RESULTS OF

ARCHAEOLOGICAL EXCAVATION AND RECORDING

AT

15-17 LONG ACRE

CITY OF WESTMINSTER

on behalf of:
Miller Construction Ltd

National Grid Reference
TQ 3015 8092

Site Code
LCR 99

June 2005

On behalf of: Miller Construction Ltd
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1) SUMMARY

This document presents the results of an excavation conducted by AOC Archaeology Group, at 15-17, Long Acre, in the City of Westminster, on behalf of London and Paris Ltd. The excavation was conducted over several months between February and August 1999, following an evaluation undertaken by the Museum of London Archaeology Service (MoLAS) in 1996.

The majority of the features excavated dated to the Saxon occupation of *Lundenwic*. There were two phases of Saxon activity. The earliest phase was characterised by gravel quarries that gradually filled and probably created a rather damp environment, dating to the almost immediate post-Roman settlement by Saxon migrants. The later phase is split, and dates to the occupation of the 'emporium' *Lundenwic* between AD 600 and 850, before abandonment was forced by Viking raids. *Lundenwic* was an important North European trading port, and this was reflected in the pottery found on the site, much of it deriving from the continent.

Initial evaluation of the site identified heavy truncation, removing all occupation layers, leaving only the fills of deeply cut features; pits and quarries. The fills of the later Saxon pits were characteristic of general settlement activity without being securely related to any specific process or function. The finds assemblage is dominated by animal bone, thus providing evidence of diet and economy. Occasional evidence of craft and industry was also present, illustrated by iron working, manufacture of bone objects and weaving.

Features dating to between 1600 and 1800 were also recorded during the excavation; the remains of a basement towards the north of the site, and a well. These were most likely the fragmentary remains of a17th century bathhouse which became a notorious brothel.

The research aims outlined prior to excavation, and the revised research aims from post-excavation analysis are discussed with reference to the results. The significance of the site within *Lundenwic* is also discussed.

2 THE SITE

2.1 Site Location (Figure 1)

The site of 15-17 Long Acre lies in Covent Garden, within the Parish of St. Martin-in-the-Fields, in the City of Westminster (Figure 1). It covers approx. 900 square metres (0.09 hectares). The property faces onto the west end of Long Acre on its north side, and is bordered by Conduit Court to the east, Floral Street to the south, and No.14 Long Acre to the west. Prior to excavation, beneath the northern half of the site was a single basement which extended 0.5m deeper than an underground car park which lay under the southern half of the site. The site is centred at National Grid Reference (NGR) TQ 3015 8092

2.2 Geology and Topography

The drift geology of the area is represented on the 1994 edition of the British Geological Survey (BGS) map as a river terrace composed of Hackney Gravel, albeit only some 200m to the west of an area of brickearth capping. In fact, it is clear that a natural layer of brickearth originally extended across the whole of the Covent Garden area, although this has frequently, as in the case of 15-17 Long Acre, been truncated or removed by quarrying and construction. Where undisturbed, this layer of brickearth has been found to be as little as 0.5m deep (Cowie & Whytehead, 1988, 49), although its depth certainly varies from site to site.

The slope leading up from the bank of the Thames becomes more gradual as it approaches Long Acre but is still discernible. In addition, the present surface of Long Acre slopes gently down from east to west. Thus Ordnance Datum heights from the area include 23.8m OD at the angle of Neal Street and Long Acre, 22.5m OD on Floral Street immediately behind the site, 21m OD to the south at the junction of King Street and Garrick Street.

The modern topography appears to relate approximately to the contours of the underlying natural ground surface. It is clear that the north-south slope of the river terrace has always existed: the height of the truncated gravel terrace at 7-10 Floral Street, some 100m to the east of 15-17 Long Acre, was 18.5m OD at the northern edge of the site and 17.25m OD at the southern edge, while the surface of untruncated brickearth, less than 200m to the south at Jubilee Hall, was c.15m OD. The heights of the surface of truncated gravel at 15-17 Long Acre are comparable to those observed at 7-10 Floral Street, with a maximum of 19.24m OD on the north side and 18.78m OD on the south side of the site, as revealed by the MoLAS evaluation (Partridge 1996, 22-5). Distinctly lower measurements of 18.32m OD and 17.89m OD respectively were produced from the borehole survey carried out subsequently by Bowden, Sillet and Partners Ltd. This is not surprising considering the degree of disturbance to the natural deposits revealed by the archaeological evaluation. Despite the fact that these measurements all represent the surface of truncated natural deposits, it seems likely that the north-south slope indicated in each case reflects the original inclination of the undisturbed ground surface.

3) RESEARCH AIMS

The original research aims were stated within the Written Scheme of Investigation *submitted prior to excavation (AOC. March, 1998). The revised research aims were stated in the* Post-Excavation Assessment *(AOC. April 2002)*

3.1 Original Research Aims

- To record all archaeological remains that will be disturbed or destroyed during the course of the development works.

- To clarify the nature and extent of the features identified during the evaluation, and assess the potential for extracting important interpretative data for the social and economic function of *Lundenwic* from the backfill of these features. Are these features Saxon in origin or are they of later date.

- To try and determine the nature of activity in this part of *Lundenwic* through the surviving features or contents of features.

- The level of truncation of the site limits the potential for recovering evidence of Saxon domestic and/or industrial activity. Given that undisturbed deposits of Saxon date are present then there is an opportunity for collecting evidence for animal husbandry, carcass processing, butchery practices and specialist (craft or industrial) activities. If bone is recovered from well defined, securely dated contexts then the following information using standard methods of metrical analysis will be recovered:

  a) dimensions of individual fragments
  b) nature of butchery (e.g. primary/secondary)
  c) species, sex, bone type, and age at death

  This collected data will be structured to specifically address the following questions:

  a) what type of butchery practices were in operation on this site?
  b) were the animals raised and butchered for the purpose of food and/or did they perform another function?
  c) what species were exploited for food purposes?
  d) what quality of meat was more commonly consumed?

- If medieval or later remains are present, what was the relationship with the early development of the surrounding area?

3.2 Revised Research Aims

The revised research aims were based upon an assessment of the degree to which the original aims were fulfilled by the excavation, and what further work was required to enable fulfilment if the aims.

- The initial evaluation revealed a number of cut features which seemed to have their origins in quarrying activity. Excavation of these features provided dating evidence placing them firmly within the Saxon period. A number of circular, conical pits were also recorded during the excavation, and these were richer in household waste, indicating habitation of the site, rather than simply quarry-based industry. What information regarding diet, economy and industry is revealed by the finds?

- Because of the heavy truncation of occupation surfaces on site, the exact nature of activity cannot be known, just interpreted from finds and the basal remains of features. Is there any zoning of activities or special distribution suggesting specific households?

- A large quantity of animal bone was collected from secure contexts, the majority from refuse-pits. What does the bone tell us regarding animal butchery? Were the carcasses were simply discarded, or were the bones being worked into tools?

- What is the significance of the Roman finds from the site: are these Roman features, or are they symptomatic of the early phase of Saxon occupation?

- What is the significance of the human bone collected from the site?

- There were no medieval features identified on site. The very obvious horizontal truncation for the 20th Century basementing has removed all archaeological deposits except for the bases of the deepest cut features. There is therefore no work to be done regarding medieval occupation of the site.

4) HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

4.1 Pre-Roman (before c. AD 60)

Traces of prehistoric activity in the area around the site is limited to a series of isolated discoveries of worked stone tools, for the most part deriving from the river terrace gravels and of Palaeolithic date. These artefacts are generally believed to have been disturbed from their original positions by the fluvial action which led to the creation of the gravels themselves. From slightly further afield, discoveries in Drury Lane and Southampton Row suggest that in the occasional cases where the surface of natural brickearth survives undisturbed, evidence does exist for significant activity in the later prehistoric period (approximately from the Mesolithic onwards). This, of course, does not apply to the present site where initial evaluation demonstrated that the brickearth has been completely removed due to the depth of existing basements.

4.2 Roman (c. AD 43 - 450)

The site lies some 1.7 kilometres to the west of the Roman city of London and approximately mid-way between the two main Roman roads leading to the west which are believed generally to have run east-west along similar alignments to High Holborn to the north and the Strand to the south. It is known that these roads, as was normal with Roman towns, were flanked by the city's cemeteries (burial was not permitted within the city walls). The present site, however, lies beyond the areas likely to have been used for burial as is indicated by the few Roman discoveries that have been made in the area. For the most part these comprise moveable finds - such as bricks and coins - recovered from Saxon contexts and have not been discovered in anything like the kind of concentration that might indicate significant Roman occupation in the immediate vicinity.

4.3 Saxon (c. 450 - 1066)

When the Roman Empire began to collapse in the later 4th century AD, the walled city of *Londinium* declined and was eventually abandoned. Sometime during the next 200 years, 'Saxons' from across the North Sea established a trading settlement in the area. In documents of the 7th to 9th centuries the settlement was referred to as *Lundenwic* and was assumed to have been on the former site of *Londinium.* The identification of the location of *Lundenwic* as actually having been in the Strand/Covent Garden area is one of the most important archaeological discoveries ever made in London (Fig. 6; Vince, 1990). Unfortunately, the discovery was not made until 1985 by which time many potentially significant sites had been redeveloped with mostly limited or no archaeological investigations.

Lundenwic was an important North European trading port described in the 730s by the Venerable Bede (a celebrated monk who recorded events of the time) as an emporium, 'a market for many peoples coming by land and sea'. It was principally a centre for manufacture and commerce, trading with similar emporia in England and on the continent via the River Thames. The name *Lundenwic* has continued to be

linked to the area in the form of 'Aldwych', eald wic, meaning 'old port or trading settlement'.

Investigations by the Museum of London in the Covent Garden area have revealed considerable evidence of the settlement in the form of buildings and alleyways, rubbish pits and human burials (Cowie, 1988; Schofield 1995, 15-17). The more important sites that have been explored in the area include those at Jubilee hall and Maiden Lane (Cowie & Whytehead 1988), as well as that at the Royal Opera House which has recently been completed (Maloney 1996). What all three of these sites have in common is that they have suffered minimal ground-disturbance, with not only the brickearth but also the remains of Saxon floors, yard-surfaces and roads on top of the brickearth being preserved. This sets them apart from many sites closer to 15-17 Long Acre, such as 1-3 Long Acre and 7-10 Floral Street, where these 'occupational levels' have been destroyed by post-medieval construction and where only the bottom of some of the deeper Saxon pits have been preserved.

The evaluation that was carried out at 15-17 Long Acre revealed a similar situation, with three of the four test trenches excavated revealing pits, albeit much-truncated, containing significant quantities of organic domestic refuse, consistent with the type of pit-fills recorded on securely-dated Saxon sites in the area. These pits provided no evidence to confirm a Saxon date, all were cut into the natural gravel, and apparently substantially truncated, the brickearth through which they were probably cut being entirely absent (Partridge 1996). There can be little doubt that substantial traces of Saxon occupation on the site did formerly exist, something demonstrated not merely by the evidence from surrounding sites, but also by the discovery of a sixth-eighth century loomweight on the site during the construction of the present building in 1954-5. It was presumably at this time that much of the destruction of natural and archaeologically significant deposits took place. The survival of the truncated pits referred to above suggested that the site could still provide useful evidence for the economy and topography of Saxon London, the usefulness varying with the depth of truncation: the basement on the south side of the site was c.0.5m deeper than that on the north side. It has been suggested that the nature of Saxon pits and pit fills frequently led to the subsidence of later surfaces, resulting in the preservation of Saxon occupation levels in the upper parts of some pits (Cowie & Whytehead 1988, 79). It is possible, therefore, if not particularly likely in this case, that small pockets of occupational material may have survived.

Attacks on *Lundenwic* by Vikings during the 9th century (in AD 842, 851 and 871-2 when they 'wintered' in London), may have been the reason King Alfred ordered the occupation and strengthening of the old walled city of *Londinium* in AD 886, which became known as *Lundenburg,* and the abandonment, at least for the most part, of the *Lundenwic* settlement. By AD 959, in a Charter of King Edgar, the area was described as a wasteland and was under the ownership of Westminster Abbey. By the later eleventh century the abbey's property was confined to the west side of Drury Lane, which appears to have been one of the earliest north-south roads in the area and may date back to the Saxon period. In AD1040 Earl Godwin camped with his forces on what presumably was largely barren ground (Maplestone, unpublished).

4.4 Medieval (c. 1066 - 1485) (Figure 2)

The area of Covent Garden - originally Convent Garden, that is, the garden of the Convent of St Peter, Westminster - is first mentioned by this name in c.1200. It continued to be used for essentially agricultural purposes throughout the medieval period, with orchards, meadow and arable cultivation. This was in contrast to the area around the Strand to the south which, as the main thoroughfare between Westminster and the City, saw a gradual build-up of high status buildings, including churches and 'inns' - palatial town houses.

The name Long Acre can be traced back to a field-name - 'Langacre' - first recorded in 1237. It appears to have lain to the north of Covent Garden and to the south of the Mercer's Company Estate, although it was part of the holdings of the Convent. If the 'Agas' map of c.1559 reflects the medieval situation, it would appear that the Convent Garden was surrounded by a wall, with Long Acre to the north (Figure 2). The precise alignment of this wall was very probably followed by the northern limit of the Bedford Estate established in 1600. This alignment, as preserved in the parish boundary shown on Morgan's map of 1682, ran along a line approximately mid-way between the present Long Acre and Floral Street frontages and therefore across the middle of 15-17 Long Acre (Richardson 1996, 55; Fig.9). The street known as Long Acre may, therefore, have its origins in a lane skirting round the northern boundary of the medieval Convent's Garden (although the lane fulfilling this function shown on the Agas Map seems to drift to the north of the alignment of the modern street). It is safe to assume that the site saw predominantly rural activity throughout this time, with the possible exception of some brickearth extraction, up to the time of the development of the area as a suburb in the seventeenth century.

4.5 Post-Medieval (c. 1485 - modern) (Figures 3 and 4)

Under the extreme pressure upon ecclesiastical institutions which led up to the dissolution of the monasteries, the Convent sold its garden to Henry VIII in 1536, it subsequently being acquired by John Russell, Earl of Bedford, in 1552. Initially, the Bedford family were more concerned with the construction of their house and grounds than property speculation, with Bedford House being erected on the present site of Southampton Street by 1600. The development site was situated immediately outside the northwestern angle of the brick wall built around the garden of Bedford House in 1610, which, as suggested above, may have followed the course of the northern boundary of the former Convent garden. This was a time of a soaring growth in population in London as a whole, resulting in substantial unlicensed construction in the area around the City, particularly in areas such as St Giles', Holborn and Covent Garden which still remained largely open. The earliest construction in the area of Long Acre was of this nature, with the earliest buildings, which were generally wooden framed, being put up c.1552 (Stapleton 1924, 73). This build-up of poor quality housing was frowned upon by the authorities, leading to a decree of 1580 by Elizabeth I that there should be no construction within three miles of the City gates. The problem persisted, however, so that in 1624 another edict from the Calendar of State Papers specified that:

'The buildings in Long Acre especially are to be pulled down and information to be brought of any future offenders' (Stapleton, op.cit.)

By this time, in c.1615, Edward, the third Earl of Bedford had, in co-operation with the Mercer's Company, who owned some of the affected land, had Long Acre laid out. Three years later the section of the southern frontage of the road, including 15-17 Long Acre, from Banbury Court to Rose Street was sold to the Earl of Pemberton. This period marks the beginning of large-scale property speculation which has continued to the present day. The Earl of Bedford was one of the very first to see the profits to be made out of such speculation and in 1631 commissioned Inigo Jones to design an prestigious housing development, the essential elements of which are still to be seen in the Covent Garden Piazza, St Paul's Church and the surrounding streets today.

In 1650 the stretch of properties on the south side of Long Acre belonging to the Earl of Pemberton passed to the Earl of Salisbury. In Hollar's bird's-eye view of 1658 the area of the site apparently fell within a large open yard behind a series of buildings on the street frontage: probably livery stables named in a map of 1673 as 'Salisbury's Stables' (Richardson 1995, 56; Fig. 8). Careful examination of Hollar's engraving suggests that the site in question comprised the eastern half of the stable-yard plus the adjacent buildings facing on to Long Acre as well as the houses and back yards of the properties facing onto the western end of Hart Street, which was later extended to form Floral Street. The wall dividing the stables from these domestic properties presumably ran along the same east-west alignment as (or may even have been a preserved remnant of) the northern wall of the garden of Bedford House (formerly the Convent Garden). It seems likely that the well discovered in Trench 1 of the MoLAS evaluation lay at the south-eastern corner of this yard, either immediately outside or within the building shown built against the boundary wall at this point (Partridge 1996, 14).

The site was acquired by Christ's Hospital (along with 18-25 Long Acre), the institution responsible for the care of the City's orphans, in 1682. Morgan's map dated to the same year indicates that considerable changes had already occurred on the site by this time. Connections between Hart Street and Rose Street (east to west) and between Long Acre and King Street (north to south) had been effected by laying out Conduit Court along the east side of the east wall of the stable yard, apparently through the position of houses and gardens shown on Hollar's view. Meanwhile Lazenby Court was set out to the west of and perpendicular to Conduit Court, on the southern side of the south wall of the stable yard, with houses being constructed along its north side, within the area of the yard, suggesting that the stables may have gone out of use by this date. Lazenby Court, in turn, was connected to Rose Street by a narrow alley running off to the south. As a consequence of these changes, the site was no longer divided into a larger northern and a smaller southern section by the former Convent garden boundary, although its line did survive in the northern side of Lazenby Court. The persistent presence of this boundary, both on this and adjacent sites, may have had an impact on the relative degrees of archaeological survival in the area, as it might have formed, in effect, an east-west terrace on the north-south slope.

All of these features can still be seen on a plan of 1718 from the archives of Christ's Hospital (Schofield 1996, 23; Fig. 10). That section of the plan which falls within the present development site, defined on the east side by Conduit Court, comprises a series of attached cottages grouped around Conduit and Lazenby Courts, their uniformity suggesting that they were built as part of a single development. The northwestern corner of the site is occupied by a 'bagnio': a public bath-house with tiled floors. It is not clear what relationship this bagnio had, if any, with the 'Duke's' and subsequently the 'Queen's Bagnio' that was established in the area in 1682 and enlarged in 1694 (Chancellor, 243). It seems most probable, however, that the two are one and the same. This establishment apparently started out respectably enough - indeed, as the name would suggest, as an extremely fashionable place in which to be seen, patronised by royalty - but became gradually less so through the years until finally becoming a notorious brothel.

Only the outlines of the block are shown in Rocque's Map of 1746 (Figure 4), which again marks both Courts, although the former Lazenby Court is marked Glastonbury Court). This switch in terminology is reversed in Horwood's map of 1799. The main change observable on subsequent maps is the extension of Floral Street (formerly Hart Street) westwards to meet the newly-created Garrick Street, one of a series of streets cut through the dense mass of lanes and housing in the northern part of Covent Garden and St Giles in the mid-late nineteenth century as an answer to the terrible slums that had established themselves there in the eighteenth century.

5) EXCAVATION STRATEGY

5.1 The present slab and modern make-up material was removed from the site by the main contractor under archaeological supervision in order to ensure that no damage was caused to underlying archaeological features.

5.2 The resulting surface (natural gravel deposits and surviving upper surfaces of features) was hand cleaned by the archaeological team and planned at 1:20 scale.

5.3 Apparent large modern features were tested to ensure that the material was not levelling fill of earlier slumped features as found in the evaluation.

5.4 All non-modern features were sample excavated. This involved excavation of a half section of each feature. If a feature appeared to be Saxon in date, or was a feature of later date but not a quarry, then the remaining half was excavated. All artefacts were collected and retained.

5.5 For environmental evidence, samples were taken from well-sealed features which demonstrated no, or very little residual material. Samples of 30 litres were taken from pit/quarry fills, combined with hand collection of animal bone. The strategy was agreed with the Environmental Archaeology Service of the Museum of London.

5.6 All on-site recording was undertaken according to usual AOC Archaeology Group methodology.

5.7 All finds were collected, retained and processed.

5.8 Any conservation requirements were undertaken by the conservator for AOC using laboratory facilities in Edinburgh and attending site when necessary.

5.9 The supervision of the slab and make-up removal was undertaken by a supervisor and an assistant. The team for the area excavation comprised an Archaeological Officer and up to nine experienced assistants. A period of four weeks was allowed for the area excavation phase. All work was under the general direction of J Moore MIFA, Director - AOC Contracting Division.

5.10 All work was undertaken according to the Health and Safety requirements of the main contractor and CDM regulations.

6) SUMMARY OF RESULTS

6.1 Phase I Saxon AD 450-550 (Figure 5)

The early Saxon phase is characterised by widespread quarrying and occasional digging of pits for use as dumps for domestic refuse. Six quarries were identified and recorded, but only one (228) yielded dating material, the other five being heavily truncated by later intrusions. It is possible that the undated features date to the Roman period, but the paucity of finds and the similarity to the dated quarry suggest they are probably all Saxon. The Early Saxon quarries are likely to have been to remove gravel, perhaps to provide yard surfaces, or for resurfacing paths and roads extant in the Saxon settlement on high ground around St. Martin's Lane at the west end of Long Acre. The gravel on this site is not particularly suited for resurfacing though, it being sandy and thus not compactable in the same way as a clay-rich soil is. It is possible that brickearth too was being quarried, but truncation has removed the upper levels from site, and therefore the potential evidence.

The filling of the largely untruncated quarry seems to have been a gradual event, beginning with the redeposition of natural gravel back into the quarry, before layers of silty clay and sand gradually accumulated by erosion and weathering, giving a scene in which pools of stagnant water lay in an area that was abandoned, and not immediately resettled. The silty clay fill would have precluded immediate drainage.

The fragmentary remains of the other quarries to the north of the site suggest that a similar process of abandonment was typical of the site by the mid sixth century.

The two pits of this phase were truncated to different levels by basements and later pit-digging, which may account for the lack of common characteristics. That which survived for only 0.40m (099) was largely filled with material from the edges of the cut, but the deeper pit, with its high quantities of bone and charcoal was clearly a refuse pit, the daub and evidence of burning in the uppermost layers suggesting a localised destruction or demolition phase. This demolition may represent either temporary abandonment of part of the settlement, or clearance of an early phase in preparation for denser habitation at the beginning of Phase IIA.

6.2 Phase IIA Mid-Saxon AD 600-750 (Figure 6)

The mid Saxon phase is also characterised by quarrying and pitting, but much more widespread, indicating a more permanent settlement and a population with greater needs.

In all, eight quarries were identified as belonging to this phase. They are all characterised by having a flat base, and all seem prone to erosion and collapse, in that the basal fills all seem to have derived from the sides of the quarry. This could be a seasonal activity, suggested by the fact that silting deposits had formed in some of these quarries before they were filled. As opposed to the earlier phase, the resultant depressions in the landscape seem to have been deliberately backfilled, perhaps simply to provide a level occupation area. Some of the pits were simply filled with

layers of sand and gravel, but four of them were definitely used as refuse pits, bone and oyster shell being the most common cultural inclusion recorded, with little pottery.

The domestic refuse pits that date to this period were concentrated to the very westernmost part of the site. These were markedly different to the quarries, in that they were round, had steep sides, and a rounded base. Also the primary fills were rich in finds, and tended to be quite organic and dark in colour, rather than containing redeposited natural gravel. These pits were also subject to erosion and collapse, as represented by thin lenses of sand and gravel.

The location of these refuse pits to the West of the site indicates zones of activity, with the dumping of household waste being kept separate from the majority of the quarries. The removal of the capping layer of brickearth upon which the Saxons would have lived has deprived the site of any evidence of roads or buildings, but the quarries indicate that this may have been a working area, and the domestic refuse indicates that people lived nearby, if not upon the site.

6.3 Phase IIB Saxon AD 750-850 (Figure7)

The latest phase of Saxon activity is separated from the previous only by the dating of the finds, and shows continuity of occupation rather than a new culture.

Two very large and one smaller refuse pit were recorded with pottery dating them to this later period. The two larger pits were over 1.20m in depth, and were filled with quantities of bone, shell, pottery, daub and charcoal, typical discards from a thriving settlement. One of the pits contained a fragmentary human skull, but this is more likely to derive from a disturbed Roman deposit.

Quarries were also recorded dating to this later period with flat bases, similar to those of the earlier phases, but the fills were characterised by occasional lenses of domestic waste. Possibly, the disposal of this refuse was becoming less regimented towards the end of the Saxon period, perhaps due to the necessity of filling pits rapidly, with a rising population.

Two further small pits were recorded, which could be either the truncated remains of post-holes, or refuse pits or quarries. Given that up to two metres of gravels and brickearth were removed from the site in the post-medieval period, some of the features are too truncated to characterise. It is possible that these were the remains of single-posted structures of the Saxon period.

6.4 Phase III Medieval AD 1066-1485

No features or finds of a medieval date were excavated on site, due to either later truncations or a lack of medieval occupation.

6.5 Phase IV Post-Medieval AD 1485-1899 (Figure 8)

The post-medieval activity on site included the very basal remains of a cellar that became redundant after 1680 and two poorly surviving walls with which it was associated. Cartographic evidence indicates that a stable block existed on the site in the 17th Century, and this cellar could be part of that structure.

In the centre of the site was a large well which had been backfilled in modern times. It was not excavated to the bottom, but the bricks of which it is constructed are of a date with the cellar.

One pit excavated yielded pottery and other domestic waste. This dump of material may be associated with the fragmentary cellar remains.

The single post-hole dating to this period had no associated features, so its function remains unknown, but it may be associated with the cellared building.

6.6 Phase V 20th Century 1900-1999

The 20th Century activity is typified by the deep basementing which has truncated the top of all features and the natural gravel deposits.

7) DETAILED RESULTS

7.1 Introduction

The excavation was conducted by AOC Archaeology Group between February and August 1999, prior to redevelopment, and based upon the findings of four evaluation trenches excavated by MoLAS in 1995.

The main excavation was conducted in two phases, the southern part of site being fully excavated before groundworks cleared the northern part of site to the level of the archaeological horizon. As a result, the entirety of the site was not visible concurrently.

Excavation was initially conducted using a machine with a toothless bucket, following the demolition of the standing building and the removal of hardcore relating to the basement slab. Once the depth of the archaeological horizon was identified, the site was cleaned by hand, and a grid established to aid recording.

7.2 Natural Geology and Topography

The natural geology of the site, and of Covent Garden, is of a gravel terrace which was formed by the Thames. In the Covent Garden area, a layer of alluvial sandy clay, known as brickearth is known to exist, but at 15-17 Long Acre, this had been truncated by 20th century and earlier basementing. The surviving, truncated gravel was recorded at a maximum height of 19.25m OD on the north, dropping gradually to 18.78m on the south side of the site. The degree of truncation is unknown, since there may have been up to 2.00m of brickearth capping the gravel, as seen at Russell Street to the east (ROH89). Also, the gravel may have been truncated.

The natural topography is in the form of a fairly flat area, sloping gently down from the east to the west, and also sloping down towards the bank of the Thames. This area is well above the level of the River, and was therefore not subject to alluvial flooding as is the case closer to the Thames.

The modern topography appears to relate to the contours of the underlying natural ground surface. The gradual slope of the river terrace towards the Thames existed during the Saxon period: the truncated gravel terrace at 7-10 Floral Street, some 100m to the east of 15-17 Long Acre, was at 18.5m OD at the northern edge of the site and 17.25m OD at the southern edge. A surface of untruncated brickearth, less than 200m to the south at Jubilee Hall, was c.15m OD. The heights of the surface of truncated gravel at 15-17 Long Acre are comparable to those observed at 7-10 Floral Street. Despite the fact that the natural deposits had been truncated, it seems likely that the north-south slope indicated in each case reflects the original inclination of the undisturbed ground surface.

7.3 Phase I, Early Saxon AD 450-550 (Figure 5)

7.3.1 Quarries

The earliest phase of Saxon occupation was represented by several quarries that were concentrated to the east of site. Their fills were unlike that of the later Phases, in that they appeared to comprise redeposited natural gravels and natural accumulation. One quarry was large, three were small and clustered together, and a fifth feature was so heavily truncated as to make its date and function indeterminate.

Quarry 228 (filled by 017, 172, 174, 181, 175 in 185; 186, 187, 188, 189, 190 in 191; 192, 193, 194, 195, 196, 200, 201, 202 in 205/206.)

The largest of the quarries had undergone later truncation, but still survived for a length of seven metres, and a width of three. The feature was not totally excavated; five slots were dug through it and an overall number given during post excavation analysis (228). The maximum depth was 0.79m, and was characterised by gently sloping sides and a flattish base. The full profile of this quarry had been truncated by modern service trenches and later Saxon intrusions, but it was dated to this earliest phase of Saxon occupation by pottery collected from one of the fills.

The primary fill was a patchy layer of gravelly sandy silt (184, 196 and 201), which was concentrated to the edges of the cut, becoming shallower to the centre. This is thought to have largely derived from erosion of the sides of the cut, and not a single find was apparent. The fill above this seemed to be largely redeposited natural gravel, but with high silt content and discolouration indicating reworking. This deposit (181, 183, 187, 190 and 200) was very compact but there was some human input, as evidenced by the finds within. The most significant dating material was two fragments of sandstone tempered pottery, dating from between AD 450 and 550. Although this is not a great deal of dating information, the rest of the datable finds indicate an early Saxon date. A small quantity of Roman building material, both brick and tegula were collected, also a heavily corroded Roman coin (SF9). This concentration of Roman finds is rarer in later features, so it may be considered that early Saxon activities, of which this quarrying is an example, cut through the remains of Roman deposits.

The unearthing of redeposited human bones adds credence to the existence of Roman deposits in the area before the Saxons established a settlement and subsequent emporium. Sealing the very gravelly fill was a silty deposit up to 0.32m thick, which was characterised by being notably greenish grey, with occasional mottled patches (174, 175, 182, 186 and 194). Within this (186) was found two human bones, a cranium and a left femoral shaft. Both were incomplete, but analysis suggested a 66% probability of them belonging to a male aged 45 or older. Although the bones may be Saxon in origin, it seems more likely that they derive from a Roman burial plot. At St Martin's in the Fields, there was a Roman and later focus; sarcophagi, possibly reused in the Saxon period, were found there and structural remains have recently been discovered. Further finds from this deposit are thought most likely Saxon, being pottery and cow bone. The pottery is thought likely to be manufactured in the London area, while the cow bone assemblage is notably dominated by elements of the skull and foot. It cannot be determined whether these are evidence of low economic status; the eating of the least meaty parts of a cow, or whether they indicate tanning being

undertaken on hides that retained these skeletal elements. A single piece of daub suggested that the earliest Saxon occupants had built themselves houses near the site. There was also a small piece of copper casting waste (SF11), but whether this was of Roman or Saxon date is unknown

The silty nature of this layer indicates a gradual filling in, as if the pit lay open for some time. The top fill of this feature was very dark brown sandy clay silt (172, 193 and 195), very similar to that below it, with bands of iron panning indicating its probable former waterlogged nature. A single iron nail could have been either Saxon or Roman. The uppermost deposits in this backfilled feature were very compact and stony (017 and 192), another largely composed of the crushed skull of a cow (202), and are thought to date from Phase IIA or later; being episodes of consolidation to provide a compact occupation surface.

Six sherds of Saxon pottery were recovered from this quarry, of which the earliest comprises two sherds of Early Saxon sandstone-tempered ware (ESSTB and ESSTD) from the primary fill [181] (39g) that could date to anywhere between AD 450 and 600. The subsequent fill [186] contained one thick-walled sherd of Greensand-tempered pottery (SLGSC) that could be of Early or Middle Saxon date (19g). The uppermost fill [192] contained a sherd of igneous rock-tempered ware that contains basalt lava (MIGL, 8g), while the interface between contexts [192] and [186] contained two small joining sherds from a second vessel in SLGSC.

Quarry 092

Little more than a shallow scoop 0.06m deep remained of this flat-based cut, which was oval and measured 1.07m by 0.92m. The sandy clay fill (091) contained fragments of charcoal, proving it was not a natural feature. The lack of stones suggests a period of disuse and silting before this pit was truncated away. No pottery was recovered from this feature.

Quarry 094

This cut also only survived for a depth of 0.06m, and had a flat base. The maximum dimensions were 1.54m by 1.17m and the fill (093) was sandy clay with little stone, suggesting gradual accumulation rather than deliberate backfilling. No pottery was recovered from this feature.

Quarry 197

Later truncation removed the majority of this feature; it measured 1.42m by 1.02m and was only 0.18m deep. No finds were apparent. The fill (198) was very gravel rich, suggestive of deliberate backfilling rather than being allowed to fill naturally. No pottery or other finds were recovered from this feature.

Quarry 080

This pit is very heavily truncated by later Saxon intrusions on all sides, surviving for a depth of only 0.07m. It unfortunately failed to yield any dating material, but stratigraphic relationships indicate that this probably belongs to the early phase. The

surviving base of the cut indicates a slight slope from west to east, which was filled by two deposits. The primary fill (097) was light greenish grey sandy silt with high gravel content. Above this, and horizontally truncated, was a deposit of yellowish grey sandy clay silt also rich in gravel (075). These two layers probably derive from either erosion of the sides of the cut, or from redeposition of the material excavated. No pottery was recovered from this feature.

Phase I Conclusions

The features interpreted as quarries are distinct from domestic rubbish pits, the material deposited within seeming to have derived from reworking and mixing of natural gravel with episodes of erosion. None of these features yielded the high quantity of pottery and animal bone which would be expected from dumps of household waste. The purpose of quarrying may have been to extract gravel for surfacing, or may have been to extract only the soil rather than stone component, for everyday uses such as daubing of wattle. It is possible that the quarries date to the Roman period, and were left open, not filling completely until the early Saxon period. The origin of the major fill, typically silty clay is most likely accumulation through natural deposition and erosion, but it is possible that a policy of deliberate filling was undertaken in the mid Saxon period

The layers that characterised the upper levels of the largest feature (228) are thought to have originated in accumulated silt being washed into the partially filled quarry. The greenish grey colouration may be due to a number of processes, none of which can be proved, but may be considered. It may be caused by organic deposits being washed in from later features, or it may be the result of direct cess. The iron panning shows the feature to have been waterlogged, but seems unlikely to have been used as a watering hole for animals, since the rotting of the cattle bones would have mad it somewhat unsavoury. The site is near a tributary of the Thames that passes St. Martin's and this may account for the probable boggy nature of the backfilled quarries. The reason for deposition of cow skull and foot bones could be many, from random discard to waste left from tanning, evidence of a poor diet, or even pagan ritual. A similar collection of bones was collected from a phase IIA pit, however (125).

The Roman material found in these features most likely derives from a Roman site in the vicinity, for example, at St. Martins, where tegulae and tiles have been found, but moveable objects such as brick, tile and pottery could have derived from anywhere, potentially the Roman walled city, 1.7km to the east.

A process of quarrying and backfilling typifies Phase 1 Saxon activity on this site. The larger quarries seems to have been left open, giving a picture of pools of stagnant water in an area that was abandoned, and not immediately resettled.

7.3.2 Pits: either late Early Saxon: Phase I or early Middle Saxon: Phase IIA

There are two pits that stratigraphically could fit into either Phase I or II. They are much closer in character to the pits of Phase IIA, so perhaps may be considered as dating from the earlier part of Phase IIA: closer to AD 600 than 750. No pottery was found in the two pits or gravel deposits that stratigraphically could belong to either Phase I or IIA, and so their dating must remain uncertain.

Pit 099

One clearly defined cut feature was an almost circular pit, 2.10m EW, over 2.2m NS and 0.42m deep, which had suffered some truncation on the southern edge by pits 078 and 158. This cut was quite regular, with gently sloping sides and a generally flat base. The pit was filled with two distinct deposits of sandy clay, the lowest being a pale greenish brown colour (101) and probably deriving from a mixture of erosion of the sides of the pit and cess. The upper fill (100) was mottled greyish brown containing occasional pebbles, gravel and a significant quantity of bone. Most of the bone belonged to cattle, at least one adult and one sub-adult, and there were also occasional skeletal remains of pig, horse and sheep. There was also a large quantity of burnt daub with wattle impressions, indicating the destruction of a house. The mottled nature of the soil, and the lack of thin varying deposits suggests that this pit was rapidly and deliberately backfilled.

Pit 125

This pit was heavily truncated by another Phase IIA feature (057), a Phase IIB feature (120) and a modern wall foundation, and only the northwest corner survived, measuring 0.90m by 0.65m in plan, and 0.78m deep. The primary fill (127) was very dark grey in colour, and featured a high quantity of animal bone showing evidence of butchery. The very dark character of the soil is typical of organic household debris rotting down in a dry environment. Most of the bones were from adult cattle, and included the head, forelimb and hind limb regions. The upper parts of the limbs, the shoulder and pelvic girdles are meat bearing and would be expected in butchery/household waste. The lower limb and foot bones do not carry much meat at all and their presence can be explained as either waste from the early stages of butchery or as waste from skinning/tanning as the feet were often left attached to the hides before the preparation of the hide was undertaken. Elements of the skeleton of a young calf were also retrieved, suggesting that animals were being kept or stalled within the vicinity.

The fill above (126) was similarly organic, but somewhat sandy, as if some collapse of the sides of the feature had occurred during deposition. Above this was a dark-brownish yellow deposit (124), resembling brickearth. This could have derived from the Saxon land surface, and be the result of subsidence, but could also be unburned daub, perhaps from the walls of a house. Interleaved with this was a spread of charcoal (142), closely associated with some fragments of daub (128) and more charcoal (123), indicating partial clearance or demolition of buildings. The upper fill (122) of this pit was firm mottled clayey silt that seemed to be a consolidation deposit, rather than the result of demolition, but it is possibly also unburned daub.

There was no pottery collected from the pit, so dating is slightly problematic. It is cut into by a Phase IIA pit, but is most probably of a similar date, to the earlier part of

Phase IIA. It is very different in character to the quarry pits of Phase I and contains such a quantity of bone as to suggest a dense population

Conclusions, Early-Middle Saxon phase

Although the tops of these pits are very truncated and no occupation surfaces were present on site, these two pits suggest that the late 6th-early 7th century witnessed house building and subsequent demolition. The two pits have very different characters, but truncation has limited the interpretation. The fills of pit [099] resembled decomposed cess, whereas pit [125] was characterised by the presence of non-cess waste; animal bone and demolition debris. Whatever the original cause for the excavation of these pits, one appears to have been specifically a cess pit, the other a rubbish pit. It is unclear whether the filling process was mostly gradual dumping or regular midden clearance, but the concentration of animal bone in the primary fill suggests initial rapid deposition. These two pits lie within five metres of each other, and it is tempting to ascribe a common household.

Gravel Deposits

There are several deposits which seem likely to be Saxon in date, but are undated because of the lack of finds material. Three areas of gravel (017, 192 and 202), overlaid the soft fill of the major phase 1 quarry [228]. The only dating evidence was Roman brick and tile, but they clearly are not of Roman date. There is no proof of their age, but one dump (017) is cut by one pit (003) suggesting that this was a consolidation action prior to the cutting of the pits of phase IIA.

7.4) Phase IIA: Middle Saxon AD 600-750 (Figures 6 and 9)

7.4.1 Quarries

Quarry 067

This quarry had an irregular shape, suffering some degree of truncation, and was 0.80m deep. There was no regularity apparent, except for the base which was flat. The primary fill (076) had a high stone component and probably represents erosion of the sides of the pit before it was filled. This was sealed by a very hard layer of sandy gravel (066) which had undergone extensive iron panning, perhaps as a result of rainwater draining through the gravel. Sealing this was a thin lens of greenish grey clayey sand (065), which was thought to be the result of natural accumulation.

Above this was a deposit of greenish grey clay with frequent patches of charcoal, and some burnt bone (077). The colour is thought to be the result of being damp, either through cess or rainwater. This deposit was sampled (sample 3), and was found to contain grains, plus woundwort and heartsease, both medicinal plants. This was

covered by a dark grey layer of clay, again with charcoal and burnt bone (064). It is likely that these two fills represent a single episode of rubbish disposal.

Sealing this sequence of soft soils was a very stony fill (063). It was grey clay that seemed to be deliberately dumped, with cow bones the only finds. This was sealed by a very compact almost black layer of silty clay (062) with extensive charcoal and butchered bones from cow and sheep. Hints of industry came from two pieces of glass waste. The fact that it was very hard may be indicative of deliberate compaction, as the layers below subsided and shrank. Over this deposit was a layer of mottled sandy clay (061), in turn sealed by a dump of redeposited natural sandy gravel (060) that may be further evidence of deliberate backfilling and compaction. Above the redeposited natural were two further dumps: both gravel-rich grey silty sand (059 and 058). One (059) contained cow and pig bones, proof of reworking of the deposit in the Saxon period.

It is thought that the most likely function of this feature was as a small quarry for gravel used as road surfaces around the emporium. The gravel may even have been used to seal malodorous cess-pits, it making a good impermeable barrier. The backfilling of this pit seems to have been focussed on consolidating the ground, with repeated layers of gravel, which would have to have been quarried from elsewhere, resulting in a continual need for backfilling.

Quarry 108

A sub-circular shallow pit was excavated, measuring 1.61m by 1.60m. It was only 0.25m deep, but is thought to have been established as a quarry. The base was almost flat, with only a hint of concavity. The primary fill (167) was clayey sand, with patches of reddish staining that may simply derive from percolation of water through the sand. The only finds present were fragments of cow bone. The upper fill (107) was greenish sandy silt, suggestive of cess, and it contained a few finds of interest. Part of a chaff-tempered jar was collected, daub within the fill indicated probable clearance of a house, and fragments of red deer antler indicated a minor industrial process. The bone assemblage was dominated by cattle, with most parts being present. Pig was represented by a single leg and dog by a single toe.

If this feature was established primarily as a quarry, it was filled with household and semi-industrial waste like the deeper pits of this phase. The single dog bone is probably evidence of redistribution of the skeleton following midden clearance. No pottery was recovered from the lower fill of this feature but the upper fill ([107]) contained four sherds from a chaff-tempered jar.

Quarry 161

A shallow quarry was recorded towards the centre of site, suffering truncation on the southern side. It was probably circular before truncation, but survived for only 1.52m by 0.81m. It was 0.34m deep, similar to other features of this Phase interpreted as quarries. The primary fill (160) was a mixture of silt and gravel, which probably derived from the sides of the pit. The fill above was a greenish grey sandy silty clay, with lenses of sand (159), which probably also came from weathering of the sides of

the cut. Not a single find came from this feature, but is dated to this period by stratigraphy and its similarity to other pits.

Quarry 162/166

An irregular sub-circular truncated cut was recorded towards the south of site. Like many of the quarry-cuts, the sides were concave, and the base largely flat. It measured 3.12m by 2.20m and was 0.31m deep. The primary fill (170) was largely composed of redeposited gravel, slumping from the edges of the cut. After this a layer of silt (173) was deposited, probably natural accumulation. The upper fills are thought to be deliberately dumped before further filling took place, using gravel-rich deposits. The lowest of these (169) was compact greyish brown gravelly silt. Above this was a similar deposit (114/ 165) that contained parts of a cow skeleton, a fragment of antler, and the tooth of a dog. There was no great concentration of finds, indicating that this was material was probably not sourced from a midden. This feature contained a single sherd of Roman amphora ([169], 10gm).

Quarry 208

A heavily truncated quarry scoop was recorded to the north of site, surviving for 2.10m by 1.10m, up to 0.34m in depth, and having a flattish base. The primary fill (212) was particularly stony, and is probably the product of immediate backfilling. A little cow bone had become incorporated with it. The deposit above (207) was dark greyish blue silty clay also containing a little cow bone, which may have been caused by water logging, perhaps resulting in a rather stagnant pool.

Quarry 211

Another heavily truncated cut was recorded to the north of the site, only 0.10m deep, and with a flat base. The fill (210) was light grey silt with some charcoal, and dominated by pig bones. This is rare on site, and may indicate a specific process that necessitated pigs. The silt was thought to be largely the result of erosion of the sides of the pit. Its relationship with pit [216] was removed by a modern service trench.

Quarry 214

This pit had suffered heavy horizontal truncation, surviving for a depth of 0.40m and measured 1.90m by 1.20m in plan. The profile showed a gently sloping side, gradually breaking to an uneven, but generally flat base. The fill (209) was very dark brown silty clay with a high organic content typical of refuse pits. Among the household waste in the pit were bones from cattle, pig and sheep, and oyster shell, but the presence of antler is indicative of industry: if it were being worked on this site, however, there would be a higher quantity of it than a single piece. Further evidence of Saxon life was revealed by part of a quern stone of Niedemendig lava (SF19), which was probably discarded after it was broken. A single sherd of chaff-tempered ware was recovered from the fill, broadly dating the feature from AD 600-750

Quarry 008

The remains of another feature also thought to have originated as a quarry was recorded to the west of site. It was truncated by modern foundations, but survived for 0.88m by 0.88m, and described a quarter-circle. It was 0.33m deep, concave, and seemed to have a flat base, but the truncation may have obscured this. The primary fill was mostly gravel, resembling redeposited natural (007). It may be that enough gravel

had been quarried, so the excess was pushed back into the pit. The upper fill (006) resembled decomposed cess, being notably sticky, and dark grey in colour. The finds within suggested it derived from site clearance, perhaps midden deposition. Oyster shells and cattle bones both indicated food waste, and there was frequent charcoal, deriving either from a domestic fire or perhaps an accident. A small fragment of copper alloy sheet was also collected, folded round a rectangular core that had decomposed (SF18). Not enough survived to determine its function. No pottery was found in the primary fill of the probable quarry [008], but the upper fill [006] contained a single sherd of chaff-tempered ware (22g).

Quarry 191

A pit 2.2m wide and 0.60m deep had been excavated into the large quarry of the first Phase. It had a rounded profile with an irregular base, and was mostly dug through the soft silt that had filled there previously. The main fill (189) was grey silty clay, and virtually stone free. It contained a small quantity of cow bone. The top 0.05m of the fill was discoloured, thought to be the result of anaerobic decomposition, suggesting this area was covered with standing water for some time. The upper fill (188) spread beyond the edges of the cut, and had high gravel content, indicating that it may have been deliberately filled to consolidate soft ground.

The function of this pit is unclear: it may have been for the quarrying of gravel, but virgin ground would have given better gravel. If it had been covered by standing water, for some time, as suggested by the discolouration of the fill, it may have been utilised by the Saxon occupants or their animals.

As with quarry [008], no pottery was found in the primary fill of quarry [191], but the upper fill [188] contained the battered rim of a chaff-tempered jar (**Figure 11, no.1**).

Conclusions, Phase IIA Quarries

These pits identified as quarries are all characterised by having flat bases and a primary fill of stony sandy clay. The upper fills vary, deriving either from natural silting or from deliberate deposition of household waste.

No pottery was recovered from quarries [067], [161], [208] or [211]. Quarries [214], [008] and [191] each contained only one sherd of chaff-tempered pottery and can only be broadly dated to the 7th or earlier 8th century.

It seems unlikely that all of the features were open concurrently: it would result in an uneven surface dangerous to the unwary and to livestock. If, as supposed, the primary function of these features was as quarries, then they could have been excavated as required, either for immediately local uses, or elsewhere in the emporium if this were an area of low density habitation. They would only have been filled when finished with, being useful hollows for disposal of household waste.

7.4.2 Pits, Phase IIA

Pit 003

A large sub-circular pit (003) was excavated towards the east of the site, cutting the edge of the large quarry from the earliest phase. It was 1.90m x 1.80m, and 0.60m deep, with a concave profile and a flattish base. The primary fill (016) was particularly silty, suggesting a gradual accumulation rather than immediate backfilling; perhaps the pit was open for some time before being filled. It contained two fragments of Roman pottery and tile, which are likely to have been disturbed from earlier deposits.

There were two further fills of this pit (001 and 002), and they were both notably dark clayey silt, indicating a high organic content. There was a high quantity of domestic refuse, which was dominated by animal bones. This was the only pit recorded to feature a high quantity of sheep/ goat bones, and may represent an individual activity. Further evidence of diet was shown by the presence of oyster shell. Eight fragments of Roman building material were clearly *ex-situ*, but may have been used in a domestic setting.

This pit also contained evidence of industrial activities: slag and iron bloom were collected, and these are both products of iron-working. There were also fragments of three different loomweights (SF12, 13 and 14), of which <12> had an impressed 'brand mark' (**Figure 12, no.1**). These weights were indicative of a second industry, weaving. The lack of any associated occupation surface for this pit, as with all on site, means that the source of the industrial waste is unknown. Likewise the loomweights, but it does seem likely that the fill derives from a single household. Seven joining fragments from an imported pitcher with a distinctive flanged rim were found in fill [002] (fabric NFEBA; not illustrated). This form is most typical of the 8th century, but may have been reaching *Lundenwic* in the later 7th century. This was good dating evidence, and also proved continental trade, since it was imported from northern France or Flanders.

Pit 057 (Figure 9)

To the very west of site was a large pit 1.60m deep with steep sides, which were prone to collapse and subsidence. The primary fills (138, 139, 140) all seemed to derive from weathering and collapse of the sides of the pit before the first active fill was deposited (112). This was dark grey silty clay, and contained up to 50% animal bone by volume. This household waste was composed of cattle and pig bone, less sheep bone, and a single piece of sawn antler from a red deer. The exploitation of all the major farmed mammals as a food source is represented in this layer, and the antler shows evidence of small scale industry. The antler fragment is the only part of the deer present, so it can be assumed that the antler was imported for working on, rather than deer being exploited as a food source here. This was quite a thick dump of

household waste, and the ensuing deposits have a different character, none being greater than 0.10m thick.

The next five deposits may have been dumped together: the sequence is of a layer of sandy silt (143); a layer of charcoal-rich clay (137); a layer of charcoal (136), a layer of burnt daub (111), a lens of silty clay with a piece of antler in it, and a layer of sandy clay (135). These may represent clearance of a destroyed Saxon house, its elements represented by daub (the walls) with wattle impressions, charcoal the remnant of wattle or structural posts, charcoal and clay being unburned daub, and sandy silt and clay the remnants of a floor or further unburned daub.

Sealing this sequence was a group of silty clays resembling brickearth, but mottled brown or grey. These deposits (134, 133, 132, 131 and 130) are each between 0.03 and 0.10m deep, and are thought to have been dumped simply to consolidate the pit, or as part of a clearance event. Above these was a further deposit of grey sandy clay containing burnt daub (098/ 129), either evidence of more destruction, or possibly an item made of fired clay. The daub was not collected.

Above this deposit, the character of the fills became much more organic, with a high concentration of bone and other finds. The first of these (095) was rich in cow and sheep bone, and contained waste from antler working. Daub from a wall was also present. Above this was a layer of sand which contained oyster shell, high quantities of animal bone, and again antler working waste (089). The topmost layer of household origin (090) contained similar finds, but was characterised by being dark brown. These three layers all contained similar finds, and may derive from disposal of a midden. Given the size of this pit, the amount of pottery found in it was disappointingly limited to one sherd of Saxon sand-tempered ware from [095] (SSAND, 10g) that cannot be precisely dated.

The full pit was topped with a final deposit (068) of compact sandy gravel, which could have provided a solid surface for future occupation. The existence of this layer suggests that truncation of the natural gravel at this location may have been minimal.

Pit 088

Post-medieval truncations had removed much of this feature, but the remaining western edge was curved with a steep concave profile. It survived at a maximum of 1.8 by 1.2 m. and was 0.92m deep. Only two fills were apparent, indicating a different process of infilling than that apparent in [057]. The primary fill (096) was composed of subtle lenses of greenish grey sandy clay silt with varied stone components. Although this was excavated as a single context, the lenses indicate that this was composed of several deposits. The finds were dominated by animal bone, particularly cow, of which almost all body parts were represented. Pig and sheep bones were also present, and most showed signs of butchery, i.e. being defleshed or chopped to access the marrow. This suggests that food waste dominates this pit, and the presence of oyster adds more information regarding diet. The upper fill (050) was dark grey sandy silt 0.1m deep, becoming deeper towards the centre of the pit. It also contained animal bone and oyster. The animals represented were again cow, sheep and pig, but a single goose bone indicates a wider diet not seen in Phase I, and two fragments of sawn

antler indicated industry. Four sherds of chaff-tempered ware (one vessel, 66g) that can only be broadly dated to between AD 600 and 750 were collected from this fill. A single fragment of Roman brick indicated that some exploitation of Roman building materials may have been undertaken. Whatever the original cause of the excavation of this pit, it was certainly filled with household waste.

A post-medieval pit cutting this (048) yielded 2 partial loomweights, these most likely came from this feature, disturbed by the cut, and collapsing in from the new edge.

Pit 158 (Figure 9)
This pit was very heavily truncated on the western side by modern concrete foundations, but the form and function were understood despite this intrusion. Its original form was probably circular, but measured 1.70m by 0.95m because of truncation. The surviving depth was 1.64m. The primary fill (157) was pale greenish brown, rich in charcoal, and may have derived from a hearth or other localised fire. The fill sealing this (156) was quite similar except for a higher frequency of pebbles, and above this was an organic layer (155) that was quite red in colour, and was thought to be largely composed of decayed wood, being quite fibrous. Whether this was structural wood or perhaps even thatching cannot be determined. It is possible that these three fills are from the same source, since the next activity in the pit was the collapse of the southeast edge, which may indicate a short period of disuse, but could equally be the result of the loose nature of the natural gravel.

The slump was sealed by a deposit of mixed grey silt (154) which seemed to have been tipped in from the west, since it was deeper on that side. It included a fragment of a loomweight (SF17, 258gm) with a 'brand mark' on the upper side (**Figure 12, no.2**). Since it was deep in the sequence of fills, the inference is that it was discarded because it was broken during use. This was sealed by grey clay (153), the deposition of which seemed to have eroded the southeast side of the cut still further. Above this, the character of the deposits changed; the lower fills were notable for a lack of finds except for the loomweight fragment, and may be considered to have derived largely from cess and animal dung.

The topmost fills of the pit were rich in animal bone and other finds. The first fill over the faecal deposits contained fragments of daub (152) that could have derived from a house. The deposit above this (054/ 151) contained animal bones from all the major food mammals: cow, pig and sheep, as well as a small quantity of fish bones of the cod family. A single fragment of sawn antler, part of a bone scale-handle (SF3) and a piece of iron slag were all evidence of industry. This deposit was sampled (sample 2) and analysed for seed remains. It contained grains and grasses, which could have been naturally growing. Above this was a layer of grey silt with charcoal (049/ 150), in turn sealed by another fill (030/ 149); sandy clayey silt with a notable quantity of cow, pig and sheep bone. The topmost fill (029/ 148) had a similar collection of animal bones, a small fragment from the shaft of a copper alloy pin (SF2) and part of a bone scale-handle were also collected (SF1).

As with the other pits, no pottery was found in the lower fills of pit [158], but the uppermost fills contained more pottery than most of the other phase 2 features (10

sherds, 264g). Stratigraphically the earliest are two sherds of chaff-tempered ware and one of Walberberg-type ware (BADOG) from [054], while the next layer ([049]) contained part of an imported greyware pitcher (NFGWD COAR) that may be from the same vessel as a sherd found in pit [147]. Above this, fill [030] contained part of a chaff-tempered jar (**Figure 11, no.2**). The topmost fill ([029]) contained a further sherd of chaff-tempered ware, and a sherd of North French-type blackware (NFBWB). The presence of BADOG suggests that this feature was filled after AD 670.

The change in the character of the fills may be explained by a change in use of the pit. It first seems to be used as a cess-pit, and the lower fills were very organic. The uppermost fills suggest rapid deposition, being thicker, and having a high quantity of bone. The presence of only small parts of jars in the fills indicates probable midden clearance.

Pit 216

The remains of an irregular shaped pit were recorded to the north of the site. Surviving for a maximum depth of 0.18m, little can be said about the form of this pit, save that it had a flat base. The only deposit filling this pit (215) was greyish green silty clay, quite gravelly, and contained a single sheep bone and a small fragment of a Saxon jar; chaff-tempered ware with a large chalk inclusion. It is likely that this feature was used as a rubbish dump, but the degree of truncation limits interpretation.

Pit 227

Another feature of this phase was heavily truncated by post-medieval buildings and the construction cuts for them. It survived for 2.00m by 1.10m ands was only 0.35m deep. The surviving edge was to the west, and the side was quite steep, dropping to a flat base. The primary fill (056) was grey silty clay, with charcoal and animal bone Most of the bone came from sub-adult pigs, cows and sheep, but dog and chicken bones were also present. Dog bones are rare on this site, and may be considered a working animal rather than a food species. Among the finds was a sandstone hone (SF5), used for sharpening knives and other blades, and a small amount of slag, evidence of iron working. The upper fill (040) had the consistency of cess and contained more animal bone, plus evidence of industry: horn cores of goat and cow were present, as was a fragment of antler, all indicative of horn-working. The primary fill of this pit ([56]) contained two sherds (9g), one of chaff-tempered ware, the other an imported greyware (NFEBB). The upper fill [40] contained four large sherds from an imported pitcher in NFGWD COAR. These imports suggest that the pit dates to after 650/670.

The original function of this feature is unclear due to heavy truncation, but the finds within suggest two processes. The upper fill may derive from midden clearance, since pottery from a similar vessel was found in another pit. This would indicate secondary deposition of the upper fill, suggesting that the waste from horn-working joined a communal midden and did not come from this pit. The primary fill and the shape of the cut offer the possible interpretation of this as a working area: it has a flat base, a steep edge, and the most significant finds are slag and the whetstone. The shallowness

of the pit is also rare on this site: although the brickearth capping and occupation horizon are gone, this would still not have been a deep feature.

Pit 220/ 223

In the northern part of the site, an oval, truncated cut was recorded, 2.60m by 2.40m and only 0.22m deep. The primary fill was a greyish green colour (219/ 222), with only few stone inclusions, and contained two small sherds of residual Roman pottery. The dark brown fill above (221)) was dark greyish brown, probably deliberately dumped, and containing cow and sheep bones. It contained a sherd of sandy chaff-tempered pottery (CHFSF).

Pit 147

To the west of the site, a small pit appeared to be cut across the top of another (158). It did not seem to be a recut of the earlier pit, but a specific single action. The primary fill (047/146) was greenish grey clayey silt, and relatively stone free, but did contain cow and sheep bone, some of which had been gnawed by a dog. Daub from a wall was also present, and also three pieces of a chaff tempered jar **(Figure 12, No.3)** and one sherd of an imported greyware pitcher (NFGWD COAR) that may be from the same pot as found in the top of pit [158]. Above this, a second fill (145) incorporated some sand and gravel, probably redeposited natural. The uppermost fill (036/ 144) was very compact, and is probably a consolidation activity. It contained a single piece of pottery, which may also be from the earlier feature.

The pottery within this feature indicates it is of Phase IIA date, but there is little evidence of this being a secondary filling phase of cut [158] after compaction, since it is located on the opposing edge to the centre of the pit. It must be a small, localised reworking of the top of the pit. Perhaps it had been partially excavated previously, and refilled.

Conclusions, Phase IIA Pits

These pits indicate a density of occupation in the 7th to 8th centuries, but the deep levels of truncation have removed the potential buildings or roads with which these pits were related. Their primary function may have been for gravel extraction, but they were definitely reused as cess and rubbish pits. The concentration of household waste in the top of most pits is suggestive of midden clearance. It is possible that these pits were utilised by more than one household, and occurred on property boundaries, but this cannot be clearly proved because of the lack of upper layers and no definable properties.

Clearance of house debris into these pits is also clear from the finds. It is likely that clearance followed destruction by fire, since there are quantities of burnt daub that clearly came from the walls of houses, as proved by hollows left by burnt out wattle. Some of the finds suggest that the burning may have been deliberate destruction,

since a perfectly good whetstone was dumped into pit [227], whereas the rest of the finds are largely fragmented or broken.

Evidence of small industries was present in most of the pits: slag from iron working was regularly found, indicating that some degree of smithing was being undertaken. The presence of small copper alloy objects do not prove that copper was being worked here, simply that the objects were used and lost or discarded.
As regards textiles, loomweights were found to have been discarded, rather than lost, since there were no whole examples collected. Pit [120], of Phase IIB, is thought to contain clearance dumps of this earlier phase. Fragments of others were found in an intrusive post-medieval pit (048), but are also thought to belong to this phase.

A lot of the dumped deposits had a notable concentration of cow feet, which may be considered evidence of tanning of hides, since these are the boniest parts of cattle. It is unlikely that any of the pits found were for tanning: they all cut into gravel, and would not have held liquid for very long because of the high porosity. This would, however, make ideal cess pits. Bone and antler working were represented by pieces of sawn antler, off-cuts too small to be fashioned into objects. Cow and goat horn cores suggested working of horn on or near the site.

The diet of this phase is dominated by cattle, but sheep and pig are present as well, as is oyster. Goose and chicken are also represented as food species in a very minor way. The few dog bones present are not thought to be evidence of diet, rather evidence of dog-ownership, be it for hunting or guarding. Of all the bones of this phase, only eight came from juvenile animals and one from a new-born pig, suggesting animal husbandry was not a priority in this part of *Lundenwic*. The eating of horse does not seem to have been widely practised, perhaps indicating the value these creatures had as working animals.

The fragment of quern is an import from Germany, and while it proves international trade or migration, it also indicates that there was a lack of suitable material to be sourced locally.

Chaff-tempered wares dominate the Phase IIA pottery assemblage, with occasional imported wares from northern France. Evidence from other sites in *Lundenwic* has shown that chaff-tempered wares were in use from the start of *Lundenwic* until the mid-8th century; it was completely dominant until *c.*730, possibly *c.*750, but seems to have gone out of use between *c.*750 and 770. Imported reduced wares also appear early in the sequence, but the NFEBA and Walberberg-type wares date to after 650/670. There is little dating evidence for the digging of the pits, as most of the pottery derives from the upper pit fills, which may indicate midden clearance.

7.5 Phase IIB Middle Saxon AD 750-850 (Figures 7 and 10)

Features dating to the latest period of Saxon activity on site are either dated by the pottery within them, or by the stratigraphic relationships of the features. They are certainly the latest Saxon features on site, in that they are only truncated by Post-Medieval intrusions, and seem to have a similar character. There is no evidence to

suggest that Saxon occupation continued in this part of the emporium after the mid 9th century. There are two types of cut feature: deep pits which only seemed to have functioned as rubbish pits, and flat based pits which seemed more likely to have been primarily quarries.

7.5.1 Quarries

Quarry 082
This quarry had quite diffuse edges, and the limits had been truncated by modern service trenches and a post-medieval well, but the phasing of this pit into the later Saxon period is confirmed by the pottery within. It measured 5.21m by 3.08m, and was 0.54m deep. The southern edge was the most clearly defined, showing a concave profile with a flat base. The first fill (081) was particularly stony, and was probably the result of initial dumping of unwanted gravel back into the pit. Above this, another very stony deposit (069) was recorded, and is probably deliberately dumped, containing cattle bone and a little Roman brick. If this feature had gradually filled, the deposits within would be siltier. Above this was grey silty clay (070). Another dump of pale silty clay (055) that sealed this gradually faded into a darker, silty deposit (053/ 177) which contained a large quantity of animal bones, mostly cattle with a small amount of pig and sheep present. Three pieces of slag were evidence of iron-working in this phase. This deposit was sampled (sample 1), and contained fish bones, grains and apple pips, adding evidence of middle Saxon diet.

No pottery was found in the lowest fills of this pit ([081], [069]) but the next layer ([070) contained a sherd of shell-tempered pottery (MSSE, 13gm) that indicates a late 8th- or 9th-century date for the feature. The only other pottery is a residual sherd of Roman white-slipped ware from a later deposit ([177]).

The similarity to the fills of the Phase I quarry (228) indicates a similar process of abandonment, with the part-filled quarry becoming a rather squalid and damp dump for household waste. Above the soft silt were two deposits of gravelly sand and sandy clay (051 and 052). These were probably deposited to consolidate the ground at a later date. It was very compact and hard, probably due to compaction when the 20th century basements were put in.

Quarry 078
This is a rather shallow, large quarry that cuts through the tops of features from both Phases I and IIA. It measured 3.42m by 2.54m and was 0.54m deep. The initial fill was very silty (071), and probably represents initial erosion of the sides of the pit once it was opened. There was clearly some human input, since there were cattle and sheep bones, a little Roman tile and some rare bone-tempered pot from the earliest Saxon period. These last are likely to have come from disturbance of an earlier pit, either [080] or [099]. Above this was a thin deposit, quite organic, which may have been the remains of the soft parts of a cow, the bones being collected as part of the

layer above (034). This was dark brown and contained both animal bones and oyster shell. Two fragments of antler indicate it was being worked in the area, and a sherd of Pottery made in France dated this pit to the 8th century. This had clearly been a very soft layer, since there was a later consolidating dump pressed into it (033).

The softness of the upper fill suggests that this may have been rather damp, and stayed so until later development necessitated consolidation of soft deposits.

The lowest fill ([071]) of this pit contained a small piece of possible early Saxon pottery (ESBOE, 6gm), suggesting disturbance of a phase I feature. No pottery was found in the next layers, but the penultimate fill [034] contained a sherd from an imported pitcher (NFGWA, 5gm). 034).

Quarry 079

A sub-circular cut was recorded towards the centre of the site the northern part seems to have partially slumped (171), giving it an irregular profile. Despite heavy truncation on the north and east sides, the sequence of filling was seen to mirror that of other quarries on site. The primary fill (102) was very similar to the natural through which this feature was cut, and indicates a period of erosion, suggesting that this pit was not immediately backfilled. Above this deposit was a layer of brown sandy silt (074), perhaps with some organic content, and containing the compacted skull of a horse. There was no evidence of butchery, suggesting that horse was not used as a food species. There is very little horse bone present on site, so this is a rare occurrence. Sealing this was a deposit of dark greyish brown sandy silt (073), very soft, containing cow bones and two pieces of antler. Two pieces of 19th century brick were in the top of this fill, but are thought to have been imported when a consolidation layer of gravel (072) was dumped.

The only pottery from this quarry was a sherd of Ipswich ware (IPSM, 26gm) from the second fill [074]); this dates the pit to after AD 730/750.

Quarry 106

One side of a pit with an almost straight southern edge was recorded towards the west of the site, which was heavily truncated by modern concrete foundations on three sides. It survived for a length of 2.75m and a width of 1.10m. It was quite shallow, being only 0.50m deep, and had a flat base, quite characteristic of the other features identified as quarries on the site. The primary fill (105) seemed to have derived from the sides of the feature itself, possibly through erosion and slumping. Sealing this was a greenish grey deposit of sand (113) which was quite stony and finds free, possibly indicating another period of erosion or abandonment. The fill above (104) was a deliberate dump of dark grey sandy silt containing a notable quantity of charcoal which must represent in part domestic clearance. Four fragments of antler and many cow bones were also within the fill, and rather interestingly, the pelvis of a large dog, which may have been a hunting animal. The top fill of this pit (103) had less bone, and was grey sandy silt with high gravel content, likely to be a consolidation deposit once the pit had fallen into disuse.

Quarry 164

A small, truncated pit of 0.83m diameter and 0.38m depth with a concave profile was thought likely to date to this phase, since it cut through a phase IIA quarry (162/166). The single fill (163) was gravel-rich sandy silt, and the only find was a piece of Roman flue tile, clearly *ex-situ*.

Conclusions, Phase IIB Quarries

These pits are all characterised by having flat bases, and primary fills of redeposited gravel. What little building material that was dumped was largely Roman, and may have been used as bases for hearths, for example. There was no daub present in any of these quarries, suggesting that settlement clearance deposits were not dumped here, and the domestic dumps may be more indicative of midden clearance. The presence of off-cuts of antler and very rare slag showed evidence of industrial processes, but the majority of evidence for this came from the dumps in pits. Although the amount of pottery was limited, the date of the sherds indicates that these pits were dug in the later 8th and/or 9th centuries.

7.5.2 Refuse Dumps in Pits, Phase IIB

Four pits were excavated which were of a distinctly different nature to the quarry scoops on site in that they were filled with refuse; pottery, animal bone, daub and discarded household waste.

Pit 023 (Figure 10)

The largest and most-clearly defined pit was a large sub-circular cut in the southwest of the site. This pit was 2.10m by 1.78m at the surface, and was seen to have a depth of 1.25m. The top of the cut had a sharp break-of-slope, and was generally concave and bowl-shaped. The total excavation of this pit revealed a sequence of filling that included deliberately dumped deposits and natural silting and subsidence. The level from which this pit was cut was truncated, as were the tops of all features on site.

The primary fill was soft dark grey sandy clay (022), with a notable content of charcoal and some heavily burnt daub. The colour suggests an organic origin, and the daub and charcoal may be evidence of clearance of a demolished house in the vicinity. A single fragment of antler suggested a semi industrial origin, but it is probably the result of random redistribution after midden clearance. This was sealed by a deposit of silty sand (021), quite variable, and resembling the natural through which the pit was cut. This deposit would seem to be the result of erosion and collapse of the sides of the pit together with a small quantity of domestic waste, indicated by a little cow and sheep bone and a piece of furnace waste. The fill above this (020) was pale greenish grey and resembled a washed out layer which has lost its organic content, and may have had a large cess component. Among the finds in this layer was a sherd of a chaff-tempered jar giving a middle Saxon date for the filling of this pit (**Figure 11, no.4**). Other finds from this fill were slag from iron working,

animal bones and some fragments of Roman brick. A horn core from a cow was also present, suggesting the horn had been used, but this could have been off site, just residual bone being deposited here.

This very pale fill was subsequently covered by a dark greyish brown deposit (019) which, was dated to after AD 770 by the presence of part of a shell-tempered lamp (MSSE; **Figure 11, no.8**). Among the other materials found within this fill were shells, bones from most food animals including chicken and goose, and frequent quantities of charcoal and burnt daub. The uppermost fill (028) was quite hard and stony and contained a large quantity of daub (from walls) or kiln lining (from an oven or kiln). This suggests strongly that there was a house or industrial area on site.

The much later date for the upper fills from the lower may be an indication of clearance of earlier material, perhaps indicating a new building being erected on the site of an old. However, the chaff-tempered pottery was in poor condition and likely to be residual. Redeposition of midden material and clearance of earlier houses seems to have been common in the Middle Saxon period; this would have been necessary in a heavily quarried site.

Pit 046 (Figure 10)
This pit was very similar in size and shape to Pit 023, being sub-circular, and 1.80m by 1.63m at the surface, and 1.38m deep. The lowest deposit recorded in this pit was a light grey deposit with some charcoal and little bone (045), clearly indicating a household origin for this fill. This in turn was sealed by a mottled green sandy deposit (044) with a high proportion of gravel. This deposit was sampled, (sample 4) but no seed remains were apparent. A large quantity of bone was retrieved from this fill, from cattle, sheep and pig. It also contained the remains of a severely compressed human cranium. Specialist examination indicated an adult male of over 50 years. There were no signs of pathology. Since no other human bone came from this deposit, it is most likely that this skull derives from the Saxon disturbance of earlier remains, either Early Saxon or Roman, and was discarded into this rubbish pit when found. Saxon graves have been found along the ridge above the Thames, and several are likely to have been disturbed by later pit-digging; occasional fragments of human bone occur on several sites in the area. The layer above this (043) was similar in that it contained a large quantity of bone, but was paler, perhaps due to leaching of minerals through water logging. It contained a piece of iron slag, indicating iron working in the vicinity. The fourth layer filling this pit (042) was notable for its similarity to the sides of the cut, suggesting a brief phase of less regular use, the sides of the pit collapsing as further household debris was added, debris including cow and pig bones and a small piece of antler. Pottery from this deposit was dated to AD 600-750, and is thought to be residual.

The fill above this was notably green silty sand (041), and was thought to be reworked natural, having some domestic finds mixed in, and may represent midden clearance. Among the ubiquitous animal bone was a goose bone, indicating a slightly wider diet than most of the fills. Pottery from the fill, manufactured in Ipswich, dated this to the late 8th or 9th centuries (**Figure 11, no.7**). Burnt daub with wattle impressions showed at least partial destruction of a house in the area. Above this, the

fill also seemed to be reworked natural sand and gravel but sandier and dark brown (038). Cattle and pig bones had been incorporated, as well as a toe-bone from a dog. Evidence of industry came from a fragment of red deer antler, but this is likely to have come from midden clearance rather than confirming the site as an industrial centre. The topmost fill (039) was very dark brown and organic. Red deer antler was again present, but there was very little bone or other finds material. The pottery (from 038 and 039) dates to after AD 730/750.

There are two possible interpretations for the filling of this pit: it may have been initially dug as a cess pit, and was then used for dumping of midden material once a suitable pile was ready during the 7th-8th centuries. This compacted over time, and the later layers at the top of the feature are attempts to consolidate it in the 8th-9th centuries. Alternately, the entire feature could be 8th-9th century, the lower levels representing a period of site clearance. It could have been dug pre 730, and the lowest fills have no Ipswich ware, but the final backfilling was certainly after 730/750. There are many pits in *Lundenwic* that have the same pattern of finds –in some cases the upper fills may be later layers that have slumped into the pit.

Pit 120

At the western edge of the limit of excavation, a large refuse pit was recorded measuring 2.0m by 1.74m and 0.95m deep, with steep sides and a rounded base. It cut through two earlier features (057 and 088). The primary fill (119) was a deposit of grey sandy silty clay with a high quantity of animal bone, mostly cattle and pig, indicating that as soon as the pit was dug, it was being used for refuse. The fill sealing this (118) was similar, but darker, also containing bone, oyster shell, charcoal and daub. This was in turn sealed by soft dark grey sandy clay (121) with an organic content, again rich in shell and charcoal. The only dating evidence came from the fill above this (116); two fragments of pottery dating from AD 670-750. It also had a large quantity of oyster shell, over 1/3 by volume. These were definitely dumped, since they lay at all angles rather than making a flat area which might be expected if they were used as capping for a malodorous cess pit. Above this was a dump of reddish brown clay with gravel (117). The colour of this layer most resembled nitrate staining from cess, and may well have come from part of another pit.

Five sherds of pottery were recovered from this pit (202gm, 0.35 EVEs). As in other features none were from the lowest layers, and the first are from the second fill [118] which contained rim sherds from jars in chaff-tempered and sand-tempered fabrics (CHSF and SSAND; **Figure 11, nos.5, 6**) and a sherd of heat-altered Walberberg-type ware (BADOC?). No pottery was present in the next fill ([121]), but the overlying deposit ([116]) contained one fragments of chaff-tempered pottery and another from the same Walberberg-type vessel (total 54gm). The fact that both sherds have purple staining on the interior suggests that pot may have been reused for boiling madder, a plant dye used on clothing. The absence of Ipswich-type ware suggests that the pottery in this pit, which is typical of the period 670-750, may be residual.

The latest pottery from this pit was dated to no later than AD 750, but its high place in the stratigraphy suggests that the pit was probably dug early in Phase III, and the finds may represent a clearance activity of phase II material.

Pit 218

A circular, concave feature that seemed primarily to be a rubbish pit cut a phase IIA pit (220/223). It measured 0.69m in diameter, and was 0.32m deep. The lower fill (224) was dark greyish green silty sand, and contained sheep, cow and pig bones, plus pottery from Phase IIA. Much of this material probably derived from the pit below, since the upper fill (217), which seemed to be a deliberate dump of household waste, contained pottery sherds from a pitcher in NFGWD COAR (**Figure 11. no.9**). This is fragmented, but may have had bossed and incised decoration in the later 8th-century fashion. Household waste was indicated by cow bones, but the fills may represent the clearance of a house or a midden, since the soil was a mix of dark sandy clay, charcoal, possible unburnt daub and a fragment of a quern of Niedemendig lava.

Conclusions, Phase IIB Pits

These pits indicate a density of occupation in the 8th to 9th centuries similar to that of Phase IIA, but all occupation surfaces had also been removed by truncation. As in Phase IIA, their primary function may have been for gravel extraction, but they were definitely reused for cess and rubbish. The concentration of household waste in the top of most pits is suggestive of midden and settlement clearance. All of the surviving daub seemed to be part of wattle and daub walls that had been destroyed by fire. Whether this destruction was deliberate or accidental is unclear. One pit (218) contained possible unburnt daub, but it may just have been a deposit of brickearth.

Whether or not the demolished houses were caused by destructive raids, the occupants of *Lundenwic* clearly had time to dispose of their rubbish into these pits, as well as clearing the ground for rebuilding. There is no evidence of activity following the abandonment of the site until the 17th century due to truncation, so the final filling of these pits, be it through accumulation or dumping cannot be described.

The distribution of the pottery suggests that some pits may have first been dug before *c.*730/750, but they were finally backfilled in the later 8th or 9th century. The concentration of household waste in the top of most pits is suggestive of midden and settlement clearance.

The most notable difference from Phase IIA to Phase IIB is the presence of pottery from Ipswich. The presence of this ware marks the second ceramic phase in *Lundenwic*, which seems to start in the mid-8th century. The actual start date is uncertain; evidence from Ipswich itself suggests that the industry started *c.*730, but it is not impossible that it took several years before the ware was traded to *Lundenwic*, and a date closer to 750 may be more accurate. The ware continued in use until the end of the settlement in the mid-9th century. Continental imports are limited but present in some of the pits assigned to this phase.

There are no copper finds from this phase. This may be due to the heavy truncation that the site suffered since AD 1600, or may be that this part of *Lundenwic* was not a settlement area, but more an area for dumping of refuse. Alternately, the inhabitants may be being less careless with valuable objects.

Evidence of small industries was present in most of the pits: slag was very rare, only two pieces from iron working was found. This may indicate less going on, but the sample is limited. As regards textiles, there was no evidence of manufacture. A loomweight was found to have been discarded, but this came from the lower fill of pit [120], thought to be a clearance dump of the previous phase. Two fragments of a reused Rhenish pot from one pit (120) have purple staining on the interior, and this is thought likely to be remnants of madder, a plant dye used on clothing, and indicates a minor industry

Bone and antler working were represented by pieces of sawn antler, off-cuts too small to be fashioned into objects. Cow and goat horn cores suggested working of horn on or near the site, but since these are dumped deposits, a direct source cannot be determined.

This provided the largest weight and quantity of animal bone of all the phases. There is a very large and varied animal assemblage with the full range of species present. Cattle are again the most numerous by all measures followed by pig and then sheep or goat. Oyster is common, but, goose and chicken are also represented albeit in a very minor way. Of all the bones of this phase, only seven came from juvenile animals and one from a new-born calf, suggesting animal husbandry was not a priority in this part of *Lundenwic*. The eating of horse does not seem to have been widely practised in this phase either, perhaps indicating the value these creatures had as working animals.

There is little apparent difference between Phase IIA and IIB; rather they continue one to the next, the main difference being the introduction of pottery from Ipswich (Saxon Gipeswic).

7.6 Phase III Medieval

There were no remains of medieval activity recovered on site, but this most likely the result of 20th Century truncation as opposed to the area being disused in the medieval period. It is likely that the area was given over to agriculture, part of the 'Convent Garden'

7.7 Phase IV Post-Medieval. 1600+ (Figure 8)

Post-medieval activity was characterised by the truncated remains of a cellar to the rear of tenements fronting onto Long Acre, several domestic pits, and by a large well which was not fully excavated, since it clearly cut deeper than the surviving archaeology.

An Early Cellar

Towards the eastern side of the excavated area was found the remains of a brick structure which included a brick floor (037), bounded by a wall to the south (009),

and a buttress (013) to the east. Examination of the bricks of the floor showed them to be 16th century, whereas the buttress dated to the 17th-18th century.

The first phase of build appeared to be the buttress and wall that bound the floor. Both of these structures, although not bonded with one another, pre-date the floor, perhaps by only a matter of hours. The buttress was built in a steep sided cut (085), and was made of brick using an English Cross-bond, somewhat irregularly, forming a roughly square block, surviving 0.46m above the associated brick floor. The buttress was not rendered or faced, except on the eastern side, where it would have been visible to anyone in the cellar. It is possible that the buttress has been heavily truncated to the north, south, and west, but there were no other foundations recorded in the vicinity.

On the southern side of the floor, 0.52m of walling (009) survived above the floor surface, the bond used being largely stretcher, and pointed on the internal face. The mortar was similar to that of the buttress, being grey and sandy, with flecks of brick, chalk, shell and flint. This wall was very heavily truncated to the east, and had suffered some damage to the western end, probably during demolition. There is no direct relationship between this wall and the buttress, but evidence of robbing may explain the lack of building materials in the southwest corner of the building

At the junction between the wall and the buttress is a rectangular area without any building material, save for a pad-like arrangement of half-bricks and stone. This could represent the footing for a massive structural timber which would have supported the building of which only the cellar survived.

The floor of the cellar (037) was also made of brick, mostly half-bricks laid in rough courses, giving a degree of regularity. Unfortunately, modern truncations and intrusions resulted in little of the cellar surviving. The fact that the bricks of the floor date to earlier than the walls is likely to be reuse: second-hand bricks were deemed suitable for flooring, since they add little to the stability of the structure.

No pottery was found in the cellar itself, but the overlying deposit of silty clay resembling brickearth (015) contained a residual sherd of Saxon chaff-tempered ware and one of post-medieval blackware that probably dates to the 17th century. This dumped deposit was in turn sealed by four more layers of dumping, one of which (011) yielded a piece of window glass and twelve sherds of pottery dating to between 1580 and 1700; these comprise a Chinese porcelain tea bowl, and three sherds of tin-glazed pottery, one with ‘Persian blue’ decoration. Another dump (014) of this sequence contained a small pin (SF6).

A plan of 1715 indicates a series of attached cottages concentrated around Conduit Court, on the eastern part of site, and a public bath-house in the northwest corner. However, the recorded structural remains yielded pottery of the 17th century, and is more likely to be the remains of ‘Salisbury’s Stables.’ It is possible that the partial basement and associated walls recorded during the excavation are remnants of this bath-house.

A Well

Towards the southern end of the site was discovered a well, and this was recorded in Evaluation Trench 1 (7), as well as during the main excavation (226). The well was built from unfrogged red bricks, possibly hand-made (average dimensions 260mm x 105mm x 65mm), and laid side by side, with the header of each brick facing inwards. The bricks were laid in courses, and were bonded with a mid grey, soft sandy mortar. On the western side of the well was incorporated a stone slab, but it is unknown whether this was a functional or practical measure. The well was not quite circular, having a flattened western edge, but had an internal diameter of 1.52m

The well had been filled in with modern sand and rubble which included modern glass and fragments of 19th Century clay-pipe, above which a capping of cement had been placed. Clearly this well ceased to function when the basement was cut. Approximately 0.60m of the backfill was excavated, but no earlier filling deposits were observed, and the well was not bottomed.

Pit 048

To the very west of the site, and truncated by a modern foundation, was a 2.0m wide circular cut, 1.60m deep, and intruding into an earlier, Saxon pit. The fill (031/032) was a dark brownish black and contained brick and tile fragments, plus mortar, bone and a single sherd of green-glazed Surrey/Hampshire border ware that dates from 1550-1700, and two loomweight fragments (SF15 and 16), one with impressed 'brand mark' **(Figure 12, no.3**). The pottery dates from the 18th Century, and the pieces of building material from the demolition phase of the early cellar. The Saxon finds collected from this feature are thought to have come from the pit through which this was cut (088). A piece of iron slag may also be of Saxon date.

Post-Hole 005

An isolated post-hole was recorded to the east of site. It was square, but was largely truncated; only surviving for a depth of 9 cm. There was an absence of finds, but the recovery of wood fragments suggests a post-medieval date for the feature.

7.8 Phase VI Twentieth Century.

Twentieth Century activity on site was clearly represented by the deep basements that had truncated all but the very bases of earlier features. Associated with these basements were intrusive cuts for services which bisected the archaeological horizon, removing direct relationships of features in several places. Not all of the modern intrusions were removed; large concrete pad foundations remained in several areas, since they had truncated all potential archaeological features. The southern area of site was truncated to around 19.10mOD, and the northern area to 18.80mOD.

8) Finds Summary

Type	Quantity
Pottery	**100 sherds**
Ceramic Building Material	17.5 Kg
Human Bone	3 fragments
Animal Bone	78 Kg
Metalwork	1 box
Glass	1 box
Clay pipes	1 box
Small Finds	17

8.1 Roman pottery

A small assemblage of Roman pottery was collected, all of which was residual, from Saxon deposits. Interestingly, the majority was from the earliest features, suggesting that vestigial Roman deposits had largely been truncated by the earliest Saxon occupation.

8.2 Saxon Pottery (Figure 11)

The Saxon pottery spans the date of the Saxon occupation between the 5th-9th Centuries. Finds of the earlier date-range are particularly rare in London, known only from three other sites.

Early Saxon

The presence of Early Saxon material on this site is of importance for two reasons. Firstly, finds of this date are extremely rare in central London, consisting of a few 5th-century items from Billingsgate and from St Brides (Blackmore 1997a), and a small 5th- to 6th-century assemblage from St Johns Clerkenwell, a short distance up the river Fleet, where sandstone-tempered wares have also been found (Blackmore in prep, f). Bone-tempered ware is very unusual, and the only other occurrences known to the writer in the London area are from 5th- to 6th-century sites at Hammersmith and at Prospect Park, Harmondsworth, where fabrics ESSTB and ESGSC have also been found (Blackmore in prep, a; Laidlaw and Mepham 1996, 35; 1999, 37). Secondly, the site is located at the western end of Long Acre, close to the junction with St Martin's Lane. It thus lies only a short distance to the north of St Martins in the Fields, a possible religious focus in the late 6th or early 7th century (Vince 1990, 60-1; Blackmore 1997b, 124), and close to the supposed western edge of *Lundenwic*, which has been taken to be on the line of Charing Cross Road, This is possibly the line of a former watercourse. Despite the small number of sherds, the Early Saxon finds from Long Acre are of great significance, raising, for the first time the fascinating possibility of activity in the area long before the development of the trading settlement, perhaps contemporary with, or even predating, the development of the near St Martin's in the Fields.

Middle Saxon
The date of a biconical chaff-tempered vessel from [118] is problematic, but it could date to the first half of the 7th century, as a body sherd from a similarly small vessel has been found at Chandos Place, Bedfordbury (Blackmore 1989, fig.29, no.18). This was also thought to predate the main activity on the site, although it may have been contemporary with the 7th-century comb-stamped chaff-tempered sherds from the same site (*ibid*, 74-7), which are thought to date to before 670.

Most of the other wares are typical for the Middle Saxon period, and compare well with finds from *Hamwic* (Hodges 1981; Timby 1986), although both non-local and imported wares are less varied than on sites to the east or closer to the waterfront. Nonetheless, the range of fabrics present indicates activity on the site between the 7th to 9th centuries, albeit possibly of a sporadic nature.

8.3 Post-Medieval Pottery
A small assemblage of six pieces was collected from the site, enabling the demolition of the cellared building to be dated to post 1680.

8.4 Roman Building Material
Roman Building material was mostly found in the earliest Phase of Saxon occupation. It would have been used for purposes such as lining hearths, and could have been brought from the walled city, 1.7km to the east, although they could have come from a local satellite settlement to *Londinium*. Roof tile, brick and flue tile were all present.

8.5 Saxon Building Material
The only Saxon building material present was daub, used to cover wattles to make the walls of houses between upright posts. This will only survive if burnt, so indicates frequent partial or total destruction of Saxon houses during the occupation of *Lundenwic*. One piece had a thin deposit of lime on the surface, suggestive of whitewash.

8.6 Post-medieval Building material
The post-medieval building material was dated to the 17th-18th centuries, and gives a date for the construction of the cellar floor and associated buttress.

8.7 Human Bone
Parts of two skulls and one long bone were collected from two separate pits. These are thought likely to have been disturbed from Roman burials near to or on site.

8.8 Animal Bone
The total quantities of bones recovered from the Saxon and post-medieval levels are shown in table 8.5. Clearly the greater part of the assemblage was provided by the Saxon contexts, and in particular by those dated to the middle phases.

Period	Phase	N. Features	N. contexts	N. bones	Weight/ kg
Saxon	I	5	11	247	6.45
	IIA	14	40	1254	33.34
	IIB	8	28	1312	38.23
Post-medieval		2	3	104	2.25
Totals		**29**	**82**	**2917**	**80.17**

Table 8.8 Quantities of bones per period/phase

Species

The most abundant bone by weight and number came from cattle. Of these, the vast majority were adult; only two bones from new-born calves were present, indicating that the rearing of cattle was not carried out on the site in the Saxon period. Other mammals eaten were sheep or goat, pig, and very rarely, horses. The latter are working animals rather than a food species. Birds were also consumed; bones from chicken and goose were collected during the excavations. Other animals present are dog, the bones of which were large, suggesting a hunting dog, and rodent (rat or mouse) bones were found in a domestic rubbish pit,

Although several sites have now been excavated within the Middle Saxon settlement at *Lundenwic*, there are clearly a number of questions that need to be answered concerning animal usage. Of particular interest is the recovery at this site of 5th -6th century material, for which there are no obvious comparisons within the earlier excavations. The aims of the investigation have been answered, and are summarised below.

Butchery

A large number of bones (1020) showed ancient breakage, usually long bone shafts specimens. These resulted from percussion i.e. a bone being struck which could have been human action or may have been an indirect action; bones hitting each other as they were thrown into a pit. Broken shafts of long bones can also be interpreted as processing for the extraction of marrow. Clear evidence of butchery was seen in the form of cut and chop-marks on bone surfaces. Cut marks were noted on 12 specimens, whilst chop marks were seen on two specimens. The condition of the bone surface and common occurrence of concreted cessy deposits is thought to have obscured further examples of cut marks.

Animal Products

Two forms of animal products were identified from the excavations. Red deer antler was present as sawn off-cuts; waste pieces. It is of particular interest that all of the antlers were shed rather than chopped from the skull of a deer carcass. At the middle Saxon sites of Jubilee Hall and Maiden lane sawn antler off cuts were also found but some of these were clearly sawn or chopped from the skull (P.137, Cowie and Whytehead 1988).

Two scale handles were found, made from limb bones, probably from cattle.

By deduction, there is evidence of other animal products from the excavation. The presence of cattle suggests dairy products were part of the diet, and foot bones present in deposits may have been attached to hides prior to tanning. Sheep would have provided wool, weaving being evidenced by the presence of loomweights.

Meat Animals
Cattle, pig and sheep were all present on site. These are the most frequent animals, cattle being the most common. Most are adult creatures, but it is possible that cattle and pig were reared within the settlement, since two neonate and occasional juvenile bones are among the assemblage. Chicken and goose bones were also present, indicating a wider diet, including poultry. Horse bones in the assemblage are largely represented by skull and foot bones. This is thought to be more likely evidence of leather working than meat consumption.

Meat Products
The early Saxon features are dominated by cattle bone. Notably, the bones present are mostly limbs and shoulders; these are the most meat-heavy parts of cattle, suggesting good diet.

The later Saxon deposits feature most cattle bones, and limbs from sheep and pigs. As with cattle, these are the meatiest parts of sheep and pig. The presence of most elements of cattle may indicate that cattle were stalled within *Lundenwic*, whereas pigs and sheep were beyond the settlements limits, only their products being brought in. Goose and chicken bones were collected from the middle Saxon features, showing a wider diet that included poultry.

Disposal Patterns
Two types of features survived on site: those which seemed to be primarily quarries, and those which only contained domestic waste. The pits with domestic waste had a significantly higher proportion of bone within than the quarries, suggesting one of two events. Either the quarries were established during a period of low density habitation, or that the filling of the domestic pits was deliberate, and the quarries were filled by a process more of accumulation.

Early Saxon Phase
For the pits from the earliest phase the species present were cattle, sheep/goat, pig and horse. The most numerous were cattle, the next most numerous pigs. The horse and sheep/goat were present only in token amounts. In terms of body parts, the cattle specimens included the head, forelimb and hind limb regions. The upper parts of the limbs and the shoulder and pelvic girdles represent those regions which are meat-bearing and would be expected in butchery/ household waste. The lower limb and foot bones do not carry much meat at all and their presence can be explained as either waste from the early stages of butchery or as waste from skinning/ tanning as the feet were often left attached to the hides before preparation of the hide was undertaken. The pig bones showed a wide distribution across the skeleton with the only notable absence being the skull.

The quarry pits from the earliest phase showed a more restricted range of species with cattle very much the dominant taxa. Again a range of skeletal parts were present, including skull, hind limb, forelimb and foot bones suggesting a combination of butchery, household waste and possibly hide processing waste. Pig is represented by just two loose teeth suggesting that its inclusion in these features may well be accidental or the result or re-deposition.

Major food animals exploited during the middle Saxon phases
The great advantage of this data is that there is sufficient information to provide for detailed analyses of domesticate utilisation within each of the later periods. These periods correspond to the occupation levels of several other sites in *Lundenwic* and so there is ample opportunity for comparison. Like the early phase, cattle, pig and sheep are all present, with occasional chicken and goose bones indicative of a wider diet. The presence of neonate cattle and pig bones is very low, but may be indicative of rearing these animals. The lack of sheep/ goat juvenile or neonate bones suggests that these animals lived beyond the settlement.

The size and type of domestic species
Although only a small number of bones were complete enough to enable measurements various patterns have emerged. The withers height calculated for cattle are quite large although it must be remembered that the metapodials are not the most reliable bones for this calculation.

The large standard deviation and coefficient of variation seen for some dimensions is suggestive of bimodality this could be due to sexual dimorphism or it may result from the inclusion of individuals from more than one breeding population in the sample. The very large cattle metapodials and phalanges seen appeared not only large but also particularly robust a possible explanation might be that these present oxen (a neutered male used for traction).

Only the cattle provided data which could be used to calculate the withers height for the Long Acre assemblage. The height for the west Stow cattle have an average of 1.12m, which is similar to the lower end of the range seen at Long Acre. The ranges seen at the Peabody site are more similar to those seen at Long Acre with 1.02-1.33m and a mean of 1.18m. It could be suggested that the cattle from *Lundenwic* sites appear to be larger in stature than those from rural sites (if West Stow is a good example of a rural site).

Evidence for craft activities
Craft activities deriving directly from animal products are indicated by antler fragments, scale handles and loom weights. The antlers are off-cuts from making other products, being the discarded waste. The pieces of scale-handle show that tool manufacture was being conducted on or near site. The loom weights show that secondary products such as wool were being woven.
Tanning and leather working is only evidenced by deduction: the horse skull and metapodials may be evidence of the remnants of a hide, as may cow metapodials.

The horse bones

Few horse bones were collected from the excavations; the bones present were metapodials, skull fragments, and part of a leg. There are not enough elements to suggest that horse provided a major food source, rather these elements are more suggestive of tanning processes. An important use for horses in *Lundenwic* would have been as dray-horses and beasts of burden. This importance and the abundance of the main food animals may preclude the eating of horse.

8.9 Metalwork (Figure 12)

Most of the metal finds were in poor condition, and have been stabilised. Further work is unlikely to generate greater understanding of the features from which the metalwork came, but there were a few interesting items.

Two Roman coins were found; both were quite heavily corroded, and came from Saxon features. They both probably date to AD 337 – 361.

An odd little copper alloy object was also found, that is part of the base of a scabbard, possibly manufactured in Scandinavia.

8.10 Industries (Figure 12)

Evidence of several industries and crafts were apparent on site. These are not big industries, but small scale. It could not be determined where these industries were carried out because of truncation of the occupation surfaces.

Slag and iron bloom from working of iron ore was found there was no casting waste, but the waste from ore was present. There was also a very small amount of glass waste, showing that there may have also been manufacture of glass objects.

Pieces of six discarded loomweights were found in refuse pits. These had been broken during the Middle Saxon period, presumably dumped because they were of no use. No other evidence of fabric manufacture was present.

Bone, horn from of cattle and goat were worked near the site, as was antler, as evidenced by sawn off-cuts. These discarded pieces are the waste from manufacture of everyday items such as combs and needles. There were no finished items. Two parts of scale-handles were collected (small finds 1 and 3).

A whetstone was collected from a Saxon pit (small find 5), which while being an interesting object, indicates part of the working economy of the period.

8.11 Samples

Four environmental samples were taken from the site. The material was charred in all the samples except <1>, which contained mineralised material. Samples 2 (054), 3 (077) and 4 (044) were taken from pits, and sample 1 (053) was taken from a quarry. They all date from Saxon deposits, with <2> and <3> dated to between AD 600-750 and <1> and <4> to AD 750-850. The samples all contained a lot of bone, but plant material was scarce or absent in all four. The aim of the analysis was to extract any

information about the diet of the inhabitants of this site, along with background information about the local environment.

The low number of archaeobotanical material present in these samples means that little can be interpreted with much certainty. Sample <1> contained apple seeds. Sample <2> included wheat grains. This low density and poor quality of preservation means that nothing can be concluded beyond that wheat was used in some form on this site, either for human consumption, for example for bread, or as fodder. The presence of charred remains, and charcoal, along with the domestic nature of the pits, leads to the conclusion that these seeds/ grains represent a small proportion of what was consumed by people living in this area. The mineralization of the grains and apple pips in sample <1> mean a high phosphorus content was present. This is normally associated with features like cess pits.

Sample <3> was slightly richer, with the material preserved by charring. The majority were Woundwort and wild pansy (heartsease). Grasses were also present, and the assemblage is typical of grassland or hedgerow environments.

8.12 Clay Tobacco Pipes

Clay pipes were collected from several post-medieval features, most being stem fragments of the 17th-18th centuries, but there was one datable piece, a clay pipe bowl (011), manufactured between 1680 and 1710, suggesting a demolition date for the post-medieval cellar.

8.13 Small finds (Figure 12)

A number of finds merited close examination and were accessioned as small finds. These are listed below. These are considered of greater interest because they immediately relate to Saxon life. The Copper alloy scabbard end is a particularly rare find, since it seems to have been manufactured in Scandinavia.

Find No.	Context	Material	Description
1	029	Bone	Handle
2	029	Cu Alloy	Pin
3	054	Bone	Handle
4	087	Cu Alloy	Scabbard end
5	056	Stone	Whetstone
6	014	Cu Alloy	Pin
7	110	Bone	Worked
8	112	Antler	Waste
9	181	Cu Alloy	Coin
10	U/S	Cu Alloy	Coin
11	186	Cu Alloy	Casting waste
12	001	Ceramic	Loom weight

13	001	Ceramic	Loom weight
14	001	Ceramic	Loom weight
15	032	Ceramic	Loom weight
16	032	Ceramic	Loom weight
17	154	Ceramic	Loom weight
18	6	Cu alloy	Coiled strip
19	209	Lava	Quernstone

9) CONCLUSIONS

9.1 Introduction, Early Saxon AD 450-550 ***(Phase I)***

The early Saxon period is considered to cover the period of the first Saxon migrants following the departure of the Romans after AD410 until the acceptance of Christianity in the early 7th century. There is no written history of this early period; the main sources are Bede's *Historia Ecclesiastica* and the *Anglo Saxon Chronicle;* these were not written until the 8th and 9th centuries respectively, and it is assumed that there had been an oral tradition of which these documents are the synthesis.

The Thames is likely to have been an early Saxon trading route: there are settlements along its shores as far upstream as Oxfordshire, and *Lundenwic* may have started as a small settlement. However, given the Roman practice of using auxiliary troops from one part of the Empire to control another, it is likely that there were already people of Saxon origin living in Britain, and the development of a settlement outside Roman *Londinium* is unsurprising.

9.2 Phase I Archaeology AD 450-550 ***(Figure 5)***

The earliest Saxon features at 15-17 Long Acre were five quarry pits. Three of these had been heavily truncated by later Saxon excavations; the largest measured approximately 12m by 5m. All had flat bases and had been filled by the same processes: a small redeposition of quarried material followed by naturally accumulated silt. This seemed to have become waterlogged, and later Saxon occupation witnessed dumps of gravel, presumably to consolidate soft, damp ground.

These quarries were dated by the pottery within their fills, which was of an early Saxon date. Two thick-walled sherds from the redeposited gravel are in a coarse ware tempered with abundant crushed sandstone and probably came from the same jar. The fourth sherd, from the interface of pit and the quarry, contains rounded Greensand quartz. Fragments of two other jars were present.

The presence of Early Saxon material on this site is of importance for two reasons. Firstly, finds of this date are extremely rare in central London, consisting of a few 5th-century items from Billingsgate and from St Brides, and a small 5th- to 6th-century assemblage from St Johns Clerkenwell, a short distance up the river Fleet, where sandstone-tempered wares have also been found. Bone-tempered ware is very unusual, and the only other occurrences known to the writer in the London area are from 5th- to 6th-century sites at Hammersmith and at Prospect Park, Harmondsworth. Secondly, the site is located at the western end of Long Acre, close to the junction with St Martin's Lane. ;A short distance to the north lies St Martins in the Fields, a possible religious focus in the late 6th or early 7th century, and close to the supposed western edge of *Lundenwic*, which has been taken to be on the line of Charing Cross

Road, possibly the line of a former watercourse. Despite the small number of sherds, the Early Saxon finds from Long Acre finds are of great significance, raising, for the first time the fascinating possibility of activity in the area long before the development of the trading settlement, perhaps contemporary with, or even predating, the development of the near St Martin's in the Fields.

There was a preponderance of Roman building material: tegula, imbrex, brick and flue tile were all present, and this hints at a Roman presence nearby. The Roman material is thought either to be brought to the area of *Lundenwic* by the early settlers for re-use on hearths or wall foundations, but may equally be indicative of a heated building in the area, beyond the walls of the fortified *Londinium*. Occasional fragments of Roman pottery also suggest a low level of Roman occupation; it seems unlikely that Saxons would carry pottery sherds around, but possibly they were using Roman pots that survived their departure. A fragmentary human skull within the quarry fill seems likely to have derived from pre-Saxon occupation of the area, and may well also be Roman.

There is a small amount of cow bone from the filled quarries, possibly discarded into the watery quarry fills as a useful rubbish dump. This indicates that there was some permanence of habitation the exact location lost through either later Saxon building or modern truncation.

9.3 The End of Phase I

Two other cut features seem to be of domestic origin, and are thought to be part of this phase, since they are truncated during the Middle Saxon period. These are a pair of pits; one featured primarily cess, with a gravel-rich deposit capping it. The other was filled with a number of thin layers of animal bone separated by lenses of gravel, over which was a mixture largely consisting of brickearth, charcoal and daub from the walls of a house. Thus one of these pits suggests direct occupation, the other rubbish disposal and clearance. Whether this latter pit contains clearance deposits from the end of Phase I, or preparation for settlement at the beginning of Phase IIA is not clear. The lack of imported goods from this early phase suggests that the Emporium '*Lundenwic*' did not start until the 7th century, the earliest Saxon settlement being more parochial.

9.4 Introduction, Middle Saxon AD 600-850 ***(Phase IIA and IIB)***

In AD 601, Pope Gregory chose London to be the primary see of England, but the Saxons reverted to paganism while their overlords were busy organising and creating Kingdoms. East Anglia, Wessex and Mercia were located in central and southern England, but Mercia became dominant by the mid 7th century. This is indicated by a Charter of 672-4 that includes the earliest reference to the Saxon 'port of London,' and refers to the Mercian king Wulfhere. It is likely that the port and ensuing trading centre (emporium) was under Mercian control, since it had no other direct access to

the south and east coasts; facing the continent. Kentish kings may have re-established themselves in London in the late 7th century, but another charter indicates that London was under the reign of the Mercian Aethelbald from AD 716.

Bede's description in the 730s of *Lundenwic* as 'an emporium for many nations who come to it by land and sea' suggests that imports from across Europe ought to be present on sites of this period.

9.5 Phase IIA ***(Figure 6)***

The second phase of Saxon occupation is characterised by a number of irregular scoops, interpreted as quarries, and by steep sided pits that were filled only by domestic refuse.

The reasons for quarrying are likely to have been practical, excavating materials necessary for settlement as *Lundenwic* grew. The site was truncated to naturally occurring gravel deposits, and it cannot be determined how much of the horizontal stratigraphy was removed by modern basementing, but all of the quarries cut at least 0.40m into the natural gravel, so it can be assumed that it was this gravel that was being excavated from within. Of the uses to which gravel was put, the most intensive was road building and resurfacing of yard areas, an activity which would have been ongoing during the life of *Lundenwic*. It is likely that the natural brickearth was being quarried as well, since it is very suitable for daub.

The result of quarrying would have been to leave large hollows around the settlement. These were seen to be made less hazardous to livestock and the populace by having secondary dumps of household waste being dumped within, and probably topped up as the fills rotted and shrank. Whether these were primary dumps of rubbish or resulted from midden clearance could not be definitely determined from the finds assemblage, but small amounts of various bones per layer suggest midden clearance the most likely.

The steep sided pits seem only ever to have been used for domestic or industrial waste. The deepest recorded was 1.60m deep, and must have been deeper when dug, since the occupation horizon was truncated by modern basementing. Unless pits like this were fenced off for safety, these deep holes would have been somewhat hazardous, since they appear to have been filled with thin layers representing single activities, rather than being subject to large dumping episodes. This does not preclude the possibility that the fills are the result of midden clearance mixed with erosion products from the sides of the pits, but the nature of the fills indicated gradual deposition.

The pottery assemblage is dominated by Chaff-tempered wares. Evidence from other sites in *Lundenwic* has shown that this ware was in use from the first half of the 7th century until the mid-8th century; it was completely dominant until *c.*730, possibly *c.*750, but seems to have gone out of use between *c.*750 and 770. Most sherds contain abundant organic material but a few are finer; of particular interest is a small sherd from [215] with a large chalky inclusion which suggests that it was imported from an

area well outside London. None of the pottery was decorated, although a few have roughly burnished surfaces.

The 150-year span indicated by the finds from this phase reflects a rise in population and density of habitation. Modern truncation has removed the upper stratigraphy, so any street layout is lost, but it is possible that the refuse pits defined property boundaries that were re-established as they filled. The pitting is concentrated to the north and west of site, away from the large quarry of the first phase, which indicates that this undisturbed area was either open ground in the 7th –8th centuries, or was still too waterlogged to contemplate digging. One feature, however (191), cuts into the largest Phase I quarry, but does not have a clear function. Perhaps it was an attempt to understand the nature of the fill, or to try and drain it in the 7th-8th centuries.

9.6 Phase IIB (Figure 7)

The process of quarrying and pit-digging was also characteristic of the latest Saxon period represented on site. The quarry pits had undergone the same filling process as those of Phase IIA, but the other pits revealed more differences. Three large pits were recorded of this date, all typified by the high quantity of pottery and animal bone within. The bone content of these three pits was very high, compared with the dumps of the previous phase, and signifies either the proximity of an area of butchery, or shows that the diet of middle Saxon Lundenwic *included a large quantity of meat. No evidence of timber frameworks or supports for the pits was apparent.*

One of these pits contained a human skull near to the base, deposited among a lot of animal bone, but probably originates in disturbance of Roman deposits. It was close to the base of the pit, and was probably discarded as soon as it was disturbed. The skull had far less cohesion than the animal bones, so seems likely to be older.

The quarries of this period were characterised by gradual filling, and date to the end of the settlement of this part of Lundenwic*. Filling them was largely sandy gravel, probably produced through erosion, which was sealed by deposits rich in household debris. This filling seemed to be a more deliberate action than that witnessed during the previous phase, and could well be the result of clearance of this part of town prior to abandonment. The silty sand at the top of several of these quarries represents accumulation deposits in the hollows that remained once the site had been abandoned.*

The most notable change in this period is the new pottery being used, from Ipswich. The actual start date is uncertain; evidence from Ipswich itself suggests that the industry started *c.*730, but it is not impossible that it took several years before the ware was traded to *Lundenwic*, and a date closer to 750 may be more accurate. The ware continued in use until the end of the settlement in the mid-9th century. The sherds from [39] are of interest as they are exceptionally thick-walled, and are slightly atypical; it is not impossible that they relate to a fine greyware pitcher found at Old

Brewers Yard, Long Acre which combines a continental form with an Ipswich-type fabric.

Shell-tempered ware is also a later Middle Saxon type of pottery. Shell-tempered wares occur only in the upper levels of the Royal Opera House and other sites in *Lundenwic*, and would appear to date from the late 8th to 9th centuries. The exact start date is uncertain; it may be as early as *c.*770, or closer to 800. Imported pottery comprises a range of wheel-thrown greywares which derive from North France or Flanders. These sherds derive from strap-handled pitchers, and in most cases decoration is confined to burnishing.

9.7 Industry

The middle Saxon deposits of Phases IIA and IIB both show evidence of industry and craft activities, but on a small scale, and may be considered either as cottage industries, or as evidence sparsely spread through redeposited midden deposits of a communal origin. The amount of waste material is small.

Evidence of small industries was present in most of the pits of phase IIA: slag from iron working was regularly found, indicating that some degree of metalworking was being undertaken. The presence of small copper alloy objects do not prove that copper was being worked here, simply that the objects were used and lost or discarded.

As regards textiles, loomweights were found to have been discarded, rather than lost, since there were no whole examples collected. Pit [120], of Phase IIB, is thought to contain clearance dumps of this phase. Fragments of others were found in an intrusive post-medieval pit (048), but are also thought to belong to this phase. Two fragments of a French/ Rhenish pot have purple staining on the interior, and this is thought likely to be remnants of madder, a plant dye used on clothing.

Phase IIB showed less evidence of industrial processes: only two pieces of slag from iron working were found. This may indicate less going on, but it may be the limited nature of the surviving deposits. As regards textiles, there was no evidence of manufacture. A loomweight was found to have been discarded, but this came from the lower fill of pit [120], thought to be a clearance dump of the previous phase.

Bone and antler working were represented by pieces of sawn antler, off-cuts too small to be fashioned into objects. Cow and goat horn cores suggested working of horn on or near the site, but since these are dumped deposits, a direct source cannot be determined.

Phase IIB provided the largest weight and quantity of animal bone of all the phases. There is a very large and varied animal assemblage with the full range of species present. Cattle are again the most numerous by all measures, followed by pig and then sheep or goat. Oyster is common, but, goose and chicken are also represented albeit in a very minor way. Of all the bones of this phase, only seven came from juvenile animals and one from a new-born calf, suggesting animal husbandry was not a priority in this part of *Lundenwic*. The eating of horse does not seem to have been

widely practised in this phase either, perhaps indicating the value these creatures had as working animals.

There is little apparent difference between Phases IIA and IIB; rather they continue one to the next, the main difference being the introduction of pottery from Ipswich (Saxon Gipeswic).

There is no evidence for any craft or industrial activities being carried out at any specific location on site. Rather, the artefactual material derives from dumping of midden deposits into large pits. This suggests some kind of regular clearance, but it may have been simply functional, filling pits as necessary.

The quarry pits which abound in all three phases of Saxon occupation are not confined to any one zone, and neither are the domestic rubbish pits. However, the site measured a limited 27m by 32m, a small area to draw meaningful conclusions regarding spatial analysis.

9.8 The End of Lundenwic

Vikings began to raid towns and ports of northern Europe during the 9th century. There were raids on London in AD 842 and 851, and in 871-2, the Vikings overwintered in *Lundenwic*. This ultimately led to the abandonment of *Lundenwic* in AD886, when King Alfred ordered the refortification of the old Roman walled city. It is possible that the upper levels of the latest pits that feature burnt daub and charcoal are evidence of these raids, but there is no direct evidence.

9.9 The Significance within *Lundenwic*.

The site lies towards the west of Long Acre, towards St Martins in the Fields, which is thought to have been a religious centre in Saxon times, and is also towards the western limit of the Saxon settlement. The pottery shows that human activity occurred in the area well before the first written record of Lundenwic. This confirms the area of 15-17 Long Acre as part of Saxon *Lundenwic* from its earliest incarnation in the fifth century to its abandonment in the ninth.

Had the expected brickearth capping and the upper reaches of the gravel terraces been extant on site, the actual footprint of houses may have been apparent. However, 20% of the site was used for quarrying during Phase I and seems to have remained soft ground for all of the Saxon occupation. Another 20% was occupied by pits during Phases IIA and IIB, and this may have made direct habitation hazardous. The evidence for direct crafts or industries is quite sparse, and this may be indicative that the site lies on the edge of *Lundenwic*, and may have been given over to quarrying and refuse disposal only. The concentration of houses seen at the Royal Opera House and the location of the Saxon waterfront to the south of the site may indicate that the main focus of the settlement was to the south and west. Burials found at Long Acre and Floral Street during recent excavations also suggest that the area is somewhat peripheral.

9.10 Medieval

No medieval features were apparent during the excavations: this area is the area of Covent Garden - originally Convent Garden, that is, the garden of the Convent of St Peter, Westminster - is first mentioned by this name in c.1200. It continued to be used for essentially agricultural purposes throughout the medieval period, with orchards, meadow and arable cultivation. This was in contrast to the area around the Strand to the south which, as the main thoroughfare between Westminster and the City, saw a gradual build-up of high status buildings, including churches and 'inns' - palatial town houses. All the deposits associated with this were truncated by post-medieval and modern activity.

9.11 Phase IV, Post-Medieval (Figure 8)

The two post-medieval structures recorded could have been functional simultaneously, but there is no direct stratigraphic link. The well, approximately in the centre of site, featured finds from throughout the post-medieval period, but seems to have been redundant by the time the modern basements were established.

The wall and floor remnants were sealed by 18th century pottery, and are probably the northwest corner of a series of attached cottages grouped around Conduit and Lazenby Courts, part of a single development that included a public bath house. This establishment apparently started out as an extremely fashionable place in which to be seen, but became gradually less so through the years until finally becoming a notorious brothel.

9.12 Phase V, 20th Century 1900-1999

The 20th Century activity is typified by the deep basementing which has truncated the top of all features and the natural gravel deposits.

10) Acknowledgements

Thanks to Dave Bull of Miller Construction for organising funding for the completion of the project. Thanks also to the finds specialists for their input and interpretations, particularly Lyn Blackmore for the pottery, Sylvia Warman for the animal bone, and Ron Humphrey for editing.

11) Glossary

Brickearth	Naturally occurring sandy clay suitable for making bricks, or for turning into daub.
Cess	Human waste, appearing largely in excavations as greenish brown soil and red staining from nitrates on the edges of features.
Chaff	Finely cut straw and hay, used as a course component in pottery manufacture**.**
Daub	Sandy clay used as walling material or for ovens or kilns. It only survives when affected by heat, such as a fire.
Emporium	A large trading settlement with a wide variety of merchandise.
Hone	A stone used for sharpening knife blades.
Loomweight	A circular clay object with a central hole, used to tauten threads on a loom.
Lundenwic	Saxon name for the London emporium.
Lundenburg	Saxon name for the walled Roman City of London.
Midden	A dunghill or pile of refuse.
Niedemendig	Area of Germany, source for Saxon querns.
Pitcher	A large jug.
Quern	Coarse stone used for grinding wheat. Saxons typically made theirs from Niedemendig Lava.
Scabbard	Sheath for a sword.
Scale-handle	Usually made of bone, the handle of a knife made by attaching a piece of flat bone to either side of the metal tang.
Tegula	Roman Roof tile
Tempering	To add coarse components such as grit, shell or bone to pottery to make it harder.
Withers	Highest point on the back of a horse.

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Figure 1: Site Location

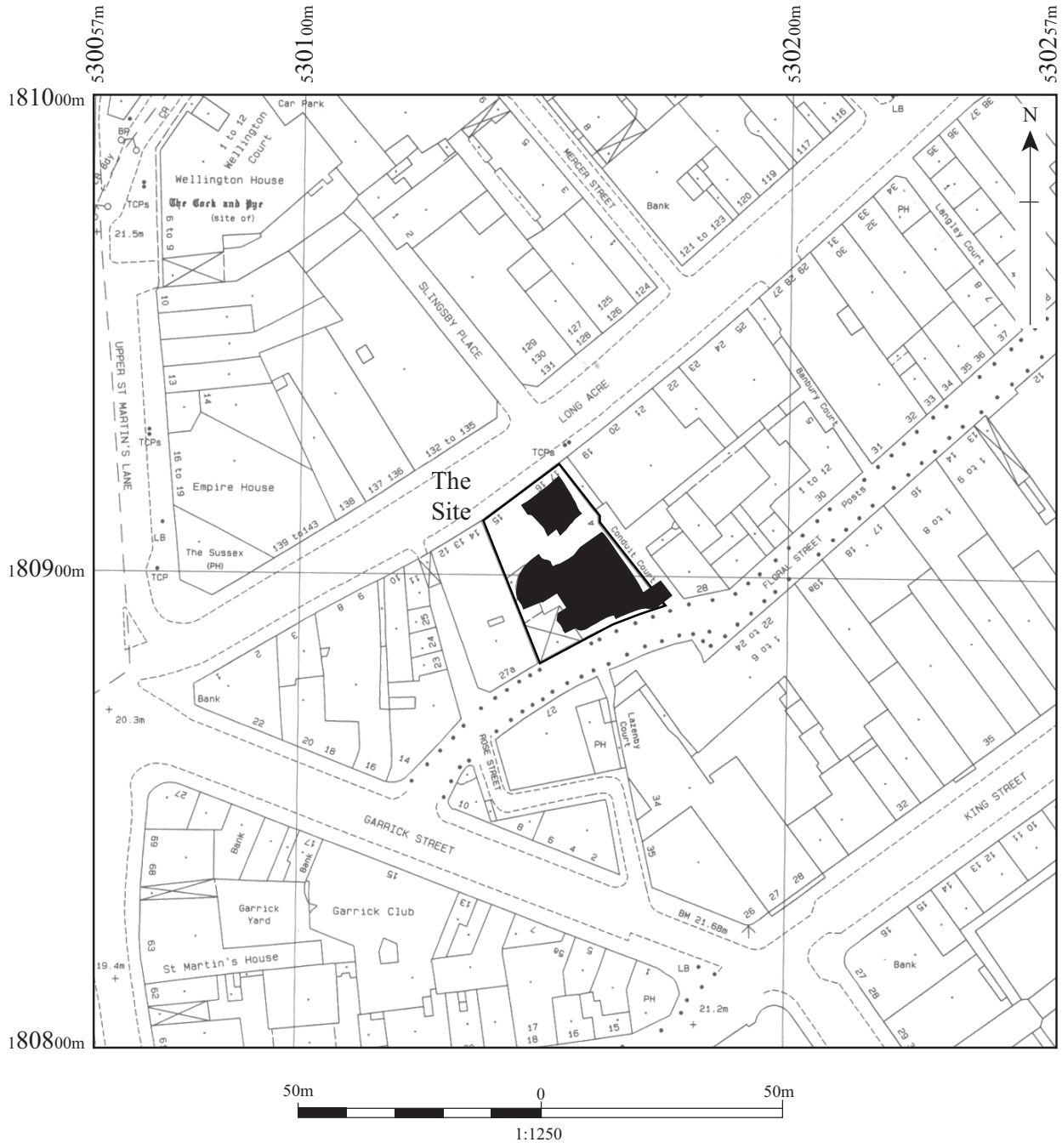

Figure 2: Excavated Areas

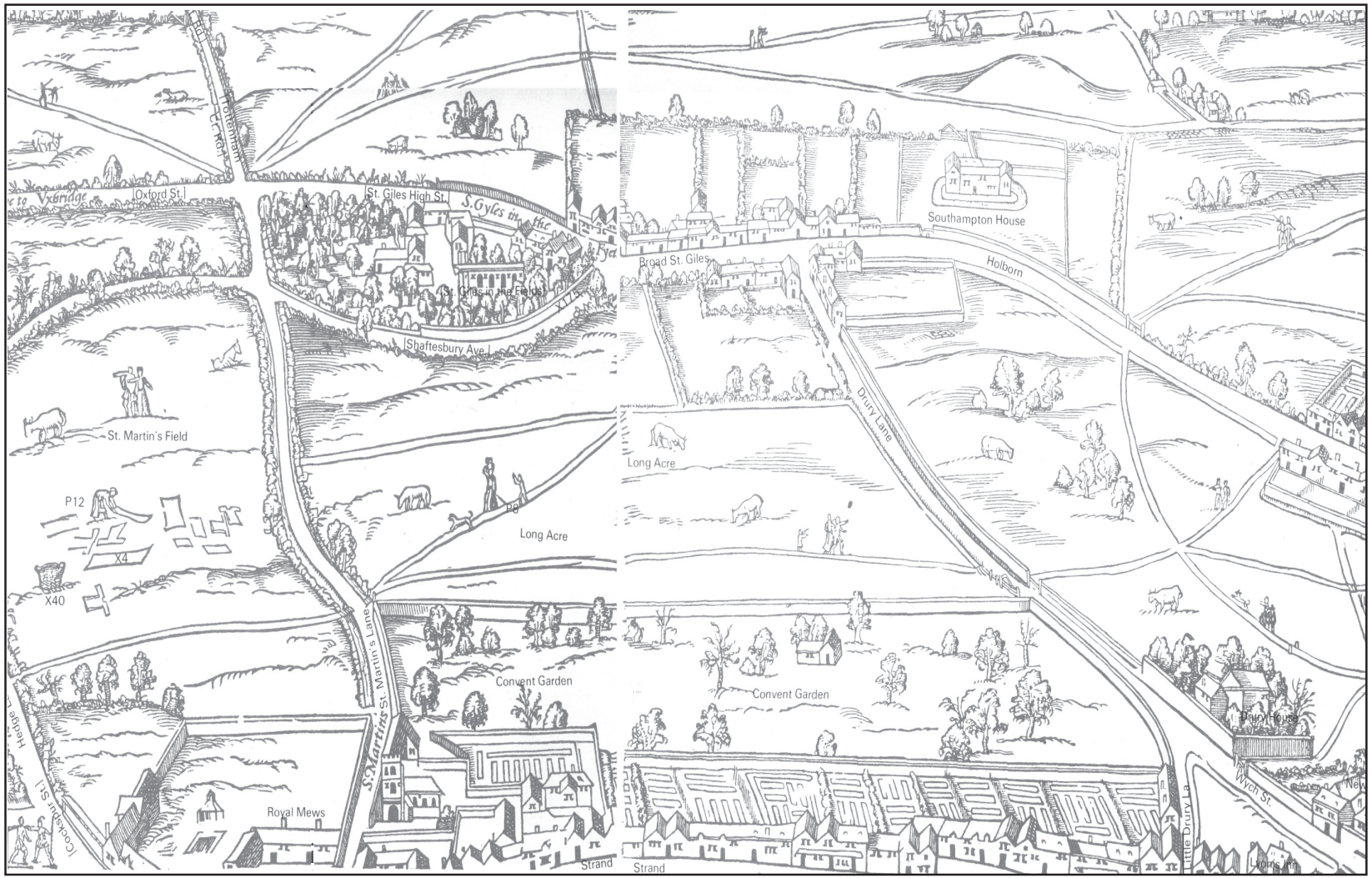

Figure 3: The 'Agas' map, 1570

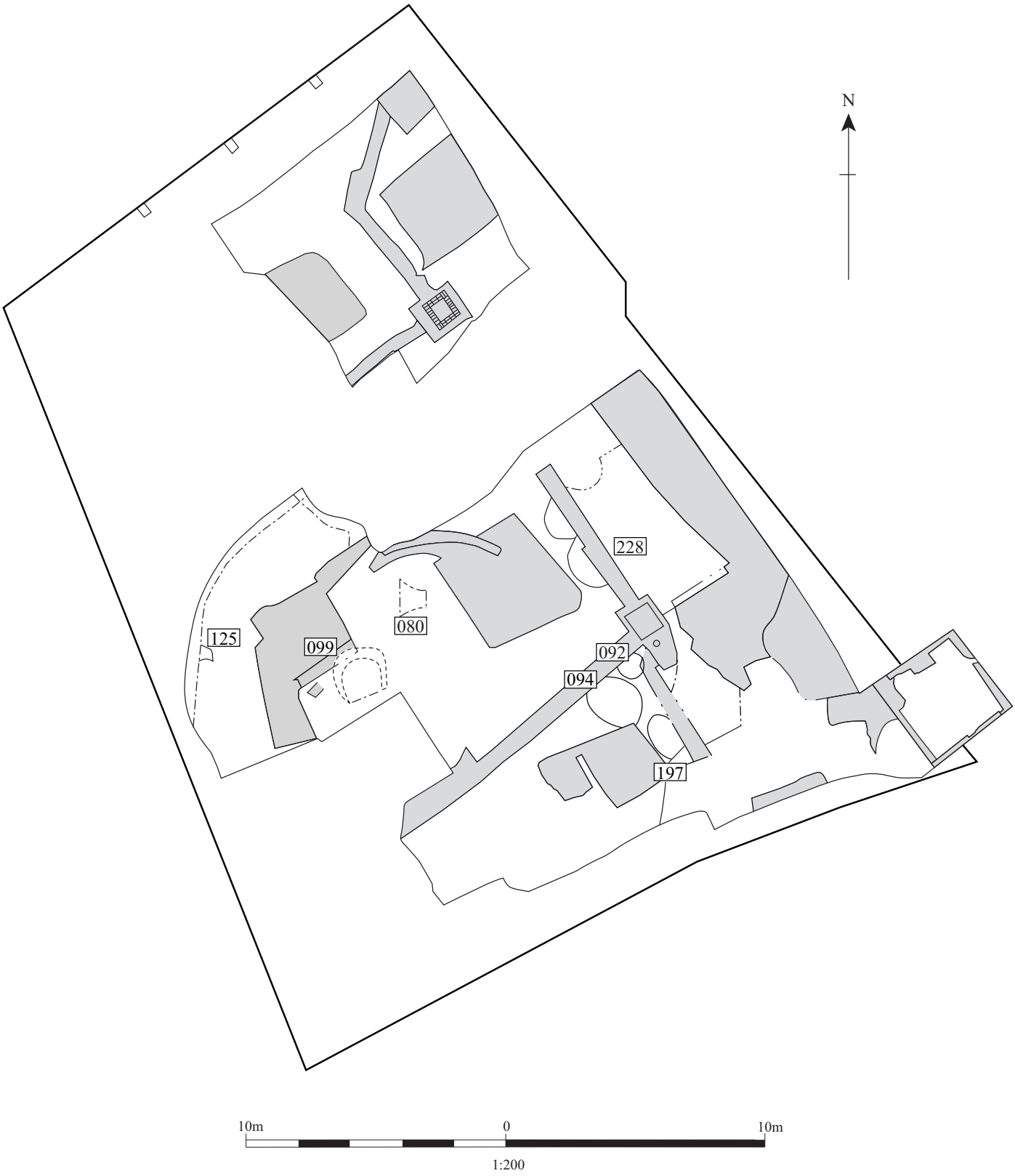

Figure 5: Phase I, AD 450 - 550

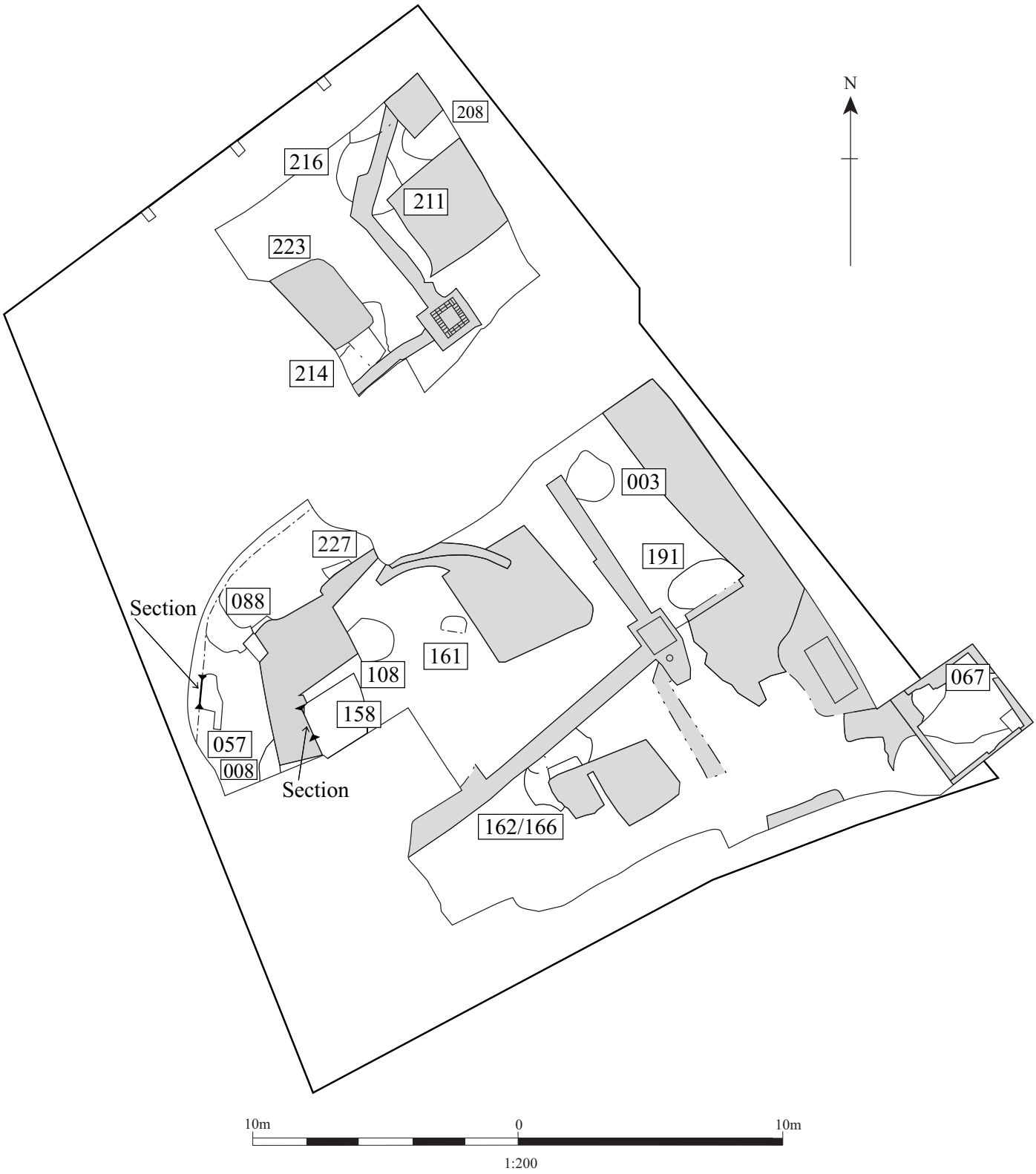

Figure 6: Phase IIA, AD 600 - 750

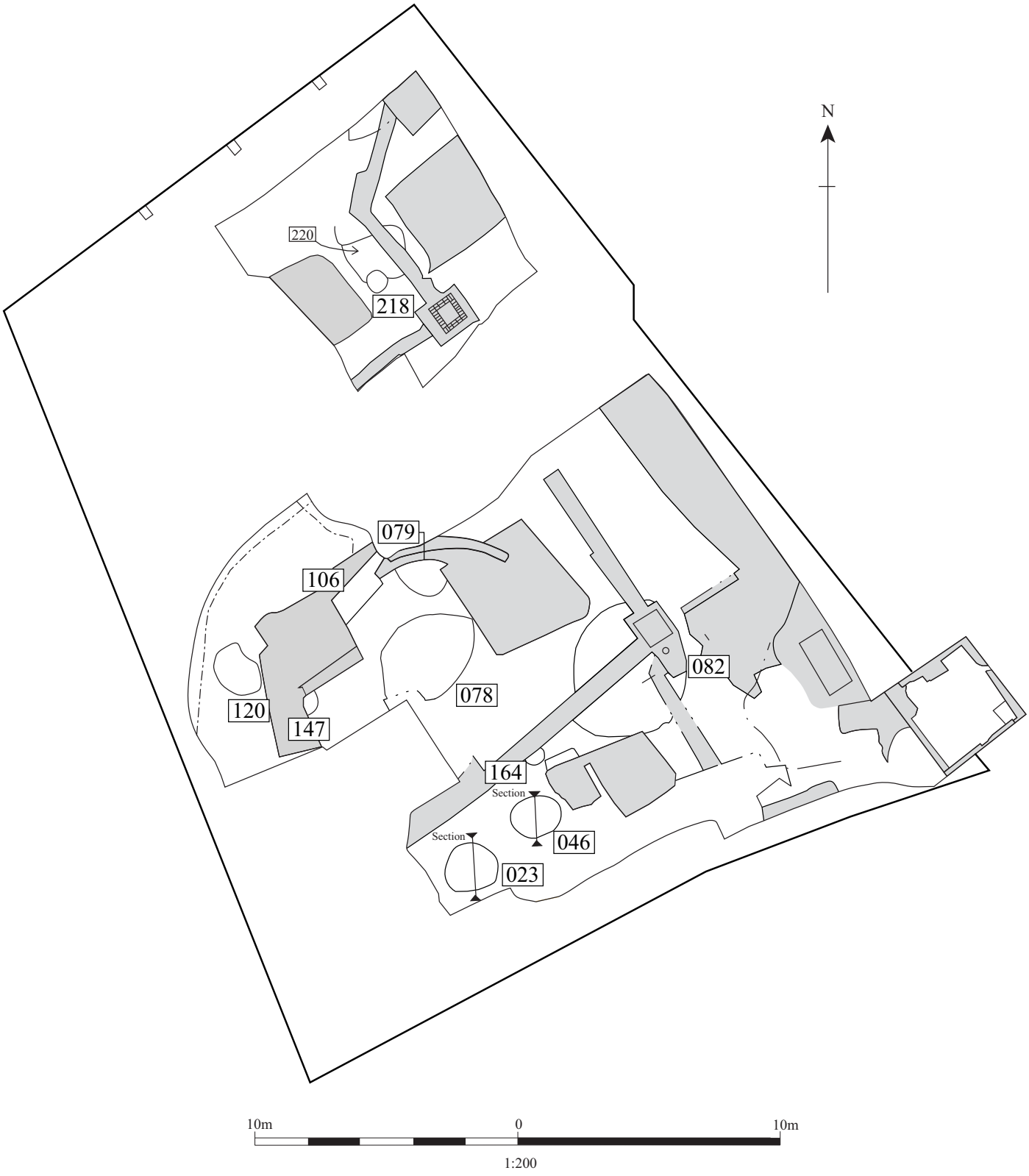

Figure 7: Phase IIB, AD 750 - 850

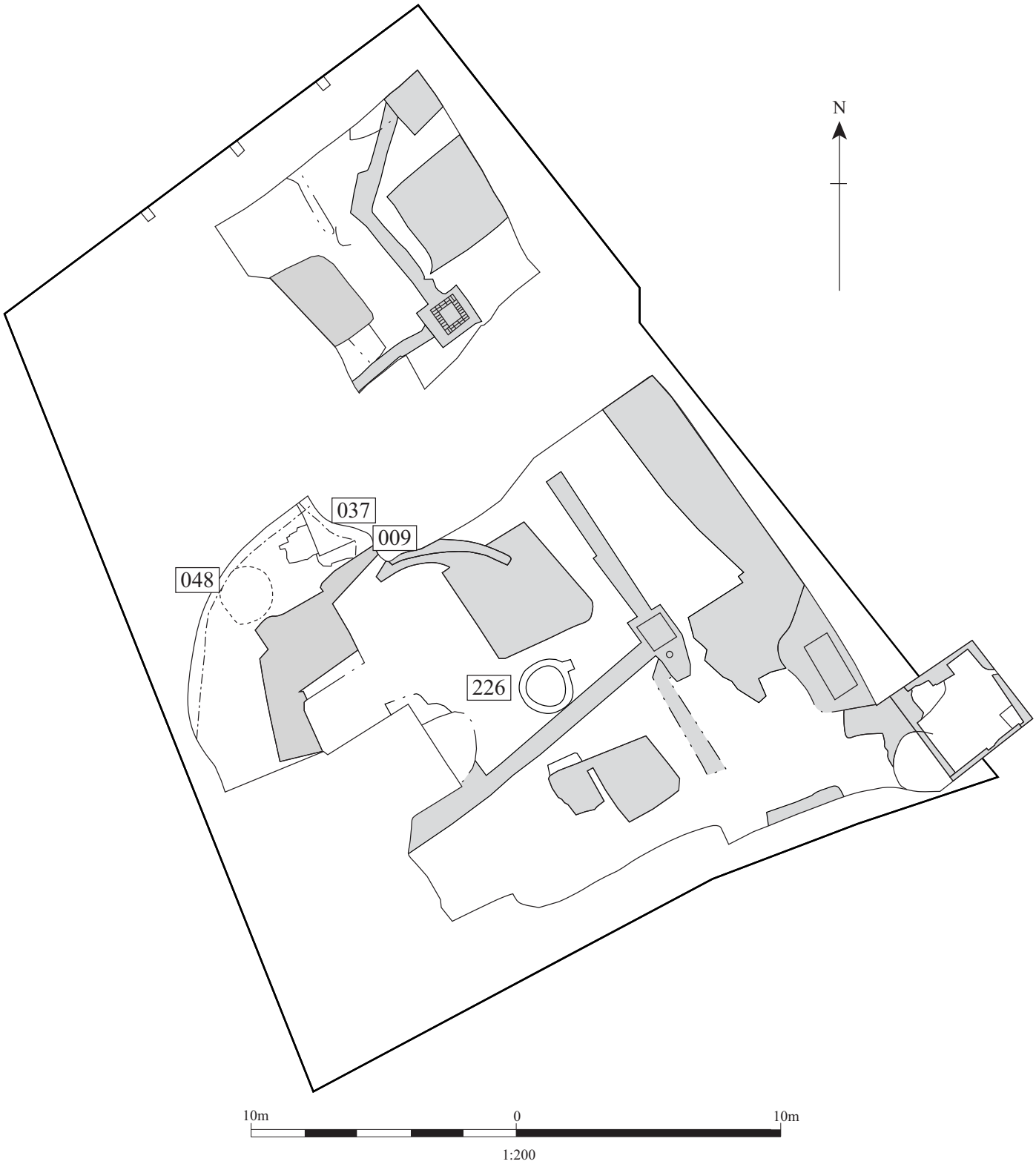

Figure 8: Post-Medieval Features

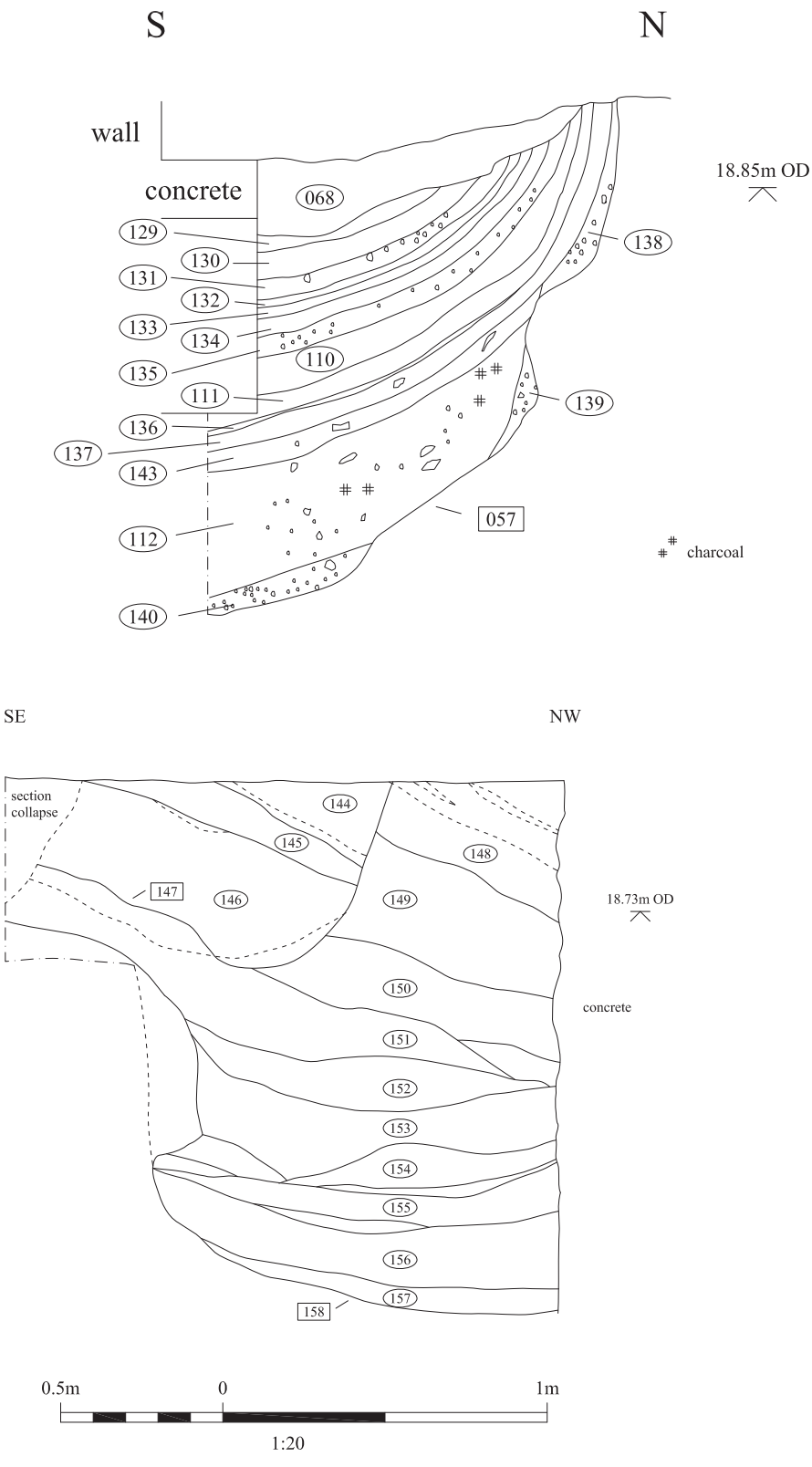

Figure 9: Sections through two pits of Phase IIA

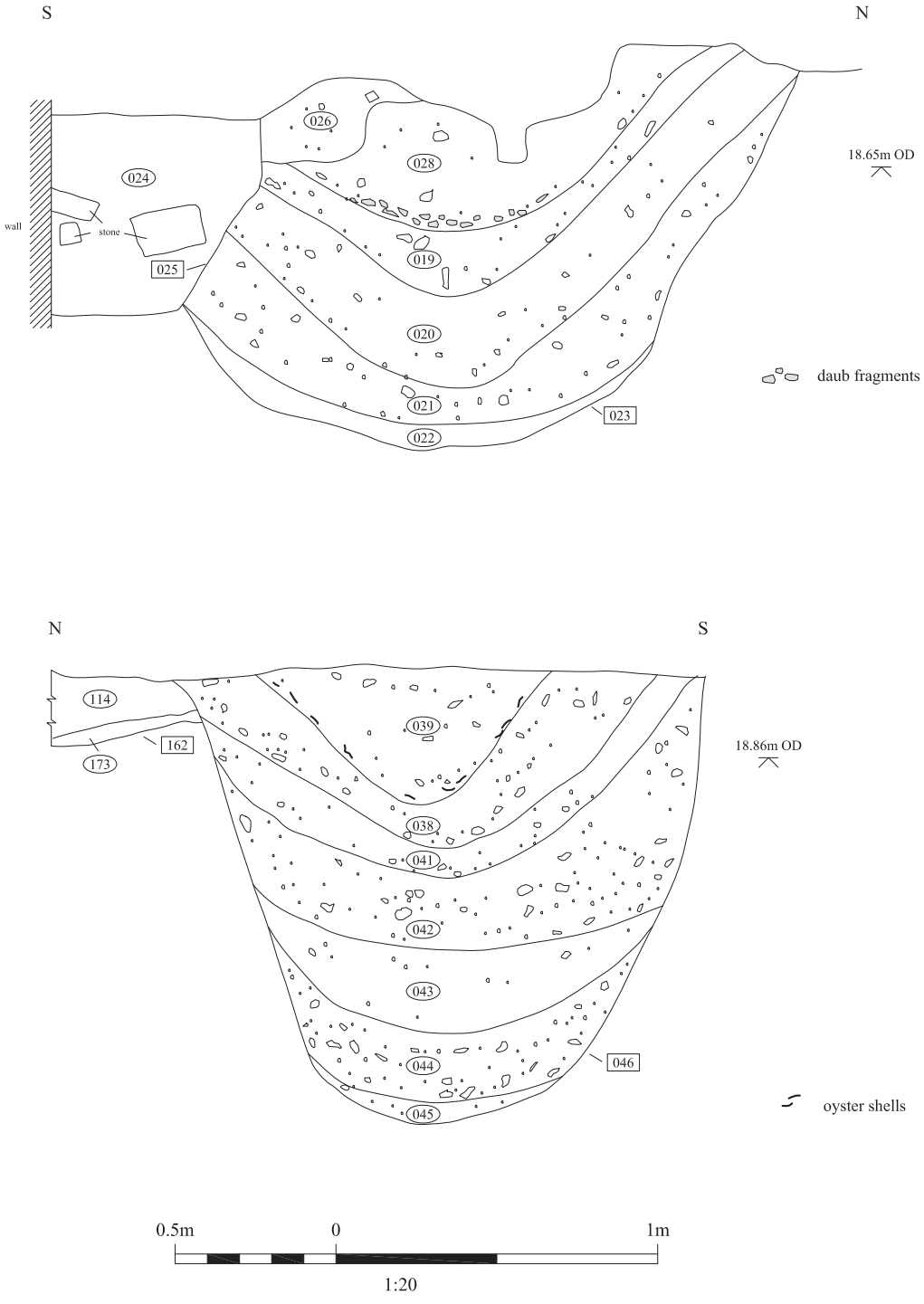

Figure 10: Sections through two pits of Phase IIb

APPENDIX A: LIST OF RECORDED CONTEXTS.

Context	Description	Length	Width	Depth	Finds
001	Greyish black clayey silt; upper fill of 003	1.90m	1.65m	0.20m	Pot, Bone, Slag
002	Mid grey clayey silt fill of 003	0.90m	0.65m	0.10m	Pot, Bone, Slag.
003	Sub-circular Pit	1.90m	1.80m	0.60m	-
004	Dark brownish grey sandy silt fill of 005	0.22m	0.22m	0.09m	-
005	Square Post-hole	0.22m	0.22m	0.09m	-
006	Dark grey sandy clay silt: upper fill of 008	0.70m	0.33m	0.14m	Pot, Bone, Metal.
007	Greenish brown sandy clay; primary fill of 008	0.88m	0.88m	0.33m	-
008	Truncated Quarry	0.88m	0.88m	0.33m	-
009	Wall running east-west	1.80m	0.25m	0.50m	-
010	Dump of demolition material	1.0m	1.0m	0.02m	?
011	Dumped deposit with a high level of burning	1.0m	1.0m	0.18m	Pot, Clay pipe, glass
012	Loose lenses of sand and mortar	2.20m	0.90m	0.04m	?
013	Brick and stone Buttress	1.20m	1.20m	0.43m	CBM
014	Dump of grey silty clay	2.20m	0.90m	0.18m	Metal
015	Dump of yellowish brown sandy clay	2.20m	0.90m	0.10m	Pot, CBM
016	Grey sandy silt; primary fill of 003	0.80m	0.70m	0.12m	
017	Greenish grey clayey silt; top fill of 228	7.06m	3.15m	0.40m	Pot, Bone
018	Not used				
019	Dark greyish brown sandy silt, fill of 023	1.17m	1.15m	0.18m	Bone, CBM
020	Greenish yellow sandy silt, fill of 023	1.56m	1.43m	0.25m	CBM, Bone, slag
021	Light brown silty sand, fill of 023	1.52m	1.49m	0.22m	Bone, slag
022	Dark grey sandy clay, primary fill 0f 023	1.06m	1.01m	0.10m	Bone, CBM
023	Near-circular Pit	2.00m	1.90m	1.25m	-
024	Modern Fill	Site	0.65m	>0.64m	-
025	Modern Cut	Site	0.65m	>0.64m	-
026	Fill of 027	4.20m	0.41m	0.24m	-
027	Drain Cut	4.20m	0.41m	0.24m	-
028	Green sandy silt: top fill of 023	1.05m	1.01m	0.39m	Bone, CBM
029	Dark reddish brown sand: top fill of 158	1.23m	1.00m	0.49m	Pot, Bone, Metal
030	Greyish green sand, fill of 158	1.48m	1.06m	0.71m	Pot, Bone
031	Same as 032	-	-	-	-
032	Very dark brown clayey silt fill of 048	2.00m	0.90m	1.62m	Pot, Bone, CBM
033	Compact mixed consolidation dump	2.11m	1.00m	0.28m	Bone
034	Greyish brown sandy silt, top fill of 078	2.42m	1.00m	0.16m	Pot, Bone, slag
035	Lens of animal bone within of 078	0.54m	1.00m	0.04m	Bone
036	Greyish green sand, fill of 147, same as 144	1.80m	0.94m	0.28m	Pot, Bone
037	Brick Floor	1.90m	0.90m	0.08m	CBM
038	Dark brown sandy silt, fill of 046	1.80m	1.63m	0.18m	Pot, Bone
039	Greyish brown organic sandy silt, fill of 046	1.48m	0.84m	0.41m	Pot, Bone
040	Greyish green sandy silt, fill of 227	1.20m	0.50m	0.15m	Pot, Bone
041	Greenish brown stony silty sand fill of 046	1.41m	1.29m	0.31m	Pot, Bone, CBM
042	Gravel-rich brown silty sand Fill of 046	1.30m	1.16m	0.28m	Pot, Bone
043	Pale grey sandy silt fill of 046	1.24m	1.08m	0.16m	Bone, slag

Context	Description	Length	Width	Depth	Finds
044	Mottled sandy silt, fill of 046	1.22m	0.97m	0.21m	Bone
045	Light grey sandy clay, primary fill of 046	0.76m	0.62m	0.12m	Bone
046	Circular Pit	1.80m	1.63m	1.38m	-
047	Grey silty clay, same as 146	2.40m	1.90m	0.48m	Pot, Bone, CBM
048	Truncated Pit	1.92m	0.90m	1.58m	-
049	Greyish green sandy silt, fill of 158	2.53m	1.94m	0.27m	Pot, Bone
050	Greyish green sandy silt, topmost fill of 088	2.10m	1.30m	0.3m	Pot, Bone
051	Compacted brownish yellow sand over 082	3.62m	1.30m	0.15m	-
052	Mixed, compact deposit over of 082	>3.00m	1.50m	0.16m	-
053	Blackish brown sandy clay, fill of 082	2.10m	1.56m	0.08m	Bone, Slag
054	Dark grey clayey silt, same as 151	1.55m	1.50m	0.20m	Pot, Bone
055	Brownish green silty clay, fill of 082	2.05m	1.80m	0.22m	Bone
056	Grey silty clay, fill of 227	2.00m	1.10m	0.20m	Pot, Bone, Stone, slag
057	Pit with loose, slumped sides.	3.64m	1.26m	1.60m	
058	Dump of grey silty sand over 067	1.90m	1.00m	0.15m	Bone
059	Greenish grey silty clay fill of 067	2.30m	1.00m	0.20m	Bone
060	Redeposited natural gravel within 067	1.20m	1.00m	0.10m	Bone
061	Grey sandy clay, fill of 067	2.55m	1.00m	0.20m	Bone
062	Dark grey silty clay fill of 067	2.65m	1.00m	0.03m	Bone, Daub, Glass?
063	Grey sandy clay fill of 067	2.65m	1.00m	0.25m	Bone
064	Dark grey sandy clay fill of 067	2.65m	1.00m	0.15m	Bone
065	Greenish grey clayey sand, fill of 067	1.35m	1.00m	0.25m	-
066	Slump onto base of 067	0.75m	1.00m	0.15m	-
067	Irregular Quarry	2.65m	1.00m	0.80m	-
068	Sealing deposit over 057	2.40m	1.00m	0.25m	-
069	Hard greenish brown clayey sand fill of 082	2.8m	?	0.16m	
070	Brownish grey silty clay fill of 082	1.84m	1.00m	0.10m	Pot
071	Greyish brown silty clay; primary fill of 078	2.53m	1.00m	0.21m	Pot, Bone
072	Compact greyish brown silty clay fill of 079	1.54m	1.00m	0.20m	?
073	Greyish brown silty clay fill of 079	2.00m	1.00m	0.24m	Pot
074	Greyish brown sandy silt, fill of 079	1.00m	0.87m	0.14m	Pot
075	Redeposited natural gravel within 080	1.50m	1.50m	0.36m	
076	Firm grey sand; primary fill of 067	2.50m	1.00m	0.55m	Bone
077	Greenish grey clay, fill of 067	2.40m	1.00m	0.30m	Bone
078	Large shallow quarry	2.54m	1.00m	0.57m	-
079	Sub-circular quarry	1.60m	1.00m	0.54m	-
080	Heavily truncated quarry	2.80m	1.70m	0.36m	-
081	Greenish grey sandy clay, primary fill of 082	2.90m	1.41m	0.12m	Bone, Metal
082	Quarry	3.05m	1.75m	0.54m	-
083	Dump of black silty clay over 067	1.10m	0.55m	0.17m	Bone
084	Redeposited natural within 085	2.00m	1.30m	0.20m	-
085	Cut for buttress 013	2.20m	1.60m	0.50m	-
086	Cut for wall 009	1.80m	0.50m	>0.25m	-
087	Unrecorded context				Metal
088	Truncated quarry	1.80m	1.20m	0.92m	
089	Redeposited natural within 057	3.00m	1.20m	0.11m	Bone
090	Brown clayey sand, fill of 057	1.30m	1.05m	0.02m	Bone
091	Grey sandy clay fill of 092	1.07m	0.92m	0.04m	-
092	Truncated Quarry	1.07m	0.92m	0.06m	-
093	Grey sandy clay, fill of 094	1.54m	1.17m	0.06m	-
094	Truncated Quarry	1.54m	1.17m	0.06m	-
095	Brown sand, fill of 057	1.70m	0.71m	0.32m	Pot, Bone,

Context	Description	Length	Width	Depth	Finds
					CBM
096	Greenish grey sandy clay, primary fill of 088	1.80m	1.20m	>0.60m	Pot, Bone
097	Redeposited natural, fill of 080	0.36m	0.33m?	0.12m	
098	Same as 129	-	-	-	-
099	Flat-bottomed pit	2.12m	2.00m	0.42m	
100	Greyish brown sandy silt, upper fill of 099	2.12m	2.00m	0.22m	Bone, CBM
101	Greenish brown sandy silt, primary fill of 099	1.99m	1.82m	0.20m	
102	Mottled sandy silt, primary fill of 078	1.16m	1.00m	0.33m	
103	Greenish grey sandy silt associated with 106	2.50m	1.00m	0.20m	Bone
104	Dark grey sandy silt, fill of 106	2.00m	1.00m	0.34m	Bone
105	Greenish grey sandy silt, fill of 106	1.45m	1.00m	0.30m	-
106	Circular Pit	1.60m	1.00m	0.50m	-
107	Dark greenish grey sandy silt, fill of 108	0.72m	0.40m	0.25m	Pot, Bone, CBM
108	Quarry	0.75m	0.40m	0.25m	-
109	Silting at base of 088	0.54m	0.32m	0.08	Bone
110	Grey silty clay, fill of 057	1.00m	0.94m	0.10m	Bone
111	Lens of daub within 057	1.00m	0.91m	0.08m	CBM
112	Dark grey silty clay fill of 057	0.90m	0.86m	0.25m	Bone
113	Greenish grey sandy silt, fill of 106	1.90m	1.00m	0.32m	
114	Light brown sandy silt, fill of 162	1.40m	0.60m	0.20m	CBM
115	Same as 162	-	-	-	-
116	Grey sandy silt with shell; fill of 120	2.00m	1.74m	0.30m	Pot, Bone
117	Reddish grey sandy clay fill of 120	1.64m	0.60m	0.26m	
118	Dark grey sandy silt, fill of 120	1.41m	1.30m	0.30m	Pot, Bone, CBM
119	Grey sandy silt, primary fill of 120	1.30m	1.26m	0.35m	Bone
120	Rounded Pit	2.00m	1.74m	0.95m	-
121	Dark grey clayey silt, fill of 120	1.60m	0.75m	0.18m	
122	Mottled grey clayey silt, fill of 125	0.90m	0.90m	0.18m	
123	Lens of charcoal, fill of 125	0.20m	0.20m	0.13m	-
124	Brownish yellow sandy clay, fill of 125	0.22m	0.22m	0.05m	-
125	Truncated Pit	0.90m	0.90m	0.70m	-
126	Grey sandy clay fill of 125	0.90m	0.71m	0.17m	-
127	Dark grey sandy silty clay, primary fill of 125	0.90m	0.32m	0.40m	Bone
128	Dark brown sandy clay fill of 125	0.48m	0.45m	0.09m	-
129	Grey sandy clay fill of 057	3.64m	1.00m	0.06m	-
130	Brown silty clay fill of 057	2.51m	0.85m	0.10m	-
131	Greyish brown silty clay fill of 057	2.45m	0.90m	0.06m	-
132	Brown sandy clay, fill of 057	2.21m	0.85m	0.03m	-
133	Brown clayey silt, fill of 057	2.04m	0.85m	0.03m	-
134	Brown sandy clay, fill of 057	1.89m	0.90m	0.07m	-
135	Yellowish brown silty sand, fill of 057	1.73m	0.90m	0.06m	-
136	Lens of charcoal within fill of 057	1.62m	1.00m	0.02m	-
137	Greyish yellow silty clay, fill of 057	1.55m	1.00m	0.07m	-
138	Green silty sand, fill of 057	1.49m	0.10m	0.06m	-
139	Grey silty clay, fill of 057	1.40m	0.08m	0.08m	-
140	Grey silty clay, primary fill of 057	1.05m	0.26m	0.06m	-
141	Same as 122	0.88m	0.81m	0.05m	-
142	Same as 123	0.90m	0.74m	0.03m	-
143	Grey sandy silt, fill of 057	1.36m	1.00m	0.06m	-
144	Green sandy silt, fill of 147	1.20m	1.16m	0.26m	
145	Mixed yellow and grey sandy silt, fill of 147	1.01m	0.85m	0.13m	Bone
146	Greenish grey clayey silt, primary fill of 147	0.82m	0.98	0.37m	-
147	Sub circular Pit	1.20m	1.18m	0.58m	-

Context	Description	Length	Width	Depth	Finds
148	Same as 029				-
149	Same as 030				-
150	Dark grey silt, fill of 158	1.70m	0.95m	0.20m	-
151	Grey clayey silt, fill of 158	1.50m	0.91m	0.23m	-
152	Greyish green sandy silt, fill of 158	1.15m	0.88m	0.17m	-
153	Grey clayey silt, fill of 158	1.10m	0.84m	0.25m	?
154	Grey and yellow silt, fill of 158	0.80m	0.78m	0.13m	Pot
155	Reddish brown organic fill of 158	1.20m	0.75m	0.13m	?
156	Grey clayey silt, fill of 158	1.25m	0.73m	0.20m	?
157	Greenish yellow clayey silt, primary fill of 158	1.10m	0.68m	0.10m	-
158	Truncated oval pit	1.70m	1.06m	1.25m	-
159	Greenish grey silty clay, fill of 161	1.52m	0.80m	0.27m	-
160	Greyish brown silt, primary fill of 161	0.64m	0.41m	0.18m	-
161	Oval quarry	1.52m	0.80m	0.34m	-
162	Irregular quarry	1.40m	0.60m	0.31m	-
163	Greyish brown sandy silt, fill of 164	0.83m	0.64m	0.37m	
164	Truncated circular quarry	0.83m	0.64m	0.38m	-
165	Greyish brown sandy silt, fill of 162	1.40m	0.60m	0.28	Bone, CBM
166	Same as 162				-
167	Greyish brown clayey sand, primary fill of 108	1.63m	1.61m	0.19m	Bone
168	Slumped edge of 120	0.40m	0.40m	0.21m	-
169	Greyish brown sandy silt, fill of 162	2.00m	0.57m	0.20m	Bone, CBM
170	Greyish brown sandy silt, primary fill of 162	0.96m	0.70m	0.15m	-
171	Cut, division of 079				
172	Dark grey clayey silt, top fill of 228	7.06m	3.15m	0.21m	Metal
173	Greyish brown silt, fill of 162	1.16m	0.51m	0.05m	-
174	Greyish green stony clayey silt, fill of 228	0.90m	0.80m	0.20m	
175	Dark grey sandy silt, fill of 228	1.30m	1.00m	0.20m	
176	Yellow sand and gravel, dumped over 082	2.12m	1.84m	0.20m	-
177	Dark brown sandy clay, fill of 082	4.30m	2.58m	0.12m	Bone
178	Greenish brown sandy clay, fill of 082	4.20m	1.00m	0.25m	Bone
179	NOT USED	-	-	-	-
180	NOT USED	-	-	-	-
181	Greyish brown sandy silt, primary fill of 228	2.70m	2.00m	0.30m	Pot, Metal
182	Blackish brown silty clay, fill of 185	0.92m	0.60m	0.11m	
183	Greyish brown silty clay, fill of 185	1.53m	0.60m	0.18m	Bone
184	Greenish grey clayey silt, fill of 185	1.27m	0.60m	0.32m	-
185	Cut, division of 228	1.53m	0.60m	0.63m	-
186	Greyish brown silty clay, fill of 228	1.90m	1.00m	0.28m	Bone, CBM, slag
187	Grey silty clay, fill of 191	2.90m	1.00m	0.30m	
188	Greenish grey clayey silt, fill of 191	3.80m	0.75m	0.32m	Pot, Bone
189	Grey silty clay, fill of 191	2.90m	0.75m	0.32m	Bone
190	Grey silty clay with gravel, fill of 191	3.80m	0.75m	0.45m	-
191	Cut into filled 228	2.20m	0.75m	0.64m	-
192	Equal to 186	2.90m	0.30m?	0.35m	Pot, Bone
193	Dark grey clayey silt, fill of 228	2.90m	0.30m	0.04m	-
194	Grey silty clay, fill of 228	2.00m	1.00m	0.34m	Bone
195	Dark grey clay, fill of 228	2.00m	1.00m	0.14m	Bone
196	Grey silty clay, fill of 228	1.70m	0.60m	0.16m	-
197	Truncated quarry	1.42m	1.02m	0.18m	-
198	Brown clayey silt, fill of 197	1.42m	1.02m	0.18m	
199	Renumbered				

Context	Description	Length	Width	Depth	Finds
200	Grey stony silt, fill of 228	1.40m	0.60m	0.60m	-
201	Grey stony silt, fill of 228	2.00m	1.00m	0.15m	-
202	Greenish grey sandy silt, layer within 228	2.00m	1.00m	0.22m	Bone
203	Modern service Cut	0.50m	0.50m	0.16m	-
204	Redeposited grey clay and silt, fill of 203	0.50m	0.50m	0.16m	?
205	Cut, division of 228	1.60m	0.85m	0.17m	-
206	Cut, division of 228	1.90m	1.90m-	0.53m	-
207	Greyish blue silty clay, fill of 208	1.85m	0.85m	0.13m	Bone, CBM
208	Truncated quarry	2.10m	1.10m	0.34m	-
209	Dark green silty clay, fill of 214	0.60m	0.60m-	0.18m	Pot, Bone, stone
210	Light grey stony silty clay, fill of 211	2.20m	1.00m	0.10m	Bone
211	Irregular quarry	2.20m	1.00m	0.10m	-
212	Greyish brown silty clay, primary fill of 208	2.10m	1.10m	0.20m	Bone, CBM
213	Modern service Cut	3.25m	0.55m	0.50m	-
214	Truncated quarry	1.90m	1.20m	0.40m	-
215	Greenish grey silty clay, fill of 216	2.70m	1.00m	0.15m	Pot, Bone
216	Truncated pit	2.70m	1.00m	0.18m	-
217	Dark brown silt, fill of 218	0.70m	0.63m	0.16m	Pot, Bone, Stone
218	Cut of unclear function, possibly pit remnant.	0.70m	0.63m	0.32m	-
219	Greyish green sandy clay, fill of 220	0.80m	0.60m	0.19m	-
220	Cut, division of 223	0.80m	0.60m	0.19m	-
221	Greyish brown silty sand, fill of 223	2.10m	1.10m	0.15m	Pot, Bone
222	Greenish grey sandy clay, fill of 223	3.00m	1.50m	0.30m	Pot
223	Heavily truncated quarry	3.00m	1.50m	0.20m	-
224	Greyish green silty sand, fill of 218	0.65m	0.51m	0.06m	Pot, Bone
225	Varied natural deposit of gravel	Site	Site	-	-
226	Well	2.10m	2.10m	>0.80m	
227	Shallow pit or quarry	1.20m	0.50m	0.35m	
228	Extensive quarry	7.06m	3.15m	0.79m	

APPENDIX B: SPECIALIST'S REPORTS.

THE POTTERY *Lyn Blackmore*

Introduction
The pottery amounts to 95 sherds (2044g, 1.28 EVEs) and ranges from Roman to 18th-century in date; no medieval pottery was found. The bulk of the assemblage is of Saxon date (75 sherds, 49 ENV, 1846gm, 1.15 EVEs) and derives from thirteen pits, eight quarry pits, and a few dumps and redeposited layers (see above). The post-Roman pottery includes several quite large fragments and most sherds are in generally good condition; the smaller and more abraded pieces, however, may have been redeposited more than once. Undoubtedly the most important element of the assemblage is the presence of a few sherds that are earlier in character than those usually found in *Lundenwic*, which are discussed below.

1) ROMAN POTTERY

Six fragments of Roman pottery were found (48g), of which one, from the base of a white-slipped jar or flagon (fabric RWS) was in quarry 082; this can only be broadly dated to 50-300. The others are of Oxfordshire colour-coated ware (fabric OXRC), and date to 270-400. They comprise two rim sherds from a bowl of Dragendorff type 38 found in pit [003] and two tiny pieces with rouletted decoration found in pit [223].

2) SAXON POTTERY (Figure 11) *Lyn Blackmore with Alan Vince*

Possible Early Saxon wares
Four sherds are atypical of the coarsewares found on Middle Saxon sites in *Lundenwic* and could predate the development of the main settlement. How much earlier they might be is unclear, but at present a late 6th- or early 7th-century date seems most likely (see discussion). Most of these sherds are from phase 1, and this suggests that the three sherds of SLGS from phase 1 could be of the same date. Five of these sherds were sampled in thin section by Alan Vince, whose full report will in due course be available online at www/avac.uklinux.net/potcat/db.php?db=potcat).

Bone-tempered ware (ESBOE)
One small body sherd from phase 3, pit [81] ([71]) is in a hard, reduced ware that contains very finely crushed bone. As this was the first example of this fabric to be recognised in *Lundenwic* (Blackmore 2002a) it was studied in thin section (sample V2085). The fabric contains 'abundant subangular and angular fragments of bone. These range from *c.*0.2mm to 1.0mm across. Most are strongly brown-stained but the degree of staining varies. Although most of these fragments are completely isotropic, those with a fresher, less stained, appearance exhibit some grey interference colour. Also present are abundant organic inclusions up to 4.0mm long and 0.5mm wide, and moderate to abundant angular quartz up to 0.2mm across. The groundmass consists of baked clay minerals whose anisotropy is masked by carbon' (Vince 2003a).

The use of crushed calcined bone as an added temper is very unusual, but this may be due to the fact that without use of a microscope the white inclusions could easily be misidentified as flint or chalk. The bone can also be dark blue-black in colour, and be mistaken for phytoliths. The tradition was first identified in Saxon pottery at Spong Hill (Brisbane 1994, group X), and has now been found on a number of sites in the Thames Valley. Findspots to the west of the City include Prospect Park (fabrics V400, V401 and Q402: Laidlaw and Mepham 1996, 34–5; Williams 1999, 74), and Hammersmith, Kingston and Hanwell (Blackmore Lundeni in prep, a). To the east it has been noted in recently studied finds from Manor Farm, Upminster and Orsett; it was not reported at Mucking, although a cursory viewing suggests that some sherds may be included in fabric type 7 (Hamerow 1993, 28). As far as can be determined these are all 5th- to 6th-century sites, and it is currently unclear how late the tradition continued.

The present fabric, however, is not truly comparable to the Early Saxon fabrics, as the bone is much finer and does not appear to have been deliberately added. Alan Vince writes that it 'is likely to be the result of the use of a sand (or sandy clay) which was already rich in phosphate nodules and bone. Such bone beds occur in the Rhaetic, in the lower Cretaceous and at various points in the Tertiary sequence, such as the base of the London Clay. Clearly the latter source is the closest to *Lundenwic,* but the only known comparable material comes from Barrow Hills, Radley, where a lower Cretaceous origin is more likely' (Vince 2003a). At present no parallels are known for this fabric.

Greensand-tempered ware (SLGS)
Like the chaff-tempered wares, Greensand-tempered wares were made in both the Early and Middle Saxon periods, and it is impossible to date them on body sherds alone. For this reason, and because most of the pottery from the site dates to the 7th century or later, it was decided to use the Middle Saxon fabric code SLGS rather than the code ESGS that was devised for definitely early Saxon rural sites around London (Blackmore in prep, a). The source of this group of wares is uncertain; they are probably from Surrey but some could be from Essex.

Two sherds from quarry 228 (fills [186], [186]/[192]) have a micaceous matrix with a slightly silty appearance that is probably derived from London clay; both resemble fabric SLGSC as defined at Jubilee Hall (Blackmore 1988, 87). That from [186], which contains sparse organic matter, and has oxidised margins, is visually similar to, but slightly finer than, TS sample 1083 (*ibid*), while the sherds from [186]/[192] are closer to TS sample 1080 (*ibid*). The latter sherd was sampled in thin section (V2105), and the following inclusions were noted: 'abundant rounded quartz grains, mainly with opaque veins and coatings, up to 0.5mm across. Abundant subangular opaque grains up to 0.3mm across. Sparse rounded chert, up to 0.5mm across, also with opaque veins and coatings; sparse angular quartz and muscovite laths up to 0.2mm across. The groundmass is composed of anisotropic baked clay minerals, sparse quartz silt and angular opaque grains' (Vince 2003a).

Sandstone-tempered ware (ESST)
Two different sandstone-tempered fabrics were found in the redeposited gravel [181]. The first has a wall thickness of 8mm; it is reduced throughout and contains a mix of

orthoquartzite, or 'sugary' sandstone and other inclusions (ESSTB). It was sampled in thin section (sample V2106), and found to contain 'abundant fragments of fine-grained quartz sandstone (orthoquartzite) up to 1.5mm across. These fragments are rounded although the individual grains of which it is composed are overgrown and therefore subangular. Also present are moderate organic inclusions, up to 2.0mm long and 0.2mm wide. The groundmass consists of dark brown baked clay minerals and sparse muscovite laths up to 0.1mm long' (Vince 2003a).

The second sherd is thick-walled (10mm), with a reduced core and reddish-grey surfaces; it contains abundant well-sorted quartz (fabric ESSTD), and was sampled in thin section (sample V2086). The fabric contains 'abundant subangular quartz grains, mainly well-sorted between 0.3mm and 0.5mm across; sparse sandstone fragments up to 1.0mm across composed of similar quartz grains; sparse rounded altered glauconite grains up to 0.3mm across. The groundmass consists of anisotropic baked clay minerals, sparse quartz silt and sparse muscovite up to 0.1mm long' (Vince 2003a).

Sandstone-tempered wares are the most diagnostic of the Early Saxon fabrics found in the London region, mainly occurring on sites that date to the 5th and 6th centuries. Two main fabric groups are found, one containing a coarse sandstone that probably derives from the north of England, the other containing the 'sugary sandstone' noted above, the source of which is unknown. Although the latter is absent here, both fabric types have been found on the adjacent site of 8-9 Long Acre, in conjunction with chaff-tempered wares (Blackmore *et al* in prep). A few other sandstone-tempered wares have been found in *Lundenwic* (eg fabrics MSSD and SSSL at Jubilee Hall: Blackmore 1988, 88-89), but they are rare and may well be residual. This suggests that the tradition continued until *c*.600, and possibly slightly later.

Limestone/slag-tempered ware (MSIGL)
One sherd from quarry pit [228] (fill [192]) in a reduced, relatively highly fired ware. The fabric is macroscopically similar to the possible slag-tempered fabric MSLQB at the Royal Opera House (Blackmore 2003, 237; Fig 41, <P24>), and also resembles a sherd from Drury Lane that contains basalt lava (Vince 2003b, sample V1741; Blackmore in prep, b). It was, therefore, sampled in thin section (sample V2084) in order to establish if there was any connection between the three types. Sample V2084 was found to contain 'abundant angular fragments of lava, consisting of laths of feldspar and light green, zoned pyroxene up to 1.0mm across in a groundmass of glass and opaque euhedral grains (titanium or iron oxides?) less than 0.1mm across. There are moderate subangular voids up to 1.0mm across. Also present is sparse rounded quartz up to 0.5mm across. The groundmass consists of anisotropic baked clay minerals and angular quartz and muscovite up to 0.1mm long. There are also some very small fragments of lava, but these are rare' (Vince 2003a).

Igneous rock-tempered wares are not common in *Lundenwic* or the London region, and the source is the Charnwood area of Leicestershire (Blackmore 1988, 89; Williams and Vince 1997). The source of the basic igneous rock fragments found in V2084, however, is unknown. Alan Vince comments: 'the rock clearly does not outcrop within the Thames basin, nor for that matter in south eastern England, the Midlands or East Anglia. It is also unlikely to originate in boulder clay in the London area, where such erratics would be few and far between. At the same time, there is

nothing in the remaining characteristics of the fabric to suggest that the pot was made at any great distance from London. It is, therefore, suggested that a basic igneous rock, either an erratic or perhaps an artefact such as a quernstone, was pre-stressed by fire-cracking, pulverised and added to the potting clay' (Vince 2003a). This fabric is the first of its type to be recognised from *Lundenwic*, but in the lava content it is related to the Drury Lane find, which contains inclusions of a bioclastic limestone not seen in any other samples from the southeast of England, together with rounded and subangular fragments of basalt lava (Blackmore in prep, b; Vince 2003b).

The date of this ware is uncertain, but it is from the same early feature as the bone-tempered sherd (see above). It could, therefore, be of late 6th or early 7th-century date, but since the bulk of the pottery from the site is of Middle Saxon date the code MSIG was used in preference to ESIG. The Drury Lane sherd was found in an isolated feature and can only be broadly dated to the 7th to 9th century.

Middle Saxon fabrics, forms and dating

Excluding the sherds described above, a total of 69 sherds (1767g, 1.15 EVES) are from Middle Saxon contexts.

Chaff-tempered wares
This is the most common ware type, with 32 sherds (546g, 0.43 EVEs). The tradition was introduced in the 5th century, was more common in the 6th century, and most popular in the 7th century. Evidence from other sites in *Lundenwic* has shown that this ware was completely dominant until the introduction of Ipswich ware (*c.*730), and that it went out of use between *c.*750 and 770 (Blackmore 1988, 84-5; 101-106; 1989, 73-7; 1999, 39; 2002b, 25, 40; 2003, 230-1). Given the length of the tradition, it is difficult to date body sherds or very small rims, but as all the present finds were from phase 2 or later it is likely that they are of 7th- or 8th-century date. No sherds are decorated, although a few have roughly burnished surfaces (*eg* a large sherd from [29]). Seed impressions were noted on sherds from [29] and [209]. Most sherds contain abundant organic material (CHAF), but a few are finer (CHSF), while two are variants that merit comment.

CHFC - A small sherd with a normal wall thickness of 5-6mm contains a large chalky inclusion 10mm x 9mm across which has distorted the wall at this point. The inclusion suggests that the original pot may have been imported from an area outside London ([215]).

CHFSF - One sherd contains abundant organic matter with abundant rounded, sparse angular quartz (up to 1mm but mainly less than 0.5mm) and scattered fine angular fresh flint up to 2mm (pit 223 ([221]). This is possibly not from the Thames basin, but the flint could be rolled Tertiary flint (A Vince, pers comm).

In all five rims are present, of which the profile of a rounded jar/bowl with upright, very slightly everted rim (**Fig.11, no.1)** falls between those of a bowl from Maiden Lane and a jar from Bedfordbury (Blackmore 1988, fig 25, no.14; 1989, fig 28, no.8). The second is a shouldered jar with short upright rim that is internally (and unevenly)

thickened (**no 2**). This form is typical of the early Saxon period (Blackmore in prep, a), but has been found on numerous other sites in *Lundenwic* and seems to have continued into the 7th, if not the 8th century. As the fabric of no.2 is quite consistent with the other chaff-tempered wares, it is probably contemporary with them. A third rim is from a *necked jar*, with long and slightly inverted neck (**no.3**); the outer surface was vertically wiped before being horizontally burnished. No exact parallels within *Lundenwic* are known, but three examples of the general type can be noted: two smaller jars from Maiden Lane and Bedfordbury, and a jar with a slightly thicker neck and more everted profile found at the Royal Opera House site (Blackmore 1988, fig.24, no.16; 1989, fig 29, no.16; 2003, 235; Fig 29, <P5>). The other two rims are from jars with everted rims; **no.4,** which is internally abraded, has a flaring profile with rounded rim edge, while **no.5,** from a small sub-biconical jar, is more angular. The rim is rather crudely finished, but the outer surface was wiped (vertically on the shoulder, horizontally on the lower body) and then burnished. The inner surface, by contrast, is badly abraded, suggesting that the pot was well used when discarded. Biconical jars are typical of the Early Saxon period, but more rounded forms such as no.5 are difficult to date as they also occur in Middle Saxon contexts, an example being a small jar found at Floral Street (Blackmore in prep, c, no.8). Everted angular rims such as that on no.5 are uncommon.

Ipswich-type wares

Only six sherds of Ipswich ware were found (676g, 0.03 EVEs), all of the fine sandy variant (IPSF). Four of these are from pit 46, including a rim sherd (fill [41]) and two from a pitcher with wall thickness of 14-18mm (fill [39]), while two small sherds with crude external burnish are from quarry [029]. The presence of this ware marks the second ceramic phase in *Lundenwic*, the beginning of which is currently placed between *c*.730-750 (Blackmore 1988, 85-7; 101; 103-6; 1989, 77-80; 1999, 39, 41; 2002b, 27, 40; 2003, 234). The ware continued in use until the end of the settlement in the mid-9th century.

Sand-tempered and other wares

Two rim sherds (Fig 11, **nos.6 and 7**) are from jars with short, upright and slightly everted rims in a very fine sandy fabric with sparse to moderate very fine organic matter (SSAND; Blackmore 1989, 82). Of these no.6 has a neatly formed rim and burnished outer surface. No 7 differs in that it contains more organic matter, while the rim and body of no.7 are more crudely finished; this pot was probably used for cooking, as it is externally sooted and has an internal residue.

Shell-tempered ware

One rim sherd with sooting around the rim edge, possibly from a lamp, was found in context [19] (Fig 11, **no.8**). Another sherd (leached and internally abraded) was found in [70]. Both contain abundant fine shell inclusions in a silty matrix with virtually no sand (MSSE) and would appear to be made of the naturally fossil shell-bearing Woolwich beds clay, which outcrops near Woolwich and elsewhere in north Kent (Vince 1998; Vince 2003c). Shell-tempered wares occur only in the upper levels of sites in *Lundenwic*, and would appear to have been introduced in the late 8th to 9th centuries (Blackmore 1988, 88-9; 102; 1989, 83; 106; 1999, 41; 2002b, 26-7, 40; 2002c; 2003, 237-8).

Imported wares

'North French' wares
Including one unstratified find, wheel-thrown wares from Northern France or Flanders amount to 22 sherds (332gm, 0.23 EVEs; for fabric descriptions/discussions see: Hodges 1981, 21-28; 68-71; Timby 1988, 92-96; Blackmore 1988, 90-2; 1989, 87; 2002, 29-30; 2003, 238-239).). Of these, one is a blackware ([29], NFBWB) and eight are partly oxidised (NFEBA); these are mainly from a pitcher with flanged rim (see Blackmore 2003, 238). The remaining sherds are greywares, with one of NFEBB ([56]) and one of NFGWA ([34]). One sherd ([49]) contains fine pellets of red clay/iron oxide, but is otherwise closer to the micaceous fabric NFGWD, although the two fabrics are probably from the same area, if not source. The other sherds are all of NFGWD, the sandier examples being recorded under a new code, NFGWD COAR. Most sherds probably derive from strap-handled pitchers, and that from [40], which has the remains of the lower handle attachment, has a horizontal burnish on the cordonned shoulder and vertically burnished lower body. The sherds from [49] and [217] are abraded, but seem to have had a self slip under a light burnish. The one rim **(Fig.11, no.9)** is slightly everted and of plain beaded form; it is from a jar or pitcher with horizontal cordon below the neck and a possibly an incised wavy line around the shoulder (non-joining and badly battered sherds). The inner surface of no.9 suggests that, like the Maiden Lane jar, this vessel may have been bossed. The rim form is similar to that of a highly decorated jar from Maiden Lane (Blackmore 1988, fig 28; plate 5; Blackmore 2003, 238-239), while zig-zag decoration has been found at Bedfordbury and at the Royal Opera House (Blackmore 1989 fig 32, no.77; Blackmore 2003, fig 47, <P38>). The same combination of these features can be seen on a jar from Zerkegem, Flanders (Holloevoet 1993, 203 and fig 10). A thin-walled sherd of NFGWA from [34] also has the edge of a spout or repoussé boss. Bossed decoration is not common in *Lundenwic*, but (in addition to Maiden Lane) has been found at Southampton Street and at the Royal Opera House; it is usually combined with rouletted decoration (*cf* Blackmore 1988, fig.28, no.56; 2002, 35; 2003, 238; Fig 41 <P30>). These forms of decoration are generally dated to the later 8th century (Blackmore 2002, 35; 2003, 238), and this fits with the location of no.9 in phase 3.

Two vessels fall into the NFEB group, which is characterised by a sandwich firing. Eight of these ([2] and unstratified) are from a pitcher in a partly oxidised ware that is similar to fabric NFRWA from Jubilee Hall (Blackmore 1988, 91) but coarser and lacking the surface slip and burnish. As it has a near sandwich firing it has been recorded as fabric NFEBA (*ibid*). Both the fabric and the flanged rim indicate that this comes from the same area of northern France as most of the reduced wares (*cf* Blackmore 1988, 91; fig.22, nos.30, reduced, and 36, oxidised). The other find is a body sherd of NFEBB from pit [227] (*ibid*).

Rhenish wares
The Rhenish wares comprise three coarse sandy sherds (123 gm). In line with previous reports these are classified as 'Badorf' wares, but they are probably from kilns in the area of Walberberg, near Badorf in the Rhenish Vorgebirge (Hodges 1980, 18-9; Blackmore 2002b; Giertz 2003). Walberberg wares are the most common Rhenish ware in the earlier levels of the Royal Opera House (Blackmore 2003, 240-241) and at other contemporary sites such as Dorestad (van Es and Verwers 1980),

and most finds probably date to *c.* 670-750; in the later 8th century these wares were superseded by a finer ware from the nearby kilns at Badorf. These wares are extremely difficult to classify as numerous kilns were operating at the same time and there are so many permutations in the nature of the inclusions and firing that is hard to determine what is typical and what is a variation. The first of the present finds is a sherd from a jar or amphora from pit [158]; the creamy fabric is closest to the existing fabric BADOG, but non-variegated. The other two sherds, from pit [120], are heat-altered and grey throughout. This makes it hard to compare them with other types, but the variegated fabric, which contains abundant sand, is closest to BADOC. These sherds are from a large, crudely finished vessel with external rilling and internal knife trimming; a purple residue over the inner surface may indicate reuse. They could be from large rounded jar/amphora like that from Chandos Place, Bedfordbury (Blackmore 1989, 89; fig.32, no.80), or a deep bowl-shaped form like those found at the Royal Opera House (Blackmore 2003, 240, fig.41, <P23>, <P29>).

Discussion

In all six sherds were recovered from the phase 1 contexts, of which two are more characteristic of the Early Saxon period (fabrics ESSTB, ESSTD). The others have parallels within *Lundenwic*, and so a date of late 6th or early 7th century is suggested for this phase. The largest amount of pottery by sherd count is from phase 2 contexts (42 sherds, 635gm, 0.33 EVES). These comprise chaff-tempered wares and imported wares, the latter mainly from northern France, but including one from the Rhineland. Together with the lack of Ipswich ware, this suggests a date between *c.*650-730/750 for most features, and perhaps 670-750 for pit [158]. In phase 3 the sherd count has dropped but the weight has risen due to the presence of Ipswich ware (25 sherds, 1098gm, 0.82 EVEs). One sherd is a residual Early Saxon type (ESBOE, from quarry [078]), but most date to after 730/750; pit [023] and quarry [082], moreover, contain shell-tempered sherds which suggest that they date to after 770. Only one sherd of chaff-tempered ware was found in a phase 5 context.

The presence of potentially Early Saxon material on this site is of importance for two reasons. Firstly, pottery of this date is extremely rare in central London, and when 15-17 Long Acre was excavated, only three other findspots were known. These comprise: the site of the Billingsgate bath house, St Brides, by the mouth of the river Fleet and St Johns Clerkenwell, where a small 5th- to 6th-century assemblage was found a short distance upstream on the same river (Blackmore with Williams 1997; Blackmore in prep, a). On both the latter sites sandstone-tempered wares were the dominant type (check) suggesting that they are earlier than the present group, which could date to the late 6th or early 7th century.

Secondly, the site is located at the western end of a ridge above the Thames that was used as a cemetery in the mid-7th century. Being close to the junction of Long Acre and St Martin's Lane, it is only a short distance to the north of St Martin-in-the-Fields, a possible religious focus in the late 6th or early 7th century (Vince 1990, 60-61; Blackmore 1997b, 124). It is also close to the supposed line of a former watercourse that ran southwards along St Martin's Lane to the Thames. Furthermore, since the excavation of 15-17 Long Acre, a few potentially 'early' sherds (probably

dating to the late 6th/early 7th century), including sandstone-tempered wares, have been found nearby at 8-9 Long Acre (Blackmore *et al* in prep). Despite the small number of sherds, therefore, the Early Saxon finds from 15-17 Long Acre are of great significance, raising the fascinating possibility of activity in the area prior to the development of the trading settlement. Whether this was contemporary with, or predated the development of the religious focus near St Martin-in-the-Fields remains to be seen.

Most of the other wares are typical for the Middle Saxon period, but the analysis of the finds from this site and that adjacent to it suggests that NFGWD was longer-lived than first thought (Blackmore *et al* in prep), the earlier vessels being thicker walled and less highly fired. As on other sites in this area of *Lundenwic*, the pottery is less plentiful, and less varied than on sites to the east or closer to the waterfront, but the range of fabrics present indicates activity on or near the site between the 7th to 9th centuries.

Acknowledgements

The samples were thin sectioned by S Caldwell, Dept of Earth Sciences, University of Manchester.

Table 1. Key to the fabric codes used in this report

Period	Code	Expansion	Date
R	AMPH	Unsourced amphora fabric	50-400
R	OXRC	Oxfordshire red colour-coated ware	270-400
R	RWS	Unsourced white-slipped fabrics	50-300
S	BADOE	Walberberg/Badorf ware type E	670-770
S	BADOG	Walberberg/Badorf ware type G	670-770
S	CHAF	Chaff-tempered ware	450-750
S	CHFC	Ditto with chalky inclusions	450-750
S	CHFSF	Ditto with abundant sand and fine flint	450-750
S	CHSF	Fine chaff-tempered ware	450-750
S	ESBOE	Early Saxon, bone-tempered ware type F	450-600+
S	ESSTB	Early Saxon, moderate medium sandstone	400-600
S	ESSTD	Early Saxon, abundant medium sandstone	400-600
S	IPSF	Ipswich fine ware	730-850
S	IPSM	Ipswich medium ware	730-850
S	MSIGL	Igneous-rock tempered ware with basalt lava	400-850
S	MSSE	Abundant bivalve shell-tempered ware	770-850
S	NFBWB	North French' blackware, sandy, reduced throughout	650-850
S	NFEBA	North French/Belgian ware with sandwich firing	600-850
S	NFEBB	North French/Belgian ware with sandwich firing; hard, burnished	600-850
S	NFGWA	'North French' greyware, coarse sand-tempered	600-850
S	NFGWD	North French/Belgian fine sand-tempered micaceous reduced ware	600-850
S	NFGWD COAR	North French/Belgian sand-tempered micaceous reduced ware	600-850
S	SLGSC	Greensand-tempered ware type C	450-550+
S	SSAND	Very fine, reduced sand-tempered ware	600-850

Table 2. The distribution of the fabric types

Fabric	Sherds	%	ENV	%	Weight	%	EVEs	%
BADOE	1	1.3	1	2.0	97	5.3	0	0
BADOG	1	1.3	1	2.0	26	1.4	0	0
CHAF	29	38.7	19	38.8	471	25.5	0.22	19.1
CHFC	1	1.3	1	2.0	7	0.4	0	0
CHFSF	1	1.3	1	2.0	6	0.3	0	0
CHSF	1	1.3	1	2.0	21	1.1	0.21	18.3
ESBOE	1	1.3	1	2.0	10	0.5	0	0
ESSTB	1	1.3	1	2.0	29	1.6	0	0
ESSTD	1	1.3	1	2.0	650	35.2	0	0
IPSF	4	5.3	3	6.1	26	1.4	0.03	2.6
IPSM	2	2.7	1	2.0	8	0.4	0	0
MSIGL	1	1.3	1	2.0	25	1.4	0	0
MSSE	2	2.7	2	4.1	47	2.5	0.12	10.4
NFBWB	1	1.3	1	2.0	13	0.7	0	0
NFEBA	8	10.7	2	4.1	47	2.5	0.16	13.9
NFEBB	1	1.3	1	2.0	6	0.3	0	0
NFGWA	1	1.3	1	2.0	5	0.3	0	0
NFGWD/NFGWD COAR	11	14.7	4	8.2	261	14.1	.07	6.1
SLGSC	3	4.0	2	4.1	32	1.7	0	0
SSAND	3	4.0	3	6.1	59	3.2	.34	29.6
Total	**75**	**100%**	**49**	**100%**	**1846**	**100%**	**1.15**	**100%**

*Table 3. Catalogue of the pottery illustrated in Fig.**11***

No.	Phase	Feature	Context	Fabric	Form	Sherds	Diam	EVE	Comments
1	2	Q 191	188	CHAF	Shouldered jar	1	100	0.05	
2	2	PIT 158	30	CHAF	Shouldered jar	4	140	0.04	
3	2	PIT 147	47	CHAF	Necked jar	1	160	0.09	
4	3	PIT 023	20	CHAF	Everted jar	1	160	0.05	Abraded
5	3	PIT 120	118	CHSF	Sub-biconical jar	1	120	0.21	115?
6	3	PIT 120	118	SSAND	Shouldered jar	1	120	0.14	115? Burnished
7	3	PIT 046	41	SSAND	Shouldered jar	1	120	0.2	Sooted
8	3	PIT 023	19	MSSE	Jar/lamp?	1	120	0.12	Sooted
9	3	PIT 218	217	NFGWD COAR	Spouted pitcher	5	140	0.07	Cordoned, ?bossed

3) POST-MEDIEVAL POTTERY *Lyn Blackmore*

Fourteen sherds of post-medieval pottery were found (150g, 0.13 EVEs). In addition there is a small sherd of post-medieval blackware (PMBL, 1580-1700) from a layer of redeposited clay ([15], ?intrusive) and a sherd from a green-glazed Border ware dish (BORDG, 1550-1700) from the ?upper fill of pit 48 ([32]) The latest finds are from the wall ([11]), which are typical of the mid-18th century; these comprise part of Chinese porcelain teabowl (CHPO), a tin-glazed plate neatly painted in the later Chinese style (TGW), a small tin-glazed sherd in the style known as Persian Blue, or *Bleu de Nevers* (TGW E), a rare type in London. A large rim sherd in plain white tin-glazed ware (TGW C) is problematic, but it probably derives from an item of sanitary ware.

Table 4: Post Medieval Pottery

Context	Type	Form	Dec.	No. frags	Date
011	CHPO	TBOWL		9	1680-1720
011	TGW	PLATE	Chinese	2	1680-1720
011	TGW C	TOILET		1	1630-1800
011	TGW E	JAR		1	1680-1720
015	PMBL	JAR		1	1580-1700
032	BORDG	BOWL		1	1550-1700

Table 5: Post-medieval Fabrics

Period	Code	Expansion	Date
PM	BORDG	Surrey/Hampshire border whiteware with green glaze	1550-1700
PM	CHPO	Chinese porcelain	1580-1900
PM	PMBL	Post-medieval black-glazed redware	1580-1700
PM	TGW	English tin-glazed ware	1570-1800
PM	TGW E	Tin-glazed ware with 'Persian blue' decoration	1680-1710

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4) ROMAN BUILDING MATERIAL *Naomi Crowley*

The fabrics have been assigned Museum of London fabric codes, examples of which can be found in the Museum of London fabric reference collection. The different types of material present are in table 8.4 with suggested date ranges for the material.

The assemblage consists mainly of Roman tile in Fabric Group 2815, the most common group of fabrics found on sites in London. These red coloured fabrics represent variation in the same clay deposit exploited in different areas over the Thames Valley Region. Kilns producing them have been identified in Essex, Hertfordshire and Surrey. The suggested date of manufacture for this group is 1st to 3rd century. The majority of the fragments are from bricks or roof tiles (tegula and imbrex), although the site did produce some more specialised tile in this fabric group including 8 fragments of combed flue tile in Fabric 2815(3006) dating to AD 50/60-mid 2nd century. Flue tile indicates the presence of a heated building.

Several contexts produced fragments of tile in Fabric 2454, including a possible opus spicatum paving brick. This is an early fabric dating from AD 50-75/80 and was manufactured in Eccles in Kent. Also present on the site were a fragment of brick in Fabric 3019 which was produced in Braxells Farm in Hampshire and has a suggested date of manufacture of AD 100-120; and a fragment of tegula in the late Roman Fabric Group 2453 which is dated to the mid-2nd to 3rd century and may have been manufactured in Hampshire.

Generally the fragments are small, but the presence of specialised tiles such as flue tile and opus spicatum may suggest the presence of a heated masonry building in the vicinity. Alternately, the Early and Middle Saxon inhabitants may have been bringing this material from the city for secondary uses.

Stone

The assemblage included a small quantity of stone, including Kentish Rag, a grey medium grained sandstone. This probably derived from Roman deposits.

Table 6: Roman Building Materials

Context	Fabric	Form	Weight (g)	Size (mm)	No	Comments and date
001	2815	Brick	180		2	1st-3rd century
	2815	Tegula	145		1	1st-3rd century
017	2815	Brick	270		2	1st-3rd century
	2815	Flue	140		1	Fabric 3006 combed keying AD 50/60 – mid 2nd century
	2815	Fragment	100		2	Small 1st-3rd century
020	2815	Brick	70		1	Small 1st-3rd century
	2815	Tegula	350		2	Reused 1st-3rd century
032	2815	Tegula	270		2	Reused 1st-3rd century. In PM feature
034	2815	Fragment	35		1	Small 1st-3rd century
	2815	Tegula	100		2	1st-3rd century
042	2454	Brick	165	T30	1	?Opus spicatum brick AD 50 – 75/80
050	2815	Brick	60		1	1st-3rd century

Context	Fabric	Form	Weight (g)	Size (mm)	No	Comments and date
053	2815	Brick	265		1	1st-3rd century
	2815	Tegula	60		1	Fabric 2459B hob nail boot print AD 120/160 – late 2nd/3rd century
054	2815	Brick	1630	T34	1	1st-3rd century
	2815	Tegula	240		1	1st-3rd century
056	2453	Tegula	135		1	AD 140/180 – 3rd century
062	2815	Tegula	100		2	Small 1st-3rd century
069	2815	Brick	60		1	1st-3rd century
071	2815	Flue	60		1	Fabric 3006 combed keying AD 50/60 – mid 2nd century
073	2815	Brick	107		1	1st-3rd century. In later feature
074	2815	Brick	620		2	1st-3rd century
075	2815	Flue	280		1	Reused Fabric 3006 combed keying AD 50/60 – mid 2nd century
107	2815	Fragment	180		2	1st-3rd century
112	2815	Tegula	40		1	1st-3rd century
114	2815	Fragment	25		1	Small 1st-3rd century
122	2815	Brick	80		1	1st-3rd century
163	2815	Flue	125		1	Fabric 3006 combed keying AD 50/60 – mid 2nd century
172	2815	Brick	100		1	Small 1st-3rd century
	2815	Tegula	45		1	Small 1st-3rd century
174	2815	Brick	90		2	1st-3rd century
175	2815	Tegula	80		2	1st-3rd century
181	2815	Brick	650		4	1st-3rd century
	2815	Flue	170		3	Reused Fabric 3006 combed keying AD 50/60 – mid 2nd century
	2815	Imbrex	85		1	1st-3rd century
	2815	Tegula	100		2	1st-3rd century
182	2815	Brick	320		1	1st-3rd century
	2815	Fragment	120		1	1st-3rd century
183	2815	Fragment	25		1	Small 1st-3rd century
186	2815	Brick	200		2	1st-3rd century
188	Stone	Rubble	140		1	Grey medium grained sandstone
	2815	Brick	50		1	Small 1st-3rd century
	2815	Tegula	390		4	Small 1st-3rd century
189	2815	Brick	460		2	1st-3rd century
	2815	Fragment	470		7	1st-3rd century
	2815	Imbrex	210		2	1st-3rd century
	2815	Tegula	200		2	1st-3rd century
192	2815	Fragment	170		5	1st-3rd century
	2815	Tegula	60		1	1st-3rd century
192/186	2815	Brick	270		3	1st-3rd century
	2815	Fragment	80		3	1st-3rd century
	2815	Tegula	410		5	1st-3rd century
194	2815	Brick	330		2	1st-3rd century
	2815	Fragment	80		1	Small 1st-3rd century
	2815	Tegula	330		2	Fabric 2459B x1 AD 120/160-late 2nd/3rd century
198	2454	Fragment	10		1	Small AD 50-75/80
	2815	Brick	60		1	Reused 1st-3rd century
	2815	Tegula	40		1	1st-3rd century

Context	Fabric	Form	Weight (g)	Size (mm)	No	Comments and date
209	2815	Brick	170		2	1st-3rd century
209	2815	Flue	40		1	Fabric 3006 combed keying AD 50/60 – mid 2nd century
	2815	Tegula	30		1	1st-3rd century
U/S	2815	Brick	130		1	1st-3rd century
	3019	Brick	760		1	AD 100-120

5) SAXON BUILDING MATERIAL *Naomi Crowley*

Daub

The site produced 5kg of daub fragments. Many of these had wattle impressions and one fragment had a limewashed surface. Most had some evidence of burning. Indeed, it would not be present as daub if it had not been burnt, and would appear as a deposit of sandy clay. Daub was typically used for covering wattle to create walls. Lime wash would be used to preserve the outer surfaces against the elements.

Querns

Two fragments of Niedemendig Lava quernstone were present in Saxon rubbish pits. These would have been used to grind wheat into flour, but discarded once broken.

Table 7: Saxon Building Material

Context	Fabric	Form	Weight (g)	No	Comments and date
019	Daub	Fragment	60	4	Burnt
022	Daub	Fragment	20	2	Small burnt
028	Daub	Fragment	1270	43	Wattle impressions x14, whitewashed surface x1, and burnt surfaces
041	Daub	Fragment	120	7	Small wattle impression x1
047	Daub	Fragment	50	1	Wattle impression
095	Daub	Fragment	30	1	Wattle impression
100	Daub	Fragment	3165	56	Wattle impressions and burning
107	Daub	Fragment	10	1	Small
111	Daub	Fragment	170	3	Wattle impressions x2
118	Daub	Fragment	75	1	Wattle impression
186	Daub	Fragment	90	1	
209	Stone	Quern	250	1	Niedemendig Lava
217	Stone	Quern	95	1	Niedemendig Lava

6) POST-MEDIEVAL BUILDING MATERIAL *Naomi Crowley*

A number of contexts contained peg roof tile in Fabric 2276 (AD 1500—1800), pantile in Fabric 2279 (18th-20th century), and post-medieval bricks in Fabrics 3033 and 3032. The bricks have been dated where possible using fabric, surface features and dimensions and these dates are included in Table 1 below. Occasional finds came from the surface of Saxon features, pressed in during reduction for earlier basements.

Table 8: Post-medieval building material.

Context	Fabric	Form	Weight (g)	Dimensions	No.	Comments and Date

				(mm)		
001	3032	Brick	345		5	Small, intrusive
013	Stone	Rubble	Sample		1	Kentish Rag
	3033	Brick	Sample	0x98x62	1	17th/18th century
	3033	Brick	Sample	0x100x62	1	17th/18th century
015	2276	Peg	140		2	AD 1500-1800
	2279	Pantile	70		1	18th-20th century
	3033	Brick	210		1	Overfired Post-medieval
022	3033	Brick	10		1	Very small Post-medieval, intrusive.
029	3033	Brick	135		1	Small Post-medieval, intrusive.
031	2279	Pantile	410		4	18th-20th century
	3032	Brick	490		2	18th/19th century
	3033	Brick	1670	0x115x60	4	17th/18th century
032	2276	Peg	2180		20	Square nail holes AD 1500-1800
	3033	Brick	13980	225x100x55, 220x110x55, 230x110x65, T60x4, T50x3	42	Several very overfired fragments, indented border x3, mainly small fragments 16th century
037	3033	Brick	Sample	215x100x56	1	Overfired 16th century
	3033	Brick	Sample	0x110x60	1	Indented border 16th century
073	3032	Brick	1720	0x105x70	3	Frogged late 19th century
	3033	Brick	260		3	Post-medieval
U/S	3033	Brick	70		1	Small Post-medieval

7) HUMAN BONE *Andy Smith*

Two skulls and a long bone were retrieved from two sealed contexts, both dating to the Saxon period.

Deposit 186 of quarry [228] contained a cranium and a left femoral shaft.

The cranium possesses compression damage and analysis was restricted. However, criteria for the estimation for sex were present; it possessed a large *Supra-orbital ridge*, a pronounced *Nuchal crest* and a diminutive left *Mastoid process*. This suggests a 66% probability of the individual being male. The individual's age cannot be assessed due to the absence of criteria available for assessment; however the cranial sutures are fusing suggesting early adulthood. Furthermore, there is a large Ossicle at lambda and another large lambdoid ossicle on the right side. Although the Frontal bone is only partially present, it appears that the divide is medial and the posterior portion suggests the presence of a metopic suture.

The femoral shaft is robust/ masculine in appearance, but no metrical data is available to confirm this assumption.

Deposit 044 of pit [046] contained the remains of a severely compressed cranium.

Due to its fragmentary state and soil concretion, measurements were not taken. The left Maxilliary arch was near complete and suggested a biological age of 45+ years; the absence of any cranial sutures also suggested a late adulthood c. 50+ years. Except for calculus deposits around the surviving teeth, there were no signs of pathology present.

Conclusion

The human bones were discarded in a quarry and a rubbish pit. Their very fragmentary condition suggests that they were redeposited from disturbed inhumations rather than primary deposits. Although Saxon burials are known from elsewhere on Long Acre, and at Floral Street and the Royal Opera House, those graves remained undisturbed. The human bones from 15-17 long Acre are considered most likely to be Roman inhumations, since the quarry (228) is among the earliest features in site. The skeletal elements were disturbed by Saxon quarrying and pit-digging, possibly from Roman cemeteries lining the two roads heading west out of the City.

8) ANALYSIS OF THE ANIMAL BONE *Dr Sylvia Warman*

8.1) Introduction

The quantity of animal bone from the excavation of the site at 15-17 Long Acre was considerable, filling ten large storage boxes. The material had been examined as part of the post-excavation assessment process (Rielly 2001) and a number of recommendations concerning further work on the material had been made:

i) The post-medieval material was not considered to require any further analysis.
ii) The Saxon assemblage should be studied in more detail concentrating on those specimens that could be identified to species.
iii) The species representation should be investigated as it may provide information on exploitation strategies
iv) Age and size data should also be recorded to assist in studying exploitation strategies.

Original Research Aims

Given that undisturbed deposits of Saxon date were present then there is an opportunity for collecting evidence for animal husbandry, carcass processing, butchery practices and specialist (craft or industrial) activities. Bone was recovered from well defined, securely dated contexts and the following information using standard methods of metrical analysis has been recovered:

- dimensions of individual fragments
- nature of butchery (e.g. primary/secondary)
- species, sex, bone type, and age at death

This collected data is structured to specifically address the following questions:

- What type of butchery practices were in operation on this site?
- Were the animals raised and butchered for the purpose of food and/ or did they perform another function?
- What species were exploited for food purposes?
- What quality of meat was more commonly consumed?

Further Research Aims:

After initial assessment of the animal bones, further questions have been raised:

- Are there any differences in disposal between refuse and quarry pits?
- What can be said about the earliest phase of occupation in *Lundenwic*?
- How were the major food animals exploited during the middle Saxon phases
- What evidence is there for the size and type of domestic species?
- Is there any evidence for craft activities?
- What does the relatively good representation of horse suggest?
- What is the significance of the human remains?

Note on methods used

The recommendations from the assessment were followed although some adaptations were made for logistic and analytical reasons. For example, the amount of ageing data turned out to be quite small, and to subdivide by phase would have not been practicable, thus the information from the all phases was pooled.

General Comments on the assemblage.

All the material in this assemblage was recovered by hand, thus a bias towards larger pieces and species can be expected with small mammals, birds and reptiles likely to be underrepresented. The condition of the bone was variable, mostly moderate or good with some occasional very poor pieces. Weathering was noted but was obscured to some extent by the concreted cess deposits which adhered to the bone even though it had been thoroughly washed during processing. This also hindered the examination of bone for evidence of butchery marks and pathologies.

The Assemblage

The total number of records in the database is 2117 of which 1120 have been identified to element and species. The total number of bones and bone fragments is 4275.

The material identified by size group or simply as mammal bone is not dealt with in detail but is summarised in the appendix by number of fragments and by weight for each context.

Species Identified

The list of species identified in this assemblage is as follows.

Bos taurus – cattle	*Cervus elaphas* – red deer
Ovis/Capra – sheep/goat	*Canis familiaris* – dog
Sus scrofa – pig	*Gallus* – chicken
Equus caballus – horse	*Anser* – goose

In some cases it was possible to separate sheep and goat specimens, this was due to the presence of skull and horn core fragments where the morphology of these two species is known to differ, and some well preserved post cranial bones are also known to show variation between the two species. However, the larger part of the assemblage comprised damaged long bones which could not be identified further than the sheep/goat level.

The Quantification Analysis

There are two popular methods of quantifying animal bones of a particular species or other taxonomic group. Firstly, the minimum number of individuals (MNI); this is useful in large assemblages where bones are well preserved - the most numerous element is selected and the number of specimens of that element from either the right or left side is counted thus producing the minimum number of live animals required to

produce the assemblage. However, when an assemblage is more fragmentary or smaller this method is less helpful and in such cases the number of identified specimens can be used (NISP). This simply involves counting the number of bones of that taxon that has been identified to element. Material that is not identified to either species or element can only be summarised by a), the total number of fragments and b) the total weight of those fragments. Weight will be biased towards cow and horse because for any particular element their bones are bigger and heavier than the smaller species such as pig, sheep and goat. Using NISP will have a bias towards dogs and pigs because they have more foot bones than cows and sheep, which in turn have more foot bones than horses.

The difference between the two main feature types (refuse pits and quarry pits) was one of the questions posed in the assessment. It was decided that the results of the quantification and body-part representation analysis should be presented for each feature type by phase. In addition to the NISP total for each species the % percentage abundance by NISP and by weight is also given for each taxon.

8.2) Species Representation and Body Part Distribution

8.2.1) Saxon Phase I: AD 450-550 (Tables 1 & 2)

For the pits from the earliest phase the species present were cattle, sheep/goat, pig and horse. The most numerous by all three measures (NISP, MNI and weight) were cattle, the next most numerous pigs. The horse and sheep/goat were present only in token amounts. In terms of body parts, the cattle specimens included the head, forelimb and hind limb regions. The upper parts of the limbs and the shoulder and pelvic girdles represent those regions which are meat-bearing and would be expected in butchery/household waste. The lower limb and foot bones do not carry much meat at all and their presence can be explained as either waste from the early stages of butchery or as waste from skinning/tanning as the feet were often left attached to the hides before preparation of the hide was undertaken. The pig bones showed a wide distribution across the skeleton with the only notable absence being the skull.

The quarry pits from the earliest phase showed a more restricted range of species with cattle very much the dominant taxa exceeding 90% in both NISP and weight. Again a range of skeletal parts were present, including skull, hind limb, forelimb and foot bones suggesting a combination of butchery, household waste and possibly hide processing waste. Pig is represented by just two loose teeth suggesting that its inclusion in these features may well be accidental or the result or re-deposition.

8.2.2) Early Saxon Phase IIA: AD 600-650 (Table 3)

This next phase comprised the only two non-fill deposits from the site which yielded animal bone. They were found to overlay early features whilst being truncated by middle phase pit cuts, so were classified as early phase IIA. These deposits lacked firm dating from ceramic evidence, thus this stratigraphic relationship was used. The sample in these two deposits/layers was much depleted compared to that seen in the

pits of the phases which preceded and followed it. Only cattle and pig are identified and only a small range of body parts is seen. Context 202 consisted almost entirely of a very fragmented cattle skull. These deposits were clearly not the result of large scale intentional disposal of refuse and may have resulted from movement of material before incorporation into a pit, or from spillage as a large quantity of refuse was aimed at a nearby pit.

8.2.3) Saxon Phase IIA AD 600-750 (Tables 4 & 5)

The animal bone sample from this phase was much larger and more varied that that from the earliest phase. The only two feature types were refuse pits and quarry pits.

The refuse pits produced the full species compliment for this assemblage. Cattle were the most numerous by all measures but pig was well-represented (at 36% by NISP). Almost every body part was represented at least once for cattle indicating that primary as well as secondary butchery and food preparation must have occurred on or very near the site. For sheep the range was smaller with fewer foot bones and a bias towards the forelimb bones. The presence of skull and horn core fragment of both cattle and sheep/goat may indicate the use of the horn for working. Pig showed a wide range of body parts including many skull fragments; the forelimb and hind limb are well represented indicating a preponderance of the main meat-bearing bones. This phase was the first in which red deer was found, in the form of antler fragments. All those which included the antler base showed the scar typical of a shed antler.

No sign of any skeletal part of red deer was seen, thus the likelihood that this species contributed to the diet at this site is very low. Horse was again present in a small but not insignificant quantity, as was dog. The presence of a small number of chicken and goose bones sheds a little more light on the broadness of the diet of the population of this site. The conclusion that this represents refuse can be drawn, and in addition to the butchery and food waste the presence of antler fragments hints at some specialist craft activity occurring on site.

The quarries from this phase showed a slightly reduced range of species; no bird or horse, but dog, red deer and the main domesticates were present. Cattle were again the most numerous species with all body parts represented. Pig was again the second most numerous. The sheep/goat sample was small with only a few parts represented. A small number (4) of red deer antler fragments were found and dog is represented by a tooth and a foot bone. This sample is quite rich but as in the earliest phase it shows a smaller quantity of animal bone and a smaller range of taxa when compared with the refuse pits.

8.2.4) Saxon Phase IIB: AD 750-850 (Tables 6 & 7)

This provided the largest weight and quantity of animal bone of all the phases. The refuse pits provided a very large and varied sample with the full range of species present. Cattle were again the most numerous by all measures followed by pig and then sheep/goat. The body part distribution for cattle was good with almost all

elements seen at least once including a hyoid (a small bone from the throat), the presence of which suggests the individual was mature and that a skull with quite a lot of flesh left on it must have been disposed. The sheep/goat body part range was biased towards the forelimb although this is partly a taphonomic bias, since skull and horn core fragments were also seen. Pig showed a wide range of parts and horse was represented mostly by skull and mandible specimens as well as a metapodial, thus it is tempting to suggest that a whole head may have been deposited in this feature. Red deer antler was present but again no skeletal parts, suggesting antler working rather than consumption of the meat. Goose and chicken are seen, as is dog, all in small quantities.

In the quarries from this later phase a more restricted range of species is seen with no goose dog or deer. Cattle were, as ever, the most numerous with a reasonable range of skeletal parts but in smaller numbers as in the refuse pits. The range of skeletal parts of pig was quite reduced being mainly teeth and forelimbs, and the same can be said for sheep/goat. The single horse bone identified is a hyoid which is odd considering there are no skull parts or mandibles, it may be that these were too fragmented to identify. A single chicken bone was also found.

8.2.5) Comparison with other sites

West Stow sheep were the most abundant species by NISP through the 5th to 7th Century, followed by cattle and then pig. Pig was recognised as particularly important in the early phase whilst cattle, due to their large size were the major meat provider in all periods (Crabtree 1989). To look at other *Lundenwic* sites, at the Royal Opera House site, cattle were the dominant species both in terms of weight and NISP although the margin between it and sheep/goat and pig narrows in the later periods, both of which are poorly represented in the early periods but increase over time. Pig and sheep/ goat alternate in occupying second place between periods (Rielly in prep). At both Maiden Lane and Jubilee hall cattle were again the most abundant domestic species by percentage of both NISP and weight, pig being the second most abundant followed by Sheep/goat (West and Rackham in Cowie and Whytehead 1988). A similar pattern is seen at the Peabody site at the National Gallery (Rackham in Whytehead and Cowie 1989).

Thus it appears that a pattern for sites in Saxon *Lundenwic* is the preponderance of cattle in both specimen number and weight, which, when the quantity of meat yielded by a single carcass is considered, is the main meat-providing species with pig as the second most numerous and sheep/goat the least numerous of domestic stock species.

8.2.6) Conclusion of Species/ Body Part Analysis

The changes through time would appear to be an increase in both the quantity of animal bone and the range of species. The dominance of cattle in all phases is very striking, since a common assumption is that pig was the preferred livestock of the Saxons. The variation between feature types is also of interest; it is clear that the widest range of material was disposed of in the refuse pit with the quarries receiving a

narrow range of species, particularly in the earliest phase. The overall pattern of Cattle> pig> sheep/goat is consistent with that seen at other *Lundenwic* sites but contrasts with that seen at the provincial site of West Stow (East Anglia).

Table 9 Saxon Phase 1: AD 450-550 pits (Features 099 &125)

Element	Cattle	Sheep/Goat	Pig	Horse
Antler				
Skull	3			
Horncore				
Maxilla	1			
Upper teeth				
Mandible			1	
Lower teeth				
Hyoid				
Atlas			1	
Axis				
Scapula	1		1	
Humerus	1		2	1
Radius	3		2	
Ulna			1	
Carpal				
Metacarpal	3	1		
Innominate	1	1	2	
Sacrum	2			
Femur	1		1	
Patella				
Tibia			1	
Fibula				
Talus				
Calcaneus				
Tarsal				
Metatarsal	1			
Metapodial	4			1
Proximal phalanx	1		2	
Intermediate phalanx				
Terminal phalanx				
NISP totals	22	2	14	2
Total weight	1775	28	469	173
MNI	**2**	**1**	**2**	**1**
% by NISP	55	5	35	5
% by weight	73	1	19	7

Table 10, Saxon Phase 1: AD 450-550 quarries (features 197 & 228)

Element	Cattle	Pig
Antler		
Skull	1	
Horncore		
Maxilla		
Upper teeth	7	
Mandible	6	
Lower teeth	1	2

Hyoid		
Atlas		
Axis		
Scapula		
Humerus		
Radius	1	
Ulna	1	
Carpal		
Metacarpal	1	
Innominate		
Sacrum		
Femur		
Patella	1	
Tibia	1	
Fibula		
Talus		
Calcaneus	1	
Tarsal		
Metatarsal	1	
Metapodial		
Proximal phalanx	1	
Intermediate phalanx		
Terminal phalanx		
NISP totals	23	2
Total weight	916	10
MNI	**2**	**1**
% by NISP	92	8
% by weight	99	1

Table 11Early-IIA layers (contexts 109 & 202)

Element	**Cattle**	**Pig**
Antler		
Skull	10	
Horncore		
Maxilla		
Upper teeth		
Mandible		
Lower teeth		
Hyoid		
Atlas		
Axis		
Scapula		1
Humerus		
Radius		
Ulna		
Carpal		
Metacarpal	1	
Innominate		
Sacrum		
Femur		
Patella		
Tibia		

Fibula		
Talus		
Calcaneus		
Tarsal		
Metatarsal		
Metapodial	2	
Proximal phalanx		
Intermediate phalanx		
Terminal phalanx	1	
NISP totals	14	1
Total weight	639	31
MNI	**1**	**1**
% by NISP	93	7
% by weight	98	2

Table 12 Saxon IIA: AD 600-750 pits (features 003,227, 120, 088, 057 & 158)

Element	**Cattle**	**Sheep/Goat**	**Pig**	**Horse**	**Red Deer**	**Dog**	**Goose**	**Chicken**
Antler					10			
Skull	10	3	17					
Horncore	8	4						
Maxilla	1		2					
Upper teeth	11		7					
Mandible	22	3	15					
Lower teeth	15	3	6					
Hyoid								
Atlas	2		1					
Axis	3		1					
Scapula	9	7	14	1		2		
Humerus	5	7	13					
Radius	7	3	4					1
Ulna	5		3				1	1
Carpal	2	1						
Metacarpal	12	5	8					
Innominate	9		12					
Sacrum	1							
Femur	11	3	21	1				
Patella								
Tibia	7	4	6	1				
Fibula								
Talus	4							
Calcaneus	6		1					
Tarsal	2							
Metatarsal	16	4	12					
Metapodial	9		2					
Proximal phalanx	13		5					
Intermediate phalanx	5							
Terminal phalanx	5							
NISP totals	199	47	150	3	10	2	1	2
Total weight	12503	1169	3874	267	430	32	1	2
MNI	**7**	**5**	**7**	**1**	**3**	**1**	**1**	**1**
% by NISP	48	11	36	1	2	0.5	0.2	0.5

% by weight	69	6	22	1	2	0.2	0.005	0.01

Table 13 Saxon IIA: AD 600-750 Quarries (features 008, 208, 211, 216, 108, 162 & 067)

Element	**Cattle**	**Sheep/Goat**	**Pig**	**Red Deer**	**Dog**
Antler				4	
Skull	2		10		
Horncore	1				
Maxilla	1				
Upper teeth			1		1
Mandible	8	2	7		
Lower teeth	7		1		
Hyoid					
Atlas					
Axis		2	2		
Scapula	1	1	3		
Humerus	2		3		
Radius		1	3		
Ulna	1				
Carpal					
Metacarpal	1	2	4		1
Innominate	2		1		
Sacrum	1				
Femur	2		1		
Patella					
Tibia	3		1		
Fibula					
Talus	2				
Calcaneus	3	1			
Tarsal					
Metatarsal	5	2	4		
Metapodial	4		1		
Proximal phalanx	5				
Intermediate phalanx	2				
Terminal phalanx	2				
NISP totals	55	11	42	4	2
Total weight	1962	159	577	112	6
MNI	**2**	**2**	**2**	**1**	**1**
% by NISP	48	10	37	3.5	2
% by weight	70	6	20	4	0.2

Table 14 Saxon IIB AD 750-850 pits (features 023, 078, 079, 106 and 046)

Element	**Cattle**	**Sheep/Goat**	**Pig**	**Horse**	**Red Deer**	**Dog**	**Goose**	**Chicken**
Antler					13			
Skull	6	4	22	2				
Horncore	6	3						
Maxilla			4					
Upper teeth	6	2						
Mandible	16	10	11	1				
Lower teeth	2	4	8	1				
Hyoid	1							
Atlas	2		2					
Axis			2					
Scapula	9	4	11					
Humerus	4	5	11				2	
Radius	15	6	4					
Ulna	1	2	5					
Carpal	2							
Metacarpal	12	6	5					
Innominate	11	3	8			1		
Sacrum	2							
Femur	7	3	3					1
Patella	1							
Tibia	11	1	9				1	1
Fibula								
Talus	9							
Calcaneus	12		1					
Tarsal	3							
Metatarsal	21	8	5				1	
Metapodial	7	1	1	1				
Proximal phalanx	17					1		
Intermediate phalanx	4							
Terminal phalanx	10							
NISP totals	197	62	112	5	13	2	4	2
Total weight	12146	1100	2429	404	668	19	25	5
MNI	**8**	**5**	**7**	**1**	**2**	**1**	**2**	**1**
% by NISP	55	16	28	1	3	0.5	1	0.5
% by weight	72	7	14	2	4	0.1	0.1	0.03

Table 15 Phase AD750-850 Quarries (features 082, 218 & 223)

Element	Cattle	Sheep/Goat	Pig	Horse	Chicken
Antler					
Skull	13				
Horncore	2				
Maxilla	1		3		
Upper teeth	6	1	1		
Mandible	4	1	3		
Lower teeth	4		4		
Hyoid				1	
Atlas	1				
Axis					
Scapula	2	1	2		
Humerus		1	1		
Radius	3	1	2		
Ulna	3				
Carpal					
Metacarpal	8	2			
Innominate	4	3			
Sacrum					
Femur	4				
Patella					
Tibia	5	1			
Fibula					
Talus					
Calcaneus					
Tarsal					
Metatarsal	7		4		
Metapodial	3				
Proximal phalanx	4				
Intermediate phalanx					
Terminal phalanx	2				
NISP totals	76	11	20	1	1*
Total weight	4255	162	365	1	1
MNI	**4**	**1**	**18**	**1**	**1**
% by NISP	70	10	8	1	1
% by weight	88	3		0.06	0.02

*coracoid

8.3) Ageing

Two methods of establishing relative age were used in this analysis, firstly the epiphyseal fusion of long bones and secondly, the eruption and wear of the mandibular dentition.

8.3.1) Fusion

The quantity of aged specimens was not large enough to enable subdivision by phase. Diaphyses were counted (epiphyses were not to prevent the double counting of the same unfused bone from the same individual). Silver's 1969 tables have been used in this analysis, apart from the acetabulum where Schmid 1972 is used.

8.3.1.1 Cattle

Table 16 Cattle distal humerus fusion: 81% fused.

State of fusion	Number
Unfused	1
Fusing	1
Fused	9
Total	11

This bone is usually fused by the age of 12-18 months thus it can be said that over 80% of the ageable cattle specimens are from individuals whose age exceeded 1-1.5 years at death. Only one of the unfused specimens was a very small porous unfused diaphysis, clearly foetal or new-born. This is not sufficient evidence, however, to suggest that rearing of cattle was practised on or near the site.

Table 17 Cattle femur fusion: 100% fused distal, 14% fused proximal

State of Fusion	Distal femur	Proximal femur
Unfused		6
Fusing		
Fused	10	1
Total	10	7

The proximal and distal epiphyses of the femur are late fusing and generally thought to fuse around the same time, at 3-4 years. The fact that so many unfused proximal femora are seen suggests that two age groups are present; those under 3-4 years and those over. Alternatively, this population of cattle has an unusual pattern of fusion in the femur.

Table 18 Cattle radius fusion: 100% fused proximal, 44% fused distal

State of Fusion	Proximal	Distal
Unfused		5
Fusing		
Fused	20	4
Total	20	9

The proximal radius is an early fusing bone at 12 –18 months, all the specimens appear to come from individuals which exceeded this age at death. The distal radius fuses later between 3.5 and 4 years. The fact that less than half of these specimens are fused shows that although many cattle were over 1.5 years over half were under 4 years.

Table 19 Cattle tibia fusion: 100% fused proximal, 54% fused distal

State of Fusion	Proximal	Distal
Unfused		5
Fusing		2
Fused	7	8
Total	7	15

There were also some unfused proximal epiphyses but these were not counted to avoid doubling up. The distal tibia fuses between 2 and 2.5 years whilst the proximal

fuses between 3 and 4 years. The animals' age at death must have included some under 2 years and others over 4 years.

Table 20 Cattle metatarsal fusion: 74% fused

Distal	Number
Unfused	5
Fusing	
Fused	14
Total	19

(only distal epiphysis was looked at as proximal is fused by birth)

This usually fuses between 2-3 years, thus most of these specimens exceeded that age at death and around a quarter were younger.

Table 21, Cattle metacarpal fusion: 63% fused

Distal	Number
Unfused	6
Fusing	
Fused	10
Total	16

This fuses at 2 –2.5 years thus the specimens here represent a group with the majority above 2.5 years at death, but a third which were younger.

Table 22 Cattle scapula fusion: 94% fused

Glenoid	Number
Unfused	1
Fusing	
Fused	15
total	16

This is an early fusing bone usually fused before 1 year thus the majority of specimens exceed this age at death.

Table 23 Cattle pelvis (acetabulum) fusion: 80% fused

Acetabulum	Number
Unfused	3
Fusing	
Fused	12
Total	15

This fuses quite early at 9 months; thus the majority of specimens exceed 9 months years old at death.

8.3.1.2) Sheep/goat

Table 24 Sheep/goat distal humerus fusion; 92% fused

State of Fusion	Number
Distal	
Unfused	
Fusing	1

Fused	12
Total	13

This fuses at around 10 months, thus these specimens are from individuals which exceeded that age at death.

Table 25, Sheep/goat femur fusion, 80% fused/ 50% fused

Distal femur	Number
Unfused	1
Fusing	
Fused	4
Total	5

Proximal femur	Number
Unfused	1
Fusing	
Fused	1
Total	2

The proximal end of the femur fuses between 2.5 and 3 years. Half the specimens were fused and so were aged over 3 years at death. For the distal femur which fuses at 3-3.5 years the majority of specimens are fused suggesting an age at death of 3.5 years or above.

Table 26Sheep/goat radius fusion: 71% fused/ 100% fused

Radius distal	n
Unfused	5
Fusing	
Fused	2
Total	7

Radius proximal	
Unfused	
Fusing	
Fused	7
Total	7

The proximal end fuses at 10 months all the specimens exceeded this age, but the distal end doesn't fuse until 3 years most specimens are fused indicating an age at death of 3 years or above

Table 27Sheep/goat tibia fusion

Distal tibia	Number
Unfused	1
Fusing	
Fused	3
75% fused	4

This fuses at 1.5-2 years, most specimens being this age or above at death.

Table 28, Sheep/goat scapula fusion: 100%

Glenoid	Number
Unfused	
Fusing	
Fused	13
Total	13

An early fusing bone, all fused suggesting an age at death of 8 months or more.

8.3.1.3) Pig

Table 29 Pig humerus fusion: 81% fused

Distal humerus	Number
Unfused	
Fusing	3
Fused	21
Total	26

This bone fuses at 1 year in the pig: most are fused suggesting an age at death of one year or above.

Table 30 Pig radius fusion: 33% fused/ 80% fused.

Distal	Number
Unfused	4
Fusing	
Fused	2
Total	6

Proximal	Number
Unfused	2
Fusing	
Fused	8
Total	10

The proximal epiphysis fuses at 1 year most specimens are fused suggesting an age at death of 1 year or above. The distal epiphysis does not fuse until 3.5 years the small proportion which have fused indicates most animals were under that age at death.

Table 31 Pig femur fusion: 18% fused

Distal	Number
Unfused	13
Fusing	1
Fused	3
Total	17

A late fusing bone at 3.5 years, the fact most aren't fused suggests an age at death of less that 3.5 years.

Ulna

The sample of ulnae was too small to tabulate but a very porous small unfused diaphysis found must be either foetal or neonate. Again this is not sufficient evidence to prove that rearing of pigs was occurring on site.

Table 32 Pig tibia fusion: 89% fused/ 77% fused

Number
8
1
9

Distal	Number
Unfused	2
Fusing	1
Fused	10
Total	13

The proximal end fuses at 3.5 years, most are fused, thus age at death is likely to be 3.5 or above. The distal fuses at 2 years, again the majority are fused.

Table 33 Pig scapula fusion: 85% fused

Glenoid	Number
Unfused	4
Fusing	
Fused	23
Total	27

The glenoid fuses by 1 year, thus the majority appear to have an age at death of 1 year or more.

Table 34 Pig pelvis (acetabulum) fusion: 75% fused

Acetabulum	Number
Unfused	3
Fusing	
Fused	9
Total	12

This region fuses at around 1 year, so the majority of these specimens have an age at death in excess of 1 year.

8.3.1.4) Other species

The small sample of horse bones showed them to be all adult with the exception of one unfused scapula along blade (a late fusing region).

The small dog sample was mostly adult except for a scapula with an unfused glenoid.

All the goose and chicken specimens that could be aged were fused.

8.3.1.5) Summary of fusion data

The evidence of the fusion indicates that the bulk of the main domestic specimens are sub-adult or adult. The fusion data is compatible with the use of the cattle, pig and sheep for meat production. The presence of neonatal pig and cattle bone suggests that these species were reared on or near the site, but there are only two in total, and could have derived from midden clearance.

Comparison with other sites

Fusion for all three species is similar to that seen at the Peabody site. The West Stow pigs appear to have been killed younger that those in *Lundenwic* including Long Acre.

8.3.2) Eruption and wear of teeth

As recommended in the post excavation assessment the eruption and wear of the teeth was recorded as a guide to relative age within the assemblage. The method selected was that devised by Grant. Unfortunately the number of complete mandibles was very small, this was boosted slightly by the use of a method for estimating the mandible wear for specimens with a tooth missing, but as many specimens had more than one tooth missing the sample remained quite small. The figure illustrated is the mandible wear stage which is calculated from the sum of the tooth wear stages of the molars within the mandible.

8.3.2.1) Tooth wear results for cattle

MWS
21
31
32
36
46

The third molar erupts at about 2 years and scores for MWS of above 30 generally indicate the M3 is in wear the majority of the mandibles are derived from adult/mature animals probably in excess of 2-3 years old. The one score of 21 indicates an animal that is not dentally mature although it may be that the skeleton was approaching full size a sub-adult. It could be argued that the older individuals might be used for traction but it must be remembered that with the exception of veal, beef was eaten older in the pre-agricultural revolution period, as most breeds matured more slowly than modern domestic cattle, but the sample is too small to draw any firm conclusions.

8.3.2.2) Tooth wear results for sheep/goat

MWS
33

35
36
38
39
43
53

Again a rather small sample, the scores for MWS but the fact that they are all at the high end of the range (few assemblages have scores above 50-55) might be an indication of individuals kept into later life which is usually interpreted as a sign that they stock was used for secondary products such as wool or milk rather than purely for meat. A much larger sample would be required before this could be used as evidence for milk/wool production. This compliments the fusion data which suggested ages of 3 years or more.

8.3.2.3) Tooth wear results for pig

MWS
14
27
33
41
49

The third molar erupts between 18 months and 2 years and the scores of 27 and above indicate M3 is in wear so the majority of this sample appears to be form adult/mature animals of over 2 years. Pigs unlike sheep goat and cattle are not providers of secondary products and as such are only kept into old age for breeding purposes. However as mentioned above domestic breeds are believed to have been slow maturing at this time unlike modern pigs that are culled at 6-8months.

8.3.2.4) Comparison with other sites

The cattle at West Stow show a much wider range of wear stages with two peaks, one at 20 and one 45 (Crabtree 1989) This may reflect different uses made of the animals e.g. beef and dairy or traction.

The pigs show a similar range to those at West Stow peaks at 30-35.

Sheep/goat have a wide range at West Stow with 2 clear peaks one 10-15 and one 35-40 suggesting 2 uses. The sheep/goat sample from Long Acre is too small to suggest that this pattern was also apparent there. The *Lundenwic* sites do not present the tooth wear data in a format which can be compared with that from either Long Acre or West Stow.

8.3.3) The Horn Cores

A small number of sheep, goat and cattle horn cores were found. The sample was mostly made up of smaller fragments of either the tip or base, and a few complete cores were identified. The sample size was considered too small to carry out measurements.

Table 35 Horncore data

Number of horn core fragments NISP	Total weight in grams
Cow 26, three are almost complete	1478
CSZ 2	22
Goat 3, one mostly complete	160
Sheep 3, one mostly complete	174

These verify the presence of both sheep and goat which a few skeletal elements indicated and that the cows, sheep and goats were of horned breeds but beyond this little information can be gained from such a small sample.

8.3.4) Measurement data

Those bones which were complete enough were measured following the dimensions defined by Von den Driesch (1976). Summary statistics calculated are; the mean, minimum (min), maximum (max), standard deviation (sd) and the coefficient of variation (cv).

8.3.4.1) Bos Taurus – Cattle;

Hind limb

Table 36 Cattle metatarsal measurements

	GL	***SD***	***DD***	***Bp***	***Bd***
mean	219.29	26.47	25.41	44.34	44.44
min	206	21.8	22.1	37.9	47.6
max	232	29.7	30	53.1	63
sd	8.94	2.70	2.49	5.04	5.51
cv	4	10	9.79	11.37	12.4
n	7	11	10	20	10

Table 37 Cattle metacarpal measurements

	GL	***SD***	***DD***	***Bp***	***Bd***
mean	197.75	35.26	23.07	55.71	60.9
min	185	27.9	19.5	49.8	49.6
max	220	47.9	25.5	67.3	71.9
sd		7.42		5.42	8.07
cv		21.04		9.73	13.25
n	4	6	4	10	6

Table 38 Cattle radius measurements

	Bp	***BFp***	***Bfd***
mean	72.35	66.67	79
min	65.6	61	79
max	89.9	82.6	79
sdev	7.33	6.21	
cv	10.1	9.31	

	3		
n	11	12	1

Table 39 Cattle tibia measurements

	Bd
mean	57.04
min	51.9
max	66.3
sd	5.18
cv	9.08
n	7

Table 40, Cattle scapula measurements

	GLP	***LG***	***BG***	***SLC***
mean	61.86	51.7	43.85	46.6
min	58.2	47.6	40.7	42.3
min	64.6	55.4	48.9	49.3
sdev	2.25	2.81	2.89	2.89
cv	3.64	5.44	6.59	6.2
n	8	8	8	6

Table 41, Cattle talus measurements

	Bd	***GLm***	***GLl***	***Dm***	***Dl***
mean	38.01	56.88	60.83	34.01	34.77
min	33.5	50.8	51.4	30.6	30
max	43.6	61.1	67.6	37	40
sd	2.79	3.00	4.94	1.76	3.11
cv	7.3	5.27	8.12	5.17	8.94
n	10	9	9	9	9

Table 42, Cattle proximal phalanx measurements

	SD	***Bp***	***Bd***	***GLpe***
mean	24.53	28.67	27.17	58.12
min	19.6	22.1	22.2	52.3
max	33	38.6	36	65.9
sd	3.28	3.89	3.58	3.58
cv	13.37	13.57	13.18	6.16
n	26	26	26	24

Table 43, Cattle intermediate phalanx measurements

	GLpe	***GL***	***SD***	***Bp***
mean	36.7	23.1	28.65	24.03
min	33	18.7	24.7	20.4
max	40	28.4	33.9	30.9
sd	2.26	3.09	3.57	3.77
cv	6.15	13.3	12.4	15.69
n	6	8	8	8

Table 44, Cattle terminal phalanx measurements

	DLS	***Ld***	***MBS***
mean	66.81	52.76	22.82
min	51.9	39.9	12.2
max	97.1	77.4	34.9
sd	12.29	12.32	6.60

cv	18.39	23.35	28.92
n	11	11	11

Withers heights

The quantity of upper limb bone lengths was too small so metapodials are used instead. It should be recognised that this will produce rather high estimates.

Table 45, Cattle withers height calculated from metacarpal greatest length

GL	Withers height
185	1134
220	1348
186	1140
200	1226

Table 46, Cattle withers height calculated from metatarsal greatest length

GL	Withers height
220	1199
213	1160
214	1166
232	1264
206	1122

8.3.4.2) Sheep/goat measurements

Table 47Sheep/goat metatarsal measurements

	GL	*SD*	*DD*	*Bp*	*Bd*
mean	142.1	11.95	10.4	20.57	24.5
min	142.1	11.6	10.4	19.2	24.5
max	142.1	12.3	10.4	21.9	24.5
sd				0.87	
cv				4.23	
n	1	2	1	10	1

Table 48Sheep/goat metacarpal measurements

	GL	*SD*	*DD*	*Bp*	*Bd*
mean	124.88	13.98	10.14	23.18	24.97
min	116.2	9.5	9	21.7	23.6
max	133.9	18.9	12.9	26.1	27.2
sd	6.59	2.25	1.44	1.18	1.12
cv	5.2	16.09	14.2	5.09	4.49
n	6	10	7	11	7

Table 49Sheep/goat humerus measurements

	Bd	*BT*
mean	30.57	28.93
min	28.6	26.5
max	35	33.7
sd	2.16	2.36
cv	7.07	8.16
n	9	9

Table 50 Sheep/goat radius measurements

	GL	***SD***	***Bp***	***Bd***
mean	136	16.4	29.59	27.25
min	136	14.9	27.2	24.9
max	136	17.9	33.50	29.9
sd			2.37	
cv			8.01	
n	1	2	7	2

Table 51 Sheep/goat scapula measurements

	GLP	***LG***	***BG***	***SLC***
mean	31.65	23.63	19.53	19.3
min	30.2	22.1	18.5	17.9
max	33.3	24.9	20.4	20.9
sd	1.04	1.14	0.69	1.17
cv	3.2	4.82	3.53	6.06
n	6	6	6	6

The withers height was not calculated because sheep and goat are mixed and factors for calculating the withers height are different for the two species.

8.3.4.3) Pig

Table 52Pig humerus measurements

	SD	***Bp***	***BFp***	***Bd***	***BT***
mean	16	38	31.4	37.79	31.46
min	16	38	31.4	25.9	28.5
max	16	38	31.4	42.5	39.9
sd				4.00	5.92
cv				10.58	18.82
n	1	1	1	15	15

Table 53Pig radius measurements

	SD	***Bp***	***Bd***
mean	17.45	30.13	32.2
min	17.2	25.9	30.7
max	17.7	37	34.1
sd		3.36	
cv		11.15	
n	2	7	3

Table54 Pig tibia measurements

	SD	***Bp***	***Bd***
mean	18.75	46.7	28.98
min	17.5	46.7	27.5
max	20	46.7	31.6
sd			1.22

cv			4.21
n	2	1	9

Table 55, Pig scapula measurements

	GLP	***LG***	***BG***	***SLC***
mean	34.84	28.42	25.31	22.80
min	32.2	24.2	22.6	21
max	39.9	34.9	28.4	26.4
sd	2.01	2.52	1.75	1.49
cv	5.76	8.87	6.91	6.54
n	18	18	17	12

Table 56, Pig metatarsal IV measurements

	B	***Bp***	***Bd***	***GL***	***LeP***
mean	12.77	14.52	17.3	86.2	83
min	11.5	13.8	17.3	86.1	82.9
max	13.7	15.5	17.3	86.3	83.1
sd		0.70			
cv		4.82			
n	3	5	2	2	2

Table 57, Pig metatarsal III measurements

	B	***Bp***	***Bd***	***GL***	***LeP***
mean	13.15	15.17	16.8	79.93	80.25
min	13	14.2	16.6	77.7	76.6
max	13.3	16.5	17	84	83.9
sd		0.95			
cv		6.26			
n	2	6	2	3	2

Table 58, Pig pelvis measurements

	LA	***LAR***	***SH***
mean	37.1	31.66	12.17
min	32.7	29.9	11.5
max	41.9	33.9	12.9
sd	4.60	1.88	
cv	12.3	5.9	
n	5	5	3

The withers heights are not calculated as no complete long bones were available for measurement of greatest lengths.

8.3.5) Discussion of measurement data

Although only a small number of bones were complete enough to enable measurements various patterns have emerged. The withers height calculated for cattle are quite large although it must be remembered that the metapodials are not the most reliable bones for this calculation.

The large standard deviation and coefficient of variation seen for some dimensions is suggestive of bimodality this could be due to sexual dimorphism or it may result from

the inclusion of individuals from more than one breeding population in the sample. The very large cattle metapodials and phalanges seen appeared not only large but also particularly robust a possible explanation might be that these present oxen (a neutered male used for traction).

Comparison with other sites

Only the cattle provided data which could be used to calculate the withers height for the Long Acre assemblage. The height for the west Stow cattle have an average of 1117mm, which is similar to the lower end of the range seen at Long Acre. The ranges seen at the Peabody site are more similar to those seen at Long Acre with 1019-1334 and a mean of 1179mm. It could be suggested that the cattle from *Lundenwic* sites appear to be larger in stature than those from rural sites (if West Stow is a good example of a rural site).

8.3.6) Bone modification

General condition of the bone

Weathering of the bone or mineral encrustation through cess was common, but does not appear to be linked to any feature type or any particular period, and extends across features from all three phases. This is in agreement with the suggestion that the pits dug for quarrying were later filled in with domestic refuse/ cess.

Weathering

The weathering of the bone was uncommon suggesting that the contexts were deposited rapidly and that bones were not left lying on the surface for any considerable amount of time. 80% of bone showed no signs of weathering, 10% slight, 5 % more noticeable with flaking, 2% flaking = roughened , 2 % severe damage with splinters, and less than 1 % disintegrating.

Gnawing

Another indicator of bone not being buried rapidly is its availability to scavengers. Gnawing was noted rarely in this assemblage but the presence of the cess deposit which in many cases was as if concreted onto the bone surface hampered the identification of any variations in the bone surface such as gnawing and cut marks.

Butchery

A large number of bones (1020) showed ancient breakage, usually long bone shafts specimens. These resulted from percussion i.e. a bone being struck which could have been human action or may have been an indirect action; bones hitting each other as they were thrown into a pit. Broken shafts of long bones can also be interpreted as processing for the extraction of marrow.

Clear evidence of butchery was seen in the form of cut and chop-marks on bone surfaces. Cut marks were noted on 12 specimens, whilst chop marks were seen on two specimens.

The condition of the bone surface and common occurrence of concreted cessy deposits is thought to have obscured further examples of cut marks.

Table 59 Details of location of cut marks. (All on cow or cow sized specimens)

Proximal phalange	cut mark proximal
Atlas	cut marks on ventral side
Mandible	cut marks around hinge
Radius distal diaphysis	cut marks
Lumbar vertebra	cut marks on transverse process
Femur	cut and chop marks around trochanter
Mandible ramus and condyle	cut marks
Pelvis acetabulum and ilium	cut marks on medial surface of ilium shaft
Anterior mandible	cut mark
Posterior mandible	cut mark
Lumbar vertebra	transverse process chopped cut mark on cranial surface.

Reason for location of butchery marks:

- Atlas separation of skull from body
- Mandible posterior separation of mandible from skull
- Mandible anterior separation of the 2 halves of the mandible
- Vertebra transverse processes separation of carcass into 'sides'
- Phalanges removal of feet possible associated with use of hide
- Radius, humerus femur jointing of meat bearing bones
- Pelvis removal of limbs for jointing.

The butchery evidence shows both the early stages of the process: the dismembering of the major parts of the carcass, and signs of secondary butchery: the separation of smaller joints of meat that would become individual meals.

The fact that butchery marks have only been identified in cow is due to the poor condition of the bone surface (covered in cess) rather than a lack of butchery on the other main domestic species.

The signs of primary butchery coupled with the neonatal bones found suggest that there is the possibility of several of the species (at least cow and pig) being reared on or close to the site.

Pathology

Pathological changes in the bone were noted for a small number of specimens.

In total nine examples of pathology were seen. By far the most common condition was alveolar disease which was seen in both mandibles and maxilla of pig and in mandibles of sheep. In modern populations of sheep this can lead to a condition called broken mouth, where the incisors are lost and the animal can't feed. In this assemblage however it was only noted in the cheek teeth where it is less serious but as

the anterior part of the mandible is more fragile it may be that examples of broken mouth are missing due to taphonomic rather than pathological reason.

Other examples of pathological changes were seen in other skeletal elements; two articulating sheep-sized lumbar vertebra in which the articulating epiphyses both show bone loss and remodelling.

A pig radius with an area showing thinning of the bone surface around the proximal end on the medial surface was also seen.

The fact that pig showed the greatest incidence of alveolar disease could reflect their diet. Hillson (1986:314), notes that this condition is seen in animals (as in humans) where the diet is carbohydrate rich – of all domesticates the scavenging urban pig would be the most likely to have such a diet.

The very small number of specimens with pathologies may be due in part to the condition of the bone and the high incidence of cessy deposits which hindered the examination of the bone surface.

Table 60 Pathology table

Id no.	feature	context	element	species	description of pathology
444	218	217	mandible	O/C	alveolar disease around M1
567	008	006	mandible	S	alveolar disease
608	023	019	skull	S	alveolar disease
836	106	104	skull	S	alveolar disease
891	046	041	proximal phalanx	B	pathology on lateral side
1445	211	209	radius	S	surface of bone looks odd on medial side pathology
1448	211	209	mandible + P2-M3	O/C	Pathology - roots have area of rough cementum at apex
1897	057	095	lumbar vertebra	SSZ	cranial epiphysis articulates with 1898 pathology where they articulate
1898	057	095	lumbar vertebra	SSZ	caudal epiphysis articulates with 1897 pathology bone lost + remodelled

8.3.7) The Red deer (*Cervus elaphas*) antler off-cuts

One interesting feature of the assemblage is the presence of a number of fragments of red deer antler, many which appear to have been chopped or sawn. This was noted in the post excavation assessment. When the bases of the antlers were identified they were all shed rather than chopped from the pedicel of the skull.

Total weight = 1210
NISP = 27

Almost all specimens were sawn, a few were chopped and some too fragmented to identify if they had been worked. No other evidence of this species was identified in the assemblage: no skull, no long bones not even any phalanges. Thus it seems likely that the presence of the red deer antler can be explained by the following model.

Antlers which are shed by the males following the annual rutting season towards the end of the year were collected and brought on to the site where they were used in manufacture, possibly of tools. The fragments found could represent the waste products of this practise. The fact that they are absent from the earliest phase may just result from the smaller sample size or collection, but it could be that this relatively specialised craft did not develop until the settlement was larger and more varied in its trade links.

It is of particular interest that all of the antlers were shed rather than chopped from the skull of a deer carcass. At the middle Saxon sites of Jubilee Hall and Maiden lane sawn antler off cuts were also found but some of these were clearly sawn or chopped from the skull (P.137) Cowie and Whytehead 1988.

8.4) Discussion

The range of species identified in this assemblage is consistent with that expected for a site of such date and location. The proportions of the different species appears to follow the pattern that emerges in a study of other *Lundenwic* sites where cattle is the most important species followed by pig, but appears to contrast with that seen at West Stow where sheep have a much greater importance in the economy.

The ageing data is in line with that seen at other *Lundenwic* sites. The presence of the neonatal cattle and pig is very significant in that it strongly suggested that pig and cattle were reared in *Lundenwic*, which would indicate a level of self sufficiency within the settlement. The lack of young sheep and goat may be the result of this species being brought in once adult for wool and meat, or may be the result of taphonomic factors.

The size of the cattle is similar to that at other *Lundenwic* sites but larger than the cattle from West Stow.

The find of the sawn red deer antler in a reasonably large quantity may be evidence of a specialist craft industry which apparently relied on the import of shed antlers from a source outside of the settlement.

8.5) Conclusion

The analysis had reinforced the picture seen from other *Lundenwic* sites and has also highlighted some contrasts with sites outside of *Lundenwic* such as West Stow. Bede refers to *Lundenwic* as an emporium. The neonatal stock and antler working evidence is in agreement with this suggestion.

The size of the sample in terms of the number of ageable and measurable bones limited the amount of comparison between features and phase within the site but was sufficient to allow comparison with other sites. A number of *Lundenwic* sites rich in animal are currently under study by various authors; once these works reach the public domain a greater level of comparison with Long Acre will be possible enabling a synthesis of the use of animals in Saxon *Lundenwic*. Comparison of the information

from this analysis with that from other *Lundenwic* sites would certainly be worthy of publication.

8.6) Bibliography

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9) Metalwork

Finds of both iron and copper alloy were collected from the excavations. The majority of the metal finds were recorded as bulk finds, but the following were given small finds numbers:

Find No.	Context	Material	Description
2	029	Cu Alloy	Pin
4	087	Cu Alloy	Scabbard end
6	014	Cu Alloy	Pin
9	181	Cu Alloy	Coin
10	U/S	Cu Alloy	Coin
11	186	Cu Alloy	Casting waste
18	006	Cu Alloy	Coiled strip

9.1 Ferrous Objects

The slag fragments

All of the pieces are non-magnetic, or else very weakly magnetic; most have chalk and charcoal within them. All appear to consist of iron corrosion products, although there is also some pale white-blue glassy material on three pieces, and many have what appears to be refractory material along one side. None of the material appears to be ore. Charcoal and wood seem to have been used as fuel, and chalk is also a common additive. No analyses were carried out; there were no visible traces of other highly coloured metals such as copper alloy or lead.

These comprise the following

001 iron bloom, one piece with bone attached
002 slag with charcoal fragments
002 two large pieces slag, probably iron with charcoal and (burnt out) wood fragments
020 one large, 2 small pieces iron bloom? Some green surface colouration (oxides), refractory material, and deposits of pale blue-white glassy material on the surface.
021 slag; probably iron, some green surface colouration indicative of hydrated iron (I) and (II) oxides; inclusions of possible furnace material and charcoal
032 slag, probably iron with charcoal and (burnt out) wood fragments 3 bags
043 slag; iron corrosion products, with some surface deposits of pale blue-white glassy material on the surface.
053 slag with charcoal and pale blue-white glassy material on the surface.
053 slag; probably iron, some green surface colouration indicative of hydrated iron (I) and (II) oxides; inclusions of possible furnace material and charcoal
054 slag; probably iron, some green surface colouration indicative of hydrated iron (I) and (II) oxides; inclusions of possible furnace material and charcoal
056 slag
172 iron nail in two pieces
177 slag, probably iron with charcoal and (burnt out) wood fragments; chalk

9.2 Copper Alloy Objects

Condition

The condition of the objects is very varied; none has good preservation of surface detail, and all have considerable corrosion, with only retaining a core, and almost all the other being completely mineralised. This indicates highly aggressive burial conditions, with oxygen and moisture freely available: possibly conditions immediately prior to burial were also conducive to corrosion, e.g. acidic, or oxidative burning.

Features of interest

Scabbard slide

[u/s] <4> (Fig 12, no.4)
Part of a cast scabbard slide (extant length 27.5mm). The elongated foot is straight-sided, with chamfered sides (width 4mm, thickness 2.5mm); it is separated from the lower terminal by a raised projection that presumably held the binding attaching the slide to the scabbard in place (length 7mm, width tapering from 4mm to 2mm at the top). The terminal is of heart-shaped form (maximum width 11mm), with incised 'X' or saltire cross and projecting triangular foot knob (maximum width 6mm). The whole is poorly made, the terminal being markedly asymmetrical, with a thickness of 1mm on one side and 2mm on the other; there are also apparent casting flaws on the back.

The presence of the lower terminal from a late Roman scabbard slide, or runner, on this site is unexpected and the piece merits some discussion. The forms and decoration of certain elements of Roman military equipment found in 3rd-century contexts can be traced back to the Antonine period, when various changes were made to the design of belt fittings, and other objects such as scabbard slides were introduced (Bishop and Coulston 1993, 119; fig 80, nos.13-15). At first the side on which the sword was worn was dictated by rank; it was probably attached to a belt by means of suspension rings (ibid, 96). During the Antonine period the baldric was introduced as an improved means of sword suspension, and with it came the use of scabbard slides, which began to replace the suspension rings (ibid 112). During the later second and third centuries, the *spatha* became the standard Roman military sword, and was always worn on the left; suspension rings were no longer used, and the scabbard was always attached to the baldric by means of the scabbard slide (*ibid*, 126). The slides were made in bone, iron and copper alloy, and vary in form. The basic form of the copper alloy examples comprises an elongated mount secured vertically near the top of the scabbard, either by two or three rivets, and/or by a binding, facing away from the wearer (Oldenstein 1976, 96; Bishop and Coulston 1993, 112; MacGregor 1997, 64). The upper and lower terminals were flush with the scabbard so as to provide support, while the central section consisted of a raised bridge, generally tapering towards the base, under which the baldric was passed. This is illustrated in a reconstruction based on the finds from a burial at Lyon (Bishop and Coulston 1993, fig 92).

The copper alloy examples are often decorated with ribbed or bevelled shafts; the ornamental upper terminals vary considerably (*e.g.* ring, foliate, pelta, and crescent, amongst other forms). The lower terminals, however, are most commonly of ogee, or heart-shaped form (Oldenstein 1976, 96), with both solid and openwork variations on the theme. The use of an incised 'X' is not uncommon, and may echo the arrangement of the straps on the baldric. The nature of the bridge and its relationship to the terminals varies, but that of the Long Acre find was almost certainly of elongated trapezoidal form (*cf* Oldenstein 1976, Taf 12).

A range of bone, iron and copper alloy scabbard slides has been found on the continent; they mainly date from the late 2nd century and went out of fashion in the mid-3rd century. The distribution is extensive; although most common on Rhenish and Danubian sites and along the frontiers of the Roman Empire, these finds occur in Syria and Dacia (Bishop and Coulston 1993, 130) and are also well-documented in Denmark. There the largest collection is from Vimose, on the island of Fyn (excavated in 1869 by Engelhardt), where no less than 115 examples of the same general form as <4> were found (Klindt-Jensen 1952, 199; MacGregor 1997, 64). Close parallels for the Long Acre terminal include an example from Osterburken, which has a similar, but more elegant, foot knob (Oldenstein 1976, Taf 12.42), one from Vimose (Klindt-Jensen 1952, 199-201, Abb 4d) and another find, thought to be from Denmark, in the Ashmolean Museum (MacGregor 1997, 64-5, no.26.2; acc 1909.112). Also in this group and with the same incised saltire cross are finds from Niederbieber (more rounded terminal; Oldenstein 1976, Taf 12.35), and Stockstad (*ibid*, Taf 12.40: more spatulate, with pointed end). A find from Zugmantel falls into the same group but lacks the cross (Klindt-Jensen 1952, Abb 4h).

In Britain, several scabbard slides, or runners, are known from South Shields (Allason-Jones and Miket 1984, 195-7, nos 643-648), and from Hadrian's Wall. The latter include an example with tear-drop-shaped lower terminal (Bishop and Coulston 1993, fig 80, no.15). This is plain, but a find from Corbridge has the same saltire cross incised on the lower terminal as <4> (ibid, fig 90, no.6). An example from Cirencester is placed by Oldenstein in the same group (ibid, 97), but the illustration suggests that the incised decoration forms a trefoil design rather than a cross (Webster 1958, 74, and fig 3, no.34). Further scabbard slides from Colchester and from Usk and Caerleon in Wales that belong to this general group are summarised by Webster (1992, 129). Other military objects on which an incised 'X' appears include an iron bolt-head from Cirencester (Webster 1958, 75, fig 3, no.38).

Despite the presence of a fort in London, scabbard slides are remarkably rare (Allason-Jones in prep). Of the few metal examples that are listed in the accessible records, two are of iron, while four are of copper alloy. The latter comprise finds from excavations in Bishopsgate (BIS82 [1018] <301>) and St Thomas' Street, Southwark (STT74 [51] <106>), and two unprovenanced examples in the Museum of London reserve collections (79.10/1&/2 and 16777). Of these the closest parallel for the Long Acre find is a complete slide, possibly an unfinished object, the trefoil-shaped lower terminal of which has a crudely incised saltire cross (MoL acc. no.79.10/1&/2). The three bone scabbard runners from the Bank of England (MoL acc. no.13936), Swan Lane (SWA81 [2158] <1250>) and from Angel Court (ACW74 [A.9] <23>), are

rather different in form to <4> (Chapman 1976). That from Angel Court is from a dumped deposit dated to after 364 (Chapman 1976, 251; Chapman 1977, 64, fig 18, no.479).

From the above, the Long Acre find probably dates from the late 2nd to mid-3rd century, but it could have been lost (or redeposited) later than this. The presence of a late Roman military fitting in Long Acre, and moreover one that is possibly unfinished, is of some interest. At present it seems most likely that it represents scrap metal collected for recycling, but given that the site is not far from two Roman roads other possibilities cannot be ruled out. It is to be regretted that this intriguing object cannot be related to a specific context on the site.

Coins

<9>, context 181 is unidentifiable because of the extreme corrosion it has undergone, and the concretions adhered to it. However, it is Roman, and likely mid 4th century.

<10>, US is a bronze coin of either Constantinus II or Constans, from the Fel Temp Reparatio series and is of the 'fallen horseman' type, and dates from AD 337 - 361. The mint is not immediately identifiable, but this is a common coin.

Pins

[029] <2> pit [158]
Pin shaft. Length 17mm, diameter 1mm. Saxon.

[014] <6> layer
Complete pin with very small hemispherical head (diameter 2mm). Total length 49mm (bent), shaft diameter 0.9mm. Post-medieval.

Uncertain

[006] <18> quarry [008] (Fig 12, no.6)
Strip, coiled two/three times, with mineralised wood adhering. Width of strip 8mm, thickness c.0.5mm. Total length c.19mm, width c.8-9mm, H c.10mm. The void measures 10mm by 1.5mm.

Conservation summary

The artefacts were cleaned as far as possible: <2> and <9> were poorly preserved and the original surfaces did not appear to have survived, so only loose soil was removed from the surface. <9> had a thick deposit of mortar or cement on one surface: although this could have been removed, it would have caused some damage to the coin; since the surface had not been preserved in any case, it was decided that it would be pointless to clean it further.

The treatments comprised mechanical cleaning, stabilisation with benzotriazole, consolidation (if the object was very fragile), occasionally a further attempt at cleaning, then protection of the surface with Incralac lacquer.

The un-numbered find from Context 6 was given a light clean only; any other treatment would have affected the preserved wood.

List of artefacts

Small Find	Context No.	Description	X-ray No.
None	006	Fragment of copper alloy: probably copper alloy sheet, folded around a rectangular core, possibly organic: now lost. There is wood preserved on the surface.	01, 03
02	029	Fragment of copper alloy pin shaft	
04	087	Copper alloy scabbard slide: flat terminal has an inscribed cross.	
06	14	Copper alloy pin: dome-shaped head, possibly tinned: covered in a hard layer of burnt soil and ash.	
09	181	(Probably) a copper alloy coin, with deposit of cement (?) on one surface. The x-rays show no signs of other features. Neither the surface nor the edges have been preserved, so removal of the cement seemed pointless.	01, 03
10	U/S	Copper alloy coin: covered in a hard layer of ash and ?corrosion products; head visible on one side	01, 03
11	186	Unidentifiable piece of copper alloy, probably casting waste. It has a metal core, but the surface has not been preserved.	

Treatment summary

1 Mechanical clean with scalpel and glass bristle brush at x10 – x40 magnification
2 Stabilise with 3% weight: volume benzotriazole in industrial methylated spirit; rinsed in industrial methylated; air-dried
3 Consolidated under vacuum with 20% weight: volume Paranoid B72 in acetone: toluene 1:1; rinsed in acetone and air –dried
4 Further cleaning with scalpel at x10 – x40 magnification, softening the consolidated surface with acetone.
5 Lacquer with 2 coats of Incralac, and a top coat of Incralac with amorphous silica

Treatment	(None)	<2>	<4>	<6>	<9>	<10>	<11>
1	✓	✓	✓	✓	✓	✓	✓
2		✓	✓	✓		✓	✓
3		✓	✓	✓	✓	✓	
4					✓	✓	
5		✓	✓	✓		✓	

Materials used

Benzotriazole $C_6H_5N_3$

Industrial methylated spirit (95% ethanol, 5% methanol)
Paraloid B72™ (Poly (ethylmethacrylate/methacrylate) 70/30) or poly[1-(ethoxycarbonyl)-1-methyl ethylene]

Long Acre 1999 X-ray catalogue

X-ray No.	KeV	Time Mins	Finds Numbers
01	30	2.0	Cont. 006; <9>, <10>
	40	2.0	Cont. 006; <9>, <10>
	50	2.0	Cont. 006; <9>, <10>
02	50	2.0	Cont. 194
03	60	2.0	Cont. 006; <9>, <10>
	70	2.0	Cont. 006; <9>, <10>
	80	2.0	Cont. 006; <9>, <10>

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10) OTHER ACCESSIONED FINDS

Lyn Blackmore

Ceramic

Loomweights (Figure 12)

Six fragments from six loomweights (1398gm) were recovered. These derive from two three phase IIA contexts: pit [003] (fill [001], <12>, <13>, <14>), and pit [158] (fill 154], <17>. Two further fragments are residual in Phase IV (pit [048], fill [032]: <15>, <16>). In addition, another weight was found in 1954 during the construction work at 17 Long Acre/Conduit Court (Cowie 1988, 42; MoL acc 55.96; Cowie with Harding 2000, gazetteer WM5).

Fabrics and forms

The fabrics and forms of Saxon loomweights found in *Lundenwic* have been discussed elsewhere (Blackmore 1988; Williams 1989; Goffin 2003; Keily in prep; Blackmore in prep), and this detail is not repeated here except where necessary. All these weights are in fabric 1a, with a fine sandy matrix that is less micaceous and possibly more sandy than those recorded at Floral Street. Weight <14> resembles coarse London-type ware in the fracture. The flint content is sparse, but varies in size and reaches 11mm across in [1] <14> and 15mm across in <12>. Weight <15> is of interest as the surface of the central perforation was covered with a white slip or limewash. This trait is uncommon, but has been noted elsewhere, for example at

Bedfordbury (Williams 1989, 109), at Bruce House, Kemble Street (Keily in prep), Maiden Lane (Blackmore 1988, 114), and possibly also at Jubilee Hall (ibid).

The weights are all between 120-140mm in diameter, the most common size found in *Lundenwic.* Five have a D-shaped section, but vary in height from 42mm to 60mm, the thickest being the bun-shaped weight <13>. The sixth weight <16> has a more biconical, or V-shaped profile; this form is considerably less common than weights with other 'C' and 'D'-shaped profiles, but seems to have been in use alongside them (Blackmore 1988, 112; Goffin 2003, 218-219).

Three weights have impressions (Fig.12, nos.1-3), of which two are on the rounded 'upper' surface. That on <12> is roughly sub-rounded with rounded base (*c.*10mm across, depth *c.*15mm); it could have been made by a small finger or rounded object such as a spindle. The impression on <15> is oval (12 x 14mm, *c.* 12mm deep), and was probably made by a child's finger. That on <17> is on the more flattened face, but this seems nonetheless to have been the 'upper' side. The impression is sub-rectangular (*cf* Williams 1989, fig 36, no.129), and was probably made with a stick, or perhaps a bone rib (upper dimensions *c.*16mm x 7mm, tapering towards the uneven base; depth *c.*10mm). Such impressions, which may have been 'brand' or owner's marks (Pritchard 1984, 65), have been noted on several other sites in *Lundenwic*, with many examples from the Royal Opera House (Goffin 2003, 221).

Dating

Loomweights are most common in deposits dating to after the introduction of Ipswich ware, *i.e.* the mid-8th century onwards, but they do occur in earlier levels. Here it is significant that none are present in the phase 1 features, but while those from pit [003] and pit [158] are associated with imported pottery that is typical of the later 7th and 8th centuries.

Stone

[56] <5> pit [227]
Complete hone of fine micaceous sandstone, with slightly polished sides but in fresh condition. This stone is impossible to source without petrological analysis, and even this might not answer the question. Maximum length 121mm, width 43mm, thickness 12-17mm.

Acknowledgements

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11) GLASS

Glass was found in only two contexts; a piece of window glass from one of the post-medieval dumped layers (011) was of little significance beyond identifying the use of windows in the post-medieval period.

The other glass collected came from the fill of a Phase IIa pit; two globules of glass waste were both thought to indicate the collection of scrap glass for re-use in a small industry.

12) INDUSTRIES

Slag and iron bloom from working of iron ore was found. There was no casting waste, but the waste from ore working was present. There was also a very small amount of glass waste, showing that there may have also been manufacture of glass objects.

Pieces of six discarded loom-weights were found in refuse pits. These had been broken during the Middle Saxon period, presumably dumped because they were of no use. No other evidence of fabric manufacture was present.

Bone, horn from of cattle and goat were worked near the site, as was antler, as evidenced by sawn off-cuts. These discarded pieces are the waste from manufacture of everyday items such as combs and needles. There were no finished items. Two parts of strap-handles were collected (small finds 1 and 3).

A whetstone was collected from a Saxon pit (small find 5), which while being an interesting object, indicates part of the working economy of the period.

13) THE ARCHAEOBOTANICAL REMAINS *Alys Vaughan-Williams*

Samples

Four samples were collected which should show evidence of diet and environment, containing finds too small for hand-collection.

Introduction

Four environmental samples were taken from the site of Long Acre. They were between 1 litre and 30 litres in volume. The material was charred in all the samples except <1>, which contained mineralised material. Samples 2 (054), 3 (077) and 4 (044) were taken from pits, and sample 1 (053) was taken from a quarry. They are all from the Middle Saxon period, with <2> and <3> dated to between AD 600-750 and <1> and <4> to AD 750-850. The samples all contained a lot of bone, but plant material was scarce or absent in all four. The aim of the analysis was to extract any information about the diet of the inhabitants of this site, along with background information about the local environment. The results are summarised in table 1.

Methodology

The samples were all processed by flotation, using 1mm and 300µm sieves. The residues were scanned for any remaining artefacts or environmental material. The dried flots were sorted using a low power microscope, and the archaeobotanical remains identified using reference books, and the collection at UCL.

Results

Sample 1 contained only 8 mineralised seeds/ grains. Five were grains, but the preservation is not good enough to allow further identification. The remaining three seeds were apple pips (*Malus* sp.) No charcoal or charred seeds were present. The only other material to come out of the sample was small animal bones, including several teeth.

Sample 2 was composed predominantly of charcoal. The plant remains consisted of a couple of *Triticum* indet grains (wheat) and Grammineae indet (grasses). The remaining seeds were unidentifiable.

Sample 3 had the material preserved by charring. The majority were *Stachys* indet (Woundwort). The other identifiable species were *Viola tricolour* (wild pansy/ heartsease), *Carex* sp. (sedge) and Grammineae spp. (grasses) including one *Phleum* sp. All of these are typical of grassland or hedgerow environments, but two are medicinal plants.

Sample 4 had no plant remains.

Interpretation

The low number of archaeobotanical material present in these samples means that little can be interpreted with much certainty. The *Malus sp.* seeds from <1> indicate that apples were being consumed. The presence of wheat grains in <2> would suggest that those mineralised in <1> may also be wheat as opposed to barley (*Hordeum*

sativum). This cannot be assumed however, due to the fact the form of preservation varies, and <1> is from a slightly later time. The preservation did not allow identification beyond wheat indet. This low density and poor quality of preservation means that nothing can be concluded beyond that wheat was used in some form on this site, either for human consumption, for example for bread, or as fodder. The presence of charred remains, and charcoal, along with the domestic nature of the pits, leads to the conclusion that these seeds/ grains represent a small proportion of what was consumed by people living in this area. The mineralization of the grains and apple pips in sample 1 mean a high phosphorus content was present. This is normally associated with features like cess pits.

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Sample	Context	Volume	Flot vol (ml)	Abundance	Preservation	Charcoal (ml)	Desc.
1	53	1l	0	O	3	0	mineralised
2	54	30l	18	O	3	50	charred
3	77	6l	6	O	3	5	charred
4	44	-	20	-	-	0	nothing

A = abundant
F = frequent
O = occasional

1 = good
2 = ok
3 = poor

Animal Bones

Following the analysis of the hand collected animal bone assemblage a number of residues from sieved samples were found to contain bone fragments. These are not mentioned in the post-excavation assessment.

A total of three contexts had samples which produced animal bone.

Sample 1 from 035
Sample 2 from 054
Sample 3 from 077

Results

The details of the material are presented in Table 1 (below).

Species list for sieved samples

Bos taurus - cow
Ovis/Capra - sheep/goat
SM - Small mammal
Fish - Fish - not identified to species

Sus scrofa – pig	ssz - Sheep-sized
Mus sp. – mouse	csz - Cow-sized

Comment

The species identified are mostly the same as those seen in the hand collected sample with the exception of fish, which only appears in the sieved samples and only in relatively small quantities, and mouse. It would be expected that small mammals would be better represented in a sieved as opposed to hand collected sample.

Unusually the sieved samples did not yield any bird remains; several species of bird were identified in the hand collected samples (see main report).

Table 1 Animal bone from sieved samples at 15-17 Long Acre

Context	Sample Number	Species	Element	part	age	Side	sex	condition	Weight in grams	No of frags	comments
035	1	S	Lower incisor	most	A	R		Apex of root missing	2	1	Enamel wear only
035	1	FISH	vertebra	mid	A	B		Processes missing	1	6	6 small bony fish vertebra
035	1	SSZ	Costal rib	frag	SA				0.5	1	Fragment of costal cartilage
035	1	SSZ	Long bone	frag					0.5	3	
054	2	B	Max + 2Molar	distal	A	R		Mesial tooth in wear	73	3	Max fragment with 2 upper molars M1-M2
054	2	S	Max + p4-m3	Frag/ teeth	A	R		chipped	18	4	Teeth all in wear
054	2	S	incisor	most	A	L		Root chipped	2	1	Quite worn
054	2	S	Max + dp2	frag	J	L			1	1	Max fragment + premolar unworn
054	2	S	Dp3 upper	most	J	L		Roots chipped	0.5	1	In wear
054	2	S	Dp4 upper	most	J	L		Roots chipped	1	1	Enamel wear only
054	2	S	maxilla	distal	J	L			1	1	
054	2	S	mandible	frag	J				1	1	Fragment of juvenile mandible
054	2	S	Dp3 lower	most	A			In 3 pieces	1	3	In wear
054	2	S	M2 lower	crown	A	L		Roots missing	3	1	Very worn
054	2	S	Tooth frags	frag	A				2	6	Various fragments of pig teeth
054	2	B	Upper premolar	whole	A	?			9	1	Cattle upper premolar worn
054	2	S	Lower canine	most	A	R	M	Base missing	6	1	tusk
054	2	S	Upper canine	most	A	R	M	Base chipped	5	1	Upper canine fits with previous specimen
054	2	S	upperM3	most	SA				4	1	Roots not yet developed
054	2	S	upper m2	most	SA				1	1	Roots not yet developed
054	2	S	upper? m/pm	crown	SA				0.5	1	Roots not yet developed
054	2	SSZ	unid	frag					42	202	Unidentified fragments
054	2	SM	Long bone	shaft					0.2	3	from a small mammal
054	2	FISH	vertebra	mid	A				0.25	2	2 fish vertebra fragments
054	2	O/C	Phalanx 2	dist	A				0.2	1	Distal end of intermediate phalange
054	2	MUS	femur	w-dist	A				0.1	1	
077	3	CSZ	unid	f					4	5	

14) Clay Tobacco Pipes

Clay pipes were collected from several post-medieval features, most being stem fragments of the 17th-18th centuries, but there was one datable piece, a clay pipe bowl (011), manufactured between 1680 and 1710, suggesting a demolition date for the post-medieval cellar.

APPENDIX C: OASIS Form

OASIS ID: aocarcha1-36048

Project details

Project name	15-17 Long Acre, Westminster
Short description of the project	The majority of the features excavated dated to the Saxon occupation of Lundenwic. There were two phases of Saxon activity. The earliest phase was characterised by gravel quarries dating to the almost immediate post-Roman settlement by Saxon migrants. The later phase dates to the occupation of the 'emporium' Lundenwic between AD 600 and 850, before abandonment was forced by Viking raids. Lundenwic was an important North European trading port, and this was reflected in the pottery found on the site, much of it deriving from the continent. Initial evaluation of the site identified heavy truncation, removing all occupation layers, leaving only the fills of deeply cut features; pits and quarries. The fills of the later Saxon pits were characteristic of general settlement activity without being securely related to any specific process or function. The finds assemblage is dominated by animal bone, thus providing evidence of diet and economy. Occasional evidence of craft and industry was also present, illustrated by iron working, manufacture of bone objects and weaving.
Project dates	Start: 23-05-1999 End: 05-08-1999
Previous/future work	Yes / No
Any associated project reference codes	LCR 99 - Sitecode
Type of project	Recording project
Site status	Area of Archaeological Importance (AAI)
Current Land use	Vacant Land 1 - Vacant land previously developed
Monument type	RUBBISH PIT Early Medieval
Monument type	QUARRY Early Medieval
Significant Finds	BOWL Early Medieval
Significant Finds	LAMP Early Medieval
Significant Finds	JAR Early Medieval

Significant Finds	SCABBARD Early Medieval
Investigation type	'Full excavation','Open-area excavation'
Prompt	Direction from Local Planning Authority - PPG16

Project location

Country	England
Site location	GREATER LONDON CITY OF WESTMINSTER CITY OF WESTMINSTER 15-17 Long Acre
Postcode	WC 2
Study area	900.00 Square metres
Site coordinates	TQ 3015 8092 51.5116994022 -0.124247331499 51 30 42 N 000 07 27 W Point
Height OD	Min: 17.89m Max: 18.32m

Project creators

Name of Organisation	AOC Archaeology Group
Project brief originator	English Heritage
Project design originator	AOC Archaeology Group
Project director/manager	John Moore
Project supervisor	Karl Hulka
Type of sponsor/funding body	Developer

Project archives

Physical Archive recipient	Museum of London
Physical Archive ID	LCR 99
Physical Contents	'Animal Bones','Ceramics','Glass','Human Bones','Industrial','Metal','Worked bone','other'
Physical Archive notes	Held at AOC until transfer
Digital Archive recipient	Museum of London
Digital Archive ID	LCR 99
Digital Contents	'Animal Bones','Ceramics','Glass','Human Bones','Metal','Stratigraphic','Survey','Worked bone','other'
Digital Media available	'Database','Images raster / digital photography','Images vector','Spreadsheets','Text'
Digital Archive notes	Held at AOC until transfer
Paper Archive recipient	Museum of London
Paper Archive ID	LCR 99
Paper Contents	'Animal Bones','Ceramics','Glass','Human Bones','Industrial','Metal','Stratigraphic','Survey','Worked bone','other'
Paper Media available	'Matrices','Microfilm','Photograph','Plan','Report','Section','Unpublished Text','Drawing','Context sheet'
Paper Archive notes	Held at AOC until transfer

Project bibliography 1

Grey literature (unpublished document/manuscript)

Publication type	
Title	RESULTS OF ARCHAEOLOGICAL EXCAVATION AND RECORDING AT 15-17 LONG ACRE CITY OF WESTMINSTER
Author(s)/Editor(s)	Capon, L.
Date	2005
Description	136 pages A4, 9 illustrations

Project bibliography 2

Publication type	An article in published serial
Title	SAXON ACTIVITY AT 15-17 LONG ACRE
Serial title	The London Archaeologist
Author(s)/Editor(s)	Capon, L.
Date	2007
Description	4 pages, 5 illustrations

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