

## **A Tudor hinterland: drainage, bridging and tanning at 156–170 Bermondsey Street, Southwark**

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with contributions by

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*Marshy conditions and flooding indicated by peat and alluvial layers showed the excavation area to have been largely uninhabitable prior to the post-medieval period. Attempts to reclaim the low-lying land, which was set back from medieval Bermondsey Street, were indicated by a substantial late medieval drainage ditch. The area, which remained a waterlogged hinterland during the Tudor period, was drained by a further network of channels, the fills of which contained pottery and leather that were both of interest. One ditch had been partially cleared of its fills, leaving a section in place supported by a revetment of timber boards and wattle, to form a causeway. Simple footbridges were built across the cleared portions of ditch in the early 16th century, probably providing access to pasture to the west. Material surrounding and sealing the footbridges contained noteworthy finds assemblages, particularly of imported Mediterranean pottery. The animal bone assemblage showed an intensification of tawing towards the end of the 17th century, to be replaced by tanning as the dominant industry. The unlawful tanning of sheep skins may be indicated at this time, and deposits to consolidate the excavated area were laid down. Tawing in a re-used tar barrel then preceded an early 18th century brick and cobble yard surface with timber and brick drains and evidence of the local tanning industries.*

### **Introduction**

An archaeological evaluation and excavation were conducted by Pre-Construct Archaeology Ltd at 156–170 Bermondsey Street and GIFCO building and car park (TQ 3330 7955) between 21 January and 4 March 2002. The site was situated 0.75km south of the present south bank of the river Thames, with ground level falling from 2.77 to 2.28m OD east–west (fig 1). Three trenches were opened for evaluation, all showing the natural sequence of sand covered by alluvial deposits and peat. Trenches 2 and 3 revealed a post-medieval tanning pit and a late medieval ditch respectively, but had been subject to much modern truncation. Trench 1, which preserved archaeological deposits to within 0.50m of the modern surface, was extended for excavation. The trench was located behind buildings still standing on Bermondsey Street, and therefore largely missed direct evidence of a post-medieval or earlier street frontage. Consequently, the excavation gave a picture of the backlands of Bermondsey from the late medieval to the Victorian periods. In particular, the transition from the late medieval into the 16th century saw interesting land management and archaeological assemblages. As the article will focus upon this period, the reader should note that specialist reports pertaining to other periods are available, but they have been edited as appropriate in the following text.

### **Topography and natural deposits into the medieval period**

Recent archaeological investigation in the area has revealed an increasingly accurate picture of the prehistoric topography of northern Southwark (Drummond-Murray *et al* 1994; Ridgeway 2003), where braided channels of the Thames flowed between sand and gravel islands. Excavations at 151–153 and 159 Bermondsey Street and 211 Long Lane detected a wide east–west channel that separated the sand eyots of Horsleydown to the north and

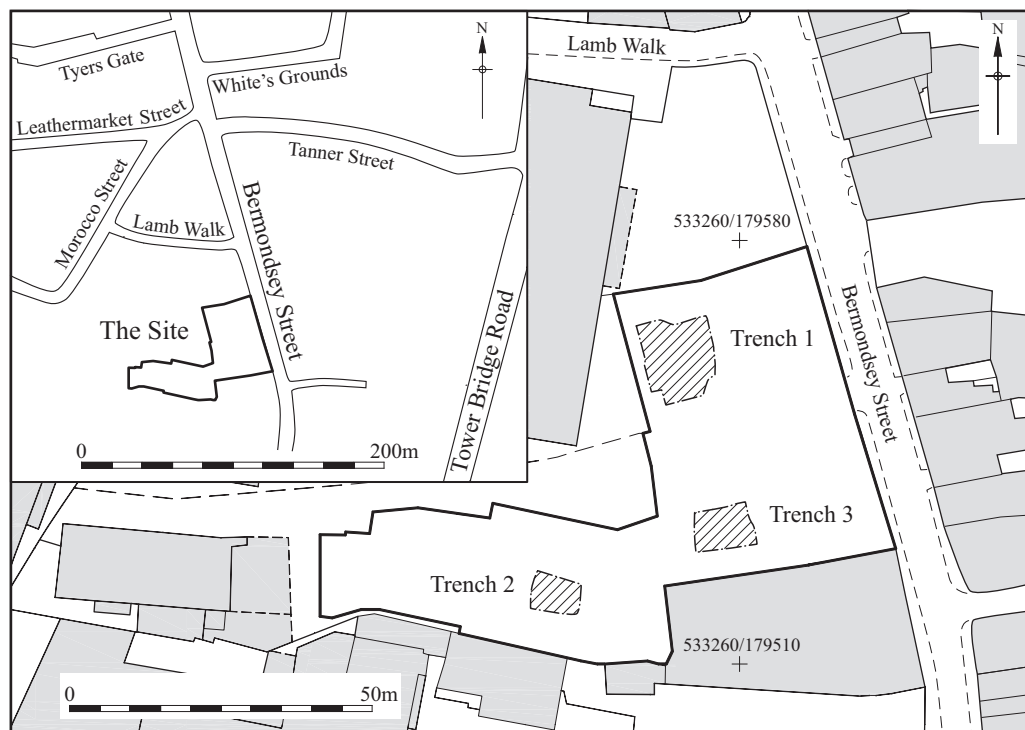


Fig 1 Bermondsey Street, Southwark: trench location with inset site location plan. (© Crown copyright Ordnance Survey. All rights reserved)

Bermondsey to the south (Darton 2002; Maloney & Holroyd 2003, 51; Wooldridge 2003). Located between these sites, 156–170 Bermondsey Street showed a compatible natural sequence infilling this channel. Flooding during the Holocene sealed the Pleistocene sand, found between  $-2.78\text{m}$  and  $-2.15\text{m}$  OD, with an alluvial deposit up to  $1.30\text{m}$  thick. The Bronze Age then saw fluctuating marine regression that led to the formation of a peat layer up to  $1.24\text{m}$  thick, essentially levelling the site area. Deposited over the peat were alluvial clays with a fairly high silt content and dense manganese flecking signifying vegetation cover, most likely within a seasonally flooded environment. The upper reaches of this layer, at  $c 0.15\text{m}$  OD, contained pottery dating from 1140 to 1350, and a distinctive 15th century shoe. Thus the area was shown to have been subject to occasional flooding into the medieval period. That this would have inhibited habitation was attested by the lack of archaeological features before this period.

### Historical background

The 11th century Cluniac Priory of St Saviour, later to become Bermondsey Abbey, was located to the south of the site. The monastic house greatly influenced local development, with roads radiating to important local centres such as Borough Market on Long Lane (Thomas 2002, 57–62). Bermondsey Street was established by the late 12th century and connected the abbey with Tooley Street and St Saviour's Dock, constructed by the abbey  $c 1250$  in the mouth of the now lost Neckinger stream (Carlin 1996, 30–1). Bermondsey Street is thought to have marked the western extent of the abbey precinct, and was initially built as a causeway across the low-lying wetlands. Ongoing attempts to control flooding were recorded throughout the 13th–15th centuries, supported by such archaeological evidence as the construction of a revetted mud wall close to the Thames (Brown & Taylor 2010). Drainage

ditches helped control the water levels in the medieval and post-medieval periods, and are often found archaeologically in north Southwark.

Bermondsey Street saw increasing development from the late medieval period onwards, and it was well established by the end of the 16th century despite the dissolution of Bermondsey Priory in 1538. Nearby excavations have revealed late medieval to post-medieval buildings fronting onto the high street (Killock 1999; Wooldridge 2003). These sites both revealed a sequence of masonry foundations with hypothesised timber superstructures and associated courtyard areas. Away from the raised road, however, early maps show open ground with animals grazing and drainage channels feeding from the wet backlands.

The economy of Bermondsey became increasingly dominated by tanning with the marginal land here being ideally suited to this pungent industry. Ditches and tidal streams provided a ready supply of water, essential for the processes associated with this industry, and this area was also within easy access of London's markets. The necessary raw material – animal hides – was obtained from nearby slaughterhouses for livestock and cattle driven in from Kent. Cartographic records from the 18th and 19th centuries depict the increasing density of tanneries and development. The area now occupied by 156–170 Bermondsey Street appeared typical, with houses fronting onto the high street and the property boundaries of yardage behind.

## **The archaeological sequence from the late medieval period**

### **DRAINAGE CHANNELS**

The earliest feature on the site dated to the late medieval period (fig 2), and because of its lack of associated cultural material it appears to pre-date the construction of buildings along this side of Bermondsey Street. It comprises a substantial east–west ditch, 2.50m wide x 1.50m deep, which was cut to channel slow-flowing water through the marshland, silting with seasonal water-lain deposits. The clean, horizontal laminations of its fill showed no disturbance in their deposition, nor, as stated, did they provide any finds save for a charred *Cyperaceae* sp. seed. The ditch represented the first attempt on the site to drain the area, but the ground surface clearly remained marshy and inhospitable. Once the drainage ditch had fully silted, a layer of material was dumped in an endeavour to consolidate the land. Pottery, including ubiquitous Dutch and German imported wares, dated the latter layer to the late 15th century.

### *A late 15th century drainage network*

A further two substantial drainage ditches were cut to form part of a presumed network of channels dating to the late 15th century. An east–west ditch exposed in trench 3 during the evaluation measured 4.60m long x 1.80m wide and a north–south ditch recorded by excavation of trench 1, was found to be 3.20m wide x 1.25m deep (fig 3). Both ditches had an irregular arrangement of stakes along their edges. The wide variation in size, species and conversion of the stakes may indicate different fencing types – the larger from stake and rail fencing and the smaller from wattle.

The two ditches showed a very similar sequence of silting. The primary fill of each dated from the late 15th century, with successively dated fills deposited into the early 16th century. The waterlogged fills reflected their depositional environment. Particularly striking were a number of cow skulls seen in section, which had evidently been dumped down the side of the ditch, slopping into the fine organic silts. Among pottery types recovered were imported stonewares including a complete Raeren stoneware drinking jug, which is considered to be a type fossil for the period. This was found together with a well-preserved leather hinged wooden patten and a large stitched leather panel in the secondary fill of the east–west ditch (figs 4 and 16). Leather recovered from both ditches included distinctive shoes that span the

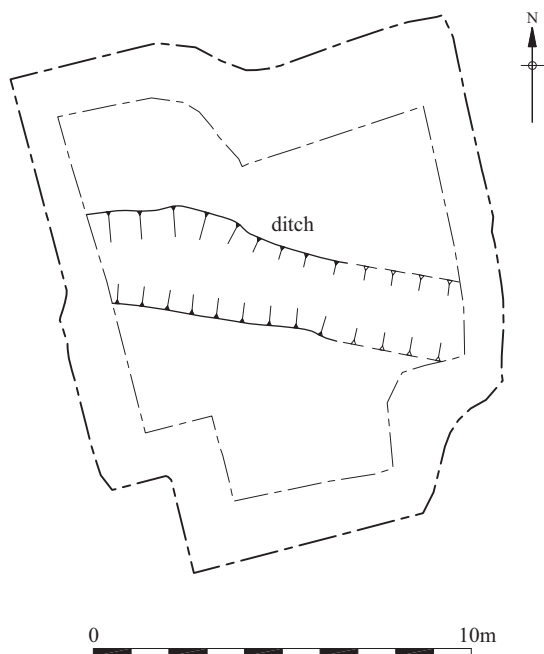


Fig 2 Bermondsey Street, Southwark: late medieval drainage channel.

transition of the turnshoe to the welted shoe construction, dated to around 1500 (Cherry 1991; Mould 2003). Separate shoe components and a pair of deliberately cut two-part quarters were suggestive of cobbling debris. Tanning and related industries such as cobbling are known to have been growing in importance in Bermondsey at this time; however, the contemporary bone assemblage showed no industrial bias towards tanning.

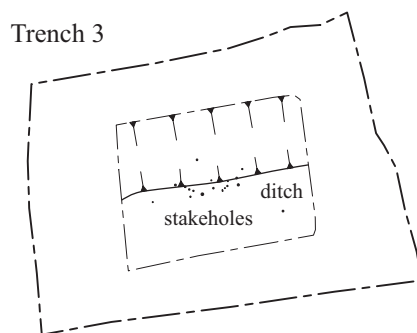
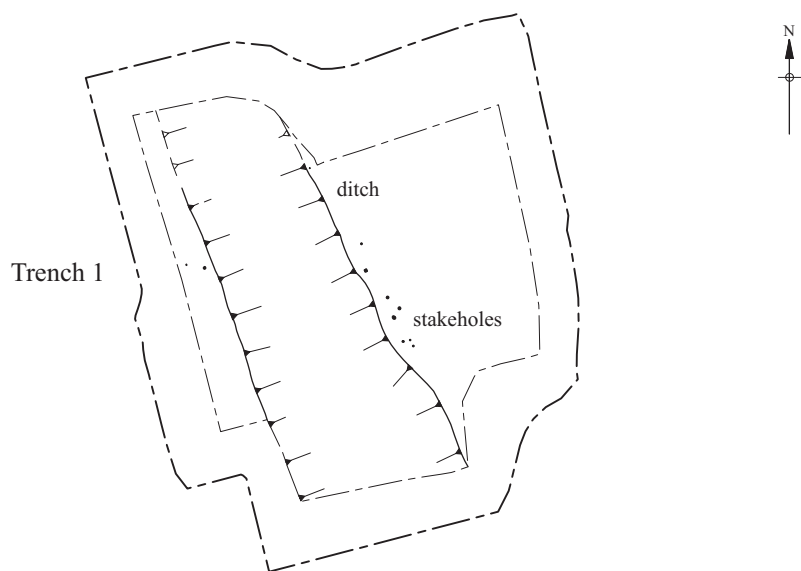
#### DITCH CROSSINGS

##### *A causeway with wattle and plank revetting*

A series of strategies to manage and cross the ditch and its fills was evident in trench 1. To the north and south, recuts removed the original series of silting deposits from the ditch leaving a low, wet causeway across it. Stakes were revealed to the east, which may have bordered an approach to this causeway, consolidated in the early 16th century with a series of dumped deposits over the remaining ditch fills. A timber revetment was erected across the ditch within the southern recut (figs 5, 6 and 11). This comprised a c 1.8m wattle hurdle with oak and elm boards, all second-hand, representing the fairly cheap construction to be expected in this marginal area. The revetment, supported by a series of stakes, held back the remaining ditch fills and dumped material. These subsequently slumped, pushing the revetment to lean southwards. This movement prompted the erection of a second phase of taller supporting stakes. A detailed study of the revetment components is presented below, highlighting the significance of the wattle hurdle.

##### *The remains of two or more footbridges*

Towards the north of the trench, waterlogging had preserved the remains of a timber footbridge that spanned the cleared out portion of ditch (fig 5). Parallel timber piles were still found to carry two small trestles. These would have once supported a narrow plank walkway



0 10m

Fig 3 Bermondsey Street, Southwark: part of the late 15th century drainage network.



Fig 4 Bermondsey Street, Southwark: shoe patten from a late 15th–early 16th century ditch fill.



Fig 5 Bermondsey Street, Southwark: an early 16th century revetted causeway and footbridges.



Fig 6 Bermondsey Street, Southwark: the early 16th century wattle and board revetment.

(c 0.70m wide) and formed a bridge nearly 4m long. Associated timber piles on the southern edge may have been the remains of a handrail (fig 12). To the east, planking had been set on edge to help prevent the collapse of the ditch sides at this area of focused activity. Rubble dumps around the pile bases possibly acted as packing to secure the structure and contained pottery dating to the early 16th century. The bridge trestles were later supported by small cross-beams only long enough to gain purchase in the silt, which had accumulated over the rubble packing.

To the south of the excavation an east–west structure of assorted piles and stakes was revealed. Although no cross-pieces survived, the structure showed evidence of an eastern abutment, and was interpreted as a footbridge akin to that further north. The large number of stakes and their varied nature (large oak roundwood, with some elm and possibly willow or alder) suggested that there were actually several phases of activity. In addition to footbridge elements (including possible handrail supports), the bases of causeway revetting may also have been present.

#### *Material surrounding the bridges*

Surrounding these structures, layers of dumped deposits raised the ground level (to north and south) to 0.56m OD, leaving the top of both footbridges still just exposed. The rubble packing around the northern footbridge was sealed by a dump of bark chippings. These almost certainly originated from tanning, which requires the prolonged soaking of hides in a solution containing oak bark. Dating was secured for this activity by the overlying deposit, which contained an early 16th century Montelupo dish sherd and the base of a stoneware jug dated 1550–80, showing that this layer was deposited after the mid-16th century. Faunal remains from these deposits showed an increase in the number of sheep metapodials, implying the first bias towards tawing (the process of converting hides into leather using salts rather than tannin using bark). Also of interest were a number of lath fragments from the cladding of a demolished timber-framed building, discussed below, and a copper-alloy object with decorative inlay thought to be a purse loop (G Egan, pers comm, fig 7, no 3).

The equivalent deposits around the southern bridge dated to the early 16th century. Once again, interesting small finds were retrieved, including a late medieval or post-medieval iron spur with large rowel still in place, and an imported Raeren stoneware spindle whorl (fig 7, no 2) (Gaimster 1997, 248, no 104; Keys 2002). Other finds from these contexts included a fragment of a copper-alloy vessel with reinforced edge and two holes that may once have been used to fix a handle, and an iron bar that retained hammerscale on its surface. This, and a possible punch or an awl, may represent material from a smithy. Aside from the small

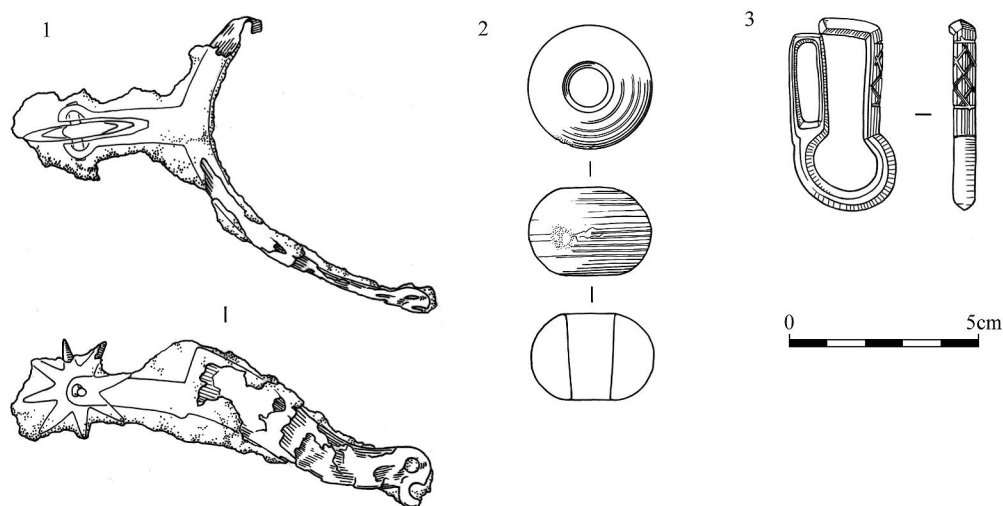


Fig 7 Bermondsey Street, Southwark: early 16th century spur, spindle whorl and purse loop.

finds, these deposits contained a noteworthy assemblage of imported pottery including Spanish and Italian wares (see Jarrett, below).

#### LATE 16TH–17TH CENTURY

##### *Tanning*

A timber-lined tanning pit, at least 5.00m in length, was just exposed in the section of trench 2 (fig 8). Although the top had been lost to modern truncation, it was set well into the underlying peat, and must therefore have been of a considerable depth. Planking and a supporting stake from this structure were sampled and found to be of cheaply imported Norwegian or Baltic pine, similar to tanning pits on other Southwark sites (Elsden 2001, 279). The fills contained a particularly high incidence of sheep horncores and also a large quantity of animal hair, which appeared to be sheep's wool and horsehair. This formed almost felted layers that had evidently accumulated over some time. The filling of this tank was dated to the late 16th to early 17th century by finds including part of a yellow glazed Border ware upright candlestick, a welshed shoe and a leather strap with buckle holes.

##### *Land consolidation and pitting*

In trench 1, a yellowish-grey silt was dumped over the structural remains of the disused footbridges in the mid to late 16th century, datable from the pottery assemblage, which included sherds of a green-glazed post-medieval slip-coated redware chaffing dish and two Dutch sgraffito bowls. Two further layers covered the extent of the excavation, showing large-scale land consolidation with dumped material to 1.37m OD. A remarkable concentration of eggshells was seen in the upper layer, which was evidently still waterlogged as indicated by the good survival of many wood fragments. The pottery from this layer, including the mouthpiece for a green-glazed Border ware whistle, suggested a deposition date between 1580 and 1600.

Several small pits and postholes cut into the new ground surface indicated land-use, but they did not form a coherent pattern. They contained pottery, stretching across the 17th century in date, including two separate sherds of post-medieval redware sugar moulds with an internal white slip. The various fills produced the earliest finds of clay tobacco pipe and glass on site. A curving fragment of glass tableware was found, made from a good quality



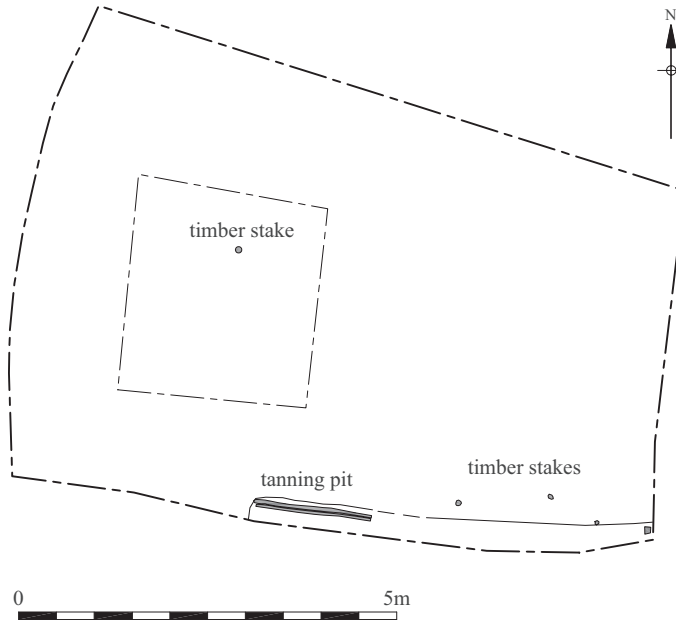


Fig 8 Bermondsey Street, Southwark: tanning in the late 16th to early 17th centuries.

clear metal (glass in a molten state), probably from a 16th century bellied tankard or small flask. A fragment of window glass with a grozed edge was also recovered which, due to its thickness and weathering, probably dated from the late medieval period or 16th century (Willmott 2003).

The excavation area was covered with a dark, friable dump layer varying between 0.15 and 0.50m in thickness that levelled the ground. Border wares and post-medieval redwares (including a sugar cone mould and syrup collecting jar) were among the pottery closely datable to 1690–1700. The condition of this deposit suggested that the area was no longer waterlogged, and therefore it provided a surface suitable for subsequent activity.

#### 18TH–19TH CENTURY

##### *18th century yardage and alleyway*

A timber cask was set into the dark levelling layer (fig 9). The boards that comprised the base or 'head' were thin and not edge joined, suggesting that the cask was for dry goods or viscous material. Thick traces of tar on the inside of the cask indicated its original function as a tar barrel. The material filling the barrel contained a high incidence of sheep horncores, supporting the proposition that it was re-used for processing animal hides. Pottery in the backfill was of 17th century date and included some interesting pieces, particularly a fragmentary green-glazed Border ware dish with very unusual stamped decoration. Fragments of a late 17th–early 18th century onion wine bottle, and a 1690–1710 clay pipe bowl were also found. When combined with the accurate dating of the previous layer, the finds secure a date for the backfilling of this feature early in the 18th century.

A clinker-rich levelling layer, sealing the re-used tar barrel, was laid to support a north–south flint cobble and red brick surface with a central shallow brick culvert (fig 9). This yard or alleyway had undergone many repairs, with 18th century pottery found among the masonry, including a further example of an internally white-slipped post-medieval redware sugar mould. The construction of an east–west covered brick drain truncated the earlier

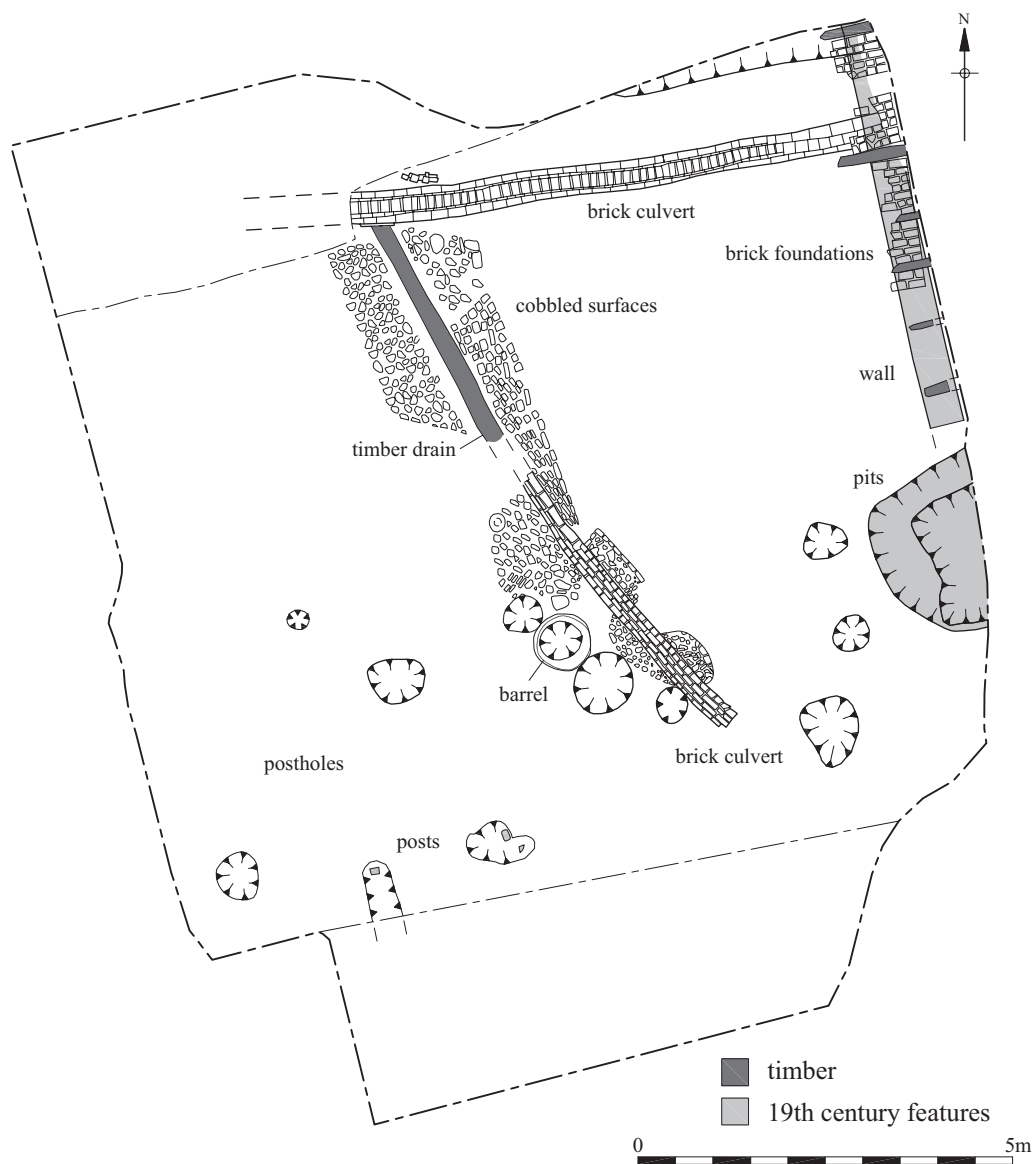


Fig 9 Bermondsey Street, Southwark: draining an 18th century yard area.

culvert; however, the drainage network was restored by the insertion of a connecting wooden drain. In the first half of the 18th century, broken fragments of clay tobacco pipe settled in the silting of the hollowed timber drain, almost certainly when three peg tiles were used to block the effluence into the brick drain. This latter drain is thought to have run from buildings fronting onto Bermondsey Street (beyond the limit of excavation to the east) and appears to have continued in use until the late 18th–19th centuries.

#### *19th century yard space*

A north–south wall was built over the 18th century covered brick drain, incorporating it into the foundations. These were of red brick, built around re-used cross-ways wooden bearers

with sill planking (fig 9). Such foundations are relatively common in the late 17th–19th centuries, and have been found to incorporate re-used ship timbers (Goodburn 2010). Distinctive pottery within the fill surrounding the foundation dated the wall to the early 19th century.

Throughout the 18th and 19th centuries, various pits and postholes were cut into the aforementioned dark levelling layer and cobbled surface, showing increased activity on the drier land. Glass waste appeared in the assemblage, namely pot metal with gall (debris which originates from the frothy scum that floats on hot glass) and moil (the waste piece of glass left on the blowing iron) fragments. The colour and quality of the glass suggested that there had been a production site operating in the vicinity during the late 17th or 18th century (Willmott 2003). A 19th century assemblage of clay pipes was retrieved from the fill of a large pit to the south of the wall (incidentally, the source of many cattle horncores). This group included a ‘Turks Head’, which was probably associated with a local public house, with the spur initialled W ?C. Two bowls initialled J C had an oak leaf border on the front of the bowl, one also with a circular incuse stamp on the back with ‘J. Critchfield’ in serif lettering. James Critchfield was a known pipe maker in Bermondsey between 1828 and 1894 (Jarrett 2002). This feature was the latest on the site, and was sealed by a series of dumps forming successive yard surfaces throughout the 19th century. The layers of tile, gravel, industrial waste, mortar, sandy silt layers and cobbles raised the ground level to that of the modern car park foundation.

## The finds

THE WATERLOGGED WOOD AND TIMBER, by Damian Goodburn with Rowena Gale

*Woodwork associated with the north–south late 15th century drainage ditch*

The stakes from the edges of the channel were made from a variety of materials, including small oak roundwood stems, cleft ash offcuts, split oak poles and cleft oak sections more than  $c$  100mm<sup>2</sup>. All the lifted examples had points made with a rather small-bladed, none-too-sharp hatchet, very atypical for this period. Records of traditional wattle workers tools of the 19th century occasionally show small narrow hatchets (‘nug’ axes) used for rod cutting and stake pointing. Most likely, this is the *ad hoc* work of a plot holder using assorted leftover and second-hand material worked with a domestic hatchet.

### *The board and wattle revetment*

The weathered oak plank was pierced with five peg holes running down the centre; four of these contained cleft pegs. One end of the plank was rounded slightly and the other sawn across for re-use. When the hidden face of the plank was cleaned, complex and evidently deliberate race knife (hooked timber marking knife) cut marks were found, but were not intelligible (fig 10). The elm plank was less weathered but clearly second-hand with four  $c$  20mm diameter peg holes and three iron nails. The plank, which was hewn on one face and sawn on the other, had a thin cream surface layer that was probably a form of paint or limewash. The origin of both planks remains obscure, but the similarity in the peg holes suggests that they may have come from the same structure, probably a form of machinery. Sawn elm planking was a commonplace material from 16th century London providing a cheaper, less durable, alternative to oak (Goodburn 1992, 125).

The wattle hurdle was 1.84m (6ft) long and 0.7m high (although it would probably have been at least 1.2m high originally). It had eight uprights or ‘sails’ rather than the nine or ten typical of recent hurdles (Tabor 1994, 133). All the elements were left whole with the bark on rather than split in half as with recent hurdles. The rod and sail ends were cut with a sharp flat-bladed hatchet or billhook to form a simple chisel point. Many of the horizontals or ‘rods’ were twisted round the end sails and woven back into the body of the hurdle to lock the weave and prevent unravelling. A type of ‘waleing’ weave, where the rods are woven

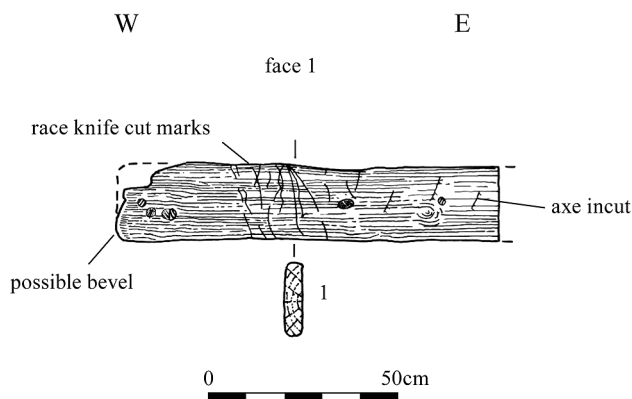


Fig 10 Bermondsey Street, Southwark: race knife marks on the oak board re-used in the wattle and board revetment.

around each other as well as the sails, was used, forming a strong rigid weave. 'Randing' was also seen, where rods weave simply through alternate sails in groups of up to four or possibly more rods at a time; an economical but weak weave (fig 11).

Portable, tightly woven wattle panels are usually found to have been carefully made of regular materials by skilled workers, whereas wattle woven *in situ* for fencing, revetting etc, has often been crudely made by plot holders of heterogeneous materials immediately to hand (Goodburn 1994, 61). In general, the impression given is of skilled wattle hurdle-making with good quality, rather uniform, rods. The hurdle was probably originally used for folding sheep, or for light temporary construction work. The hurdle contrasts with the larger, rougher and more robust examples found revetting the late medieval mud wall at Bermondsey Wall West (Goodburn 2010). The hurdle also shows much greater regularity and skill in weaving than *in-situ* wattle work of approximately the same date found at Abbots Lane, Tanner Street, and other sites in north Southwark (Elsden 2001, 276; Goodburn 2009).

The wattle was sampled from the well-preserved cut butt ends of rods and sails. Thin-section analysis using standard techniques (Gale & Cutler 2000) found the age and diameter of the roundwood and, when possible, season of felling. Twelve rod (or weaver) samples were examined; eleven of *Quercus* sp. (oak) with one *Corylus avellana* (hazel). The majority showed seven years' growth, although some showed six growth rings, and one weaver, just five. Their

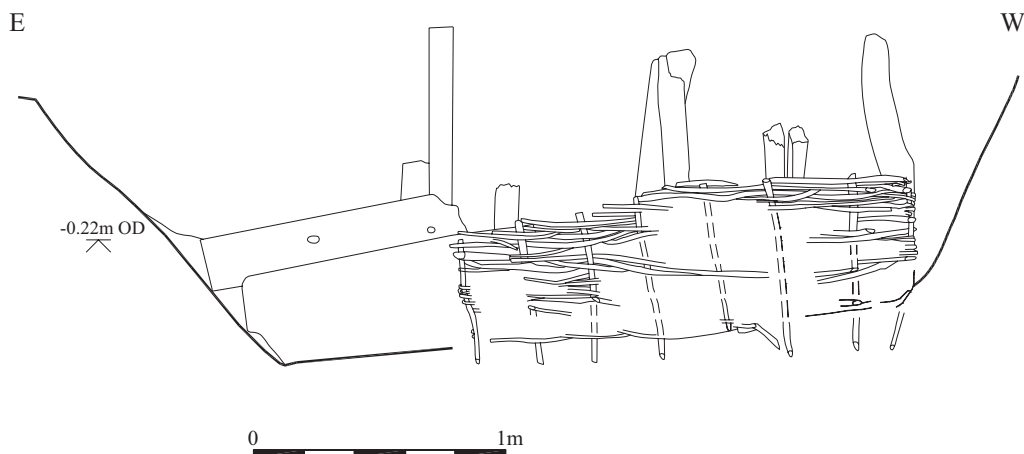


Fig 11 Bermondsey Street, Southwark: the well-preserved early 16th century wattle hurdle.

diameter ranged from 15 to 30mm, with most measuring 20–25mm. A moderate growth rate was noted, and nearly all examples were felled when dormant; one was possibly felled in late summer. Each of the eight sails was sampled. Seven of these were *Quercus* sp. with one *Corylus avellana*. These had six to eight growth rings, and were very similar to the weavers, although three of the eight were cut in the early or late growing season.

Recent archaeological work in south-east England is bringing to light changing patterns in wattle construction, with this hurdle giving a significant new insight. Oak is generally thought of as providing timber and firewood, although very young oak stems, coppiced after three years, have been found in refined wattles from the Bronze Age to high medieval periods. Wattle made with stems of the age seen here is rare in species other than hazel. Later periods see the use of older rods, but the stems are split in half, for example the 9- to 10-year-old hazel rods typical of the late 18th–20th centuries. A very fragmentary hurdle from Hay's Wharf, Southwark suggested that this change from young to old, split, stems began in the 16th–17th centuries (Goodburn 2009). Here, at the beginning of the 16th century, there is a hurdle clearly demonstrating the transition between ancient and later post-medieval practices in woodmanship and wattle hurdle-making.

#### *The northern footbridge and associated timbers*

The remains of a simple, small bridge were found across the ditch, comprising a pair of parallel trestles. Each trestle was made of a pair of fast-grown oak roundwood piles, bridged by a slightly decayed and compressed oak cross-piece. The eastern cross-piece was pegged on to the pile head while the western cross-piece was slightly notched to fit the pile head and then secured with an iron nail, possibly representing different phases of work. The length of the cross-pieces implied that the decking was no more than 0.7m wide, and probably comprised two planks. If the trestles were evenly spaced across the ditch, the length of the bridge would have been *c* 3.8m. Just to the east, 30mm-thick sawn elm planking was set on edge to form an abutment to the bridge, supported on the western side by roundwood piles (fig 12). Along the southern edge of the bridge, an irregular line of assorted piles may have been the remains of handrail supports, while a pair of pit-sawn oak piles may signify a later, higher trestle.

Short-span pedestrian bridges do not need elaborate supporting structures, and the middle of the span need only have been supported by a pair of uprights. Documentary sources describe this method for a rather larger pedestrian bridge over the ditch next to the Rose playhouse (LMA: SKCS October 1605). The simple work could have been carried out by a small gang of semi-skilled men with a simple tool kit and either a heavy hand-held pile rammer or a light piling rig.

At less than *c* 0.7m wide, the bridge would have been unsuitable for wheeled vehicles, and livestock must have been carefully controlled, especially in the wet conditions of this area. The levels suggest that the bridge would have been under water for much of the day in the 16th century unless the mud walls and sluices of the Thames frontage were very efficient and carefully managed. It is evident that the bridge was partially dismantled, as some structural items lay within deliberate dumps of material infilling the ditch.

#### *Woodwork preserved in deposits surrounding the northern bridge*

Several large sections of lath from lath and plaster or render cladding of a demolished timber-framed wall were found in the deposits surrounding the piles of the northern bridge. They varied between 38 and 45mm wide and were *c* 4mm thick. Three of the largest sections are shown in figure 13. The bulk of the laths were of oak heartwood, radially cleft for strength and low shrinkage. Very unusually, one of the laths found was of radially cleft beech, showing traces of woodworm. Beech lacks the resistance of oak to borers and decay, and it is known from documentary sources that beech laths were far cheaper – about the same price as the

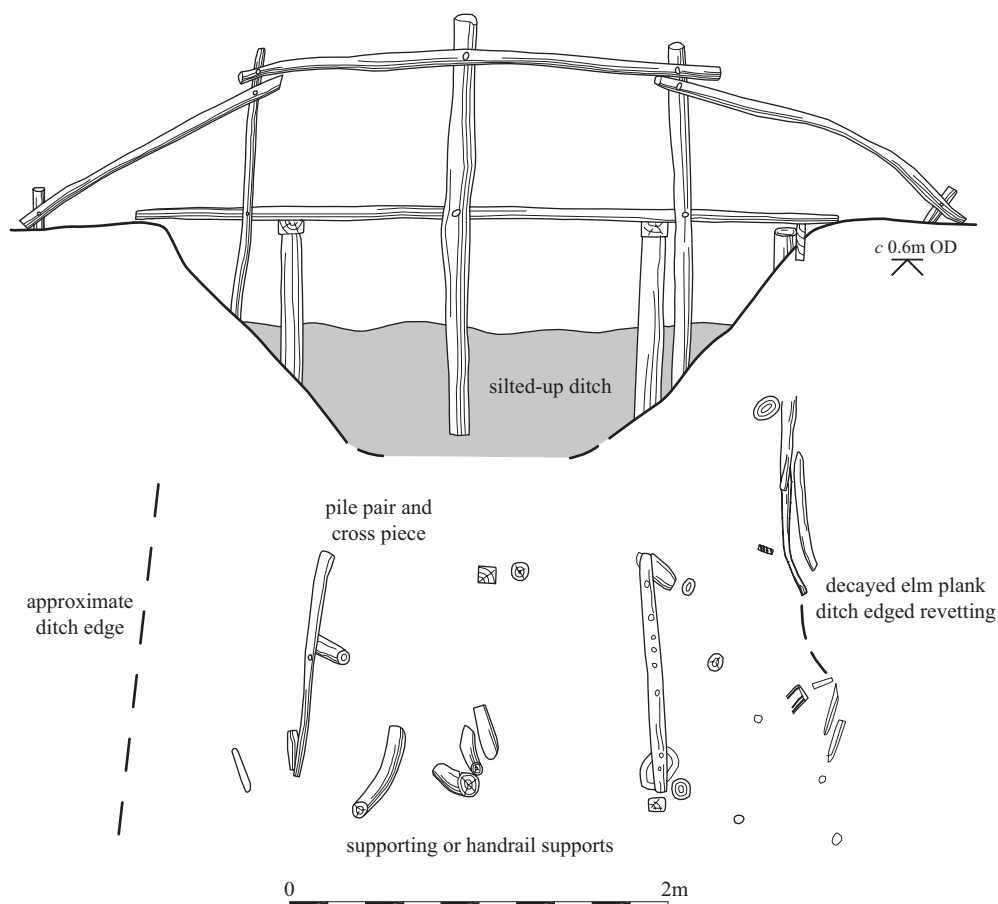


Fig 12 Bermondsey Street, Southwark: a sketch reconstruction of the early 16th century footbridge.

much less durable oak sapwood laths (Salzman 1952, 240). These examples had been secured with small iron nails with shanks  $c$  2–3mm square, the spacing of which suggested that the laths covered large timbers in the wall or ceiling frames. This means that the parent structure was rendered and or plastered (possibly even pargetted) so that the main beams, posts and braces were not visible as they are in the reconstructed Globe Theatre and many extant 16th century buildings in south-east England.

### Conclusion

The site provides a window on the relatively cheap and casual woodwork found on the south-east urban fringe of London. The nature of the materials and weave of the re-used wattle hurdle from London has been compared with other examples of wattle hurdles and woven *in-situ* wattle from London and has been shown to exhibit intermediate characteristics between those of typical medieval and recent wattle hurdle-making. The evidence for the construction of simple footbridges in the 16th century using cheap, probably local, materials is quite clear. This can be set against the varied evidence for higher status, more elaborate carpentry from London's Tudor and Elizabethan waterfront, such as the timber-framed quays found at Victoria Wharf, Limehouse (Tyler 2001). The laths recovered from around the northern footbridge were of cleft oak and the very rarely preserved beech. These provide evidence of London's late medieval building techniques and materials.

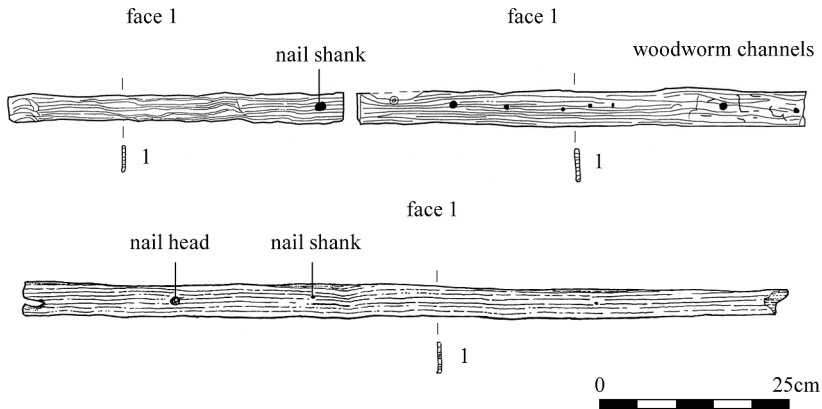


Fig 13 Bermondsey Street, Southwark: details of selected oak and beech lath fragments from the late 16th to 17th centuries.

#### THE POTTERY, by Chris Jarrett

The assemblage comprised a total of 654 sherds from 63 contexts dating from the medieval period to the 19th century. There are also two residual Roman sherds.

##### *Medieval surface layers*

The upper reaches of the medieval alluvial deposit produced two sherds of South Hertfordshire greyware (SHER), dated 1170–1350, one belonging to a jar decorated with an applied vertical strip of clay. Single sherds of Early medieval sand and shell ware (EMSS), dated 1050–1150, a sherd of London-type ware (LOND), dated 1080–1350 with an external white slip and green glaze, and a sherd of Sandy shelly ware (SSW), dated 1140–1220. The sparse amount of medieval pottery recovered probably reflects the wet, marginal landscape surrounding Bermondsey Abbey. The earliest dumped layer in trench 1 produced late medieval pottery such as Coarse Border ware (CBW), including a red-slip decorated sherd probably from a cistern (CBW CIST), dated 1340–1500, and the base of a Late London ware (LLON) vessel, dated 1400–1500. A sherd of Early Post-medieval redware (PMRE), dated 1480–1500 was also present together with fragments of a Yellow-glazed Post-medieval slip-coated redware (PMSRY) carinated bowl. Imported pottery included sherds of Dutch slipware (DUTSL), dated 1300–1650 in the form of a two-handled carinated bowl and the base of a bowl with pulled feet in Dutch sgraffito ware (DUTSG), dated 1450–1550.

##### *Successive fills of the late 15th century ditches*

In trench 3, the primary fill of the east–west ditch produced 15th century Late London ware pottery and included the base of a bowl or dish. Surrey whitewares were also represented by sherds of Coarse Border ware jugs and a 1380–1500 dated Tudor green ware (TUDG) cup also occurred, comprising a rim sherd with a handle. The secondary fill also produced sherds of late medieval pottery and included, among the Coarse Border wares, the rim of a flat-topped cooking pot (CBW CP FT), dated 1340–1500, while sherds of Cheam ware (CHEA) dated 1350–1500 were also present (Pearce & Vince 1988). Late London ware was present in the form of sherds from a bowl or dish, the rim of an internal lid-seated rounded jar and the thumbled base of a jug copying German stonewares (fig 14, no 1). The rim of a white-slip decorated pitcher and sherds of a bowl or dish and jug were found in Early Post-medieval redware. Imported pottery consisted of sherds of Raeren stoneware drinking jugs, including a complete example dated *c* 1480–1550, considered a type fossil for the period (Hurst *et al*

1986, 64). There was also a Dutch redware beaker with cordons on the top half of the body while the basal area was horizontally combed (fig 14, no 2). The top fill of this ditch contained much of the same pottery types as found in the lower fills, but of note is part of a Dutch slipware dripping dish. Also in this fill is the rim of a 15th century Midlands late medieval orange ware (MORAN) shouldered jug with an applied, pinched horizontal strip of clay at the base of the neck and a coarse green glaze below the strip (fig 14, no 3).

In trench 1 the large north–south aligned drainage ditch produced early post-medieval pottery throughout its fills. The earliest fill, dating from the late 15th century, produced sherds of a large Early Post-medieval redware rounded pitcher (fig 14, no 4) and sherds of a Yellow-glazed Post-medieval slip-coated redware jug. A later fill contained parts of both of these vessels, also sherds of Coarse Border ware, Early Post-medieval redware represented by fragments of a bowl and cauldron and the rim of a jar in Post-medieval bichrome redware (PMBR). There was also a largely complete yellow-glazed Post-medieval slip-coated redware rounded bowl of medium size (fig 14, no 5). The rim of a Cistercian ware (CSTN) vessel, dated 1480–1600 occurred and imports consist of drinking vessel fragments in Siegburg stoneware (SIEG), dated 1300–1630, Langerwehe (LANG), dated 1350–1550 and Raeren stoneware. Dutch redware and Post-medieval slip-coated redware vessels were also present. A later fill of the ditch produced more sherds of Early Post-medieval redware, large rounded pitchers or jugs and a small sherd of a Dutch slipware bowl or dish. Later ditch fills produced 16th century pottery such as the base of a possible cistern in Early Post-medieval redware and the base of a Cistercian ware cup or mug. Small sherds of Early Post-medieval redware and Raeren stoneware were found, with brown-slipped Siegburg stoneware (SIEB), dated 1450–1550 and Dutch redware in the top fill.

#### *Material surrounding the footbridges*

The packing around the northern footbridge produced sherds of a Saintonge green-glazed jug, dated 1250–1650, sherds of an Early Post-medieval redware jug and a Raeren stoneware drinking jug, indicating an early 16th century date for its deposition. Subsequently, more sherds of Early Post-medieval redware and a small sherd from a polychrome Montelupo tin-glazed earthenware (MLTG) dish (fig 14, no 6) were deposited. The internal blue ‘scale’ and orange border is comparable with Berti’s *genre 23, contorno a ghirlanda* dated 1480–1510 (Berti 1998, 115–16, plates 50–6). The final deposit surrounding the footbridge produced a fragmentary but largely complete Early Post-medieval redware cauldron with pulled feet (fig 14, no 7) and the base of a yellow-glazed Post-medieval slip-coated redware (PMSRY) straight-sided vessel with incised wavy line decoration that might represent a drinking vessel or vase (fig 14, no 8). Imported wares were represented by base sherds from a Raeren stoneware drinking jug, a Cologne or Frechen stoneware (KOL FREC) jug, dated 1550–80, and the shoulder of a Spanish green-glazed bottle (SPGR), dated 1480–1650.

The ditch was recut to the south, with fills surrounding the timber structures producing notable pottery groups. The primary fill included a sherd of Cistercian ware and the rim and wall sherd of a Dutch sgraffito rounded bowl (fig 15, no 9). Of special note were the Spanish wares present such as the rim and kicked base of a Seville blue and purple tin-glazed (Isabella ware) dish (fig 15, no 10), dated 1500–50 (Gutiérrez 2000, 48; Hurst *et al* 1986, 54–7). Also present was the base of an early 16th century Seville lusterware bowl decorated with a central leaf design in gold lustre surrounded by a broad blue band (fig 15, no 11). The fabrics were identified as coming from this region of Spain by their metamorphic inclusions (Hurst *et al* 1986, 54). The secondary fill of the recut ditch contained fragmentary pottery comprising Early Post-medieval redware, Siegburg, Langerwehe and Raeren stonewares. Particularly interesting in this fill was a Late Valencian (VALE) lugged bowl, decorated in yellow gold and with the lettering ‘.aon..’ on the inside wall (fig 15, no 12). Such lettering on Valencian lusterware is dated to between c 1474 and 1600, but the later inscriptions tend to be illegible (Gutiérrez 2000, 32, 35). Additionally, the rim of a Spanish tin-glazed earthenware dish



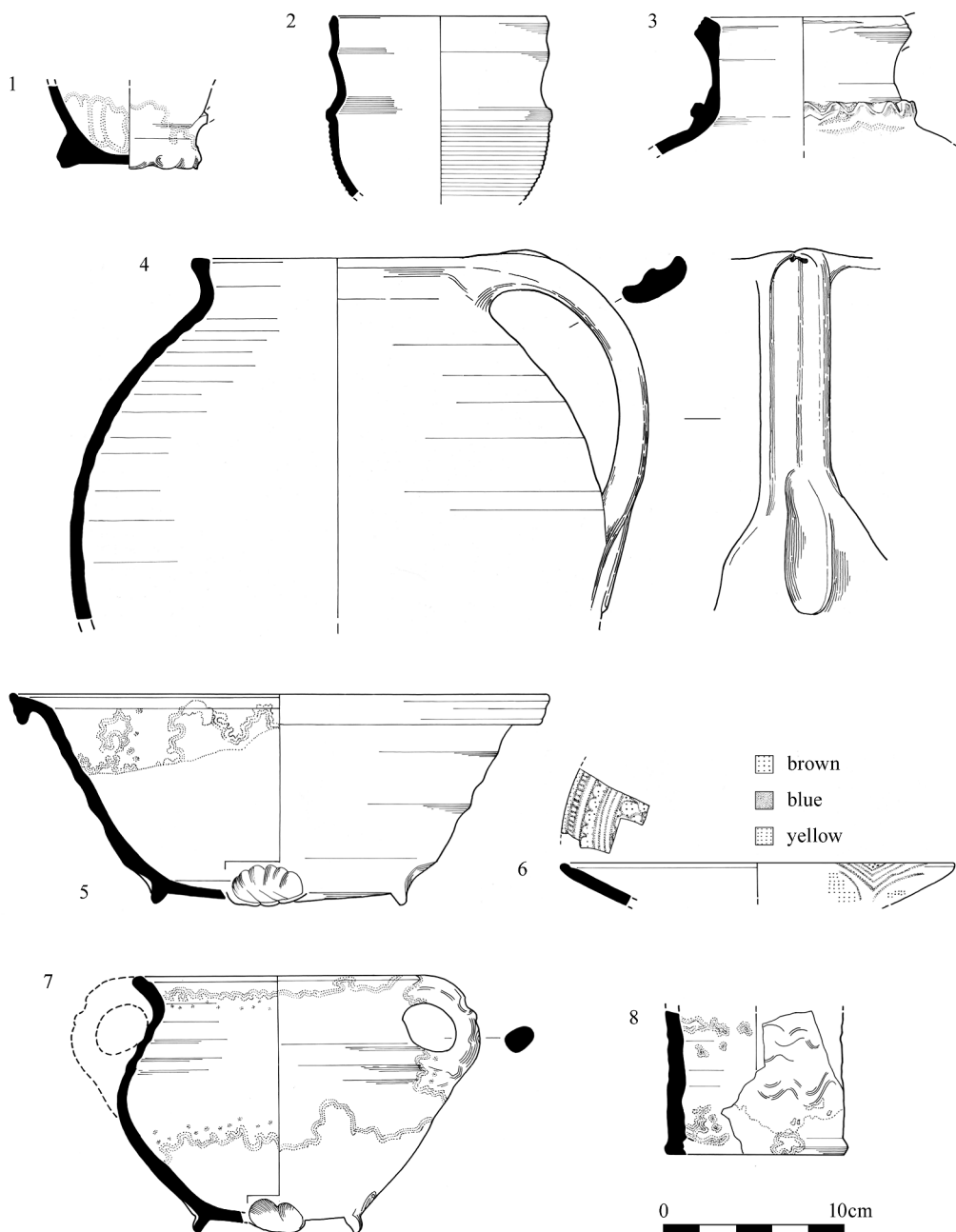


Fig 14 Bermondsey Street, Southwark: a selection from the pottery assemblage, nos 1–8.

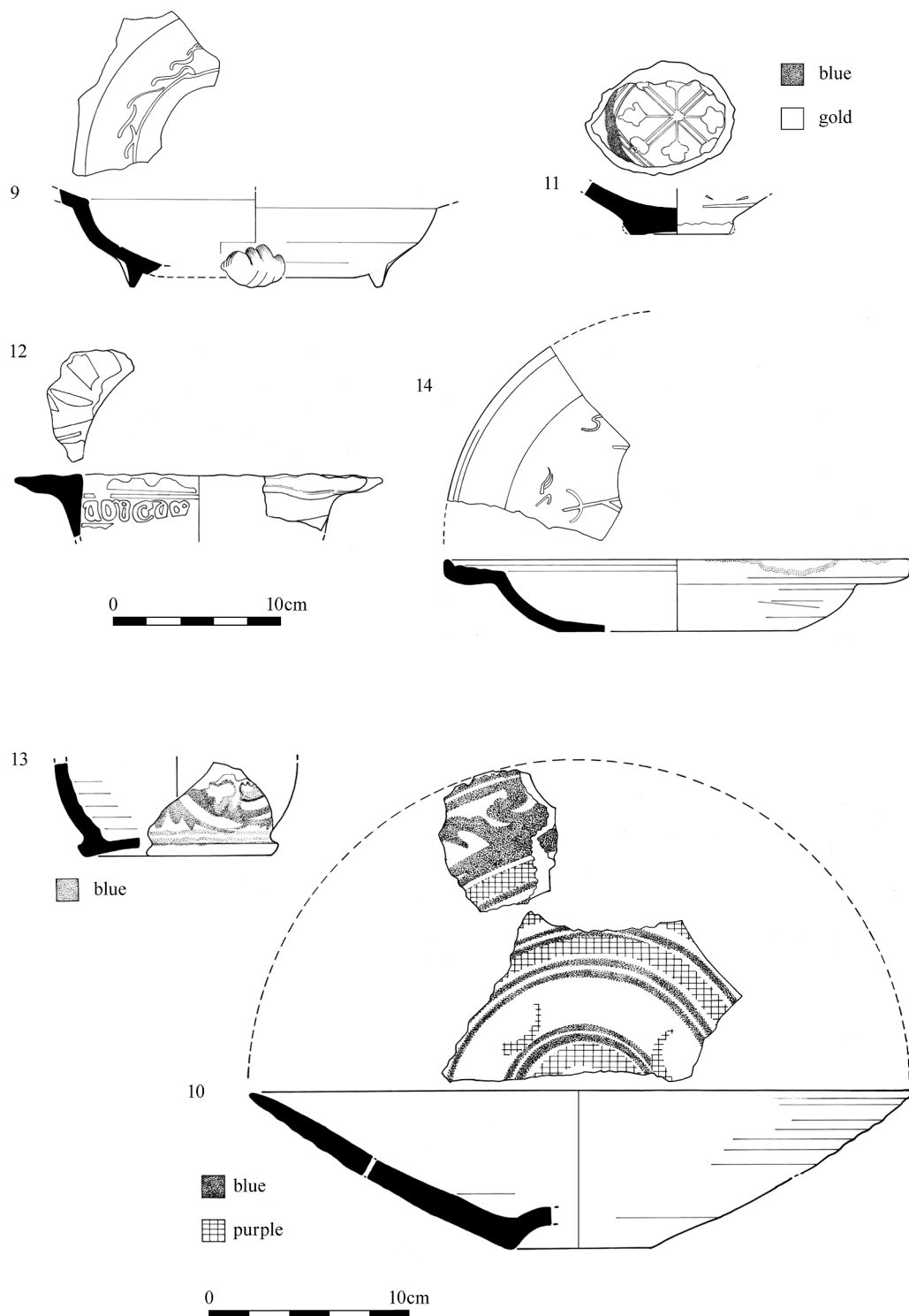


Fig 15 Bermondsey Street, Southwark: a selection from the pottery assemblage, nos 9–14.

(STGW) and the base of a blue and white Italian tin-glazed earthenware (ITGW) drug jar (fig 15, no 13) were present. There was also a small rim sherd of a Beauvais single sgraffito (BEAU1) dish, dated 1500–1630, while Dutch slipware was present in the form of sherds of bowls, a chaffing dish and a carinated colander.

### *Land consolidation and pitting*

Dumped material sealing the footbridges produced mostly sherds of 16th century local coarse redwares, including part of a green-glazed Post-medieval slip-coated redware chaffing dish, together with sherds of two Dutch sgraffito bowls (fig 15, no 14). There were also single sherds of an Early Border ware jug (EBORD) and a Martincamp type 1 (buff earthenware) flask, both dated 1480–1550, as well as a sherd of Tudor blackware (TUBL), dated 1480–1600. Two trench-wide consolidation layers showed dating spanning the 16th century. The shoulder of a Cologne stoneware (KOLS) drinking jug, dated 1500–1580 and a locally made vessel were found, the latter comprised the body and base of a green-glazed Post-medieval slip-coated conical jug or vase with cordons on the body, between which were deep diagonal thumb impressions (fig 16, no 15). Also of note was the mouthpiece for a green-glazed Border ware whistle. The base of a Surrey-Hampshire green-glazed Border ware bowl, dated 1550–1700 and the rim of a Post-medieval redware bowl, indicated a deposition date for the upper layer at the end of the 16th century.

The fills of postholes cutting into the highest of these consolidation layers contained pottery of a 17th century date, including sherds of Post-medieval redware (PMR) and Post-medieval fine redware (PMFR), also Border ware and Frechen stoneware. A single sherd of a post-medieval redware sugar mould with internal white slip is likely to date to the late 17th century. Sugar moulds with internal white slip are rare in waster deposits from the 1660–1680 dated phase 3 Woolwich kiln site, but are common from *c.* 1680-dated deposits elsewhere such as waster deposits at Deptford (Jarrett 2004; Pryor & Blockley 1978, 65).

### *18th century yardage*

A re-used tar barrel contained a pottery assemblage with some noteworthy vessels, including a Post-medieval redware porringer (fig 16, no 16), a Frechen Bartmann jug and a local Tin-glazed earthenware (TGW D) charger, decorated in a blue and purple geometrical design, dated *c.* 1650–75. Also of a similar date was the rim of a Dutch tin-glazed fluted dish with a blue swag on white design. There was also a fragmentary, but largely complete green-glazed Border ware dish decorated with a circular radial stamp (fig 16, no 17). These stamps occurred on the flat rim in groups of three, in four discrete sets, but between these were a group of two single stamps. There was also a single stamp in the centre of the dish. Decoration is very unusual on Border ware and when it occurs usually consists of combed lines. This example may be compared to 16th century Beauvais green-glazed ware examples as found at Site 6, London Bridge Street for the Jubilee Line extension (Knight 2002, 19, fig 27).

An unusual vessel (fig 16, no 18) was recovered from the fill of a pit cutting the cobble and brick surface. It was made of the local coarse red earthenware fabric, but with the addition of abundant organic material, possibly horse dung. A wall sherd and a splayed base with a groove on the side give a diameter of 240mm. Internally, there are two, plain circular ‘stamps’ with diameters of 9mm, at a distance of 26mm apart, presumably placed around the internal circumference of the vessel. The surfaces are oxidised and have occasional clear glaze splashes, while the core is reduced to a very dark grey. The rare occurrences of these organic-tempered medieval and post-medieval fabrics are often associated with industrial vessels or, as at Baltic House in the City of London, with bell moulds (Egan 2002, 48–61). With a surface too rough to act as a casting mould, the true purpose of the vessel remains unknown, but it probably had an industrial use. The vessel is dated by association with a 1680–1710 dated tobacco pipe.

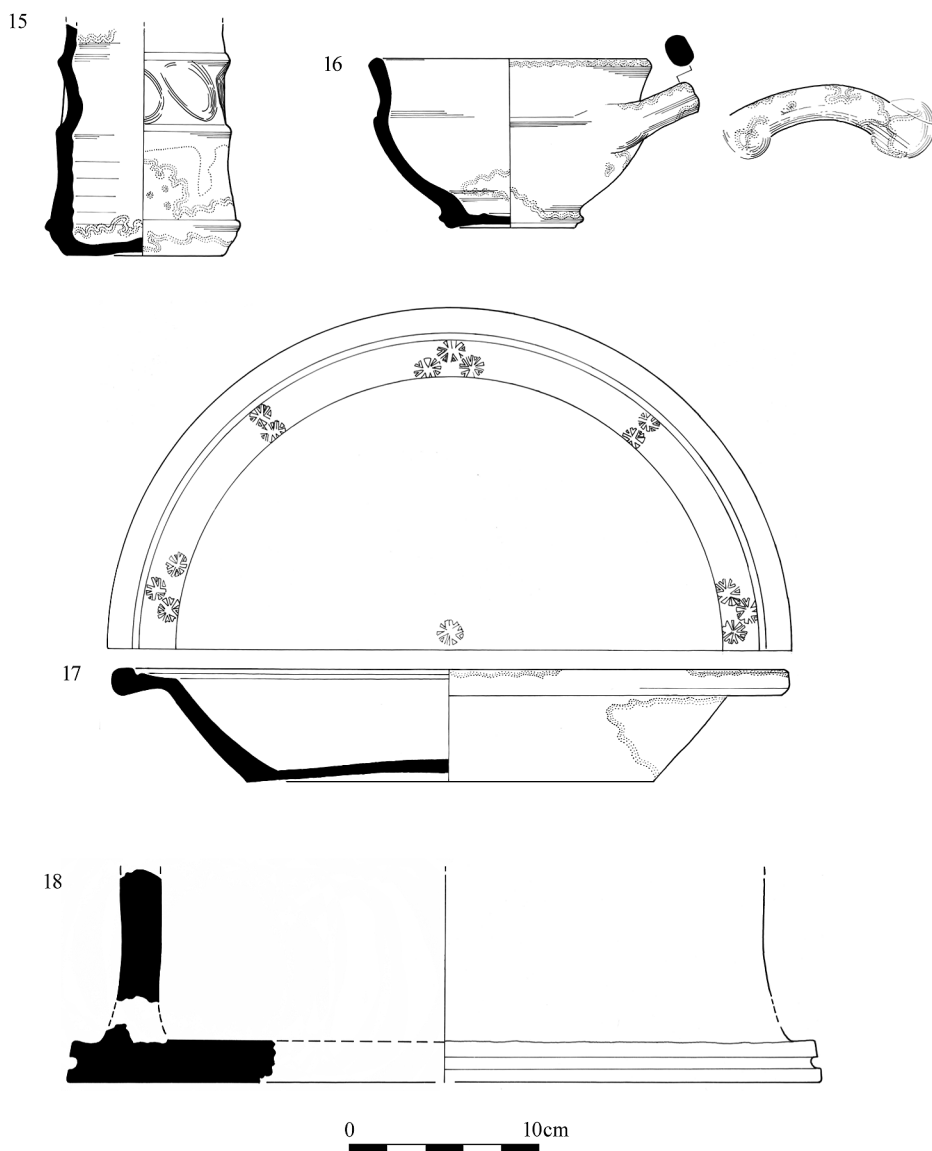


Fig 16 Bermondsey Street, Southwark: a selection from the pottery assemblage, nos 15–18.

### *Discussion*

#### Late medieval to early post-medieval transition

The 15th–16th century ceramic sequence on the site parallels the changes happening elsewhere in London. In the 15th century, London's pottery was mostly supplied from the Coarse Border ware industry, with smaller amounts of Surrey whiteware from Cheam, and the local redware, Late London ware. All these industries came to an end around *c* 1500 and the local Early Post-medieval redware, evident from *c* 1480, became the main pottery-type in London during the 16th century, providing mostly durable wares for the kitchen, table and storage. Dutch redware was a common import to London from the late 14th century,

as were slip-decorated and occasionally sgraffito decorated vessels from *c* 1450, offering the option of a better quality ware locally, while immigrant Dutch potters influenced the 16th century redwares.

Drinking vessels were supplied from the Surrey-Hampshire whiteware industries as Early Border ware, evolving into the Border ware industry of the late 16th and 17th centuries, but a counterpoint to these whitewares was Cistercian ware, a competently glazed redware produced at many places in the Midlands and Yorkshire. The former was a major supplier of drinking vessels to London, as were the German stonewares from Siegburg and Langerwehe, and between *c* 1480 and 1550 Raeren stoneware is conspicuous. Thereafter, Frechen stoneware was common in the form of Bartmann or Bellarmine jugs.

The transition, on site, from the 15th to 16th century was seen between the filling of the drainage channel and the archaeology surrounding the revetting and bridges. Coarse Border ware had been the dominant fabric in the ditch fills but small quantities appeared to be residual in later deposits. Early Post-medieval redware became the dominant fabric in the deposits surrounding the wooden structures, giving an early 16th century date. Other comparable early 16th century assemblages in Southwark have been published, for example Toppings Wharf and Fennings Wharf (Orton *et al* 1974; Pearce 2001).

### Imported wares

Imported pottery was present on the site from the earliest dumped consolidation layer and the channel fills, but as ubiquitous Dutch redwares and German stonewares. Interestingly, the uncommon Mediterranean wares were all concentrated in the aforementioned deposits around the revetting and bridging structures. The majority of these – Seville polychrome ware and lusterware, Late Valencian lusterware, Spanish and Italian tin-glazed ware and the Montelupo ware – occur as single vessels on the site. Their rare occurrence in London indicates that these pottery types were not normally traded and were more likely to have been personal items. The French Saintonge ware and Beauvais single sgraffito ware are more common in London, while the Italian tin-glazed drug jar and the Spanish green-glazed ware bottle may have been imported for their contents. Other sites on Bermondsey Street have also produced 16th century imported pottery in the form of a Spanish Green-glazed lebrillo from 175 (Jarrett 2001) and a sherd of Late Andalusian tin-glazed ware from 171 Bermondsey Street (Darton 2010). However, this site must afford one of the better assemblages of early 16th century imported pottery in the area, including those wares recovered from excavations within the precincts of Bermondsey Abbey.

Although finds of Italian and Spanish ceramic *exotica* are found throughout medieval and post-medieval London, in the 16th and 17th centuries they are more concentrated on the Thames riverside frontages of modern Southwark and Tower Hamlets and reflect maritime connections rather than trade. In these areas, sites with notable early post-medieval pottery assemblages with interesting imported wares include a deposit from the foreshore at Spice Quay, Shad Thames (Sabel & Jarrett in prep) and from a revetted channel at 12–26 Magdalen Street (Chew & Pearce 1999) as well as two sites on Narrow Street, Limehouse, (Killock & Meddens 2005; Tyler 2001). It would therefore seem likely that the early 16th century pottery from 156–170 Bermondsey Street might have come from a household occupied by either a merchant or someone with a maritime career or associations.

The presence of vessels associated with the sugar-refining industry on the site is of interest, although not surprising as sugar-houses tended to be located close to the Thames, but also close to slaughterhouses ('bulls blood' being used in the process of refining sugar from molasses). Southwark, being an ideal location on the Thames with a large tanning industry and accompanying slaughterhouses, has produced several sites with sugar-refining vessels, including West Court Yard, Shad Thames (WCW 98) and Swan Street (SWN 98), at the southern end of Borough High Street (Jarrett 2000; Sabel & Jarrett in prep).

## THE SMALL FINDS, by Märit Gaimster

Of particular interest is an unstratified belt fitting of cast copper alloy (fig 7, no 3: sf <37>). One arm is finished in a rectangular loop, while the other, engraved with cross-hatching, forms a spring with an L-shaped top. The base of the fitting, which measures 50mm in length and 22mm in width, forms a suspension loop. Parallels with purse frames and other purse fittings make an interpretation of this fitting as a purse holder plausible. In the 15th and 16th centuries, cloth or leather purses were suspended from belts by swivelling loops, and were held open by metal bars and often frames. They were frequently decorated with cross-hatching inlaid with niello (cf Egan 2005, fig 50, no 268; Margeson 1993, 40–41, fig 24, no 290). A purse frame in the Museum of London collections also has a swivel loop with a shape that echoes the Bermondsey Street find (Ward Perkins 1940, pl XXXIV.1).

A near-complete wooden patten associated with phase 8 (context 39, sf <1>), measures 268mm long, the equivalent of a modern size 5½. It consists of a flat wooden one-piece sole with pointed toe, and the shape suggests it was for a right shoe. Heel and toe straps would have been fixed with nails to the edges of the sole. Wooden pattens were commonly used from the late 14th into the early 16th centuries, with the wooden type, often hinged for comfort, used to protect the shoes and clothing from the mud and dirt in the streets. Leather pattens were overshoes worn indoors to protect the feet from cold (Egan 2005, 23; cf Grew & de Neergaard 1988, 91–105).

A find from phase 10 comprises a near-complete iron spur (context 206, sf <29>), with a large eight-pointed rowel (diam 30mm) still in place (fig 7, no 1). The spur has a short neck (L 30mm) and D-section sides that curve gently down under the wearer's ankle and with front ends rising to figure-eight terminals. Behind the heel, the upper edge rises above the neck. The spur is associated with 16th century pottery and has some parallels in a spur from Chelmsford in Essex (Cunningham & Drury 1985, 57 and fig 35, no 94). Spurs with similar eight-pointed rowels are also known from Tudor and Stuart period finds in London (Egan 2005, 184, nos 1053–4).

## THE LEATHER, by Quita Mould

*Introduction*

The leather principally comprised shoe components of 15th and early 16th century date with a single 17th century shoe and a small number of later shoe fragments. A stitched panel, strap fragments and a very small amount of waste leather were also recovered. It is estimated that at least 34 individual shoes are represented. Much of the assemblage appeared to be cobbling waste, as heavily worn soles and sole repair pieces were common while uppers were under-represented. Five shoe styles could be recognised: a side-lacing shoe/boot (fig 17, no 1) and a buckle-fastening shoe/boot (fig 17, nos 2 and 3) of 15th century date, a low shoe with buckle and strap fastening (fig 15, no 4), a high-throated shoe/ankle boot (fig 17, no 5) of 16th century date, and a 17th century latchet fastening shoe (fig 17, no 6).

*Late medieval to early post-medieval*

Components from three shoes of turnshoe construction, two having pointed toes of distinctly 15th century style, and a waste piece cut from the edge of a cow hide were found within the medieval redeposited alluvial clay of trench 3. The east–west drainage ditch truncating this layer contained shoes dated to the 15th and early 16th centuries. The remains of shoes of turnshoe construction, dating to the first half of the 15th century, were found in the primary fill. Single examples of a shoe or boot of cow-hide lacing at the side (fig 17, no 1) and fastening at the instep with a strap and buckle (fig 17, no 2) were present. A higher fill, mentioned earlier for the shoe patten, also preserved a large stitched panel (fig 18), 15th century shoe components including a low, buckle-fastening boot of calf skin with two-part quarters 150mm

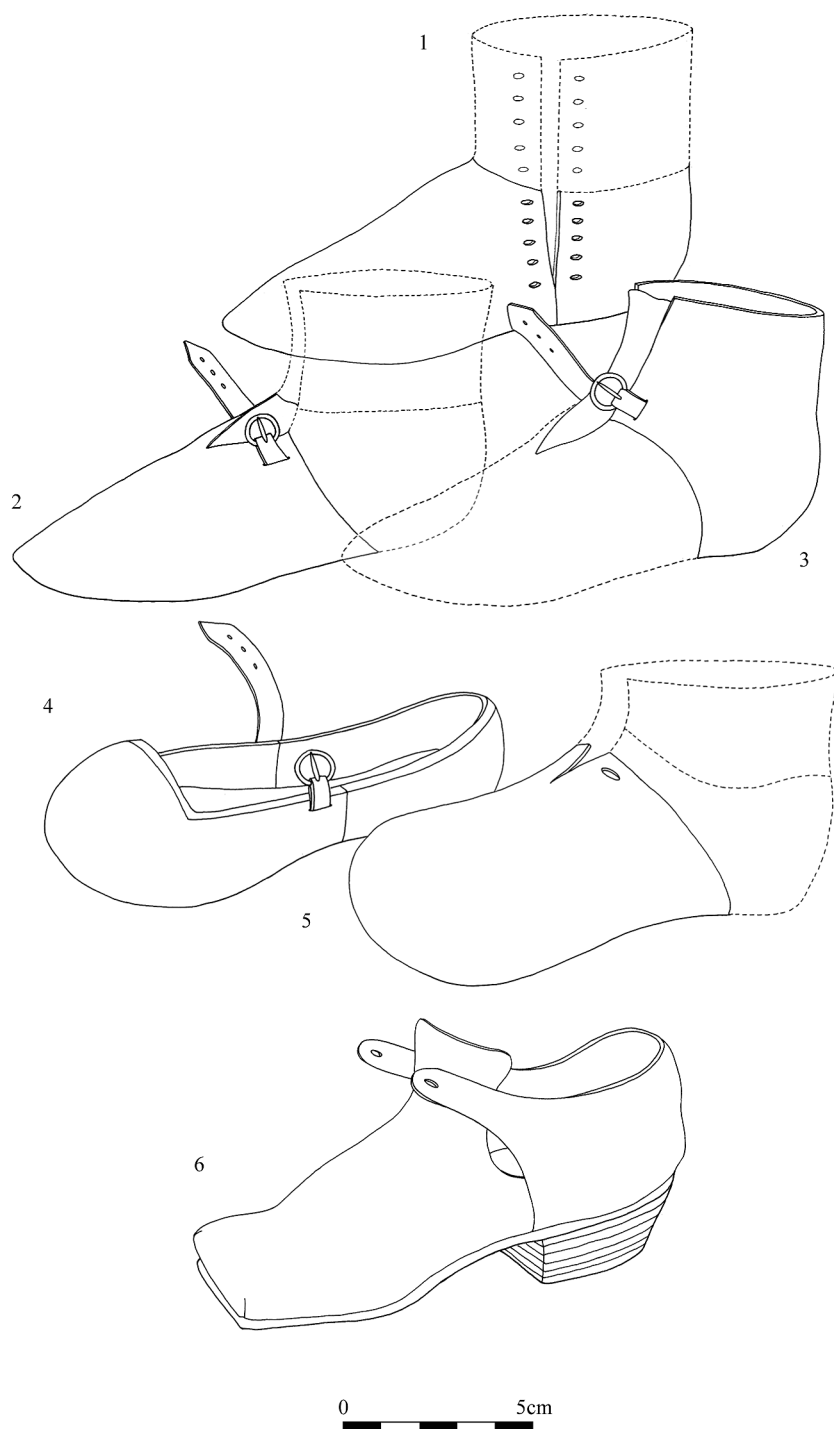


Fig 17 Bermondsey Street, Southwark: shoe styles found.

high (fig 17, no 3), and a single piece of secondary waste. The upper fill contained shoe components of later 15th and early 16th century date and a single piece of primary waste. The rectangular panel (fig 18) of 4mm thick cow hide, 418mm wide and originally more than 380mm long, may have come from the front panel of a large bag. Elliptical grain/flesh stitches mark the former position of three parallel straps, each more than 30mm in width and 135mm long, that had been sewn to the grain side of the panel. The lack of any thread impression on the flesh side of the panel suggests that it had been lined originally.

The north-south drainage ditch contained a single repaired sole of later 15th century type and shoes of early 16th century style. Shoes of the same distinctive Tudor shape made in both turnshoe and welted constructions were noted in the ditch fills with a pair of two-part quarters that had been deliberately cut, suggestive of cobbling debris. Shoe components of an early 16th century style made in both turnshoe and welted construction and a fragment of textile were found in a layer dumped to consolidate the causeway. Recuts of the ditch

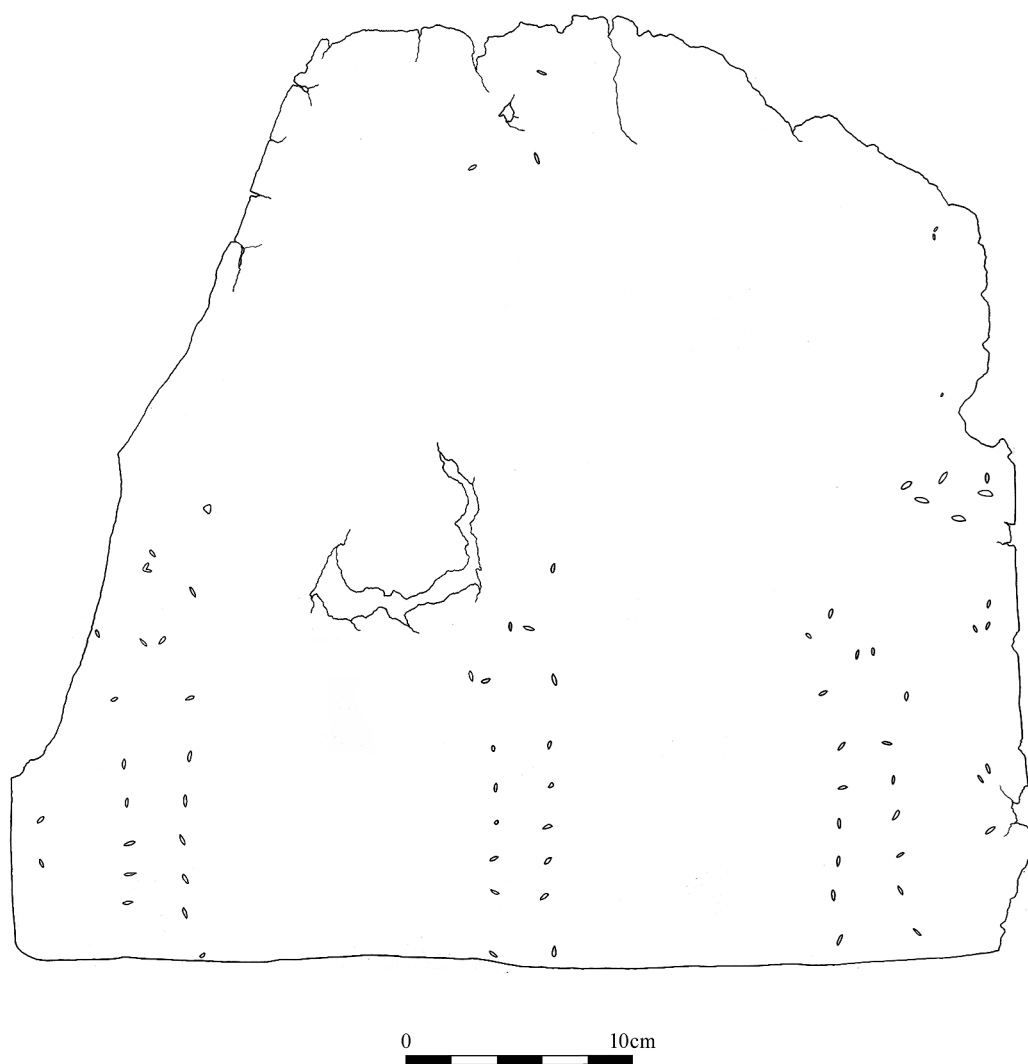


Fig 18 Bermondsey Street, Southwark: Late 15th-early 16th century stitched leather panel.



contained a low shoe that fastened with a strap and buckle across the instep (fig 17, no 4) and a high-throated shoe or ankle boot (fig 17, no 5), both of cow hide, and a heavily repaired 15th century shoe sole. Shoe components from a subsequent fill had again been cut up in a manner indicative of cobbling. The majority of these shoes dated from the reign of Henry VIII (1509–47).

### *17th century*

The large tanning pit found in trench 2 (fig 8) contained a fragment of sole or clump sole repair in its primary fill, with a welted shoe of early to mid-17th century style (fig 17, no 6) and a strap with buckle holes in the upper fill. Two samples of animal hair (species not identified) were also noted from the tanning pit. The animal hair may well derive from initial hide preparation and be related to the work of the tannery rather than subsequent back-filling.

### **Glossary** (after Grew & de Neergaard 1988)

*Clump*: a thick extra sole on a shoe.

*Lasting margin*: the part of the upper pulled onto the underside of the last (a wooden block matching the shape of the foot) and is later used to join the upper to the sole.

*Quarters*: the sides and heel of a shoe upper, which join the vamp on either side of the foot.

*Rand*: narrow strip of leather, triangular in section, sewn between the upper and the sole to make the join more watertight.

*Turnshoe*: shoe constructed inside out and then reversed – or ‘turned’ – so that the seams and much of the stitching are on the inside.

*Turn-welted*: the upper, inner sole and turn-welt (strip of leather wider than a rand with two parallel rows of stitches) are sewn as for a turnshoe, but the turn-welt extends outside the lasting margin for attachment to a second, outer sole.

*Upper*: parts of a shoe covering the upper foot and consisting of vamp, quarters, and possibly, inserts.

*Vamp*: the front section of the shoe upper.

*Welt*: a strip of leather wider than a rand (narrow strip of leather, triangular in section, sewn between the upper and the sole to make the shoe more watertight) with two parallel rows of stitches.

### THE ANIMAL BONE, by Lisa Yeomans

#### *Introduction*

Since the late medieval period leather production has formed a major aspect of the economy in Bermondsey. Numerous streams supplied the large quantities of water used by the tanners and tawyers; hides were readily available from butchers, and the wooded high ground of Surrey provided a source of oak bark (Sargent 1938). Archaeological evidence for leather production has been found at numerous sites in the vicinity (Divers *et al* 2002; Drummond-Murray *et al* 1994; Elsdon 2001; Heard 2000; Killock 1999; Wooldridge 2003). Recent excavations at 156–170 Bermondsey Street provided a comparable sequence and included a significant quantity of faunal evidence indicative of the industry.

Characteristics of the animal bone assemblage highlight changes in site use; studied in detail by examining the species proportions (fig 19) and differences in skeletal element representation (fig 20), they provide a useful method for discerning developments in the leather industry.

#### *The assemblage*

The two late 15th to early 16th century ditches provided the earliest significant quantity of animal bone. The assemblage was typical of domestic waste, with both cattle and caprine bone representing a variety of skeletal elements. Cobbling debris was retrieved from these fills, but the faunal remains indicated no evidence of leather production. Any association with the industry was probably confined to its later production stages when the leather was fashioned into the finished articles.

Caprine bones become increasingly frequent through the 16th–17th centuries. The majority of these were metapodials or horncores and represent tawyers' waste removed from the hides after they had been transported from the butchers to the leatherdressers.

To the south of the site, trench 2 just clipped the edge of a large timber-lined pit dated to the early 17th century. The size of the feature (over 5m in length) and its method of construction are typical of a pit used for the immersion of cattle hides in tanning liquors. The various fills, however, contained mostly sheep horncores indicating tawyers' waste. The two occupations, tanning and tawing, were separate and craftsmen were forbidden to engage in the others' trade (Clarkson 1960a; 1960b). It is not likely there was anything unlawful about both tawing and tanning being done at the same works, provided that it was carried out by individual craftsmen qualified by their respective guilds to do it. The presence of sheep remains in the tanning pit was probably the result of a tawyer using an abandoned tanning pit from an adjacent workshop to discard a quantity of waste.

One of a number of pits dug during the 17th century contained a cattle metatarsal with a hole drilled through the medial side of the proximal articulation. This type of modification has been identified on other sites associated with tanning and may indicate the presence of a tannery in the vicinity of the site during this period. The bone was subsequently modified into a pinner's bone, which is a common find in Southwark, where a pin-making industry became established in response to the formation of a mineral and battery (beaten/hammered metal) works at Rotherhithe and the large quantities of waste iron wire generated by this installation (Archer 1934).

During the 18th century the frequency of cattle increased and, in contrast to the cattle bone found in earlier contexts, selective parts of the skeleton were deposited at the site. Horncores formed the majority of the cattle bones and can be taken as indicative of tanning waste; these were recovered from a pit fill and dumped layers associated with the yardage. The caprine bone continues to be dominated by the remains of horncores and metapodials and included a quantity of sheep horncores from the sunken barrel. This feature was probably used to bate the sheepskins – the process of soaking in a mixture of bird droppings and dog faeces.

Evidence from other archaeological sites in the area has suggested that from the late 17th through to the 19th centuries there was growth in the heavy leather industry. Two tanning tanks were installed at 33 Tanner Street, reflecting a shift in emphasis from tawing to tanning (Heard 2000) and a comparable trend was observed at Tyers Gate in the 19th century (Divers *et al* 2002). Although the evidence from 156–170 Bermondsey Street is also consistent with these results it should be remembered that these sites represent a small number of the workshops operating in Bermondsey during these centuries. Clarkson (1960a) argued that leatherdressing was particularly important during the 16th and 17th centuries. The archaeological evidence may indicate a subsequent expansion of the heavy leather industry.

Throughout the sequence the leatherworkers appear to have practised the removal of horn from horncores. The majority of the sheep horncores displayed chopmarks to the lateral, basal area of the horncore in a characteristic manner suggestive of horn removal (Drummond-Murray & Liddle 2003). Once the sheaths had been removed they would have been traded on to hornworkers.

### *Use of sheepskin and goatskin*

One aspect of the leatherdressing industry that has largely been unexplained is the selection of hides used. While goatskin produces a leather of better quality, the faunal remains from post-medieval workshops are devoid of goat bones (Noddle 1994). The morphological characteristics that separate sheep and goat metapodials (Boessneck 1969) and metrical criteria for distinguishing between the metacarpals of sheep and goats (Payne 1969) were applied to the sample from 156–170 Bermondsey Street and no goat bone was identified.

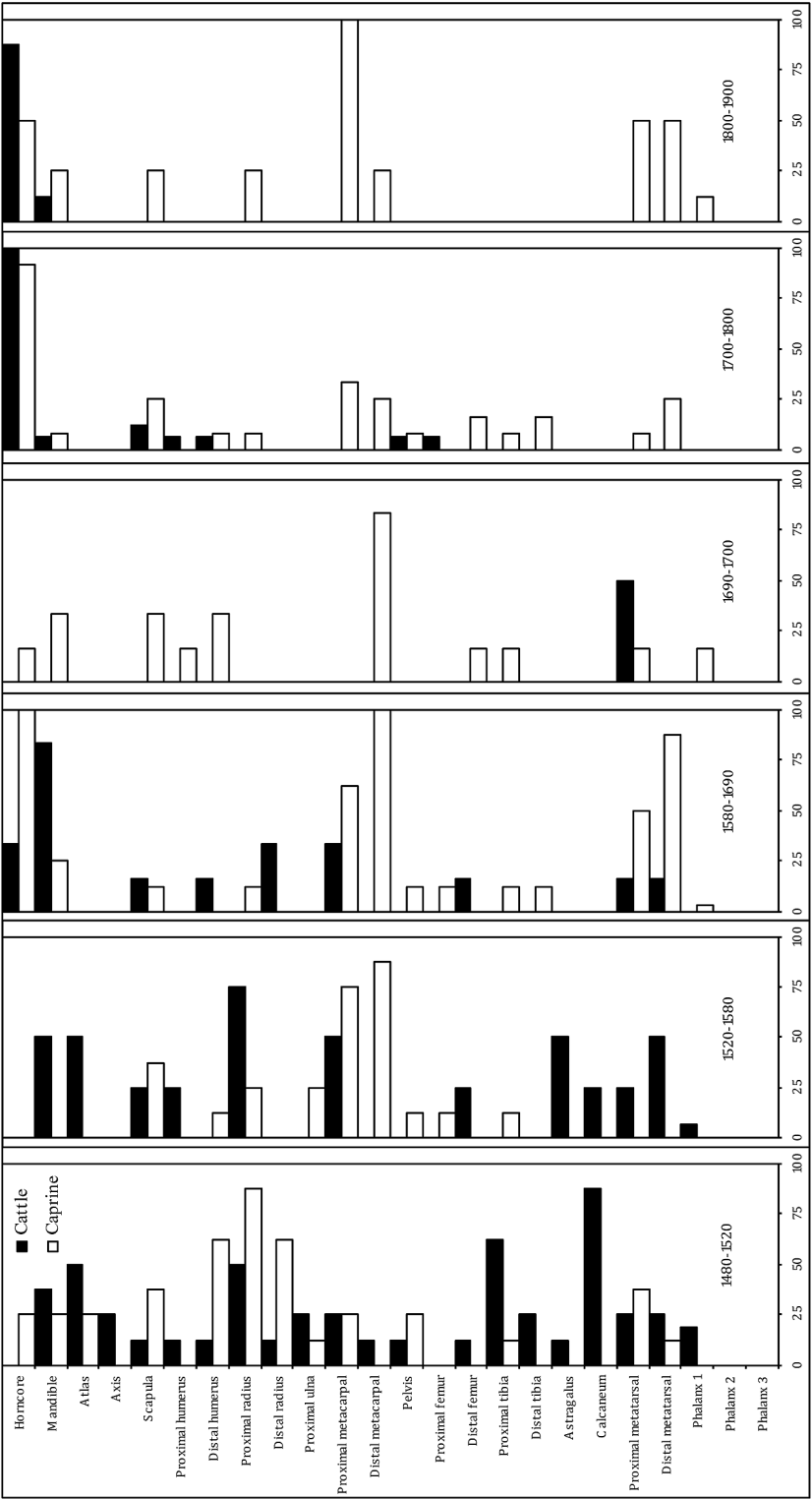


Fig 19 Bermondsey Street, Southwark: representation of the taxonomic groups based on the number of identifiable specimens (NISP). Sample size for each phase is shown by the histograms in boxes.

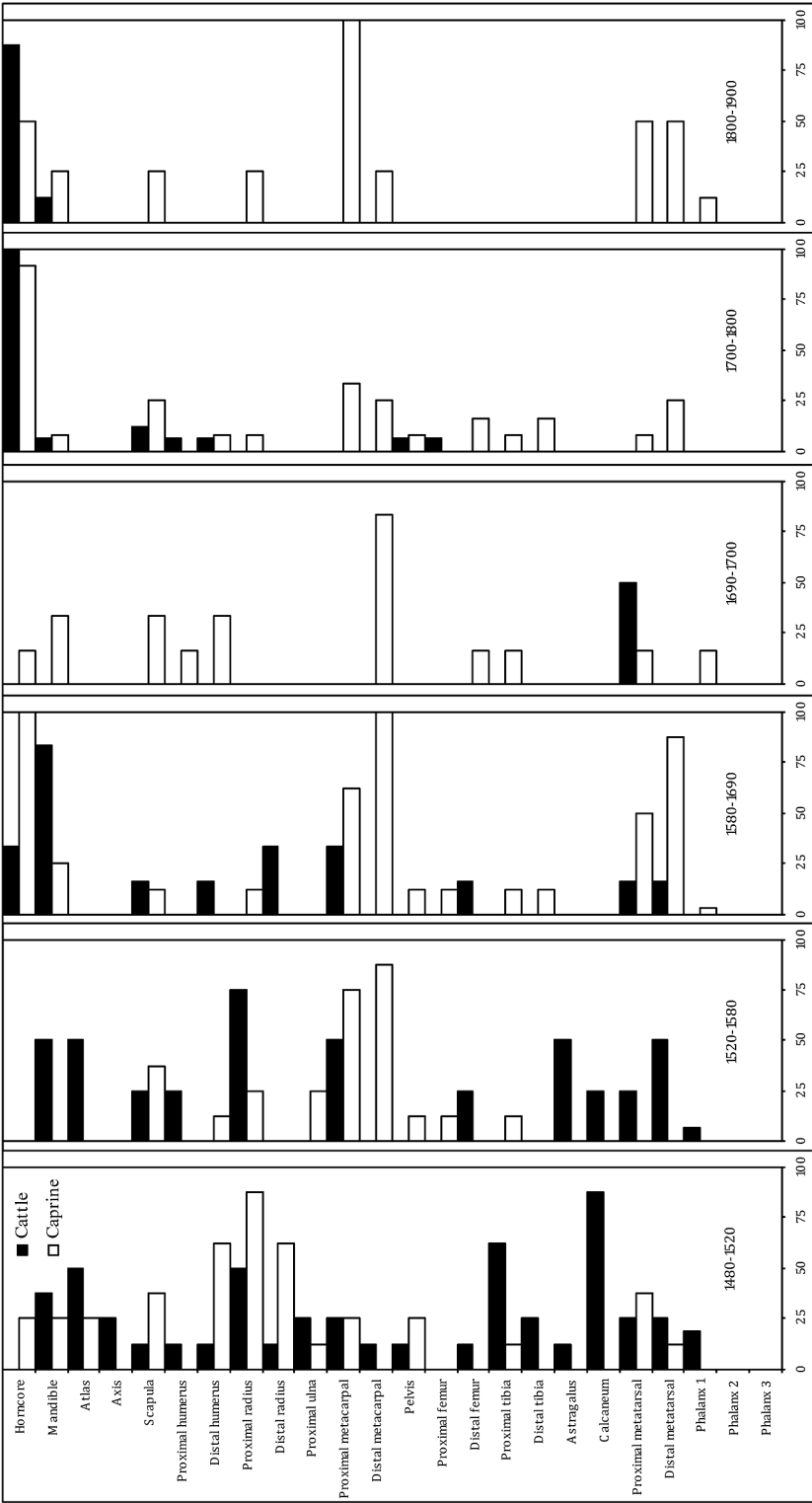


Fig 20 Bermondsey Street, Southwark: skeletal element representation of cattle and caprine bones by approximate phasing dates. The graph is corrected for differences in the anatomical frequency of bones in a complete skeleton and various degrees of fragmentation by showing the minimum number of elements (MNE) as a proportion of the expected representation based upon the minimum number for individuals (MNI) for the species within each phase.

Historical sources attest to the use of goatskin; for example, in 1621 over 2000 goat and 57,000 kid skins arrived in London from France, Spain and the Baltic (Clarkson 1960a). Between the years of 1611 and 1614 around 16,000 or 17,000 goat hides left Scotland mostly en route to London (Smout 1965). At the end of the 17th century around 50,000 goat hides were being exported from Scotland per annum, while 2000 goat and 456,000 kid skins were imported from the Continent (Clarkson 1960a; Smout 1965). Other sources include Chester and Ireland as locations recorded in documents of the 1660s as supplying raw goat hide to London.

Moroccan leather is the name given to the material manufactured from goat skins; Morocco Street, located close to Bermondsey Street, probably derived its name from this association. Given the historical evidence it seems likely that goat skins were being processed in Bermondsey, begging the question why is there so little zooarchaeological evidence for this aspect of the industry? Mutton and lamb commanded a respectable price on the butcher's block and would have been driven into the City on the hoof. Goat meat, on the other hand, was not sold in any significant quantities in cities. The additional cost of transporting horns and lower-limb bones from outside the City to the leatherworkers would outweigh the benefit to leatherworkers of having the horns to assess the quality of the hide or bones to act as handles.

### *Conclusion*

The faunal evidence from 156–170 Bermondsey Street, in comparison with other evidence, allows a reconstruction of the leather industry at the site. It is suggested that a tawyer's workshop was operated here from the end of the 15th century, and as the 17th century drew to a close, tanneries in the area appear to emerge more prominently onto the leather-manufacturing scene, resulting in the deposition of a quantity of cattle horncores at the site.

### ENVIRONMENTAL SAMPLING, by Alys Vaughan-Williams

#### *Late medieval ditch*

A sample was analysed from the alluvial clay fill of the late medieval ditch. The only evidence for human presence, apart from the fact that it originated from a ditch, was a single charred Cyperaceae sp. seed, which may have become charred through being used as fuel. The remainder were a mix of wetland and ruderal (rough ground) species. Flora that is found inhabiting rivers and river banks or marshland included *Rumex hydrolapathum* (water dock), *R. sanguineus* (wood dock), Cyperaceae, *Potamogeton* sp. (pondweed), *Lycopus europaeus* (gypsywort) and *Polygonum hydropiper* (water-pepper). Pondweed in particular requires a constant, though preferably slow, flow of water, indicating the drainage function of this feature. The remaining species included *Stachys sylvatica* (hedge woundwort), *Lamium* sp. (dead nettle), *Silene alba* (white campion) and *Sambucus nigra* (elder). These could have lined the banks of the stream, or have grown as colonisers of the marshland. Nevertheless, the assemblage clearly contains a significant component of ruderal flora. Therefore it is likely that, although not wooded, the landscape was now composed of fields with hedges and occasional trees.

#### *16th century consolidation material*

The material dumped over the disused footbridges was sampled. The pollen assemblage was composed of species that colonise open waste ground and/or cultivated land. The charred seeds of *Silene alba* dominated the assemblage (59%). Also found charred were seeds of *Brassica sinapsis* sp. (cabbage/mustard), a single *Triticum/Hordeum* sp. (wheat/barley) grain and the rachis of *Triticum* sp. (wheat indet). The remainder of the sample was waterlogged and consisted of the ruderal *Chenopodium album* (fat hen), *Atriplex* sp. (oraches), *Melilotus* sp. (melilots),

*Stachys sylvatica* and *Sambucus nigra* (elder). There was also a single seed of *Carex* sp. (sedge) and one *Ficus carica* (fig) seed.

The abundance of charred foods in this assemblage indicates that there were quite substantial domestic activities occurring at this time, especially with the presence of species from the cabbage family and cereal grains. Chaff, such as rachis fragments, often implies crop processing or cleaning on a site, which in turn can mean that crops were being cultivated locally. With only one grain and one rachis fragment, it would be unwise to conclude this; however, it seems likely some form of local cultivation was taking place at this time, and domestic activities, ie cooking, were also identified. The remaining ruderal, waterlogged species like fat hen are common arable weeds, or are found in the hedges around fields of cultivation. The lone fig seed is not unusual, as during the post-medieval period, the draining of Southwark led to a large influx of people and the development of ports, hence the introduction of exotic foods such as fig.

### *Conclusion*

The sample of the late medieval ditch fill indicated a waterlogged environment, probably restricted to the ditch itself. Around it, the environment indicated was essentially ruderal, with grassland, hedges, and occasional trees scattered around. By the later medieval period measures to raise, drain and protect the land with barriers had begun, allowing the land to be used as pasture and fields (Divers *et al* 2002; Knight 2002; Tyers 1988). The late 16th century assemblage indicated there was a significant increase in the settled population in this area. Domestic activities were occurring, with wheat if not barley being cooked at this time. Fig must also have been imported and consumed. Crop cleaning may have occurred on the site, but this cannot be more than conjectured owing to the limitations of the evidence. The origin of the sedges may be related to the dumping of straw used for bedding, roofing or winter fodder, or it may just represent the remains of plants growing in the ditch itself.

## **Discussion and conclusions**

### **DRAINAGE**

Initial attempts to drain this marginal area of Southwark started in the medieval period, as indicated by the alluvially filled east–west channel that was cut into the clays deposited during the medieval period. The ground surface was at just 0.45m OD, whereas high spring tides of the mid-15th century reached beyond 2.40m OD (Goodburn 2003). Drainage measures such as this ditch and the construction of river walls (Brown & Taylor 2010) must have been effective. By the late 15th century, the land had dried sufficiently and dumped material had been used to consolidate usable ground. Meanwhile, the fills of two further drainage, and perhaps also boundary, ditches, although wet, were no longer deposited by flowing water. These later ditches were not seen to be connected; however, they were so similar in fill, dating and scale that they almost certainly formed part of a network of such channels covering the low-lying ground of Tudor Bermondsey. On many sites in the vicinity similar ditches have been seen, ranging in date from the medieval to the post-medieval periods, for example the 15th–16th century channel at Hay's Wharf, which also paralleled this site with the remains of fencing along the edges of the channel (Goodburn 2009).

### *A time of transition*

The fills of the ditches dated from the end of the 15th century to the beginning of the 16th century – a period that saw many transitions in material culture, including the aforementioned shift from Coarse Border wares to Early Post-medieval redwares between 1480 and 1500. Also around this time, shoemaking techniques were changing from the turnshoe to the welted

construction technique by the introduction of a rand. At present, the time for the turnshoe to be generally replaced by the welted construction as the principal shoemaking technique is uncertain (Mould 2003). Both types were found in the fills of the Tudor ditches, including pieces of cobbling debris. This is significant, as the deposition of this type of waste tends to occur when a style is in vogue rather than when it is discarded after an unknown period of wear. Pottery provided sequential dating to the fills and supported the date of 1500 given by Cherry (1991) for the introduction of the welted shoe. The turnshoe, however, appeared to continue in production into the early 16th century, showing a period of overlap, or perhaps it is indicative of conservative followers of fashion.

#### 15TH TO 16TH CENTURY PROPERTY AND LAND USE

##### *Roadside buildings*

Excavations opposite the 156–170 Bermondsey Street site at nos 151–153 (Wooldridge 2003) and to the north at nos 100–104 (Killock 1999) uncovered phases of roadside buildings from the medieval period onwards. Masonry foundations were revealed and were assumed to have had timber-framed superstructures. No such early foundations were seen here as excavation was set too far back from the street frontage. Nevertheless, sections of lath from a demolished timber-framed building and a fragment of late medieval–16th century window glass attested to the presence of similar buildings fronting onto Bermondsey Street adjacent to the excavated area. Interestingly, the presence of cheap beech laths, susceptible to woodworm, suggested the timber-framing was of relatively poor quality. This is in keeping with the description of Bermondsey Street given by Carlin (1996, 53) as a cheap district that attracted an influx of Flemish immigrants in the 15th century.

##### *Channel crossings*

The 15th–16th century ditch would almost certainly have acted as a boundary between properties at right-angles to Bermondsey Street and onto open land to the west. Its association with habitation along Bermondsey Street is clear from the associated domestic debris. The lack of such material in the earlier east–west ditch of medieval date supports the suggestion that its function was largely for drainage rather than a boundary marker, although a dual function including the latter cannot be excluded. In the early 16th century, ditch fills were cleared out of the north–south ditch to leave a low causeway across the channel. This demonstrated that access was required between the two areas, implying the local use of drainage to create space. Although it remains unknown how the land was used, it must have continued to be prone to occasional flooding, and was perhaps used as pasture.

The causeway was shown to have been rather unsound by the slumping of material supported by the revetment, and by attempts to firm the crossing with dumped material. The footbridges were most likely built to provide a drier and more stable crossing. Excavations in Lafone Street, Southwark exposed the more structurally robust remains of a late 13th century timber-framed bridge, built within the cleared portion of a ditch (Bates & Minkin 1999). This special application of timber framing, with posts tenoned into sole-plates, was employed from after the Conquest until the 16th century, with driven piles (as seen here) utilised in bridge building towards the end of this period (Rigold 1975). These observations, however, were made on more substantial examples than the cheaply-built footbridges seen here. Such structures seem to have escaped academic attention and, to date, none has been excavated in the vicinity. Nevertheless, footbridges must have been common at one time in the ditched wetland of north Southwark.

The presence of two bridges in such close proximity, as is the case here, raises questions of land tenure and common or private access routes. Three properties may be represented and it is possible that the stakes thought to mark an approach to the causeway (fig 5) may

be the remains of property boundary markers; however, at only 3m wide this would seem quite narrow, especially in comparison with properties excavated at 100–104 and 151–153 Bermondsey Street (Killock 1999; Wooldridge 2003). Two properties, each with their own bridge, may be indicated, but this would not explain the central causeway. It therefore seems likely that one bridge replaced the other as a common access route. The pottery from around the northern bridge did appear to be very slightly later, but with no stratigraphic relationship, and a very similar sequence of events, this remains open to interpretation.

#### TANNING AND TAWING

This area of Bermondsey is well known for its associations with the tanning trade from the medieval period onwards. Tanned skins were subject to several stages of processing. Initially dehaired in a slaked lime solution, the skins were scraped clean and then bated in faeces to soften the hide. They were then soaked in a solution containing oak bark, naturally rich in tannins. A branch of tanning less frequently referred to, or recognised archeologically, is the faster, lighter industry of tawing; a form of leatherdressing. In this process the skins of smaller animals such as sheep and goat are treated with oil, flour, egg yolk and alum (a compound of aluminium sulphate and potassium sulphate). The finer leather produced would be used for garments, shoe uppers, gloves, book covers, etc. The two industries were quite distinct, to the extent that an assize of 1468 (quoted by Stow in his survey of London, 1598) stated that a tanner must ‘tanne no Shepis Ledder, Gotis Ledder, Deris Ledder, Horsis Ledder nor Hyndes Ledder [...] and if he do the contrary [...] his Fyne is at every tyme 6s. 8d and to forfeit al that is forfeitable’ (cf Waterer 1946, 106). The tanning of these skins was legally the province of the tawyer. Clarkson (1960) notes that this division may not have been enforced in rural areas, but in the specialised urban quarter of Bermondsey it would certainly have been the case.

The presence of 15th century cobbling waste showed the first evidence of trades associated with the tanning industry, although at this stage there was no direct indication of tanning or tawing at the site. The general trend seems to have been that tawing in the vicinity intensified from the early 16th century to the end of the 17th century. This was indicated by an increasing bias towards sheep metapodials and horncores in the animal bone assemblage and with an old tar barrel used for tawing at the turn of the 18th century. Subsequently, tanning became the dominant industry – a trend broadly paralleled elsewhere in Bermondsey, for instance in excavations on Tanner Street (Heard 2000), where 16th century tawing switched to ‘true’ tanning in the 18th century. At 156–170 Bermondsey Street, unusual supporting evidence was seen for early tawing. Large concentrations of eggshell from the layers sealing the 16th century bridges suggested that hides were being treated with egg yolk and alum. Tanning was indicated in the same period, not from large quantities of horncores, as is often the case, but from a drilled cattle metacarpal and a deposit of oak bark chippings. The metacarpal had been re-used as a pinner’s bone and may have originated elsewhere, but the bark is likely to have been waste from nearby processing. Therefore one can see the waste of two industries supposedly separated by law, in the same series of deposits. This may indicate the area to have had shared access, where local craftsmen would dispose of small quantities of waste. However, this assumption of law-abiding leatherworkers may be misplaced, as the crossing of trades was also seen in the large early 17th century tank of trench 3, where layers of hair, identified on site as sheep and possibly horse, had accumulated with sheep horncores and oak bark in a tanner’s pit. Similar but earlier 12th–13th century tanning and tawing activity has been identified at the Moor House site in the City of London (Butler 2006).

#### *Possible signs of related trades*

As previously discussed, the site was notable for the 15th and 16th century ceramic sequence and the range of imported Italian and Spanish pottery present. It might be suggested that



the proximity of Bermondsey Abbey explains these widely sourced and traded wares; however, 156–170 Bermondsey Street was outside the abbey precinct and the pottery assemblage had uncommonly high frequencies of imported wares. With evidence for tawing on the site, it is tempting, if speculative, to propose that there might be a connection between the two. During the 13th and 14th centuries, alum was imported from the eastern Mediterranean, but after the fall of Constantinople in 1453, this trade dried up, and a new source of alum was eventually secured in Italy (Cherry 1991). If a merchant or someone with maritime associations did live in the vicinity, it is possible that their connections were related to the import of alum from Italy, or possibly goat skins from Spain.

It is worth drawing attention to the early 16th century purse loop (fig 7). At this time, an ordinance prohibited the use of any metal of lower quality than copper or steel for belt fittings, with lead, pewter and tin being specifically forbidden (Waterer 1946). Particularly ornate articles were the reserve of the elite, so this example with inlaid copper alloy was of fair, but not ostentatious quality. A late 15th to early 16th century locking purse buckle, and an early 16th century wire loop, as sewn into a purse to prevent theft, were found at 151–153 Bermondsey Street (Wooldridge 2003). Material suggestive of a nearby smithy, including a punch or awl, was found in early 16th century deposits at 156–170 Bermondsey Street, and one might tentatively suggest that with a supply of tawed leather, metal fittings and tools, the nearby work of the guild of pouch-makers might be represented.

#### ROYAL OAK YARD

Large-scale dumping at the end of the 17th century facilitated development on the higher and drier land. Increased pressure on space meant that buildings were extended away from the ribbon development of Bermondsey Street, and Rocque's map of 1747 shows the site to have been bounded by buildings to the north, south and east. Whereas much of the surrounding land is depicted as fields, this small area is shown as part of Royal Oak Yard, supporting the archaeological evidence from the 18th century for an open yard area. This courtyard holds parallels with other sites on Bermondsey Street, for example at nos 100–104, where a brick and cobbled surface was found to the rear of buildings fronting onto the high street (Killock 1999).

The remains of 19th century wall foundations were exposed running parallel to Bermondsey Street. The position of this wall agrees with property boundaries drawn on Horwood's map of 1799, suggesting that it was the wall backing the rear gardens of properties on the high street. If it can be assumed that these boundaries were maintained from the previous century, the cobbled and bricked surface appears to have formed a drained passage along the side of an open yard area that backed onto the rear gardens of houses on Bermondsey Street. This may also have implications for the interpretation of access to the 16th century bridges, suggesting a common access route behind private properties on Bermondsey Street.

Both bridges had gone out of use by around 1580, when they were sealed by successive episodes of dumping. Between 1690 and 1700, a dark consolidation layer was dumped over the excavation area. A re-used tar barrel set into this material was used for bating sheep skins at the start of the 18th century, after which time the site was occupied by metallised yardage. A cobble and red brick surface incorporated a brick culvert running along the back of properties on Bermondsey Street. The deposits from this phase contained finds that were suggestive of local glassworking and sugar refining in the 17th–18th centuries, with the animal bone assemblage attesting to a rise in the tanning industry. Successive dumped yard surfaces through the 19th century raised the ground level to that overlaid by the modern car park.

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SKCS Records of the Surrey and Kent Commissioners for Sewers

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