also found. They were made in both adult and children's sizes. The adult examples were often taller, fastening with two buckles and straps (five examples noted Fig. 101.11, 101.12). A single boot, with two quarters, had been fastened at the instep with a lace, as well as a pair of strap and buckles up the leg. These buckled boots have been found in early 15th-century contexts at several locations in London (Grew & de Neergaard 1988, 41) and around the country. Similarly, at Moor House examples were found in contexts associated with pottery dating from the mid 14th–15th centuries.

Shoes fastening with a strap over the instep were also popular. At least nine were found and a number of one-piece quarters found separately are likely to come from other examples. The shoes had high, curving throats and one-piece quarters that were raised at centre back and cut to dip below the ankle on one or both sides. Some buckled over the instep with a long strap joined to one side of the vamp (Fig. 101.13). Others had the fastening strap sewn to the quarters and may have tied, rather than buckled, across the instep (Fig. 101.14). Occurring in adult sizes, the smallest example recorded was adult size 3 (continental 35 ½). They were found associated with late 14th and 15th-century pottery. An insert piece from a vamp wing is the only evidence for a shoe with a lower-cut throat.

The remains of five sandals (Fig. 101.15) with multiple-layered leather soles, and a nailed toe strap of cowhide from a wooden patten (Fig. 101.16) were found in contexts dating from the mid 14th to the end of the 15th century. A five-layered sole of a sandal, to fit an adult size 7 (continental 41), of a shape popular in the late 14th century, and another of adult size 1 (continental 33) with a toe strap of cowhide, were found in recuts of the north–south parish ditch [1744] and [1728] respectively. Whether worn as sandals or as overshoes, this type of footwear is a common find in London (Grew & de Neergaard 1888, 101 and table 21) and is relatively so elsewhere in England, though apparently rare in other parts of Western Europe (Goubitz *et al* 2001, 267–268).

The waste leather

Waste leather was found in small quantities in 25 individual contexts. The waste leather includes primary waste, such as hide edges, udder and other unusable areas of hide, and secondary waste, from the cutting out of pattern pieces during manufacture of leather goods. Secondary waste characteristic of shoemaking was found in eleven contexts and shows that sweepings from a shoemaker's workshop were being thrown away at Moorfields at this time. The high proportion of heavily worn shoe soles and clump sole repairs recovered, and secondary cutting on shoe parts, suggests that waste from a cobbler's workshop (or workshops) was also being disposed of. Eight C-shaped, curved trimmings, rubbish from another leatherworking trade, were found in a recut [1700] of the parish ditch [1701].

Other items

The fill [147] of a large east–west ditch [156] running across the north of the site contained the remains of a flap-closing purse of cowhide with a sheep/goatskin lining (Fig. 102.1). It was associated with pottery dating between 1270–1350. The bottom of the purse is pointed at the centre, a feature also seen on a 14th-century purse from Stockholm (Fredrikson & Zerpe 1992, fig. 208). A fragment from a stamp-decorated belt (Fig. 100.2) was found in [1744] containing pottery dating from the mid 14th–mid 16th century. The remaining hole is heavily worn showing that an object, possibly a knife or purse, had been suspended from it. A handle made from a re-used shoe sole was found in the same deposit.

A piece cut from a panel of cowhide with tooled and

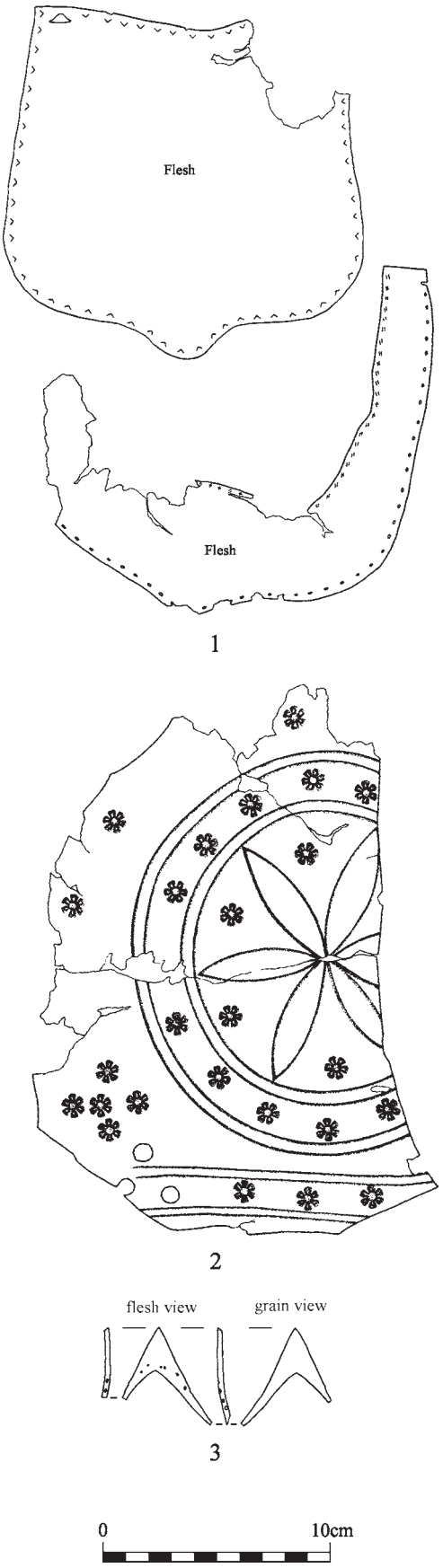


Fig. 102 Medieval worked leather (scale 1:3)

stamped decoration (Fig. 102.2) from an unrecognised item was found in fill [1756] of ditch [1763]. A strap of cowhide with three pairs of holes toward one end was found in the same context.

A small group of leather including a piece cut from a knife sheath lining of goatskin was found in fill [1412] of a rectangular pit [1473]. A small, V-shaped piece of bovine leather seamed around the 'interior' edge (Fig. 102.3) was found, along with front-lacing shoes and waste leather, in the fill [935] of an east–west ditch [970] in Area 5. Though the shape is reminiscent of a finger gusset, double fourchette, from a glove, the stitching and relative stiffness of the leather indicate it has not been used for this purpose. It is too small to have acted as a tongue for a shoe with a delta-slit front opening (Goubitz *et al* 2001, 299 fig. 1d). At present the identity is unknown to this author and it is illustrated here in the hope it will be recognised by others.

Post-medieval features

A small amount of leather was found in post-medieval contexts. Datable shoe components of later medieval date and a circular panel from a leather ball (Mould *et al* 2003, 3407 fig. 1728c) were found in fills [1832] and [1833] of the post-medieval recuts of the City ditch [1846]. Backfill dating to the first half of the 16th century [1736] and [1737] in a barrel well [1750] included a small amount of shoemaking waste and a thonged strap.

A bucket and the terminal cut from a belt with linear, tooled decoration were found in fills [824] and [825] of a circular brick-lined well or cesspit [826] in the southeast corner of the site. Pottery dates the backfilling of the well/pit to the 17th century. The bucket, of cowhide, was at least 266mm tall with an estimated internal base diameter *c.* 165–185mm. The principal components of the bucket are illustrated (Fig. 103). The construction of the bucket is comparable with buckets thought to be of 17th and 18th-century date (Mould & Cameron 2005) though not themselves from dated contexts. This bucket varies from them in some respects, having features such as the tapered supporting strip covering the body panel seam that occur on buckets of 16th-century date. The circular base differs from other buckets in having been made in two halves joining with a closed grain/flesh seam. The base was supported beneath by, presumably crossing, narrow strips, apparently to brace the base in the manner of the crossing straps seen on other examples. The interior of the bucket has a cream/buff/orange-coloured deposit staining the surface that may relate to the burial environment rather than an original surface coating or contents. No evidence for pitch on the interior was observed.

Catalogue of illustrated items

Fig. 100.1 (1) Leather knife sheath. Handle and blade area separated by a moulded collar. Central butted back seam with edge/flesh whip stitching. Front decorated with handle and blade panels of incised foliate motifs with stamped ring

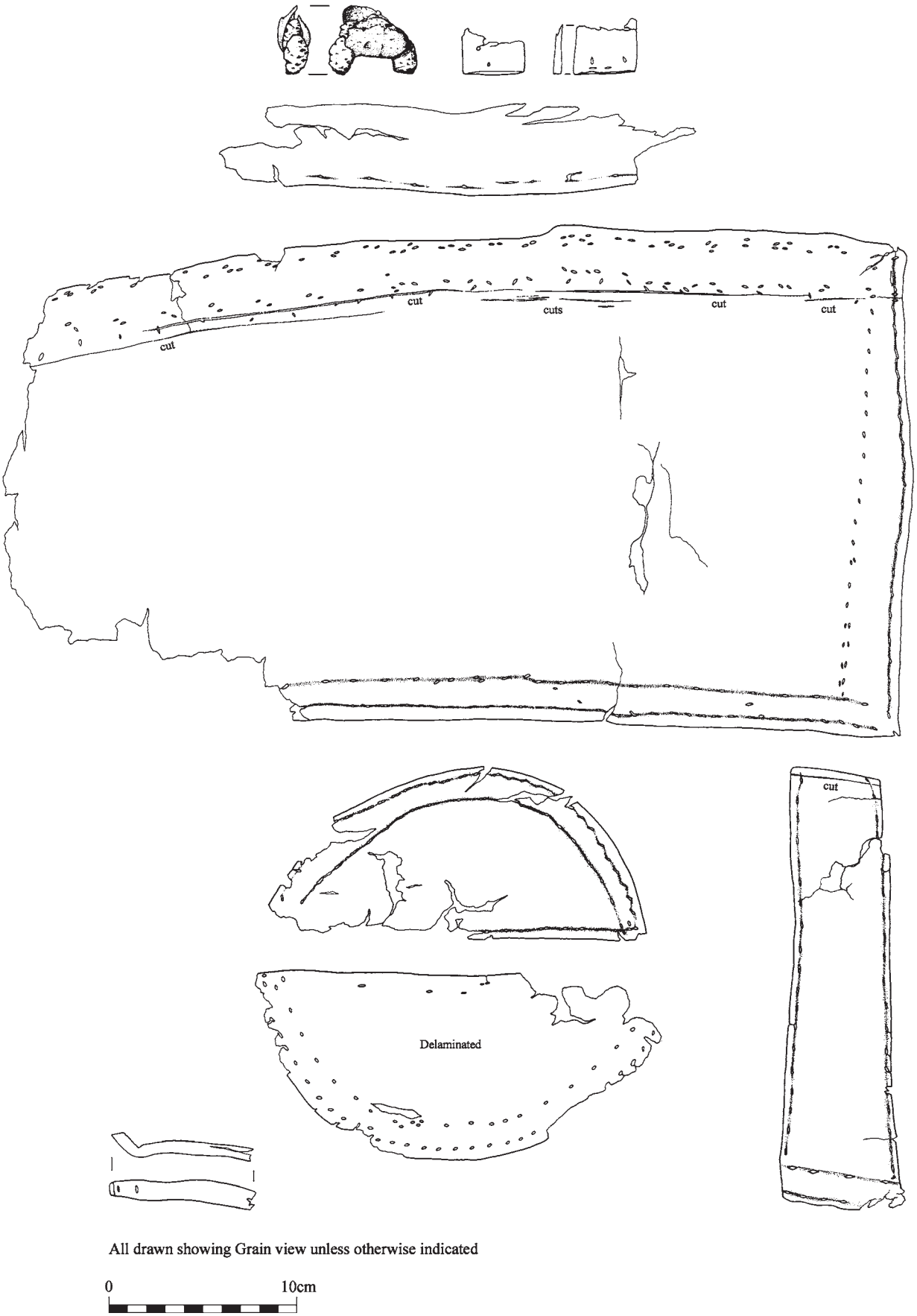


Fig. 103 Iron fittings and leather fragments from a post-medieval bucket (scale 1:3)

infilling. Back has tooled decoration, handle panel with linear ornament, the blade with debased trilobate arcading within double-bordered triangles. Leather calfskin. Length 151+mm, max width 40mm.

Fig. 100.2 (3) Leather belt fragment with stamped decoration. Belt with tooled edges, broken across one end and cut across a hole at the other, with an oval suspension hole, much worn at its base. Decorated on the upper face with two stamped Tudor Rose motifs with a garland between a pair of plain borders, and stamped, pelleted infilling (stamp of a double line of four pellets). Leather worn bovine. Length 68+mm, width 47mm, 3mm thick.

Fig. 102.1 (2) Leather flap-closing purse. Rectangular back panel with rounded corners and central peak to the lower edge. Butted edge/flesh seam around the edges, one corner now missing. A pulled slit is present in the top left corner. Lining for lower edge of the front flap. Lining has a narrow, folded hem sewn with grain/flesh stitching from a closed seam along the outer edge and whip stitching from a lapped seam along the inner edge. Fragment of grain/flesh stitching may come from the front panel. Leather back panel worn bovine, lining worn sheep/goatskin. Back panel depth 147mm, width 160mm, lining depth 148mm.

Fig. 102.2 (4) Leather panel with tooled with stamped decoration. Sub-rectangular panel cut from a larger object with three holes (diameter 3mm) in one corner. Decorated with a large, central, compass-drawn, six-petalled flower within a double border, with a double, linear border along the one remaining edge. A stamped six-petalled flower motif is used as infilling in the borders, between the compass drawn arcs and in a quincunx close to the holes. Leather cowhide. Length 248+mm, width 158mm, 4mm thick

Fig. 102.3 (5) Leather V-shaped piece seamed along the interior edge. The edge/flesh seam (stitch length 4mm) changes to an edge/edge stitching at each point. Leather bovine. Length 49mm, max width 40mm, 3mm thick

Fig. 103 (6) Leather bucket. Circular base of two halves joining with a closed grain/flesh seam (thread impression on grain side) and with a moulded, closed seam with two lines of grain/flesh stitching around the edge to join to the body panel. A narrow strip 5mm thick has the same moulded profile at the surviving terminal and two stitches matching the base seam. The rectangular sheet body panel joins with a butted edge/grain seam. The seam is covered by a single, tapering supporting strip, sewn with grain/flesh stitching (thread impression on grain side) around the edge and incorporated into the base seam. Fragmentary remains of the rim band, also with a line of grain/flesh stitching along the surviving edges are present. The panel has a series of horizontal secondary cuts below the mouth band stitching. When originally examined a fragment of the wooden hoop that ran around the mouth beneath the mouth band was noted. Two fragments of handle mount, and a broken annular ring of iron (diameter 48mm) with remains of the handle terminal present, (handle width 34mm, 4mm thick). Also present are several delaminated fragments from the base and other components. Leather cow hide.
Body panel length 490+mm, height 266mm
Base panels length 217mm, width 98mm; length 205mm, width 101mm

THE TABLET-WOVEN BAND

Penelope Walton Rogers

A woven band or strap was recovered from waterlain silt deposits (Fig. 104). The complete width of the band, selvedge-to-selvedge, is 45mm; the surviving length, cut at one end and torn at the other, is 130mm; and the weave is 1.2mm thick. This was mistaken for a leather strap when first excavated, but it is in fact a very densely woven tablet weave made from silk. The silk is gummed or 'dupion' silk, which means that the filaments are still in pairs held together by the natural silk gum, which gives the band a hard, dark appearance. Fine tack-marks and iron corrosion show that it was originally pinned to a rigid support along both long edges.

The weave is technically two-hole tablet-weaving, apart from the selvedges, which are both made of three cords of four-hole tablet-weaving, twisting ZSZ. For the main body of the weave, the tablets have been set up so that the cords lie alternately Z and S, but the weave has been staggered, which almost certainly means that the band was woven on four-hole tablets, of which only two opposing holes were threaded. By lining up threaded holes with non-threaded, the band can be made by passing the weft at each quarter-turn of the tablets (for weaving instructions, *see* Collingwood 1982, 162-163, fig.108(a)). This construction gives an even surface and a band which does not easily distort. The density of the weave is achieved by using a fine yarn, plied Z2S, and packing the warp together very tightly, approximately 28 cords per cm, with a weft set at 18–22 threads per cm.

The context of the band is 16th century. By this time, tablet-woven bands had been in use for several centuries, for girdles and garment trimmings, and a wide variety of techniques had been established. Relatives of the Moor House technique can be found in girdles from 14th- and 15th-century sites in London (Crowfoot *et al* 1992, 134–138) and a near match for the weave appears in a narrow linen band attached to a late 13th-century buckle from Bramble Bottom, near Eastbourne (Crowfoot 1954). The Moor House band is significantly wider than any of these, the widest of which is 30mm, and was probably used, not in clothing, but as a trim on furniture such as a bed, or perhaps a carriage.

Fig. 104 Tablet-woven silk band

THE TIMBER

Damian Goodburn

Much of the late medieval and post-medieval wood work recovered from the site was found lying in ditch or well fills, although some material was found used for structural purposes such as well linings and truncated ditch edge revetments (or possibly fences along the edge of ditches). The nature of the land use of the zone just outside the City wall provided a very different context for the deposition and use of woody materials to that from the better-known waterfront zones and this is reflected in the diverse nature of the assemblage discussed below.

Probable displaced fence pales of late medieval date

The multitude of ditches dug in late medieval and early post-medieval times worked to drain and probably separate plots of land such as gardens and paddocks which covered the site. Some thin fragments of radially cleft oak found lying in the ditch fills resemble recent cleft oak fence pales and are here tentatively interpreted as such. Examples included timbers from a marsh deposit [1777], [1778]; one, of weathered slow grown oak, survived 135mm wide by 22mm thick and 660mm long, with an ancient break, another was similar but up to 180mm wide. Another fragment of similar material had two small eroded nail holes set about 0.5m apart which may be traces of the nails used to fasten the pale to a pair of parallel rails of some kind.

A medieval wheel hub or 'nave'

Recognisable parts of wheeled vehicles are extremely rare finds on archaeological sites due to their largely organic nature and portability. Therefore, the finding of this item is important despite its weathered, squashed and split condition. The nature of the object from the fill of north–south ditch [1002] was not immediately clear but on careful washing the form of a distorted spoked wheel hub or 'nave' became apparent (Fig. 105). After assembling the fragments in a best fit configuration the dimensions were 0.58m long, with an oval cross section of *c.* 255mm by 188mm. The original diameter before crushing must have been in the region of 200mm (8 inches). The central bore for the axle must have been *c.* 80mm (3¼ inches). To judge from the proportions of wheelwrights' work from the early 20th century the wheel must have been of moderate size or very light construction.

Mortises for six spokes survived but the original wheel probably had as many as twelve. Fragments of three rectangular-section tapered spoke ends survived but their length is unknown. Very surprisingly, the nave was made of a whole log of beech of moderate growth. Although a tough timber, beech has planes of weakness radiating out from the centre just where the spoke mortises were made. In recent British wheelwrighting naves were generally made of elm or occasionally oak (Jenkins 1965, 110); both timbers are tougher and more suitable for outside use than beech. The spoke ends were also beech, radially cleft from a straight grained log. Although considered second best in recent times (Jenkins 1965, 115), beech seems to have been widely known as a timber for wheelwrights prior to the 19th century as estate timber valuation records sometimes show (eg Roberts 1999, 198). Unfortunately, there were not enough annual rings in the beech elements to attempt tree-ring dating.

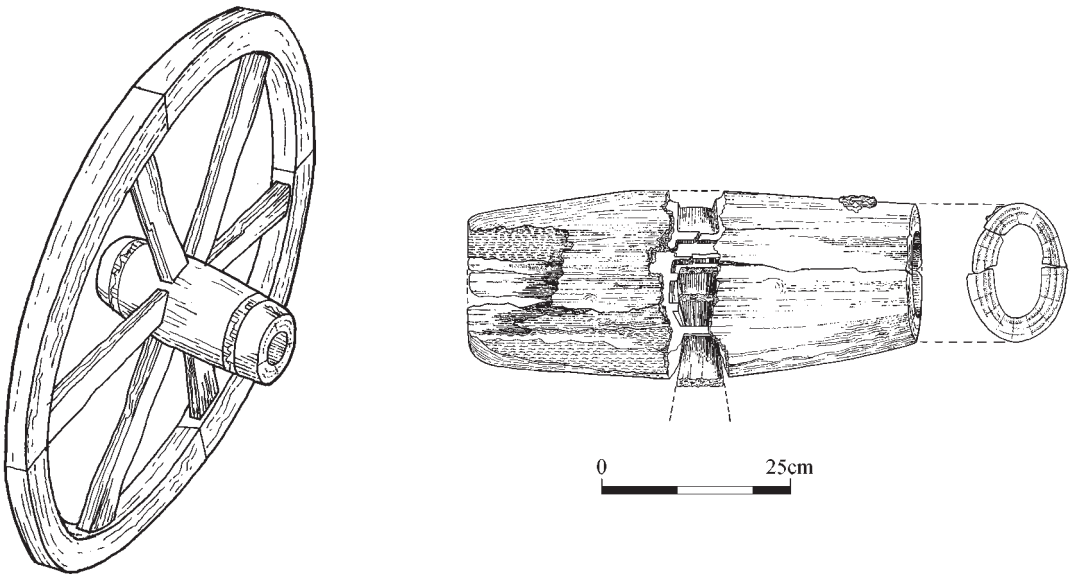


Fig. 105 Wheel hub or nave (scale 1:10) and reconstruction

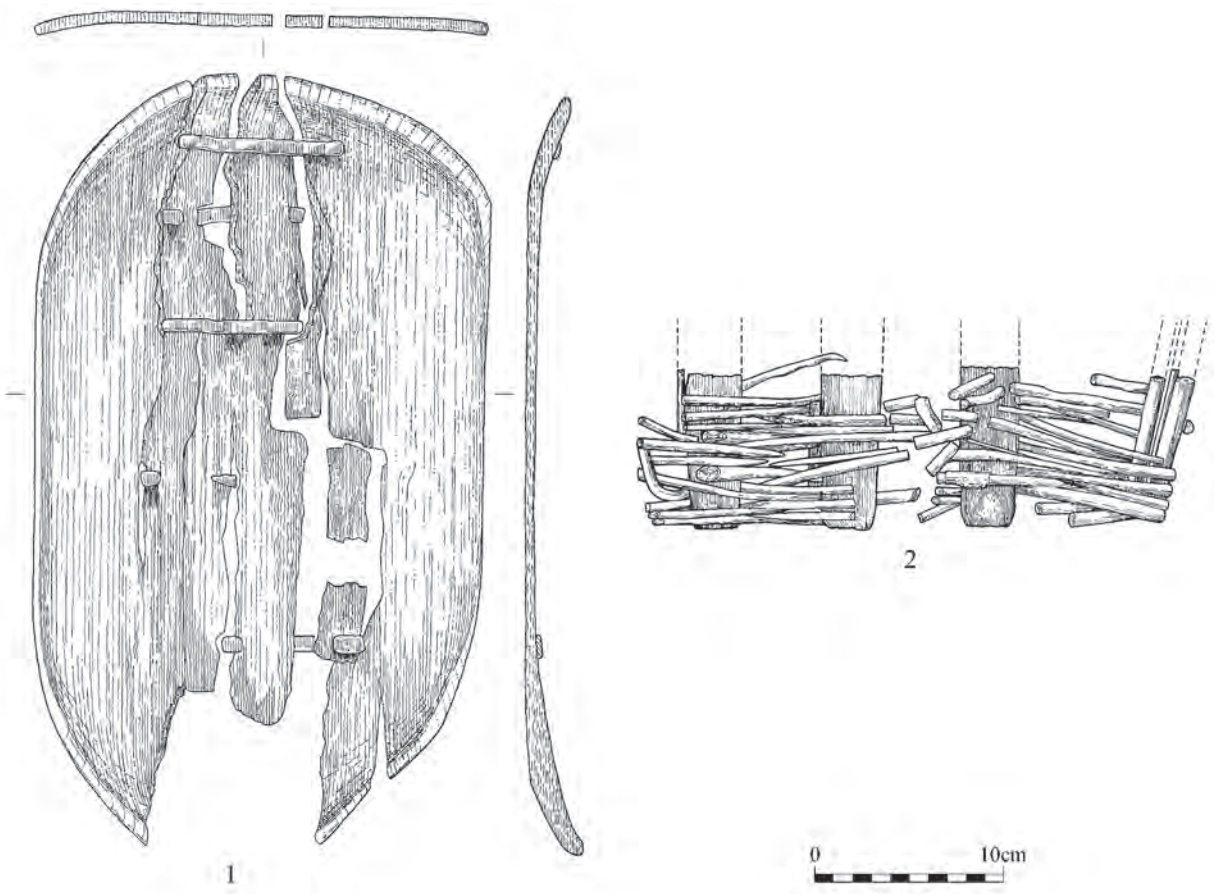


Fig. 106 Beechwood shovel blade and fragments of basketry (scale 1:4)

Although the surfaces of the timber were weathered it was clear that the spoke ends had been accurately trimmed with a keen axe and the nave had been hewn and shaved but not turned as in more recent British wheelwrighting. These last two features are also known from a pair of damaged 16th-century elm wheel naves found at Abbots Lane in Southwark (Goodburn in prep, a). Corroded traces of an iron binding survived at one end and both ends of the nave were probably originally reinforced in this way. A broken and very corroded nail-like fragment of iron *c.* 18mm diameter and 180mm long was also found with the nave, which might possibly have been part of a lynch pin.

In sum, it appears that this wheel nave derived from a lightly made wheel probably from a light cart or carriage rather than a heavy wagon. Its discovery has thrown some light on a very little known area of historic woodworking showing that the techniques and materials used in the late medieval period by wheelwrights were not quite those of the recent past. The nave may have been part of a wheel reused as a kind of grid or filter set in the drain to block the flow of rubbish into the City ditch of the time as described by Stow for the 16th-century Walbrook at Dowgate (*see* Chapter 5).

A wooden shovel blade of late 15th to early 16th-century date

An object recovered from one of the fills of the parish boundary ditch [1744] is clearly the blade part of some type of shovel or scoop-type tool, a category of woodwork only very rarely found on waterlogged sites in London. Although the blade is rather split and slightly distorted the best fit of the fragments provides the following dimensions: 415mm long by 255mm wide and 20mm thick with an internal 'dish' of *c.* 30mm (Fig. 106.1). Decay and moderate use abrasion had removed all the tool marks but it is clear that it had been carved out of a tangentially faced plank-like section of beech which may well have been sawn out. This meant that the planes of weakness in the timber (medullary rays) ran through its thickness making the item rather weak and prone to splitting in alternately wet and dry conditions. The shovel blade had indeed split in use and been repaired using five soft iron staples in the manner sometimes seen in wooden bowl repairs (Morris 2000, 2188). There are few late medieval to 16th-century parallels for this object although a heavier oak shovel with a squarer end has been found in York (Morris 2000, 2315) and recent excavations at the site of the London Bridge development in Southwark have produced a beech shovel of *c.* 14th-century date (Goodburn in prep, b).

In recent times lightly made beech shovels with rather squarer ends were carved from stronger radially faced boards in the Chilterns and elsewhere and used for malting or handling light dry goods; tangentially faced beech was considered prone to splitting and warping (King 1992). Perhaps this item was used originally for handling light dry material and then, once damaged, used for a while to scoop out soft wet silt in the ditches on the site eventually to break and be abandoned there.

A section of unusual basketry

Yet another rare find was a section of collapsed basketry of an unusual combination of materials from the early 16th-century recut of the City ditch. It was lifted as a block with some surrounding ditch fill and the most coherent section very carefully washed and drawn in detail (Fig. 106.2). The most intact sections are clearly fragments of a flat panel from a rectangular basket or pannier type container. The weave was made using a mixture of cleft oak laths (mainly sapwood, 'spelks') 30–25mm wide by *c.* 3mm thick and small rods with the bark on of what was probably 1-year-old willow *c.* 8–10mm in diameter. The fine rods were wound round the flat laths and at the edge of the panel three round rods, in a simple under and over weave. Fragments of what may have been 'stakes' (vertical rods during the weaving of the basket) were found pushed between the rods parallel to the spelks, which might suggest that the illustrated section was part of a base.

No close parallels are known to this writer for this type of weave of late medieval to 16th-century date, although there are strong similarities to a woven lid of a box or basket found in York of broadly this period (Morris 2000, 2290). In more recent times cleft laths and small rods were used in *gwyntell* baskets made in Dyfed, Wales but they had a round form without flat panels (Jenkins 1965, 52). Perhaps we can see this basketry as fragments of a broken pannier for goods coming into the City from the north, that was thrown away reasonably near to where it was opened.

Assorted cooperage finds mainly from 16th to 17th-century well linings

A considerable number of elements of truncated stave-built wooden vessels, 'cooperage', were recovered from the site. The key comparative material is unpublished finds from recent London excavations and the published corpus from York (Morris 2000, 2224). A few small sections of weathered cleft oak and isolated staves may derive from secondary use in pale fencing but most elements derive from vessels re-used as linings in seven wells or pits of 16th to 17th-century date.

The elements survived in various states of preservation from decayed impressions to slightly eroded but solid timber staves of the sides of casks. Some of the truncated but solid cask bases even had well-preserved split roundwood hoops attached. In one unusual case virtually all the staves had been removed from a well lining leaving the waterlogged hoop bindings around the impression of the cask [1750]. All the stave end or 'head pieces' were of radially cleft oak, the most common material found in historic casks in Britain until the late 19th century. Notes on some of the better-preserved cooperage items are listed below.

Cask [119] survived as a partially preserved end of a cask ('head') of which only three narrow boards survived *c.* 100mm and 110mm wide but only *c.* 10mm thick due to decay. The remains are of a lightly built cask that may have functioned as a pit — rather than well — lining.

Cask [701] survived much more intact with *c.* 40% of the full length of the staves preserved, although the grooved end ('Croze') had been cut off before reuse. The staves in this case were only 13mm thick and up to *c.* 105mm wide which also shows that the cask was lightly built, possibly to receive semi-dry or dry goods. The hoops left impressions on the outside faces of the staves showing that they were almost continuous.

Cask [1750] had relatively well preserved hoops made of small deciduous roundwood, which had been split in half and shaved to just less than half a rod. The bark was left on and two headed ash pegs used to secure the over lap which was then bound with what appears to be split rods of 1-year-old willow. The sides of the hoops were also notched to secure the bindings.

Stave [988] was found 'loose' in the fill of well [926], it had a broken length of 0.59m was *c.* 130mm wide with a thickness of over 14mm. It had a bung hole *c.* 70mm in diameter reinforced by a nailed-on batten across the grain, which is an unusual feature.

A roughly built early 17th-century timber form for a masonry well

A simple form or frame of oval shape was found supporting the masonry lining of well [826]. It was made of hand sawn elm planks *c.* 30mm thick, two main planks were roughly cut to form an opening of only 0.45m (*see* Fig. 58). The butting area of the planks was not jointed but strapped with two short lengths of nailed on planks. In other London examples of late medieval and early post-medieval date such form-work or well sills have usually been found to have been jointed and pegged together forming a level surface. The work could be seen as a comparatively quick cheap job that could have been made by the bricklayer/mason rather than a skilled carpenter. The size of the hole suggests that a pump pipe would have been used with this particular well rather than a bucket.

Miscellaneous worked timber fragments

A number of other items of worked timber of interest were found, the function or origin of which is uncertain. One example was at first thought to be a possible bakers' peel. However, on close examination the 700mm long by 215mm

wide and 23mm thick sawn oak plank fragment was found to have been used at least twice before abandonment with an assortment of relict peg holes and hewn indentations.

In some cases sawn oak plank fragments, such as were recovered from a recut of the parish ditch, could be displaced sheathing from ditch edge revetments, others may have been used as duck boards. Smaller items such as wood chips, cleft oak batten or lath fragments may simply be building demolition or construction debris. One small loose fragment of radially cleft beech only 7mm thick may have been a panel in a small item of furniture, or possibly a book leaf.

Cut roundwood ends and possible pruning offcuts

The lifted cut roundwood ends were all heavily truncated, some were 'loose' isolated fragments of debris from roundwood working or cutting. In other cases the small fragments of roundwood were found as stake tips along the edge of a north–south ditch. An example of the latter is a stake tip from the parish ditch probably of alder, 40mm in diameter with a simple oblique 'chisel' point. Such small stake tips could only have supported a rather light wattle fence that would not constrain large livestock.

THE ANIMAL BONE

Philip L. Armitage

Numbers of bone elements/fragments and species represented

A total of 4,033 animal bone elements/fragments (NISP) from medieval and post-medieval contexts were submitted for analyses and interpretation. Of these, 3,784 (93.8% of the total NISP) are identified to species/taxon and anatomy, and 249 (6.2%) remain as unidentified fragments. Table 19 provides an overview of the summary counts of the bones by species/taxon and site phase. Whilst the bulk of

Phase	*Sample*	*Deposit type*	*NISP*	*MNI*
9	<10>	Fill of ditch [102]	1	1
9	<13>	Fill of ditch [115]	2	2
9	<27>	Fill of ditch [411]	1	1
9	<30>	Fill of ditch [419]	3	2
9	<51>	Fill of ditch [428]	1	1
9	<42>	Fill of quarry pit [484]	4	2?
Totals			**12**	**9**

Table 18 Summary counts (NISP) of the frog bone elements recovered by means of environmental sampling from the medieval (Phase 9) deposits.

Species/Phase	*8*	*9**	*9***	*10*	*Totals*
Horse (*Equus caballus)*	10		137	1	148
Donkey (*Equus asinus*)			1		1
Cattle (*Bos*)	140	331	1507	95	2073
Sheep (*Ovis)*	53	93	616	57	819
Goat (*Capra*)			4		4
Pig (*Sus*)	13	18	177	4	212
Dog (*Canis*)	4		161	16	181
Cat (*Felis*)	6	5	28	2	41
Fallow deer (*Dama dama*)	1		3		4
Red/fallow deer		1			1
Roe deer (*Capreolus capreolus*)	2	54	27		83
Rabbit (*Oryctolagus cuniculus*)			9		9
Black rat (*Rattus rattus*)			1		1
House mouse (*Mus musculus*)				1	1
Wood mouse (*Apodemus sylvaticus*)				4	4
Mouse spp.				1	1
Greylag/domestic goose (*Anser anser*)	1	13	43	5	62
Mallard/domestic duck (*Anas platyrhynchos*)			4	1	5
Domestic fowl *Gallus gallus*)	1	6	79	6	92
Swan (*Cygnus olor*)			1		1
Raven (*Corvus corax*)			3		3
cf. heron (*Ardea cinerea*)			1		1
Cod (*Gadus morhua*)		15	7		22
Ling (*Molva molva*)			1		1
Haddock (*Melanogrammus aeglefinus*)		1			1
Herring (*Clupea harengus*)			1		1
Common frog (*Rana temporaria*)			12		12
Subtotals	**231**	**537**	**2823**	**193**	**3784**
unidentified mammal	57		167	4	228
unidentified bird		7	7		14
unidentified fish		2	2	3	7
Subtotals	**57**	**9**	**176**	**7**	**249**
TOTALS	**288**	**546**	**2999**	**200**	**4033**

Table 19 Summary counts of the identified bone elements/fragments (NISP) from medieval and post-medieval deposits, by site phase and species/taxon

9*: from tanning/tawing pit [1452]
9**: From all other Phase 9 contexts

the bones submitted had been hand-collected, included among the data shown are skeletal elements of small faunal species recovered from sieved soil/environmental samples. Table 18 gives details of the twelve frog bones from six of the sieved samples. In addition to the frog bones, six mouse bones (representing one house and one wood mouse) were identified in a sample from Phase 10 post-medieval well [826] and a single herring caudal vertebra came from a Phase 9 medieval recut [428] of the City ditch.

Overall, 26 species are represented (fifteen mammalian, six birds, four fish and one amphibian). These consisted of *Equus caballus* (domestic) horse, *Equus asinus* (domestic) donkey, *Bos* (domestic) cattle, *Ovis* (domestic) sheep, *Capra* (domestic) goat, *Sus* (domestic) pig, *Canis* (domestic) dog, *Felis* (domestic) cat, *Oryctolagus cuniculus* rabbit, *Dama dama* fallow deer, *Capreolus capreolus* roe deer, *Rattus rattus* black rat, *Mus musculus* house mouse, *Apodemus sylvaticus* wood mouse, *Anser anser*/domestic grey-lag/domestic goose, *Gallus gallus* (domestic) domestic fowl, *Anas platyrhynchos*/domestic mallard/domestic duck, *Cygnus olor* mute swan, *Corvus corax* raven, *Ardea cinerea* heron, *Gadus morhua* cod, *Molva molva* ling, *Melanogrammus aeglefinus* haddock, *Clupea harengus* herring, *Rana temporaria* common frog.

Methodology

Identification, measurement, recording, and analyses of the bulk of the animal bones followed standard zooarchaeological methodological procedures, as detailed elsewhere by the author (*see* Armitage 1999, 162–163).

Antler growth stage	*Age*	*Age group terminology (a)*	*paired*	*right*	*left*	*indet*	*Total*	*%*
First head	1 year	a kid		4	3		7	10.1%
Second head	2 years	a gerle	1	9	6		16	23.2%
Third head	3 years & over	a hemule	4	23	15	1	43	62.3%
Fourth head	over 5 years	a fair roebuck		2	1		3	4.4%
Totals			**5**	**38**	**25**	**1**	**69**	

Table 20 Ageing the roe deer antlers from medieval deposits
a: Nomenclature follows the time-honoured system of English huntsmen (see Whitehead 1980:154)
b: Total number of antlers is equivalent to the minimum numbers of male deer (MNI) represented

Age class	*Measurement*	*No. specimens*	*Mean*	*Min.*	*Max.*	*SD*
First head (1 yr.)	Length	7	96.3	68	114	
	Pedicle circumference	7	50.7	49	54	
	Burr circumference	1		57		
Second head (2 yrs.)	Length	14	181.0	129	265	37.38
	Pedicle circumference	15	57.7	43	73	9.07
	Burr circumference	13	97.9	84	114	13.02
	Span	1		118		
Third head (3 yrs. +)	Length	34	226.4	190	264	21.28
	Pedicle circumference	38	71.8	55	88	7.4
	Burr circumference	38	116.5	92	146	13.96
	Span	1		113		
Fourth head (5 yrs.+)	Length	2		140	188	
	Pedicle circumference	3	71.7	68	74	
	Burr circumference	3	126.7	113	135	

Table 21 Measurements (in mm) of the roe deer antlers from medieval deposits
In the case of antler pairs, measurements on only one of the antlers have been included in the analyses

Aspects of the methodology used in the this project not covered in the above reference are as follows:

Ageing and measuring the roe deer antlers from Phase 9 medieval deposits

Ageing of the roe deer represented in the Phase 9 deposits was based on the descriptions and illustrations of antler growth and appearance in this species, given in Tegner (1951, 50–55) and de Nahlik (1974, 74–85, including figs. 15a to 15d). Measurement of the roe deer antlers followed the established British huntsmen's system for quality evaluation of antler trophies, as described and illustrated in de Nahlik (1974, 170–177, including fig. 21). According to this internationally recognised system, 'length' is recorded by means of a flexible tape measure from the base of the burr (coronet), along the outside of the main antler (beam) to the tip of the terminal tine. 'Circumference of the burr' is also measured by means of a flexible tape. In the few examples from Moor House where both right and left antler pairs survived intact (attached to portions of the frontal bone), measurements were taken of the 'span' (distance between the right and left antler tips) also using a flexible tape. An additional measurement was also taken: 'circumference of the pedicle' (not used in trophy evaluations but employed in zooarchaeological studies on deer antlers, as indicated by its inclusion in the system of von den Driesch (1976, 37, fig.11C – measurement (40)). Von den Driesch's measurement (41), circumference at the base of the antler beam, proved imprecise and difficult to obtain in those mature antlers exhibiting well developed pearling on the beam, and so was abandoned early on in the study.

Distinguishing donkey and horse scapulae

Among the Moor House *Equid* bones, a scapula from context [741], the fill of a Phase 9 medieval shallow pond [742], stood out as noticeably different from the identified horse scapulae from the site. In the [741] specimen, apart from its much smaller overall size, there was marked curvature in the blade (costal surface is concave) and the neck was considerably constricted. Both these morphological features matched those given in Fleming (1891, 99–100) for distinguishing the shoulder blades of *Equus asinus* (domestic donkeys) from those of *Equus caballus* (domestic) (horses). Supporting evidence that the [741] scapula was indeed donkey was provided by measurements taken of its smallest length of the neck (von den Driesch 1976 measurement SLC) and greatest length of its *processus articularis* (GLP). Both of these values fell precisely within the recorded size ranges for modern *Equus asinus* published by Buitenhuis (1991, 48–49). Further metrical distinctions between the donkey and horse scapulae arising from this study are discussed below (*see* Phase 9 medieval deposits).

Ageing and sexing horses by their dentition

For determining age, two methods were adopted: the first based on patterns of wear exhibited by the incisor teeth (criteria of the American Association of Equine Practitioners 1966), and the second based on crown height measurements taken on the upper and/or lower cheek teeth (method of Levine 1982). Sex was determined by the presence (male) or absence (female) of the canine tooth (criteria of Scott & Symons 1964, 380).

Reconstructed sizes in the cod from the medieval deposits

Estimates (in cm) of total length (TL) from measurements taken on selected cod bone elements from Phase 9 were calculated using the regression formulae of Rojo (1986).

Results of the analyses

Medieval deposits (Phase 9) 12th to 15th centuries

The Phase 9 medieval deposits produced 3,545 animal bone elements/fragments, forming the largest proportion (62.3% of the total NISP) of the bone assemblage from the Moor House site. As with the samples from the Roman and post-medieval phases, much of the material is recognised as food debris, but unlike the two other phases there are very high concentrations of cattle horn cores present in association with relatively large quantities of roe deer antlers. All the horn cores and the deer antlers in these particular deposits are believed to have been waste from tanning/leather working industries. The roe deer antler assemblage is especially noteworthy, as it would seem to be rare if not unique among medieval sites in Britain, and therefore was the subject of a detailed study, the results of which are summarised below along with observations on the cattle horn cores.

Waste from tanning/leather working industries (1–4)

1) Roe deer antlers: A total of 81 roe deer antlers were recovered from Phase 9 deposits, with the greatest concentration (54 = 66.7% of the total) coming from the fills of rectangular tanning pit [1452] and the second largest concentration (14 = 17.3% of the total) from the fills of north–south ditch cut [2032] (*see* Fig. 37). Within the rectangular pit, one of the fills yielded by far the greatest quantity from a single context (24 specimens). Besides the antlers from the rectangular pit and ditch cut a smaller quantity (six specimens) came from a fill of north–south ditch [1530], with an additional six single/isolated specimens from the ditch complex. Apart from five specimens in which both the right and left antlers survive attached to a portion of the frontal bone, the majority of the antlers are single (ie either right or left detached specimens) but even these include the pedicles attached to fragments of

the frontal bones, indicating they derive from hunted/killed animals and not from shed antlers. Shearing chop marks on the frontal bones indicate the manner in which the antlers had originally been removed from the head as pairs, which later became broken and separated. Knife scoring marks on the frontal bone fragments indicate removal of the skins. None of the antlers shows evidence of further working and there appears to have been no utilization of these antlers as a raw material (for instance in manufacturing cutlery handles). Coupled with the absence of any associated post-cranial elements of roe deer, it seems the antlers had been imported in skins removed from deer hunted, killed, butchered or consumed elsewhere, in the same way that cattle, sheep and goat horns were often left in the hides/skins supplied to tanners by butchers (as discussed by Prummel 1982; Serjeantson 1989; and Armitage 1990). A reason for leaving the antlers in the skins is suggested by information obtained by Schmid (1974 quoted by Serjeantson 1989, 139) from a Swiss farmer who told her that when skinning goats, part of the head with the horns was usually left on the skin so that 'the tanner can easily know the age of the animal'. This procedure perhaps explains why roe deer skins were supplied to the London leatherworkers with their antlers still attached. Following sorting of the deer skins, these antlers had then been discarded as unwanted waste.

In roe deer, only males develop antlers, which reach full growth by June/July and are shed in October/November. During the 13th century (the date of the Moor House antler assemblage), the hunting season for roebuck was from Easter to Michaelmas (29th September) (Whitehead 1980, 168). From the appearance of the antlers from the present site, it seems these particular deer had been hunted sometime between June/July and September, and that the majority had been full grown/mature individuals. Of the 69 antler specimens that can be aged, 46 (66.7%) are identified as representing male deer aged three years and over at time of death (Table 20). Summaries of the measurements taken on 63 antlers are given in Table 21.

MacGregor (1989, 108) writing on the question of supplies of red deer antlers from slaughtered animals to medieval urban craftsmen makes the observation that with the imposition of Norman rule access to deer was severely limited and illegal for the majority of the British people. He concluded that from the time of the Norman Conquest, the bulk of the antlers reaching manufacturers from slaughtered animals would probably have been 'channelled through the royal and noble households that operated a jealously guarded monopoly on hunting'. By implication, the present author suggests the skins (with antlers/part of skull still attached) were supplied to the London leatherworkers via the same channels, with the deer being killed by authorised/licensed huntsmen in the forests around London.

2) Cattle horn cores: High densities of cattle horn cores are recorded for samples from the fills of ditch [2032] and the rectangular tanning pit [1452]. Within the later feature, two fills in particular produced noticeably large

Element/Context Group	*Fills of pit [1452]*	*Fills of ditch [2032]*	*Fill of ditch [1753]*
date	*AD 1180–1300*	*late C11th–mid C13th*	*AD 1480–1550*
portion of cranium with paired horn cores	3	1	
detached horn core/ portion of frontal bone	68	54	8
cranial fragments	22	2	9
premaxilla	4		
maxilla	1		1
mandible	19		3
tooth	7		1
hyoid	2		
vertebra	1		8
cervical	11	1	11
thoracic	14		11
lumbar	7	1	9
sacrum			4
caudal	2	1	2
rib	88	4	45
sternum			1
clavicle			
scapula	5		4
humerus	1		3
radius	2		
ulna	2	1	2
carpal			
metacarpus	5	1	2
innominate	5		21
femur	1		5
tibia	2		8
fibula			
patella			
calcaneum	3		4
talus	1		1
tarsal	1		1
metatarsus	4		2
metapodial			
phalanx I	8	3	2
phalanx II			
phalanx III	1	1	
sesamoid			
long bone shaft fragment	41	1	23
Totals	**331**	**71**	**191**

Table 22 Anatomical distributions of the cattle bone elements (NISP) from medieval deposits

Age class	Suggested age range (years)	Fills of rectangular pit [1452]]		Fills of ditch cut [2032]	
		No. of specimens	% total	No. of specimens	% total
1. Juvenile	1 – 2	26	38.2%	6	11.8%
2. Sub-adult	2 – 3	7	10.3%	10	19.6%
3. Young adult	3 – 7	15	22.1%	9	17.6%
4. Adult	7 – 10	13	19.1%	16	31.4%
5. Old adult	over 10	7	10.3%	10	19.6%

Table 23 Cattle horn cores: summary of the attributed ages of the specimens from medieval deposits

Length Class	small horned			short horned			medium horned				Totals
	M	C	F	M	C	F	M	C	F	I	
Context/Age Class											
Fills of rectangular pit [1452]											
3. Young adult		1		2	6	1	4		1		15
4. Adult		1			2	5	1	2	1	1	13
5. Old adult					1	2		3		1	7
overall	0	2	0	2	9	8	5	5	2	2	**35**
Fills of ditch cut [2032]											
3. Young adult			2		3		1	2	1		9
4. Adult					2	4	3	6	1		16
5. Old adult				1	4		1	2	2		10
overall	0	0	2	1	9	4	5	10	4	0	**35**

Table 24 Summary of the numbers of male, castrate and female cattle horn cores attributed to the small-, short-, and medium-horned length classes from medieval deposits
Key: M = male, F = female, C= castrate, I = indeterminate

quantities: [1400] in which horn cores made up 16 (32%) of the 50 cattle bone elements, and [1453] in which horn cores comprised 33 (63.5%) of the 52 cattle bone elements. The highest frequency came from the combined fills of the ditch cut [2032] where horn cores comprised 55 (77.5%) of the total 71 cattle bone elements. Other Phase 9 medieval deposits contained smaller quantities, as illustrated with reference to one of the fills of a large north–south ditch [1753] in which eight horn cores (4.2%) were present among the total of 191 cattle bone elements (*see* Table 22). Many of the horn cores show evidence of having been removed from the head by means of a shearing chop directed either to the base of the skull or just below each horn core base. Knife cuts on the frontal bone fragments of these specimens provide evidence of the removal of the hides in the cattle represented. Given the documentary evidence of the presence of tanneries in the Moorfields area from the 13th century onwards (*see* above), coupled with the evidence of skinning on the archaeological specimens, it seems highly likely that all of the concentrations of cattle horn cores at the site are, therefore, the waste product of the tanning industry. The association between large deposits of cattle horn cores found at archaeological sites and the process of tanning is explained elsewhere (*see* Armitage 1990, 84). The results of the analyses of two of the larger cattle horn core assemblages from the site (following the methodology of Armitage & Clutton-Brock 1976) are presented in Tables 23 & 24, and the metrical data summarised in Table 25.

Special mention should be made of the polled (naturally hornless) cattle cranial portion in the sample from [409] fill of ditch cut [411]. In appearance this animal is small (breadth across the frontal bone measures 115mm), and there is a prominent frontal eminence. No knife (skinning) cut marks could be found on the specimen and it is unclear whether on not this cranium represents tanning waste.

3) Sheep horn cores: Portions of chopped sheep crania with paired (R & L) horn cores attached were present in the samples from pit [417], ditch [1407], rectangular tanning pit [1452], and a recut of the parish ditch; and these are identified as tanyard waste. Three of the four specimens are identified as adult males; the sex of the fourth specimen is indeterminate. Other Phase 9 medieval deposits yielded detached sheep horn cores (3 males and 3 castrates), as well as seven skulls with the horn cores removed (chopped

		Fills of rectangular pit [1452]					Fills of ditch cut [2032]				
Age Class	*Measurement**	*No. of specimens*	*Mean*	*Min.*	*Max.*	*SD*	*No. of specimens*	*Mean*	*Min.*	*Max.*	*SD*
3. Young adult (3–7 years)	LOC	13	140.6	56.0	200.0	34.5	8	135.9	75.0	195.0	
	BCR	12	130.2	83.0	149.0	20.4	9	136.5	84.0	189.0	
	MxD	12	45.3	28.6	58.8	7.9	9	47.4	25.4	66.9	
	MnD	12	35.0	23.2	43.6	5.3	9	37.7	23.5	49.6	
4. Adult (7–10 years)	LOC	8	127.9	56.0	182.0		11	152.5	107.0	201.0	28.1
	BCR	9	118.5	88.0	160.0		14	139.1	100.0	202.0	25.6
	MxD	9	40.0	27.8	52.2		14	48.8	33.5	71.0	9.5
	MnD	9	33.0	23.1	47.5		14	36.5	25.8	52.1	6.2
5. Old adult (over 10 years)	LOC	6	149.7	120.0	203.0		8	182.7	148.0	191.0	
	BCR	6	131.0	109.0	150.0		10	160.1	127.0	204.0	28.4
	MxD	6	46.8	34.1	54.5		10	56.3	43.6	71.5	9.9
	MnD	6	35.4	31.2	40.5		10	42.4	34.2	50.8	7.2
OVERALL	LOC	27	138.8	56.0	203.0	34.3	27	156.5	75.0	201.0	43.3
	BCR	27	126.5	83.0	160.0	19.9	33	144.8	84.0	204.0	29.9
	MxD	27	43.9	27.8	58.8	8.0	33	50.7	25.4	71.5	10.9
	MnD	27	34.4	23.1	47.5	5.3	33	38.6	23.5	52.1	7.7

Table 25 Cattle horn cores: summary of the attributed ages of the specimens from medieval deposits
All measurements are given in mm.
Key to Measurements: LOC = length of outer curve; BCR = basal circumference; MxD = maximum diameter at the base; MnD = minimum diameter at the base

off), two of them also split in half along the sagittal axis to facilitate removal of the brain for cooking/eating. These skulls together with the detached horn cores may represent primary butchery refuse, debris from horn-working activity, and/or domestic household food rubbish rather than tanyard waste.

In addition to the presence of horned sheep, Phase 9 medieval deposits also yielded evidence of polled (naturally hornless) sheep, represented by seven crania. Given that the sheep horn cores are all identified as males or castrates, it may be suggested these polled crania are from female sheep. The paper by Armitage & Goodall (1977) provides a more detailed discussion on medieval horned and polled sheep

4) Goat horn cores: Four female goat horn cores (three specimens from [147] and one from [1857]) are believed to represent waste from tanning.

Bone-working waste/products

Phase 9 medieval deposits also yielded examples of 'points' fashioned from proximal ends of cattle metatarsal bones; five single specimens from the marsh deposit and various pits and ditches including the City ditch (Fig. 107). Also, six sawn proximal and distal ends of cattle metatarsal bones, and one sawn distal end of a cattle metacarpal bone were recovered from various features, including the ditch complex and the City ditch. In addition, there is a single example of a 'pinner's bone' fashioned from a cattle metatarsal bone, from recut [1753] of the parish boundary ditch.

Fig. 107 Worked bone points

Horse (criteria of the American Association of Equine Practitioners 1966 and Levine 1982):

one adult male c. 11 years

Cattle (age classes of O'Connor; referenced in Bond and O'Connor 1999)

neonate	*juvenile*	*immature*	*sub-adult 1*	*sub-adult 2*	*adult 1*	*adult 2*	*adult 3*	*elderly*
	3	2					4	

Sheep (age classes of Payne 1973)

A = 0 - 2 mnths	*B = 2 - 6 mnths*	*C = 6 - 12 mnths*	*D = 1 - 2 yrs*	*E = 2 - 3 yrs*	*F = 3 - 4 yrs*	*G = 4 - 6 yrs.*	*H = 6 - 8 yrs.*	*I = 8 - 10 yrs.*
1	2		4	2	4	6		2

Pig (age classes of O'Connor; referenced in Bond and O'Connor 1999)

neonate	*juvenile*	*immature 1*	*immature 2*	*sub-adult 1*	*sub-adult 2*	*adult 1*	*adult 2*	*adult 3*	*elderly*
	1	2		5	2	3	1		

Table 26 Ageing of the mandibles of the main domesticates from medieval deposits

Domestic food refuse

The bones recognised as discarded domestic kitchen/table waste indicate a diet comprising beef and veal, mutton and lamb, and pork as the staples, supplemented with goose, domestic fowl, rabbit, and marine fish. Venison (from fallow deer) and the occasional duck enlivened the basic diet. Ageing the mandibular teeth of the main meat-yielding species (cattle, sheep and pig) provides insight into the kill-off (slaughter) patterns of the main meat yielding species that supplied the London meat markets at this period (*see* Table 26). Whilst calves and lambs feature noticeably in the overall diet of the inhabitants, suckling piglets seem to have been eaten only very occasionally (represented by three bones: one mandible and one innominate and one calcaneum). The pork consumed appears to have mainly come from domestic boars, as evidenced by the sexing of the canine teeth (tusks), which identified thirteen males and only two females. Among the domestic fowl skeletal elements, the tarsometatarsal bones of four female (unspurred) and three male (spurred) birds are identified (using the criteria of West 1982a). Two of the male tarsometatarsal bones exhibit extensive bony swelling/outgrowths (massive exostoses) at their distal ends. The aetiology of this pathological condition is unknown, but occurs in modern domestic fowl of advanced age (*see* Baker & Brothwell 1980, 167). Greatest length (GL) measurements taken on the bone elements of domestic fowl and geese from Phase 9 deposits are summarised as follows:

Domestic fowl - humerus GL 76.6, 78.4, 79.1mm; femur GL 68.5, 72.8, 76.5mm; tibiotarsus GL 96.2, 100.3, 121.9, 128.7, 136.3, 144.9mm; tarsometatarsus (spurred = male) GL 89.7, 95.9, 115.0mm (very large!); tarsometatarsus (unspurred = female) GL 68.2, 77.7mm

Geese – coracoid GL 70.2, 79.6mm; humerus GL 154, 159, 162, 164, 167mm; carpometacarpus GL 80.4, 83.8, 85.0, 87.5mm; tarsometatarsus GL 81.9, 88.0mm

The cod consumed on the site appear to have been of a respectable size, ranging from 0.91m to 1.25m total length (N=3). Other fish represented are all marine species (ling, haddock and herring) and no freshwater fish are identified.

Whilst the majority of the food debris from the Phase 9 medieval contexts indicates the sources had been households of reasonable means that enjoyed diets of 'solid sufficiency', one of the fills of parish ditch recut [1753] dated to the period 1480–1550, yielded food waste that appears of exceptional quality, variety and richness and, therefore, presumably derived from a higher status household. In this fill there are high proportions of bones of calves (7% of the total cattle bones identified as food debris) and lambs (10% of the total sheep bones identified as food debris), as well as bones of wildfowl (heron and swan), and those of fallow deer (evidence of venison consumption) and marine fish (cod and ling). Poultry (domestic fowl and geese) also feature strongly in the diet. It is important to recognise that throughout the later medieval period both swan and heron would have been expensive luxuries available only to the richer households, who spit-roasted such birds and served them up at the table garnished with special sauces (ginger sauce being recommended for herons) (*see* Wilson 1976, 109–113).

Scavengers

The practice of disposing of food and other organic refuse material in the ditches and pits at Moorfields attracted animal scavengers to the area, including ravens, represented on the site by three skeletal elements. During the medieval period, ravens were a common sight in London, and in recognition of their usefulness as urban scavengers were protected birds, a status removed soon after Charles II's reign when they were considered noxious vermin requiring eradication owing to their predation on farmyard poultry

and their raiding of country rabbit warrens (*see* Fitter 1945, 51–52 & 87; Jones 1972, 110).

Stature of the horses and sheep

Estimates of the withers heights in the horses and sheep represented in the Phase 9 medieval contexts at Moor House may be calculated as follows from the lengths of their leg bones (method of Kiesewalter 1888 for horses and Teichert 1975 for sheep):

Horse: values range from 126.9 to 144.1cm (N = 5)
Sheep: values range from 54.4 to 61.9cm, mean 57.6cm SD 2.18 (N = 15)

Donkey scapula

As discussed by Baxter (2002) archaeological remains of domestic donkeys 'are exceptionally rare on British sites of all periods'. For the medieval period from London there appears to be only one other published specimen to date, a partial skeleton from a mid-late Anglo-Saxon deposit at Deans Yard, Westminster SW1 (Baxter 2002). According to Dent (1972, 72–73, 90, 92–103) donkeys in medieval England were never widely used as pack animals and were viewed as the most inferior and undignified of riding mounts; their value lay in breeding mules.

In view of the rarity of such archaeological finds of this species, the specimen from Moor House deserves special mention. The specimen in question is a right scapula from an adult donkey, recovered from the fill of a shallow pond [742] (*see* Fig. 37), dated 1270–1300. Measurements taken on this specimen revealed that unlike the horses represented at the site, where the smallest length of the neck (SLC) is equivalent or exceeds the length of the glenoid cavity (LG), SLC (41.2mm) in the donkey scapula was shorter than LG (47.6mm). This morphological difference may be expressed in the form of an index: SLC/LG x 100. Applying this index the results obtained for the *Equid* scapulae across all phases from Moor House are shown in Table 27.

Observations on the dogs represented in Phase 9 deposits

Five intact/partially complete dog crania were identified among the bone samples from the ditch complex and a pit fill. From the surface markings of the basilar part of the occipital bones (criteria of The & Trouth 1976), four of the five crania are identified as males, whilst the fifth (incomplete) specimen is indeterminate. Measurements taken on these crania are summarised in Table 29.

Among the five crania, one specimen is noteworthy as an example of the small lapdogs that became popular and fashionable ladies' pets in the later medieval period, in households of the nobility and wealthier classes. Such dogs are encountered at the feet of ladies depicted on medieval monumental brasses in English churches, as for example on the 1430 brass to Agnes Salmon at Arundel, Sussex. Excavations at the site of Baynard's Castle, London, produced a skull of one of these lapdogs (dated 1499–1500). A photograph of this particular specimen appears in Armitage (1977, fig. 20) showing the characteristic short snout, rounded forehead, and small sagittal crest. Comparison of the Baynard's Castle and Moor House specimens reveals that although slightly smaller, the Moor House dog exhibits the same distinctive cranial morphology with respect to its cephalic index, snout index, and snout width index. Both archaeological specimens compare favourably with these same indices calculated for the skull of a modern Toy Yorkshire Terrier in the collections of the Booth Museum of Natural History, Brighton (Table 28).

From length measurements in their leg bones, estimates of shoulder heights in twelve dogs from Phase 9 contexts were calculated using the regression formulae of Harcourt (1974). The values so obtained are summarised as follows: The smallest dog was 30.9cm and the tallest 75.7cm; with a mean value calculated at 51.5cm and Standard Deviation for the sample = 10.74.

Context	*Phase*	*Index Value*	*Species*
Pond [742]	9	86.5	Donkey
Fill of ditch [1868]	9	104.8	Horse
Fill of ditch [798]	4	100.5	Horse
Brickearth [1178]	3	107.4	Horse
Fill of channel [1013]	2	103.7	Horse

Table 27 Morphological differences of donkey and horse bones from site

Specimen	*CI*	*SI*	*SWI*
Moor House [453]	67.7	45.1	44.9
Baynard's Castle BM(NH) Acc. No.78.6081	67.5	46.5	41.6
Modern Toy Yorkshire Terrier, Booth Museum, Brighton Acc. No. 100565	67.1	47.1	44.3

Table 28 Morphology of the medieval dog skull from ditch [453] in comparison with the later medieval specimen from Baynard's Castle, London, and a modern Toy Yorkshire Terrier.

Key to craniometric indices (method of Harcourt 1974): CI = cephalic index; SI = snout index; SWI = snout width index

Phase	*Context*	*Sex*	*1*	*2*	*3*	*8*	*15*	*25*	*29*	*30*	*32*	*34*	*36*	*38*	*40*	*P4 L*	*P4 B*
9	Fill of ditch [156]	male	190.0	173.0	176.0	98.5	67.2	35.2	56.2	103.0	51.6	64.3	38.5	56.3		20.0	9.1
9	Fill of ditch [453]	indet.	107.0			48.3	30.2		47.4	72.4	36.5	44.3	21.7			13.1	6.1
9	Fill of ditch [1474]	male	203.0	181.0	176.0	105.2	64.7	39.1	57.4	106.0	57.2	66.4	36.8	58.5		18.2	9.4
9	Fill of pit [1535]	male	179.0			93.9	66.0	29.8	56.0	87.0	45.8	60.5	32.9	48.2	45.5	20.1	10.2
9	Fill of quarry pit [1895]	male	183.0	175.0	161.0	92.1	62.5	35.3	59.9	96.0	48.6	62.5	36.6	55.2	47.0	19.6	9.7
10	Dump layer [1804]	female	173.0	170.0	164.0	81.5	63.4	38.3	54.1	103.0	51.4	63.5	36.7			19.0	10.2

Table 29 Measurements of the adult dog skulls from the medieval (Phase 9) and post-medieval (Phase 10) deposits

All measurements are given in mm and follow the system of von den Driesch 1976

Post-medieval deposits [Phase 10] 16th/17th centuries

Food bones predominate all the samples from the post-medieval period (Phase 10), indicating a diet of 'solid sufficiency' comprising much beef (with veal) and mutton (with lamb), supplemented by lesser amounts of pork and the flesh of domestic geese, fowl and ducks. There is no evidence of either extravagance or the exotic in the food debris from Phase 10 deposits.

Intermixed with the household food waste are parts of the skeletal remains of pet/feral dogs and cats. Among the former is a female terrier-type dog represented by a cranium from a dump layer dated to the 16th/17th century. This specimen has a moderately developed sagittal crest. Analyses of the measurements taken on the cranium (Table 29) reveal a cephalic index of 60.6, snout index of 47.1, and snout width index of 45.0 (values calculated after the method of Harcourt 1974). Stature in one of the dogs represented in a 17th-century fill of rubbish pit [1718] is calculated at 43cm from the lengths of its long bones (method of Harcourt 1974).

A small masonry well [826] acted as a pit-fall trap that proved fatal for at least one immature house mouse and one immature field mouse, as evidenced by their bones recovered from one of the fills. An isolated femur represents the house mouse, whilst the remains of the field mouse comprise one ulna, one femur, one tibia, and one innominate bone. A mouse cranial fragment from the same context cannot be identified to species. The presence of a field mouse perhaps suggests open ground nearby with a reasonably dense vegetation cover or even woodland, but this species will also inhabit open grassland areas and gardens (*see* Lawrence & Brown 1973, 95; Flowerdew 1977, 212).

ENVIRONMENTAL ANALYSIS

Nick Branch, Alys Vaughan-Williams, Barbara Silva, Chris Green and Alan Williams

As with the Roman deposits, environmental archaeological assessment of contexts from sampled features revealed the potential to provide information on the broad environmental history and economic and dietary practices of the period. In order to achieve these aims, six broad features were subject to detailed laboratory analysis to quantify the environmental archaeological data; the features investigated included drainage ditch [167], the tanning pit, a dump deposit [1709], the parish ditch and both the medieval and post-medieval phases of the City ditch (*see* Appendix 2, tables). The analyses conducted were:

1. Sedimentological descriptions of an east–west medieval drainage ditch [167], the medieval City ditch [1875] and drainage ditch [1816] (Fig. 112 and *see* Fig. 44).
2. Pollen analysis of the sedimentary sequence within the east–west medieval drainage ditch [167], the medieval City ditch [1875] and drainage ditch [1816].
3. Plant macrofossil analysis of the sedimentary sequence within the east–west medieval drainage ditch [167], the medieval City ditch [1875] and drainage ditch [1816].

Results of the analyses

Investigation of the sedimentary sequence in the east–west medieval drainage ditch, feature [167]

The sedimentary sequence in ditch [167] (Appendices 2 and 3) is composed of silt with varying amounts of clay

and sand (8.66–9.16m OD). The well-sorted nature of the sediments suggests primary deposition by natural processes, probably because of erosion of the margins of the feature. However, the presence of gravel and wood in the upper part of the sequence may indicate that anthropogenic materials were also 'dumped' into the feature. The pollen record from feature [167] is dominated by herbaceous taxa, including Poaceae (grass family, maximum 51%), Cereal type (eg *Triticum/Hordeum* – wheat/barley, maximum 69.2%), Apiaceae (carrot family, maximum 11.8%), *Chenopodium* type (eg fat hen (goosefoot family), maximum 13.9%) and *Sinapis* type (eg charlock (mustard family), maximum 3.5%). Tree pollen are poorly represented but include *Quercus* (oak, maximum 4%), *Ulmus* (elm, maximum 3%), *Alnus* (alder, maximum 1%), *Fagus* (beech, maximum 1.7%), *Betula* (birch, maximum 1%), *Pinus* (pine, maximum 1%) and *Taxus* (yew, maximum 0.5%). Shrub pollen include *Corylus* (hazel, maximum 2.8%), *Viscum album* (mistletoe, maximum 2.4%), *Hedera helix* (ivy, maximum 2%), *Calluna vulgaris* (heather, maximum 1%) and *Ligustrum* (common privet, maximum 1%). Pollen and spores of aquatic, moss and fern vegetation are poorly represented, with the exception of *Typha latifolia* (reedmace, maximum 12.2%).

Although interpretation of the pollen record is constrained by many of the taphonomic issues highlighted above (see Chapter 3), eight broad plant communities are represented:

1. Open deciduous woodland found on dry, neutral-alkaline soils and consisting mainly of beech, elm, oak, ivy, mistletoe and hazel (eg chalk down-land)
2. Open mixed deciduous – coniferous woodland found on dry, acid soils and consisting mainly of oak, birch, pine, heather and bracken fern (*Pteridium aquilinum*) (eg Lower Greensand)
3. Open coniferous woodland found on both alkaline and acid soils, and sometimes associated with foci of human activity (eg church yards) eg yew and privet
4. Wet woodland consisting of alder and polypody fern (*Polypodium*)
5. Damp ground vegetation consisting mainly of meadowsweet (*Filipendula*), bedstraw (*Galium*), sedge (Cyperaceae), reedmace, bur-reed (*Sparganium*), horsetail (*Equisetum*), water dropwort (*Oenanthe*) and *Botrycoccus* algae
6. Tall herb grassland (eg meadow, waste ground, edge of cultivated fields) consisting mainly of grass, species in the carrot family, mugwort (*Artemisia*), black knapweed (*Centaurea nigra*), fat hen and thistle (*Cirsium*)
7. Short herb grassland (eg pasture, waste ground) consisting mainly of grass, cow wheat (*Melampyrum*), docks and sorrels (*Rumex* sp), clover (*Trifolium* sp.) and dandelion (*Taraxacum*)
8. Cereal cultivation consisting mainly of cereals (eg wheat and barley), grass, ribwort plantain (*Plantago lanceolata*), cornflower (*Centaurea cyanus*) and possibly charlock

The plant macrofossil analysis of ditch [167] indicated the presence of three broad plant habitats, providing broad support for the pollen data: (1) Damp ground or wetland; (2) Cultivated ground; (3) Ruderal/Grassland. The primary fill [137] was dominated by *Chenopodium rubrum* (red goosefoot), *Ranunculus sceleratus* (celery leaved buttercup) and *Foeniculum vulgare* (fennel). These plants colonise waste ground or cultivated land, marshy areas or ditches, and open waste ground. Fennel is also used in cooking. Wetland species include the perianths of *Rumex maritimus* (golden dock), occasional buds of *Salix* sp. (willow), and seeds of *Polygonum lapathifolia* (pale persicaria) and *Eleocharis palustris* (common spike-rush). In addition to these species, secondary fill [140] also contained frequent seeds of *Ranunculus trichophyllus* (thread-leaved water-crowfoot), *Rumex crispus* (curled dock) and *Atriplex* sp. (oraches). Cultivated ground was indicated by the presence of *Aethusa cynapium* (fools parsley), *Chenopodium album* (fat hen), *Polygonum lapathifolia* and *Rumex crispus*. Grassland seeds include those of Poaceae indet (grasses), *Artemisia* sp. (mugwort), *Leucanthemum vulgare* (oxeye daisy) and *Centaurea* sp. (knapweed).

Investigation of the sedimentary sequence in the north–south medieval parish ditch, feature [1763]

The sedimentary sequence in parish ditch [1763] is composed of silt with gravel at the base of the sequence overlain by a complex series of deposits consisting mainly of silt or clay with varying amounts of gravel or sand (8.70–9.55m OD) (Appendices 2 and 3; Fig. 108). These deposits indicate the gradual infilling of the feature by natural processes, in particular the 'slumping' of the margins of the ditch. However, the presence of charcoal throughout the sequence suggests that anthropogenic activities in close proximity to the feature may be responsible for some of the material in the ditch fills.

The pollen record from the ditch is dominated by herbaceous taxa, including Poaceae (grass family, maximum 52.1%), Cereal type (eg *Triticum/Hordeum* – wheat/barley, maximum 50.5%), Apiaceae (carrot family, maximum 4.8%), *Chenopodium* type (eg fat hen (goosefoot family), maximum 22.6%), *Sinapis* type (eg charlock (mustard family), maximum 5.1%), *Taraxacum* type (eg dandelion, maximum 13%), *Centaurea nigra* (black knapweed, maximum 6.5%) and *Centaurea cyanus* (corn marigold, maximum 4.4%). Tree pollen are poorly represented but include *Quercus* (oak, maximum 5%), *Ulmus* (elm, maximum 11.3%), *Alnus* (alder, maximum 4.5%), *Fraxinus* (ash, maximum 1.1%), *Betula* (birch, maximum 1.4%), *Pinus* (pine, maximum 3.4%), *Taxus* (yew, maximum 0.5%) and *Picea* (spruce, maximum 0.2%). Shrub pollen are diverse and include *Corylus* (hazel, maximum 2.8%), *Calluna vulgaris* (heather, maximum 2.8%), *Erica* (eg cross-leaved heath, maximum 0.5%), *Juglans* (walnut, maximum 2.2%), *Ligustrum* (privet, maximum 1.2%), Rosaceae (rose family, maximum 1.1%), *Salix* (willow, maximum 2.3%), *Sambucus* (elder, maximum

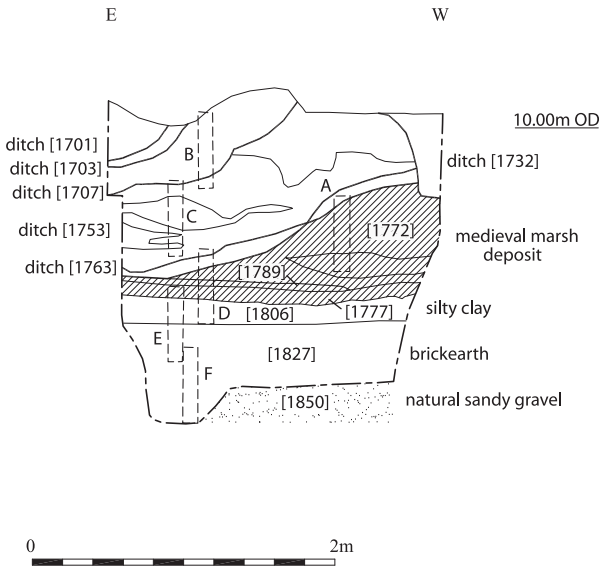


Fig. 108 Section 4, across parish ditch showing location of column sample <302> (A–F) (scale 1:50)

1.4%), *Ulex* (gorse, 0.5%) and *Hedera* (ivy, maximum 3.6%). Pollen and spores of aquatic, moss and fern vegetation are well represented, such as Cyperaceae (sedge family, maximum 4%) and *Typha latifolia* (reedmace, maximum 10.2%).

The pollen record from the ditch indicates eight broad plant communities:

1. Open deciduous woodland found on dry, neutral-alkaline soils and consisting mainly of elm, oak, ivy, ash, rose and hazel (eg chalk down-land)
2. Open mixed deciduous – coniferous woodland found on dry, acid soils and consisting mainly of oak, birch, spruce, gorse, pine, heather and bracken fern (*Pteridium aquilinum*) (eg Lower Greensand)
3. Open coniferous woodland found on both alkaline and acid soils, and sometimes associated with foci of human activity (eg church yards) eg yew, privet, walnut and elder
4. Wet woodland consisting of alder, willow and polypody fern (*Polypodium*)
5. Damp ground and open water vegetation consisting mainly of meadowsweet (*Filipendula*), bedstraw (*Galium*), sedge (Cyperaceae), reedmace, bur-reed (*Sparganium*), horsetail (*Equisetum*), water dropwort (*Oenanthe*), tormentil (*Potentilla* type), meadow rue (*Thalictrum*), bogbean (*Menyanthes*), *Tilletia sphagni* fungus and *Botrycoccus* algae
6. Tall herb grassland (eg meadow, waste ground, edge of cultivated fields) consisting mainly of grass, species in the carrot family, mugwort (*Artemisia*), black knapweed (*Centaurea nigra*), hedge woundwort (*Stachys*), fat hen, thistle (*Cirsium*) and nettle (*Urtica*)
7. Short herb grassland (eg pasture, waste ground) consisting mainly of grass, docks and sorrels (*Rumex* sp), clover (*Trifolium* sp.) and dandelion (*Taraxacum*)
8. Cereal cultivation consisting mainly of cereals (eg wheat and barley), grass, ribwort plantain (*Plantago lanceolata*), cornflower (*Centaurea cyanus*) and possibly charlock

The plant macrofossil analysis of the ditch indicated that the base of the sedimentary sequence contained low concentrations of plant material. Nevertheless, seeds of *Ficus carica* (fig), *Sambucus nigra* (elder) and the damp-loving *Ranunculus sceleratus* were present. Charcoal, wood and abundant woody material with twigs, buds and moss were also present. Other samples contained well-preserved plant macrofossils and indicated the full range of plant habitats identified in feature [167]. Wetland or marshy species included *Ranunculus repens* (creeping buttercup), *R. sceleratus, R. trichophyllus, Rumex maritimus* and *R. crispus.* Grassland and/or woodland were represented by *Salix* sp., *Atriplex* sp., *Malva sylvestris* (common mallow) (mericarp intact), *Chenopodium album, C. rubrum* and *Sonchus asper* (prickly sow-thistle). These species can also be found as weeds in arable fields. Contexts [1709] and [1749] also contained occasional to frequent *Nepeta cataria* (catmint), which is commonly found in waste places (Carruthers, 1993). A range of fruit and nuts that are commonly eaten by humans were also present. These were *Rubus* sp. (brambles), *Prunus cerasus* (dwarf cherry), *P. domestica/cerasifera* (wild/cherry plum), *Sambucus nigra, Brassica/Sinapis* sp. (cabbage/mustard), *Pisum sativa* (peas) and *Foeniculum vulgare* (fennel). An abundance of fennel was particularly apparent in the plant assemblage recovered from context [1739]. The seeds/pips of *Vitis vinifera* (grape) and *Ficus carica* represented 'exotic' plants. *Cannabis sativa* (hemp) seeds were present in all but one of the samples.

Investigation of the sedimentary sequence in the medieval City ditch, feature [1875]

The sedimentary sequence in ditch [1875] is composed throughout the sequence of silt and clay with varying amounts of gravel (Appendices 2 and 3, Fig. 108). Due to the presence of charcoal in most of the contexts, it is reasonable to assume that the infilling of the City ditch occurred because of natural and anthropic processes. The former would have consisted of 'slumping' of the ditch margins, whilst the latter included 'dumping' of waste materials probably from nearby domestic occupation. The pollen record is dominated by herbaceous taxa, including Poaceae (grass family, maximum 50.5%), Cereal type (eg *Triticum/Hordeum* – wheat/barley, maximum 30.3%), Apiaceae (carrot family, maximum 6.2%), *Chenopodium* type (eg fat hen (goosefoot family), maximum 28.4%), *Sinapis* type (eg charlock (mustard family), maximum 21.6%), *Rumex* (docks and sorrels, maximum 4.3%), *Ranunculus* type (buttercup, maximum 4.3%), *Taraxacum*

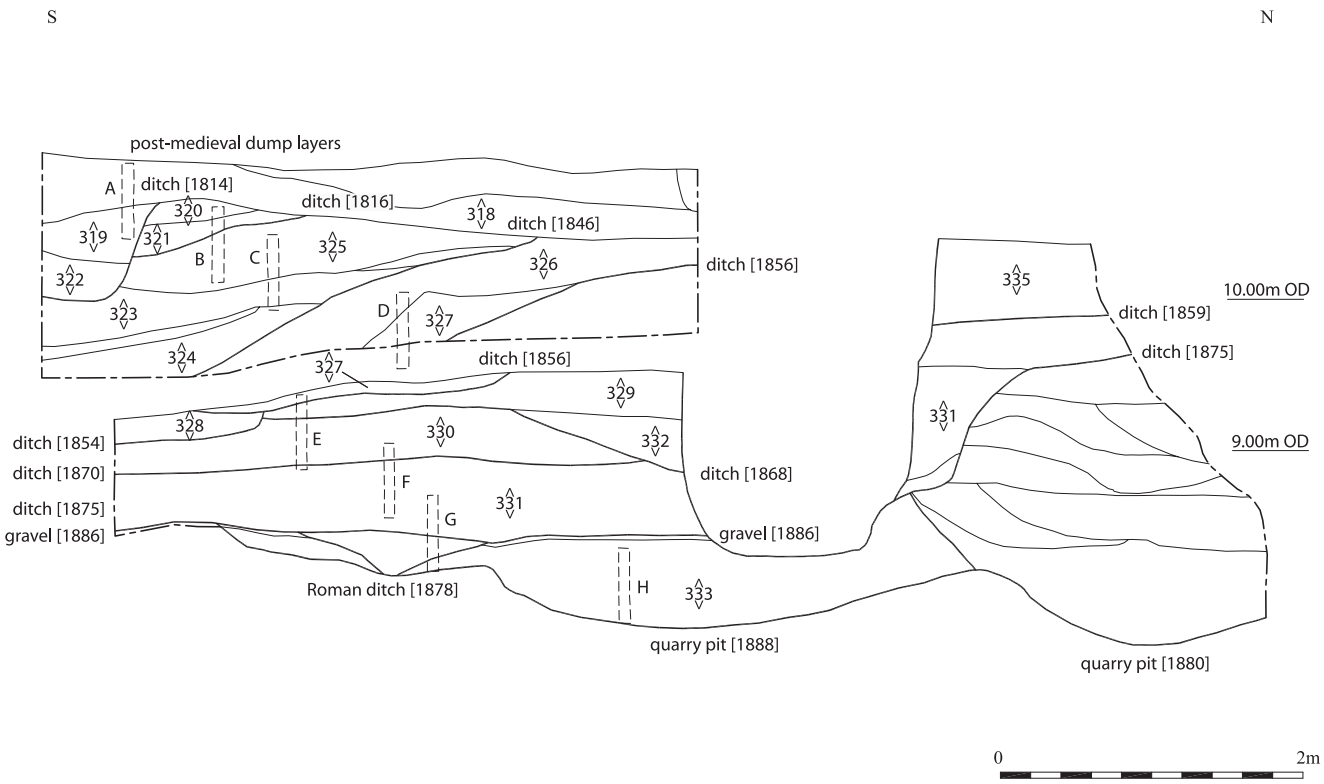


Fig. 109 Section across City ditch showing location of column sample <317> (A–H) and spot samples (scale 1:50)

type (eg dandelion, maximum 20.2%) and *Centaurea nigra* (black knapweed, maximum 4.5%). Tree pollen are poorly represented but include *Quercus* (oak, maximum 9.8%), *Ulmus* (elm, maximum 3.3%), *Alnus* (alder, maximum 0.9%), *Betula* (birch, maximum 3.7%), *Fagus* (beech, maximum 0.9%) and *Pinus* (pine, maximum 0.8%). Shrub pollen are diverse and include *Corylus* (hazel, maximum 7.3%), *Calluna vulgaris* (heather, maximum 1.4%), *Erica* (eg cross-leaved heath, maximum 1.1%), *Juglans* (walnut, maximum 0.5%), *Ligustrum* (privet, maximum 1.6%), Rosaceae (rose family, maximum 0.6%), *Salix* (willow, maximum 3.7%), *Ilex* (holly, 0.6%) and *Hedera* (ivy, maximum 0.9%). Pollen and spores of aquatic, moss and fern vegetation are poorly represented, and include Cyperaceae (sedge family, maximum 2.2%) and *Typha latifolia* (reedmace, maximum 2.6%).

The pollen record from ditch [1875] indicates eight broad plant communities:

1. Open deciduous woodland found on dry, neutral-alkaline soils and consisting mainly of elm, oak, beech, ivy, rose and hazel (eg chalk down-land)
2. Open mixed deciduous – coniferous woodland found on dry, acid soils and consisting mainly of oak, birch, holly, pine, heather and bracken fern (*Pteridium aquilinum*) (eg Lower Greensand)
3. Open coniferous woodland found on both alkaline and acid soils, and sometimes associated with foci of human activity (eg church yards) eg privet and walnut
4. Wet woodland consisting of alder, willow and polypody fern (*Polypodium*)
5. Damp ground and open water vegetation consisting mainly of meadowsweet (*Filipendula*), bedstraw (*Galium*), sedge (Cyperaceae), reedmace, bur-reed (*Sparganium*), horsetail (*Equisetum*), tormentil (*Potentilla* type), meadow-rue (*Thalictrum*)
6. Tall herb grassland (eg meadow, waste ground, edge of cultivated fields) consisting mainly of grass, species in the carrot family, mugwort (*Artemisia*), black knapweed (*Centaurea nigra*), hedge woundwort (*Stachys*), fat hen, thistle (*Cirsium*) and nettle (*Urtica*)
7. Short herb grassland (eg pasture, waste ground) consisting mainly of grass, docks and sorrels (*Rumex* sp), cow wheat (*Melampyrum*), clover (*Trifolium* sp.) and dandelion (*Taraxacum*)
8. Cereal cultivation consisting mainly of cereals (eg wheat and barley), grass, ribwort plantain (*Plantago lanceolata*), cornflower (*Centaurea cyanus*) and possibly charlock

The plant macrofossil analysis of ditch [1875] (sample <319>, [1812]; sample <322>, [1813]; sample <323>, [1832]; sample <327>, [1855]; sample <328>, [1853]; sample <331>, [1873]) indicates that the contexts were dominated by species indicative of damp ground, arable fields and grassland. *Ranunculus* spp. dominated all of the contexts, in particular *R. sceleratus* (marshy fields and ditches). Common nettle, small nettle, fat hen, orache,

bramble and fool's parsley were also common. These species grow on open disturbed ground and within arable fields.

Sample <327>, from recut [1856] provided a sparse plant assemblage with just a few seeds indicative of plants found on disturbed ground, such as *Lamium album* (dead nettle) and *Solanum dulcamara* (restharrow). In sample <323>, from recut [1856] and <328> from recut [1854] *Ficus carica* occurs in quite large quantities. Other plant remains indicating possible edible produce included *Brassica/Sinapis* sp., *Rorripa nasturtium-aquaticus* (water-cress), *Rubus* sp. and the stones of *Prunus cerasus, P. spinosa* (sloe) and *P. domestica/cerasifera.* One seed of *Linum usitassimum* (flax) was present in sample<328>. Sample <331> contained a similar range of plant species, but also contained an abundance (56%) of *Potamogeton* sp. (pondweed) and *P. pusilus* (lesser pondweed), both of which require a permanent water-body (still or slow moving). Other wetland species present were *Alisma aquatica* (water plantain), *Damasonium alisma* (starfruit), *Eleocharis palustris* and Cyperaceae indet. (sedge). There were also frequent seeds of *Aethusa cynapium.* Sample <322> from the post-medieval recut of the ditch, was distinctive in having both mineralised and charred grains and seeds. Occasional Poaceae (grass) caryopses, and seeds of *Malva* sp. (mallow) and *Foeniculum vulgare* (fennel) were mineralised. In addition, one mineralised and one charred internode of *Triticum aestivum* (bread wheat), one charred grain of *Tritcum* sp. (wheat indet) and one charred grain of *Hordeum* sp. (hulled barley) were present.

Discussion

By the medieval period the area outside the City walls in the upper Walbrook valley had become a marsh known as Moorfields. Ditches were excavated in an attempt to drain the land and reclaim some of the marshland for pasture, cultivation and settlement. The pollen and plant macrofossil assemblages recovered from the sedimentary fills of the medieval drainage ditches at Moor House support this model. They indicate the presence of standing and/or slow flowing water within the ditches (eg pondweed), damp conditions at the ditch edges (eg common spike-rush and sedges) and marshy ground proximal to the ditch sides (eg docks, mallow and buttercups). Together with plants such as red goosefoot, fat hen and creeping buttercup, the plant assemblages suggest that the area surrounding the ditches was probably alluvial flood meadow or pasture. The presence of a range of woodland and shrubland taxa in the pollen record, including elm, birch, pine, oak, willow and brambles is rather surprising and may represent 'long-distance' transportation to the site as a component of the regional pollen rain. Alternatively, it may indicate the local growth of isolated trees on land reserved for gardens and parks, waste ground, and the edges of ditches and field borders as hedgerows (*see* also 1–6 Aldersgate; Scaife 2001). Further evidence for the deliberate planting of trees for ornamental or practical purposes (eg fruit trees) may be suggested by the identification of privet (hedges), walnut (nuts), rose (ornamental) and yew (ornamental/religious) pollen.

The evidence for local arable agriculture is unclear. The presence of hulled barley and bread wheat provide unequivocal evidence for the utilisation of cereals but the poor preservation and concentration of both have been found at a number of medieval sites, such as 1–6 Aldersgate Street (Carruthers 2001), Jennings Yard, Windsor (Carruthers 1993), Potterne, Wiltshire (Carruthers 2000) and Worcester (Greig 1981). Only one seed of flax was found at Moor House (context [1853], sample 328, feature [1875]) and therefore it cannot be assumed that flax was cultivated.

The remains of fruits are fairly abundant from Moor House indicating quite a diverse human diet consisting of blackberries/raspberries, plums, cherries, elderberries, figs and grapes. There is no direct evidence to suggest that the ditch was being used as a latrine apart from the few mineralised remains in context sample <322> (from the post-medieval recut of the City ditch [1875]). This context also contained a few charred remains of grains and chaff, as well as fennel seeds. Although there is no direct evidence to suggest the deposit was from a cesspit (eg faecal debris), mineralised seeds are commonly found in the sedimentary fill of this type of feature. Therefore, the mixture of domestic food remains in this deposit, including charred grains, could be the result of 'dumping' of floor sweepings from a domestic unit into a latrine that was later cleaned and the contents 'dumped' into the ditch (*see* Greig 1981). An alternative explanation, and considerably less informative, is simply that the deposit is unrelated to cesspit cleaning and the mineralisation is due to post-depositional alteration of the seeds as a result of downward movement of phosphatic materials from overlying contexts. Support for this interpretation may be found in the simple fact that the deposit contained very few seeds of plant species commonly found in cess, such as the hardier bramble and elder seeds.

The occurrence of whole stones of larger fruits, such as plums and cherries, are clearly unrelated to cess deposits, since these stones would not normally be consumed and digested. Therefore, it is likely that these deposits represent at least some household waste. They are often associated in archaeological deposits with characteristic weeds, such as fat hen, stinking chamomile and grassland species, which colonise field-borders and the crops themselves. However, it is important to note that fat hen and stinking chamomile can also be found growing in a range of other plant communities.

The presence of 'exotic' plants such as grape and fig indicate the occurrence of trade, probably linked to ports established along the River Thames (Greig 1981; Knight, 2002). Neither plant flourishes in the British climate today, although viticulture did occur in England during the warmer climatic episode known as the 'Medieval Warm Period' (Willcox 1977; Carruthers 2001). Both species are commonly found on Roman, medieval and post-medieval archaeological sites.

The plant macrofossil remains from 1–6 Aldersgate Street (Carruthers 2001) provided valuable information on the medicinal use of a variety of plants during the medieval period. These plants are also present at Moor House, although the evidence is not so compelling for the local presence of medicinal (physic) gardens. The following possible medicinal plants are present in the Moor House assemblages: flax (linseed oil can sooth coughs and colds); hemp (eases pain); mustard and common mallow (applied as a poultice); hemlock and catmint (sedative and antispasmodic) (*see* also Carruthers 1993). Hemlock has been found at a number of different sites including Waltham Abbey (Moffat 1987) and the Dominican Priory in Oxford (Robinson 1985), where it is believed to have been cultivated (Carruthers 2001). However, these species are also field weeds, and are common in a variety of ruderal habitats and, for this reason, must be interpreted with caution. The composition of the assemblages does not provide sufficient evidence to indicate whether these particular plants were being used medicinally or in the kitchen. Nevertheless, they do provide a useful guide to the plant species available to the local population during this period, and it would be surprising if they were not being used to sooth the various ailments suffered by those living nearby.

GEOCHEMICAL AND PLANT MACROFOSSIL ANALYSES OF A MEDIEVAL PIT

Nick Branch and Alys Vaughan-Williams

This report summarises the findings arising out of the geochemical and plant macrofossil analyses of a medieval pit [1452] that contained an abundance of deer antlers and lime within the sedimentary fills. It was suggested that this feature may be associated with 'tanning' and in particular 'white tanning', a technique that uses 'alum' (aluminium potassium sulphate) to make the leather supple and to create the whitening effect. To test this hypothesis, two analyses were conducted on the sedimentary fills. The first involved the identification of waterlogged, mineralised and charred plant macrofossils in order to establish a possible relationship between the plant taxa present within the pit and the tanning process. Secondly, geochemical analysis of the sedimentary fills was conducted in an attempt to identify the presence of 'alum', or other elements possibly associated with the tanning process.

Methodology

Plant macrofossil analysis

Plant remains were extracted from four samples (contexts [1400], [1419], [1445] and [1453]) by deflocculation of a 100ml sub-sample in hot water, followed by sieving through 4mm, 2mm, 1mm and 300µm mesh sizes. The plant material was sorted and identified using a low power zoom-stereo microscope. Identifications were made with the assistance of the reference collections at University College London and Royal Holloway. Plant nomenclature and taxonomy follows Stace (1997). The results are presented in Table 30.

Geochemical analysis

Six samples were submitted for geochemical analysis, one from each of the main contexts representing the sedimentary fill of the pit, and two 'control' or 'background' samples from the 'natural' alluvial deposits underlying the site (labelled 'alluvium1' and 'alluvium2'). The samples were dried at 60–80°C and then finely powdered in a swing mill grinder. 0.2 of powdered sample was then dissolved in 6ml of hydrogen fluoride (HF) and $HCLO_4$ (2:1 mixture). This was evaporated to dryness, cooled and dissolved in 20ml of 10% HNO_3. This solution was analysed by ICP-AES for: iron (Fe), magnesium (Mg), calcium (Ca), sodium (Na), potassium (K), titanium (Ti), phosphorus (P), manganese (Mn), barium (Ba), cerium (Ce), cobalt (Co), chromium (Cr), copper (Cu), lanthanum (La), lithium (Li), nickel (Ni), lead (Pb), scandium (Sc), strontium (Sr), vanadium (V), yttrium (Y) and zinc (Zn). Also, 0.2g of powdered sample was fused with 1g of LiBO2 at 850°C and the mixture dissolved in 5% HNO3. This solution was then analysed for silicon (Si), aluminium (Al) and zirconium (Zr) by ICP-AES. All analyses were made using the Perkin Elmer Optima 3300R ICP-AES system. The major elements are quoted as weight percent oxides and the trace elements as parts per million of the element. The results are presented in Table 31.

Results and interpretation of the plant macrofossil analysis

Context [1453] contained an abundance of *Atriplex* sp. (orache), *Chenopodium album* (fat hen) and *Spergula arvensis* var. *sativa* (corn spurrey), as well as *Ranunculus sceleratus* (celery-leaved buttercup), *Sambucus nigra* (elder), *Impatiens parviflora* (small balsam) and *Anthemis cotula* (stinking chamomile). Two grains of charred and waterlogged wheat (*Triticum* sp.), along with straw fragments (chaff) were also present. These taxa are associated with a wide range of habitats including waste (eg orache and fat hen) and damp ground (eg celery-leaved buttercup), cultivated fields (eg corn spurrey) and woodland/shrubland (eg elder and small balsam).

Context [1419] was dominated by *Ranunculus sceleratus* (celery-leaved buttercup), with *Impatiens parviflora* (small balsam), *Chenopodium album* (fat hen), *Stellaria graminea* (lesser stitchwort) and *Polygonum lapathifolium* (pale persicaria). Straw fragments (chaff) were also present. These taxa are associated with a wide range of habitats, particularly damp ground (eg celery-leaved buttercup), but also waste ground (eg orache and fat hen), woodland/

Genus	*Species*	*English Name*	*Sample*	*200*	*202*	*204*	*205*	*totals*
			Context	*1400*	*1419*	*1445*	*1453*	
Waterlogged plant macrofossils								
Cereals								
Triticum	sp.	Wheat	grain				1	1
Weeds								
Ranunculus	*sceleratus*	Celery-leaved buttercup	seed	25	553		10	588
Urtica	*dioica*	Common nettle	seed	186				186
Chenopodium	*album*	Fat hen	seed	2	8		159	169
Atriplex	sp.1	Orache	seed	506			233	739
Stellaria	*graminea*	Lesser stitchwort	seed		6			6
Spergula	*arvensis* var. *sativa*	Corn spurrey	seed	2			90	92
Polygonum	*lapathifolium*	Pale persicaria	seed		2		1	3
Polygonum	Sect. *avicularia*	Knotgrasses	seed	1	5			6
Brassica/ Sinapis	sp.	Cabbage/ mustard	seed	2				2
Impatiens	*parviflora*	Small balsam	seed	24	9		3	36
Sambucus	*nigra*	Elder	seed	2			4	6
Anthemis	*cotula*	Stinking chamomile	seed				1	1
Mineralised plant macrofossils								
		Straw fragments	chaff		2		2	4
Charred plant macrofossils								
Cereals								
Triticum	sp.	Wheat gr.	grain				1	1

Table 30 Waterlogged, mineralised and charred plant remains from medieval pit [1452]

	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	MnO	Ba	Co	Cr	Cu	Li	Ni	Sc	Sr	V	Y	Zn	Zr	La	Ce	Sm	Eu	Dy	Yb	Pb
Alluvium1	64.95	14.36	8.94	1.62	0.64	0.28	2.92	0.76	0.18	0.03	414	21	122	28	19	67	15	74	148	27	94	368	34	62	8.8	1.5	4.7	3.1	18.8
Alluvium2	78.85	8.87	5.57	0.95	0.47	0.27	2.17	0.63	0.11	0.03	326	13	82	18	11	37	10	58	98	22	59	718	34	64	7.3	1.1	3.7	2.2	15.2
1400	58.68	4.58	3.11	0.59	10.09	0.32	1.19	0.29	1.06	0.12	289	6	33	75	7	22	5	229	41	15	170	244	17	23	3.3	0.6	2.4	1.1	181.5
1419	33.64	2.79	2.09	0.59	26.82	0.23	0.73	0.17	0.93	0.10	201	3	20	93	4	16	3	436	27	13	126	151	16	29	1.9	0.5	2.0	0.8	131.0
1445	18.06	2.47	1.49	0.62	9.89	0.26	0.61	0.20	1.07	0.06	189	2	17	54	3	11	3	209	21	8	118	142	9	10	0.3	0.3	1.1	0.5	64.8
1453	56.34	3.35	2.95	0.44	12.30	0.25	0.95	0.23	0.88	0.08	261	7	29	72	5	24	4	239	39	13	254	207	15	22	2.9	0.6	2.0	1.1	233.2

Table 31 Geochemical analysis of medieval pit [1452]

shrubland (eg small balsam) and cultivated fields (eg pale persicaria).

Context [1400] contained an abundance of *Atriplex* sp. (orache) and *Urtica dioica* (common nettle), as well as *Ranunculus sceleratus* (celery-leaved buttercup), *Impatiens parviflora* (small balsam), *Chenopodium album* (fat hen), *Spergula arvensis* var. *sativa* (corn spurrey), *Brassica/Sinapis* (cabbage/mustard) and *Sambucus nigra* (elder). These taxa are associated with a wide range of habitats including nitrogen-rich ground (eg common nettle), waste (eg orache and fat hen) and damp ground (eg celery-leaved buttercup), cultivated fields (eg corn spurrey) and woodland/shrubland (eg elder).

Unfortunately, context [1445] contained no plant macrofossils.

Results and interpretation of the geochemical analysis

Contexts [1400], [1419], [1445] and [1453] indicate enhanced values for five major and trace elements by comparison with the 'control' samples: calcium (Ca), phosphorus (P), copper (Cu), zinc (Zn) and lead (Pb). It is interesting to note that neither potassium (K) nor aluminium (Al) show enhanced values, and this may be attributed to either the absence of 'alum' in the samples

or, and more likely, the solubility of these elements. The enhanced levels of calcium and phosphorus, and the correspondingly low levels of potassium and aluminium, could therefore be due to the addition of lime and organic matter to the feature (forming insoluble calcium phosphate), a practice that would increase the pH of the water within the pit creating an alkaline solution. Phosphorus may be derived from a number of additional sources, including manure, plant residues, human waste, domestic waste and the parent material. Organic phosphorus, which may be microbial in origin, is very stable (insoluble) in acid and alkaline solutions and fully interacts with humic components produced by the decay of organic matter. In contrast, inorganic phosphorus will become highly soluble in organic rich deposits (eg manure). Therefore, the geochemical results may indicate both the addition of lime (forming insoluble calcium hydroxide) and organic matter (forming insoluble organic phosphorus) to the pit.

The presence of zinc and copper is also of interest because these trace elements, which are important for plant growth and reproduction, also occur in high values. This may be attributed to enhanced levels of the insoluble organic forms of zinc and copper in the organic rich substrate within the pit. In addition, it is notable that the insolubility of zinc and copper increases with higher pH levels, providing possible further evidence for the presence of alkaline conditions in the feature. The presence of enhanced levels of lead is difficult to explain, although it may be derived from industrial practices taking place on the site during the medieval period, such as metal-working, or from the deposition of domestic sewage.

Discussion and conclusions

Plant macrofossil and geochemical analyses were conducted at Moor House with the aim of establishing whether feature [1452] was a tanning pit. Due to the paucity of previously published environmental archaeological data on this subject, the exercise was deemed to be largely experimental but would nevertheless provide a valuable insight into the potential of plant macrofossil and geochemical analyses for establishing the presence of tanning. It is apparent from the available archaeological and anthropological literature that the tanning process is highly complex and consists of a series of stages, which vary historically and geographically. For these reasons, it is difficult to know which stage, or stages, in the tanning process may be represented by an individual feature, and therefore what 'signature' may be left in the environmental archaeological record. The results from Moor House have demonstrated that well-preserved plant macrofossil and geochemical records can be obtained from a tanning pit, but unless a systematic environmental archaeological study is conducted on features of this type, interpretations will continue to be speculative and lack the precision necessary to establish the presence of one or more of the stages in the tanning process.

The interpretation of the results from Moor House must therefore be viewed with caution, but nevertheless provide a 'working hypothesis' that may be tested by further research. The results indicate that the feature [1452] was probably a tanning pit, but the absence of plant materials typically associated with the supply of organic dyes and pigments during the tanning process eg oak and pine bark, and acorns, suggests that the process at Moor House involved other substances. This result is entirely consistent with data from archaeological excavations at The Green in Northampton, which have provided outstanding evidence for three tanneries, dated to the late 15th–17th centuries (Shaw 1996). At Moor House, these substances probably included phosphate-rich organic matter eg straw and faecal material, and lime (calcium hydroxide), which created conditions suitable for the removal of hair and fat (mucopolysaccarides), and other unwanted surface materials from the animal hides, as well as tanning agents. This interpretation implies that the tanning pit at Moor House was probably used for more than one stage in the tanning process, which is supported by the results from Northampton. However, the data from The Green also indicate that it is possible to differentiate between lime-rich pits, phosphate-rich pits (for mastering) and humic-rich pits (for tanning) based upon geochemical analysis. These exciting results emphasise the potential of further research into the geochemical properties of tanning pits. Although the geochemical results do not indicate that 'alum' was used in this process, this practice cannot be excluded because both potassium and aluminium are highly soluble.

The plant macrofossil record also indicates that the vegetation cover surrounding the pit probably consisted of waste ground, damp ground and possibly woodland/shrubland. The evidence also suggests that cultivated fields may have been present locally, and that the by-products of cereal processing and/or activities associated with animal husbandry eg fodder and bedding, were deposited in the pit.

Chapter 7 Discussion of Medieval and Post-Medieval Activity

The medieval pottery assemblage from the site consisted of only 1,331 sherds which for a site of some 2,700 square metres was not large. This reflected not only the widespread truncation of medieval layers caused by the construction of the tower and underground car park of Moor House but also the marginal nature of the land in the medieval period. From the time of the construction of the Roman City wall at the end of the 2nd century/beginning of the 3rd century AD until the 12th century the waterlogged and marshy nature of the area meant that this part of London was largely unoccupied and under-utilised. There were other more easily accessible and more productive areas that the population could use first. The very occasional sherd of late Saxon and Norman pottery from the site suggests that very little was happening on the site at this time. From the 12th century there is evidence of leather manufacture taking place on site: possibly both tanning of cattle hides and tawing of roe-deer skins and possibly sheep and goat hides, or at least the initial processes, involving the defleshing and removal of hair. This may have been because, after initially setting up on the Walbrook within the City walls, leather workers were forced out by City ordinances to Moorfields where there were plentiful supplies of water and they were remote enough not to annoy their neighbours with the unpleasant smells associated with the manufacturing processes.

Remains of fence pales were recovered from the both the marsh deposits and from within the large east–west aligned drainage ditch to the south of the site. This suggests that the marsh was not completely open land but that it was at least at some time divided by fences into parcels of land, which may have been divided up into different leased areas, as indicated in documentary records, which state that the City of London laid claim to the whole marsh (*see* above).

Thereafter there were two periods of more sustained use of the area, as represented by the medieval pottery assemblage dating to *c.* 1250–1350 and *c.* 1350–1500. The archaeological record suggests that a concerted effort was made to drain the land and construct a series of ditches to drain water from the marsh off into the City ditch. The layout of the ditches suggested a sophisticated system of drainage and flooding was built, to manage the area as water meadows, so that crops of early grass or hay could be grown to feed sheep or cattle. The relative scarcity of pottery and other finds suggest that it was mainly an agricultural environment and that rubbish from the City was not systematically being dumped in the area. This is supported by a similar dearth of rubbish in the City ditch, which is at variance with other parts of the City ditch such as Aldersgate (Butler 2001) which attracted the rubbish from London.

The environmental evidence of Moorfields indicates that the area was a waterlogged marshland, with a typical collection of plants such as rushes and reeds, inhabited by frogs, but that it was subjected to periods of drying out when plants more associated with wasteland took root. Pollen and plant macrofossil analysis indicate the presence of standing or slow-flowing water within the drainage ditches of the marsh suggested by the presence of pondweed with damp conditions at the ditch edges indicated by common spike-rush and sedges and marshy ground beyond the ditches represented by the presence of docks, mallows and buttercups. These plants together with the presence of red goosefoot, fat hen and creeping buttercup suggest that the area around the ditches was flood meadow or pasture. Woodland and shrubland pollen of elm, birch, pine, oak, willow and brambles may have been transported to the site or may represent isolated trees growing in gardens, waste land or on the edges of ditches and in hedgerows. The deliberate planting of ornamental or fruit trees nearby is suggested by the presence of privet, walnut, rose and yew. The presence of hulled barley and bread wheat might suggest the cultivation of crops in the vicinity, but given the limited number recovered these may have reached the site by other means. Evidence of fruit in the diet of the local inhabitants was fairly abundant within possible cess deposits and household waste, with blackberries/raspberries, plums, cherries, elderberries and more exotic varieties such as figs and grapes being present. Medieval and early post-medieval London was in many ways a garden City with many private gardens both within and outside the City wall. It is documented that these gardens grew vegetables, fruit, herbs and even vines for personal consumption or sale (Barron 1989, 47) and it is probable that this was happening before the ordinance of 1415, which might have only regulated the practice of dividing the Moor into plots of land for gardens. The presence of raven bones indicates that scavengers were attracted to the marsh by the food and other organic debris that was being dumped in the area.

Components from at least 125 leather shoes were recovered from medieval deposits across the site and most notably residually from the early post-medieval parish ditch. With this material were small quantities of waste leather including primary waste such as hide edges, udder and other unusable areas of hide, and secondary waste from the cutting out of patterns during manufacture of leather goods. The secondary waste and the quantities of heavily

worn shoe soles, clump sole repairs and secondary cutting on shoe parts suggest that waste from a cobbler's workshop was being disposed of on site. Eight 'C' shaped leather trimmings represented discarded waste from another leatherworking trade. Both this waste and the cobbler's waste may have been disposed of locally by trades that had their premises in the vicinity outside the City walls, but it is more likely to represent the disposal of waste in convenient ditches by trades working within the City walls. There are constant references to the dumping of rubbish from the City in the ditches of the Moor; one of the worst offenders were the Curriers' Company who dressed, levelled and greased tanned leather and had their Hall in the Cripplegate area (Weinreb & Hibbert 1983, 165). In 1526 they were served with an injunction to 'forthwith cleanse all such filthe and ugly thing by them used and laid in the ditches surrounding the Moorfield' (Levy 1990, 84).

The majority of the animal bone from the medieval contexts consisted of food debris together with cattle horn cores, roe deer antlers and sheep and goat horn cores, which was waste from tanning and tawing. The bones representing discarded kitchen and table waste suggest a diet rich in beef, veal, mutton, lamb and pork as staples supplemented by goose, domestic fowl, rabbit and marine fish, with occasional venison from fallow deer, and duck. Some of the sheep skulls with horn cores, together with detached horn cores, suggest that a mixture of primary butchery waste, household food debris and possible horn working debris was being discarded on the site in the medieval period. There was also evidence of bone working in the form of points fashioned from cattle metatarsal bones and several bones exhibiting signs of sawing. It is probable that the majority of this waste was being discarded outside the City by trades and households, which again operated and lived within the walls.

The medieval small finds assemblage contained such objects as horseshoes, iron shears, knives, keys, a honing stone, and a bone tool that might have been utilised in industries such as leather working or agriculture that was practised in the area. Other objects included dress accessories such as strap ends, lace chapes and personal objects such as a bone needle, an antler comb and a thimble, which might either represent accidental loss by people working in or crossing the marsh or perhaps the dumping of waste from the City.

Four bone skates were recovered from medieval fills of the City ditch and other deposits on the site. A further bone skate was recovered from an apparent Roman fill of a ditch. All were made from horse metatarsals (Fig. 110). Although it has been claimed that these were never used in the Roman period, evidence of Bronze Age and Iron Age examples were found in Thuringia in Germany and ones dating to between the 2nd and 4th centuries AD have been discovered in Frankfurt (MacGregor 1976, 64). Up to 1982 only seven stratified examples were known from London dating to from the late 10th to the 13th centuries (West 1982b, 303); seven more were added to the list of 11th and 12th-century date in 1991 (Pritchard 1991, 208–209). More recently a number of examples have been published from London, including those of late 11th-century date from Fennings Wharf (Wardle 2001, 206, 208), of 12th to 13th-century date from Cripplegate (Keily 2004, 123) and 12th and 13th century ones from Bishopsgate (Swift 2003, 30, 33). There is tentative evidence of earlier skates, which were provided by a possible unfinished example of 8th-century date from the Royal Opera House (Blackmore 2003, 307–308) and another unfinished one of Roman date from northwest Southwark (Pipe 2003, 180). Whilst two bone skates recovered from City ditch deposits in a tunnel beneath Aldersgate might be of Roman date, as the fills contained a large assemblage of Roman pottery, two sherds of late Saxon pottery and some Saxon leather might suggest they are more likely of that period (Armitage 2001, 79–80). A bone skate was recently recovered from a Roman context at Broad Street but was thought to be medieval in date and intrusive (Harward 2004). Whilst the Moor House example might thus be Roman in date, the difficulty in defining the edges of features on site due to bioturbation of the marsh, indicates it is also most likely to be medieval.

FitzStephen writing in the late 12th century describes the use of these skates in Moorfields:

> When the great marsh that washes the Northern walls of the City is frozen, dense throngs of youths go forth to disport themselves upon the ice. Some gathered speed

Fig. 110 Bone skates

> by a run, glide sidelong, with feet set well apart, over a vast space of ice. Others make themselves seats of ice like millstones and are dragged along by a number who run before them holding hands. Sometimes they slip owing to the greatness of their speed and fall, every one of them, upon their faces. Others there are, more skilled to sport upon the ice, who fit to their feet the shin-bones of beasts, lashing them beneath their ankles, and with iron-shod poles in their hands they strike ever and anon against the ice and are borne along swift as a bird in flight or a bolt shot from a mangonel.
>
> (Stenton 1934, 31)

The presence of the skates on the site prove the validity of the description and confirm that, especially during the winter months, Moorfields was sufficiently flooded to provide areas of ice large enough to skate upon. Whilst the Fennings Wharf example and others found at Watling Court and Pudding Lane (West 1982b, 303) may represent skates discarded after use on the frozen Thames, such other examples from Cripplegate in the west and Bishopsgate in the east demonstrate that the area of flooding covered much of the northern area outside the City walls.

THE CITY DITCH

During the medieval period the City walls and ditch were continually repaired and maintained. Stow mentions repairs to the walls being undertaken in the reigns of John, Henry III, Edward III, Richard II and Edward IV (Stow 1994, 41–42). He also records that 'the ditch...was begun to be made by the Londoners in the year 1211, and was finished in the year 1213, the 15th of King John. This ditch being then made of 200 feet broad'. Thereafter, it was 'cleansed' in 1354, 1379 and 1414, while 'Ralph Joceline, mayor, 1477, caused the whole ditch to be cast and cleansed' (Stow 1994, 50–51). Regular 'cleansings' were recorded by Stow, taking place between Aldgate and the Tower in 1519, in the Moor ditch in 1540, in 1549, 1569 and lastly in 1595 when money was granted:

> … for the reformation of this ditch, and that a small portion thereof, to wit, betwixt Bishopsgate and the postern called Moorgate, was cleansed, and made somewhat broader; but filling again very fast, by reason of overraising the ground near adjoining, therefore never the better.
>
> (Stow 1994, 51)

Fig. 111 Skaters on Moorfields

However, although the ditch in the area of the marsh was still being re-dug in 1595, much of the circuit of the ditch had already been infilled by the second half of the 16th century to satisfy the constant need for more space within the environs of the cramped City. By 1553 the City ditch between Newgate and Aldersgate had been vaulted over and there were more leases in what is now Fore Street and Houndsditch recorded in the decades after, suggesting building and encroachment on the former City ditch. The City tried to persuade those owning or renting land near to the ditch to keep it in good repair. In 1576 William Boxe, an alderman, promised to maintain the banks of his garden adjacent to the ditch between Cripplegate and Moorgate and to skim the filth from the ditch from time to time; but this had little effect as he was found to be encroaching upon the ditch two years later. In 1588 the City granted a rent rebate for a year if their tenants cleaned out the ditch and spread the spoil on the adjacent gardens (Schofield 1993, 145).

The medieval City ditch examined on site showed evidence of constant cleaning out with at least three recuts being made within the 13th/14th centuries. The surviving recuts show that the ditch on each occasion was not scoured out to its former width or depth. The date of backfill and the evidence of many recuts accords with the many 'cleansings' recorded by Stow (1994) in the 14th and early 15th century. The evidence of a post-medieval date for the last two recuts of the City ditch is based on very few sherds of pottery, but they suggest that the first might be part of the Ralph Joceline major works of 1477 and the latter one of the scourings that took place between 1540 and 1595. However, each phase of medieval and post-medieval ditch was found to be slightly narrower than the previous and it is stated by Stow that the redigging of the feature in 1595 between Bishopsgate and Moorgate was also broader than previous ditches. Perhaps the apparent dumped layers which sealed the ditch are in fact fills of this wider ditch, the edge of which extended beyond the limits of Area 2 and which continued on the west side of Moorgate.

The ditch on the present site, the outer edge of which measured *c.* 26m from the wall, conforms very much in size to that observed at Aldersgate, which measured *c.* 25m. To the west, a section at St. Giles Cripplegate Churchyard revealed the ditch as having a flattened 'V' shaped base with a width of 30–35 feet (9.10–10.65m) with a 9 feet (2.75m) berm from the wall and being between 6 and 9 feet (1.80m–2.75m) deep below the offset of the Roman wall (Grimes 1968, 85). However, this would seem to contradict Stow who stated that the ditch was some '200 feet broad', although no concrete evidence for such a width of City defence has been found up to now. However, at St. Alphage the visible width of the ditch was recorded as 45 feet (13.70m), but a broad waterlogged hollow to the north was felt either to be part of the marsh or perhaps a very wide stretch of the ditch (Grimes 1968, 89). It has been suggested that this great width of ditch would only have been found in the waterlogged area of Moorfields (Grimes 1968, 89), although the Copperplate and Agas maps of the mid 16th century do not show a particularly wide section of the ditch in this area. It is possible that in especially wet winters when the area became flooded that it was impossible to define the edge of the ditch and that a huge sheet of water 200 feet wide backed up against the City walls. Alternatively the ditch may have narrowed as it approached Moorgate, which may have been in existence since Roman times as a postern.

The dating of the various ditch recuts at Moor House may be compared with the excavations on City defences to the west at 1–6 Aldersgate and Cripplegate. At the former a Saxo-Norman ditch was revealed together with up to six phases of medieval and post-medieval City ditch, dating to the 13/14th century, 1350–1400, 1400–1500, *c.* 1500, late 16th century and 17th century (Butler 2001, 53–57). On a number of sites in Cripplegate evidence of several phases of recuts of the ditch was also revealed. A Saxon ditch that had silted up by the end of the 12th century was observed to the north of the City wall at St. Alphage; the fills of a ditch dated to the early 13th century were sealed beneath the floor of Bastion 14. At St Alphage fills of recuts were dated to the periods 1350–1500 and 1480–1550, a later recut was backfilled between 1580–1620 and a final recut was dated to the mid 17th century (Milne 2001, 9–18).

The major evidence from Aldersgate and Cripplegate, together with more tentative indications at Houndsditch where a 12th-century horseshoe was found (Maloney & Harding 1979, 350–353; Milne 2001, 35) and at Ludgate Hill where late Saxon pottery was found within a recut (Hill 1977, 45), suggests that the City was indeed defended by a ditch in the late Saxon period with the upcast possibly placed against the wall to form an embankment to cover holes in the defensive circuit (Milne 2001, 35). There was, however, no evidence of this found at Moor House. This may have been because all trace of it had been removed by the later medieval ditches or perhaps because it was felt that the waterlogged marsh was enough protection for the City in this northern part of the defensive circuit.

The medieval City ditch, which according to Stow was excavated in 1211–1213, has been found on a number of sites in the vicinity. At 6–7 St Alphage Garden/4 Fore Street (Merrifield 1965, 309–310) a broad flat-bottomed ditch filled with black earth was observed. In 1911 building work monitored by Norman and Reader at the former site of 123 London Wall (to the northwest of Armourers' Hall) revealed the remains of a portion of the medieval City ditch which was filled with black soil and measured 18 feet (5.48m) deep at its deepest point. It was observed *c.* 50 feet (15.24m) north of the face of the City wall and extended beneath Fore Street in the north (Norman & Reader 1912, 270). Building work monitored by E. Loftus Brock in 1882 revealed part of the medieval City ditch which consisted of 'a deep mass of yielding black mud' extending across the site and beneath the south edge of Fore Street which is now the north side of the traffic island between Moorfields and Moorgate (Loftus Brock 1882, 425).

The dark grey waterlain silt and clay fill of the base of the City ditch at Moor House is similar to that observed in the ditch at Aldersgate (Butler 2001, 54), St. Giles

Cripplegate Churchyard and St Alphage (Grimes 1968, 86) to the west and at Houndsditch (Maloney & Harding 1979, 351) to the east, which suggests that along much of the western and northern circuit that the ditch was filled with water. Although there was evidence of at least one recut during the 14th century at Aldersgate and Cripplegate, the ditch at Moor House was recut at least three times during the 13th and 14th centuries. This may have been because the presence of the marsh led to the ditch silting up in this area much more rapidly than elsewhere on the circuit. It is also possible that greater maintenance of the ditch was a necessity at this point to keep open the drainage system in Moorfields of which the City ditch formed an integral part.

Plant macrofossil analysis of the ditch fills revealed that the contexts were dominated by species indicative of damp ground such as celery-leaved buttercup, and of arable fields and open disturbed land (common nettle, small nettle, fat hen, orache, bramble and fool's parsley) and grassland. Pollen analysis supported this, but also provided indications of open deciduous woodland provided by elm, oak, beech, ivy, rose and hazel; open mixed deciduous woodland, with oak, birch, holly, pine, heather and bracken fern; open coniferous woodland with privet and walnut; and wet woodland provided by alder, willow and polypody fern. Damp ground and vegetation associated with water was represented by meadowsweet, bedstraw, sedge, reedmace, horsetail, tormentil and meadow-rue. Grassland both tall and short was suggested by grass species, carrot species, mugwort, black knapweed, hedge woundwort, fat hen, thistle, nettle, docks, sorrels, cow wheat, clover and dandelion. Cereal cultivation was suggested by the presence of wheat and barley, ribwort plantain and cornflower.

There is limited evidence from the site that the City ditch remained open into the early post-medieval period. Recuts of the ditch in the late 16th century were also recorded at Aldersgate and Cripplegate. Three maps, the Copperplate of *c.* 1559, the Agas of *c.* 1562 and the Braun and Hogenberg *c.* 1572 all show the City ditch still in existence in the 16th century and apparently filled with water. However, the ditch does not seem to be as wide as it once was, as it does not extend as far as Fore Street, and gardens and tenter fields are depicted as having encroached on its northern edge. This is reflected in the fact that the northern edge of the last phase of recutting of the ditch recorded at Moor House is some 6.5m further south than the first. The ditch is not depicted in the Norden and Speed maps of 1593 and 1611, suggesting that it had been backfilled at that date. The dating evidence for the backfilling of the ditch and the levelling of the site is based on a very few sherds of pottery but seems to indicate that the ditch went out of use in the late 16th century. However, there was no evidence from the site that a later ditch was recut during the 17th century, as had been the case at Aldersgate (Butler 2001, 57) and St Alphage (Grimes 1968, 88; Milne 2001, 18) to the west and Dukes Place to the east (Maloney & Harding 1979, 354). The ditches at Aldersgate and St Alphage were much narrower, 5.5m and *c.* 11m wide respectively, than the medieval ditch and it is possible that the northern edge of such a feature did not extend onto the site but was located to the south under the road at London Wall.

POST-MEDIEVAL ACTIVITY

The lack of post-medieval pottery, with the exception of the waster sherds from one barrel well, is symptomatic of the large scale truncation which was caused by the construction of the 20th-century building and car park on the site. Only deeply cut features such as wells, ditches or cellar floors survived. However, the archaeological evidence for the building development of the area as represented by the wells and cesspits seems to support the documentary and cartographic evidence that the site was generally not built upon until the late 16th and early 17th century. From the pottery and glass assemblages recovered from wells on site it seems that, from the beginning of the sustained development of the area, inns were also present on site to furnish the needs of the local residents. Although the assemblage of a large number of drinking vessels from two wells and the finds of high quality food waste from the parish ditch may also suggest that a wealthy institution such as the Armourers' Hall to the south of the site in Coleman Street might have been disposing of their waste in any convenient hole in the area. The rest of the post-medieval animal bone assemblage represented normal discarded food waste with beef and mutton predominating with lesser amounts of pork, geese, fowl and ducks.

The finding of a new post-medieval redware pottery production site is a significant discovery and not only helps to supply important new information on the production of pottery in late 16th-century London but also contributes to the nature of the occupation of the marshland in this last century of its existence. Documentary sources show that a pottery had been present since the late 1560s and the analysis of the pottery recovered from the site demonstrates that the pottery kiln was in production between 1580 and the early part of the 17th century. The establishment of pottery kilns in this location may be explained by the fact that in the 16th century Moorfields was still relatively unoccupied and had ready supplies of clay and water. However, by the early years of the 17th century things had changed; the marsh was being reclaimed and built upon and between 1606 and 1610 the area of the marsh known as Lower Moorfields, nearest the City walls, was turned into a park. There would no longer have been the ready access to supplies of clay, which would have had to be brought in from further afield as the whole of the marsh was gradually reclaimed, leading to pottery manufacture apparently ceasing in the early 17th century.

Other industrial activities were also apparently taking place on the Moor. Evidence of a brick clamp in the vicinity was provided by the presence of brick clamp wasters in the backfill of two late 16th-century/early 17th-century wells. The fabric of the wasters broadly date manufacture to between the 14th to early 18th centuries, and this material could have been redeposited from earlier contexts. The

evidence of only small scale quarrying on the site in the medieval period suggests that any brickmaking was taking place further to the north. Large-scale brickearth quarrying was found at the Island site, Finsbury Pavement, where the presence of a large number of brick wasters suggested a clamp in the vicinity (Malcolm 1997, 39–40) and similar pitting and evidence of burnt chalk from the manufacture of lime were found at 4–6 Finsbury Circus (Lambert 1920, 102–103). This might suggest that the brick clamps were located just off Finsbury Pavement in the area of present day Finsbury Circus and they might be those used by Ralph Joceline to repair the City wall in 1477, as recorded by Stow at the end of 16th century (Stow 1994, 41–42). However, it is possible that the manufacture of bricks continued in the general area into the 16th century and the bricks required for the construction of the pottery kilns could have been manufactured locally. Overfired and warped bricks were used to line the well in the northeast corner of the site and may have come from these brick clamps.

Two fragments of copper-alloy sheet recovered from the parish ditch represent evidence of metalworking; although this may have been taking place on or near the site it might represent discarded waste from the City.

Chapter 8 Conclusion

The excavation at Moor House has provided important evidence of the topography and land use of this area, immediately outside the City walls, from Roman times into the post-medieval period. The history of the area was moulded by the presence of water, with streamlets and tributaries of the Walbrook flowing down to meet the main channel of the river to the southeast. Evidence of periods of inundation is present throughout the archaeological record. In between the times when the area was waterlogged it can be seen that the area was encroached upon by Roman occupation spreading from the City, and utilisation of the natural resources for brickearth, sand and gravel quarrying was made, with pottery evidence suggesting that most activity took place in the 2nd century AD.

The major topographic feature in the vicinity, the river Walbrook, may have been the focus for a possible pre-Roman tradition, which continued into the Roman period, consisting of the ritual placement of objects in the various streams and ditches. Several horse and sheep skulls were placed in the bases of ditches and a quantity of disarticulated human bone was also recovered from the site. All the pieces were long bones or skull fragments and many showed evidence of having been exposed before deposition. The deposition of human skulls in the upper reaches of the Walbrook is well attested and it is possible that many of the fragments recovered reflect the continuance of a Celtic tradition rather than destruction of a Roman cemetery.

Once the City wall was built in the early 3rd century the area became marginal land. The almost complete lack of 3rd- and 4th-century Roman pottery, or indeed any pottery until the 12th century, suggests that the area was not utilised in any meaningful way for a thousand years; although there is tentative evidence of periods when the area was drier and attempts were made to manage the land by the digging of drainage ditches and dividing it into strips by means of fences.

It appears that one of the major uses of this area during the early medieval period was for leisure pursuits, including skating on the frozen marsh in winter, the evidence for such activity being provided by the discovery of several bone skates. From the 13th century onwards with the documented recutting of the City ditch in 1211 it appears that once more the area began to be more utilised. The construction of the regular network of north–south and east–west ditches suggests that the land was either being parcelled out as documented in a order of the Common Council in 1415 or that a system of agriculture, perhaps a mixture of arable and pasture, was being practised which utilised the winter flooding of the land.

From the 14th century, it is recorded that the tanners were operating in Moorfields, a fact that was witnessed on site by the presence of at least two probable tanning or tawing pits and a quantity of horn cores and antlers, with the archaeological evidence suggesting that they may have been present since the late 12th century. Tentative evidence of other industries in the vicinty such as possible horn workers, shoemakers and brick makers was also recovered, although it is probable that many of the finds were from dumps of material that had been spread onto the Moor from the City.

During the 16th century, the marsh was gradually reclaimed and it appears that it was also at this time that the City ditch was deliberately infilled. The first evidence of building in the area is attested by the presence of a series of barrel- and masonry wells and a series of cesspits. Most of these were backfilled in the first half of the 17th century suggesting that they were perhaps in use from the late 16th century. All evidence of the associated buildings and cellars was removed by the widespread truncation caused by the construction of the Moor House tower and underground car park, with the exception of a heavily truncated brick floor in Area 2.

Finds recovered from the post-medieval features show evidence of further industrial use of the area, with the presence of a previously undocumented pottery kiln and an early glass manufacturer, suggested by the discovery of a quantity of pottery wasters and kiln furniture and glass crucibles.

All in all the results from the archaeological investigations show what a wealth of archaeological information can be retrieved from even the most truncated of City sites. Although less than a metre of stratified deposits survived the construction of Moor House tower and underground car park in 1961, an archaeological and historical narrative of the site could be achieved. This led to the largely unknown agricultural nature of the land immediately outside the City defences being discovered. The site was more than just a marsh, it was a marsh that was at periods was being managed for agricultural purposes but was also an area for popular pastimes, both of which left an imprint in the archaeological record. The significant find of the inscribed slate and the regionally important discovery of an unknown pottery kiln have shown that once again even on the apparently most unprepossessing sites one can never predict what is lurking below the ground.

APPENDIX 1. GEOCHEMICAL DATA FROM MEDIEVAL PIT [1452]

TSNO	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	MnO
V2133	14.99	6.55	1.45	0.65	0.38	2.48	0.69	0.1	0.035
V2134	15.34	6.99	1.46	0.57	0.39	2.57	0.74	0.08	0.04
V2135	15.54	7.11	1.48	0.69	0.42	2.68	0.75	0.22	0.046
V2136	10.77	5.34	0.93	0.47	0.33	2.12	0.6	0.08	0.021
V2137	14.93	6.75	1.41	0.59	0.41	2.49	0.74	0.1	0.032
V2138	13.55	6.22	1.23	0.48	0.41	2.36	0.7	0.08	0.028
V2139	11	5.58	0.92	0.38	0.32	2.09	0.65	0.07	0.017
V2140	11.26	5.78	0.97	0.5	0.33	2.22	0.63	0.11	0.022
V2141	11.81	5.89	0.98	0.41	0.36	2.21	0.62	0.07	0.017
V2142	12.79	6.21	1.03	0.45	0.37	2.27	0.65	0.08	0.023
V2143	11.49	5.88	0.97	0.38	0.35	2.24	0.63	0.06	0.018
V2144	11.06	5.81	0.97	0.46	0.34	2.22	0.61	0.09	0.025
V2145	12.42	6.09	0.91	0.8	0.38	2.28	0.62	0.61	0.018
V2146	14.63	6.61	1.35	0.68	0.41	2.53	0.76	0.15	0.027
V2147	14.1	6.08	1.78	2.58	0.31	2.88	0.74	1.24	0.036
V2148	14.19	6.62	1.43	0.68	0.39	2.4	0.73	0.12	0.035
V2149	15.17	3.83	1.13	0.39	0.24	2	0.65	0.1	0.013

Table 32 ICP-AES analysis. Major elements measured as percent oxides

TSNO	Ba	Cr	Cu	Li	Ni	Sc	Sr	V	Y	Zr*	La	Ce	Nd	Sm	Eu	Dy	Yb	Pb	Zn	Co
V2133	377	105	31	81	57	16	81	132	28	61	45	84	47.094	9.3	1.7725	5.1	2.5	639.11	87	22
V2134	378	107	29	82	59	16	79	138	29	58	46	95	47.94	9.2	1.7505	5	2.6	564.96	82	24
V2135	412	110	35	75	65	17	89	122	31	69	46	118	48.316	9.6	1.8445	5.4	2.9	1167.06	121	28
V2136	352	85	24	47	40	12	70	96	23	46	38	86	39.668	8.1	1.533	4.2	2.1	398.03	62	16
V2137	382	105	32	71	52	15	79	126	23	61	40	79	41.642	8.2	1.5625	4.3	2.4	1956.07	92	22
V2138	356	97	27	66	41	14	75	119	20	55	36	80	37.318	7	1.289	3.7	2	731.85	76	16
V2139	332	76	26	49	38	12	63	99	22	50	37	85	38.446	7.6	1.421	3.9	2	302.9	60	13
V2140	376	92	26	50	41	13	75	108	25	47	42	96	43.804	9.2	1.611	4.6	2.3	440.14	66	15
V2141	367	91	25	51	39	13	72	106	23	47	40	92	41.548	8	1.5055	4.2	2.1	423.09	64	15
V2142	355	95	26	58	40	13	72	116	21	50	38	89	39.386	6.6	1.2895	3.9	2	657.91	65	18
V2143	351	94	24	50	41	13	69	114	25	47	40	99	41.83	8.5	1.506	4.5	2.2	791.71	60	16
V2144	370	91	28	49	43	12	72	107	25	45	43	104	44.932	8.8	1.6095	4.8	2.3	781.74	64	15
V2145	428	89	47	47	42	13	97	90	19	58	32	75	33.276	6.5	1.1955	3.4	2	856.58	282	11
V2146	411	108	40	71	46	16	88	129	22	55	38	77	39.198	7.7	1.3695	3.7	2.1	575.77	99	14
V2147	597	103	95	62	54	16	152	147	24	72	36	78	37.788	6.7	1.396	4.2	2.5	73.3	149	18
V2148	396	109	56	71	56	15	87	132	29	57	42	92	44.274	8.7	1.669	5.1	2.6	1762.01	84	19
V2149	368	85	48	53	29	13	100	94	14	53	34	67	34.498	4.5	0.9085	2.7	1.6	1744.93	67	12

Table 33 ICP-AES analysis. Minor and trace elements measured as ppm

APPENDIX 2. PLANT REMAINS FROM MEDIEVAL AND POST-MEDIEVAL FEATURES

				Medieval City ditch [1875]					
Sample				**323**	**327**	**328**	**331**	**335**	**Totals**
Context				**1832**	**1855**	**1853**	**1873**	**1858**	
Genus	**Species**	**English Name**							
Weeds									
Ranunculus	*repens*	Creeping buttercup	seed	10			8		18
Ranunculus	*sceleratus*	Celery-leaved buttercup	seed	225	5	98	21	397	946
Ranunculus	*trichophyllus*	Thread-leaved water-crowfoot	seed				15		15
Ficus	*carica*	Fig	seed	32		25			57
Urtica	*dioica*	Common nettle	seed	79		2	38	30	149
Urtica	*urens*	Small nettle	seed	3		4			7
Chenopodium	*rubrum*	Red goosefoot	seed	75			39		114
Chenopodium	*album*	Fat hen	seed				3		3
Atriplex	sp.1	Orache	seed	23		113	12	150	298
Stellaria	sp.	Stitchwort	seed			14			14
Silene	cf. *alba*	White campion	seed			6	6		12
Polygonum	*bistorta*	Common bistort	seed	2					2
Polygonum	*lapathifolium*	Pale persicaria	seed			1		2	2
Polygonum	Sect. *Avicularia*	Knotgrasses	seed			1	9		10
Rumex	*crispus*	Curled dock	seed	3				2	5
Rumex	*maritimus*	Golden dock	seed			20	16		36
cf. *Populus*	sp.	Poplar fruit	seed					1	1
Malva	sp.	Mallow	seed	1					1
Brassica/ Sinapsis	sp.	Cabbage/ mustard	seed	2			2		4
Iberis	*sempervirens*	Perennial candytuft	seed	1					1
Salix	sp.	Willow	seed			5			5
Rubus	*fructicosus*	Blackberry	seed					2	2
Rubus	*idaeus*	Raspberry	seed	8	1	3	4		16
Prunus	*cerasus*	Dwarf cherry	stone	1					1
Prunus	*spinosa*	Sloe (Blackthorn)	stone			1			1
Prunus	*domestica/ cerasifera*	Cherry/ Wild plum	stone			1			1
Pisum	*sativum*	Pea	seed	4					4
Euphorbia	*helioscopia*	Sun spurge	seed			1			1
Linum	*usitatassimum*	Flax	seed			1			1
Pimpinella	*saxifraga*	Burnet-saxifrage	seed					10	10
Aethusa	*cynapium*	Fools parsley	seed	11	2	3	50		66
Foeniculum	*vulgare*	Fennel	seed	4		3			7
Conium	*maculatum*	Hemlock	seed			6	8		14
Carum	sp.	Caraway	seed					5	5
Solonum	*dulcamara*	Restharrow	seed	1	4	2		5	12
Stachys	*sylvatica*	Hedge woundwort	seed					1	1
Lamium	*album*	Dead nettle	seed		2				2
Galeopsis	sp.	Hemp-nettle	seed			2			2
Lycopus	*europaeus*	Gypsywort	seed				5		5
Asperula	*arvensis*	Blue woodruff	seed	2				3	5
Sambucus	*nigra*	Elder	seed	2		2	3	7	14
Cirsium	sp.	Thistles	seed				5		
Centaurea	sp.	Knapweed	seed	3					3
Lapsana	*communis*	Nipplewort	seed			1			1
Picris	*hieraciodes*	Hawkweed oxtongue	seed		1	2			3
Sonchus	*asper*	Prickly sow-thistle	seed			9	7		10
Anthemis	*cotula*	Stinking chamomile	seed	1					1
Alisma	*aquatica*	Water-plantain	seed				35		35
Damasonium	*alisma*	Starfruit	seed			3			3
Potamogeton	*pusilus*	Lesser pondweed	seed				10		10
Potamogeton	sp.	Pondweed	seed				375		375
Eleocharis	*palustris*	Common spike-rush	seed				3		3
Cyperaceae	Indet	Sedges	seed	3			12		15

Table 34 Waterlogged plant remains from the medieval City ditch

				Ditch	dump	Parish ditch	marsh	Post-medieval City ditch [1814]		
Sample								**319**	**322**	**totals**
Context				**167**	**1709**	**1763**	**1777**	**1812**	**1813**	
Genus	**Species**	**English Name**								
Waterlogged plant remains										
Weeds										
Ranunculus	*repens*	Creeping buttercup	seed			37	7	4		4
Ranunculus	*sceleratus*	Celery-leaved buttercup	seed	394	10	98		64	17	81
Ranunculus	*trichophyllus*	Thread-leaved water-crowfoot	seed	18		14	104	1		1
Ficus	*carica*	Fig	seed		4	31	14			
Cannabis	*sativa*	Hemp	seed			3				
Urtica	*dioica*	Common nettle	seed			13				
Urtica	*urens*	Small nettle	seed					1		1
Chenopodium	*rubrum*	Red goosefoot	seed	300		23	16		6	6
Chenopodium	*album*	Fat hen	seed	1		2		30		30
Atriplex	sp.1	Orache	seed	28	3	182	6	67	8	75
Stellaria	*gramineae*	Lesser stitchwort	seed			1				
Stellaria	sp.	Stitchwort	seed			7				
Spergula	*arvensis* var. *sativa*	Corn spurrey	seed			4				
Agrostemma	*githago*	Corncockle	seed			1				
Silene	cf. *alba*	White campion	seed	1	5	8	2	30	2	32
Polygonum	*lapathifolium*	Pale persicaria	seed	3		2	3			
Fagopyrum	sp.	Buckwheat	seed			1				
Polygonum	Sect. *Avicularia*	Knotgrasses	seed	2		8				
Rumex	*acetosella*	Sheep's Sorrel	seed			1				
Rumex	*hydrolapathum*	Water dock	seed			5				
Rumex	*crispus*	Curled dock	seed	1		6	3			
Rumex	*maritimus*	Golden dock	seed	11	4	5	7			
Malva	*sylvestris*	Common mallow	seed			18	3			
Malva	sp.	Mallow	seed			4				
Brassica/ Sinapsis	sp.	Cabbage/ mustard	seed		5	20			2	2
Rorippa	*nasturtium-aquaticum*	Water cress	seed					1		1
Cochlearia	sp.	Scurvygrass	seed					61		61
Iberis	*sempervirens*	Perennial candytuft	seed	2						
Salix	sp.	Willow	seed	1				3		3
Rubus	*idaeus*	Raspberry	seed	2		14				
Potentilla	sp.	Cinquefoil	seed					6		6
Prunus	*cerasus*	Dwarf cherry	stone			2				
Prunus	*domestica/ cerasifera*	Cherry/ Wild plum	stone			2				
Vicia/ Lathyrus	sp.	Vetch/ pea	seed			3				
Pisum	*sativum*	Pea	seed			1		1		1
Fabaceae	Indet	Pea family	seed			3				
Ulex	*europaeus*	Gorse	seed		3					
Euphorbia	*helioscopia*	Sun spurge	seed			1				
Vitis	*vinifera*	Grape vine	seed			4		1		1
Aethusa	*cynapium*	Fools parsley	seed	16		12	4			
Foeniculum	*vulgare*	Fennel	seed	149		71			3	3
Conium	*maculatum*	Hemlock	seed			4				
Bupleurum	*rotundiflorum*	Throw-wax	seed			8				
Torilis	*japonica*	Upright hedge-parsley	seed			2		1		1
Solonum	*dulcamara*	Restharrow	seed			2		7		7
Verbena	*officinalis*	Verbain	seed			2				
Stachys	*sylvatica*	Hedge woundwort	seed			1				
Lamium	*album*	Dead nettle	seed			4		7		7
Galeopsis	*segetum*	Downy hemp-nettle	seed		2	26			3	3
Galeopsis	sp.	Hemp-nettle	seed		33		5		1	1
Nepeta	*cataria*	Cat mint	seed		3	26				
Prunella	*vulgaris*	Selfheal	seed			12				
Plantago	*lanceolata*	Ribwort plantain	seed			3				
Asperula	*arvensis*	Blue woodruff	seed			8				
Sambucus	*nigra*	Elder	seed	1	8	29	4	11		11

				Ditch	dump	Parish ditch	marsh	Post-medieval City ditch [1814]		
Sample								319	322	totals
Context				**167**	**1709**	**1763**	**1777**	1812	1813	
Genus	**Species**	**English Name**								
Waterlogged plant remains										
Centaurea	sp.	Knapweed	seed	1						
Picris	*hieraciodes*	Hawkweed oxtongue	seed			2	2	5		5
Sonchus	*asper*	Prickly sow-thistle	seed		2	37				
Artemesia	sp	Mugwort	seed	1						
Anthemis	*cotula*	Stinking chamomile	seed			4		3		3
Leucanthemum	*vulgare*	Oxeye daisy	seed	1				1		1
Chrysanthemum	*segetum*	Corn marigold	seed					4		4
Alisma	*aquatica*	Water-plantain	seed				4	1		1
Potamogeton	*pusilus*	Lesser pondweed	seed					3		3
Potamogeton	sp.	Pondweed	seed		4	1	5			
Eleocharis	*palustris*	Common spike-rush	seed	2	2	1		3		3
Cyperaceae	Indet	Sedges	seed		6	9		2		2
Sparganium	*erectum*	Branched bur-reed	seed			2				
Poaceae	Indet	Grasses	seed	1		4				
Mineralised plant macrofossils										
Cereals										
Triticum	*aestivum*	Wheat	internode						1	1
Weeds										
Malva	sp.	Mallow	seed						1	1
Foeniculum	*vulgare*	Fennel	seed						3	3
Sambucus	*nigra*	Elder	seed						1	1
Poaceae	*indet*	Grasses	seed						2	2
Charred plant macrofossils										
Cereals										
Hordeum	sp.	Hulled barley	grain						1	1
Triticum	sp.	Wheat.	grain						1	1
Triticum	*aestivum*	Wheat	internode						1	1

Table 35 Waterlogged, mineralised and charred plant remains recovered from medieval and post-medieval features, and post-medieval city ditch

APPENDIX 3. POLLEN DIAGRAMS

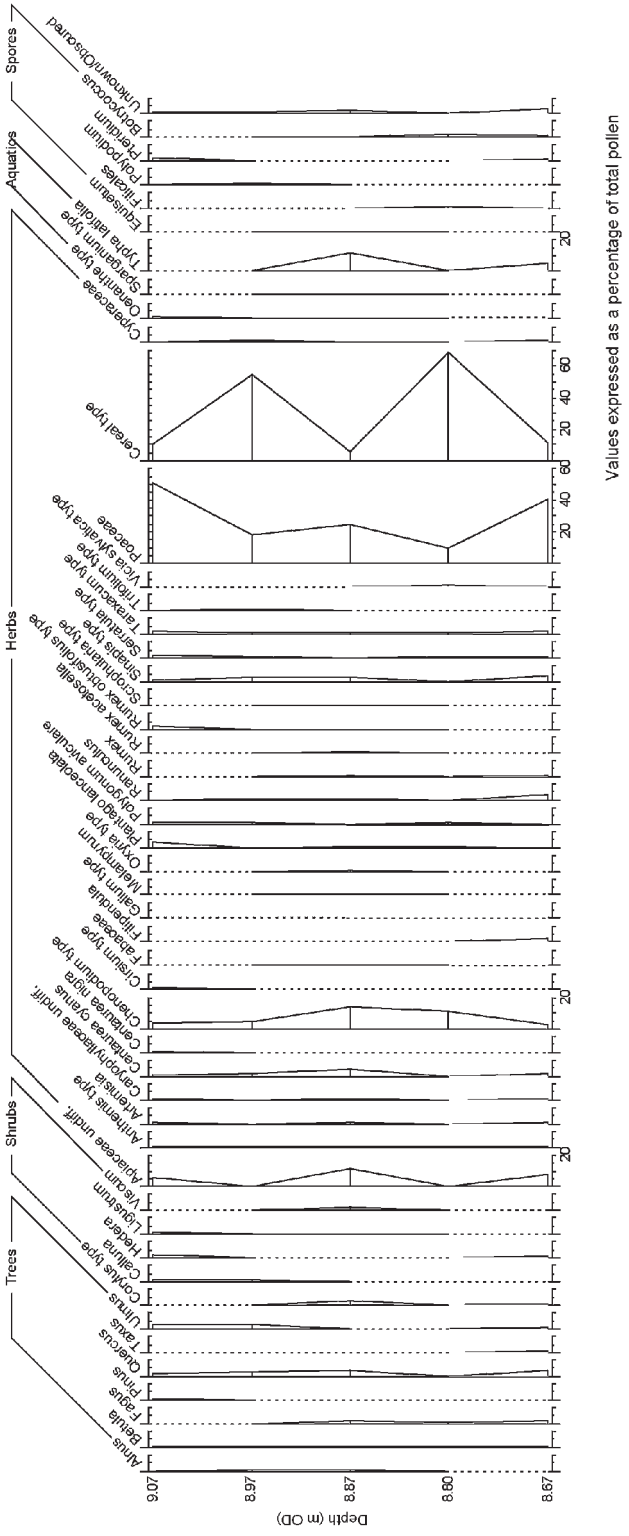


Fig. 112 Pollen diagram for column sample <21>

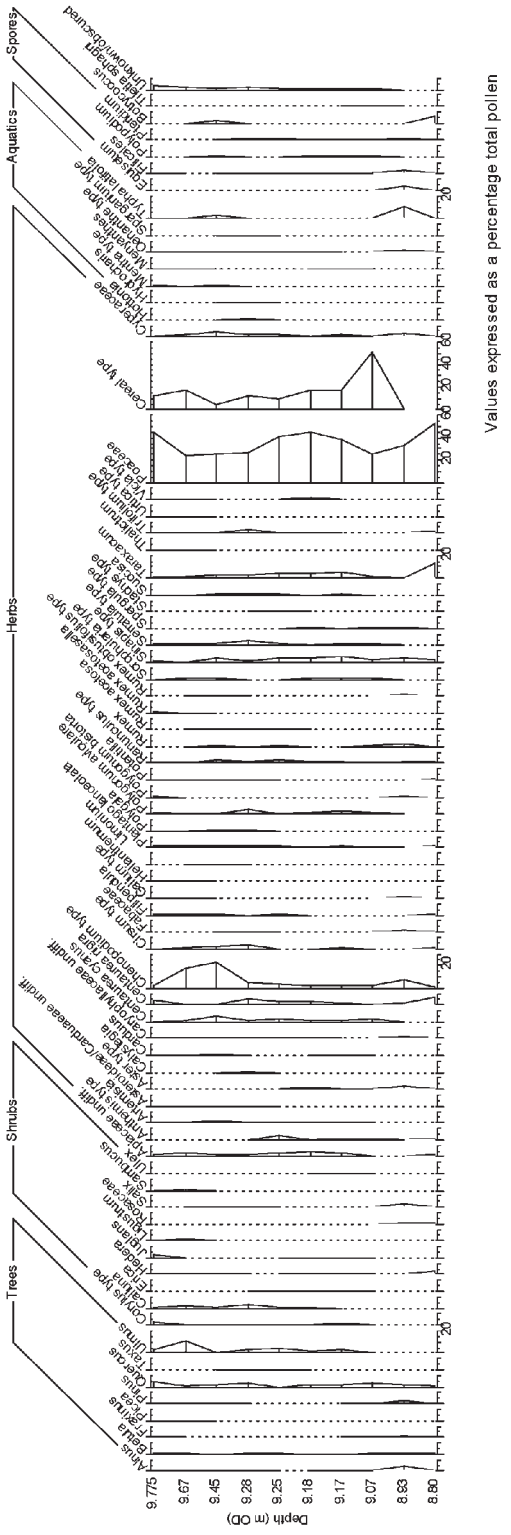


Fig. 113 Pollen diagram for column sample <302>

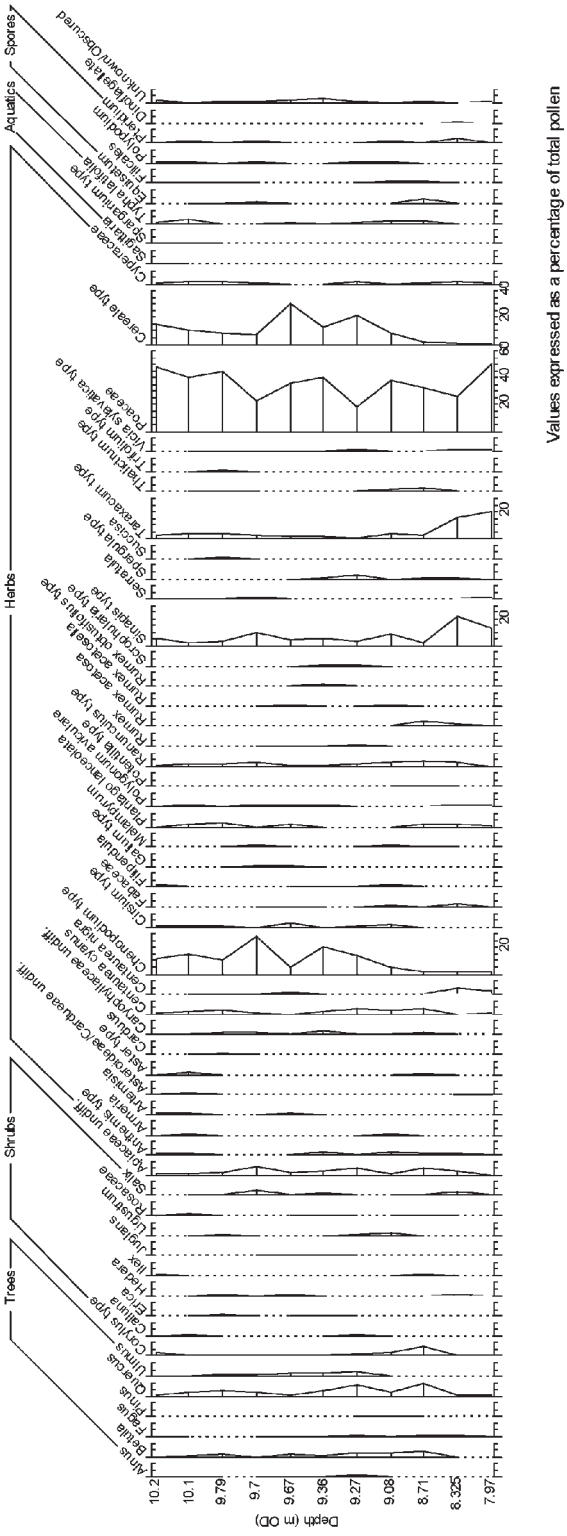


Fig. 114 Pollen diagram for column sample <317>

RÉSUMÉ

Agnès Shepherd

L'opération archéologique à Moor House a commencé voilà six ans par des analyses géotechniques de tranchées de reconnaissance en 1998, suivies d'une évaluation et plusieurs phases de fouilles entre 2000 et 2002, et a fini par une phase d'observation par passes mécaniques dont celle d'une connexion d'égout lors de son extraction en 2004. Pendant ce temps, malgré la survie limitée des vestiges archéologiques, mesurant approximativement un mètre d'épaisseur à l'intérieur de l'empreinte des bâtiments existants, une richesse d'informations a été récupérée provenant d'un secteur peu connu archéologiquement de la Cité de Londres. Le quartier en question formait la partie nord du fossé défensif de la ville et les terres au-delà, qui ont été un marais de la période romaine tardive jusqu'au XVIème siècle, connu sous le nom de Moor (lande) ou Moorfields dès la période médiévale.

La présence d'eau et notamment celle de la rivière Walbrook à l'est, va dominer l'histoire de ce quartier jusqu'au XVIIème siècle. Les éléments les plus anciens trouvés sur le site sont les restes de petits cours d'eau et canaux qui s'entrecroisaient jusqu'à leur embouchure dans la rivière principale Walbrook à l'est. L'envasement d'un des canaux nous suggère au moins une activité limitée de l'Âge de Fer tardif à la fin du Ier siècle ap J.-C.. La première activité faite par l'homme s'est passée pendant les trois premiers quarts du IIème siècle ap J.-C. et a consisté en l'exploitation fréquente du sable et du gravier et très probablement du brickearth (argile utilisée pour la fabrication des briques) qui à cette époque recouvraient le site. Ces activités ont contribué encore plus à la position basse et à la marginalisation du quartier. Un dépôt mince de brickearth s'est alors formé dans le secteur et a rempli et couvert les anciens puits de carrière en 160/170 ap J.-C.

Un certain nombre de vestiges ont été mis à jour dans le brickearth. Ceci semble représenter une période d'activité continue dans le secteur pendant le dernier tiers du IIème siècle ap J.-C. jusqu'en 200/220 ap J.-C.. L'activité en question consistait en l'exploitation de carrière, des fossés de drainage et une quantité de trous de poteaux et de piquets, qui associés aux surfaces de gravier et quelques restes structurels possibles, pourraient suggérer l'occupation du site. La date finale de cette phase d'activité est significative car elle coïncide avec la construction du mur d'enceinte de la Cité à la fin du IIème siècle ap J.-C.. La construction de ce mur a eu un effet dévastateur sur le secteur car il a empêché la rivière Walbrook de se déverser librement vers la Tamise et a mené à un accroissement des terres inondées en amont de la vallée du Walbrook. L'exploitation répandue de cette localité au siècle précédent au fur et à mesure que Londinium s'étendait, semble aussi avoir été un facteur contribuant à ce phénomène puisque le secteur s'est retrouvé encore plus bas qu'auparavant. Une série de mauvais hivers et de lourdes averses peut aussi avoir accéléré le processus.

Ensuite le secteur a été occupé par un marais et il semblerait que l'homme ait tenté d'utiliser le secteur pendant les prochaines 1400 années jusqu'à ce que la reconquête du marais ait été amorcée au XVIème siècle. Un dépôt de vase grise, couvrant entièrement le site pourrait être le résultat de bioturbation causé par l'action du passage répété d'animaux et des hommes à travers un environnement humide et par la croissance de plantes aquatiques et terrestres. Aux IIIème et IVème siècles, l'activité s'est limitée au creusement de fossés pour tenter de drainer et gérer ce terrain. L'existence du fossé élargi de la ville romaine du IVème siècle a probablement été démontrée par des découvertes d'objets exclusivement romains trouvés dans les strates les plus profondes remplissant ce fossé. Cependant ces pièces ont peut-être été enlevées par le remous et l'érosion de la rive nord du fossé.

Un assemblage d'os humains consistant en plus de cent pièces, presque exclusivement d'os longs et de fragments de crâne, a été mis à jour parmi toutes les phases d'activité du site du début de l'ère romaine au post-médiéval. La plus grande concentration a été récupérée dans le voisinage d'un long cours d'eau orienté est-ouest coulant le long de la partie nord du site. La datation au carbone d'un échantillon d'os provenant de trois phases différentes a confirmé une date romaine pour ces restes, qui avaient été déplacés par des activités postérieures sur le site. Bien qu'ils semblent représenter les restes déplacés du cimetière romain dont on connaissait déjà l'existence au nord-est du site, le contenu de l'assemblage suggère un niveau de rituels et représente peut-être les vestiges de placements délibérés dans les eaux sacrées de la rivière tributaire Walbrook de certaines parties du squelette humain, probablement après l'exposition et l'excarnation.

Aucun objets ou vestiges n'ont été trouvés datant de la période entre les Vème et XIème siècles ap J.-C. et il semblerait que de la fin de l'ère romaine à la période du haut moyen âge peu d'activité ait eu lieu dans Moorfields et que le marais ait conquis le secteur. La toute première activité médiévale a commencé vers l'ouest du site dans les XIIème et XIIIème siècles où on a trouvé des preuves de la fabrication du cuir consistant de mégisserie et de tannage. Ces activités ont été certifiées respectivement par la découverte d'un grand assemblage de bois de chevreuil pour l'une et d'une quantité de cornes de bétail pour l'autre. Plus tard dans les XIIIème et XIVème siècles, deux grands fossés de drainage alignés est-ouest ont été reliés en réseau par une série de fossés plus petits orientés nord-sud. Ce système avait été conçu pour régler le flux d'eau à travers le site et peut-être aussi pour protéger la première récolte d'herbe et de foin pour les animaux comme on peut rencontrer presque de la même façon dans les terres grasses et humides ou noue du sud-ouest de l'Angleterre.

L'édifice médiéval principal qui a déterminé en grande partie l'alignement des autres fossés sur le site était le fossé de la ville même. Celui-ci a été recreusé plusieurs fois entre le XIIIème et XVIème siècle et semblerait avoir été remblayé à la fin du XVIème siècle.

Les vestiges post-médiévaux sur le site étaient majoritairement de simples trous profonds tels

que des fosses, des puits et des fosses d'aisances, qui étaient associées aux bâtiments construits dans le secteur dès la fin du XVIème au XVIIème siècle. Cependant, un fossé important orienté nord-sud mis à jour le long de la périphérie ouest du site représente peut-être la circonscription entre la paroisse de st. Giles excepté Cripplegate et celle de St. Stephen's Coleman Street. De ce fossé a été retrouvé un objet rare : une ardoise gravée dépeignant une croix latine composée de svastikas et du « sceau de Salomon » qui pourrait avoir fait partie d'un reliquaire. Provenant d'un des puits garnis d'un baril, un grand assemblage de rejets et de pièces de four ont été mis à jour. Il représente les déchets d'un site de production de poteries dite « redware » qui n'avait jamais été enregistré auparavant. Ce four était peut-être situé dans le voisinage et était peut-être aussi associé à la maison d'un fabricant de pot mentionnée par Stow et possiblement lié au potier Richard Dyer, qui a été documenté comme travaillant à l'extérieur de Moor Gate dès 1568.

Ce volume commence par le contexte dans lequel les fouilles archéologiques se sont déroulées. Puis l'ordre archéologique est décrit en détail avec un chapitre détaillant l'activité romaine. Puis suit une série de rapports de spécialiste discutant l'importance de l'assemblage romain. Ensuite la séquence médiévale et post-médiévale est décrite, avec les assemblages de cette date rédigés par les spécialistes appropriés. Enfin, l'importance du site est discutée dans le dernier chapitre, mettant en évidence la signification d'un petit secteur peu connu et peu compris situé immédiatement à l'extérieur du mur de la Cité en bordure du marais de Moorfields.

ZUSAMMENFASSUNG

Sylvia Butler

Die archäologischen Untersuchungen von Moor House dauerten etwa sechs Jahre, angefangen mit der ursprünglichen Überwachung von geotechnischen Testgruben in 1998 bis zur Auswertung der Stätte und mehrerer Ausgrabungsphasen zwischen 2000 und 2002. Die Untersuchungen wurden letztendlich abgeschlossen von einer Beobachtungsphase, die in der Überwachung der Ausgrabung einer Abwasserverbindung in 2004 gipfelte. Während dieser Zeit wurde innerhalb der Grundfläche des bestehenden Gebäudes trotz des relativ geringen Überlebens von archäologischen Funden eine etwa einen Meter dick messende Fülle von Informationen über einen archäologisch wenig bekannten Teil der City of London enthüllt. Dieses Gebiet bestand aus dem nördlichen Teil des Stadt-Verteidigungsgrabens und dem Land unmittelbar dahinter, welches von der späteren römischen Periode bis zum 16. Jahrhundert von einem Sumpfland bedeckt wurde, das seit der mittelalterlichen Periode als das Moor oder Moorfields bekannt ist.

Die Geschichte der Stätte ist bis zum 17. Jahrhundert dominiert von der Präsenz von Wasser und insbesondere von dem Fluss Walbrook im Osten. Die ältesten Merkmale der Stätte waren die Überreste von kleinen Bächen und Kanälen, welche die Stätte durchzogen bis sie sich dem Hauptfluss Walbrook im Osten anschlossen. Die Ausfachung einer der Kanäle deutet auf zumindest limitierte Aktivitäten in der späten Eisenzeit bis zum Ende des 1. Jahrhunderts AD hin. Die frühesten, zivilisationsbedingten Aktivitäten erschienen während der ersten drei Viertel des 2. Jahrhunderts AD und bestanden aus einer großflächigen Gewinnung des Sandes und Kiesels und höchstwahrscheinlich des Ziegeltons, welcher die Stätte einst bedeckte. Dies trug weiter zu der tief liegenden und randgebietartigen Natur der Lokalität bei. Eine dünne Ablagerung von Ziegelton wurde dann in das Gebiet gespült und füllte und bedeckte die früheren Ausschachtungsgruben um 160 AD bis 170 AD.

Es wurden eine Reihe von Merkmalen in diesem Gebiet enthüllt, welche in den Ziegelton geschliffenen waren und eine Periode von andauernden Aktivitäten während der Zeit vom letzten Drittel des 2. Jahrhunderts AD bis zum Jahre 200/220 AD zu verkörpern schienen. Die Aktivitäten bestanden aus der Aushebung von Ausschachtungsgruben, Abwassergruben und einer Reihe von Stangen- und Pfostenlöchern, welche zusammen mit Kiesoberflächen und möglicherweise strukturellen Überresten eine Okkupation der Stätte andeuten könnten. Der Zeitpunkt der Beendigung dieser Phase der Aktivitäten ist bedeutungsvoll, da sie mit der Errichtung der Stadtmauer am Ende des 2. Jahrhunderts AD zusammentrifft. Die Errichtung der Stadtmauer hatte eine verheerende Auswirkung auf das Gebiet. Die Mauer verhinderte das freie Fließen des Flusses Walbrook in Richtung Themse und führte zu einer Anhäufung von mit Wasser gestautem Land in der Region des oberen Walbrook Tales. Die ausgedehnten Ausschachtungen an der Lokalität im vorherigen Jahrhundert während der Ausbreitung von Londinium würden ebenfalls ein beisteuernder Faktor der Wasserstauung gewesen sein, da das Gebiet zu diesem Zeitpunkt noch tief liegender gewesen wäre als zuvor. Eine Reihe von kalten Wintern und starken Regenfällen könnten den Prozess ebenfalls beschleunigt haben.

Danach wurde das Gebiet von einem Sumpf bedeckt und menschliche Versuche es zu nutzen wurden während der nächsten 1400 Jahre beobachtet bis dann die Rückgewinnung des Sumpfes im 16. Jahrhundert eingeleitet wurde. Eine graue Schlick Ablagerung, die die gesamte Stätte bedeckte, könnte ein Beiprodukt von Bioturbation gewesen sein, welche durch das Überqueren eines nassen Umfeldes von Tieren und Menschen und das

Wachsen von Wasserpflanzen und anderem pflanzlichen Leben verursacht worden war. Aktivitäten im 3. und 4. Jahrhundert waren beschränkt auf die Aushebungen von Graben in Versuchen das Land trockenzulegen und zu bewirtschaften. Mögliche Beweise des vergrößerten, römischen Stadtgrabens des 4. Jahrhunderts wurden von ausschließlich römischen Funden aus der tiefsten Aufschüttung des Stadtgrabens geliefert. Es ist jedoch möglich, dass diese Funde von der erodierenden nördlichen Kante des Schnittes herein gewaschen wurden.

Es wurde eine Ansammlung von menschlichen Knochen gefunden, die aus über 100 Teilen von fast ausschließlich langen Knochen und Schädelfragmenten bestand. Sie stammten aus allen Aktivitätsphasen der Stätte - von der frühen römischen bis zur nachmittelalterlichen Zeit. Die größte Konzentration wurde in der Umgebung eines großen Ost-West ausgerichteten Wasser-Features entdeckt, welches entlang des nördlichen Teiles der Stätte lief. Die Radiokarbonmethodische Datierung von Testknochen aus drei verschiedenen Phasen bestätigte eine römische Datierung für die Überreste, welche durch spätere Aktivitäten an der Stätte gestört worden waren. Obwohl die Knochen vielleicht die gestörten Überreste des römischen Friedhofes darstellen, welcher sich bekanntlich im Nordosten der Stätte befindet, deutet die Zusammenstellung der Sammlung auf einen Grad von ritueller Aktivität hin, und sie stellte möglicherweise innerhalb der heiligen Wasser der oberen Walbrook Nebenflüsse die Überreste von bestimmten, für rituelle Zwecke platzierten Teilen des menschlichen Skelettes dar, möglicherweise einer Exposition und Exkarnation folgend.

Es wurden keine Funde oder Merkmale enthüllt, die aus der Periode zwischen dem 5. und 11. Jahrhundert AD stammten, und es scheint, dass vom Ende der römischen Epoche bis zur frühen mittelalterlichen Periode wenig Aktivitäten in Moorfields stattfanden und der Sumpf sich zu diesem Zeitpunkt durchgesetzt hatte. Die älteste, mittelalterliche Aktivität fand gen Westen der Stätte im 12. und 13. Jahrhundert statt. Hier wurden Anzeichen der Lederherstellung in Form von Weißgerbung entdeckt, bezeugt durch die Bergung einer großen Ansammlung von Rehwild Geweihen. Es gab ebenfalls mögliche Anzeichen von Gerbung bezeugt durch die Entdeckung einer Reihe von Viehhorn Innenteilen. Später im 13. und 14. Jahrhundert wurden zwei große Ost-West ausgerichtete Abflussgraben mit einer Reihe von Nord-Süd ausgerichteten, kleineren Graben zu einem Netwerk verbunden. Dieses System wurde konstruiert um den die Stätte durchquerenden Wasserfluss zu regeln und könnte entworfen worden sein, um die frühe Saat von für Vieh vorgesehenes Gras und Heu auf die gleiche Weise zu schützen, wie dies die Flussauen des Südwestens von England tun.

Das mittelalterliche Hauptmerkmal, welches wiederum größtenteils die Ausrichtung der anderen Graben an der Stätte bestimmte, war der Stadtgraben. Es wurde offenbart, dass dieser vom 13. bis zum 16. Jahrhundert mehrfach wieder ausgegraben worden war und letztendlich am Ende des 16. Jahrhunderts aufgefüllt worden zu sein scheint.

Die nachmittelalterlichen Merkmale an der Stätte waren größtenteils beschränkt auf tief geschnittene Merkmale wie Gruben, Brunnen und Jauchegruben, welche mit den Gebäuden in Verbindung gebracht wurden, die vom späten 16. und 17. Jahrhundert gebaut wurden. Ein wesentlicher Nord-Süd Graben, welcher entlang der östlichen Peripherie freigelegt wurde, repräsentiert jedoch möglicherweise die Pfarrbezirk Grenze zwischen St Giles ohne Cripplegate und St Stephen's Coleman Street. In diesem Graben wurde der seltene Fund einer beschrifteten Schiefertafel gemacht, welche ein lateinisches Kreuz zeigte, das aus Hakenkreuzen und einem 'Solomons Kreuz' bestand und möglicherweise Teil eines Reliquiars darstellte. Eine große Ansammlung von Tonwarenabfällen und Brennofen Ausstattungen aus einem der Barrelbrunnen stellten den Abfall einer vormals unaufgezeichneten Redware Ton-Produktionsstätte dar. Der Brennofen befand sich möglicherweise in der näheren Umgebung und könnte in Verbindung gestanden haben mit dem von Stow erwähnten Haus eines Töpfers und möglicherweise mit dem Töpfer Richard Dyer, welcher dokumentiert wurde außerhalb Moor Gate ab dem Jahre 1568 gearbeitet zu haben.

Diese Ausgabe beginnt mit dem Hintergrund der archäologischen Ausgrabungen. Die archäologische Abfolge wird dann im Detail beschrieben mit einem Kapitel, das sich auf die römischen Aktivitäten konzentriert. Es folgen eine Reihe von speziellen Berichten, die die Wichtigkeit der römischen Funde behandelt. Danach wird die mittelalterliche und nachmittelalterliche Abfolge beschrieben und die Funde dieser Zeit von den entsprechenden Experten behandelt. Die Wichtigkeit der Ausgrabungsstätte wird dann in einem abschließenden Kapitel behandelt, welches die Bedeutung eines wenig verstandenen Gebietes unmittelbar außerhalb der Stadtmauer am Rand des Sumpfes von Moorfields hervorhebt.

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INDEX

Page numbers in italics refer to illustrations or tables.

The area around Moor House was always wet and uninviting, crossed by numerous small tributaries of the Walbrook; but once the wall surrounding the Roman City of Londinium was built conditions worsened, the flow of these streams was impeded and a marsh began to form, despite attempts at drainage. Wet conditions continued to dominate this area, known from the medieval period as the Moor or Moorfields, until the 16th century. This volume brings together the results of fieldwork conducted over six years, beyond the City wall on the edge of Moorfields.

PCA

PRE-CONSTRUCT ARCHAEOLOGY

MONOGRAPH 6

Situated adjacent to the extensive Roman northern cemetery, the site presents evidence of alternative mortuary rites. The recovery of human long bones and skulls from within the numerous channels crossing the site hint at a continuation of pre-Roman traditions: the placing of selected skeletal elements into water, following exposure and excarnation.

Several bone skates were recovered from medieval features; it is documented that in the harsh winters of the late 12th century the flooded and frozen marshes of Moorfields were used as a skating rink for local youths. This marginal area was used a dumping ground for waste, and the location of numerous foul-smelling industries such as tanning and tawing, and tenter grounds. A network of drainage channels constructed in the 13th and 14th centuries reflect attempts to manage the flooding and create watermeadows.

Ultimately attempts to tame the marsh succeeded and the area became increasingly populated. A large assemblage of wasters and kiln furniture from the backfill of a barrel well provide the first material evidence of a late 16th and early 17th century redware pottery production site.

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