LATE ROMAN BURIALS AND EXTRAMURAL MEDIEVAL AND LATER DEVELOPMENT AT PREMIER PLACE, DEVONSHIRE SQUARE, HOUNDSDITCH, LONDON EC2

David Sankey and Brian Connell

With appended specialist reports by Rupert Featherby, Jane Liddle and Lucy Whittingham

SUMMARY

During redevelopment on the site of the former Houndsditch Telephone Exchange, an archaeological watching-brief discovered 36 Roman burials lying beneath the modern basements. Subsequent excavation revealed regular rows of closely spaced graves, without grave goods, but many with crushed chalk in the coffin. This is consistent with a late Roman 'managed cemetery'. Also revealed were medieval and post-medieval pits, wells and cesspits. Medieval cesspits indicate extramural development when this area lay within the garden of Holy Trinity Priory.

INTRODUCTION

Between 21 September and 15 November 1999, the Museum of London Archaeology Service (MoLAS) carried out an archaeological watching-brief at Premier Place, 2½ Devonshire Square, London EC2 (Fig 1), which was being redeveloped as offices by the Sun Life Assurance Society plc. The National Grid Reference for the centre of the site is NGR 53337 18143.

The site had previously been occupied by the Houndsditch Telephone Exchange: the deep basements and underground rail system of this building had completely removed all archaeological remains except on a strip of land at its eastern side. Here, although all historic land surfaces had also been removed by basements, some cut features, such as pits, wells and graves, were known to survive. In 1986, for example, an excavation at 9–12 Cutler Street (site code CUE86) encountered a single inhumation with crushed chalk and some later post-medieval pits (Heathcote 1988, 383).

During the watching-brief in the eastern part of the site, Roman burials were discovered immediately below the level of the modern basements. As a result, brief archaeological excavations were undertaken in small areas during the demolition and piling programme. The watching-brief and excavation were recorded under Museum of London site code CDV99. A separate photographic record and descriptive survey was made of a 19th-century building (the Drill Hall) on the site.

The research archives for site CDV99 and the Drill Hall are deposited with the Museum of London and may be consulted by prior arrangement at the London Archaeological Archive and Research Centre (LAARC), Mortimer Wheeler House, 46 Eagle Wharf Road, London, N1 7ED. In addition to the specialist reports appended to this article, reports on the clay tobacco pipe, by Kieron Heard (Heard 2001), and the accessioned finds, by Jackie Keily (Keily 2001), can also be found within the site archive.

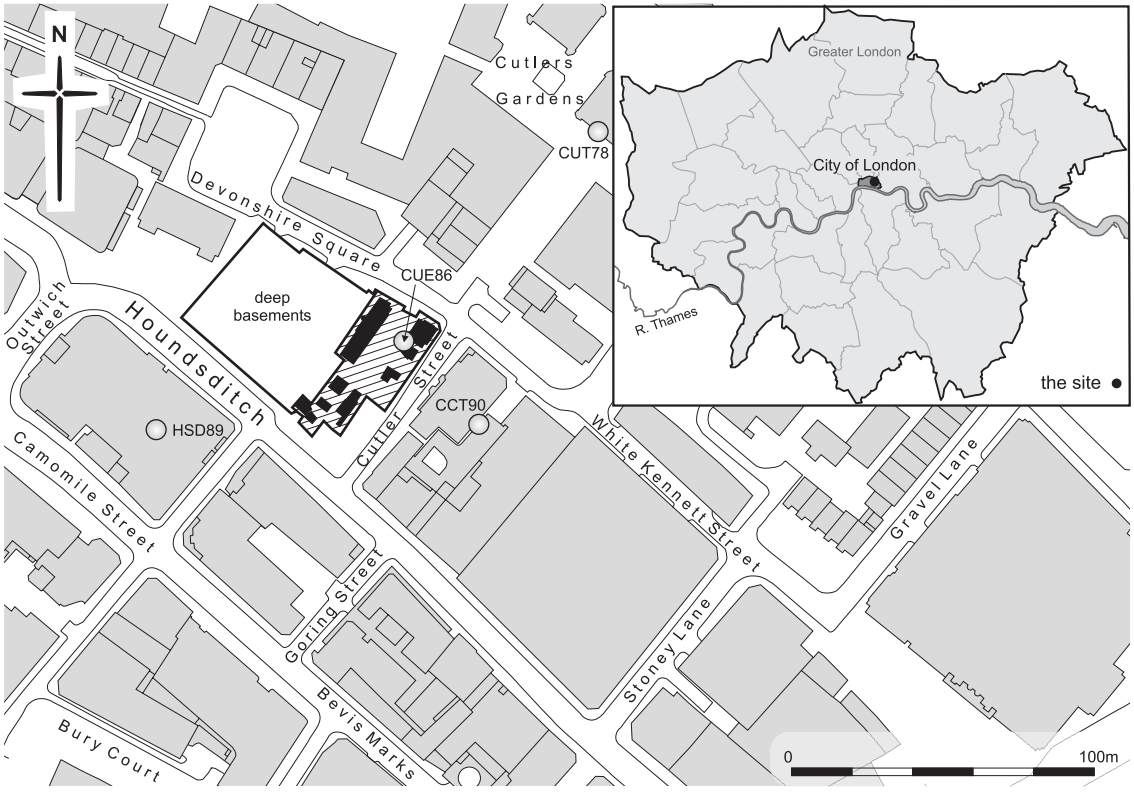

Fig 1. Site location showing area of watching-brief and other nearby sites mentioned in this report (Scale 1:2500)

ROMAN BACKGROUND

The site lies beyond the built up area of the Roman city and is some 65m north of the city wall built in *c.*AD 200 (Fig 2). An earlier formal boundary or *pomerium* had been established some time after AD 120: ditches on Dukes Place (Maloney 1979, 294–5) and monumental foundations at Bishopsgate (Filey 1991, 272) suggest that this boundary may have followed the same alignment as the later defences. Ermine Street, the Roman road to Lincoln, left the city through Bishopsgate and lay about 160m west of the site. The origins of the road are probably contemporary with the foundation of London *c.*AD 50.

Roman law forbade the burial of the dead within the designated limits of a town (Salway 1981, 694) and the cemeteries of Roman London lay beside the major roads leaving the city but outside the city boundaries. The Houndsditch site lies within the northern cemetery, which flanked Ermine Street (Hall 1996, 64–73) and extended at least as far north as 201 Bishopsgate (site BGA90/BGB98), over 500m from the city wall (Swift 2003, 8 and 21–4). Burials within the northern cemetery have also been recorded at Spitalfields Market (SRP98); the PLA Warehouses, Cutler Street (CUT78) and 20–26 Cutler Street (CCT90); 58–60 Houndsditch (HSD89); and 9–12 Cutler Street (CUT86).

THE ROMAN CEMETERY

Description

The natural brickearth was truncated at *c.*10.8m OD. Cut into it were 35 Roman inhumation graves containing 36 individuals (one grave contained a mother and stillborn child). All were aligned roughly west–east, except for two which were aligned roughly south–north (Fig 3). The west–east burials were arranged side-by-side in orderly rows with little intercutting between the graves. The extant burials defined at least five such rows. There was also a small

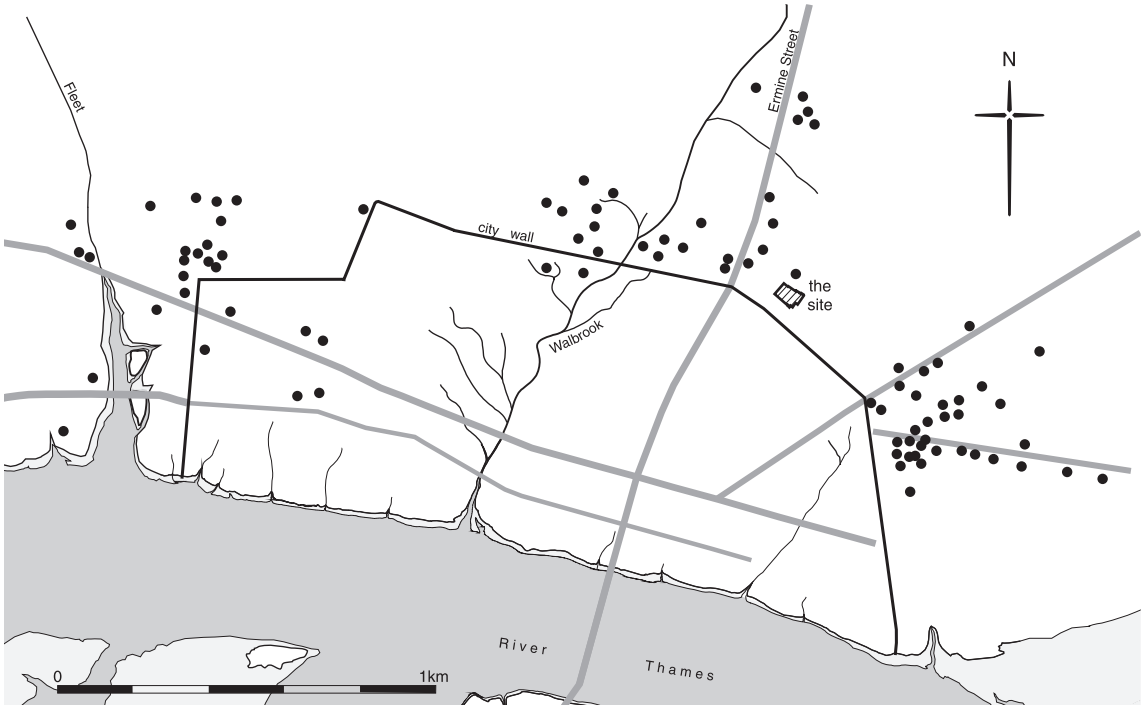

Fig 2. The site in relation to the Roman city wall (built c.AD 200), main Roman roads and cemetery areas of Roman London (dots: each dot representing several known burials) (Scale 1:20,000)

number of cut features, slightly larger than the graves but on a similar west–east alignment (Fig 3), one of which was cut by a later burial. These could be graves that were dug but never used or the base of grave cuts where the body had been removed by later truncation. The west–east burials are aligned almost exactly parallel to the city wall to the south of the site. They do not appear to have been aligned on Ermine Street. This suggests that the burials are likely to postdate the construction of the wall in *c.*AD 200 or at least any earlier boundary such as the mid-2nd-century *pomerium*.

There is no direct dating evidence for the burials at Premier Place — all the Roman pottery from the grave fills is residual. Nevertheless the pottery mainly dates from AD 120–300, and 19 of the burials contain pottery dated to the 2nd century. The lack of cremation burials may be the result of truncation, since cremation burial pits were probably shallower than inhumation graves. However, the lack of cremations may also be an indication of a late Roman date for the use of this part of the northern cemetery. In the eastern cemetery, for example, cremation burials predominated over inhumations during the early use of the cemetery but became relatively scarce in its later use (Barber & Bowsher 2000, 116). The use of chalk-like material is also indicative of a late date. The practice of encasing corpses in chalk, gypsum, lime or plaster mainly belongs to the 4th century (Philpott 1991, 91). Although some earlier examples have been encountered in the eastern cemetery, the majority derived from the later use of the cemetery (Barber & Bowsher 2000, 104). It is also the case that there were no extant burial goods in any of the burials at Premier Place. This contrasts with other parts of the northern cemetery, such as the Spitalfields area where recent excavations have shown that 20–25% of the burials were accompanied by some item (C Thomas, pers comm). Excavations within the cemetery on the eastern side of Roman London found 24% of graves to contain goods (Barber & Bowsher 2000, 117). The absence of grave goods may also be an indicator of late Roman date.

The only potential relic of a burial ritual was a collection of fish and animal bones found next to the two south–north burials (Fig 3). Cod

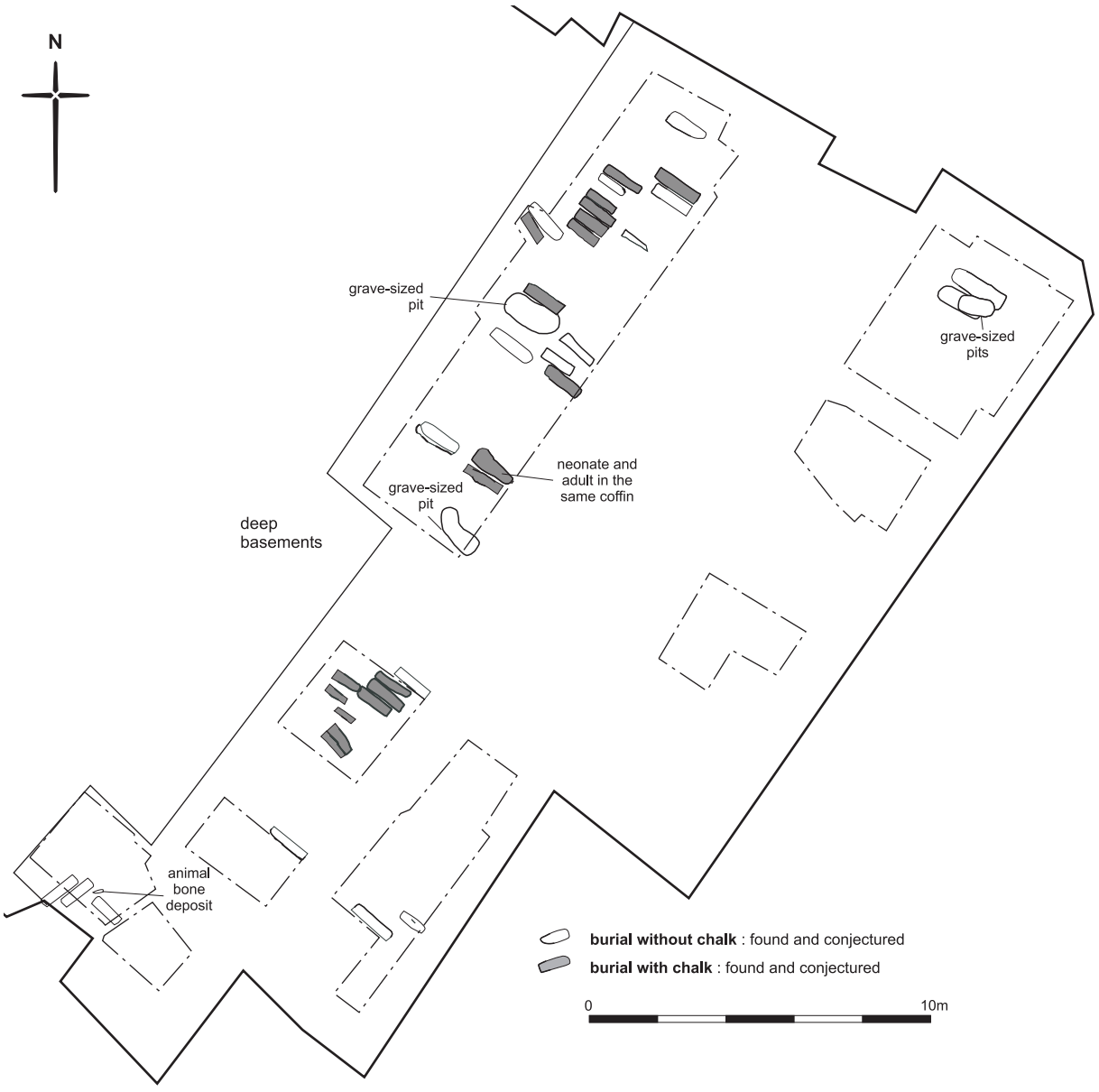

Fig 3. Roman graves and grave-sized pits (1:200)

remains, particularly skull bones, were most common — perhaps the remains of a funeral meal or offering — but a mackerel vertebra and a small quantity of cattle, sheep/goat, pig and chicken remains were also recovered.

The skeletal remains show that the alignment and attitude of the inhumed bodies were remarkably consistent; all were supine and extended with hands lain either at the top of the leg or in the centre of the pelvis (Figs 5–6). The individuals in the west–east burials were all laid with their heads to the west. In the two south–north burials the inhumed individuals' heads lay to the south. About 70% of the burials yielded positive evidence for the use of a timber coffin, either from a pattern of nails surrounding the

Fig 4. Row of Roman burials revealed during the excavation at Premier Place, from the north

body and/or the outline of a coffin preserved by crushed chalk surrounding the body (Table 1). The remaining 30% of burials may also have been in coffins, although no evidence survived.

The white powder present within the coffins of 19 of the burials is assumed to be crushed chalk. Although the powder found at Premier Place was not sampled, analysis of similar deposits found on other sites has invariably demonstrated it to be crushed marine chalk (Barber & Bowsher 2000, 101–2). The crushed chalk occurred as either a thin layer, less than

Fig 5. Recording Roman burials at Premier Place; the burial in the foreground shows the use of a chalk-like substance within the coffin, from the north

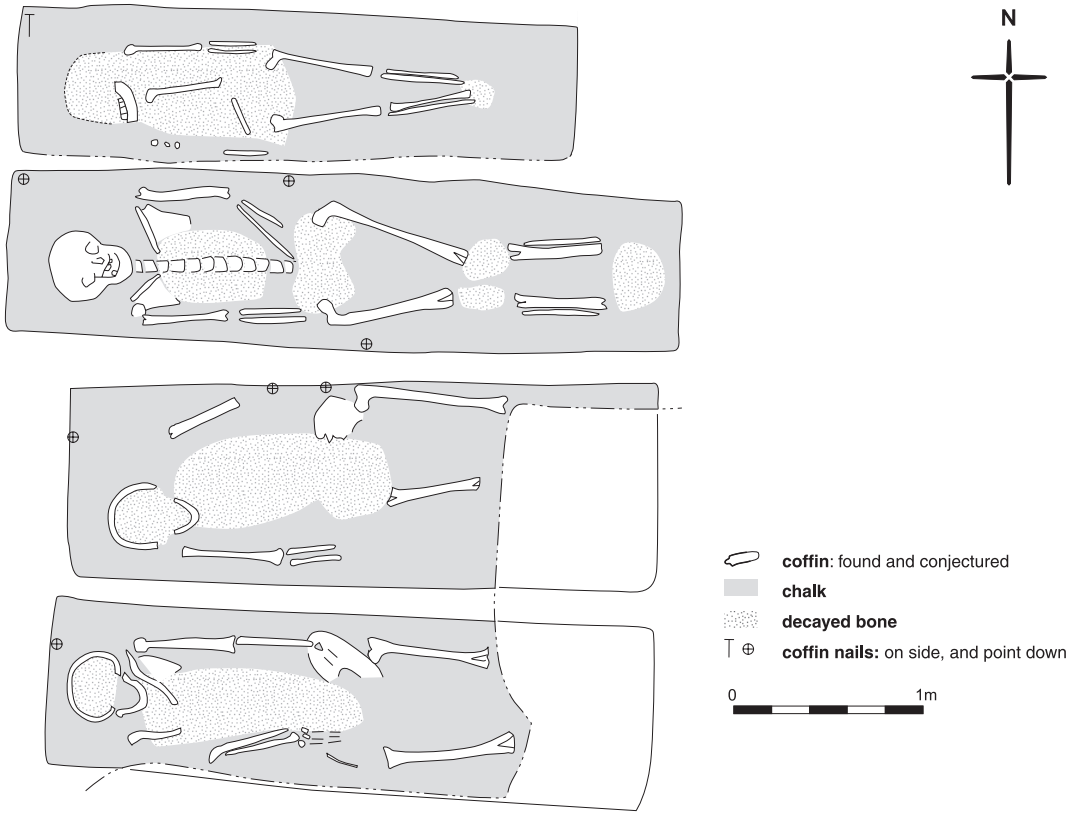

Fig 6. Group of closely spaced Roman burials in wooden coffins with chalk-like substance within the coffin (scale 1:40)

Table 1. Roman burial summary table

Context	Coffin	Chalk	Age	Sex	Stature	Comments
[102]	nails	no	15	?female	not determined	
[108]	no evidence	no	26–45	female	not determined	
[111]	no evidence	no	*c.*5–10	not determined	not determined	south–north burial
[112]	no evidence	no	16	?male	not determined	
[114]	no evidence	no	adult	not determined	not determined	south–north burial
[122]	no evidence	no	26–45	male	not determined	
[124]	by chalk	yes	45+	female	1.71m	
[127]	by chalk and nails	yes	26–45	?female	1.71m	neonate [131] next to lower right leg within coffin
[129]	by nails	no	45+	male	not determined	
[131]	by chalk and nails	no	36 weeks	not determined	not determined	in coffin with adult [127]
[132]	no evidence	no	adult	not determined	not determined	
[133]	nails	no	45+	female	1.66m	
[146]	by chalk and nails	yes	45+	female	1.59m	
[147]	no evidence	no	45+	female	not determined	
[148]	nails	no	adult	not determined	1.53–57m	
[151]	no evidence	no	adult	female	not determined	
[152]	by chalk	yes	adult	not determined	not determined	
[153]	nails and chalk	yes	26–45	female	not determined	
[154]	no evidence	no	26–45	female	1.48m	
[155]	by chalk, stain and nails	yes	45+	female	not determined	
[156]	nails	no	17–25	?male	not determined	
[159]	nails	no	adult	not determined	not determined	
[160]	chalk and nails	yes	17–25	not determined	not determined	
[161]	by chalk	yes	23–35	female	not determined	
[162]	by chalk	yes	26–45	?female	not determined	
[163]	by chalk	yes	11	?male	not determined	
[166]	by chalk	yes	adult	not determined	1.6m	
[69]	no evidence	no	45+	?male	1.64m	
[70]	by chalk	yes	adult	not determined	not determined	
[81]	by chalk and nails	yes	15	?female	not determined	
[82]	by chalk	yes	adult	not determined	not determined	
[83]	by chalk	yes	26–45	?male	not determined	
[84]	by chalk and nails	yes	3 to 4	not determined	not determined	
[85]	by chalk	yes	45+	male	not determined	
[86]	by chalk	yes	no info	no info	no info	
[87]	by chalk and nails	yes	17–25	female	not determined	
[99]	no evidence	no	26–45	male	not determined	

100mm thick, beneath the body or as a fine sprinkling within the coffin. Whilst 64% of the females were buried with chalk, only 42% of the men were. At Premier Place, both the total proportion of chalk burials and the gender bias within them are unusual. In comparison, the excavated evidence suggests that chalk burials within the eastern cemetery accounted for only *c.*12.4% of the total and that no gender bias was present (Barber & Bowsher 2000, 101, 104).

The cemetery population

A full description of the skeletal remains is found in Brian Connell's appended report and the reader is referred there for a more detailed consideration of the figures cited below.

There were 29 adults and 7 sub-adults within the sample of 36 excavated individuals. The sex of 21 of the adults could be determined and 7 males and 14 females were present. The body of what was probably a stillborn child was found interred near the lower legs of one of the adults, probably a female. Similar occurrences of young infants and adults (both male and female) in the same grave have been found within the eastern cemetery (Barber & Bowsher 2000, 100–1). The physique of both sexes was typical for the period — the estimated mean stature was 1.67m for the males and 1.63m for the females, both figures well within the normal range of variation seen in the larger sample from the excavated parts of the eastern cemetery (Conheeney 2000, 280) and the Roman cemetery at Poundbury (Molleson 1993).

It may be noted in passing that visceral surface lesions on ribs within the cemetery population provided further evidence for the presence of tuberculosis in Roman London.

Discussion

The graves are closely set in well ordered rows and the bodies are laid out in a similar fashion, many in wooden coffins (Fig 6). Indeed some of the graves were only *c.*100mm apart and, unless adjacent graves were open at the same time, may have needed markers defining the plots so as to avoid disturbance by later burials. Many of the characteristics of this layout conform to those of a late Roman managed cemetery, a cemetery type which developed in the first decades of the 4th century AD and which was probably specifically urban in its origins. There need be no direct association of this cemetery type with Christianity since it appears 'around or soon after the time of the Peace of the Church, when Christian influence on burial practice in the community at large was unlikely to be great' (Philpott 1991, 226–8).

The use of chalk within burials may be as a cheap substitute for gypsum or lime and the chalk burials might therefore be analogous to the 'plaster burials' which are widely attested in later Roman Britain (Philpott 1991, 90). Although Green suggests that the origin of 'plaster burials' is as a pagan Hellenistic rite in the Eastern Mediterranean which was adopted by Christians as suitable for those who believed in the imminent physical resurrection of the dead (Green 1977, 46–52), there is no reason to strongly associate 'plaster burials' with Christianity (Philpott 1991, 93–5). It has also been suggested that the use of chalk may have had a symbolic value; its whiteness may have held meaning, symbolising light (Barber & Bowsher 2000, 320–1).

The fact that all the excavated burials were inhumations, that a high proportion were chalk burials and none contained grave goods is most likely to be explained by their late Roman date. It cannot, however, be discounted that this part of the northern cemetery may also have been used by a specific group connected by occupation, status or faith.

MEDIEVAL AND POST-MEDIEVAL BACKGROUND

There is little evidence for Saxon or early medieval activity in the vicinity of the site. In the 13th century the medieval City ditch (the *Hondes Dich*) was widened so as to extend from the City wall almost to the line of modern Houndsditch. The present road is derived from a path or track which originally ran along the outer side of the ditch (Hunting 1984, 13–16). From the 13th century, the site lay in an extramural garden belonging to Holy Trinity Priory, Aldgate (mentioned in 1255–56), which comprised 7 acres (2.83 ha) (Schofield & Lea 2005, 18).

By the time of the copperplate map of *c.*1559 the north-east side of Houndsditch was lined by houses with gardens to their rear (Fig 7). Some of the properties came into the possession of the Cutlers' livery company in the 15th century and some of the leases are preserved (Hunting 1984, 28). These tell us that properties on Woolsack Alley (now Cutler Street) were used as houses, gardens, yards and workshops by numerous trades, including a fishmonger, a joiner, a saddler and tallow chandlers. Some of these properties lie within the area of the present site. Second-hand clothes dealers, known as 'fripperers' or 'phelipers', were beginning to appear in the Houndsditch area in the 14th century; this trade was later to become the dominant activity in the area (Hunting 1984, 31).

By the time of Faithorne and Newcourt's map of 1658 the land to the north of Houndsditch was more intensively developed. The site lies on the boundary between the wards of Bishopsgate to the west and Portsoken to the east. The wards were administrative units that evolved in the medieval period and neighbouring wards often developed in different ways. By the 17th century

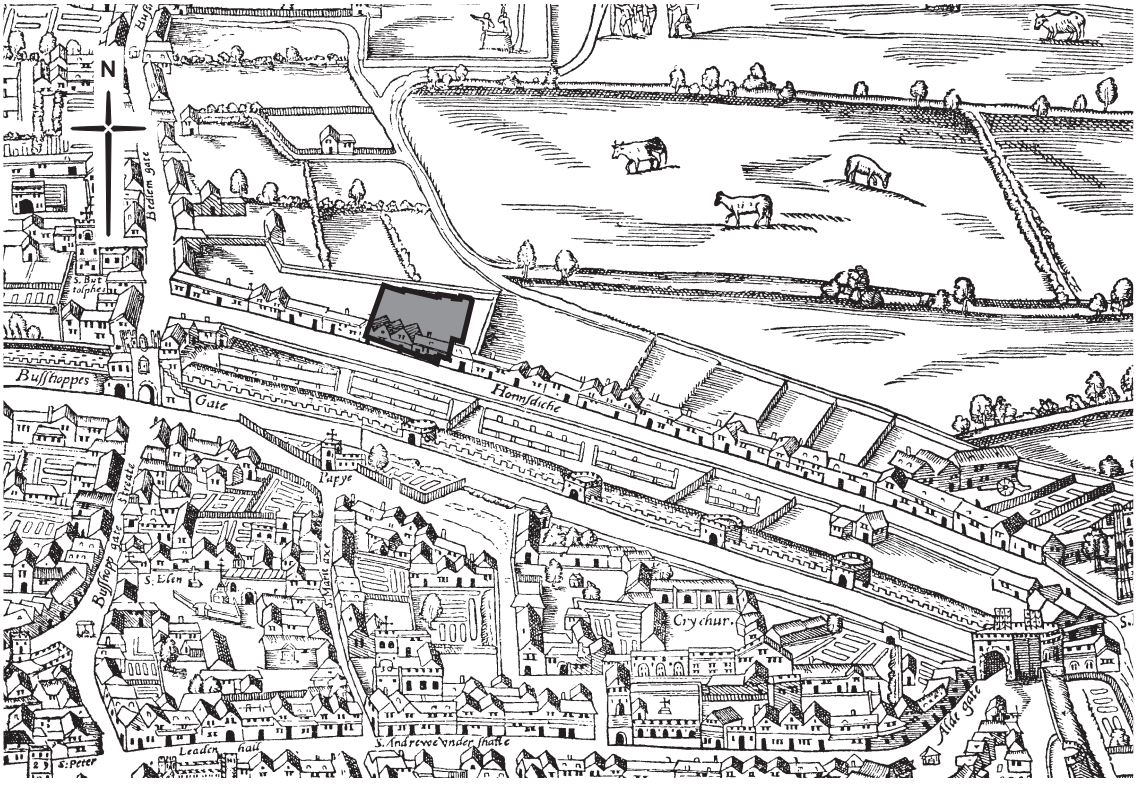

Fig 7. Detail from a copperplate map of c.1559, showing the approximate location of the site in relation to Houndsditch, the City wall and ditch, and Holy Trinity Priory within the west wall of Aldgate (Guildhall Library)

Bishopsgate ward was becoming gentrified with the construction of large merchants' houses and gardens such as Devonshire House (now the area of Devonshire Square, immediately north of the site). The ward of Portsoken to the east and south remained more commercial with numerous craft activities continuing (Hunting 1984, 32). Both Morgan's map of 1682 and Rocque's map of 1746 show the tight pattern of tenements and alleys in the area of the present site by Houndsditch and the larger, more spacious properties to the west and north.

As the 18th century progressed, warehouses for Britain's growing imperial trade were being built in and around the City; in the vicinity of the site, increasing competition for space led to the demolition of the larger merchants' houses. The East India Company owned warehouses in Still Yard, the former name of the narrow passage that separated the telephone exchange building from the earlier Drill Hall (Hunting 1984, 58), and a complex now known as Cutlers Gardens, located just to the north of the site.

In the 19th century, the north side of Houndsditch became a major centre for second-hand clothes dealers. The fact that many of these traders were Jewish meant that the area had several Jewish institutions such as a synagogue and schools. Tenements and workshops occupied the site on the Houndsditch side, and to the north lay two important institutions connected with the second-hand clothes trade. The Clothes Exchange dates from the mid-19th century and the Clothes Market is a little later (Harben 1918, 153). The Drill Hall building formerly on the present site was the somewhat altered 19th-century Clothes Exchange. The northern façade of the building was 'trimmed' in the post-War period, presumably to widen the road now called Devonshire Square.

THE MEDIEVAL SEQUENCE

Barrel-sized pits and a barrel well

A series of barrel-sized pits, often with irregular

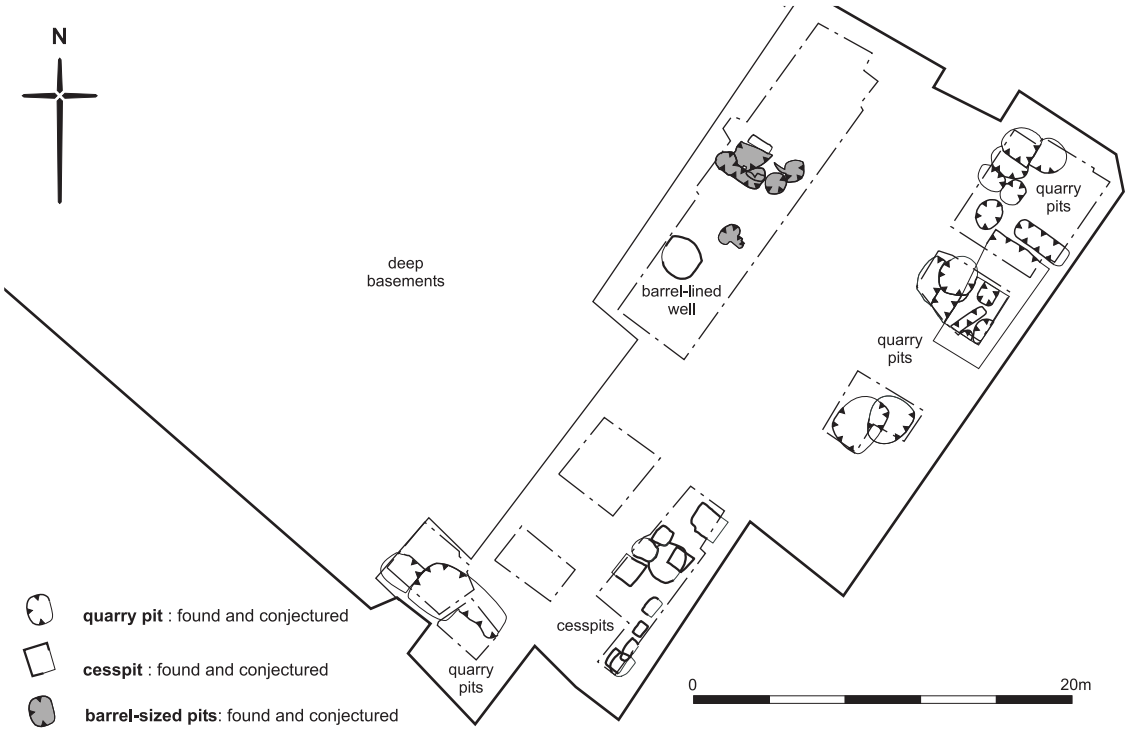

Fig 8. Plan of medieval features (Scale 1:400)

extensions to one side, was excavated towards the north of the site (Fig 8). The pits were backfilled with sterile deposits which appeared to be soil from the surrounding area. The fills certainly did not contain the usual domestic rubbish that one would expect of a refuse pit of these dimensions (*c.*1.5m diameter). It is possible that the pits were originally dug to hold barrels: these were subsequently removed and the cuts backfilled. As these features, which contained no direct dating evidence, cut the earlier Roman burials, they are likely to be of medieval date. The barrels may have been used as water butts or tanks containing a steeping fluid. Both would be consistent with the ownership of the area by Holy Trinity Priory when the area was used for monastic gardens. Water butts may have been used as a reservoir for certain forms of horticulture, while tanks could have held the liquid used to tan leather or parchment.

It may be significant that these pits were found near a large, deep, barrel-lined well (Fig 8). The well was probably constructed in the 12th century, and the pottery assemblage from its fills included coarse London-type ware (LCOAR), shelly sandy ware (SSW), and an early style London-type ware (LOND EAS) jug dated 1140–1220.

The site's largest deposit of animal bones was recovered from the barrel well and was dominated by goat horncores. It is possible that these cores were dumped together, and if so, they may have come from a single source and therefore could represent waste from a small-scale horn-working shop situated in the area. A number of cattle bones (from the head and limbs) were also recovered from the well. The butchery on the limb bones is indicative of disarticulation, and the skull fragments suggest that these remains may also have derived from butchery waste. Sheep/goat bones showed an emphasis on head and lower limb bones, neither of which contain a lot of meat and would not usually have gone to the consumer. The recovery of these bones usually indicates the deposition of waste from primary butchery, including slaughter and initial carcass preparation (Dobney *et al* 1996, 23). A small quantity of food waste, from domestic fowl and fish such as plaice/flounder and cyprinidae,

was also recovered; a goshawk wing bone may be a chance find.

Cesspits

A row of 12th- or 13th-century cesspits was excavated near to Houndsditch (Fig 8). They were generally rectangular, 1.0–1.5m wide; cesspits of this size would have been appropriate to a domestic, family-sized dwelling. They formed a discrete group and presumably lay within the backyard or garden of a dwelling fronting onto the path outside the *Hondes dich*. The cesspits produced a small pottery assemblage of 41 medieval sherds, with most of the pottery from the fills dated to 1140–1220. The presence of some potentially earlier fabrics, such as coarse London-type ware (LCOAR 1080–1200) and London-type ware (LOND 1080–1350), could suggest that some fills started accumulating as early as 1080; however, it is more likely that these deposits are contemporary with the remainder of the pottery assemblage.

More possible horn working waste came from two cesspits: one contained three cattle horncores with evidence of removal from the skull, while the fills of the second included the rear part of a cattle skull with both horncores attached, although cut through approximately 20mm from the base of the cores. Skinning marks on the skull suggest processing for the tanning industry and could indicate that the horns were removed before the hide was dispatched to the tanner, with part of the skull attached. A large hole in the frontale, with splinters of bone broken into the brain cavity, indicates that the individual was poleaxed. Cattle-size vertebrae with evidence of possible work-related pathology were also recovered, as well as the articulations from two male cattle pelves.

Other animal waste, including a sheep skull split lengthways, possibly for the removal of the brain or for stewing, and a cod cleithrum, suggests food waste was also present.

Quarry pits

There was a large number of sizeable quarries (Fig 8) on the site, dug for the extraction of both brickearth and gravel, which appear to date mainly from the late 13th or early 14th century — slightly later than the use of the barrel-lined well or cesspits. Some of the quarry backfills contained disarticulated human bone disturbed from earlier Roman burials.

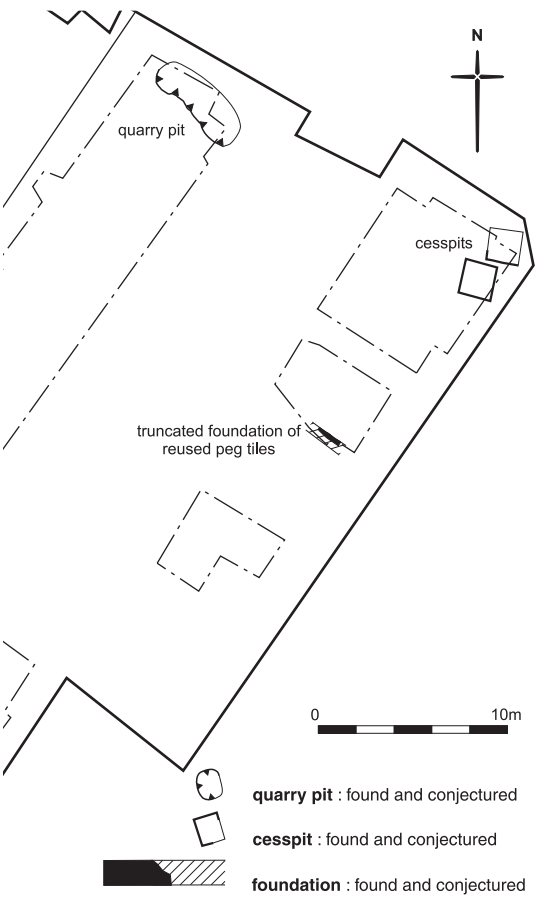

Fig 9. Plan of 16th-century remains (Scale 1:400)

POST-MEDIEVAL OCCUPATION

A small number of 16th-century features was encountered on the site (Fig 9). Two cesspits, squarer and larger than their medieval counterparts, were recorded in the north-east corner of the site, which suggests that houses had by now been built along Cutler Street towards what has become Devonshire Square. One fill produced four small undiagnostic sherds of coarse Surrey-Hampshire border ware (CBW) dating from within the broad range of 1270 to 1500; another fill yielded two sherds, one a Mill Green ware (MG), the other an imported early Siegburg stoneware (SIEG) jug. A quarry to the north-west of the site contained large quantities of rough-hewn, fine-grained limestone, probably the waste produced from reworking of ashlar blocks used to make decorative stonework. A

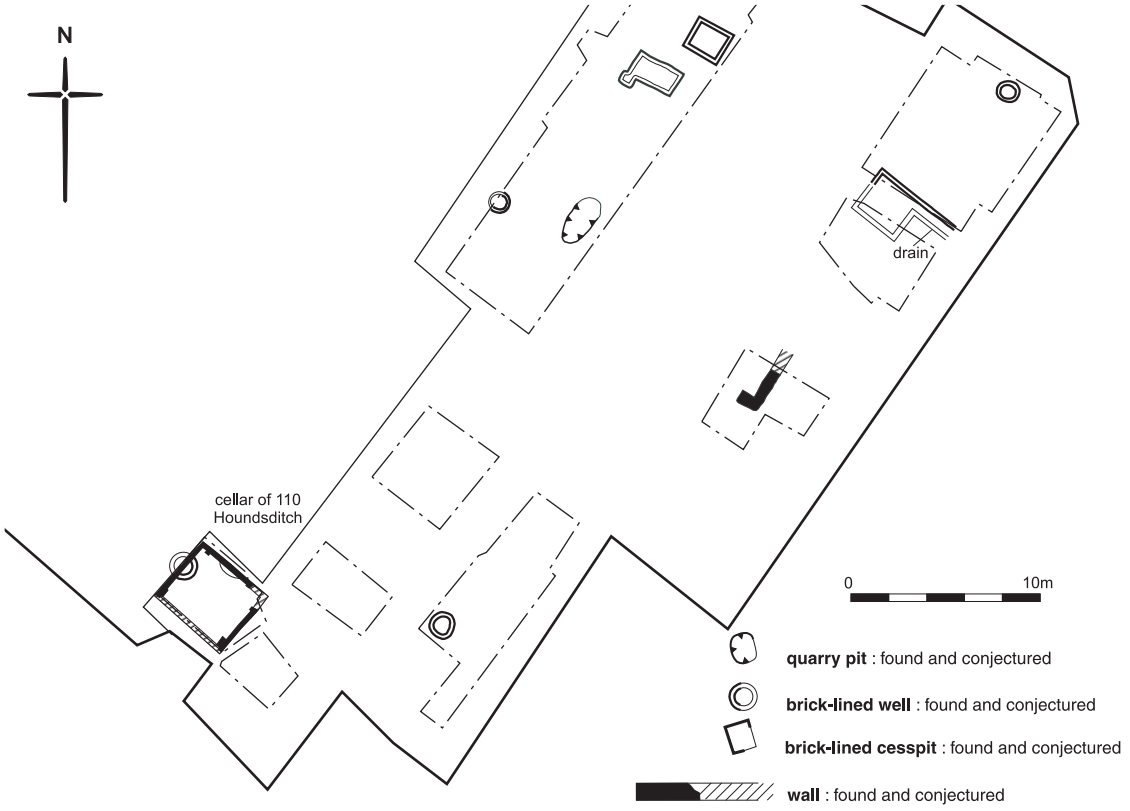

Fig 10. Plan of the 17th- to 19th-century remains (Scale 1:400)

small section of masonry foundation constructed of reused peg tiles was so heavily truncated it was uncertain as to what form of building it was related.

There was also archaeological evidence for the occupation of the site in the 17th and 18th centuries. Apart from a poorly-dated robbed wall alignment, the remains consist mainly of wells and cesspits (Fig 10). These are likely to have been in gardens or yards, although they could have been located in cellars. Contemporary maps indicate that Middlesex Street (Petticoat Lane), linking Bishopsgate with Whitechapel, had been constructed by the mid-17th century and that the area was more densely built up with tenements, alleys, and yards or gardens.

A red brick-built well near the north-east limit of excavation contained an extremely organic fill dated to 1600–30 and the final use of this feature may have been as a cesspit. The fill [16] produced a small post-medieval assemblage of 10 sherds including Surrey-Hampshire border whitewares (BORDG/Y), Surrey-Hampshire border redware with green glaze (RBORG), Frechen stoneware (FREC), London-area post-medieval redware (PMR), Werra slipware (WERR), Weser slipware (WESE), and Westerwald stoneware (WEST BIC). It also contained small quantities of food waste. Another red brick-lined well lay on the western side of the site, where it cut through the medieval barrel well. No finds were recovered from this feature. A further brick-built well was recorded towards the Houndsditch frontage (Fig 10).

One of the fills of a cesspit on the east side of the site produced a large pottery assemblage of 260 sherds from 77 well-preserved vessels, forming a tightly-dated group dating to 1630–1700. The assemblage contains a large collection of Surrey-Hampshire border whitewares (BORDY/G/B/0), Surrey-Hampshire border redware (RBOR) and tin-glazed earthenware (TGWA/C) and smaller quantities of London-area post-medieval redware (PMR), metropolitan slipware (METS),

combed slipware (STSL), Staffordshire-type black-glazed wares (STBL), and Midlands purple ware (MPUR). Analysis of clay tobacco-pipe bowl forms (Heard 2001) suggests that the cesspit was backfilled in the period 1700–10. However, nearly half of the pipes are of types that were in common use during the period 1660–80, suggesting that the material used to backfill the cesspit had accumulated over quite some time. The 18th-century pipes from this pit include three with makers' marks moulded on the sides of the heel, in the usual fashion. There is a type OS10 (Oswald 1975, 37–41) bowl with the mark *WP*. This mark occurs frequently on sites in the City of London, most notably nearby in the Spitalfields area. The maker is unknown, but was probably working near the site. A similar bowl has the mark *IW (crowned)*, which does not seem to have been recorded previously in London, although the initials alone occur with some frequency. There is also an example of a type AO25 (Atkinson & Oswald 1969, 171–227) pipe with the C*rowned Sun* mark, which has been found in some numbers in the Spitalfields/Bishopsgate area, suggesting that it was used by a local pipe maker.

Two 19th-century brick-built cesspits lay a little further to the north. The fills were mainly coal-ash and clinker. A square brick cellar (Fig 10) on the Houndsditch frontage is also thought to be of 19th-century date and to be part of 110 Houndsditch. To the east of the cellar, in the south-east corner of the site, a red brick-built well was backfilled with nightsoil and contained a large pottery assemblage, comprising 81 sherds from 24 vessels, dated 1770–1800. These are well preserved vessels in creamware (CREA), Chinese blue and white porcelain (CHPO BW), painted and transfer printed pearlware (PEAR PNTD and TR1), combed slipwares (STSL), and white salt-glazed stonewares (SWSG), London stoneware (LONS DWT), Midlands orange ware (MORAN), Midlands purple ware (MPUR), tin-glazed earthenwares (TGWA, TGW BLUE), and Surrey-Hampshire border whiteware (BORDB). It is noteworthy that brown-glazed Surrey-Hampshire border wares were present at this date. These wares become more common in the later part of the 17th century (Pearce 1992), but are evidently still present in this late 18th-century group.

An interesting, though poorly stratified, find was an 18th-century ivory and iron folding pocket-knife (<17>; Keily 2001). Similar knives but with differently shaped handles have been found at a number of sites. The contents of an 18th-century well at Bishops Waltham, Hants (Barton 1969, 186, no. 90 and fig 70, no. 90) produced a pocket-knife with tortoiseshell scales and a 17th-century deposit at Ardingly fulling mill and forge (Goodall 1976, 60, no. 7 and fig 9a, no. 7) produced an early example with shaped bone scales.

DISCUSSION OF MEDIEVAL AND LATER REMAINS

The earliest medieval remains from the site date from the mid-12th century, from around the time that the area was acquired by Holy Trinity Priory. The Priors are thought to have obtained permission for a private postern, marked by a door jamb found in the City wall at Dukes Place, 230m to the east (Maloney & Harding 1979, 349). This was closed in 1477 as a result of the strengthening of the City wall under Mayor Jocelyn (Schofield 1994, 11). The postern may have provided for access across the area of the City ditch but any evidence of this was removed when the ditch was recut in 1477.

The horncores in the backfill of the barrel well clearly suggest that small-scale horn working was occurring on site. The series of barrel-shaped pits nearby may have contained tanning tanks and could indicate that parchment was also being made on site. The tanning of leather is also evinced by a cattle skull with characteristic butchery marks found in an adjacent cesspit. In this context, the documentary evidence for the presence of a saddler on the site in the 15th century may be significant. It seems that secondary animal products were being worked in a marginal, extramural area of the City. Although no dwellings of the workforce involved in these trades have been found, the cesspits associated with this settlement were excavated and they date from the foundation of Holy Trinity Priory onwards. The production of parchment was often carried on alongside tanning leather, having many of its processes in common, and required soaking in a caustic solution of calcium. The heads and feet were often left attached to the skin and utilised in other related processes such as the production of neatsfoot oil (Serjeantson 1989, 136–7). Calf, goat/kid and sheep/lamb skin were all used for parchment (Bischoff 1990, 8–10).

Holy Trinity Priory was suppressed at the

Dissolution. The Priory may have become a source of raw materials for building and the fine-grained limestone waste found in a quarry may have been taken from the demolished priory walls. In the 100 years after the Dissolution London's population multiplied by 7 to 8 times (Stone 1972, 72–5, 131) and the former Priory property, with its gardens and dwellings, would have become increasingly subdivided and intensively built up. If the size and shape of the pits is a guide, the status of the area may have risen over this period.

The development of the site through the succeeding centuries saw a gradual infilling of open spaces and a change from what may be termed 'domestic industry', where craft workshops or storage space occurred within domestic residences, to purpose-built industrial or warehouse premises. An example of the latter would be the 'Drill Hall' which stood on the site prior to redevelopment. This building had been used to store and sell second-hand clothes to the rag trade. However, the archaeological remains of the 17th and 18th centuries produced mainly domestic assemblages typical for the City of London.

SPECIALIST REPORTS

HUMAN BONE

Brian Connell

Methods

A total of 36 inhumation burials was recovered from Premier Place (Table 1, Fig 3). Full descriptions of each of the skeletons are available in the relevant research archive (Connell 2001).

Age determination

For the adults in this sample, age determination was based on changes in the pubic symphysis (Brooks & Suchey 1990), and where this area of the pelvis was missing the auricular surface method was used (Meindl *et al* 1985). The amount of wear on the molar teeth was also used (Brothwell 1981). For the sub-adults, age determination was based on tooth eruption (Ubelaker 1989), diaphyseal lengths (Scheuer & Black 2000), permanent molar root formation (Moorrees *et al* 1963), and epiphyseal fusion (Scheuer & Black 2000).

Sex determination

The biological sex of the adult skeletons was based on visual observation of pelvic and cranial characters following Phenice (1969), Ferembach *et al* (1980) and Buikstra and Ubelaker (1994). Sex determination in sub-adult individuals is more problematic because the secondary sexual characteristics are not usually manifest until puberty. An indication of the sex of sub-adults (with surviving dentition) is given by plotting permanent canine tooth dimensions against those of the adults sexed by osteological methods.

Continuous and discontinuous traits

The calculation of stature was based on the formulae devised by Trotter (1970). Metrical data were recorded to standards following Buikstra and Ubelaker (1994) and Brothwell (1981). Non-metric traits were recorded following the definitions of Berry and Berry (1967) and Finnegan (1978).

Pathology

All pathological alteration was described (in the full catalogue) and classifications of any disease processes follow Aufderheide and Rodriguez-Martin (1998) and Ortner and Putschar (1981).

Preservation and completeness

The skeletons were mostly very incomplete and poorly preserved. The preservation was poor for 20 of the 36 skeletons examined (56%). The exterior cortical surfaces were badly eroded and many of the articular ends were missing. Of the 16 burials that had good or moderate preservation (grade 1 or 2), 7 were in coffins with a chalk-like material. Fig 11 shows the percentage completeness of the skeletons and it can be seen that all except two are 50% complete or under. The poor preservation and incompleteness of many of the skeletons has implications for the availability of osteological characters used for age and sex determinations and this meant that less than the full range of methods could be applied.

Human variation

Age and sex

This sample consists of the remains of 29 adults

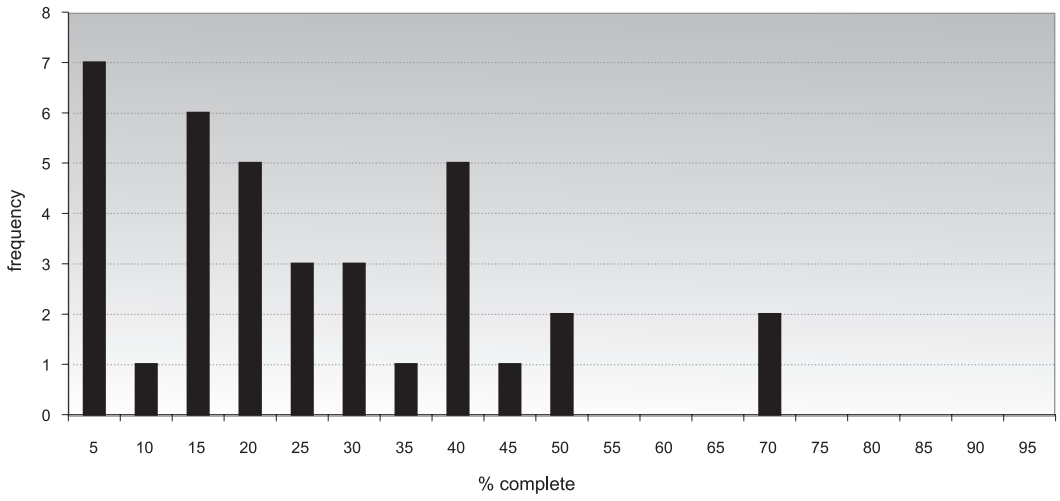

Fig 11. Completeness of the skeletons (count of bones per individual expressed as a percentage of the total normally present)

(81%) and 7 sub-adults (19%). Of the 29 adults, 9 (31%) could not be more accurately aged other than to an 'adult' age category due to the absence of osteological age indicators. The distribution of age at death for the entire group is shown in Fig 12. The adults consist of 7 males and 14 females plus 8 individuals (22%) where the sex could not be reliably determined.

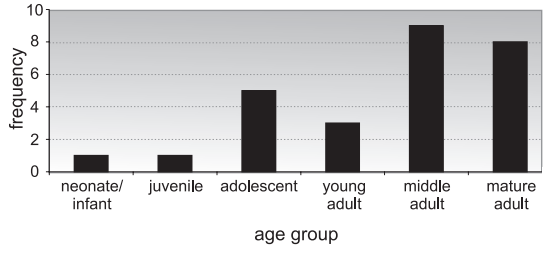

Fig 12. Mortality profile: neonate/ infant — up to 12 months; juvenile — up to 5 years; adolescent — up to 16 years; young adult — 17–25 years; middle adult 26–45 years; mature adult — 45+ years (this figure does not include the nine individuals aged as 'adult')

The skeleton of a perinatal individual [131] was found adjacent to the lower legs of an adult [127]. None of the limb bones of the perinate were sufficiently intact to permit an estimation of gestational age; however, the greater wing of the sphenoid bone was measured (26.8mm). This measurement was compared to data from modern foetuses compiled by Fazekas and Kosa (1978). The sphenoid bone reaches a mean size of 26.4mm (n=8) at 36 weeks old, and this suggests that the skeleton [131] was probably a stillbirth.

In order to determine the sex of the juveniles in this sample, measurements of the permanent mandibular canine teeth were assessed as these teeth are known to be sexually dimorphic. Measurements of these teeth in adults who have been sexed by osteological methods can be used as a baseline from which to determine the sex of juveniles (Mays & Cox 2000). Molleson (1993) used this method to identify the sex of the juveniles in the Roman cemetery at Poundbury and found that there was good discrimination between boys and girls. However, this method is population-specific and depends on the degree of sexual dimorphism expressed in the adults. Only four juveniles had surviving dentition ([81], [102], [112] and [163]) and a bivariate plot of canine tooth dimensions for adults and the sub-adults of unknown sex is given in Fig 13. It can be seen that two skeletons ([112] and [163]) can be classified as male. Two adolescents, both aged *c.*15 years old ([81] and [102]), fall into the female scatter.

The presence of both adult and juvenile males and females in the sample as a whole suggests that it is demographically normal, that is, no members of the contributing living population are being excluded on the basis of age or sex.

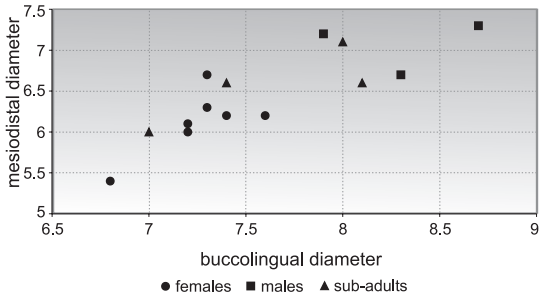

Fig 13. Bivariate plot of mandibular canine tooth dimensions (mm)

The demography of this sample closely parallels that seen in a small sample (n=20) from a 3rd- to 4th-century Roman cemetery in London studied by Bentley and Pritchard (1982). They found that of the 20 individuals excavated, 14 (70%) were in one of three clusters of mixed adult and juvenile individuals.

Stature

Only 8 skeletons were sufficiently intact to provide long bone lengths and hence stature estimates. The mean male stature was 1.67m (n=2) and this is similar to the mean of 1.66m from Poundbury (Molleson 1993) and 1.69m from London (Conheeney 2000). The mean female stature was 1.63m (n=5), although this is dragged down slightly by a small female [154] from Group 25 who had an estimated stature of 1.48m. However, the smallest female encountered in the eastern London cemetery complex was 1.45m (Conheeney 2000, 280). An eighth individual [166] could not be reliably sexed and is not included in these calculations. The stature estimates for both males and females are within the normal range of variation seen in two other large Roman cemetery groups.

Few other cranial or postcranial measurements were possible, and in almost all cases the sample size was very small ($n \leq 6$). The only measurements possible in any number were those relating to the diameters of the proximal femoral and tibial shafts. A summary of platymeric and platycnemic values is given in Table 2.

Non-metric traits

Non-metric traits are caused by variation in the growth centres of bone and by variation in the shape and position of soft tissues. Multiple genes determine the presence or absence of some of these traits and they are often used in biodistance studies and in investigating the inter-relatedness between individuals in a skeletal population. Frequencies of these traits in this sample are available in the relevant research archive (Connell 2001, tables 3 and 4).

Table 2. Summary of platymeric and platycnemic indices

	Number	Mean
Platymeria		
male	5	83.7
female	5	82.1
Platycnemia		
female	4	77.3

The genetic and environmental factors that govern the expression of these traits are still poorly understood and Tyrrell (2000, 293) has pointed out that the main areas of controversy relating to the use of non-metric traits have still to be resolved. Therefore, it is doubtful that the small sample size and poor preservation, coupled with uncertainties about the meaning of trait expression, would produce any meaningful results. The question of family relationships within these burials is a difficult one to answer; this hypothesis would perhaps be better tested with DNA analysis.

Palaeopathology

A variety of pathological conditions are present in this group. The most common condition is degenerative joint disease; this is commonly seen in both modern and archaeological populations (Rogers & Waldron 1995, 32). A detailed description of the skeletal pathology in each individual is given in a catalogue in the research archive (Connell 2001). Five individuals show evidence of fractured bones suffered earlier in life. Most of the fractures (7/10) occur in the upper limbs. Two males ([83] and [129]) had fractured left clavicles, the former also having a fractured left rib. Colles fractures were present in two adult females ([127] and [146]). In one of these [146] there was also a fractured right first metacarpal and in the other [127] there were fractures in the scapula and lower limb. In this skeleton [127] it is unlikely that the force which caused the Colles fracture would

be transmitted to the blade of the scapula and these probably represent two separate injuries. Colles fractures are often caused by falling on an outstretched hand, and are the commonest injury seen in modern fracture clinics (Dandy 1993, 206). An isolated fracture of the first metacarpal (thumb) had occurred in an adult male [85]. Colles fractures and fractured metacarpals were also frequent in the eastern London Roman cemetery (Conheeney 2000, 285). Trauma in the lower limbs consisted of a single case of a fractured tibia and fibula in an adult female [127], probably caused by severe twisting stresses; in modern populations fractures of the tibia and fibula are a common injury in all age groups (Duckworth 1995, 151). The general pattern of trauma in this group is of fractures that can be attributed to commonly occurring accidents; falls and fractures of the lower limbs and forearm were also the most commonly encountered in the large sample from Poundbury (Molleson 1993, 204).

Two adults ([69] and [124]) and two sub-adults ([112] and [163]) have fine woven bone deposits on the visceral surfaces of one or more ribs. Studies on documented skeletal samples have demonstrated a correlation between the presence of these rib lesions and people who are known to have died from tuberculosis (Roberts *et al* 1994; Kelley & Micozzi 1984), although a direct relationship cannot currently be verified (Roberts *et al* 1998, 57). In this sample, 4 individuals out of 26 (15.4%) with surviving rib elements show these lesions and this compares with frequencies of 4.6% and 19.4% seen in other Roman cemetery groups (Roberts 1989, cited in Roberts *et al* 1998). In addition to woven bone deposits on the ribs, one skeleton [112], from an adolescent male approximately 16 years old, has a lytic lesion in the twelfth thoracic vertebra. This lesion might represent the early destructive changes of vertebral tuberculosis. Tuberculous destruction of vertebrae has been identified in Roman cemeteries dating from the mid-1st century AD (Mays & Steele 1995) and 2nd–4th centuries AD (Stirland & Waldron 1990), so we know that tuberculosis was present in Britain during the Roman period. At least two cases of probable tuberculosis have already been identified in Roman London (Conheeney 2000, 287). The lesions found on the four Premier Place skeletons represent an inflammatory response to a pulmonary infection, with a high probability that the lesions are induced by pulmonary tuberculosis. Evidence to support the theory that tuberculosis induces these lesions is increasing (Roberts *et al* 1998; Roberts 2000). Therefore, it is reasonable to conclude that in this small group of skeletons there is a chronic pulmonary stressor most likely to be tuberculosis.

Most of the joint disease occurred in the vertebrae, although one mature adult male [85] had osteoarthritic changes in the hands. The distribution of degenerative joint changes (osteophytes, sub-chondral pitting and eburnation) is given in Table 3. A mature adult female [147] has a series of symmetrical interarticular erosive lesions in the carpometacarpal, metacarpophalangeal, and metatarsophalangeal joints. The lesions are lytic and sharply defined with marginal osteophytes. The left talocrural (ankle) joint is also ankylosed, but there are no erosive changes in the sacroiliac joints. The central position of many of the lesions would not suggest rheumatoid arthritis, which tends to affect joint margins (Rogers & Waldron 1995). The absence of sacroiliac involvement is uncharacteristic of seronegative spondylarthropathy, although in this group of diseases there is a much greater tendency for the joints to fuse (Rogers & Waldron 1995, 70). Rogers *et al* (1991) have described a case of erosive lesions in the joints of the carpus and hands and have suggested erosive osteoarthritis as the cause; however, skeleton [147] is only 40% complete and it is difficult to determine the exact distribution of lesions. This in turn makes a firm classification more difficult but the joint changes can be classified as an erosive arthropathy. Erosive arthropathies were also noted in the Roman cemetery at Poundbury (Molleson 1993, 192) and Conheeney (2000, 287) reported a probable case of psoriatic arthritis, although the basis for the diagnosis is not given.

A mature adult female [146] had a series of nodular excressences of bone on the endocranial aspect of the frontal bone. This represents a condition known as hyperostosis frontalis interna. This is a common finding in post-menopausal females; these alterations result from hormonal changes after the menopause (Ortner & Putschar 1981, 294). Hyperostosis frontalis interna was also observed in the population from Poundbury, where 26 cases were found, 19 of them women; three times as many women as men were affected (Molleson 1993, 194).

Table 3. Distribution of degenerative changes in major joints

Joint surface	Right	Frequency	Left	Frequency
temporomandibular: glenoid fossa	0/13		0/14	
temporomandibular: condyloid process	0/9		0/10	
sternoclavicular: medial clavicle	0/4		1/7	14%
acromioclavicular: lateral clavicle	3/3	100%	1/2	50%
sternoclavicular: clavicular fossa: manubrium	0/3		0/3	
acromioclavicular: clavicular facet: acromion	1/3	33%	0/4	
glenohumeral: glenoid cavity	1/11	9%	1/14	7%
glenohumeral: humeral head	0/11		0/11	
humeroulnar: humerus: trochlea	0/11		0/9	
humeroradial: humerus: capitulum	0/10		0/8	
humeroulnar: ulna: trochlear notch	0/13		0/11	
proximal radioulnar: ulna: radial notch	0/11		0/12	
distal radioulnar: ulna	0/6		0/1	
humeroradial: radius head	1/7	14%	0/6	
proximal radioulnar: radius head	0/6		0/7	
distal radioulnar: radius	0/6		0/4	
radiocarpal: radius (for scaphoid)	0/7		0/5	
radiocarpal: radius (for lunate)	0/7		0/5	
radiocarpal: scaphoid	0/6		0/3	
radiocarpal: lunate	0/4		0/1	
coxal: acetabulum: os coxa	1/14	7%	2/17	12%
coxal: femoral head	0/13		0/17	
femoropatellar: anterior femur	1/10	10%	0/8	
femorotibial: femur:medial	2/12	17%	1/9	11%
femorotibial: femur: lateral	1/13	8%	0/10	
femoropatellar: patella	1/6	17%	0/5	
femorotibial: tibia: medial	1/11	9%	0/6	
femorotibial: tibia: lateral	0/10		1/7	14%
proximal tibiofibular: tibia	0/4		0/3	
talocrural: tibia	0/11		1/9	11%
proximal tibiofibular: fibula	0/2		0/2	
talofibular: fibula	0/6		0/3	
talocrural: talus	0/9		0/7	
talofibular: talus	0/7		0/6	

ROMAN POTTERY

Rupert Featherby

The Roman pottery assemblage comprised a total of 134 sherds from 33 contexts; six contexts also produced post-Roman pottery. All 33 contexts are small in size (less than 30 sherds) and the assemblage has been recorded in accordance with the standards of the Museum of London Archaeology Service. The condition of the assemblage is generally poor with just under 50% being abraded, burnt or worn (excluding mortaria). The sherds range in size from small to large, with the majority ranging from small

to medium. Six contexts contain 1st-century AD pottery, but as each context contained only one or two sherds, this should be regarded as a *terminus post quem* rather than a firm date for the activity.

Imported wares account for 27.6% of the assemblage by sherd count, which is fractionally higher than the inland City average, which is 25.8% (Symonds 1998, 345). Samian is the most common imported ware (14.9%), compared to amphora (7.5%). The averages for an inland City assemblage are 13.9% amphora and 9.6% samian (Symonds 1998, 344). The figure for samian is also twice that of samian within the eastern Roman cemetery, 6.7%, but it would appear that this low figure is partially due to the late date of that cemetery (Symonds 2000, 123). However, it must be remembered that the assemblage size is very small. Eight sherds of amphora were found, two of Baetican Dressel 20, four of Gaulish type, one of Cadiz, and one unsourced.

The most common ware type is black-burnished (Table 4), which at 22.4% is over five times higher than the inland City average of 3.5%. Both reduced (17.2%) and oxidised (19.4%) wares are lower than the averages for the City (28.9 and 22.6% respectively). Due to the size of the assemblage, there is a limited range of vessel types (Table 5). Bowls are the most common form at 12.7%; jars are the next most common type at 7.5%.

Table 4. Breakdown of Roman pottery by fabric type

Ware	No. of sherds	% of assemblage
Amphora	7	7.5
Black-burnished ware type	30	22.4
Fine ware (imported)	7	5.2
Fine ware (Romano-British)	11	8.2
Fine ware, reduced	5	3.7
Oxidised wares	26	19.4
Reduced wares	23	17.2
Samian	20	14.9
Tempered	2	1.5

Just under half of the material is imported (either amphora or Southern/Central Gaulish samian). Of these, over half the imports are Central Gaulish samian dating *c.*AD 120–250. Seven sherds of Alice Holt Surrey ware were identified, ten of Verulamium region white ware,

Table 5. Breakdown of Roman pottery by form

Form	No. of sherds	% of assemblage
Amphora	9	6.7
Beaker	6	4.5
Bowl	17	12.7
Bowl/dish	3	2.2
Dish	7	7.2
Jar	9	7.5
Lid	1	0.7
Mortaria	4	3.0
Miscellaneous	76	56.7

and one of North Kent shelly ware, all dated to *c.*AD 50–160. Black-burnished wares (1, 2 and black-burnished styles) account for the majority of the assemblage, dating to *c.*AD 120–400.

Amongst the later Roman pottery, Nene Valley colour-coated wares (including white fabric and white-coloured varieties), dating *c.*AD 150–400, were the most common. One sherd each of Alice Holt Farnham, dating *c.*AD 250–400, and Oxfordshire red colour-coated ware, dating *c.*AD 270–400, were also identified.

MEDIEVAL AND POST-MEDIEVAL POTTERY

Lucy Whittingham

The earliest groups of medieval material, dated 1140–1220, are associated with cesspits and a barrel-lined well (Fig 8). Pottery of a slightly later medieval date (1230/1270–1350) is associated with some of the quarry pits. All of these medieval assemblages show a preference for the consumption of local ceramics, with the majority of the fabrics being London-type ware, the products of the Surrey whiteware industries, south Hertfordshire greywares and shelly sandy wares. The small quantities of Continental imports from France (Saintonge), the Low Countries (Andenne-type), and the Rhineland (Siegburg unglazed stoneware) are not unusual finds within the City.

Assemblages of a similar date and composition have been found in areas of quarrying just beyond the peripheries of the City wall. Similarly dated quarrying sequences have been noted at Pilgrims Street near Newgate (PWB 88; Blackmore 1993), and further to the south at Blackfriars Court just outside Ludgate (LUB98; Jeffries 1999a). Other sites such as Chiswell Street (CSU 98; Blackmore 1998a) and Finsbury

Square (FSQ 98; Blackmore 1998b) are located just outside Moorgate. West Smithfield provided an assemblage that is similar in character and date to the one at Houndsditch (WSI97; Jeffries 1999b).

The post-medieval assemblage supports the cartographic evidence suggesting that development to the rear of the Houndsditch frontage plots began in the earlier post-medieval period. The vast majority of the assemblage was recovered from a cesspit [33] and a brick-built well [90] (Figs 9–10). These groups are both typical domestic assemblages, their composition being typical of assemblages from the two periods represented. The former is a large group dated 1630–1700, which showed a preference for the consumption of local ceramics such as tin-glazed earthenware (produced in Southwark and Lambeth) and locally produced post-medieval redwares (including fine redwares). The function of this group was mostly utilitarian, associated with hygiene, as shown by the presence of a high number of chamber pots, together with vessels that were used in the kitchen for food storage and distribution. Some tablewares and vessels for display are present in tin-glazed earthenwares such as the fluted dish.

The medium-sized group from well [90] was deposited between 1770 and 1800, and is very different in its composition when compared to that from cesspit [33]. It is comprised primarily of pearlware, creamware and Staffordshire white salt-glazed stoneware. The vessels are much finer and the tablewares form a more significant proportion of the assemblage. These groups reflect both the pattern of food consumption, and the difference between 17th- and late 18th-century domestic ceramic assemblages.

ANIMAL BONE

Jane Liddle

Animal bones were recovered from all phases of activity on the site. As discussed above, the bones from the medieval and post-medieval deposits indicate that horn working, butchery and food waste were all deposited within the wells and cesspits (Table 6). The absence of small mammal bones, even from samples, indicates that the area was not open to scavengers and could suggest that the waste was not left open in the pits and wells for long periods of time.

Table 6. Species representation by fragment count from medieval and post-medieval contexts

Species	**Medieval**			**Post-medieval**
	Cesspits	Barrel-lined well	Total	Brick-lined well
Cattle	15	15	30	0
Cattle-size	6	15	21	3
Sheep	1	0	1	0
Goat	0	23	23	0
Sheep/goat	3	8	11	0
Sheep-size	1	27	28	5
Pig	0	2	2	0
Unidentified mammal	0	6	6	0
Chicken	0	1	1	2
Domestic goose	1	1	2	0
Unidentified bird	0	0	0	1
Medium-size hawk	0	1	1	0
Cyprinidae	0	2	2	0
Cod	1	0	1	0
Elasmobranch	0	0	0	1
Gadidae	0	0	0	1
Plaice/flounder	0	1	1	0
Unidentified fish	0	22	22	5
Frog/toad	0	2	2	2
Total	**28**	**126**	**154**	**21**

Food products

The bones recovered from the medieval cesspit and well groups indicate that waste from food preparation, and possibly post-consumer waste, was discarded. The style of butchery suggests that the carcasses had undergone primary butchery associated with jointing. The meat may then have been removed from the bones, which were then discarded by the butcher. A sheep skull split in two indicates that either the brain was removed for consumption or that the skull was sold in two halves for cooking. This would suggest that it might have resulted from household food waste.

Fusion and tooth wear were visible on long bones and mandibles, and showed that a large number of the domesticate bones were from mature individuals. All cattle from the medieval deposits were over two years of age, and a number were over seven years. This indicates that the bones may have derived from older individuals culled after their useful life for milk production, breeding or traction. Although few bones could be sexed, two cattle pelves from medieval cesspit group 19 were from large, robust males. Within the same pit group, two butchered adjoining cattle lumbar vertebrae showed grooving, eburnation and extension of the articular surfaces. These modifications are normally interpreted as the result of a degenerative disease of the articular cartilage known as osteoarthritis (Baker & Brothwell 1980, 114–17). The disease is normally the result of constant trauma to the joint, accelerating the normal ageing process, and may indicate that the ox was used for traction prior to slaughter for meat.

A small number of sheep/goat bones derived from individuals under one year, indicating remains from animals bred primarily for their meat. One sheep/goat mandible, however, showed wear on the teeth associated with an individual of between six and eight years of age, indicating that some older livestock were also present within the assemblage. If a sheep, this could indicate an individual used for wool production, breeding or milk, and if a goat, it may have been used for breeding or milk. A foetal sheep/goat bone from well group 23 was so small that it must have been associated with a ewe and killed when its mother was slaughtered.

Stature calculations were only available for one cattle and one sheep/goat bone, both from the medieval barrel-lined well. The cattle radius provided a withers height of 972mm and the sheep/goat metatarsal indicates that the individual stood at 534mm high. These sizes are comparable to Jersey-sized cattle and soay-sized sheep and are similar to other individuals recovered within London from the medieval period, for example at Number One Poultry (Rielly in prep) and New Fresh Wharf (Armitage 1982, 98). Due to the small number of measurable bones, however, no direct comparison can really be made owing to the possibility that the measurable bones were not an average size for the rest of the livestock.

The skulls of cattle recovered were small with a characteristic Jersey ridge on the frontale. This indicates that the cattle were small, unimproved breeds, common throughout the medieval period.

Pig bones were not common; Armitage's study of the contribution of the three main meat-species to the diet, using the weight of their bones (1982, 96), shows that on medieval London sites, pig represented only a very small fraction of the diet. Grant (1988, 157–9) showed that during the medieval period pig numbers reduced in towns, and they were much less important than cattle or sheep. Grant suggests that this was due to the return to pasture of much previously cultivated land, on whose by-products pigs had traditionally been fed during autumn. It is also suggested that an increased profit available from keeping sheep and cattle was a contributing factor. So, it is possible that the small quantities of pig bones recovered show the effects of a reduction of pig husbandry in the country. Although pigs were kept within backyards in the city, their numbers would have been small and could not have contributed substantially to pork production.

The small assemblage of post-medieval bones, from a brick-built well, contained no domesticate bones identifiable to species, suggesting that the well was not used for the systematic dumping of food or butchery waste.

Industrial products

As the assemblage of domesticate bones is not large, the number of horncores, mainly from goat but with a small number from cattle, represents a moderate proportion of the bones recovered. This indicates that the area was used for industrial waste disposal as well as food

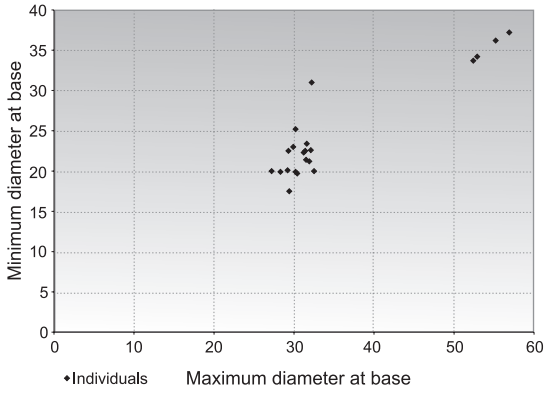

Fig 14. Maximum and minimum diameters of the base of horncores; grouping may indicate sex

waste, suggesting that during the 12th and 13th centuries the area was an industrial zone, possibly for small-scale artisan activity.

A total of 23 goat horncores was recovered from the barrel-lined well. Most of the horncores were compacted bone, which indicates maturity, rather than the more porous bone seen on younger individuals. Fig 14 shows the distribution of sizes, using maximum and minimum diameter at base. The graph indicates two definite groupings, with four individual horncores larger than the main group of a similar size. This most likely indicates a sexual difference, as male goats are larger and stockier than females and have larger horns. It is therefore evident that most of the horncores were from females, with only four male horncores identified. The source of the horn could have been ex-breeding and milk-producing stock that had been sent to slaughter. The moderately small deposits may have derived from artisan horn working using a smaller, cheaper horn than the large-scale horn working industry deposits seen at sites such as Number One Poultry (Rielly in prep), where large male horncores dominated the deposits of goat horncore.

The smaller number of cattle horncores from the cesspits and well indicates that cattle horn may also have been processed for working in the area, but on a smaller scale. A posterior skull with both horncores removed *c.*20mm from the base may have been butchery waste with the horns having already been removed for the hornworker. The skull also showed signs of poleaxing. Armitage has identified styles of butchery associated with horn removal (1982, 102). The technique involves the removal of both horns together with portions of the frontal and parietal bones by administering a sweeping blow to the back of the head. In addition a further blow was often required across the frontal to totally remove the horns and skull portion. This style of butchery was evidently used to remove the horns recovered from Premier Place and gives a clear indication that the deposits would have resulted from discard by the horn worker.

Dobney *et al* (1996, 23) note that horncores, once the horn was removed, were of little economic use, and would normally be dumped locally for convenience. This is yet another indication that small-scale goat and cattle horn working was practised within the immediate vicinity.

Fish and birds

The small assemblages of fish and bird bones in medieval features indicate that there was little food waste from any species deposited. This compares well with the limited evidence of domesticate food waste and suggests that the features were mainly used for the deposition of butchery and industrial waste. The small quantities recovered include plaice/flounder, cod and cyprinidae, indicating that although the food waste was not extensive, both marine and freshwater resources were used. The small numbers of chicken and goose bones also indicate food waste.

A goshawk wing bone was recovered from the barrel-lined well. It is widely assumed that birds of prey were not eaten due to their status; they reputedly had the same worth as a horse or greyhound (Hagen 1995, 144). If the bird did not derive from food waste, there are two other possible reasons for its presence in the well. The first is that it may have been a wild bird and the second that it was a bird used for falconry. The first possibility is more unlikely, as hawk species such as the sparrowhawk and the goshawk are specialist hunters, rather than carrion feeders, and therefore require habitats with enough scrub or tree cover to enable them to ambush their prey (Mulkeen & O'Connor 1997, 442). It is therefore probable that goshawk remains recovered from medieval urban and suburban contexts derived from birds bred and kept solely for falconry. Falconry was mainly a sport of the gentry, although social position determined which bird, within a hierarchy, could be flown

(Grant 1988, 180). Goshawks were within the lower ranks of this hierarchy, tending to belong to yeomen (Eastham 1977). They were slightly above the status of sparrowhawks, which were kept by priests, but below that of merlin, owned by ladies. The peregrine was the highest-ranking falcon and was solely the bird of princes and nobles. The recovery of the bone may suggest that a yeoman, or possibly a senior cleric, discarded his dead hawking bird within the well.

Within a post-medieval brick-built well a small assemblage of fish was recovered, including gadidae and elasmobranch. These are both marine species and indicate possible small-scale exploitation of marine resources. Chicken bones were recovered in very small numbers and provide evidence that domestic fowl were consumed and their waste deposited in the well.

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