

EXCAVATIONS AT ISLAND SITE, FINSBURY PAVEMENT, LONDON EC2

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SUMMARY

This project comprised a number of phases of evaluation and excavation that took place both on and off site. The process started with a desktop survey of the potential archaeological survival allied to an initial testpit survey. This phase led to excavation of the deposits on Imperial House, Dominion Street, and the simultaneous evaluation of Dominion Buildings, South Place. The final phase of work on the site was the excavation of Dominion Buildings and Verum House, 60–72 Finsbury Pavement, during the enabling works phase of the main construction programme.

The site lies within the confines of an area that was known as Moorfields marsh during the medieval period: an area to the north of the City with poor drainage, subject to inundation and used for the disposal of waste from the City. These conditions have led to remarkable preservation of artefacts from industrial processes and domestic refuse but little in situ evidence for the industries themselves. The Finsbury Island Project has confirmed previous excavation results in the marsh area with large quantities of well preserved finds, including exotic imported ceramics, and in addition it has provided extensive evidence for the quarrying of the brickearth and the production of bricks probably in part for the documented rebuilding of the City wall in 1477.

INTRODUCTION

The Finsbury Island Site lies on the east side of Finsbury Pavement, the northern extension of Moorgate, and is bounded by Lackington Street, Dominion Street and South Place. The centre of the site is at National Grid Reference TQ 3281

8180. It is located outside the northern boundary of the City in the London Borough of Islington in an area that was formerly part of Moorfields, a large waterlogged area which in comparison to other areas of the City remained undeveloped until relatively recently (Fig 1).

Over a three year period (1992–94) the Museum of London Archaeology Service (MoLAS) carried out a series of evaluations and excavations on the site in advance of redevelopment. Now that this has been completed the 11m-deep basement has removed all remaining archaeological deposits.

In October 1992 the developer, London and Manchester Assurance Company Limited, commissioned an Archaeological Impact Assessment with the aim of defining any potential archaeological implications of the development and to make recommendations to ensure that any buried remains were encompassed within the scheme (Malcolm 1992). Three separate buildings occupied the site at the time of the assessment covering approximately 2850 sq m with basement slabs varying in height from 12.49m to 9.29m OD. This initial assessment suggested that up to 1900 cu m of archaeological deposits might survive and that invasive measures would be needed to define a programme of phased excavation and recording work.

The first phase of site work took place in November–December 1992, with seven 2m-square testpits dug by mechanical excavator on Imperial House, following demolition, and a single pit of smaller size dug in the underground

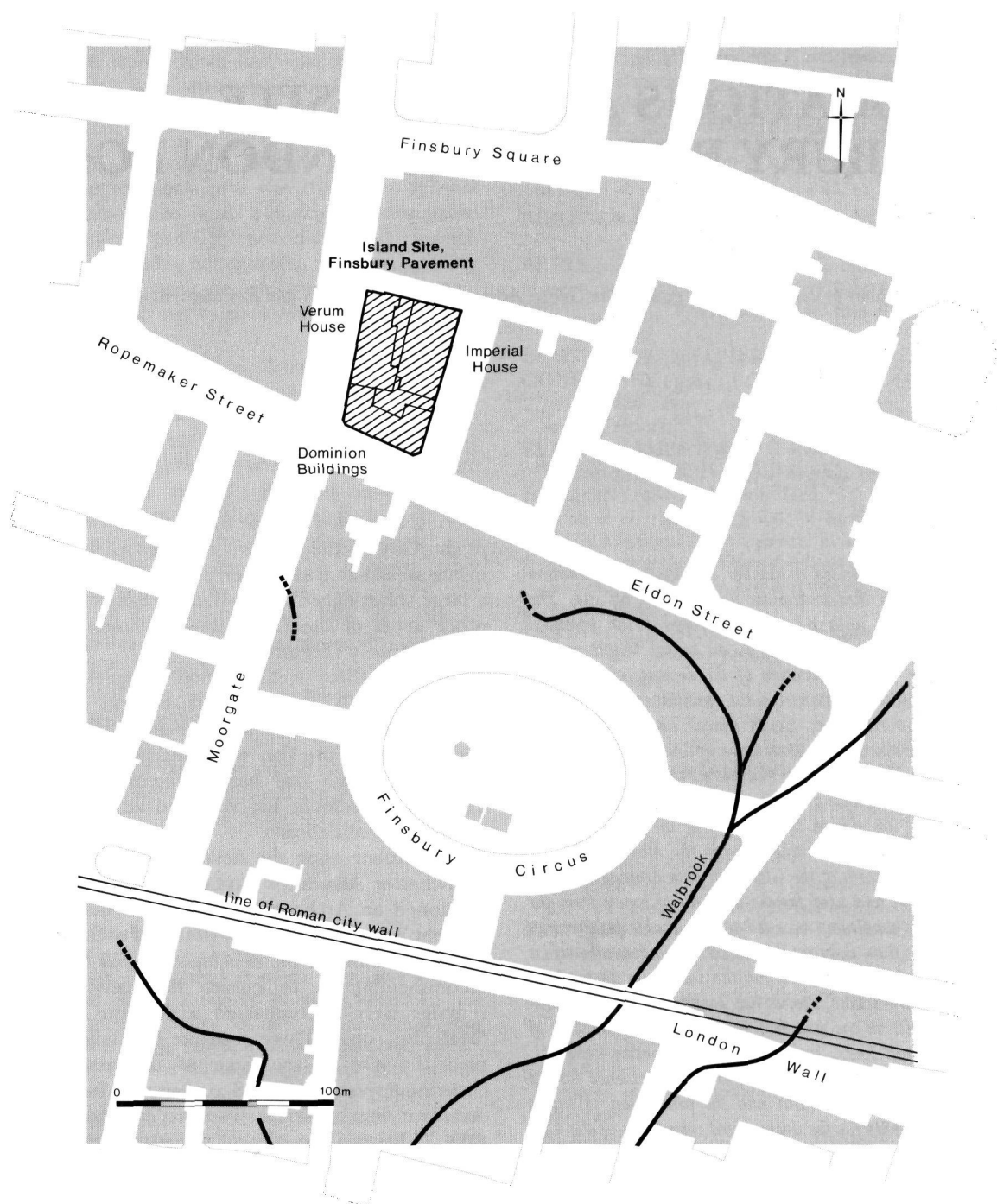


Fig 1. The location of the site

car park of Dominion Buildings. The Imperial House pits confirmed that the 1933 development had truncated most of the archaeological deposits but that a few features survived within the

truncated brickearth; horizons with greater and lesser sand contents within this deposit indicated that the site had prehistoric potential. The testpit in Dominion Buildings produced evidence of

prehistoric, Roman, Saxo-Norman and later activity, but no indication of deep marsh deposits. From this work it was possible to refine the potential volume of archaeological material and to design the next phase of work which consisted of a further five testpits at Dominion Buildings and excavation of the surviving deposits on Imperial House. This work took place in May and June 1993, and ended with Imperial house being handed over for redevelopment, all archaeological deposits having been excavated and recorded. With this phase of work at an end archaeological work halted, thus allowing the two remaining buildings to be demolished and some of the temporary works to be emplaced which required only a minimum of archaeological monitoring. The final phase of site work began in March 1994, and lasted for a total of eight weeks during which excavation took place on Dominion Buildings and on as much of Verum House as was practicable. For the remainder of 1994 work proceeded on the research archives which are now complete and available for consultation at MoLAS. This paper is only a survey of artefacts and environmental material. It is hoped that further research on the material may be undertaken in future (Fig 2).

THE ARCHAEOLOGY OF THE SITE

The site sequence has been described in terms of succeeding episodes of land use, sub-divided into phases where appropriate. These episodes begin with Open Area 1, which describes the natural topography and post-glacial landscape, and finishes with Open Area 5 which includes all the later post-medieval activity up to the present day.

Open Area 1 (Natural Topography)

The site lies on the second terrace of the gravels in the floodplain of the River Thames and in the northern reaches of the valley of the River Walbrook. Surface topography of the site shows a drop of 2.21m from north to south, a fall of 32.5mm per metre. To the east of Dominion Street the ground slopes down to the Walbrook but across the site itself there is a slight slope to the west. Site work and boreholes indicate that below the archaeological deposits lay a stiff brown sandy-clay (brickearth) with stones, varying to a compact light orange-brown sandy-silt with

some clay below, between 1.2m and 1.5m thick and located below 11.02m OD (Borehole Report 1970). The deposit included pale brown mineralisation streaks and occasional bands of fine quartzite pebbles that seemed to define horizons within the stratum. Five 2m-square holes were excavated through this material to determine whether any evidence for prehistoric activity survived within its matrix. No such evidence was found despite the recovery of a single proximal blade flake from the first testpit in Dominion Buildings. Beneath the brickearth was a series of sand and gravel strata, 1m to 1.7m thick, forming the post-glacial river terrace deposits at between 10.04m and 8.64m OD. These, in turn, sealed a thin band of firm brown sandy-clay with some stones over grey London clay. The brown clay is probably the weathered upper surface of the London Clay.

Open Area 2 (Roman to 15th century)

This period of land use, divided into four phases of activity, represents a period of time from the Roman occupation to the middle of the 15th century. During this period various activities were recorded on the site but it remained an area of waste, or marginal, land beyond the usual inhabited area of the City. For much of the medieval period the main topographic feature was the waterlogged terrain variously known as The Moor or Moorfields Marsh. However, this has not survived to any great extent in the archaeological record; its presence is indicated more by indirect influences on the deposits. The period of time for the duration of Open Area 2 has been sub-divided by using ceramic dating and the stratigraphic analysis of the types of feature recorded. In many cases this dating is absent, so phasing has relied purely on stratigraphic interpretation.

After the construction of the Roman city wall, in AD 190–225, the free flow of the Walbrook was impaired and it began to back-up to the north of the wall (Merrifield 1983, 160). Although the area had been little used during the 1st and 2nd centuries a few burials had been interred, and an east-west road constructed south of the site by the mid 3rd century (Askew 1988). Following this a further phase of Roman burials formed part of an extra-mural cemetery to the west of Bishopsgate (*ibid*). A single inhumation was recovered from the area of Verum house

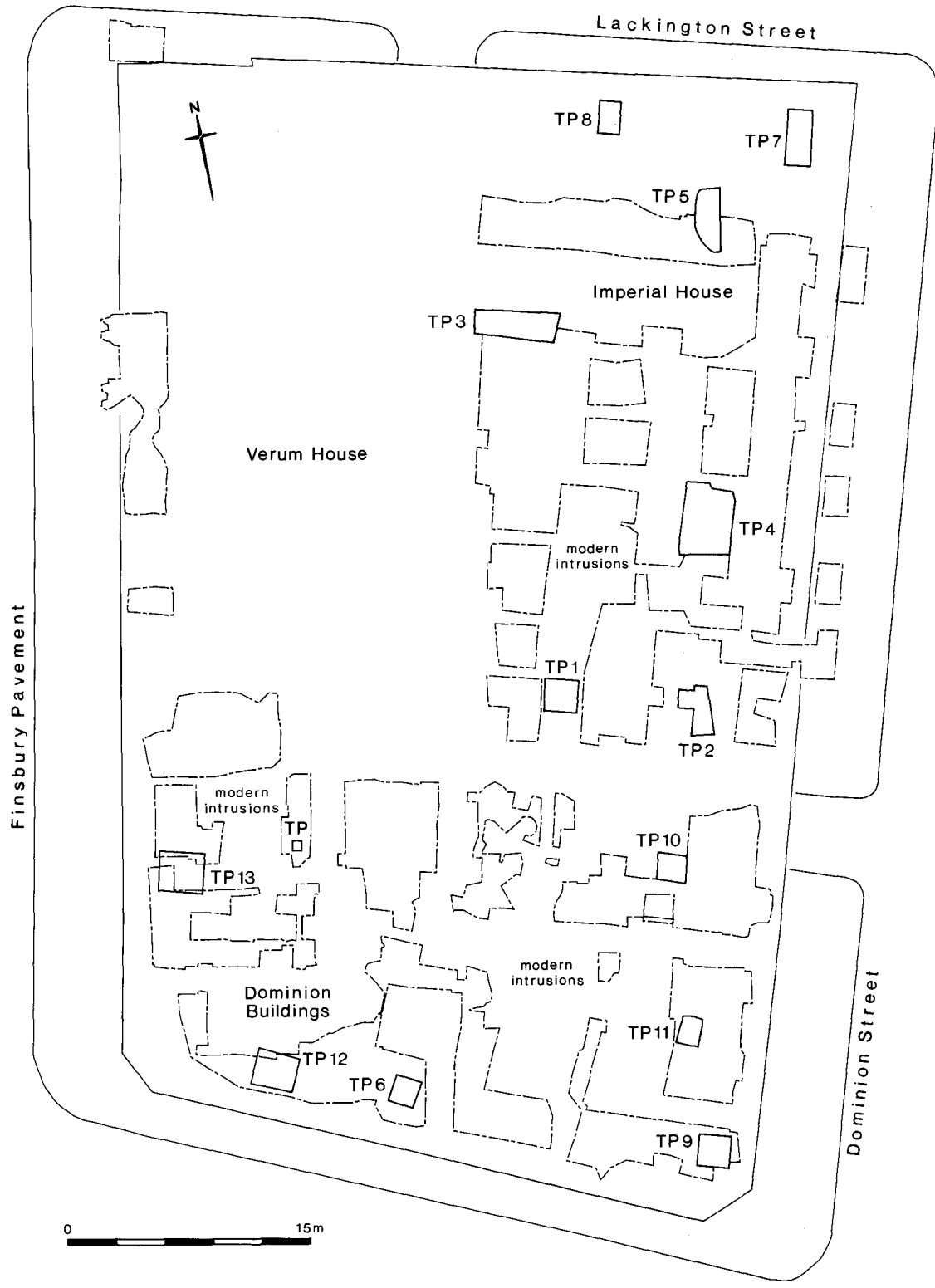


Fig 2. Limits of archaeological investigation

prior to its construction in 1972, but the site appears to have been beyond the main cemetery area. Only abraded Roman pottery was found redeposited in a residual context. By the 4th century the area seems to have been largely abandoned and was to remain so for the next 600 years, allowing a seasonal marsh to develop. This phase was not well represented on the site, which seems to have been on an area of slightly elevated ground, not permanently flooded but possibly subject to periodic inundation. Despite the fact that it was usually free of water, access to the site area must have been difficult, which might explain the paucity of archaeological evidence before the Norman Conquest. The first documented record is in a charter of 1068 which says 'a running water to water into the said city from the same More' (Lambert 1920, 143).

The first phase of activity identified on the site encompasses the period up to the end of the 12th century and consisted of a number of features which had been cut into the brickearth. Very little dating evidence was retrieved from this phase but all the recorded features had been sealed by the dumping associated with phase 2. They seem to represent small-scale usage of the site during the period with some drainage works taking place and occasional minor structural features, such as fences. The most notable feature was a north-south aligned ditch, that extended for at least 1.6m, with steep sloping sides and a rounded base. The fill was a dense, saturated orange-brown silty-clay with charcoal and oyster shell inclusions together with a single sherd of Early Medieval Sandy ware (AD 900–1150). This ditch may have been an early attempt at draining the marsh which built up in the post-Roman period.

At some time following the end of the 12th century there was a change with at least 0.3m of brickearth dumped over large parts of the site. In general this material raised the ground surface to about 11.20m OD with more material backfilled into hollows and less on areas of higher ground. In several places distinct horizons within the deposit were noted. These were probably a result of the upper surface suffering weathering with the upper 800mm showing evidence of root disturbance. In 1211 the City Ditch was excavated for the dual purpose of defending the City and draining the marsh (Thornbury 1887, 196). The ditch was 200 feet wide and must have produced huge quantities of brickearth. It is likely, therefore, that the redeposited brickearth

on the site dates to this period. Little pottery was recovered from this phase; only a few sherds of London-type, Kingston and South Hertfordshire grey wares were found giving a date range of 1150–1350. In the period following the dumping of the brickearth a number of root fragments and root stock disturbance, from large bushes or trees, were recorded. The remains were too fragmentary to identify but suggest that the brickearth dumping may have reduced the flooding.

After the middle of the 13th century the site was dry enough and sufficiently accessible to be used for horticultural purposes (phase 3). This is evidenced by 13 east-west aligned parallel features or slots cut into the brickearth dumps (Fig 3). The majority had been truncated at both ends but survived for a length of 4m with indications of a length of over 9.50m. They varied slightly in width from 0.50m to 0.80m but this was mostly due to truncation from above which also affected their depth which was up to 0.30m with the bases at between 9.94m and 10.10m OD. The slots had distinct profiles with very steep, almost vertical, edges to the south and a much more gradual slope to the north. In two cases the features appeared to have rounded butt-ends to the east but this may have been due to the fact that there had been more truncation in this area. All the slots had similar fills composed of a compact grey-brown sandy clay-silt which became darker towards the base and contained occasional animal bone and pottery inclusions with charcoal and ceramic building material flecks. In addition the sides of the cuts were streaked with disturbance from roots or insects within the feature.

These features were almost certainly bedding trenches for the deliberate cultivation and exploitation of a crop. The exact crop cannot be established on the basis of the trench profiles alone but a number of possibilities exist. It may have been the hop plant (*Humulus lupulus*) used in the production of beer; however, this is not attested until the 16th century as the first plants for commercial exploitation were imported from Holland in 1520. However, the plant was native to Britain and may have been used on a small scale before this (De Rougemont 1989, 71). Hops were imported during the 15th century from Holland; more than 170 sacks arrived at London in 1480–1 according to Petty Customs Accounts (Cobb 1990, 21–208). The development of oast houses does not begin until the 16th century with

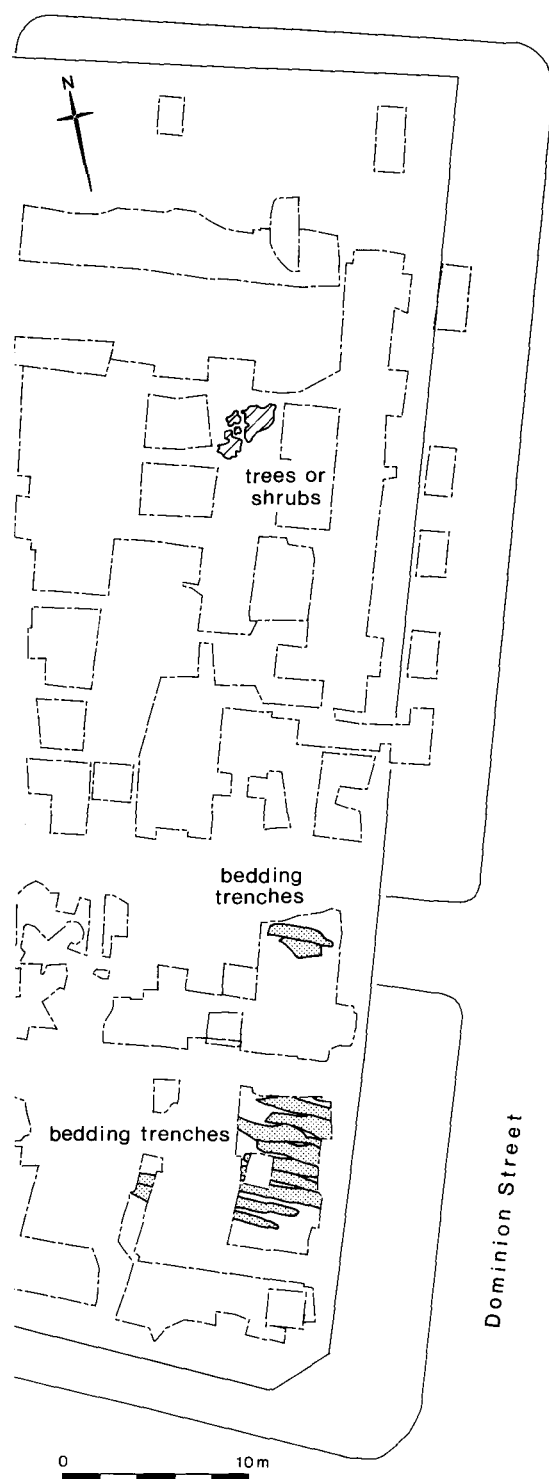


Fig 3. Open Area 2

small-scale use of maltings for beer production before this date. An alternative crop may have been vines (*Vitis vinifera*); but the bedding trenches may have been too close together to allow these plants to grow successfully and climatic conditions may have been too harsh. The third possibility is a root vegetable such as parsnip (*Pastinaca sativa*) or turnip (*Brassica rapa*) but the trenches appear to have been too large, particularly when the possible truncation is taken into account. Definite attribution of the bedding trenches therefore remains unclear but they appear to have been in a dry environment since the raising of the ground surface had largely removed the threat of frequent flooding. Sherds of South Hertfordshire grey ware, London-type and Late Rouen wares were retrieved giving a date range of 1250–1350. Interpretation of the stratigraphy suggests that they are from contexts dating from 1250–1450 with reuse of the trenches resulting in the disturbance of earlier deposits. All the pottery from the slots is likely to be residual as only the latest fill is represented. The absence of frequent flooding in this part of 'the Moor' runs contrary to most of the documentary references which continually imply the sodden nature of the area: an entry in the Mayor's Court Rolls of 1301 describes a dispute over a passenger boat carrying six persons which was operating on the marsh (Thomas 1924, 113–14).

Partially overlapping the period when the bedding trenches were in use was phase 4 (late 14th–mid 15th century). This consisted largely of further dumps of brickearth that eventually sealed the bedding trenches. The main constituent of these dumps was a mid grey-brown clay-silt with charcoal, bone, snail and ceramic inclusions. A number of these dumps contained ceramic building material as contamination from the next episode of activity, probably incorporated into the phase 4 dumps during very wet conditions. The pottery from the dumps was a mixture of Kingston-type ware, London-type ware, South Hertfordshire grey ware and Spanish Red Micaceous wares together with quantities of abraded Roman pottery suggesting that much of the material is residual and later than the 13th to 14th-century date indicated. The dumps were in general similar to those of phase 2 which may indicate that they were part of a necessary reclamation measure taken in response to a rise in the water table during the 14th or 15th centuries. This interpretation is confirmed by the presence of large numbers of wetland plants

represented by rush (*Juncus* spp.) and sedge (*Carex* spp.) seeds from the dumps together with seeds of disturbed ground/wasteland plants including docks (*Rumex* spp.) and elder (*Sambucus nigra*) indicating the marginal aspects of the land. The dumps were associated with a number of cut features, including one group of 11 stake-holes which contained Roman pottery and a single Neolithic proximal blade flake, all of which were redeposited. A small number of slightly larger post-holes were also identified but truncation by modern concrete intrusions prevents a clearer understanding of their form or function. They have been interpreted as the remains of fences or single posts possibly for tying up boats.

The increase in the activity taking place on the site at the end of the 14th and into the 15th century may be linked to a series of documented events taking place in the City. In 1365 an ordinance of the Pelterers' guild laid down that leather-workers should live and work in the Walbrook area to the north of the City (Riley 1868, 614–16). From this period onwards there was increased usage of the area so that by 1411 the mayor ordered rubbish to be cleared from it and drainage ditches to be dug. He also inspected the Moor and made an ordinance that the trees and hedges should be removed and that no one should establish gardens there in future (Sharpe 1909, 101). The Moor was divided into small parcels of land in 1415, by order of the Common Council, and the Moorgate built into the City wall to provide access (Riley 1868, 614–16). This increase in activity in Moorfields is linked, therefore, to the expansion of the City and the need for land for building, industrial space and possibly for market gardening.

Open Area 3 (late 15th-mid 16th centuries)

Land use during this period comprised a single phase of activity apparently across the whole of the site. A series of large brickearth quarries was dug and the material processed into bricks (Fig 4). This had a major effect on both the topography and the earlier archaeological features. The actual processing seems to have taken place off the site as no evidence for clamp kilns was found but both the preparation of the materials and the discarding of wasters took place on the site. The brickworkings had a detrimental effect on the reclamation of the area undermining the previous relatively stable con-

ditions and causing resurgence of severe flooding with large pools of standing water. There is evidence that the workings extended over a considerable area, having been found on Ling House (Mackie 1988) 15m to the east. They probably made the whole area uninhabitable after the brickmakers moved on to exploit other brickearth deposits.

At the base of the brick-pits a large number of distorted brick fragments were found pressed into material below and these fragments constituted up to 40% of the volume of each context. The profiles of the features were relatively shallow, rarely being more than 0.5m deep. Their bases varied in character depending on their depth but were usually irregular in shape, having both concave and convex aspects. It appears that the deeper cuts penetrated the drier layers of brickearth to a depth where accumulated water would not drain away and that this resulted in the bases of the features becoming very soft and slurry-like. This seems to have had two effects. First it allowed any brick waste thrown into the pits to sink into the deposit below; secondly at the base of some pits there is evidence for trampling, possibly by cattle, judging by the size and shape of the imprints. This trampling has been preserved when the water in the pits later evaporated and the brickearth dried, fossilizing the imprints. It is not clear why cattle were present around the pits; it is probable that the area was used for grazing once the brick makers had moved on. Several cows are shown in Upper Moorfields on the copperplate map of the mid 16th century.

In overall size the features were between 13m and 15m across and sub-circular in plan, with a number of individual pits only 3m across. All of the larger pits, of which at least four have been identified, dated from between 1450 and 1550 with the smaller pits forming a later group that continued in use into the 17th century.

The features had all been dug to extract brickearth for brick manufacturing, a process which is attested in Moorfields dating back to at least 1477, when Stow says 'Ralph Joceline mayor, for repairing of the wall of the City, caused the said More to be searched for clay and brick to be burnt there, *etc*, by which means this Field was made worse for a long time' (Strype 1755, 54). The brickearth was probably fired in large clamps, (some of which may have been identified by Lambert around Finsbury Circus and beside Finsbury Pavement (Lambert 1920,

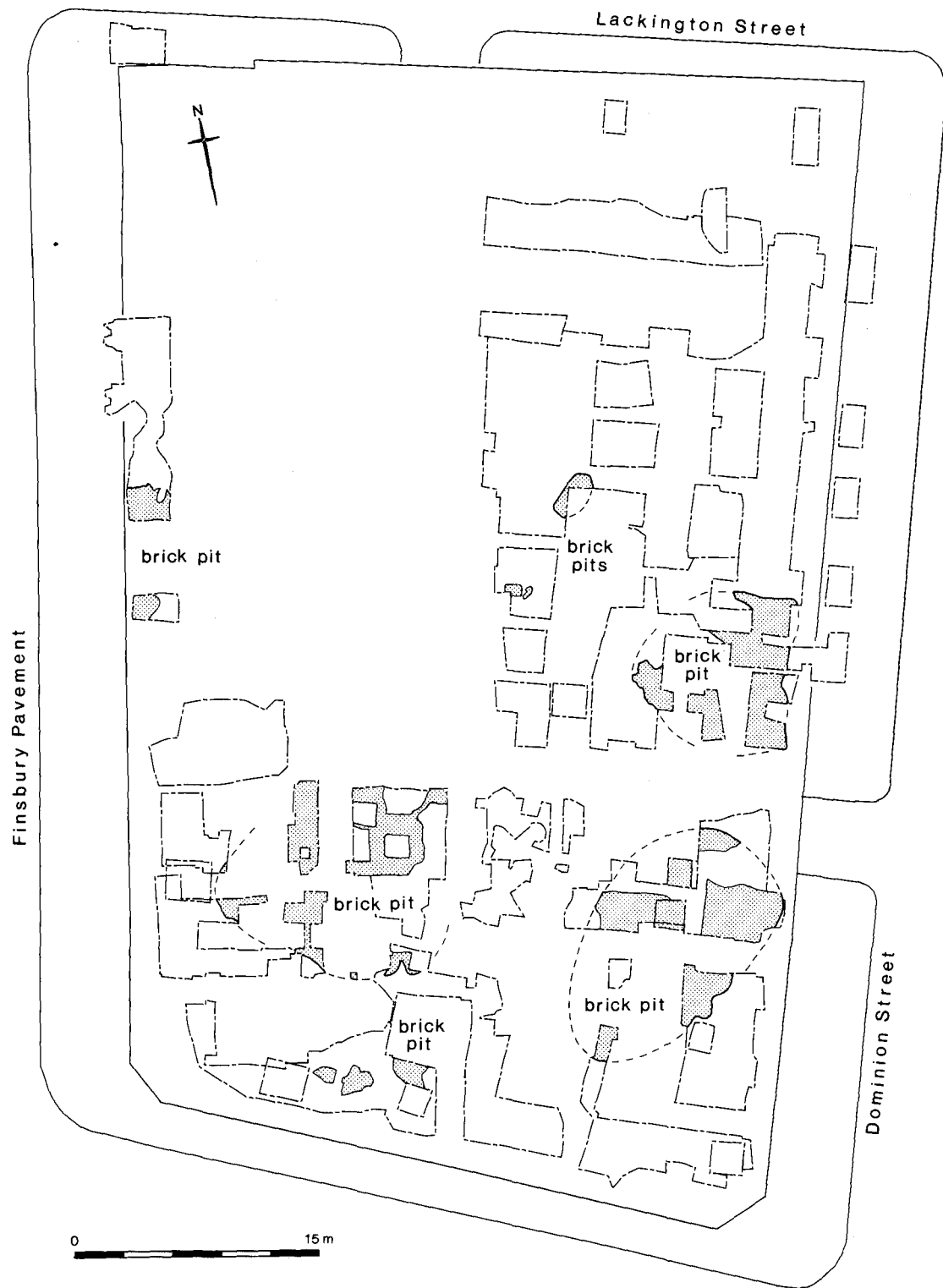


Fig 4. Open Area 3

102). Evidence for clamp kilns was not recorded during the current excavations but the fact that distorted, under- and over-fired, wasters from the process were thrown back into the extraction pits suggests that the activity was taking place very close to the site. The problem of access in a periodically flooded area suggests that the clamps may have been adjacent to the road from Moorgate (now also Finsbury Pavement), to the east. This would permit the finished bricks to be loaded onto wagons for transport to the construction site, the City wall.

The recorded sequence suggests that the brick manufacturing took place as a distinct activity which was completed before any of the succeeding reclamation dumps were deposited. This may indicate that the brick-makers followed a migratory pattern, moving into an area, digging the brickearth over a period of possibly a single year per pit then moving on when an area was worked-out. This had a disastrous effect on the local environment by creating large pools of standing water, some of which probably interconnected. The bricks manufactured on or near the site appear to have been of two main clay fabric types of which the less sandy version appears to have been more common. A third type, which is not well represented, consists entirely of well- or over-fired bricks with a high percentage of calcium carbonate inclusions. It is not clear whether these were made from a separate brickearth or are a result of changes taking place in the clay during firing.

In addition to the brick-pits a number of other features seem to have been dug in association. At least two of the pits have a number of small posts or stakes erected in the base, probably part of some structure used during the digging. Barrow-runs or shovelling platforms may have been in use or walkways may have been constructed across areas already worked out to allow more dumping to take place. One feature close to the western edge of the site consisted of a cut at least 2m by 1.5m in area and more than 0.6m deep. Its base contained a large quantity of charcoal and a small quantity of brick waste. There were also indications that the sides of the feature had been stained or scorched, suggesting that this may have been part of one of the clamps used in the firing process. These were temporary structures of green bricks stacked over channels of fuel on a level surface (Brunskill 1990, 27). Above this between 30,000 and 45,000 bricks were stacked up to 5m high interspersed with ash and covered with green bricks (*ibid*).

The clamp would then be fired and dismantled over a two to three week period. Three types of bricks would usually be produced by this method: sammel bricks at the edges, which were under-fired; over-fired examples in the centre; and usable bricks in the remainder of the clamp (*ibid* 28). The majority of the bricks discarded on the site fall into the first two categories. A brick recovered from one of the testpits was of particular interest, being made of a local brickearth with an indented upper border. It was incomplete but had a breadth of 134mm and a thickness of 63mm. This makes it one of the broadest bricks ever found in London. Bricks of a similar fabric, though smaller, were found at 2-7 Dukes Place in 1977, in an arched foundation that was part of the 15th-century reinforcement of the City wall also attributed to 1477 (Tyler 1990).

In addition to the bricks a large number of tiles was recovered. These have been assessed against an established series of fabric types. The majority were peg roofing tiles with the largest number dating to the late medieval and post medieval period. Only eight fragments of ridge tile were recovered from the site, most of which are of the same fabric as the peg tiles, implying that both were made at the same tileries. Three ridge tiles were in an unusual brown to orange sandy fabric with frequent quartz inclusions up to 0.5mm in size, and small (0.05mm) black iron oxide and occasional silty inclusions. These tiles all have a decorative white slip pattern, a very rare feature in London.

The pottery from the brick pits dates mainly to the late 15th century, although some is from the 16th century. A few contexts produced pottery dating to the later part of 16th century which had slumped into the features from above. The ceramic groups are dominated by Rhenish stonewares, such as a Langerwehe jug with a collared rim (Fig 6 No. 4), and there is a consistent presence of Raeren drinking jug fragments. Other sherds worthy of mention include a Tudor Green ware, compartmented, condiment dish. Some of this material is likely to have been residual as it sank into the mire from the reclamation dumps deposited on Open Area 4.

Open Area 4 (16th century to c.1610)

After the depredations of the brick-workers the area reverted to a worse condition than at any

time in the previous two hundred years. Successive attempts were made to clear the area, beginning in 1498 when the northern part was given over to archery practice (Strype 1755, 380). A number of archers are to be seen on the copperplate map practising at 'twelve score' (Holmes 1963, 27) the main competition held on St Bartholomew's Day in August (Strype 1755, 95). Clearance of rubbish must have been somewhat easier in Upper Moorfields but closer to the City it seems that the brickearth pits had removed much of the ground surface and early in the 16th century serious reclamation attempts began with orders by the mayor to prevent the dumping of rubbish in both 1512 (Strype 1755, 380) and 1526 (CLRO, Repertory of the Court of Aldermen 8, f.230v).

Judging by the evidence from the site both these orders were ignored, as rubbish continued to accumulate throughout the period. A large number of distinct spreads of material was dumped into the open brick pits, and over the unquarried areas, to cover the site to a depth of at least 0.3m. In some places, at the edge of the site, where the dumps had not been truncated there were up to 4m of deposits from the 16th to late 18th centuries (see Open Area 5). Across most of the site, however, only the material from the 16th century and residual artefacts from earlier centuries survived. The majority of the material was waterlogged, or moist, and all of it appears to have been waterlogged in the past. The layer covered virtually all the site to a varying degree and had been backfilled into the brickearth quarries to form a more level surface at between 11.08m and 10.50m OD. This level had been truncated by the construction of the modern buildings which had basements at 11.92m and 11.26m OD (in Dominion Buildings). Many of the dumps could be recognised as being of similar character across wide areas of the site, indicating that there was a systematic approach to the dumping. It also suggests that large quantities of material were being transported from specific locations to be dumped (for this reason the material may be considered as a valid group for analysis).

A number of trades and industries have been identified from the dumps. Whilst the presence of bell founding waste does not necessarily indicate that the process was taking place close to the site the dumps containing this material can probably be ascribed to a location nearby. An enormous quantity of finds, both ceramic and

non-ceramic, together with animal bone and plant remains from bulk soil samples were recovered from the dumps, which it has not been possible to analyse fully. The dumps do, however, confirm previous interpretations that Moorfields was used as the City rubbish dump in the 15th to 17th centuries. In this role the area replaced the waterfront which had previously been extended by dumping rubbish behind revetments.

Accessioned finds

The range of finds and quality of the material recovered means that it is possible to build up a detailed picture of some aspects of life in 16th-century London and also acts as a check against which to assess previous groups. Particularly well represented are a number of industrial processes such as copper-, iron- and lead-working, together with pinmaking and the cloth trade. The metal, stone, leather and textile finds from the 16th and early 17th-century marsh and infill deposits are a particularly useful assemblage of a finds group recovered under modern conditions which can be set beside those retrieved from similar deposits in the Moorfields area investigated earlier this century which tended to emphasise selected, quality items (Norman & Reader 1912, 259-344; Lambert 1920, 76). Leather especially, and some metalwork were highlighted in these publications, though over the years more attention has been focused on the unique assemblages of textiles recovered at that time. The newly found items now make it possible to see just how highly selective were the textile fragments that have come to the Museum of London from earlier investigations, with a clear preference for complete or nearly complete garments (stockings, vests and sleeves) but virtually none of the ragged scraps which are prevalent from the fieldwork of the 1990s. The same is true for leatherwork, with near-complete shoes in previously published assemblages but mainly scraps among the recently recovered finds. Metalwork, too, has benefited from more comprehensive retrieval, with smaller items such as coins and seals being far better represented than among the relatively large, generally more complete and decorative objects (notably spurs) published in 1920 (Lambert 1920, 99).

Several finds from the site can be singled out for attention, as their significance is already evident, and others can help expand our

knowledge about some of the industrial processes and consumer goods present in Tudor London. There is a full catalogue of the finds in the research archive but only space in this report to mention a few. The numbers refer to accessions within the catalogue.

Lead seals were put on newly woven cloth to show that the quality was good enough for the market, and several of these control marks were found during the investigations. It is not clear at present whether or not the seals relate to textile fragments from the same group of deposits. An unused seal No. <212/3> must have come from a place where cloth was being processed or examined by officials, perhaps one of the extramural tenter grounds (Egan 1994, 119 & 171). Very large numbers of seeds belonging to Fuller's teasel (*Dipsacus sativus*) were recovered from several contexts in the same group which suggests that they represent residues from activities associated with the textile industry. The seed head of Fuller's teasel was used for raising the nap on woollen cloth. A teasel plantation for the cloth trade is recorded as being located in the area used for the Artillery ground in the 17th century, close to Moorfields (Schofield 1993), while the copperplate engraving of 1559 and the Agas Map of 1570 show tenter yards to the east and west of Moorfields. Thus, the Moor would have provided a convenient area for the disposal of refuse from these activities.

The other cloth seals from the site are all stamped, No. <215> and others with the arms of Tudor England and a portcullis. No. <215> is a London seal for the alnage (textile inspection by Crown officers) without which no cloth could legally be sold, and No. <216> has a trade mark including the initials WF, perhaps those of a weaver or clothier. The London seal, together with No. <217> are the first of this particular style of seal discovered, even though somewhat similar London seals from the reign of Elizabeth are known across the country (cf Egan 1994, 40-1, 61 & 170 fig 19). The deposits also produced part of a French cloth seal from the town of Arras, perhaps originally attached to one of the famous imported hangings. The stamp includes three rats, a pun on the place-name that used to be included in the town's civic heraldry. On the back of the seal there is also an imprint from the textile to which it was attached, so it is possible to see the kind of fabric traded across the Channel. These unusual finds bring out something of the complicated trade in textiles,

the fastest-growing component of England's booming mid 16th-century mercantile economy, and a significant factor in the establishment of London's pre-eminent position in the nation's expanding trade.

Seeds of hemp (*Cannabis sativa*) were found in relatively large numbers. This plant was used for its fibres in the textile industry (Grant 1988, 122) and oil may have been extracted from the seeds. Small numbers of flax (*Linum usitatissimum*) seeds were also found. Nettle (*Urtica dioica*) was well represented in the samples; it was also exploited for its fibres although the nettle is an exceptionally high seed producing plant and a very common weed of wasteground. Seeds of dyers' rocket (*Reseda luteola*), a plant used in the dyeing industry, were also recovered in moderate quantities; although this is a relatively common waste ground weed. Amongst the finds associated with the textile industry is a spindle whorl of stoneware No. <929> imported from Raeren in Germany, a place that seems to have had a monopoly on the English market for these simple spinning tools during the 16th century (Moorhouse & Hurst 1981; Egan & Moir in prep).

A number of textile pieces appear to have been rough off-cuts, some rolled into wads and dumped in with domestic refuse. These have not been the subject of much analysis as yet but they may have been sanitary towels or pads. If this interpretation proves to be correct the material could form the basis of further studies on sanitation and hygiene in the early modern era.

The site has produced a great deal of evidence for metalworking in copper alloys, iron and lead with a variety of processes represented by the dumped material. There is much waste from casting copper alloy, with over 1.5kg of fragments of ceramic moulds (eg Nos <325-62 & 328>). These seem to have been used for founding bells (cooking vessels and candlesticks are less likely possibilities), some of which would have had a base (mouth) diameter of just over 0.30m. The moulds would have been used once only, and some of them bear the imprints of the coarse straw ropes used to keep them together prior to firing. A number of pieces of large, flaring, thick-walled crucibles in a purplish fabric and (like the moulds) with dribbles of metal on them, were recovered (for example Nos <388, 381, 382, 383, 384, 385, 327> - the last two being from deposits which also produced ceramic moulds, Nos <386, 387 and 390>). Some or all of these may be from the same workshop as the moulds.

Among several dress hooks, all of types well known in London from the 16th-17th century, one No. <232> has the attachment hole still partially blocked from the casting. There has been some suggestion that these decorative fastenings were made in the Low Countries but if this apparent waster from Finsbury Island can be connected with any of the crucibles it would be the first evidence for English production.

In addition to evidence for casting, some of the dumps produced manufactured items and finished goods. They included tools for pin-making in the form of pinners' bones (Nos <62 and 83>) which are cattle leg bones (metapodials) adapted by trimming one end to make four flat surfaces with shallow grooves to hold the wire shanks of pins while they were being sharpened (Macgregor 1985, 171). Copper-alloy wire is common in post-medieval strata across London, and some pieces from these particular deposits may originally have gone with the bone tools, but none is from the same contexts (Nos <229, 223> – several pieces twisted together, Nos <242 and 441>); this includes two pieces of suitable length for pin shafts (<228 and 223>). The only certain pin from the group, with the usual wound-wire head, is No. <191> at a surviving length of 26mm with the point broken off (No. <97> may also be a pin).

Iron processing of some kind appears to be attested by slag Nos <143> and <148>, and possibly <147>, but nothing more specific has been recognised among the finds. None of the large number of knives recovered, for example, is obviously unfinished (though none appears to have a maker's mark, which should have been added prior to sale).

Lead, which is widespread on sites in London, was constantly used in building maintenance and other repairs as well as for a range of manufactured goods. It is present on the Finsbury Island site, in the form of sheet offcut <445> and runnel <269>, though neither item is definitive of the intended use or end product(s).

There are also some more unusual finds associated with metalworking. An incomplete mould of limestone for producing at least three rectangular ingots $c.85 \times 12 \times 10$ mm is one such find <271>. This may have been for copper alloy, lead, or precious metals (traces from melting the former two at least have been recognised on the site, though none of this evidence is from the same deposit). A number of crucible fragments were also recovered.

Other finds include glass and leather, particularly leather. Large quantities of leather were retrieved from the reclamation dumps but much of the material has not yet been analysed. The items include both complete and partially finished shoes, a possible leather coat and several scabbards. Plain window glass is a common and mundane find in 17th-century and later deposits, but <258> is probably among the earliest fragments recovered in London of the post-medieval tradition of manufacture. Unlike most medieval window glass, which had regularly been used in domestic buildings by the rich since at least the 13th century, this piece is relatively undecayed, retaining its translucency despite its (presumably original) greenish tinge. Relatively little work has been undertaken on excavated domestic window glass in London, the most important centre of consumption from the 16th century (the crucial period for the development of a popular market for glazing). Lead window came No. <273> is in the 'medieval' tradition, but its thinness suggests that it may be an early milled piece extruded between two wheels in a vice to maximise the length of a given weight of lead (Egan *et al* 1986, 303–9). Far less common is a small, plain lead trough for feeding caged birds No. <277>. It was squashed completely flat when found and may originally have been rectangular $c.45 \times 45$ mm, but its identification as an early piece of mass-produced equipment for pets is not in doubt. Decorated lead troughs for pet birds had been around in London from the second half of the previous century at least, but this find may be among the earliest stratified examples of the plain types which became common in the 17th and 18th centuries.

Pottery

The ceramics recovered from the reclamation dumps have proved to be an important group with more than 400kg of pottery (the majority) coming from Open Area 4. Although the pottery from this group is largely redeposited it can still cast some light on the nature of 16th-century ceramics in the capital.

The pottery from Open Area 4 is typified by the presence of locally produced redwares, such as Tudor Brown, Guys and Cheam Redwares. There is also an interesting range of exotic imported pottery. Why there should be a large amount of mundane pottery with a minority of

imports is unclear, but it could be a result of mixing during redeposition. Alternatively it could be an indication of the varying status of the groups represented, with low-status coarse domestic wares and high-status imports. The latter was used by a smaller percentage of the source population and therefore was less frequently deposited and recorded in the archaeological record. The presence of high-status imports within the group is indicative of a high-status source within the group which probably derived from a number of sources simultaneously.

Certain contexts, particularly those on the Imperial House site, seem to have produced a disproportionate quantity of Dutch wares, both Dutch red earthenware and Dutch slipware. Among this group there are examples of a variety of cooking vessels, bowls, jugs and jars; as well as a lid decorated with white slip arcs. This high proportion of Dutch pottery is not continued throughout the rest of the group. The large quantity of Dutch wares and a number of other Dutch-style finds, including a near complete fireguard from 31–35 Wilson Street (Cox 1989, 15) and possible immigrant metalworking moulds from Ling House, on the other side of Dominion Street (Mackie 1988, 31–2), may indicate that a Dutch community had been established within the City. At Holy Trinity Priory, near Aldgate, Jacob Jansen, a potter from Antwerp was working from 1572 (Schofield & Lea in prep). This may have been one source for some of the pottery identified.

The exotic imported, pottery includes a Dutch slipware dish with a pouring lip and pinched feet; a Spanish mercury jar; a South Netherlands Maiolica albarello and an unusual German white ware spout, possibly from a baby feeder.

The presence of large quantities of crucible fragments are indicative of metal working waste. Additionally this group produced exotic imports including a Mature Valencian Lustreware albarello (Fig 6 No.6) with traces of arabesque script, a South Netherlands Maiolica vase and a Saintonge chafing dish. Two stratigraphically related deposits produced sherds of a *Cuerda Seca* dish made in Seville in the 16th century (Fig 5 No.2). This polychrome tin-glazed vessel is decorated with zones of different coloured glaze separated by unglazed lines formed by wax, that burns away during firing. This example appears to be a geometric pattern in pale and medium blue, pale and dark brown and green. The base has a characteristic concave base and green rim.

This type of vessel was not widely traded, so this dish is more likely to have been a souvenir than an imported trade item (Hurst *et al* 1986, 92).

The occurrence of unusual imports continues throughout the sequence, with a good example of a South Netherlands Maiolica vase (Fig 5 No.1), and further fragments of a Saintonge chafing dish. Further Iberian imports include a Spanish tin-glazed ware waisted albarello with a plain blue external glaze and plain white internal glaze (Fig 5 No.3), and an Isabella tin-glazed ware dish with a characteristic pattern of concentric blue and purple circles and crosses (Hurst *et al* 1986, 56).

Two groups from reclamation dumps were of sufficient size to be worthy of quantification, which were broken down by estimated vessel equivalents (EVEs) which show the breakdown

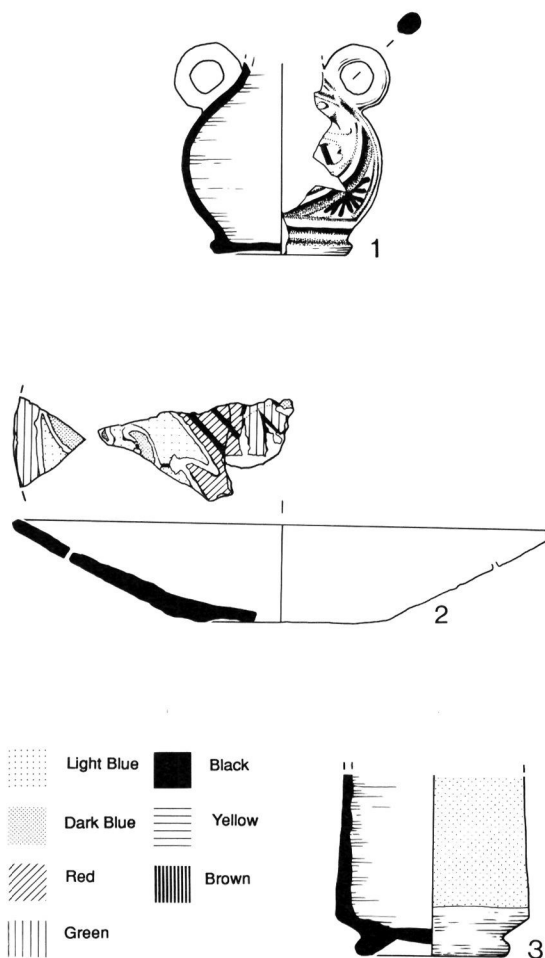


Fig 5. Nos 1–3 (Scale 1:4)

Table 1. *The pottery from group 12.17 (breakdown of fabrics and forms from 1500–50 group, expressed as rim EVEs to two decimal places)*

	Bowl	Pip	Dish	Jar	Jug	Col	Wp	Cup	EVEs	% of total
CHEAR		.33	.19		.39				0.91	15
COLP			0.9						0.09	2
DUTR	.09	.33						.08	0.50	9
DUTSL			.23			.02	.03		0.28	5
GUYS			.36		.22				0.58	10
RAER					.58				0.58	10
TUDB	.43	1.77	.45	.22					2.87	48
TUDG								.07	0.07	1
EVEs	0.52	2.43	1.32	0.22	1.19	0.02	0.03	0.15	5.88	
% of Total	9	41	22	4	20	0.5	0.5	3		
Storage and transport										4
Cooking and food preparation										71
Table/decorative ware										24.5
Miscellaneous										0.5
Local										74
Imported										26

Others present (O.OO EVEs) include CSTN cupt, DUTR drip and TUDB colander

of fabrics and forms (Orton 1975, 30–5). The first of these groups (12.17) dated to 1500–50 consisting of 1635 sherds weighing 31032g (Table 1). The group was located on the eastern side of the site and consisted of a reclamation dump sealing an earlier brick-working pit.

The form and function categories (Table 2) are the same as that used by Orton and Pearce

(Thompson *et al* 1984, 63) and the modifications used for the Tower of London Postern pottery report (pottery in Whipp in prep).

The second group (12.18) was made up of four contexts dated to 1500–1550 consisting of 253 sherds weighing 6744g (Table 3). The group was located to the west of group 12.17 and consisted of a number of spreads of silty sand with some clay and very frequent inclusions of domestic waste.

Clearly the breakdown of these groups is quite similar, with a distinct emphasis towards locally produced cooking and food preparation vessels. The paucity of quantified 16th-century ceramic groups makes comparison difficult. The main source of comparable groups comes from Tower of London Postern excavations 1979 (Whipp in prep). The fill of the postern tower produced a series of assemblages of pottery from the late 15th century to the 17th century, which have been quantified and broken down in the same way as the above groups (Table 4). Ultimately these assemblages should be compared with further excavated groups such as those from the waterfront at Abbots Lane in Southwark, which produced large groups of pottery dating to the first half of the 16th century, including a large number of imports from Italy, Spain and France (Bluer 1993).

Table 2. *Museum of London fabric and form codes used in this report*

Fabric and form code	Pottery type
BOT	Bottle
CHEAR	Cheam redware
COL	Colander
COLP	Columbia plain ware
CSTN	Cistercian ware
DUTR	Dutch red earthenware
DUTSL	Dutch slip ware
GUYS	Guys ware
ISAB	Isabella tin-glazed ware
PIP	Pipkin
RAER	Raeren stoneware
SKIL	Skillet
TUDB	Tudor Brown ware
TUDG	Tudor Green ware
WP	Watering pot

Table 3. The pottery from group 12.18 showing breakdown of fabrics and forms from second 1500–1550 group expressed as rim EVEs to two decimal places

	Bowl	Pip	Dish	Jug	Bot	Lid	Cup	Skil	EVEs	% of total
CHEAR		.46	.07		.51	.43			1.47	35
DUTR		.25					.29		0.54	13
EVEs	0.44	1.15	0.33	0.42	0.51	0.43	0.29	0.66	4.23	
GUYs	.26		.21					.66	1.13	27
ISAB			.05						0.05	1
RAER				.31					0.31	7
TUDB	.18	.44		.11					0.73	17
% of total	10	27	8	10	12	10	7	16		
Storage and transport										12
Cooking and food preparation										70
Table/decorative wares										18
Local									79	
Imported										21

Table 4. Sources of pottery from Tower of London Postern in period 1480–1680

Function	%1480–1520	%1500–1550	%1530–1570	%1580–1680
Storage and transport	14	4	1	3
Cooking and food preparation	49	70	64	50
Table/decorative ware	37	26	35	40
Other/residual				7
Local	64	87	82	71
Non local		3		1
Imported	36	10	18	27

The two Finsbury groups are similar to one another and the high quantities of cooking and food preparation vessels mean these groups resemble the Tower of London groups of 1530–70. In contrast to the groups from the Postern, the Finsbury site produced greater quantities of imported pottery, possibly indicating that the groups have a closer affinity to material from the lower fills of the postern tower. The latter produced high quantities of imported pottery as well a preponderance of cooking and food preparation forms, although not as high as in the Finsbury groups.

The bulk of the local fabrics from Finsbury are redwares such as Tudor Brown, Guys and Cheam redwares. The material from the postern had a proportion of derivatives of Tudor Brown ware, tempered with coarse quartz and calcareous inclusions, which derivatives are entirely absent from the Finsbury material. This may be indicative of locally sourced pottery serving very

small areas of the City, although the Guys type ware watering pot (Fig 6 No.8) is out of the ordinary.

White wares, such as Coarse Border ware, are almost totally absent. This may indicate lack of penetration by Surrey White wares to the northern side of the City. This was not the case on Abbots Lane (near London Bridge in Southwark) where the assemblages produced substantial amounts of Coarse Border wares (Bluer 1993). This is not surprising considering the location of that site on the south bank of the Thames.

This material adds to the scanty typology of 16th-century pottery groups from London. The preponderance of cooking and food preparation vessels accompanied by a tantalising range of ordinary and exotic imported pottery tells us something about the socio-economic nature of the area. It shows that there was a high-status source for part of the group associated with the

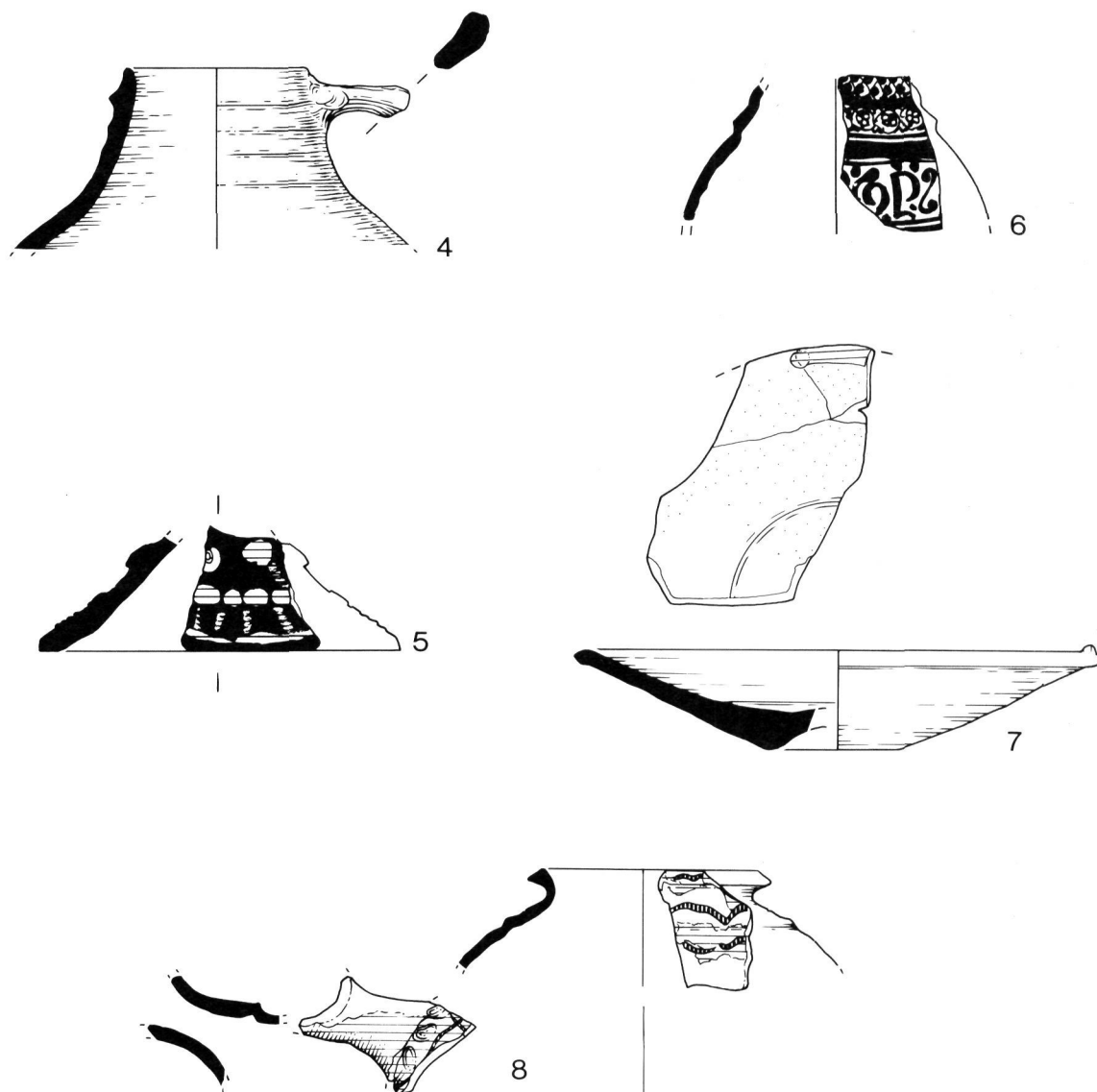


Fig 6. Nos 4-8 (Scale 1:4 except No.5 scale 1:2). For key see Fig 5

imported wares. This element declined over a period of time with the assemblage becoming more homogenous in character.

The exotic imports include Iberian lustre ware which has its origins in the Middle East, but was made by Moorish potters (under patronage of the leading aristocratic dynasties) in the region of Valencia from the mid 14th century. These individuals zealously guarded the manufacturing techniques of their spectacular products, often elegant pieces with elaborate Islamic decorations. Their lustre wares were sought after not only in

Spain itself but by people of the highest rank in France and Italy (Caiger-Smith 1985, 101). The albarello (Fig 6 No.6) from Finsbury belongs to the late 15th century, when Islamic motifs were replaced by European patterns, such as the foliage borders found on this vessel. A transitional element is the presence of arabesque script.

In addition to the lustre ware albarello there is an elegant pale blue glazed albarello (Fig 5 No.3), probably manufactured in Catalonia. These Spanish albarelli possibly came from a pharmacist either in the area or the source of

the dumped material. The large range of differing Spanish ceramics may be indicative of cherished possessions or evidence of extensive trading with Spain. Although trade with Spain went back to the 13th century, it increased following the marriages of Henry VIII to Catherine of Aragon and Phillip II to Mary Tudor. The presence of the *Cuerda Seca* dish (Fig 5 No.2) is highly unusual, being previously confined to ports in the south of England. The products of Seville are well represented by the presence of Isabella Polychrome and Columbia Plain ware (both named after sites in North America). The Columbia Plain dish is decorated with a dipped green glaze rim, an Islamic motif (Fig 6 No.7).

The exotic products are not confined to Spanish wares. Others include a chafing dish from the Saintonge area of south-west France. The trade in ceramics from this area paralleled the trade of Gascony wine, with wool and textiles flowing the other way from England.

The desire to own exotic and out of the ordinary ceramics could not be fulfilled by the local industries and was satisfied by colourful pottery brought from the Low Countries, Spain, France and Staffordshire *eg* a Cistercian posset pot (Fig 6 No.5).

Botanical evidence

The analysis of plant remains concentrated on the 16th-century reclamation dumps of Open Area 4, particularly group 12.05 from which 770 litres were examined. This group consisted of a large number of dumps within a brick-making pit on the east side of the site. Cereals were represented virtually entirely by charred grain, albeit in low quantities. The most common identifiable cereals were free-threshing bread wheat (*Triticum aestivum*), and barley (*Hordeum sativum*) with 14 and 19 grains respectively. The barley belonged to the six-row hulled variety with the recovery of both twisted and straight grains. Several grains of either wild or cultivated oat (*Avena* spp.) and a single rye grain (*Secale cereale*) were identified. A rachis fragment of rye preserved by waterlogging was also found.

These cereals may have been used on their own or as a mix of several species for bread, biscuit-making and in pottages. Pottage, a stew made from a mix of root vegetables, cereals and sometimes meat, was the national dish of all

classes until at least the 17th century (Hammond 1993, 31–2).

Bread wheat was the main bread-making grain. Barley, rye and oats were sometimes used for coarse bread in south England and both may have been used as animal fodder. Barley was also used in the production of ale and beer. Hops represented by seeds in several samples, were also used in brewing.

This range of cereals is very similar to other finds of grains in London from both medieval sites, Billingsgate (Pearson *in prep*), St Mary Spital (Thomas *et al in prep*), and post-medieval sites; the Fleet Valley (McCann 1993), and the Royal Mint, (Grainger *et al in prep*).

Grain assemblages from this period are usually very small which may be attributed to the fact that the cereals were often processed and milled into flour prior to their arrival in the City.

No pulses were found in the samples although this contrasts with the documentary records. John Gerrard (1545–1612) writes that they were sown in gardens and in fields everywhere about London.

Common vegetables represented by the seeds of the *Brassica/Sinapis* species group (cabbage, rape, turnip, charlock) were recovered, often in high numbers, from 26 samples. These seeds are frequently found on both medieval and post-medieval sites in London although the problem of separating out and identifying the individual taxa means that it is not usually possible to establish whether the seeds represent cultivated crops or their wild relatives. This pattern also extends to other common vegetables such as carrot (*Daucus carota*) several seeds of which were recovered from two assemblages. The limited evidence for common vegetables may be due to the fact that the edible parts of the plant are consumed before they set seed (Armitage *et al* 1987, 276). Common vegetables were used in pottage and as salads, well-seasoned with oil, while from the end of the 17th century they began to be used as an accompaniment to meat (Weinstein 1990, 97).

Sixteen different species of fruits were represented in the samples. The small-seeded fruits included fig (*Ficus carica*), grape (*Vitis vinifera*), elder, blackberry/raspberry (*Rubus fruticosus/idaeus*), strawberry (*Fragaria vesca*), pear/apple (*Pyrus/Malus* sp.), mulberry (*Morus* sp.), barberry (*Berberis vulgaris*) and possibly redcurrant (*Ribes cf. rubrum*). Fruit stones consisted entirely of *Prunus* species: plum/bullace (*Prunus domestica*),

sloe/blackthorn (*Prunus spinosa*) and cherry (*Prunus avium/cerasus*). The variation in the size of the plum stones suggests that a number of different varieties were present. Some plum stones showed evidence of rodent attack with circular cavities on the stones suggesting that they had been gnawed. Hazel (*Corylus avellana*) and walnut (*Juglans regia*) were represented by whole nuts and shell fragments. Virtually every medieval and post-medieval site in London has produced evidence of these fruit species with fig, elder, grape and blackberry/raspberry seeds being the most common.

Documentary records suggest that virtually all the fruit species represented may have been used for a wide range of foods and drink (Wilson 1984). Unripe grapes were pressed and fermented to make verjuice (grape juice) while ripe ones were pickled and made into wine. According to MacLean grapes were not eaten fresh (Maclean 1981, 269). Elderberry wine was produced as an adulterant of more expensive foreign wines or to disguise English raisin wine, a common practice in the post-medieval period (Grieve 1992, 268). Sloe was used to make sloe wine/gin; wild and native cherries for liquors; apples for cider; and the red juice of mulberries used in a pottage known as murrey (Wilson 1984, 269). Many of the fruits may have been preserved for later consumption, for example figs, hazels and walnuts. Elderberry fruit and flowers were used for jams and jellies. Barberries were used for garnishing meat and fruit dishes or were candied with sugar and used as a sweetmeat. Strawberries, plums and damsons were soaked in white wine and sugar and oil extracted from walnuts.

Documentary evidence suggests that little fruit was consumed fresh in the medieval and early post-medieval period as it was considered unhealthy, popularly associated with common illnesses such as diarrhoea and dysentery. Instead, fruit was mixed with other foods and cooked (Wilson 1984, 299). Fruits were eaten roasted with sugar, confits and fennel seed at the end of the meal to close up the stomach, although this was sometimes an appetizer at the tables of the more wealthy. The cost of native fruit, with the exception of gooseberries, was relatively high in the early post-medieval period, because of the short season of availability from July (strawberries) to October (apples). Many of the fruits identified in the samples were grown extensively in London in both private gardens and at religious houses. Sixteenth-century cartographic evidence shows

the presence of orchards within the City walls. Some of the fruits may have been imported from local areas, for example, the county of Kent in the 16th century was a leading supplier of fruit, particularly apples, pears, cherries and plums, or from overseas (Weinstein 1990, 82). Grapes and figs were both grown in England and imported.

Three samples produced a small number of cucurbit seeds. These are extremely difficult to identify owing to cross fertilisation and the large number of hybrids. As yet there is no overall consensus as to their classification. The finds included seeds of cucumber (*Cucumis sativa*), melon (*Cucumis melo*) and possibly watermelon (*Citrullus lanatus*). These species are infrequent finds on medieval and post-medieval sites in London although 16th-century samples at the Royal Mint (Grainger *et al* in prep) produced seeds of watermelon, melon and cucumber/melon, while cucumber/melon seeds were recovered from 16th-century deposits at St Mary Spital (Thomas *et al* 1997).

Cucurbits were cultivated primarily for their edible flesh. Cucumbers were probably commonly used as a vegetable salad in summer although they were also pickled as gherkins for winter consumption. Both melon and watermelon were important for their fresh fruit while the seeds could also be made into a cake for livestock feed. Oil may have also been extracted from the cucurbits and used for lighting or cooking.

Cucumber was the only member of the cucurbits found in the samples to be commonly cultivated in Britain and north-west Europe prior to the 16th century. It needs a warm climate but not as hot as that required for melon, which only produces fruit in Britain if grown under glass. Cultivars of melon suitable for greenhouse production in a British summer were not developed until the 17th century, which suggests that the seeds in the samples may represent imported fruits. Watermelon, documented in 16th-century herbals, requires artificial heat to set fruit in north-west Europe (Letts 1991). Thus, the one seed in the assemblage probably represents an import and could possibly be linked to the contacts that have already been discussed with regards to the pottery.

The following herbs were represented by low numbers of seeds in a few samples: fennel (*Foeniculum vulgare*); possibly garden parsley (*Petroselinum crispum*); opium poppy (*Papaver somniferum*); and rosemary (*Rosmarinus officinalis*). The seeds from a number of the *Brassica/Sinapis* spp.

may have included taxa used as spices, for example black mustard (*Brassica nigra*) and white mustard (*Sinapis alba*). These herbs may have been used for flavouring in both fresh and dried form, although found in low numbers, these seeds, with the exception of rosemary, may simply represent weeds.

The presence of rosemary is interesting as it is believed not to set seed even in Northern France let alone England (Grieg 1993, 325), which may account for the fact that this is the first seed record of this plant known from London deposits and may represent imports from southern Europe.

Some of the plants represented in the assemblages may have had a range of other uses, for medicine *eg* opium poppy (*Papaver somniferum*), for flooring/thatching *eg* sedges and rushes, and as animal fodder *eg* the grassland plants. Others may represent the residues of garden/ornamental plants *eg* box (*Buxus sempervirens*) and holly (*Ilex aquifolium*).

From the 14th century the contents of stone/brick cesspits were emptied when full and the rubbish carted out of the City. This represents a change to the previous practice in the medieval period of excavating new pits for the burial of rubbish (Watson *in prep*). The stone/brick cesspits would have been regularly cleaned out by well-paid workmen and the material carried away in pipes (barrels) (Grieg 1982, 49). The stratigraphy of the fills from a number of post-medieval pits at Cutler Street (Schofield 1987, 79) and 16th/17th-century pits from 119–121 Cannon Street (*ibid* 120) illustrates this point, where the residues of older fills were found adhering to the sides of the pits (Giorgi *in prep*). When no longer in use the pits would have been filled in and covered over.

A useful dumping ground for all refuse in the City prior to this period would have been the dumps behind the waterfront revetments. However, by the 16th century, the expansion of the City into the Thames had virtually ceased on the north side of the river, with stone walls being built on many riverside properties. Thus, there would have been an increase in the use of areas outside the City walls, such as Moorfields for the dumping of rubbish.

Previously excavated areas outside the City walls that have been interpreted as rubbish dumps include 16th-century assemblages from Broad Sanctuary, Westminster (Armitage *et al* 1987, 268). Pollen analysis from this site showed the presence of weeds of disturbed waste ground,

grasses and rushes plus economic plants (*eg* buckwheat, hemp). Nematode eggs indicative of human and animal faeces, and a range of animal bone (large and small mammal, bird, fish) including evidence of butchery waste was also found. Like Moorfields, this was interpreted as a wet area used for the disposal of rubbish.

Another area for dumping rubbish was the City Ditch. Assemblages from ditch fill samples, at 90–94 Old Broad Street, show that by the 17th century the Ditch was being backfilled with human faecal material, and general household and food refuse (Holden & Pipe 1991).

Botanical assemblages from 16th-century pit-fill deposits within the City walls may be compared to the Finsbury samples from outside the City walls, although such a study is limited by the small body of evidence available within the City for this period.

Sixteenth-century assemblages from Watling Court (Schofield 1987, 210) and 28–32 Bishopsgate (*ibid* 51) produced a small range of small-seeded fruits preserved by mineralisation and waterlogging and very occasional charred grains and weed seeds. However the size of these samples and their preservation was not particularly good (Giorgi *in prep*). In contrast, a well sampled 16th-century cesspit from 54 Lombard Street with good preservation produced both epidermal fragments of cereals, fruits, sedges and rushes plus fruit seeds, and a range of wasteground weed seeds (*eg* goosefoots/oraches (*Chenopodium/Atriplex* spp.), campion/catchfly (*Silene* sp.), stinking mayweed (*Anthemis cotula*), wild radish/charlock (*Raphanus raphanistrum*)) (Holden 1992). All these taxa were found in the Finsbury material showing that such pits from within the City could have provided both food refuse and wasteground/garden weeds for the dumps at Moorfields.

Outside the City walls, contemporary deposits at St Mary Spital (Thomas *et al* *in prep*) and the Royal Mint (Grainger *et al* *in prep*) show a much closer resemblance to the Finsbury samples. Pit-fills from St Mary Spital produced mixed assemblages including a range of fruit species, herbs, spices, flax, hemp and hop and a range of wild plants, interpreted as the residues from animal fodder, flooring, roofing and garden plants. Similarly, mixed assemblages of economic plants and weeds from a range of habitats were recovered from 16th-century assemblages from the Royal Mint. However, these similarities, particularly the wider range of weed taxa, may

be attributed more to extensive analysis of samples on these sites and preservation rather than a reflection on the location of these sites on the periphery of the City.

Animal bone

The 16th-century reclamation dumps also produced a large quantity of animal bone (over 300kg) of which 4052 fragments have been analysed (128kg). In addition, 10 bulk samples were taken and sorted (through a 1mm mesh) for their bone content. These produced 776 (1.74kg) bone fragments. The subgroups were selected on the basis of contributing to the overall study of the site. They were all well-dated to the 16th century and consisted of rubbish dumps which had been backfilled into the brick pits.

The lack of gnawed bones in the assemblage suggests that burial of the bones was both rapid and thorough. Cattle, sheep/goat and pig dominate the assemblage. Assuming that most of the cattle and sheep-size fragments also belong to these three species, they would then comprise approximately 90% of the assemblage. The assumption is based on the likelihood that the three major domesticates would comprise similar proportions of the cattle and sheep-sized identified and unidentified portions of each bone collection.

Three quantitative methods were used to assess the assemblage *ie* total fragment count (TF), epiphysis only (EO after Grant 1975 and 1984) and total weight to assess the assemblage. The use of a weighted quantitative method, in this case EO, is necessary in order to limit the effects of recovery and fragmentation biases, both of which favour the relatively greater representation of larger animals *ie* cattle. EO, as used here, can reduce the former bias by excluding the smaller skeletal parts as carpals/tarsals and phalanges, and can also affect the latter bias by concentrating on the articular ends only (the cattle limb bones tend to be heavily fragmented in comparison to those of sheep/goat and pig).

Taking either the TF or EO figures for each subgroup (an amalgamation of primary site data to facilitate analysis) it is clear that there is a wide variation in the proportion of these species and cattle and sheep/goat in particular (Table 6). Pig is consistently the least well represented. The combined results using the more reliable EO method suggest similar proportions of cattle and sheep/goat.

A final point concerns the abundance of sheep and goat. Of the two species only sheep was positively identified. While this evidence does not exclude the possible presence of goat, it would seem likely that the majority of the sheep/goat assemblage is composed of sheep.

The remaining animals can be classed as either domestic, 'managed' or wild. In the first category is horse, dog and cat. None of these species was well represented and, due to the large proportion of dog and cat articulated remains these are likely to be over-represented. 'Managed' is used here to describe the likely status of red deer, roe deer, fallow deer and rabbit. All these species are known to have been kept in enclosed parks, the latter within initially artificial warrens following their introduction to this country by the Normans (Astill & Grant 1988, 164). Such parks continued up to and beyond the 16th century and it is likely that they contributed the principal source of venison and rabbit. The meat of red and fallow deer was undoubtedly restricted principally to the wealthier classes. Rabbit was certainly a luxury item during the medieval period and may have continued to be so into the early post-medieval period (Maltby 1979, 61). Both deer species are poorly represented while rabbit is fairly abundant throughout.

The wild species include hare and, from the sample residues, small rodent. Both rabbit and hare have been found on a number of medieval/post-medieval sites where, during the 16th century, rabbit replaces hare in abundance (Maltby 1979 and Davis 1987, 194). This site appears to follow the general pattern. What the change-over signifies is possibly the increased availability of rabbit as the keeping of these creatures became more widespread (Cantor 1987, 37). The small rodents are vole and mouse sized animals and these probably represent local fauna.

A total of 13 species of bird were recovered (Table 5), of which four are likely to be domestic while the rest are wild. The domestic species include, in order of abundance, chicken followed by goose, duck and peacock. It is possible that a few of the goose and duck bones may belong to wild birds. All the wild birds, with the exception of the thrushes and small passerines, can be described as game. The peacock, heron and crane are clear indicators of high status.

A minimum number of 14 fish species was identified. Marine species dominate this list, most abundant being those in the cod family *ie* cod and haddock, and also herring, plaice and

Table 5. *Animal bone species from Open Area 4*

Mammals	Birds	Fish
cattle, <i>Bos</i> sp. sheep, <i>Ovis</i> sp. goat, <i>Capra</i> sp.	chicken, <i>Gallus</i> sp. domestic/wild goose, <i>Anser anser</i> domestic/wild duck, <i>Anas platyrhynchos</i> teal, <i>Anas crecca</i> heron, <i>Ardea cinerea</i> peacock, <i>Pavo</i> sp. crane, <i>Grus grus</i> curlew, <i>Numenius arquata</i> oystercatcher, <i>Haematopus ostralegus</i> woodcock, <i>Scolopax rusticola</i> green plover, <i>Vanellus vanellus</i> thrush, <i>Turdus</i> Sp small passerines	rocker, <i>Raja clavata</i> eel, <i>Anguilla anguilla</i> conger eel, <i>Conger conger</i> herring, <i>Clupea harengus</i> pike, <i>Esox lucius</i> roach, <i>Rutilus rutilus</i> angler, <i>Lophius piscatorius</i> cod, <i>Gadus morhua</i> haddock, <i>Melanogrammus aeglefinus</i> cod family indeterminate <i>Gadidae</i> gurnard, <i>Triglidae</i> brill, <i>Scophthalmus rhombus</i> plaice, <i>Pleuronectes platessa</i> flounder, <i>Platichthys flesus</i> ; sole, <i>Solea solea</i> ; flatfish indeterminate
pig, <i>Sus scrofa</i> horse, <i>Equus</i> sp. dog, <i>Canis familiaris</i> cat, <i>Felis</i> sp. red deer, <i>Cervus elephas</i> fallow deer, <i>Dama dama</i> roe deer, <i>Capreolus capreolus</i> hare, <i>Lepus europeacus</i> rabbit, <i>Oryctolagus cuniculus</i> vole, <i>Microtus/Arvicola</i> sp mouse, <i>Apodemus/Mus</i> sp		

Table 6. *Cattle, sheep/goat and pig representation*

Subgroup	Species	TF N	TF %	EO N	EO %	Weight kgs	Weight %
12.04	cattle	218	48.5	129	42.3	17.43	73
	S/G	209	46.5	159	52.2	5.83	24.4
	pig	22	5	16.5	5.5	0.61	2.6
12.05	cattle	467	49.5	215	39.8	36.95	79.3
	S/G	328	34.8	254	47	5.85	12.5
	pig	147	15.7	70.5	13.2	3.77	8.2
12.17	cattle	252	56.6	159	47.9	20.72	77.6
	S/G	135	30.3	126	38	3.36	12.6
	pig	58	13.1	46.5	14.1	2.6	9.8
All	cattle	937	51	503	42.7	75.1	77.3
	S/G	672	36.6	539	45.8	15.04	15.5
	pig	227	12.4	133.5	11.5	6.98	7.2

flounder. Freshwater fish as eels, pike and roach were clearly of secondary importance. It is possible that pike could be regarded as a high-status item (Dyer 1989, 61–2).

Fish were clearly supplied from near and far. Fishing fleets operating in the North Sea, in both deep and shallow waters, ensured a ready supply of fresh fish for the London markets (Wheeler & Jones 1976). In addition the Thames itself supported diverse freshwater fisheries along the river and out into the North Sea.

All species present could have contributed to the diet, with the likely exceptions of dog, cat and the small rodents. Apart from information from historical sources, proof is supplied by the

presence of bones with cut marks. The exception is skinning marks. Proving the animal was skinned does not automatically suggest that the meat of the resulting carcass was intended for consumption. Such marks are apparently present on the single dog bone with cuts. Conversely the single horse bone with cut marks is typical of meat waste. Though rare, there is clear evidence for eating horse flesh from other urban sites in London *eg* from 175 Borough High Street (Schaaf 1976, 3–7).

The bulk of the demand for meat was met by the major domesticates with cattle dominant followed by sheep/goat and pig (Table 6). Meat may have been supplied to the City from a

variety of sources. Evidence for local stock raising is provided by the presence of foetal/neonatal bones. This age group is represented by each of the major domesticates. The incidence of young calves may point to a similar avenue of supply as does the presence of juvenile chickens. However it can be assumed that this source provided only a small part of the total meat demand of the City during the 16th century. Historical accounts suggest that London at this time was chiefly reliant upon its neighbouring shires for food. However, it seems cattle were also arriving from as far away as Wales (Skeel 1926, 135–58), though not in the numbers which were commonly driven along this route in the 17th and 18th centuries (Armitage 1978, 218). Deer and rabbit were probably imported from the nearest deer park/warren, or possibly from further afield.

Whatever the source of supply, it is clear that the majority of cattle, sheep/goat and domestic fowl represented in the overall assemblage were not raised primarily for their meat. This is demonstrated by the proportion of animals and birds represented in these contexts which are beyond the best age for eating which points to the greater importance of secondary (*ante mortem*) products. Certain areas of the site did produce evidence of enough immature sheep/goat individuals to suggest that meat production was of some importance. In addition the cattle assemblage shows a peak of infant individuals probably indicating veal production.

Unlike the other domestic species, pigs have little value except for their post-mortem products, principally their meat. A study of the age profile of this species will indicate the intensity of exploitation. The very high proportion of first year animals suggests their use was intensive. This could relate to the change-over underway in this period from the pannage system to the more efficient system of sty husbandry. One reason for this change was the availability of surplus whey due to the increase in dairy production during the early post-medieval period (Maltby 1979, 83–4). Rabbits are also valued chiefly for their meat but it is not clear whether those represented were wild or managed.

There is historical evidence for the organisation necessary between the supply stage and the consumer (Fisher 1954, 146). Such organisation can be confirmed archaeologically by the finding of bone deposits which display particular characteristics. At this site, one context contained an over-representation of sheep skull parts while

another displayed an almost complete dearth of sheep primary waste (head and lower limb parts). This implies the presence of at least two organisational stages. The latter assemblage can be regarded as the waste from a butcher's shop (or possibly from a large household) while the concentration of sheep skulls could have been dumped from an abattoir.

There is also evidence for the use of other post-mortem products, namely skins and horn. Skinning cuts were observed on cattle and dog bones. However it can be assumed that the skins of other species were also used, possibly including all the mammals with the exception of the small rodents. The use of horn is indicated by a number of cattle and sheep skull fragments from which the horncores have been removed.

The importance of *ante-mortem* products has been confirmed for cattle, sheep/goat and domestic fowl. Cattle is represented principally by young calves and animals which have reached full adulthood. This age profile is quite typical of a herd exploited for its milk *ie* with male calves culled prior to their first winter, while the females would be kept for milk production as long as possible (Legge 1992, 25–6). This exploitation strategy conforms to the noted increase in milk production during this period (Maltby 1979, 83–4). Unfortunately the sexing evidence taken from a sample of metacarpals suggests a dominance of mature males/castrates rather than females. Taken at face value this evidence indicates the presence of work animals *ie* involved in pulling and carrying. However, the sexing data should be treated with some caution due to the small sample size. The mature and adult sheep/goat individuals were possibly kept either for their wool or milk. Wool is more likely due to the fact that the majority of sheep/goat bones clearly belong to sheep and that southern England saw a distinct rise in the importance of wool production from the late medieval period onwards (*ibid*). Evidence for this trade was also noted amongst the artefacts which included cloth seals and textile fragments. The large proportion of mature domestic chicken, goose and duck suggests the importance of egg production. More evidence for this was provided by the significant quantities of eggshell recovered from some of the dumps.

Horse, dog and cat were probably all used as work animals. The size of the horses represented, all approximately 12–14 hands, would suggest a pulling or carrying, rather than riding, use.

Similarly the small size of the dogs, standing approximately 40–50cm at the shoulder would possibly suggest a non-hunting use, unless for small game.

The size ranges of these three species are typical of the period, as indeed are those, in general, of the other domestic animal and bird species present. However there are a few larger cattle and sheep present *ie* shoulder height sizes ranging up to 240cm and 174cm respectively. These larger animals clearly coincide with the improvement in husbandry practices and the possible introduction of new breeds which took place in England from the early post-medieval period (Davis 1987, 188).

Open Area Five (17th–20th centuries)

Land use on the site during this period consisted of at least five phases of activity including four phases of buildings. These structures had been removed or truncated and were not recorded, except in terms of documentary evidence, and have, therefore, not been separately numbered. Open Area 5, defining the later features which were cut through the reclamation dumps or are attributed to modern activities, contains the only material recorded or excavated. This land use period has a wide date range (1610–1993) and little importance archaeologically other than to show that there was considerable development of the site following the reclamation of the marsh. The site continued to be used as a rubbish dump throughout the 16th century despite prevention orders by the Mayor in 1512 and 1527 (CLRO, *Repertory of the Court of Aldermen* 2, ff.128, 168b). By 1607 some improvements had been made in the state of the ground, partly as a result of the Honourable Artillery Company being granted a lease for Bunhill Fields (Brett-James 1935, 453–60). The ground was levelled and gravel paths laid out with a number of trees planted so that by 1610 it had become a place for walking and began to attract a number of booksellers. It was also, however, known for wrestling and ‘cudgel-players’ (Thornbury 1887, 196). After the Great Fire, in 1666, the refugees from the City gathered on Moorfields living in tents and ‘miserable huts’ (*ibid*). This led to a period of neglect which resulted in standing water becoming common again, by 1729 (Cox 1990, 9). By 1800 the first tenement buildings had been

constructed on the site which were succeeded by subsequent structures up to the present day.

CONCLUSION

The Finsbury Island site has produced a relatively straightforward stratigraphic sequence of deposits rich with artefactual and environmental evidence. The material highlights the growth of the City at the end of the 15th century and the range of both industrial activities and domestic consumables. The only other comparable sites in London are those associated with the dumping behind the late medieval waterfront revetments on both sides of the river.

The development of the marsh in the late/post-Roman period is known mainly from later documentary sources as little archaeological evidence survives for a widespread marsh. A number of the sites in the area have produced waterlogged material but this has usually been from channels or drainage ditches and not from horizontal and stratified organic deposits. The large organic spreads which have been recorded, as at Ling House and Finsbury Island, are associated with late 15th–16th-century reclamation following quarrying of the brickearth in the immediately preceding period. In contrast to the paucity of archaeological evidence the documentary sources from the medieval period almost always refer to Moorfields as marshy or even as an area of standing water, used for skating in the winter (Pegge 1772, 50) and navigable by boat (Thomas 1924, 113–14). These references may have exaggerated the true state of affairs since there are relatively few references to Moorfields in comparison to other areas of the City. Moorfields held no interest to most commentators, being an area of waste land outside the City wall and was, therefore, described in terms of its most exotic features and not necessarily the most representative. Neither Pegge nor Thomas provide details as to the exact location of the activities, which may have been confined to a small area of land or restricted to some of the channels that have been identified archaeologically.

The true state of affairs before construction of Moorgate may have been more complex than the occasional generalisations made in medieval documents and seized upon by later commentators when the problem of flooding had already been exacerbated by the brickearth quarrying at

the end of the medieval period. The creation of the marsh may have originally been partially deliberate to provide a further defensive feature protecting the northern approaches to the Roman city. This was caused when the Walbrook began to back-up against the City wall through which inadequate culverts had been constructed. Whether or not this was done deliberately it must have occurred naturally in the post-Roman period when the culverts were not maintained. The marsh itself was, however, restricted to a narrow strip 25m to either side of the main Walbrook channel which flowed along a depression in the gravel 200m to the east of the Finsbury site (Malt & White 1987).

During the medieval period there is little evidence of the site flooding with any regularity, suggesting that the limited drainage works undertaken in the Saxo-Norman period were adequate. Environmental evidence from the botanical remains suggests a fairly dry area of waste ground with the presence of bedding trenches indicating that cultivation was possible. It is not until the 15th century when the brickearth quarrying began that flooding and standing water accumulated. This situation was mitigated but not solved by dumping rubbish in the open pits which had the effect of raising the ground sufficiently above the water level, except during wet periods. It did not solve the problem, however, as the water was retained within the dumps with no opportunity to drain away. This situation prevailed until recently when the advent of piled and deeply-founded buildings pierced the dumps and altered the level of the water table to the increasing detriment of the previously anaerobic condition of the archaeological deposits.

The concept of a medieval marsh stretching from Whitecross Street in the west to Bishopsgate in the east is, therefore, largely a recent phenomenon which has been imposed on the more distant past. The botanical remains from the medieval period confirm a drier environment than is usually ascribed to the area and provide a new impetus for further studies into this aspect of Moorfields.

The registered finds and ceramic assemblages from the 16th century echo the trades and manufacturing processes taking place within the City with many of the excavated dumps including distinct groups of artefacts which probably came from particular workshops or households. These groups included associated animal bone and

botanical material indicative of the diet of Londoners. Particularly important are a group of high status imported ceramic vessels which shed light on trade contacts during this period and reflect the provenance of some of the rubbish dumps. Although this report has only summarised the findings of the excavation archive reports containing all the data recorded on the site and during subsequent analysis are available for consultation at the Museum of London (site code FIP92).

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