The Origins of Mid-Saxon Southampton

Excavations at the Friends Provident St Mary's Stadium 1998-2000

By Vaughan Birbeck
with Roland J.C.Smith,
Phil Andrews and Nick Stoodley

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Front cover: 7th century gold pendant with garnet-cloisonné and filigree decoration from grave 5508

Back cover: Aerial view of St Mary's Stadium (courtesy of Bluesky); 7th century gold crescentic pendant from grave 4202 and a small skein of gold thread from mid-Saxon cess pit 5274

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The following Wessex Archaeology staff were involved in the Stadium project. Adrian Chadwick directed the field evaluation in 1998–9 and the excavation of the electricity substation site in 1999. Vaughan Birbeck directed the excavation of the stadium footprint in 2000. Supervisory support on site was provided throughout by Paul Gajos, and by Angela Batt and Rachel Every (finds supervision) during the excavation phase. Over 60 site staff were involved during the excavations and their hard work and professionalism is acknowledged, particularly during the wettest April on record in 2000. The site and office-based finds and environmental work were co-ordinated by Lorraine Mepham and Michael J. Allen respectively, and Bruno Barber undertook initial editing of the report. The sieving programme was co-ordinated by Sarah F. Wyles and Phil Harding examined the flint. The project was managed from start to finish by Roland J.C. Smith, and Phil Andrews has been a constant source of advice and support throughout the project, in particular in the final production of this important publication report.

The archive and finds have been deposited with Southampton City Museums.

Summary

The Friends Provident St Mary's Stadium is located in central Southampton on the north-east side of what was the mid-Saxon town of Hamwic, an important manufacturing and trading centre from the late 7th to the mid-9th century. The excavations undertaken in 1998–2000 represent the single most extensive investigation within the settlement and uncovered an area of approximately 1.25 hectares.

The most important discovery was an early mixed-rite cemetery, the inhumation burials dating to the late 7th/early 8th century and some of the cremation burials perhaps a little earlier. That cremation was apparently still being undertaken at such a late date may have important implications for mixed-rite cemeteries where cremation is assumed not to have continued beyond the end of the 6th century. The inhumation burials were characterised by a relatively high proportion of well-furnished weapon burials and a small number of richly furnished female graves. It is suggested that the cemetery may have originated with an elite, possibly Jutish group representing the earliest inhabitants of Hamwic, and that it therefore pre-dated the arrival of the West Saxons in 686. The discovery of a cemetery which began in the second half of the 7th century brings the origins of Hamwic into line with those of other major English trading centres at London and Ipswich, perhaps all established through royal intervention.

A further important discovery was that mid-Saxon settlement covered the entire extent of the Stadium site, an area subject to little previous investigation, thereby increasing the known area of Hamwic from 42 to 49 hectares. Although a peripheral part of the town, occupation appears to have spread across the entire area during a period of rapid growth and expansion in the 8th century. A street, at least ten buildings and more than 400 pits were recorded. There was also evidence for a variety of small-scale crafts and industries, and a range of finds was recovered, some representing regional and long-distance trade. A relatively high proportion (approximately 25% by weight) of imported pottery was present, perhaps reflecting a combination of the site's proximity to the waterfront and the presence of foreign traders.

Of particular significance is the environmental information, derived from a comprehensive programme of sampling and analysis never before undertaken on a site in Hamwic. The animal bone reinforces previous conclusions of a plentiful though dull meat diet, but the mineralised, charred and waterlogged plant remains provide a much fuller picture of this element of the diet, the arable economy and the local environment, both within and immediately around Hamwic. Overall the picture of Hamwic is of a rather dirty, polluted, and unhealthy settlement, pockmarked with rubbish and cess pits, where disease and parasitic infection were daily hazards.

The decline of settlement in the 9th century mirrors that seen elsewhere in Hamwic, although there is no certain evidence for occupation continuing beyond *c*. 850 at the Stadium site. This decline can be attributed to a changing political climate at this time resulting from Viking disruption to the trading networks and a threat to the settlements themselves. There is some slight evidence for activity on the site in the 10th century, including a pit containing the remains of as many as 30 pots, but following this the area reverted to fields until redevelopment for housing and the Southampton gasworks began in the mid 19th century.

1. Introduction

O when the saints go marching in
O Lord I want to be among the number
When the saints go marching in!

The St Mary's Stadium Project

On August 25th 2001 at 3.00 pm, the first ever Premier League football match at St Mary's Stadium kicked off between Southampton FC and Chelsea FC. This brought to an end 103 years of football at *The Dell* in Bannister Park in the west of the City of Southampton. Southampton Football Club had returned to its roots in the inner city Parish of St Mary's on the west bank of the River Itchen.

In 1885 the St Mary's Church of England Young Men's Association Football Club was founded, with links to St Mary's, the parish church and probably of Saxon origin (Morton 1992, 50). While initially itinerant and with no fixed abode, the Club's success, in conjunction with the growth in popularity of association football, resulted in a permanent home at *The Dell* in 1898 (Juson 1999).

The desire for a new ground for Southampton Football Club was mooted from the 1940s onwards because of the restricted capacity of *The Dell*. This was exacerbated with the requirement for 'all-seater' grounds in the 1990s that further restricted capacity. With the continued footballing success of the Club, the need for a new stadium was paramount by the late 1990s. After a century at *The Dell* and after many possible alternative sites in and around Southampton had been considered, a site for a new stadium was finally chosen at Britannia Road in St Mary's, within view of the spire of the parish church. This site was doubly appropriate not only because the origins of the Club lay in St Mary's but also because it partly lay within Hamwic, the mid-Saxon town of Southampton, the forerunner of the present City and the place from which the County of Hampshire gets its name (Fig. 1).

In view of the archaeological importance of Hamwic, a programme of archaeological investigations at the Stadium site was commenced in late 1998 and ended in early summer 2000. Fifteen months later Chelsea's Jimmy Floyd Hasselbaink scored the first league goal at the pristine St Mary's Stadium in front of 31,100 fans. This report sets out the results of the programme of archaeological work. It details the background to the project, the results and a discussion and overview that sets the archaeological results into the context of our current knowledge about Hamwic.

The Site

The Stadium lies approximately 1 km to the east of Southampton city centre. The Stadium site covers an area of *c.* 4.5 ha, bordered by Marine Parade, Belvidere Road, and Britannia Road to the east, an industrial estate to the south, the railway line to the docks to the west, and Transco land to the north (Fig. 2). The River Itchen is now *c.* 100 m to the east of the site, although before construction of the existing wharfage the shoreline lay close to the present line of Marine Parade and Belvidere Road.

Before redevelopment the site was semi-derelict industrial land, primarily associated with the former Southampton Gasworks. It was occupied by a series of buildings, structures, bases of gasholders, concrete slabs, and hardstandings (Fig. 3), most of which were removed during the course of the archaeological site works.

The ground surface generally lay at *c.* 4 m aOD (above Ordnance Datum) with a fall of approximately one metre from north-west to south-east across the site. The top of geological deposits recorded in the archaeological works ranged from 3.40 m OD in the north-west down to 1.70 m OD in the south-east of the site. The geological deposits comprised brickearth, a fine sandy silt, above river terrace gravels. The thickness of brickearth above gravel varied across the site, decreasing from approximately 2 m in the north-west down to less than 0.15 m thick in the south-east of the site.

Local variations in colour and texture of the brickearth were recorded, with the most noticeable difference being observed in the south of the East Stand, representing the lowest point of the site in closest proximity to the River Itchen. Here the brickearth was distinctly greyer in colour with a more clayey texture. It may represent reworked brickearth merging with alluvium.

Archaeological and Historical Background

At the commencement of the archaeological programme in 1998 the Stadium site was known to lie on the north-east fringe of the mid-Saxon town of Hamwic, of national and international importance, and the most extensively investigated 8th–9th century

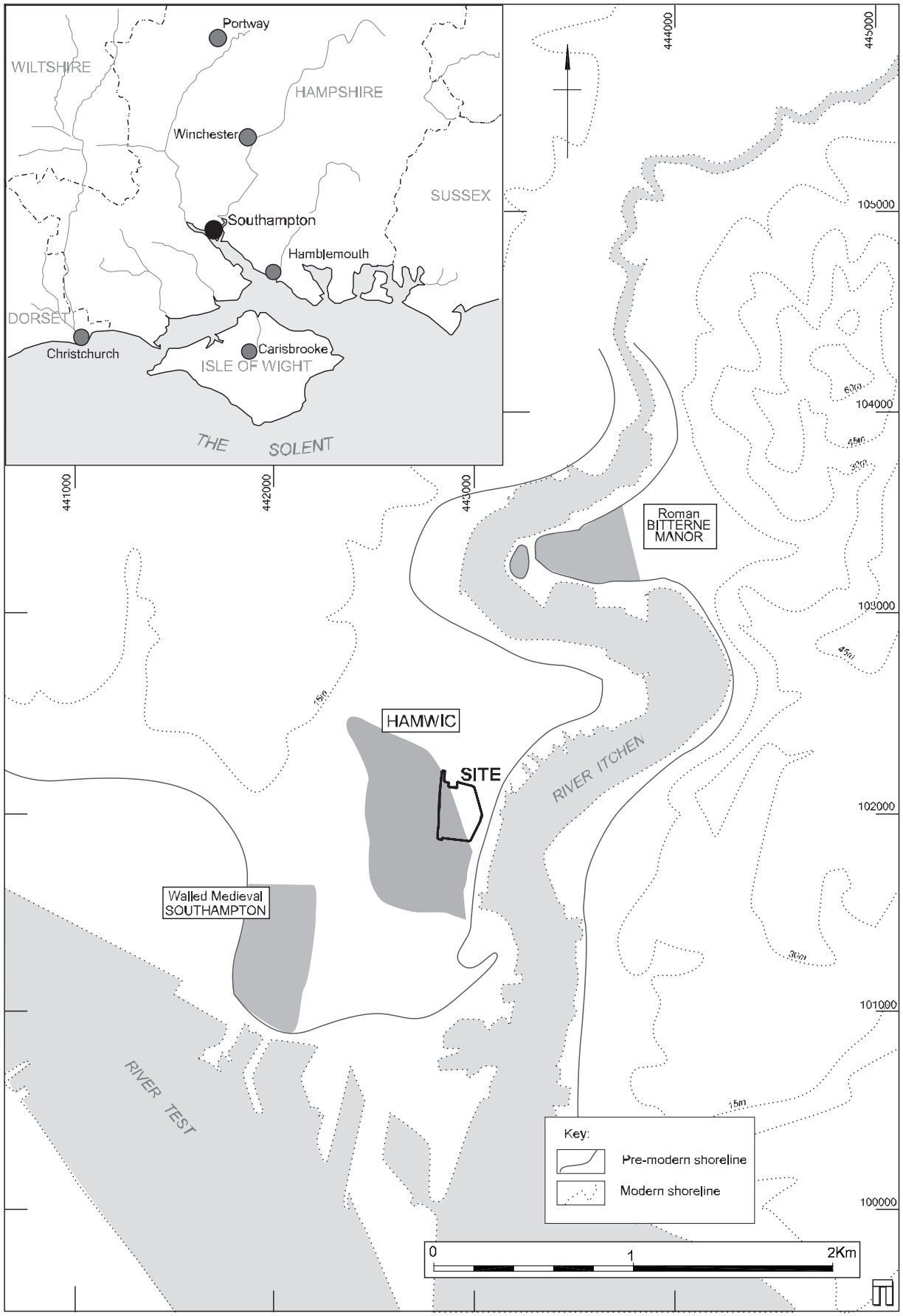


Figure 1 Location of the Stadium site within mid-Saxon Southampton (Hamwic) and (inset) of Southampton in relation to the towns of central Southern England (partly based on unpublished information supplied by Alan Morton)

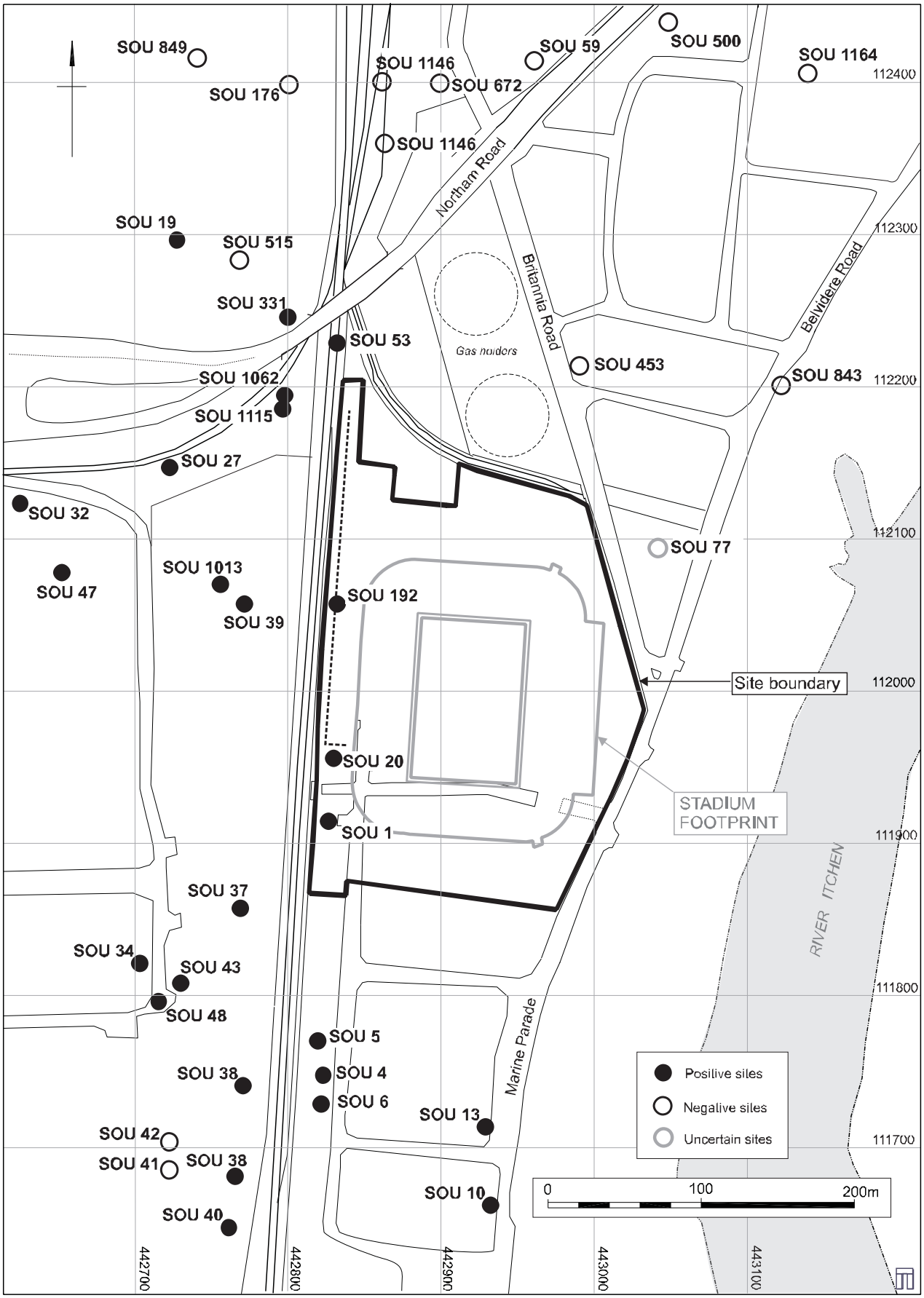


Figure 2 Location of the Stadium site in relation to the modern town plan, the R. Itchen, and other archaeological sites in the vicinity

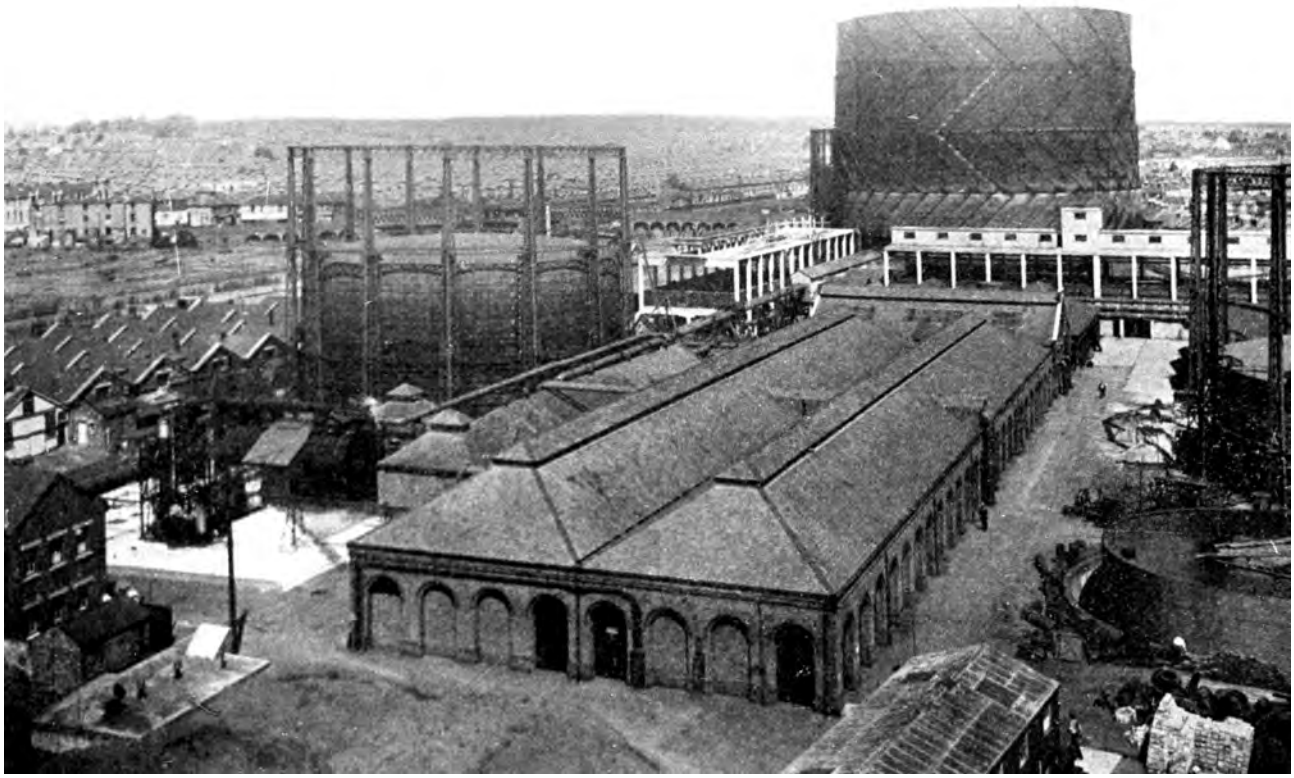


Figure 3 View of the site in the late 1940s, showing the Southampton Gasworks, looking north. © National Gas Archive, Transco plc

otown in England. Accounts of the history, development, and investigation of the Saxon town are reported elsewhere, including the results of excavations in Hamwic from 1946 to 1983 (Morton 1992) and on excavations at Six Dials (Andrews 1997), the single largest programme of archaeological investigation before the Stadium site. Readers are referred to these texts for detailed discussion of the origins, development, and abandonment of the mid-Saxon town; salient points relevant to the Stadium site are included here.

From the outset, however, it should be emphasised that, despite many years' research, only *c.* 3% of the Saxon town had been subject to archaeological excavation by 1998. Although the Stadium site has significantly increased that percentage to *c.* 4.5%, generalisations about Hamwic and statements on typicality should be treated with due caution.

Prior to the Stadium project, Hamwic was known to have covered an area of at least 42 ha centred on the present suburb of St Mary's and extending eastwards as far as the River Itchen. Available dating evidence supported the view that the town was founded around AD 700 as a new settlement, away from the remains of the Roman settlement at Bitterne Manor (perhaps *Clausentum*), although the possibility of an origin in the late 7th century was not excluded (see Morton 1992, 26–8). The 8th–9th century settlement developed and grew around a near-regular plan of gravel streets with timber houses, workshops, and stores set within individual properties.

The town was a production and trading centre with contacts in continental north-west Europe as well as elsewhere within England. A wide range of crafts and industrial activities took place within the town, in different households rather than within wider zones of activity. Such crafts included metalworking, bone and antler working, spinning, weaving, and hide preparation. By the end of the 9th century the area was substantially abandoned, although dispersed settlement continued into the Late Saxon period and in one area, around St Mary's Church, into and beyond the later Middle Ages.

Earlier archaeological excavations had taken place towards the south-west corner of the Stadium site, at Melbourne Street, in the 1970s (Fig. 2, SOU 1 and SOU 20; Holdsworth 1980). Observations were also made along the western edge of the site during pipelaying in 1984 (Fig. 2, SOU 192). These investigations had demonstrated that Hamwic extended into the south-west part of the Stadium site. However, the exact extent to which the town had developed to the north-east of SOU 1 and 20 was unknown (Morton 1992, fig. 9b), although investigations were beginning to demonstrate an absence of evidence to the north-east of the Stadium site, reflecting the presence of

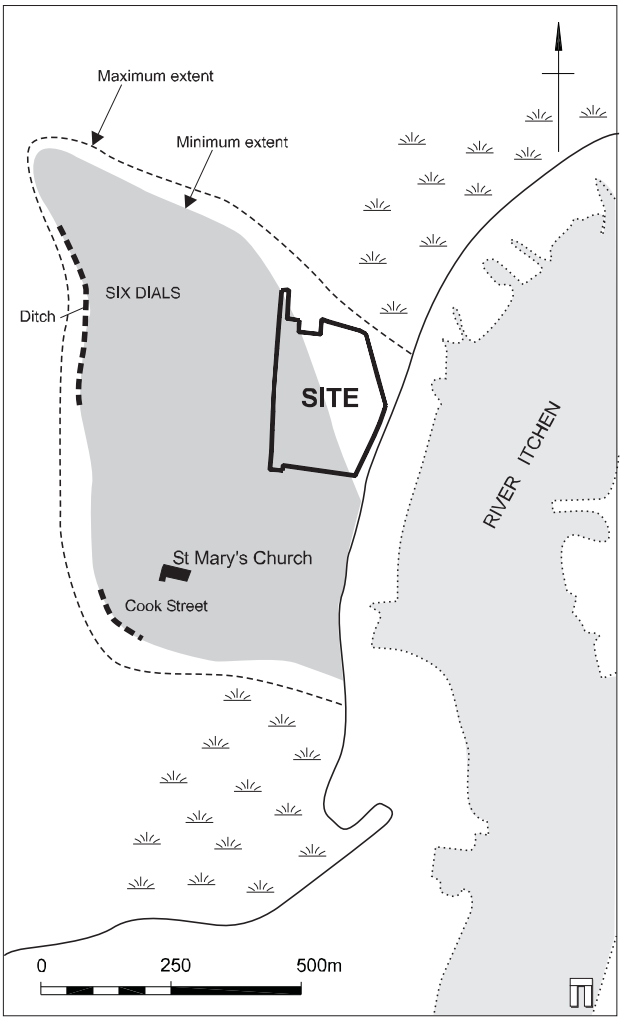


Figure 4 Conjectured extent of the town of Hamwic (after Morton 1992, fig. 9b). Its boundaries were marked by the R. Itchen to the east, salt marsh to the south, Northam Marsh to the north-east, and by a boundary ditch to the west

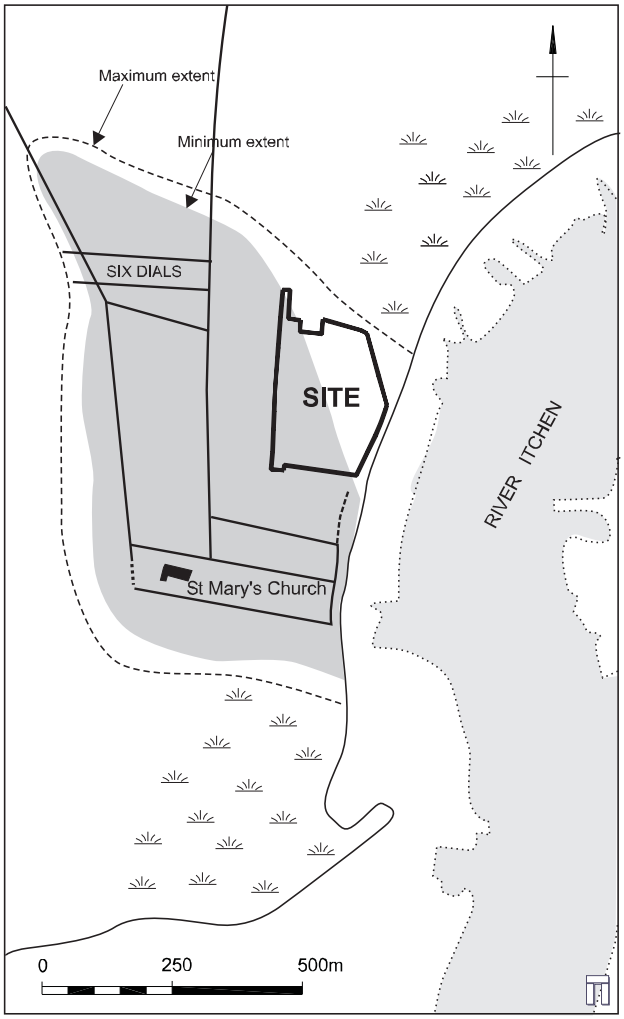


Figure 5 The Hamwic street pattern (after Morton 1992, fig 10d)

Northam Marsh. In other areas of the town the maximum probable extent of settlement had been determined, limited by salt marsh to the south and the River Itchen to the east (see Fig. 77). The boundary ditch at Six Dials to the north-west acted as a limit to the earliest phase of occupation in this area, but subsequent settlement spread beyond it.

The early origins of the town remained a matter of conjecture (*ibid.*, 26–8). Early occupation might have occurred simultaneously at several locations, expanding and merging with each other, or at one nucleus, which expanded rapidly and in a controlled manner. The focus for early settlement has been variously suggested as being in the vicinity of St Mary's Church, or on the waterfront, or at Six Dials (see Fig. 4).

There remains the possibility that Hamwic grew from a pre-existing 7th century settlement. No firm archaeological evidence exists for such a settlement, although much of Hamwic remains unexcavated, and such evidence might only be slight and difficult to recognise. Scull (2001) argued that there was enough pre-700, or possibly pre-700, material to indicate an earlier start. The possible location of such a non-urban settlement has been suggested some 250 m to the west of the Stadium site at SOU 47, in relatively close proximity to two early cemeteries, at SOU 20 and SOU 32 (see Fig. 2), the former possibly containing elite burials (Morton 1992, 28, 51–2).

A series of metalled and unmetalled streets and alleyways was established very early in the development of Hamwic. Some were laid in straight stretches over 100 m or more establishing a relatively regular street pattern within the town (Fig. 5). One probable street was found within the Stadium site, and a postulated strand road (*ibid.*, 38) running alongside the Itchen shoreline, may have extended along the eastern edge of the site.

Excavations at SOU 1 and SOU 20, towards the south-west corner of the Stadium site, recorded mid-Saxon occupation, typified by many pits, a few wells,

and numerous post- and stake-holes representing at least two timber buildings (Holdsworth 1980). Finds of pottery, glass, coins, and metalwork were recovered alongside large quantities of animal bone and marine shells. These features and their contents are comparable to evidence for mid-Saxon occupation found elsewhere within the town, except that in larger excavated areas properties defined by physical boundaries can often be discerned, such as at Six Dials (Andrews 1997, 46). Property boundaries may be represented by fence lines, pit alignments, or by street frontages.

One of the potentially most significant aspects of the excavation at SOU 20 was the discovery of two graves (Holdsworth 1980, 38), part of a cemetery of unknown extent. Each grave contained a spear and one also contained a seax, representing the only weapons recovered from Hamwic before the Stadium excavation. These graves were interpreted as early features within the town, although their full significance was unknown (Morton 1992, 28). While the cemetery of which these burials were a part fell within the Stadium site, the proximity of other mid-Saxon cemeteries, such as the later example at SOU 13 (*ibid.*, 121) 200 m to the south, indicated the potential for other cemeteries within the site. In this respect, undated human bone recovered from SOU 77 just to the north-east of the Stadium site (*ibid.*, 48) may be of significance, although its derivation from a Saxon cemetery is unsubstantiated.

By AD 900 most of the mid-Saxon town appears to have been abandoned and the site was beginning to revert to open agricultural land; many areas remained that way until the expansion of Southampton in the late 18th and 19th century. This appears to have been the case for the Stadium site where field boundaries are recorded on maps of around 1600 and thereafter. These boundaries may have medieval origins, although the fields that they defined were beginning to be encroached upon by development from the end of the 18th century onwards.

It was probably in the second half of the 1790s that the Northam branch of the ill-fated Southampton and Salisbury canal was dug across the north-west corner of the Stadium site (Welch 1966; Course 1976), at the same time that Northam Road was built. The gasworks originated in 1818/19, on a small site well to the south of the Stadium site, and 'migrated' northwards in a number of stages during the 19th and 20th centuries. The first housing on or very near to the Stadium site dates to the 1830s and 1840s. Bevois Street and Longcroft Street are both shown on a map of 1835, with extensive housing. Melbourne Street does not appear then, but is shown laid out on a map of 1842 (with very little building). According to a detailed 1846 map, much of Melbourne Street was built up with terraced housing, and seems to be a post-railway development. The London & Southampton Railway (as it was then known), that forms the western boundary to the site, laid the first lines in 1839/40 (Moody 1992, 5–7 and 33–8). Bevois Street, being an earlier feature, actually spread across the later-chosen route of the railway. Some houses in Bevois Street appear to have been demolished, and certainly its east end was severed from the rest of itself. It continued to be called Bevois Street until after the post-World War 2 demolition of the houses, when the eastern stub became subsumed into Longcroft Street. Longcroft Street was originally just a short and narrow stretch to the east of Bevois Street and on a different alignment, roughly at 90° to Marine Parade. The Gasworks did not displace earlier housing when expansion occurred, but generally utilised areas where there was no housing. Some houses on the north side of Longcroft Street did disappear early in the 20th century, probably a result of the Gasworks expansion into the area in the late 19th century. However, the biggest changes in housing came in the second half of the 20th century, following wartime bombing and a post-war policy of slum clearance in the Chapel area. What had been a community of densely-packed artisans' dwellings was replaced by light industrial units, with the Gasworks now occupying a substantial area to the north of Longcroft Street (see Fig. 3). However, by the latter part of the 20th century, many of the Gasworks structures became obsolete and were demolished. The site had become a semi-derelict, inner city brown-field site.

The Archaeological Project

Once proposals for the new Stadium were in place, and because of the site's potential archaeological importance, Southampton City Council required an initial programme of field evaluation before determining Southampton Football Club's planning application. The field evaluation, comprising two phases of trial trenching, was undertaken in late 1998 and early 1999 (Wessex Archaeology 1999a and b). Despite limitations on the extent of the evaluation imposed by standing buildings and buried gasworks structures, it was soon apparent that Saxon deposits occurred throughout the Stadium site. Although these deposits were sealed below 0.5–1.4 m of modern overburden and in places were truncated by modern intrusions, there remained some areas relatively free of modern disturbance. A subsequent ground-probing radar survey was, however, generally unsuccessful in clearly establishing the extent of the buried disturbances (Stratascan 1999).

In consequence, Southampton City Council, with the full agreement of English Heritage, required an

Figure 6 Trench location plan

Figure 7 Excavation in progress in the South Stand area, looking south-west, with St Mary's Church in the background

appropriate strategy to mitigate the impacts of construction. The principles of this strategy were that:

> 'those parts of the development that carry a threat to the archaeological deposits will be excavated. It is intended that, apart from agreed exceptions, where other forms of investigation are appropriate, the entire threatened area will be opened to excavation'.

The principal areas threatened by development comprised the footprint of the new Stadium, specifically the North, South, East, and West Stands, and a new electricity sub-station in the south-west corner of the site. Lesser impacts would result from the digging of footings for a new railway footbridge in the north-west corner of the site, service diversions, footings for a retaining wall on the Britannia Road frontage, and other peripheral works. Elsewhere, preservation *in situ* was to be achieved below the pitch and below the car parking areas on all four sides of the Stadium.

The Stadium footprint, electricity sub-station, and footings for the railway bridge were all subject to detailed archaeological excavation, while the remaining development works, including the removal of contaminated ground – mainly in the vicinity of former gas holders – were subject to archaeological watching briefs. The areas subject to detailed excavation and watching briefs are shown in Figure 6.

The archaeological site works followed a uniform excavation strategy agreed with the Southampton City Council. Generally, major solid obstructions such as concrete bases, slabs and footings were left *in situ* to avoid further disturbance which would result from their removal, hence the somewhat irregular plans of some of the excavated areas (see Fig. 6). The principal Saxon feature types comprised pits, post-holes, stake-holes, and graves. All pits were half-sectioned, except in a few cases where a quarter-section was considered appropriate. Post-holes were half-sectioned, but stake-holes were not routinely excavated except where they formed part of a structure. All graves were fully excavated. The excavation of other Saxon deposits, such as gravel surfaces, and also later features was agreed on site as appropriate. The excavation programme took place between December 1999 and May 2000, employing a team of up to 30 archaeologists. A general impression of the site's setting and of excavation conditions is provided by Figures 7 and 8.

Dating and Phasing

The date of the earliest mid-Saxon occupation in Hamwic as a whole is discussed by Morton (1992, 26–8), who concluded that:

> 'it is more likely that Hamwic's origins can be dated to the first decades of the 8th century, rather than the late 7th century or the middle of the 8th century'.

Andrews (1997, 20) was more inclined towards the possibility of a slightly earlier date, prior to AD 700,

Figure 8 Excavation in progress in the South Stand area, looking east, with modern wharfage in the background. The mid-Saxon waterfront would have been rather closer

as was Scull in his consideration of the cemetery evidence (Scull 2001). The dating of the early cemetery at the Stadium site to *c.* 650–720, and by inference the settlement or settlements that it served, appears to lend support to the latter suggestion.

The cremation and inhumation burials belonging to this early cemetery represent the earliest datable Saxon features at the Stadium site. Their dating is derived principally from a study of the grave goods, with some help from stratigraphic relationships and a series of radiocarbon dates which are presented and discussed below. This evidence provides a precision of sorts for the dating of this important cemetery.

Such precision is not so achievable for the subsequent mid-Saxon occupation on the site. As with previous excavations in Hamwic, establishing a degree of accuracy for dating deposits spanning perhaps 200 years is fraught with the difficulties previously described by Morton (1992, 27) and Andrews (1997, 13). Limited stratification, principally the sequence of deposits within pits as well as intercutting pits, provides some relative dating alongside limited chronological dating from finds, principally the pottery, coins, and glass.

This, however, has only allowed limited phasing into early mid-Saxon (before *c.* AD 750), mid mid-Saxon (AD *c.* 750–800/850) and late mid-Saxon (after *c.* AD 800/850). Only a relatively small number of features and deposits can be confidently assigned to either the early or late mid-Saxon phases, and the vast majority fall within middle phase. For this reason this report follows a similar format to Andrews's (1997), and describes the principal attributes of the settlement evidence in turn within which potentially earlier and later elements are presented and discussed. Unlike Andrews's volume, however, this report sets out the entire results of the project, including details of the finds and environmental analyses. As such it should complement the predominantly site or finds-based publications to date on Hamwic.

Overall, the Stadium site has a major contribution to make to our knowledge and understanding of the late 7th–9th century town. In particular:

- it represents the largest area ever excavated in Hamwic in one campaign,
- it fills an area of Hamwic that previously had been subject to very little investigation,
- the early cemetery has given us detailed and important information about the events leading up to the establishment of Hamwic,
- it provides types of evidence, particularly environmental data, that were not available from previous excavations, and which will stand as benchmarks for future work,
- it promotes comparison with other sites, including those nearby that were published almost a quarter of a century ago (Holdsworth 1980).

2. Before Hamwic

The earliest pre-Saxon material from the Stadium site is a small assemblage of worked flint, most residual in mid-Saxon contexts but some pieces were found in the surface of the brickearth. Much of the flint comprises undiagnostic and broken flakes. A few pieces are technologically or typologically distinctive and are dated more precisely.

Mesolithic material is represented by blades and cores, the majority recovered in the south-east of the site. A broken obliquely blunted point was found in a small irregular scoop along with one sherd of mid-Saxon pottery. Truncated blades, scrapers, and a microdenticulate may also be of Mesolithic date. All of the pieces were made on small nodules of flint from the local gravels which would have been easily accessible on the foreshore of the River Itchen, a short distance to the east. Finds of tranchet axes and picks (Wymer 1977, 121) and other Mesolithic material from excavations within Hamwic (Andrews 1997, 15) indicate that hunting groups exploited the immediate area, and probably the whole of the Solent basin, on a large scale.

Small quantities of residual Neolithic material were also present, including a flake from a ground flint axe, end scrapers made on flakes, and a small bifacial axe or knife from the topsoil in the West Stand. This material was also made on nodules of heavily rolled flint from the local gravels. Two end scrapers were made on large flakes, which may have been quarried from the chalk. Other large flakes and fragments of this distinctive raw material from elsewhere on the site may also be of Neolithic date. A single barbed and tanged arrowhead was found in a tree throw in the West Stand.

Seven sherds (20 g) of Late Bronze Age or Early Iron Age flint-tempered ware were recovered from mid-Saxon features. No features of this date were recorded, although a nearly complete Middle-Late Iron Age pot was found in a small pit excavated on SOU 20 (Smith 1984, 45).

The residual prehistoric material adds to a growing body of evidence for extensive, though not intensive, use and exploitation of the river valley margins in and around Southampton (Smith *et al.* 1984, 45–7; Crockett 1996; Adam *et al.* 1997).

A moderate assemblage of Roman pottery, ceramic building material, coins, and other metal finds was also recovered, the majority from Saxon features, and a group of possible cultivation furrows was sealed below a Saxon gravel surface, interpreted as a street, in the East Stand. The furrows may be of Romano-British date and, if so, add to the growing body of evidence for Roman agricultural activity recorded elsewhere within Hamwic (Morton 1992, 24; Andrews 1997, 15). Much of the more abraded pottery and ceramic building material probably results from (Roman) manuring, while some items, including jewellery, finewares, and coins are likely to have been scavenged as souvenirs, heirlooms, or scrap for recycling in the mid-Saxon period; this is discussed further below in the various finds catalogues. Some Roman material such as brick, tile, and unworked stone may have been deliberately collected from Bitterne Manor or other nearby Roman sites and reused in hearths or other structures, or as weights or ballast.

3. The Early Cemetery (7th–early 8th Century)

The earliest securely dated features recorded at the Stadium site were 18 cremation burials and 23 inhumation burials (Fig. 9). The majority of the graves lay in the West Stand, with two cremation burials towards the west end of the North Stand and an unusual double inhumation burial in the South Stand. A further group of eight inhumation burials in the North Stand are believed to be a later cemetery, and these are described in Chapter 4.

Dating

The majority of the 23 inhumation burials are dated to the later 7th or early 8th century (between *c*. AD 650 and 720) on the basis of diagnostic grave goods (below). Two graves excavated in the 1970s at SOU 20 (Holdsworth 1980, F183 and F288), immediately to the west of the West Stand, are of a similar date and, in view of their close proximity, are clearly part of the same inhumation cemetery (see Fig. 9).

The absence of chronologically distinctive finds means that the dating of the cremation burials is more problematic. None of the pottery vessels which contained the cremated remains is more closely datable than 5th to 7th century and the grave/pyre goods recovered from the cremation burials (a bone or antler medallion and an ivory bag ring) have a similarly broad date range. No Saxon cremation burials have previously been found in Hamwic and the Stadium site examples, therefore, represent a significant discovery.

Radiocarbon Dating
by Michael J. Allen

In an attempt to clarify the chronology, five radiocarbon determinations were obtained, three from pyre debris (identified charcoal) and two from cremated human bone, from four cremation burials in the early cemetery. A further radiocarbon determination was obtained from one of the inhumations in the later cemetery (burial 7381, see below). The results have been calibrated with the 20 year atmospheric calibration curve using CALIB 2.15 using the data sets in Stuiver *et al.* 1993 and are expressed at the 95% confidence level with the end points rounded outwards to ten years following the form recommended by Mook (1986).

The results presented in Table 1 show large discrepancies between the dating of the cremated bone and that of the pyre debris. The results obtained from charcoal are considered more reliable than those from cremated bone as the technique of radiocarbon dating cremated bone is still in its relatively early stages of development. Few independently corroborated results have been published. Recent results seem to show an off-set of up to 250 radiocarbon years earlier than independently validated dates for the same event. At present it seems that this 'off-set' is neither constant nor consistent (discussion at International Radiocarbon conference, Oxford, 2003). Results on charcoal and cremated bone from the same cremation urn (urn 7140, from grave 7138; 1245±40 BP and 1510±45 BP respectively) at the Stadium site, which are considered to be part of the same event, seem to be as much as 250 radiocarbon years apart. Furthermore, although the two determinations on cremated bone are statistically distinguishable at the 95% confidence level they fall between about 100 and 250 years earlier than those on charcoal. This seems to be typical of the method giving consistently older age-estimates. The three results from charcoal are not statistically indistinguishable from each other at the 95% confidence limit, however those from burials 5114 and 5106 are.

It should be noted, however, that if the dating of the bone is correct, the cremation burials most probably occurred in the early Saxon period not later than the early 7th century at the very latest. This would be in line with traditional dating of cremation burials in Saxon England, but would have to imply

Table 1 Radiocarbon dates from the cemeteries

Grave	*Material*	*Context/ urn*	*Lab. no.*	*Result BP*	*δ13‰*	*Calibrated result AD*
7138	charcoal, *Corylus*	7140	GU-9322	1245±40	-26.2	670–880
7138	cremated human bone	7140	GrA-18295	1510±45	n/a	430–630
5106	charcoal, *Corylus*	5107	GU-9324	1350±40	-25.2	610–770
5114	charcoal, *Corylus*	5115	GU-9323	1420±45	-25.6	550–680
5134	cremated human bone	5135	GrA-18294	1540±45	n/a	420–610
7380	human bone	7381	NZA-14941	1245±70	-19.7	650–950

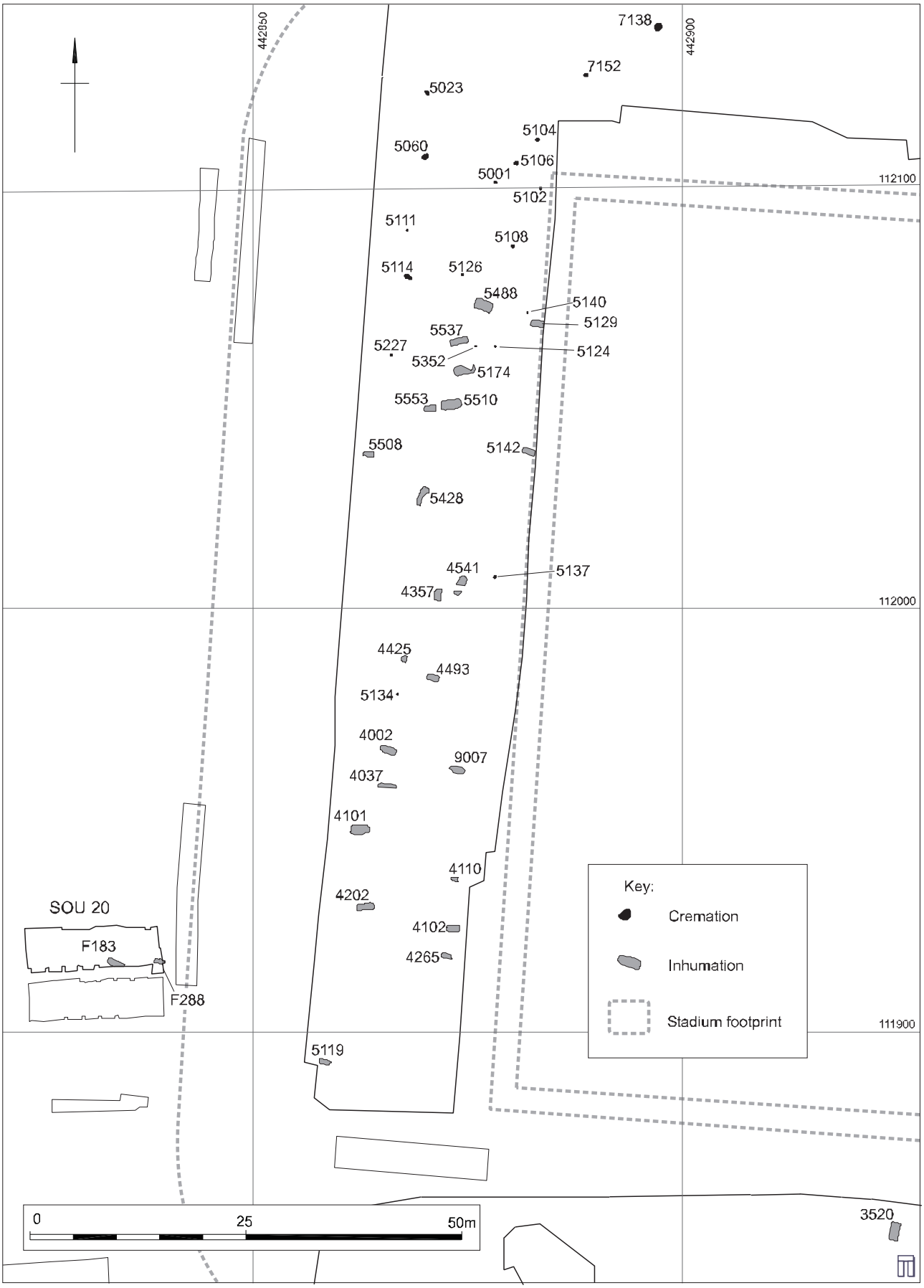


Figure 9 Plan of the early cemetery, beneath the West Stand, also showing the location of two graves found on the earlier SOU20 excavations

that there was no continuity with the inhumation cemetery, datable from its grave-goods to the late 7th century. On the other hand, the radiocarbon determinations from the charcoal indicate a potential date range of late 6th–late 9th century, with a 7th century date being considered most likely on other grounds (see below). This would mean that the cremation burials were being made in southern England about a century after they are usually thought to have ended.

Cemeteries of 6th–7th century date in the region around Southampton, such as those excavated at Alton (Evison 1988), Bargates (Jarvis 1983), and Portway (Cook and Dacre 1985), all now or formerly in Hampshire, often contain both inhumation and cremation burials of broadly contemporary date. It is, therefore, likely that the two separate burial traditions were at times practised simultaneously within single cemeteries; this appears to be the case at the Stadium site. However, what is particularly significant about the Stadium site is that the two rites were apparently being practised together at such a relatively late date, in the second half of the 7th century. At Alton and Portway no urns are claimed to be post-6th century, although at Apple Down, Sussex, the cremation burials were argued by Down and Welch to extend beyond the middle of the 7th century (1990, 108–9).

In at least one case in the Stadium site cemetery, an inhumation grave (5129) clearly post-dated a nearby cremation grave (5140) as it contained four sherds of the cremation urn within the grave fill. It is possible, therefore, that all the cremation graves pre-date the inhumation graves. However, the radiocarbon dates, along with the dating of the cremation urns and grave/pyre goods, and their proximity to the inhumation burials, suggest that the cremation cemetery (or at least some graves) are probably broadly contemporaneous with the inhumation cemetery (ie, between *c*. AD 650 and 720). Clearly, the issue of dating has not been completely and satisfactorily resolved, but further high-precision determinations on burials from other mixed-rite cemeteries may show at least some cremation burials to be later than has previously been assumed.

The Cremation Burials

The 18 cremation burials (Figs 9 and 12a) were originally contained in urns, but truncation caused by medieval and post-medieval cultivation and 19th- and 20th- century building construction had damaged the majority of them to a greater or lesser degree. In two cases little more than a few sherds of the vessel and a small deposit of cremated bone survived. However, in most cases 15–95% of the vessel survived and six of the cremation burials were only slightly disturbed.

Where practical the backfill of all cremation graves was retained for the recovery of artefacts, cremated bone, and possible pyre debris. The graves were then recorded with the urns and their contents in situ prior to the lifting of the urn. All urns were lifted whole, along with their contents, for excavation in a more controlled environment. Two of the urns (5025 in grave 5023 and 7150 in grave 7152), of which approximately 60–70% and 90% respectively survived in the ground, were too badly underfired for the retrieval of sherd material. Consequently the only records of the form of these vessels are the field drawings and photographs.

All the cremation burials were deposited in small, sub-circular graves, usually only a little larger than the vessel they contained. The one exception was grave 5114, a large irregularly shaped grave, which also contained a dump of what seems likely to be pyre debris. Possible pyre debris were also recovered from the backfill of several other graves and within the fill of a few of the cremation urns.

One of the more truncated urns (urn 5173, grave 5174) appears to have been buried in an inverted position as only the rim and upper body of the vessel survived. All other vessels, with the exception of urn 5115 (grave 5114), which was laid on its side, and those in the graves that were too truncated for the position of the urn to be discerned, were buried in an upright position.

Catalogue

A plan of the burial accompanies each entry, with an inset to show its location within the early cemetery, along with illustrations of the associated pyre and burial goods (see Figs 10–11). Detailed discussion of individual items follows the catalogue.

Grave 5001
This approximately circular grave was 0.32 m in diameter and 0.11 m deep with near-vertical sides and a concave base. It contained an adult of indeterminate sex, aged 30 years or over (5003), in an organic-tempered (fabric 1) pottery vessel. An estimated 50% of the urn survived. A small quantity of burnt animal bone, possibly sheep, was recovered from within the urn and probably represents pyre goods. A small quantity of cremated human bone (0.6 g) was also recovered from the backfill of the grave (5002). This probably represents redeposited pyre debris.

Grave 5023
This oval grave was 0.46 m long, 0.34 m wide and 0.24 m deep with irregular sides and a concave base. It contained an adult, possibly male, aged between 35

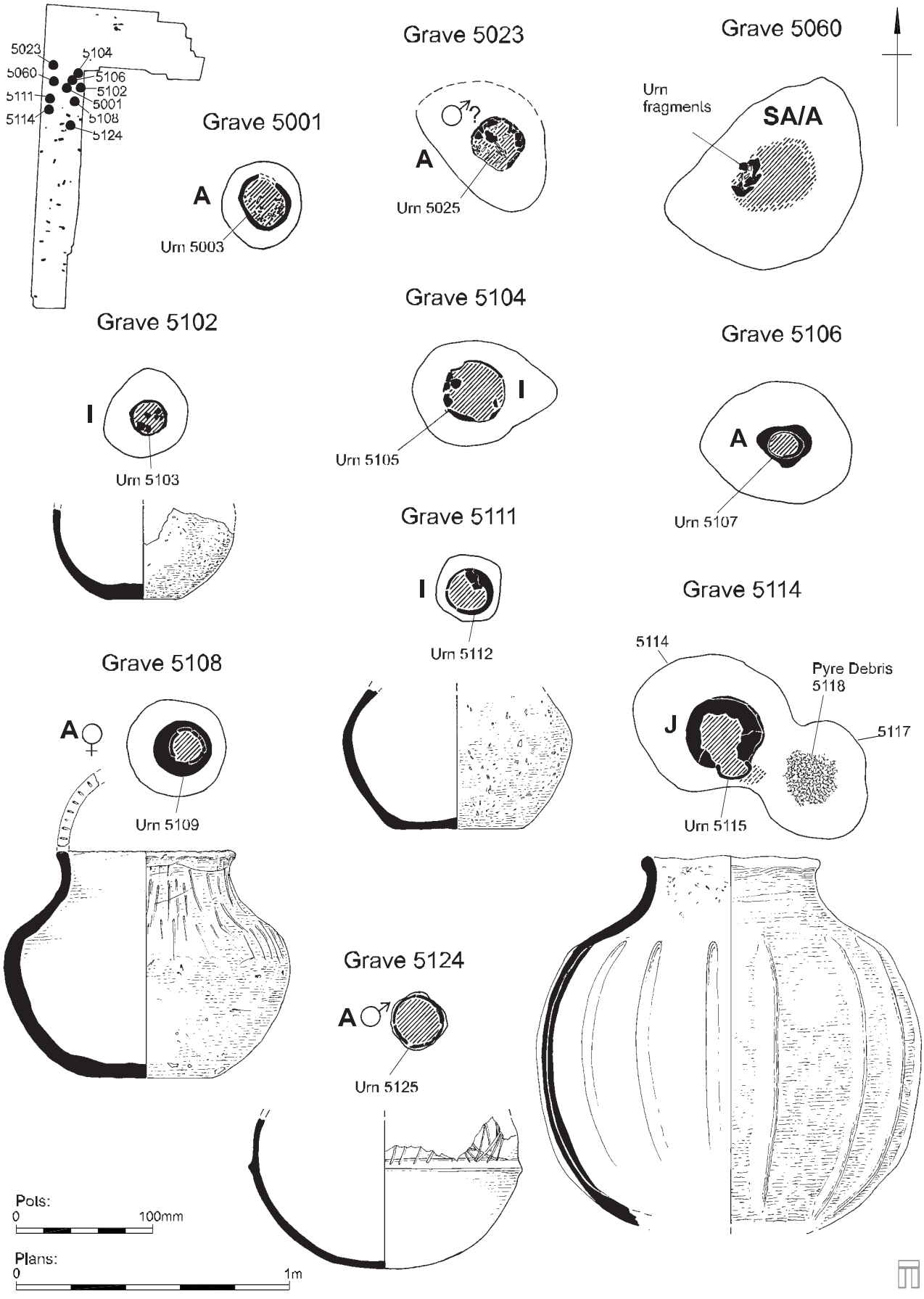


Figure 10 Cremation burials 5001–5124

and 50 years (5025), in a very underfired sandy-tempered pottery vessel. An estimated 60–70% of the urn survived. A small quantity of apparently unburnt animal bone, probably an ungulate jaw fragment, was recovered from within the urn. A small quantity of cremated bone (13.2 g), possibly representing material spilled from the urn during burial, was also recovered from the backfill.

Grave 5060
This irregularly shaped grave, which was 0.70 m long, 0.62 m wide and survived to a depth of 0.05 m, had been very heavily truncated. This probably originally contained an urned cremation burial, but all that survived was a few sherds of organic-tempered pottery (fabric 1) and a small quantity of cremated bone (7.9 g), recovered from the backfill of the grave (5061). The cremated remains were of a subadult or adult of indeterminate sex, aged over 13 years.

Grave 5102
This sub-circular grave was 0.34 m long, 0.30 m wide and 0.10 m deep with near-vertical sides and a flat base. It contained an infant of indeterminate sex aged between 1 and 3 years (5103). The grave had been very heavily truncated, and only an estimated 40% of the organic-tempered (fabric 1) urn survived.

Grave 5104
This sub-circular grave was 0.51 m long, 0.38 m wide and 0.15 m deep with moderately steep sides and a concave base. It contained an infant of indeterminate sex aged between 6 months and 3 years (5105). Although truncated, an estimated 60% of the organic-tempered (fabric 1) urn survived.

Grave 5106
This sub-circular grave was 0.52 m long, 0.47 m wide and 0.24 m deep with steep sides and a concave base. It contained an adult of indeterminate sex aged 25 years or over (5107). An estimated 90% of the very underfired, organic-tempered (fabric 1) urn survived *in situ*, but this could not be recovered intact. Radiocarbon dating of charcoal from redeposited pyre debris within the urn produced a determination of 1350±40 BP, cal AD 610–770 (GU-9324) (see Table 1).

Grave 5108
This circular grave was 0.35 m in diameter and 0.17 m deep with near vertical sides and a flat base. It contained an adult female aged between 30 and 40 years (5109). Only the rim of the otherwise complete organic-tempered (fabric 2/3) urn had been damaged. Possible organic residue was noted on the interior of the urn.

Grave 5111
This sub-circular grave was 0.25 m in diameter and 0.08 m deep with steep sides and a flat base. It contained an infant of indeterminate sex aged approximately 3 years (5112). An estimated 70% of the organic-tempered (fabric 1) urn survived.

Grave 5114
This irregularly shaped, rather elongated grave was 0.93 m long, 0.53 m wide and 0.16 m deep with steep sides and a concave base. It contained a juvenile of indeterminate sex aged between 8 and 12 years (5115). The urn was lying on its side within the grave, and adjacent to this was a deposit of pyre debris (5118). A small assemblage of cremated animal bone from within the urn probably represents pyre goods, as does the animal bone recovered from the pyre debris. The animal bone could only be identi-fied as that of a small ungulate. An estimated 95% of the organic-tempered (fabric 1) urn with bossed decoration survived. Radiocarbon dating of charcoal from within the urn produced a determination of 1420±45 BP, cal AD 550–680 (GU-9323) (see Table 1).

Grave 5124
This sub-circular grave was 0.19 m in diameter and only 0.03 m deep, with steep sides and a concave base. It contained an adult male aged 30 years or over (5125), and the base of the sandy-tempered urn with tooled decoration.

Grave 5126
This circular grave was 0.27 m in diameter and 0.12 m deep with vertical sides and a flat base. It contained an adult female aged between 25 and 45 years (5127). An estimated 50% of the organic-tempered urn survived. Pyre goods, represented by the burnt remains of an ivory bag ring, were also recovered from within the urn

Grave 5134
This very heavily truncated, sub-circular grave was 0.22 m in diameter and only 0.02 m deep, with moderately steep sides and a concave base. It contained the badly damaged remains of urned burial 5135, that of an adult of indeterminate sex age 30 years or over. A small quantity of cremated human bone (12.4 g) was recovered from the backfill of the grave, and only an estimated 15% of the organic-tempered urn (fabric 1) survived. Radiocarbon dating of the cremated bone produced a determination of 1540±45 BP, cal AD 420–610 (GrA-18294) (see Table 1).

Grave 5137
This sub-circular grave was 0.40 m long, 0.35 m wide and 0.15 m deep with steep sides and a concave base.

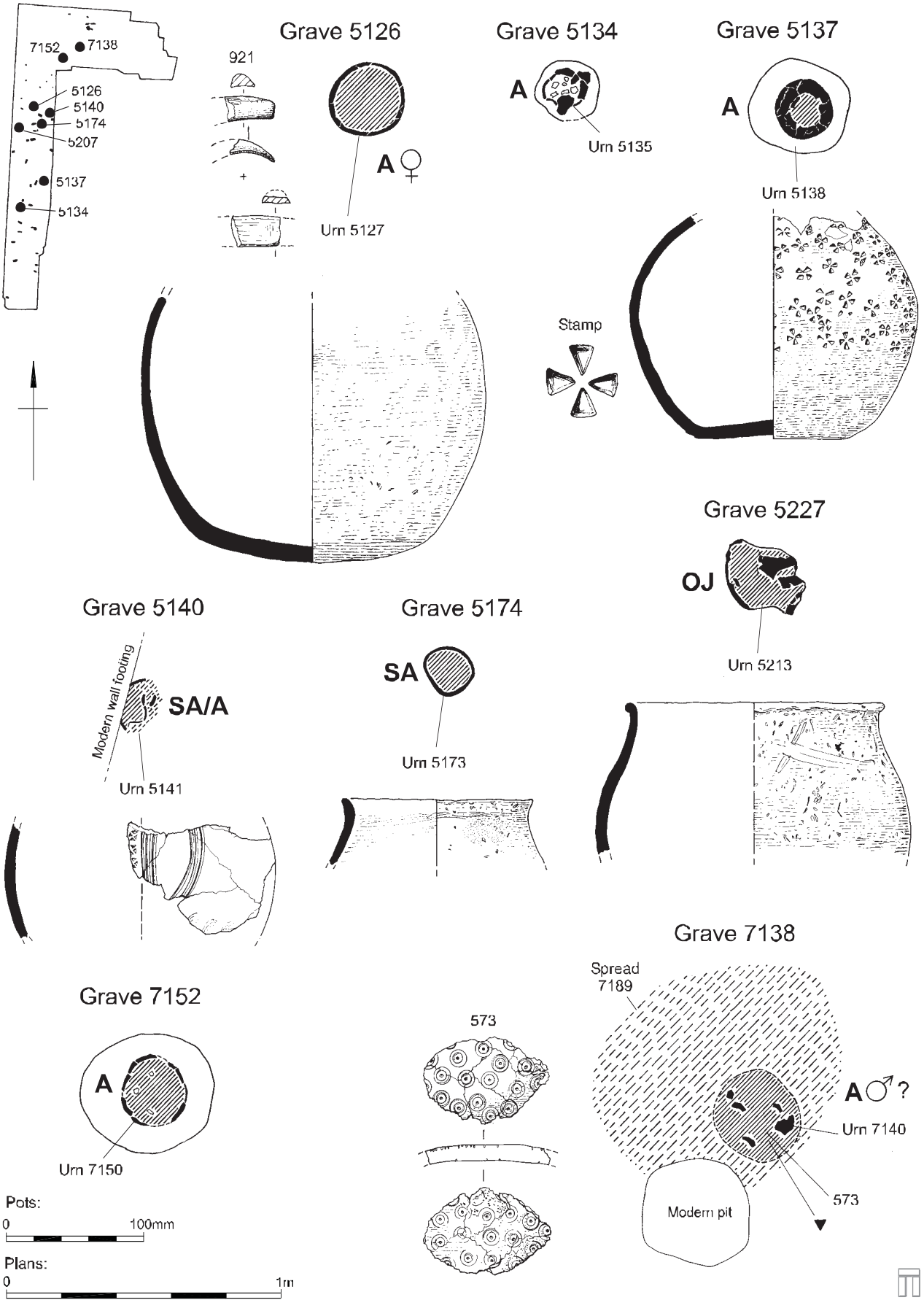


Figure 11 Cremation burials 5126–7152

It contained an adult of indeterminate sex aged 35 years or over (5138). A small quantity of cremated human bone (51.8 g) was recovered from the backfill of the grave (5139), along with over 30 very small fragments of burnt animal bone probably representing pyre goods. Most were not identifiable, but some are probably small ungulate and one could be from a hare-sized mammal or even bird. Charcoal recovered from within the urn probably represents pyre debris. An estimated 95% of the organic-tempered urn (fabric 1) with stamped decoration survived.

Grave 5140
This heavily truncated burial had been largely removed by modern wall footings and too little remained to discern the shape or dimensions of the grave. The grave contained a subadult or adult, aged 13 years or older, of indeterminate sex (5141). Only approximately 30% of the sandy-tempered urn with stamped and bossed decoration survived.

Grave 5174
This circular grave was 0.18 m in diameter and only 0.05 m deep, and contained a subadult, aged between 13 and 18 years, of indeterminate sex (5173). An estimated 30% of the organic-tempered (fabric 1) urn survived, inverted within the grave – the only example of an inverted urn found in the cemetery.

Grave 5227
No cut could be clearly defined for this very heavily truncated grave, although it was clear that it only survived to a depth of 0.05 m. The remains of an older juvenile, aged between 9 and 12 years, of indeterminate sex, were recovered, along with an estimated 20% of the organic-tempered urn (fabric 1).

Grave 7138
This circular grave had been very badly damaged and some of the contents of the urn had been spread beyond the limit of the grave (spread 7189); cremated human bone (11.0 g) and fragments of pottery were recovered from this spread. The grave was 0.35 m in diameter and 0.14 m deep with steep sides and a concave base. It contained the remains of an adult, possibly male, aged 45 years or over (7140). An estimated 20% of the sandy/organic-tempered urn survived. A small quantity of cremated human bone (6.4 g) was also recovered from the backfill. Pyre goods were represented by a roughly circular bone or antler object, decorated with ring-and-dot motif on both faces, possibly a discoidal amulet, recovered from the remains of the urn with a single fragment of burnt animal bone, probably pig. Radiocarbon dating (see Table 1) of charcoal from within the urn produced a determination of 1245±40 BP, cal AD 670–880 (GU-9322). Cremated bone from within the urn produced a determination of 1510±45 BP, cal AD 430–630 (GrA-18295).

Grave 7152
This sub-circular grave was 0.48 m long, 0.44 m wide and 0.07 m deep with steep sides and a flat base. It contained an adult of indeterminate sex, aged between 30 and 45 years (7150). A small quantity of cremated human bone (8.2 g) was also recovered from redeposited pyre debris within the backfill of the grave. An estimated 20% of the underfired, organic-tempered urn (fabric 1) survived, and a small quantity of cremated animal bone, including pig and cattle, was recovered from within the urn and probably represents pyre goods.

The Cremated Human Remains
by Jacqueline I. McKinley

Cremated bone was recovered from 28 contexts from the 18 cremation graves. The material was recovered from urned burials, five deposits of pyre debris within cremation grave fills, and from the fills of five other cremation graves representing material disturbed from within the associated urned burial.

Four of the better preserved urned burials were excavated in a series of 20 mm deep spits, the subdivisions from which were maintained throughout analysis. The only complete urn 5109 (grave 5108) was excavated by the writer in a series of spits and quadrants, an annotated section and series of plans demonstrating the horizontal and vertical distribution of the skeletal elements are held in archive.

Analysis followed the writer's standard procedure for cremated bone (McKinley 1994a, 5–21; 2000a). Age was assessed from the stage of skeletal and tooth development (Beek 1983; McMinn and Hutchings 1985), and the patterns and degree of age-related changes to the bone (Brothwell 1972; Buikstra and Ubelaker 1994). Sex was ascertained from the sexually dimorphic traits of the skeleton (Gejvall 1981; Buikstra and Ubelaker 1994).

Taphonomy
Disturbance
All except one of the cremation burials had suffered some degree of damage from later disturbance. More than 50% of the vessels containing bone survived in about half of the burials, with more than 75% in only five. In these cases it is unlikely that much, if any bone loss will have occurred as urns are frequently not used to full capacity (below). The disturbance may, however, have led to increased bone fragmentation. In most of the other burials only between 15–25% of the vessel survived; although in some cases redeposited

Table 2 Summary of results from cremated bone analysis

Grave	*Context*	*Type*	*Total wt (g)*	*Age/sex*	*Pathology*	*Pyre goods/debris*
5001	5002	?rpd in grave fill=5003	0.6	subadult–adult >13 yr		
5001	5003	urned burial	44	adult >30 yr	op – patella; new bone – patella	0.4 g animal bone (?sheep)
5023	5024	?spill=5025	13.2	adult >18 yr		
5023	5025	urned burial	373.4	adult *c*. 35–50 yr ??male	op – sacrum; exostoses – femur shaft, patella	0.2 g animal bone (ungulate)
5060	5061	?urned burial+rpd	7.9	subadult–adult >13 yr		
5106	5101	rpd in grave fill=5107	15.5	adult >18 yr		
5102	5103	urned burial	24.1	infant *c*. 1–3 yr		
5104	5105	urned burial	7.1	infant *c*. 0.5–3 yr		
5106	5107	*urned burial+rpd	204.5	adult <25 yr	exostoses – calcaneum	charcoal common in upper fill
5108	5109	**urned burial+rpd	284.1	adult *c*. 30–40 yr ?female	Schmorl's node – 3T	occasional charcoal in upper fill
5111	5112	urned burial	12.7	infant *c*. 3 yr		
5114	5115	*urned burial+rpd	202	juvenile *c*. 8–12 yr		4.3 g animal bone; occasional charcoal
5114	5116	rpd in grave fill=5115	0.6	immature <15 yr		
5114	5118	?=5115 (spill)	6.3			animal bone (small ungulate)
5124	5125	urned burial	194	adult >30 yr ?male		
5126	5127	urned burial	537.8	adult *c*. 25–45 yr ?female	pitting – rib facet; mv – wormian bone	7.8 g ivory bag ring
5134	5135	urned burial	55.3	adult > 30 yr	ddd – L	
5134	5136	= 5153 redep in grave fill	12.4	adult > 18 yr		
5137	5138	*urned burial	697.3	adult > 35 yr	oa – rib; dislocation? – rib	rare charcoal throughout
5137	5139	?rpd in grave fill = 5138	51.8	adult > 18 yr		
5140	5141	?burial	2.6	subadult–adult >13 yr		
5174	5173	urned burial	146.9	subadult 13–18 yr		
5227	5213	urned burial	148.4	juvenile *c*. 9–12 yr		
7138	7139	= 7140 redep. in grave fill	6.4	adult > 18 yr	oa – T	animal bone (small ungulate + small mammal/bird)
7138	7140	urned burial	462.6	adult > 45 yr ??male	ddd; pitting – T articular processs	0.3 g worked bone, 0.8 g animal bone (pig)
7152	7150	urned burial	158.8	adult *c*. 30–45 yr		5.4 g animal bone (pig+cattle)
7152	7151	= 7150 redep. in grave fill	8.2	adult > 30 yr		
7138	7189	rpd from grave fill = 7138	11	adult > 18 yr		

bone was recovered from the grave fill, some bone may have been lost from these deposits and the level of bone fragmentation is likely to have been increased.

Condition

The visual condition of the bone is good, with evidence for surface erosion or abrasion in only one instance, the badly disturbed juvenile burial 5213 (grave 5227). Although most of the burials contained some bone from the axial skeleton and a few fragments of articular surface, other than in the undisturbed burial 5109 (grave 5108) the quantities were relatively small (eg, *c*. 25% of the identified bone in urn 5109 comprised fragments of axial skeleton compared with an average of 3.1% from the others). It is known that bone porosity has a major affect on its survival (Nielsen-Marsh *et al.* 2000) and it has been demonstrated that trabecular bone is the first to be lost in acidic soil conditions, often crumbling to dust as it is excavated (McKinley 1997a, 245). Large fragments of trabecular bone survived intact in urn 5109 (grave 5108), but it is possible that some originally within the more disturbed deposits will not have survived excavation.

Demographic data

A total of 18 individuals was identified, each burial containing the remains of a single individual (Table 2). Those identified comprised six (33%) immature individuals including three young infants (0.5–3 yr), two older juveniles (8–12 yr) and one subadult (13–18 yr), and 10 adults (55%) including three mature individuals (25–45 yr) and seven mature/older (>45 yr). Two other individuals were identified as subadult/adult (>13 yr). It was possible to suggest the sex of only five adults (50%), including three males and two females. The distribution of aged and sexed individuals is plotted in Figure 12b and c (see below).

Pathological lesions and morphological variations

Pathological lesions were observed in the remains of eight individuals, being limited in extent and distribution due to characteristics of the cremation rite (McKinley 1994a, 106). A summary of the observed lesions is included in Table 2.

Trauma

Lesions in a thoracic vertebra from the burial 5138 (grave 5137) appear to reflect the dislocation of a rib, with the formation of a new articular surface displaced slightly anteriorly on the body of the vertebra. No other traumatic lesions were observed, but there may have been other damage to the rib-cage.

Joint disease

Lesions indicative of osteoarthritis (Rogers *et al.* 1987; Rogers and Waldron 1995) were noted in two joint surfaces from two adults (Table 2). The rib lesions from the burial 5138 (grave 5137) may be associated with the possible dislocation discussed above. Degenerative disc disease – a condition resulting from the breakdown of the intervertebral disc largely related to age and reflecting 'wear-and-tear' (Rogers and Waldron 1995) – was observed in the remains of two adults, one of which was male. Schmorl's nodes – destructive lesions in the vertebral body indicative of disc damage – most frequently occur in the vertebrae subject to greatest mechanical stress at points in the normal curvature of the spine (Manchester 1983). Lesions were recorded in one female spine.

Osteophytes (irregular growths of new bone along joint margins), pitting, and other destructive lesions may develop in response to a number of conditions and it is not always possible to ascertain the specific cause of individual lesions (Rogers and Waldron 1995). Osteophytes were observed in single joint surfaces from two adults, with pitting in single joints from two others.

It is not always possible to be conclusive with respect to the aetiology of exostoses, bony growths which may develop at tendon and ligament insertions on the bone. Causative factors include advancing age, traumatic stress, or various diseases.

Morphological variation

Variations in the skeletal morphology may, with other predisposing factors, indicate genetic relationships within a 'population' (Berry and Berry 1967). Some traits are argued to reflect developmental abnormalities, for instance, wormian bones (Brothwell 1972, 95–8), which were noted in one individual.

Aspects of pyre technology and ritual

Although the majority of the cremated bone was white in colour, indicative of full oxidation of the bone (Holden *et al.* 1995a and b), most burials contained a few bone fragments with variations in colour indicative of incomplete oxidation. Variations ranged from brown (basically unburnt), for example some

Key to Table 2 (opposite)

** = undisturbed; * = >90% survival; rpd = redeposited pyre debris; oa = osteoarthritis; ddd = degenerative disc disease; op = osteophytes; mv = morphological variation; T = thoracic vertebrae; L = lumbar vertebrae

animal species identified by S. Hamilton-Dyer

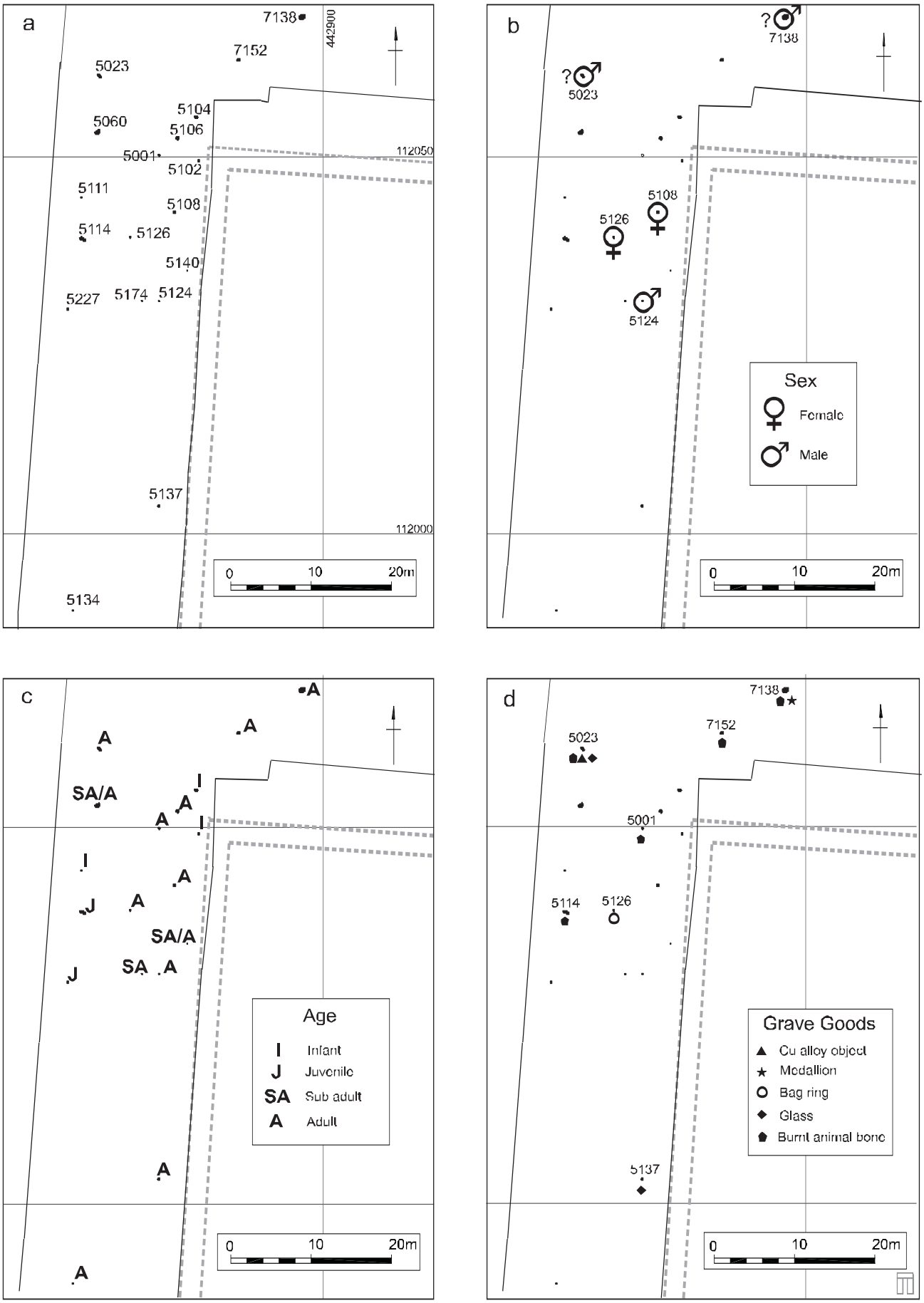


Figure 12 Cremation burials: distributions. a) location of graves, b) distribution by sex, c) distribution by age, d) distribution of grave or pyre goods by category

finger phalanges from burial 5109 (grave 5108) and black (charred), for example the occipital vault from burial 5213 (grave 5227), through hues of blue and grey affecting a variety of skeletal elements. Numerous factors may affect the efficiency of oxidation (McKinley 1994a, 77–84), including the location of individual skeletal elements (peripheral parts such as hands and feet may be marginal, thereby attaining a lower temperature and being preferentially placed to fall off the pyre before completely oxidised); the length of time for cremation (affected by quantity of fuel and potentially the weather, with insufficient time for skeletal elements with heavy soft tissue coverage to fully cremate); and the presence of other items on the pyre potentially cutting off oxygen supply to the corpse. The former and the latter are likely to have been the main factors affecting the few bone fragments showing incomplete oxidation in most cases here. The one exception is burial 7140 (grave 7138) where there was extensive patchy blue/grey coloration indicative of a general shortfall across the entire pyre part-way through cremation, which was perhaps curtailed by adverse weather, or insufficient fuel being used to build the pyre. The observed variations are similar to those seen in contemporaneous cremation burials in northern (McKinley 1993a) and central-eastern England (McKinley 1994a). Some colour variation was also noted at Portway, Andover (Henderson 1985), and at Alton, Hampshire, where the bone was almost uniformly a pale grey (Powers 1988) which suggests it was not quite fully oxidised, probably as a result of a slight shortage in fuel or time.

The weight of bone recovered from the burials varies widely, with an overall range of 7.9–697.3 g, mean 209.4 g, but these figures include the heavily disturbed burials from which bone may have been lost and the immature burials. The mean for the adult burials (including disturbed) is 301.8g. If the undisturbed or only slightly disturbed vessels are considered, the range is from 202.0 g (juvenile) to 697.3 g. The most reliable impression of the quantity of bone originally included in the burials is gained from the less disturbed deposits (above), but even here the range for the adults is large at 204.0–697.3 g, the former representing a maximum of *c.* 20% of the expected weight of bone from an adult cremation, the latter *c.* 70% (McKinley 1993b). The inclusion of only a proportion of the cremated bone in the burial is a recognised part of the rite, but why there should be such wide variation remains unclear (McKinley 1997b). Both the range and averages are lower than those observed in contemporaneous burials from northern and central-eastern England, the average for undisturbed adult burials from Sancton, Yorkshire being 882.2 g (McKinley 1993b), with similar figures from Spong Hill, Norfolk (McKinley 1994a, 85). Data from more southerly cemeteries are not necessarily directly comparable, largely due to the lack of distinction between disturbed and undisturbed deposits. Ranges rather than actual weights are given for Portway (Henderson 1985), the maximum being between 400–500 g, with only one other more than 300 g and the majority (many of which were obviously disturbed; Cook and Dacre 1985) less than 50 g. Only one weight (469 g) is presented for the 46 deposits from Alton (Powers 1988; Cameron 1988). The weights of bone recorded for Worthy Park, Hampshire ranged from 3.3–295.8 g, including all deposit types and conditions and all ages (Bayley 2003). These generally low weights, together with those from the Stadium, may suggest a regional variation in the average quantities of bone included in burials as compared with those further north. However, the four deposits from Christchurch, Dorset (*ibid.*; disturbance/condition not stated), show a more extensive range at 225–1106 g, with a mean of 597.7 g, the latter still being lower than from the northern cemeteries.

The majority of bone in all except one of the adult burials was recovered from the 10 mm sieve fraction (50–91% of bone with an average of 73%). In burial 5107 (grave 5106) and the infant and juvenile burials, the majority was recovered from the 5 mm sieve fraction. The maximum fragment sizes from the adult burials ranged from 31–70 mm, with an average of 52 mm. As may be expected, the greatest percentage of bone in the 10 mm fraction was recovered from undisturbed burial 5109 (grave 5108) which also contained one of the largest fragments (at 62.7 mm), though the largest fragment was recovered from the slightly disturbed burial 5138 (grave 5137). These figures demonstrate the well-recognised protective role of the urn and the general increase in fragmentation levels due to disturbance (McKinley 1994b). The level of fragmentation resulting from excavation and post-excavation procedures (despite great care) is illustrated by the fact that the maximum pre-excavation fragment from burial 5109 was 90 mm, showing almost 70% reduction after excavation (*ibid.*).

A number of factors may affect the size of cremated bone fragments (McKinley 1994b), the majority of which are exclusive of any deliberate human action other than that of cremation itself, and there is no evidence in this instance to suggest any deliberate fragmentation prior to burial. In this the site shares a characteristic seen in the vast majority of British cremation burials of all periods (McKinley 1994b; 1997b; 2000a). The fragmentation levels are slightly lower than those seen at Spong Hill and Sancton, with an average of *c.* 50% and 43% from the 10 mm fraction respectively, and average maximum fragment sizes of 42 mm and 35.5 mm. The average

maximum fragment from Portway was 35 mm (Henderson 1985; figures are not available for Alton and Christchurch). The slight variations between the Stadium and the other sites may reflect a number of intrinsic and extrinsic factors, the latter of which may include techniques of bone recovery from the pyre site for burial (McKinley 1994a), involving, for example, more careful handling of this essentially brittle material.

With the exception of the young infant graves from which very low bone weights were recovered and where skull fragments were most commonly identified, bone fragments from each skeletal area were identified in each burial. Considering the effects of the potential loss of trabecular bone (above), the normal bias resulting from the ease with which skull fragments may be recognised, and the difficulties in distinguishing individual long bones (McKinley 1994a, 6), there was no discernibly deliberate selection of specific skeletal elements for burial. Relatively low numbers of tooth roots and the small bones of the hands and feet were identified; this may indicate the recovery of individual bones for burial by hand from the pyre site, discriminating against such small bones.

None of the cremation burials contained the remains of more than one individual. In this, the cemetery appears to be at odds with a common characteristic of the rite, where generally, within all periods, an average *c*. 5% of burials contain the remains of two individuals (McKinley 1997b). Other Saxon cemeteries in the north and central-eastern areas of England have been found to contain figures ranging from *c*. 4% to *c*. 7% (McKinley 1993b). . It is interesting to note, therefore, that no dual cremation burials were recognised at Alton (Powers 1988, Cameron 1988), Portway (Henderson 1985), Worthy Park (Bayley 2003) or Christchurch (Bayley 1983) – though the last was very small. If a genuine absence, this may indicate a regional variation in the rite.

Small quantities (maximum 5.4 g, comprising very small fragments) of cremated animal bone were recovered from a minimum of five (28%) of the burials (see Table 2; Fig. 12d). Identified species (identifications by S. Hamilton-Dyer) include cattle, pig, possibly sheep, small ungulate, and possibly bird. Only one context contained the remains of more than one species (fill 7139 in grave 7138). The skeletal elements could only be distinguished in a few cases, but included elements of skull and axial skeleton. In each case, only one area of the skeleton was identified, suggesting only parts of the animals had been included on the pyres, possibly as joints of meat. The inclusion of such material – the remains of pyre goods – is a common characteristic of the rite seen in all periods but predominating in the Anglo-Saxon (McKinley 2000a). Cremated animal bone has been recovered from 23–44% of burials in various Anglo-Saxon cremation cemeteries in the north and central-eastern areas of England (McKinley 1994a; McKinley and Bond 1993); the quantities are commonly large, with between one and five species per burial, the most frequently occurring species being horse (*ibid.*; Bond 1993; 1994; McKinley 2000a). This tradition does not appear to be mirrored in the findings from cemeteries in the south of England, no cremated animal bone having been identified from the cremation burials at Worthy Park (Bayley 1973), Christchurch (Jarvis 1983), Portway (Cook and Dacre 1985), or Alton (Evison 1988).

Redeposited pyre debris – mixed deposits of fuel ash and small quantities of cremated bone – was recovered from the grave fills of eight burials (*c*. 44%), the debris being deliberately added to the grave fill after the burial had been made. In all cases the pyre debris appears to have originated from the same cremation as the bone contained within the burial. The inclusion of pyre debris in grave fills is a common characteristic of the rite throughout its use and reflects the proximity of the pyre site to the place of burial (McKinley 1998; 2000b). The temporal exception to this part of the rite has been the Anglo-Saxon period, as represented by the cemeteries in central and north-eastern England (*ibid.*), such as Spong Hill and Sancton. No pyre debris was recorded in association within the cremation burials or graves at Christchurch (Jarvis 1983) or Portway, though there is reference to 'dark earth' in the latter which may have included small fraction charcoal (Cook and Dacre 1985).

Charcoal was recovered from several of the features and deposits containing cremated bone at Alton (Evison 1988), but it is unclear whether all the deposits – denoted 'cremations' (?burials) – were all burials; the evidence is not conclusive in all cases and some may have represented scattered material or deposits of pyre debris. Some charcoal was recovered from within three of the Stadium site burials. In burial 5107 (grave 5106) the charcoal inclusions were limited to the upper 100 mm of the vessel fill, with a similar distribution in burial 5115 (grave 5114). However, there was redeposited pyre debris in the grave fills around both burials and it is likely that some debris entered the burials post-depositionally, material from the grave fills infiltrating the burials subsequent to loss of the organic lids which presumably originally covered them. Burial 5061 (grave 5060) was badly disturbed and it is not possible to ascertain the original position of the pyre debris, but it is likely to reflect the same pattern as the others.

Within the urned burials emptied in spits (five burials), between 79% and 97% of the bone was confined to the lower 60 mm of the fills. Commonly, no bone was recovered from the uppermost 20–60 mm of the urn; below this, small quantities of bone above the main mass of material had clearly attained their position as a result of bioturbation. Several of the burials showed a concentration of bone towards one side of the vessel (eg, urns 5109, 5127, and 5138) indicating that the urn had been laid or tipped over to one side to receive the bone. In other cases (burials 7150 and 7140), there appeared to be more even horizontal distribution of bone suggesting the urn was either upright when the bone was added, or the contents had been re-aligned by shaking. The detailed excavation by the writer demonstrated that fragments from the various skeletal areas were present within all the main levels of the fill. There was no evidence, therefore, to suggest deposition in any skeletal order, the contents apparently representing a random collection of skeletal elements from across the pyre mixed together at the time of deposition. This observation corroborates those made on similarly processed burials elsewhere (McKinley 1993b; 1994a).

Charcoal

by Rowena Gale

Charcoal was associated with several of the 18 cremation burials and its presence can almost certainly be attributed to the remains of pyre fuel. However, it is possible that some may represent the burnt remains of grave goods or equipment (eg, the bier or stretcher). Two contexts (from graves 5023 and 5060 respectively) were selected for charcoal analysis and were processed, prepared and examined using standard methods (Gale and Cutler 2000).

The charcoal from both contexts was sparse and very fragmented. Oak (*Quercus* sp.), the hawthorn/Sorbus group (Pomoideae) and gorse (*Ulex* sp.) or broom (*Cytisus* sp.) were common to both samples; additional species included birch (*Betula* sp.) in grave 5023 and hazel (*Corylus avellana*) in grave 5060.

The comparatively few taxa identified may reflect the paucity of charcoal, although the similarity of species in the two graves tends to suggest that it may have been customary or practical to use a relatively narrow range of species for pyre construction at this time. The framework of the pyre probably incorporated large branches, poles or trunks with narrow roundwood or twiggy material as infill or kindling. Of the species named, oak would have been the most appropriate for the basic structure, although evidence from the charcoal is too slight to verify its use as such in this instance. Nevertheless, we can be certain that the construction of the pyre would have required a large volume of wood – something in the order of one tonne for an adult cremation (McKinley 1994b). When seasoned, the species identified would have provided high calorie wood fuel (Webster 1919; Edlin 1949; Porter 1990). Gorse, in particular, burns with great ferocity and heat, although it is relatively short-lived in comparison to mature oak.

In historical times, evergreen species, such as pine (*Pinus* sp.), yew (*Taxus*) and box (*Buxus* sp.) (thought to represent immortality and regeneration) and some broadleaf species, such as rowan (*Sorbus aucuparia*) (offering protection of the dead), have traditionally been associated with burial (Dallimore 1908; Cornish 1946; Grigson 1958; Cooper 1978). There is now a growing body of evidence to suggest that the association of particular trees and funerary customs dates from prehistoric times. For example, during the Bronze Age it seems likely that the exclusive use of oak for some funeral pyres was related to either status, gender, or age (Smith 2002). Observations by Tacitus (*Germania*, 27; Mattingley 1948) on the burial practices of Germanic Celts during the 1st century AD record that particular (although un-named) wood/s were used for high-status cremations. Unfortunately, although many plants and trees were strongly linked to Anglo-Saxon and Viking gods or beliefs (Davidson 1964), archaeological evidence of woods/trees associated with cremation rituals (if any) for the Saxon period is sparse.

Grave Goods from the Cremation Burials

The more complete pottery vessels and individual grave or pyre goods are illustrated in Figures 10 and 11. The distribution of grave or pyre goods (excluding pottery) is shown in Figure 12d.

Pottery

by Lorraine Mepham

Eighteen vessels were recovered from the cremation cemetery. A further vessel was recovered from an unusual double inhumation burial (3520) within the South Stand, the only pottery grave good from the inhumation cemetery. These 19 vessels are considered here as a group.

Condition of the vessels varied, but was generally fair to poor. The complete profiles of only two vessels could be reconstructed, and most had been at least partly truncated, removing the upper parts of the vessels, and leaving between 15% and 95% surviving. Sherd breaks were generally slightly to badly abraded. Four sherds which almost certainly derive from the vessel in grave 5140 were found redeposited within

the grave fill of nearby inhumation grave 5129. Two vessels (5107 and 7150) had the appearance of being badly underfired, with sherds extremely soft, very friable and badly abraded. Table 3 gives the details of fabric and form for the individual vessels.

Fabrics and vessel forms

Most of the vessels are in organic-tempered fabrics (Timby 1988, fabrics 1, 4, 6, 11), with two vessels in sandy fabrics (*ibid.*, fabrics 9 and 13). There is no reason to suppose that any of these fabrics was not locally produced. A petrological comparison of fabric samples with local clays has previously proved inconclusive (*ibid.*, 120–2), although the assumption, given the ready availability of suitable clays and other raw materials, is that most of the coarsewares found in Hamwic were produced in or close to the settlement itself.

Full profiles could be reconstructed for only two vessels, and partial profiles for seven others (a further two are illustrated, but insufficient survives of each for an accurate reconstruction of profile). The form of the reconstructed vessels has been classified as far as possible using nationally recommended nomenclature (MPRG 1998) although, in the absence of the upper parts of several vessels, the distinction between jar and bowl is not always apparent. Of the nine full/partial reconstructable profiles, two are biconical jars and seven are rounded jar/bowl forms. Where bases survive, two have fully rounded bases and five have flat or slightly sagging bases with rounded basal angles.

Surface treatment varies: seven vessels are burnished, three externally, two internally, and two all over. Six vessels are decorated: one with impressions on top of the rim, two tooled, one stamped, one bossed and one stamped and bossed. One of the bossed schemes (5115), with continuous long vertical bosses, is of a type known as 'melon-ribbing'. The stamps can be defined as 'plain negative cross' and grid motifs (grave 5140; Briscoe B1 a and F 2b respectively), and a 'diagonal rectangular cross' (pot 5138; Briscoe 1981, C3 b). None of these stamped motifs is paralleled within the settlement assemblage.

The vessel from grave 5124 stands out amongst this group in several respects. It is noticeably well made (even wall thickness and smooth profile), well finished (burnished inside and out) and well fired. The fabric is not found elsewhere in the cemetery assemblage (although it is matched within the Southampton type series: Timby fabric 9). The plain raised cordon and tooled decoration are unusual; they are not, as far as is known, paralleled within any other Saxon assemblage from Hamwic. There is a suggestion that the fabric type, which is not common, may actually belong to the late Saxon period (Timby 1988, 82). This, however, would certainly be anomalous within the early cemetery assemblage, so an earlier date for this fabric type has been clearly demonstrated in this particular case.

Pots as containers

Most of the vessels from the cremation cemetery had demonstrably been used as containers for cremated human bone. In two instances (graves 5060, 5124) the graves had been so badly disturbed that the original function of the vessel within the grave was not apparent, but it is likely that these two vessels had also been used as cremation urns.

The question of whether these vessels were specifically made for use as funerary containers is not easily answered here. Evidence from East Anglian cremation cemeteries, such as Spong Hill, shows distinct differences between settlement and funerary assemblages, with the assumption that certain vessel types, generally of high quality and frequently elaborately decorated, were certainly chosen, if not specifically manufactured, for use in the funerary rite. Brisbane (1981) concludes that urn production at Spong was well organised, with urns deriving from several different sources (based on analysis of fabric and stamp groups), whereas the settlement pottery reflects production based at household level. The picture at the Stadium site (and at the Portway cemetery at Andover; Cook and Dacre 1985) appears, on the surface, to be in complete contrast. The cremation vessels (with the exception of the vessel from grave 5124) are not of noticeably high quality, showing inconsistent attention to surface treatment or decoration, and they are in fabrics which are assumed to be locally produced. This would certainly suggest production at a settlement if not household level, but was this production specifically for use in burials, or were these re-used domestic vessels? The answer is equivocal for, on the one hand, there are two pots (5107, 7150) which were so badly underfired that they could not feasibly have functioned as utilitarian containers. On the other hand, another vessel (5109) has what looks like a burnt residue on the interior surface, and the vessel from grave 5124 is very well fired and finished.

The predominance of organic fabrics within the cemetery assemblage might be considered significant were it not the case that these fabrics also formed the greater part of the earliest settlement assemblage (see below), broadly assigned to the first half of the 8th century. This was also the case at Mucking where the range of (organic) fabrics from the 6th–7th century settlement and cemetery was essentially identical (Hamerow 1993, 31). In contrast, the evidence from Portway, Andover, suggests that there is a marked difference between the fabrics of vessels from the 6th century cremation cemetery and those from other early Saxon sites in the Andover area; organic-

Table 3 Pottery vessels from the early cemetery

Pot no.	*Grave*	*Fabric grp*	*Fabric*	*Vessel form*	*Comments*
5003	5001	I	1	unknown	body & base sherds only
5025	5023	I	1	unknown	body sherds only; burnished inside & out
–	5060	I	11	unknown	badly disturbed; body sherds only
5103	5102	I	11	rounded jar	
5105	5104	I	11	unknown	body sherds only; burnished externally
5107	5106	I	11	unknown	very underfired; only 2 body sherds retrieved
5109	5108	I	6	biconical jar	residue on interior surfaces; impressions on top of rim
5112	5111	I	1	biconical jar	
5115	5114	I	1	rounded jar	burnished; bossed decoration
–	5124	III	9	rounded jar/bowl	burnished inside & out; raised girth cordon; tooled decoration
5127	5126	I	11	rounded jar	burnished externally
5135	5134	I	1	unknown	body & base sherds only
5138	5137	I	1	biconical jar	stamped decoration
–	5140	III	13	unknown	body sherds only; stamped and bossed decoration; sherds also from grave 5129
5213	5227	I	11	rounded jar	
7140	7138	I	2	unknown	body sherds only; burnished internally
7150	7152	I	1	unknown	very abraded body sherds only; underfired?
–	3520	I	1	rounded jar	from double inhumation burial
7173	5174	I	11	jar (?rounded)	

tempered wares dominated the cemetery assemblage but were far less common at nearby settlement sites (Cook and Dacre 1985, 104).

The lack of distinctive features for most of the cemetery vessels at the Stadium site means that comparisons with the settlement assemblage remain inconclusive – there are a number of plain jar forms in organic-tempered wares from the settlement. There are, however, no stamped or otherwise decorated vessels in these wares which, given the size of the sample (251 sherds), would suggest at least one point of difference between the two assemblages. A similar distinction between cemetery and settlement assemblages was noted at Mucking, where the cemetery produced the largest proportion of the decorated vessels from the site, including most of the bossed forms (Hamerow 1993, Hirst and Clarke, in prep).

Associations

Of the 18 cremated individuals, a broad age range could be determined for all, and gender (or probable gender) for five, showing that people of all ages from infant to adult, and both sexes, were buried in the cemetery. The sample is of course too small to draw any statistically valid conclusions about the potential association of, for example, different age groups and vessel types, but on this evidence there is no obvious correlation between age and 'quality' of vessel (defined on the basis of size, surface finish, and decoration) – one of the largest vessels, well finished and decorated, contained a juvenile. However, it can be observed that two infants (graves 5102 and 5111) were contained in pots which were noticeably smaller and that the 'best' urn, 5124, contained a mature male.

One vessel came from an unusual double inhumation in the South Stand (3520; below), where

it had been placed between the feet of the two adults (indeterminate sex) buried within the grave. The grave is otherwise richly furnished with weapons and associated fittings, and suggests the burial of two significant individuals, but apart from faint vertical tooling on the lower part of the vessel, the pottery vessel (in an organic-tempered fabric) is not in any way unusual. Pottery vessels in inhumation burials are more frequently associated with females, but the pattern is not sufficiently significant to postulate gender-symbolism for this artefact type (Stoodley 1999b, 136).

Dating

The circumstances of burial of the vessels from the early cemetery have allowed an opportunity to inform on the dating of the two fabric groups (see Timby 1988) represented – organic-tempered wares (Group I) and sandy wares (Group III) – but this adds little to existing knowledge.

Previous work on the Hamwic coarsewares has encountered problems of dating resulting from the lengthy timespan of various fabric types, and the degree of residuality within the deposits excavated, although numismatic evidence does provide useful independent dating (Timby 1988, 111–16). It has been possible, however, to identify a broad chronological sequence for the various fabric groups. Amongst the early wares are the organic-tempered fabrics (Group I), belonging to an early Saxon ceramic tradition which is well documented on sites across southern England and beyond from the 5th to at least the 8th century – these wares are almost completely absent from deposits in Hamwic from the 9th century. Within this group, the densely organic-tempered fabric 1 appears to represent an earlier tradition than the sandier fabrics (eg, fabric 11). The sandy wares (Group III) have a longer timespan, appearing in the early Saxon period, but peaking at Hamwic around the 8th century, and declining thereafter.

Other chronological evidence comes from the decorated forms. Stamped decoration is generally considered to be a 6th–7th century phenomenon, although within Hamwic stamping is absent from the early deposits, appearing only in the later 8th or early 9th century (Timby 1988, 106). The 'plain negative cross' motif on vessel 5138 is certainly paralleled elsewhere in Hamwic (Hodges 1981, fig. 2,5), although not the rectangular cross motif on the vessel from grave 5140. However, stamped decoration does not seem to occur on vessels of fabric group I (organic-tempered wares), which might suggest an earlier (6th/7th century) date for vessel 5138. The 'melon-ribbing' seen on vessel 5115 is a technique dated by Myres to the 7th or 8th centuries (Myres 1977, 11). Mention should perhaps also be made here of a decorated vessel found in the churchyard at Pagham, East Sussex, possibly a cremation urn, with stamped decoration within combed panels in a similar manner to the vessel from grave 5140 (Cunliffe 1974, 127–9, fig. 1, 1). Myres suggested a late 6th or 7th century date for this vessel, but a late 7th century date now seems to be favoured (Down and Welch 1990, 134). Elsewhere, no comparable pot stamps have been recognised amongst the assemblages from Worthy Park (Winchester), Bargates (Christchurch), Apple Down (West Sussex), or on the Isle of Wight (N. Stoodley, pers. comm.).

The vessel forms themselves are not particularly chronologically distinctive, although it may be noted that the biconical (or, using Myres' typology, 'sub-biconical') forms (vessels 5109, 5112, 5138) do not seem to be represented amongst the other Hamwic coarseware assemblages, which are restricted to rounded forms. This may be another indication of an early date range (possibly pre-7th century) for at least some of the cemetery vessels. Biconical, stamped cremation vessels from the Apple Down cemetery 1 are dated to the 6th century (Down and Welch 1990, 213, fig. 2.62, nos 64, 75). A slight stratigraphic indication comes from the inclusion of residual sherds from grave 5140 in nearby inhumation grave 5129.

The group of vessels from the cemeteries, then, would not be easy to date closely on the grounds of fabric and/or form alone, although the predominance of organic-tempered wares could be taken to indicate a date relatively early within the sequence. The artefactual associations provide very limited additional dating evidence. Both the discoid bone amulet from grave 7138 (vessel in fabric 2), and the ivory bag ring from grave 5126 (vessel in fabric 11) are types which can be broadly dated to the early Saxon period, although both have been recorded in contexts of mid-Saxon date (see below). Artefacts from inhumation burial 3520 (vessel in fabric 1), however, include a belt suite that has a relatively restricted date range for manufacture of *c.* 640–70 (see below).

Despite some variation in the radiocarbon dating evidence (see above, Table 1), the dates for the charcoal (rather than the cremated human bone) are considered to represent the more likely date of the cremation burials. The relevant dates have been obtained from grave 5114 (cal AD 550–680), grave 5106 (cal AD 610–770) and grave 7138 (cal AD 670–880). These dates place the cemetery (or at least selected graves) within the range of late 6th to late 9th century. The pottery vessel from grave 5114 is in fabric 1, that from grave 5106 in fabric 11, and that from grave 7138 in fabric 2. The conclusion from all the strands of evidence discussed above is that the

cremation cemetery assemblage has a start-date which almost certainly pre-dates what was previously thought to be the earliest known settlement in Hamwic, around or slightly before AD 700. Furthermore, it is considered unlikely to have extended much, if at all, into the 8th century.

Worked bone and other objects
by Rachel Every
A fragmented, worked bone object was recovered from cremation urn 7140 in grave 7138 (item 573) (Fig. 11). This object is heavily burnt and incomplete, but was probably originally discoidal in shape, and is decorated with incised ring-and-dot motifs on both faces. It is possibly made from antler and may be an amulet. A similar example of a discoid amulet with incised ring-and-dot motifs was recorded from the cemetery at Barrington, Cambridgeshire (MacGregor 1985, fig. 61g). Other examples are known from cemeteries both in this country (eg, Polhill, Kent) and on the Continent, with an overall date range spanning the early to mid-Saxon period (*ibid*., 107).

Two small fragments of an ivory bag ring were recovered from cremation urn 5127 in grave 5126 (item 921) (Fig. 11). This object is too fragmentary for its original form and diameter to be reconstructed. Similar examples have been found in East Anglian cemeteries such as Spong Hill (Hills and Penn 1981, fig. 178) and Edix Hill (Meaney 1998, 268–9), and in general their date range falls in the early Saxon period, from the 5th to the 7th century, though several examples of ivory bag rings are recorded from inhumation graves dated to the second half of the 7th or even the first half of the 8th century (MacGregor 1985, 112; Geake, 1997, 81). Hills (2001, 140) does, however, have them 'stopping' at the end of the 6th century in cremation burials. In inhumation cemeteries ivory bag rings are invariably associated with female burials. A Mediterranean source has been postulated for these objects, which makes their presence in Early Saxon graves in England interesting, given their absence from the rich Frankish graves of the period.

A 'globule' of copper alloy and two very small fragments of glass (not illustrated) were recovered from cremation urn 5025 in grave 5023. The copper alloy globule presumably represents the melted remains of an object which was burnt on the pyre. One of the splinters of glass is pale green and the other clear in colour, but their minute size means nothing further can be deduced. Two further, very small fragments of clear vessel glass (not illustrated) were recovered from cremation urn 5138 in grave 5137, both deriving from a vessel of unknown form.

The Inhumation Burials

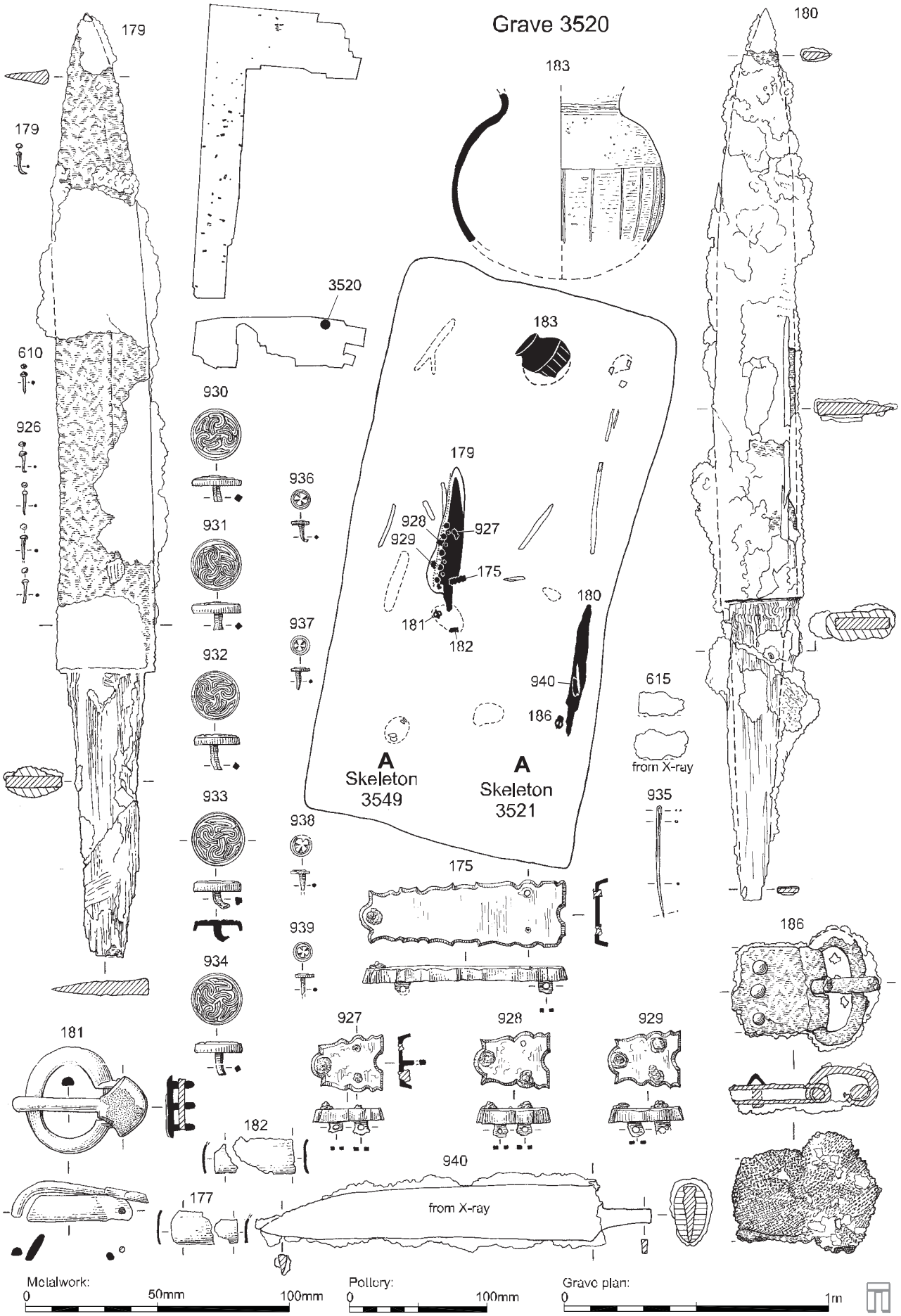
Twenty-two inhumation graves, were excavated in the West Stand. A twenty-third grave (3520), an unusual double burial, lay in the South Stand. Two further graves excavated in 1975 at SOU 20 (F183 and F288) also belonged to this group of inhumation burials (Figs 9 and 30a). The full extent of the cemetery remains to be determined but, with the possible exception of the west side, the limits can be estimated with a reasonable degree of certainty (see below).

It should be noted that many of the graves in the early inhumation cemetery were particularly difficult to identify, being cut through and backfilled with clean brickearth. Once it became clear at an early stage that many of these graves contained metal grave goods, a strategy for the systematic use of a metal-detector in areas of apparently undisturbed brickearth was employed. A Laser 3B machine was used by an experienced metal-detectorist. Anomalies identified by the detectorist were rigorously hand-cleaned and reduced in plan until any objects and associated grave plan were identified. Where graves were more readily identified, the metal detector was also used to anticipate associated metal grave goods. It is estimated that this method identified at least three graves that might otherwise have been overlooked. There remains the possibility, therefore, that graves unaccompanied by metal grave goods were missed.

In general, all of the graves were sub-rectangular with vertical or near vertical sides and flat bases. Several of the burials had been truncated as a result of medieval and post-medieval cultivation or by the foundations of 19th and 20th century buildings associated with the Gasworks, but the majority were in graves over 0.2 m deeper than the levels of truncation and were relatively undisturbed. With the exception of the few graves where possible coffin stains were identified, the colour of the backfill was almost indistinguishable from the brickearth, although the grave fills tended to be less compacted.

Bone recovery from all the inhumation burials was very poor (generally less than 10% of the skeleton surviving), probably due to adverse (acidic) soil conditions, and bone was completely absent in six graves (4101, 4265, 5428, 5510, 5537, and F183 on SOU 20). However, it should be noted that redeposited bone in several pits, which almost certainly derived from disturbed burials, was in relatively good condition.

Eight of the inhumation graves were damaged to varying degrees by mid-Saxon pits dug after the early cemetery went out of use. In one example (pit 4368), approximately 35% of two disarticulated skeletons were found in the base of the pit, which largely


Grave 3520
179
180
183
3520
610
926
930
931
932
933
934
936
937
938
939
179
928
929
927
175
181
182
180
940
186
615
from X-ray
935
A
Skeleton
3549
A
Skeleton
3521
175
186
181
927
928
929
182
940
177
from X-ray
Metalwork:
0
50mm
100mm
Pottery:
0
100mm
Grave plan:
0
1m

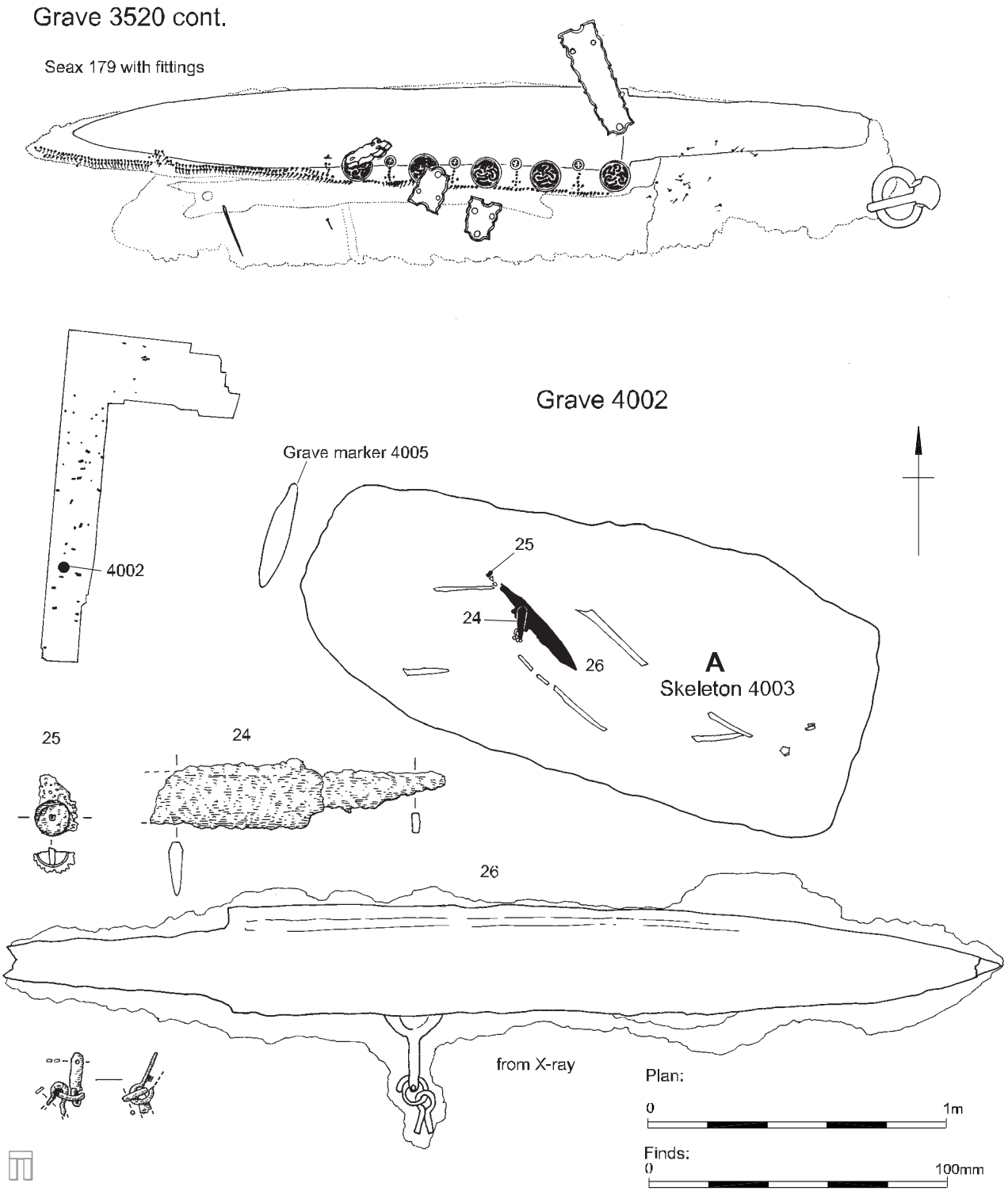


Figure 13 (opposite) Inhumation burial 3520 (seaxes 179 and 180 shown at 1:3)

Figure 14 (above) Inhumation burials 3520 (continued) (seax 179 shown at 1:4) and 4002 (seax 26 shown at 1:3)

truncated a small grave-like feature (4425), and it appears likely that the excavation of the pit had destroyed the majority of a grave. Furthermore, the remainder of the probable grave had been almost completely emptied, and it is suggested that the excavators of the pit found some grave goods and emptied the rest of the grave in a search for further items. The human remains from this grave (and apparently another) had then been dumped into the base of the pit, along with an iron knife (item 385) which may also have originally been deposited in the grave. Human bone was also recovered from several other contexts, particularly from the basal fills of pits 4325 and 4368, and this too is assumed to have been redeposited from disturbed graves for which no other evidence was recorded. Human bone from non-grave contexts is listed in Table 4 and discussed further below.

Three of the graves in the West Stand were aligned approximately south–north with the head at the southern end (4357, 4541, and 5428); the grave containing the double burial (3520) in the South Stand was also aligned roughly south–north with the heads at the southern end. The orientation of these four graves varied from 0° (grave 4357) to 20° (grave 4541) east of OS grid north. The remaining 19 graves, plus the two on SOU 20, were all aligned approximately west–east, with orientations between 72° (grave 5352) and 116° (grave F183, on SOU 20) east of OS grid north. Where enough bone survived, or where the positioning of the grave goods indicated the position of the body, the head was always to the west. Although the poor preservation of the skeletons often made the positioning of the bodies within the graves very difficult or impossible to discern, where enough did remain, all appeared to be lying in a supine, extended attitude with the arms by the sides. Similar positions were inferred from the arrangement of grave goods where little or no bone was present.

Organic staining, probably representing some form of coffin or chamber, was noted in three of the inhumation graves (4037, 5129, and F288, the last on SOU 20). In 4037 the staining was recorded in the sides and base of the grave and is assumed to represent a coffin or lining filling virtually the entire grave. In 5129 very ephemeral and intermittent staining in the upper part and sides of the grave indicate the position of a container. The height of the possible container was estimated to be approximately 0.40 m, based on the difference in levels between the bottom of the grave and the position of the spearhead (item 339), which appeared to have been placed on the top of the coffin/chamber. As the extent of the staining was somewhat smaller than the grave cut it is assumed to represent a coffin rather than a chamber, but this is rather uncertain. The remains of a wooden coffin or lining was also recognised in grave F288 (SOU 20), visible as a dark stain along the sides and base of the grave (Holdsworth 1980, 38). Large fragments of charred wood, possibly parts of a plank, were found in grave 5428. These may represent some form of structure within the grave, though later disturbance by pit 5371 make this interpretation uncertain.

Catalogue

A plan of the burial accompanies each entry, with an inset to show its location within the early cemetery, and illustrations of the associated burial goods (Figs 13–29). A summary of the distribution of grave goods is presented in Figures 30d and 31. Detailed discussion of individual items and groups of items follow the catalogue. All graves were rectangular and oriented west–east unless otherwise indicated.

Grave 3520 (Figs 13–15)
This large grave was orientated approximately south–north (10° east of O.S. north) and was 2.20 m long, 1.15 m wide and 0.30 m deep with vertical sides and a flat base. It contained two skeletons, placed side by side in supine, extended positions with the heads to the south.

Skeleton 3521, that of an adult, aged 18 years or older, of uncertain sex, which was in very poor condition, lay on the east side of the grave with the head to the south. Only approximately 10% of this skeleton survived. It was accompanied by an iron seax with a horn handle (item 180) in an alderwood and leather scabbard and an iron buckle (item 186), both of which lay along the right hand (eastern) side. An iron knife with a horn handle and the mineralised remains of a leather sheath attached (item 940) was found between the seax and the right femur.

Skeleton 3549, that of an adult of uncertain sex aged between 25 and 35 years, was also in poor condition and only approximately 7% survived. This was accompanied by an iron seax with a wooden handle (item 179) in a richly decorated wood and leather scabbard (items 926, 930–34, 936–9) which lay in the area of the right hip. This was associated with a belt set comprising a copper-alloy catchplate (item 175), buckle (item 181) and three mounts (items 927, 928 and 929 – lifted in the soil block along with the seax). A copper-alloy needle (item 935) was also recovered from the soil block which contained the seax and belt fittings. A flat, undiagnostic fragment of copper-alloy (item 182) and a copper-alloy pin-head (item 610) were recovered from the same area.

A complete organic-tempered pot (item 183: fabric 1) was placed between the feet of the two bodies. A second flat, undiagnostic fragment of

Figure 15 View of double inhumation burial 3520 (no scale)

copper-alloy (item 177) and curved fragments of copper-alloy (item 615) were recovered from samples taken of the backfill (3522) in the pelvic area of both skeletons. Textile remains, possibly representing clothing, were found on the two buckles (items 181 and 186) associated respectively with the two seaxes.

Grave 4002 (Fig. 14)
This grave was 1.95 m long, 0.89 m wide and only 0.06 m deep (truncated), with steep sides and a flat base. It contained skeleton 4003, that of an adult, aged 18 years or older, of uncertain sex, of which approximately 7% (upper and lower limbs) survived. This had been placed in a supine position with the legs slightly flexed to the right with the left leg overlying the right at the ankles and the head towards the west. A group of three iron objects was found in the area of the left hip; these comprised a knife (item 24), an unidentified object (item 25) and a seax with a horn handle (item 26) and metal sheath fittings.

Immediately to the west of the grave was a small slot (4005) 0.36 m long, 0.08 m wide and 0.13 m deep, with near-vertical sides and a concave base filled with greyish-brown silty clay. This is presumed to represent some form of grave marker.

Grave 4037 (Fig. 16)
The southern side of this grave had been completely removed by a modern pipe-trench. It was 2.20 m long, 0.45 m (surviving) wide and 0.35 m deep with vertical sides and a flat base. The grave contained skeleton 4085, that of an adult of indeterminate sex, aged 18 or over. This appeared to have been placed in a supine, extended position with the head towards the west. Dark organic staining (4064) around the sides and base of the grave probably represents the remains of a coffin.

Two glass beads (items 46 and 47) were recovered from the neck/shoulder area and an iron object, a tool or key (item 50) and a nail covered in mineralised wood lay immediately to the left of the skull. A small iron ?rivet with mineralised wood attached (item 654) was also recovered from a soil sample taken from around the skull. Around the feet was an area of staining (4086), probably the remains of some form of organic container, possibly a bag. This contained an iron ring (item 49), a 1st century AD copper-alloy brooch (item 48), and ten small fragments of perforated copper-alloy sheet (item 45) – almost certainly derived from a single, unidentified object.

Grave 4101 (Fig. 16)
This grave was 2.20 m long, 0.90 m wide and 0.35 m deep with steep sides and a flat base. No skeletal remains survived, although a dome-headed stud (item 248) was recovered from the base of the cut, towards the northern side.

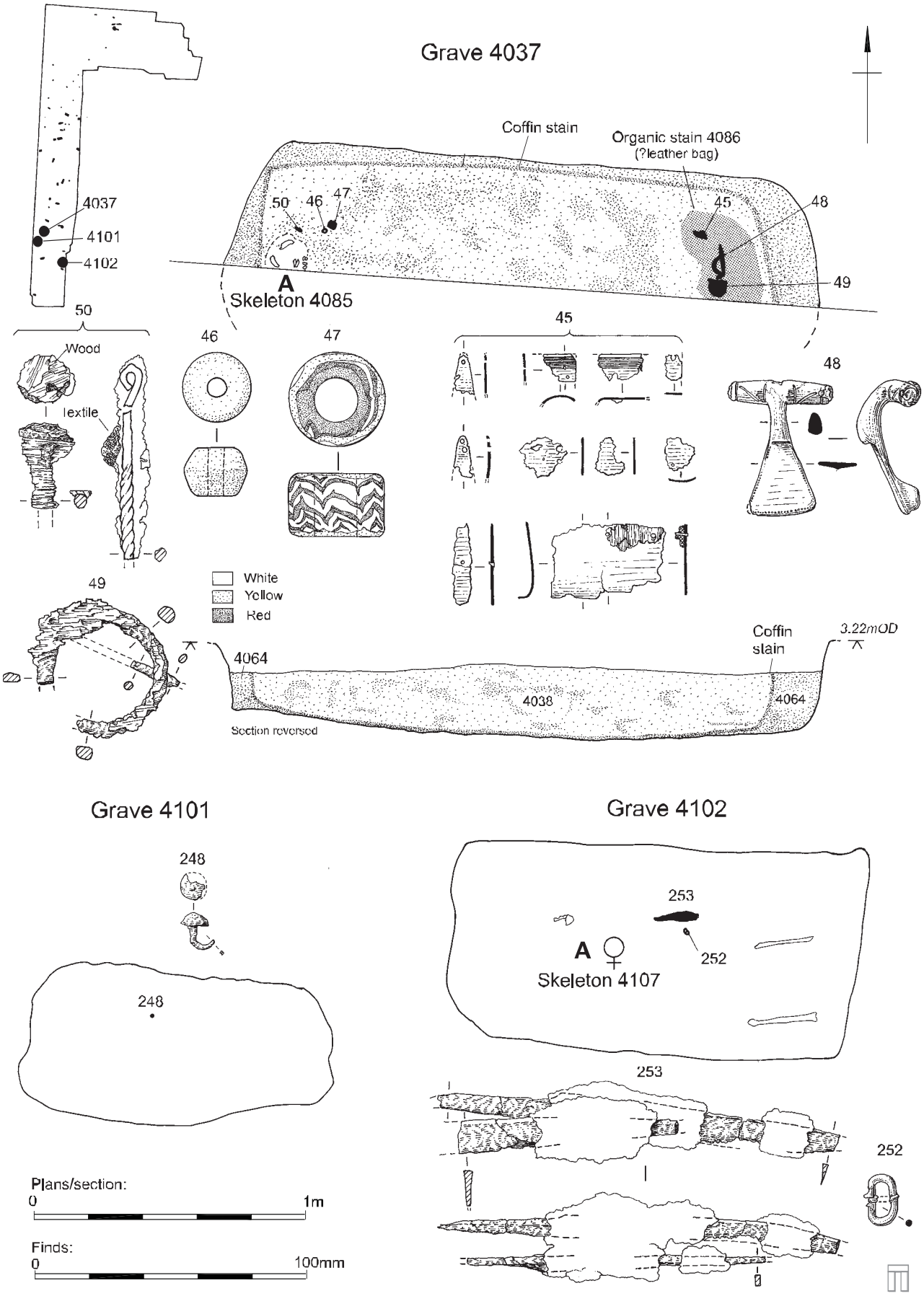


Figure 16 Inhumation burials 4037 (beads 46 and 47 and brooch 48 shown at 1:1), 4101, and 4102

Grave 4102 (Fig. 16)
This was 1.66 m long, 0.76 m wide and 0.17 m deep with steep sides and a flat base. It contained skeleton 4107, that of a possible female adult aged between 18 and 25 years. This was placed in a supine, extended position with the head towards the west and was accompanied by a copper-alloy buckle (item 252) and two iron knives (item 253), which lay in the area of the left hip.

Grave 4110 (Fig. 17)
The eastern end of this grave had been completely removed by pit 4113. It was 0.80 m (surviving) long, 0.52 m wide and only 0.05 m deep (truncated), with steep sides and a flat base. The grave contained skeleton 4112, that of a subadult or adult, aged 13 years or older, of indeterminate sex. This had probably been placed in a supine position with the head towards the west. A copper-alloy buckle (item 254) was recovered from the area around the right hip.

Grave 4202 (Figs 17–18)
This grave had been truncated along its southern side by a modern pipe-trench. It was 2.10 m long, 0.84 m (surviving) wide and 0.23 m deep with vertical sides and a flat base. The grave contained skeleton 4203, that of an adult female aged between 18 and 25 years. The position of the skeleton was uncertain due to the poor preservation of the bones, but was probably in a supine position with the legs slightly flexed to the right and the head to the west.

The burial was accompanied by the possible remains of a wooden box or casket with metal fittings (item 328) placed at the feet. This appeared to contain a copper-alloy workbox (item 328a) and a decorated silver disc (item 328b), the disc itself perhaps within the workbox. An iron knife (item 332) and an unidentified iron object (item 333) lay by the left side of the torso. Two series B silver sceattas (items 329 and 330), datable to the late 7th century, and a thin lamella of silver bearing the impression of a third, were found above the chest. Around the neck was a necklace (item 565) which comprised a gold pendant (item 331), four silver 'bulla' pendants (item 567), four glass beads (item 566), and fragments of copper alloy, possibly the remains of two other 'bulla' pendants (item 568). Textile remains, perhaps representing clothing, were found on the knife blade (item 332) outside the remains of its possible leather sheath.

Grave 4265 (Fig. 19)
This grave had been truncated at the eastern end by pit 4125 and along the southern side by pit 4236. The grave was 1.35 m (surviving) long, 0.63 m (surviving) wide and 0.12 m deep with moderately steep sides and a flat base. No skeletal remains survived. An iron knife (item 346) was found in the base of the grave cut in a position which would probably have been above the pelvis.

Grave 4357 (Fig. 19)
This grave was orientated south–north, and had been truncated on its western side by pit 4412 and completely removed at its northern end by a modern wall foundation. The grave was 1.50 m (surviving) long, 0.90 m wide and 0.17 m deep with near vertical sides and a flat base. It contained skeleton 4358, that of an adult of indeterminate sex, aged 18 years or older, which was placed in a supine, extended position with the head to the south. The burial was accompanied by an iron knife with a horn handle (item 366) and the mineralised remains of a leather sheath in the area of the left hip, and an iron spearhead with the remains of a hazelwood shaft (item 367) to the left of the skull.

Grave 4425 (Figs 19 and 56)
This heavily truncated feature, largely removed by pit 4368, has been interpreted as a probable grave cut that was aligned west–east. The surviving part of the grave cut was 0.97 m long, 0.87 m wide and 0.28 m deep, with vertical sides and a flat base. The remaining fill of the grave appeared to have been almost totally excavated during the digging of the pit and part of the skeleton, that of an adult male between 25 and 40 years old, redeposited in the base of the pit. Interestingly, the remains of a second individual, that of a subadult aged 17–19 years was also represented among the skeletal remains from this pit (in fill 4373, see Table 4). An iron knife (item 385) was also recovered from among the redeposited skeletal remains in pit 4368 and may have originally accompanied one of the burials.

Grave 4493 (Fig. 19)
This grave had been truncated at the eastern end by pit 4379. The grave was 1.45 m (surviving) long, 0.76 m wide and 0.42 m deep with near vertical sides and a flat base. It contained a very degraded skeleton (4495), that of a subadult or adult of indeterminate sex and age. This had probably been placed in a supine, extended position with the head to the west. No grave goods or finds were recovered.

Grave 4541 (Fig. 20)
This grave, orientated approximately south–north, had been partly truncated by a modern wall footing, although the base of the grave survived below this. The grave was 2.38 m long, 1.0 m wide and 0.30 m deep with vertical sides and a flat base. It contained skeleton 4555, that of an adult, possibly male, aged between 18 and 30 years. This was in a supine,

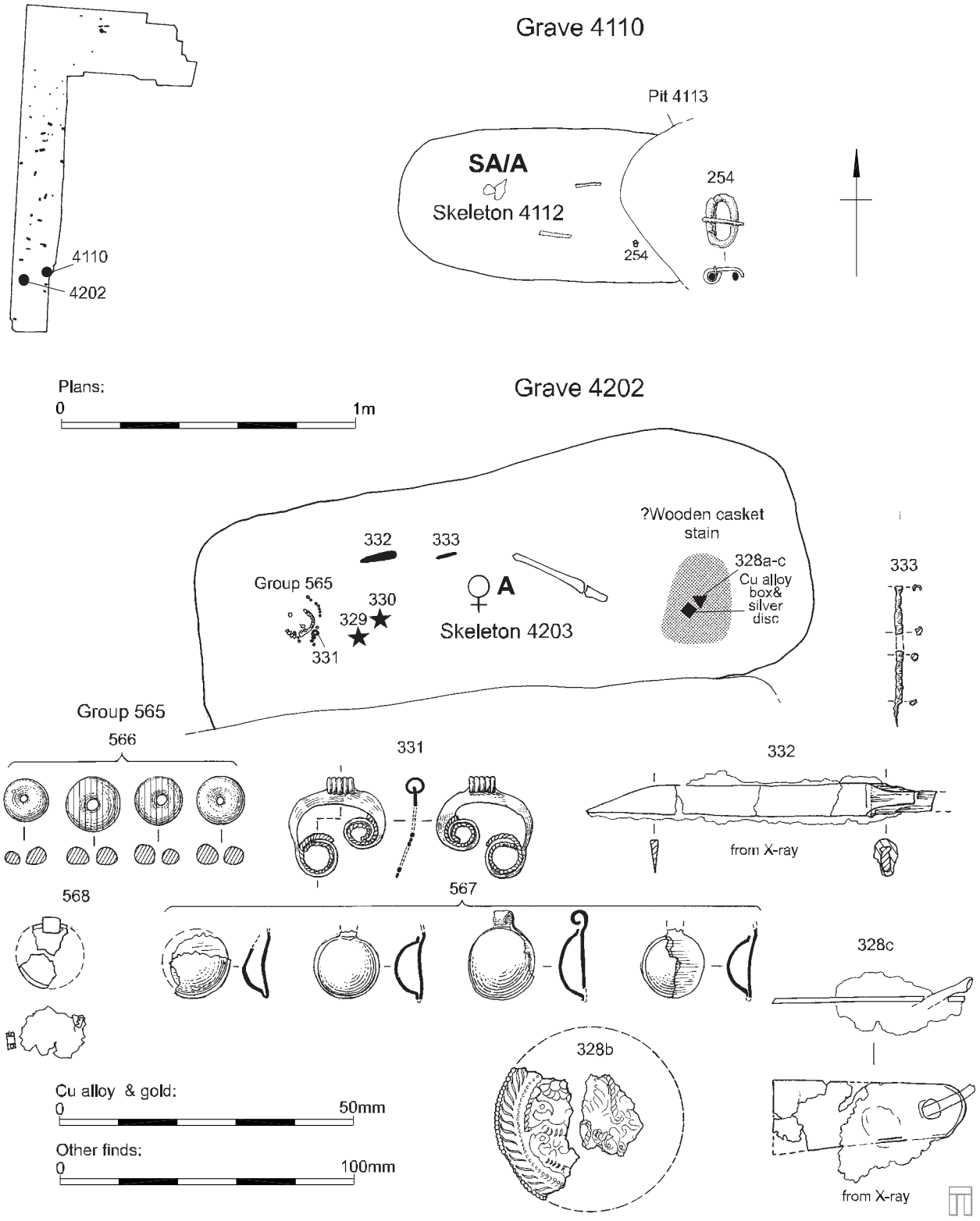


Figure 17 Inhumation burials 4110 and 4202

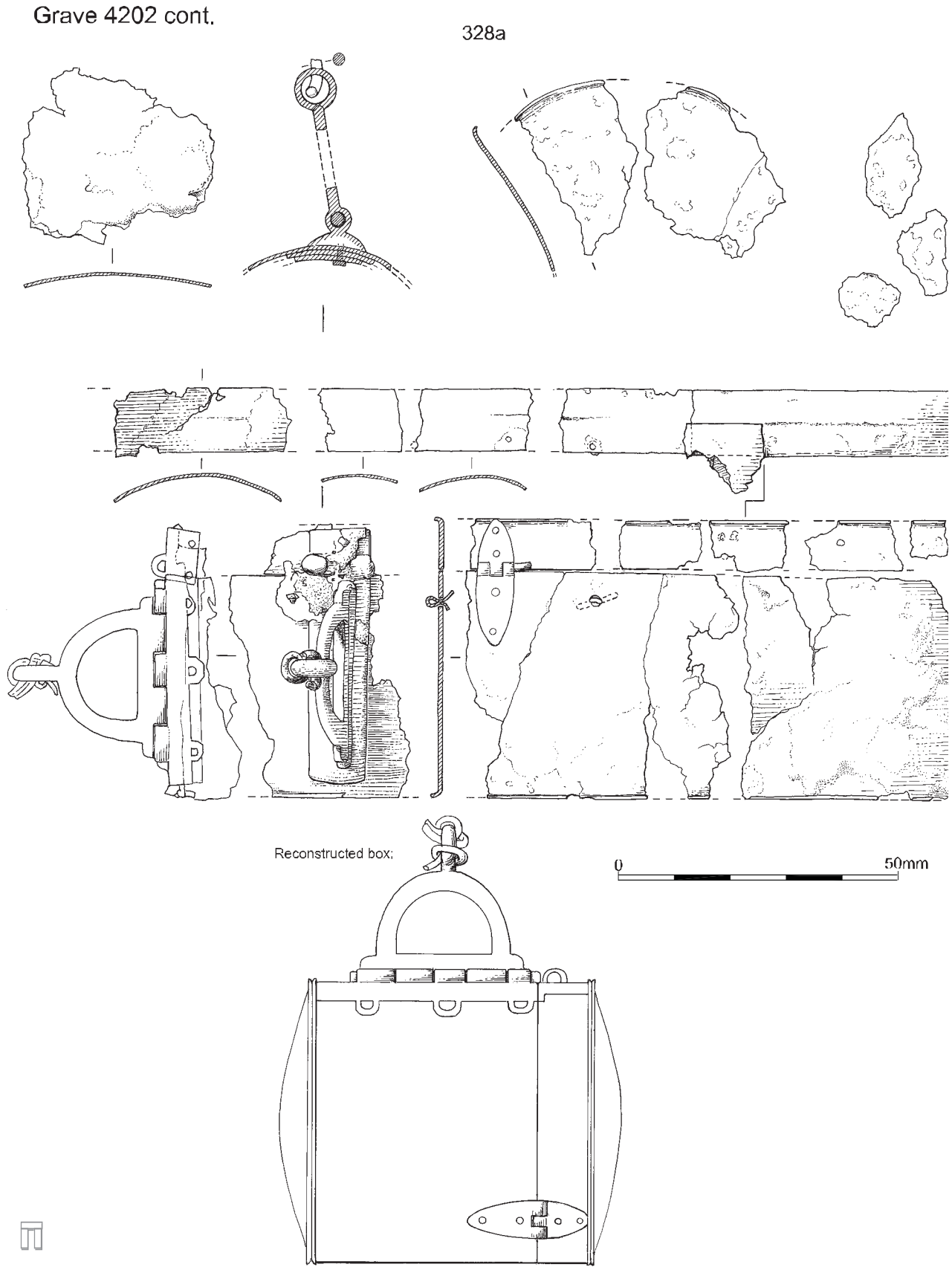


Figure 18 Inhumation burial 4202 (continued)

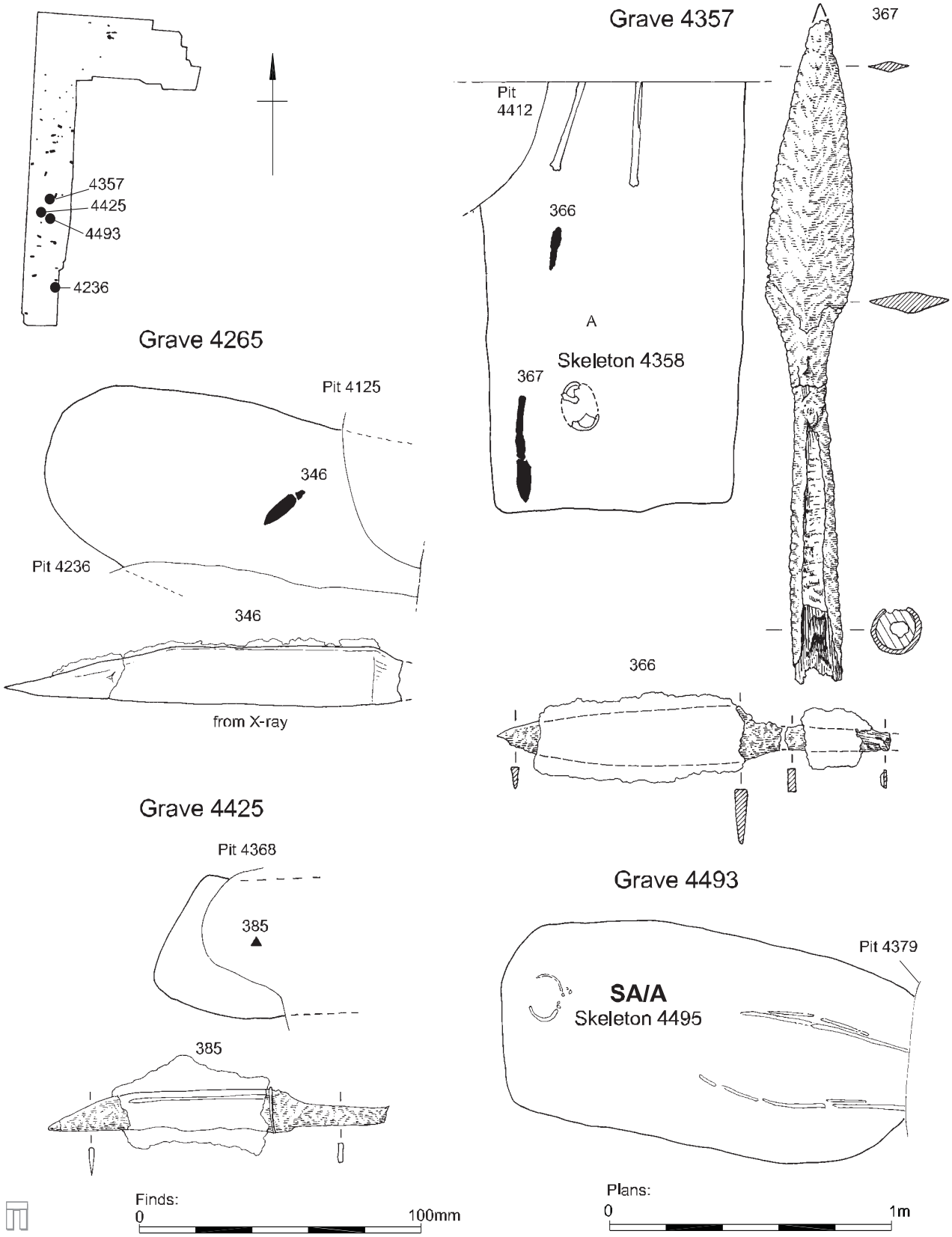


Figure 19 Inhumation burials 4265, 4357, 4425, and 4493

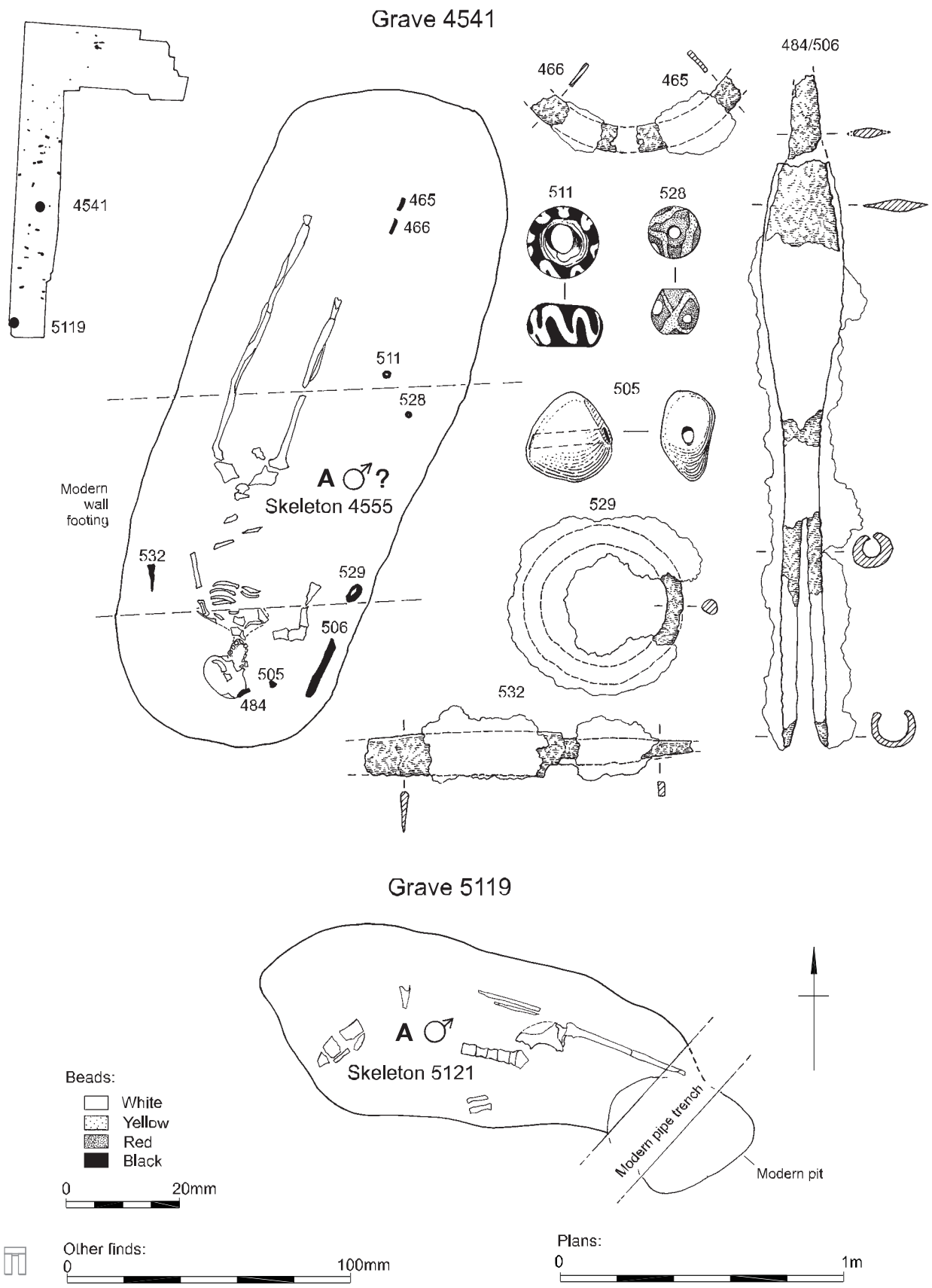


Figure 20 Inhumation burials 4541 and 5119

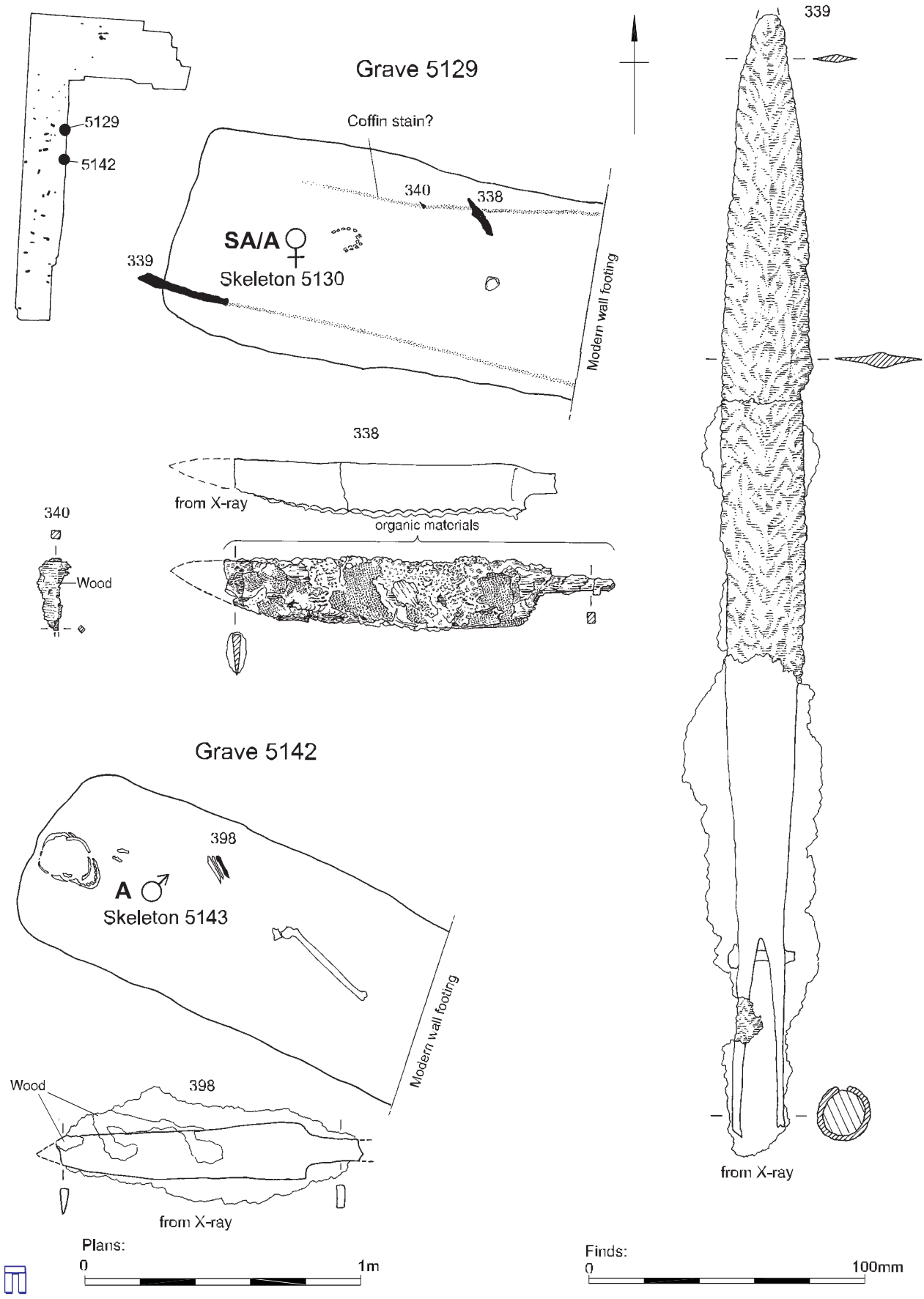
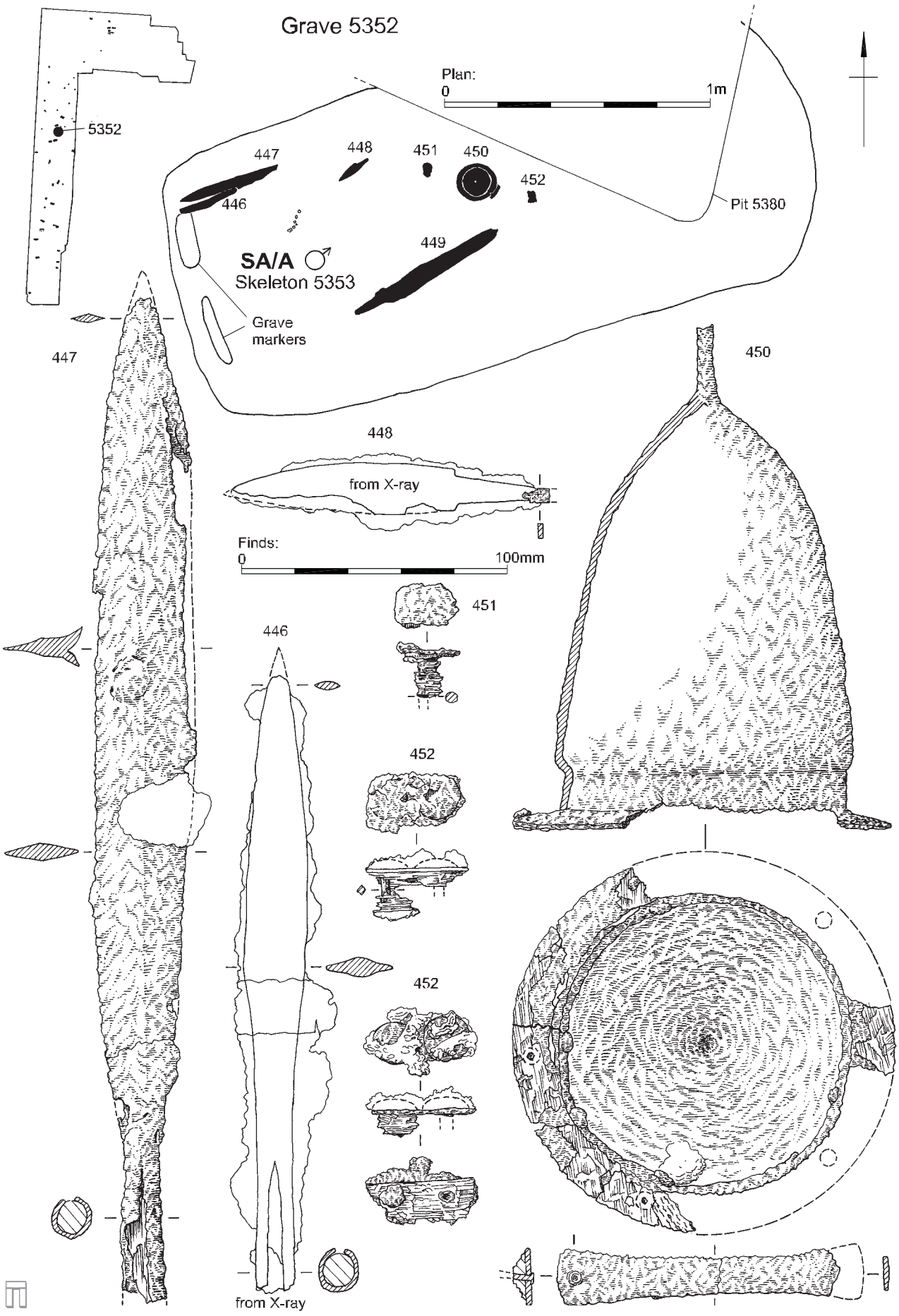


Figure 21 (above) Inhumation burials 5129 and 5142

Figure 22 (opposite) Inhumation grave 5352


Grave 5352
Plan:
0
1m
5352
447
448
451
450
452
446
Pit 5380
449
SA/A ♂
Skeleton 5353
Grave
markers
447
448
from X-ray
Finds:
0
100mm
451
446
452
452
450
from X-ray

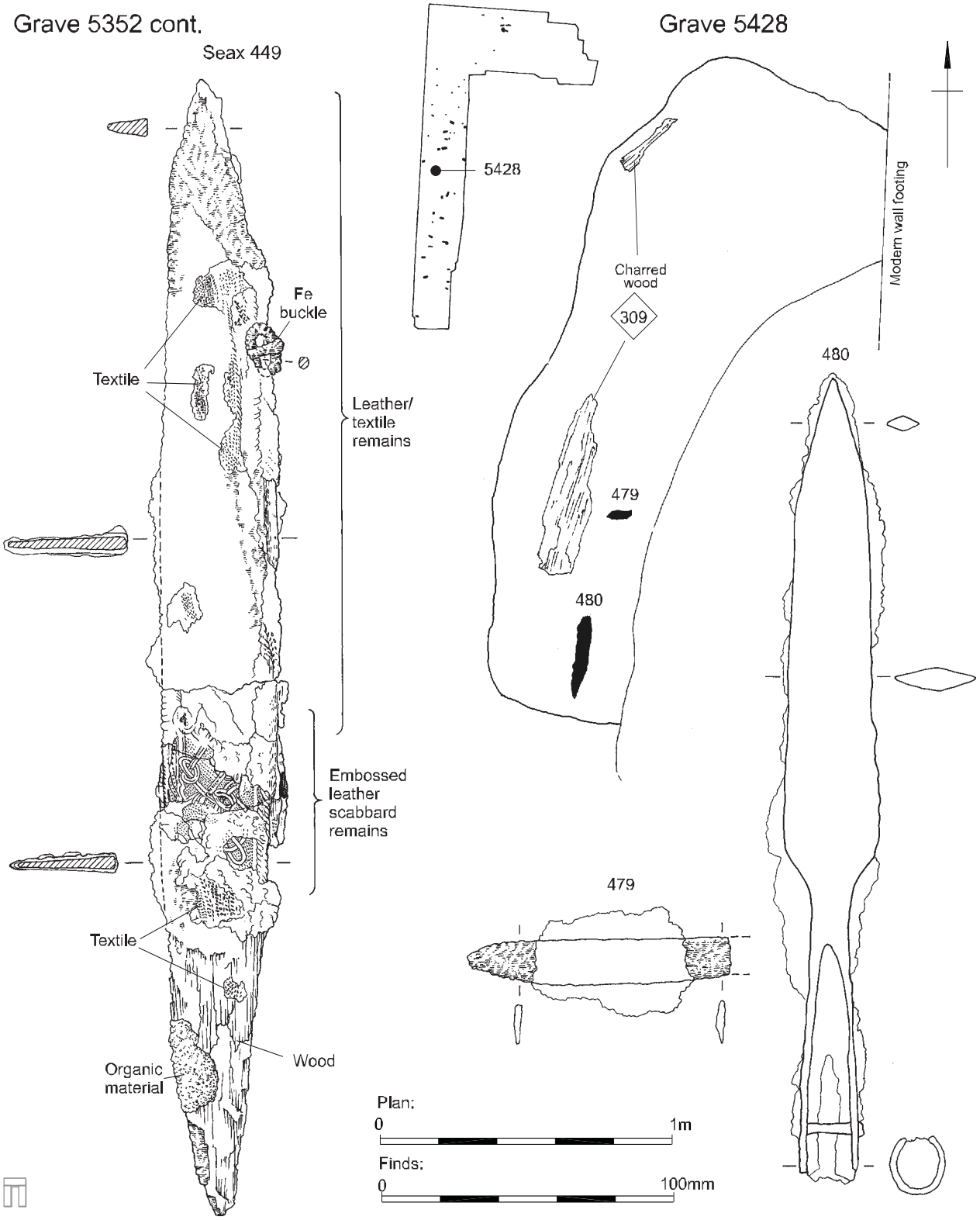


Figure 23 Inhumation burials 5352 (continued) (seax 449 shown at 1:3) and 5428

extended position with the left arm flexed across the body and the head to the south. Within the grave fill, two slightly curved iron objects (items 465 and 466) were found approximately 0.20 m above the feet area with an unidentified iron object, most likely to be part of the tip of spear 506 (item 484), *c.* 0.20 m above the skull. The skeleton itself was accompanied by a spearhead (item 506) close to the right shoulder, an iron ring (item 529) – just below the spearhead – beside the right arm, and an iron knife fragment (item 532) beside the left elbow. An amber bead (item 505) was to the right of the skull and two glass beads (items 511 and 528) were found to the right of the right leg.

Grave 5119 (Fig. 20)
This very irregularly shaped grave had been truncated at its eastern end by modern disturbances. It was 1.50 m (surviving) long, 0.67 m wide and 0.08 m deep with moderately steep sides and a flat base, and contained skeleton 5121, that of an adult male between 25 and 45 years old. This was in a supine, extended position with the arms extended to the sides and the head to the west. No associated grave goods were present.

Grave 5129 (Fig. 21)
A modern wall foundation had completely removed the western end of this grave which was 1.53 m (surviving) long, 0.72 m wide and 0.50 m deep with vertical sides and a flat base. It contained the very degraded skeleton (5130) of a subadult or adult possible female between 16 and 20 years old. The position of the skeleton is uncertain due to the poor survival, but the head was to the west. This was probably buried within a rectangular coffin or chamber, represented by a dark stain (5131), within the redeposited brickearth backfill. A single nail or rivet (item 340) recovered from this area may have been part of the coffin.

An iron spear (item 339) appears to have been placed on top of the western end of the coffin before the grave was backfilled. Textile remains found adhering to the spearhead probably represent some form of wrapping. An unusual serrated iron knife (item 338) was located in the area of the left hip within the coffin. Textile remains found on both sides of the knife, each of which were of a different weave, probably represent the remains of an inner garment and outer gown or shawl.

Grave 5142 (Fig. 21)
This grave had been truncated at the eastern end by modern wall footings. It was 1.50 m (surviving) long, 0.65 m wide and 0.23 m deep with vertical sides and a flat base, and contained skeleton 5143, that of an adult male aged 50 years or over. This was in a supine, extended position with the head to the west. An iron knife (item 398), in the area of the left hip, accompanied the burial.

Grave 5352 (Figs 22–4)
Pit 5380 had truncated much of the north-eastern part of this grave, which was 2.42 m long, 1.12 m wide and 0.30 m deep with vertical sides and a flat base. Two small slot-like features, approximately 0.20 m long, 0.05 m wide and 0.10 m deep, adjacent to the western end of the grave may represent some form of grave marker(s). The grave contained skeleton 5353, that of a subadult or adult male aged between 16 and 20 years, which was lying with the head to the west. Too little remained of the skeleton to discern its attitude within the grave.

The burial was accompanied by two iron spearheads (items 446 and 447), one of which had an ash wood shaft, that lay to the north side of the head. An iron knife (item 448) lay along the north side of the torso, an iron seax with a horn-veneered wooden handle (item 449) in the remains of an embossed leather scabbard along the south side of the torso, and an iron shield-boss (item 450) above the pelvic area. Two identical objects, comprising five fragments of

Figure 24 View of inhumation burial 5352 from the east, with weaponry (2m scale)

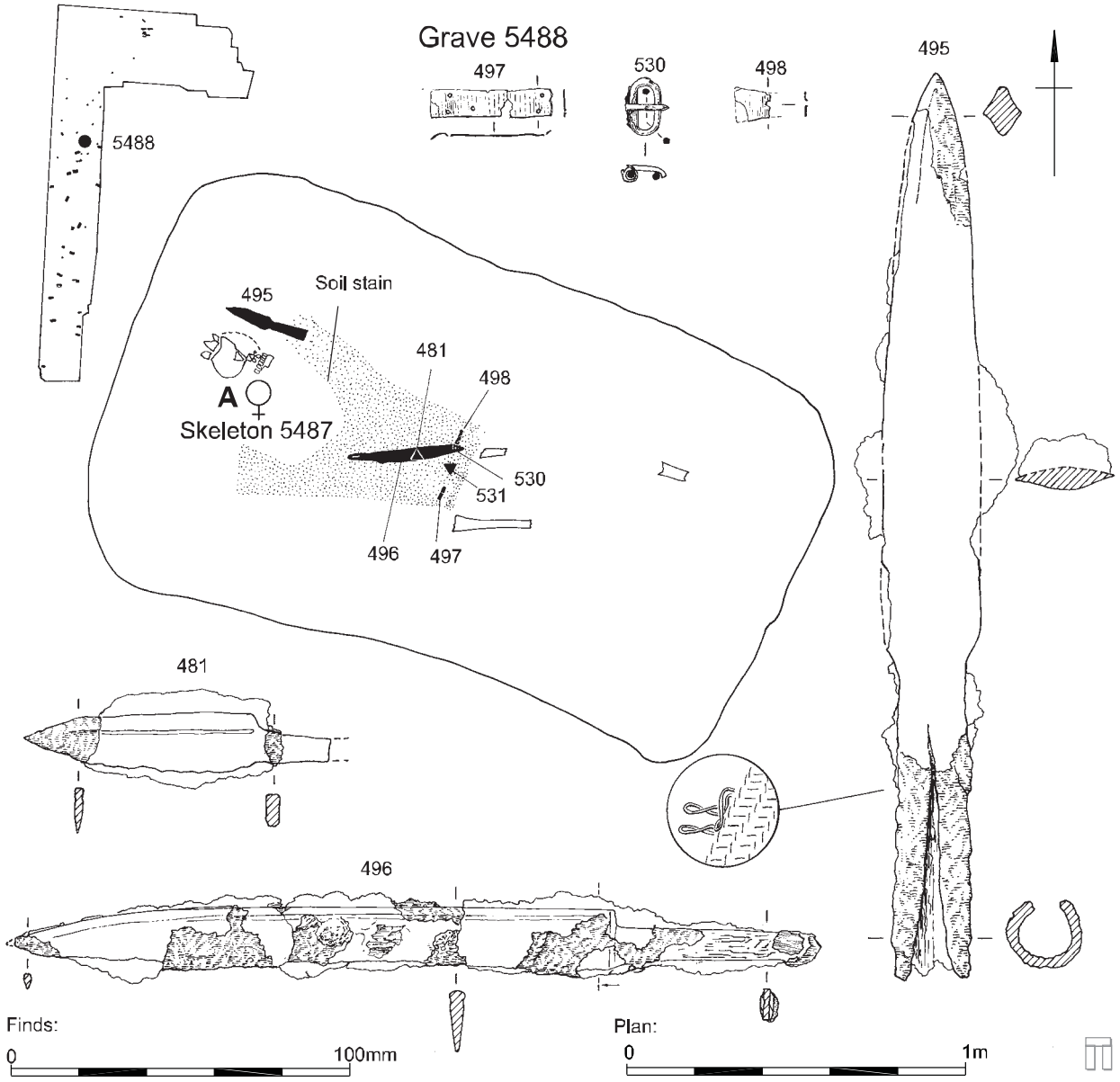


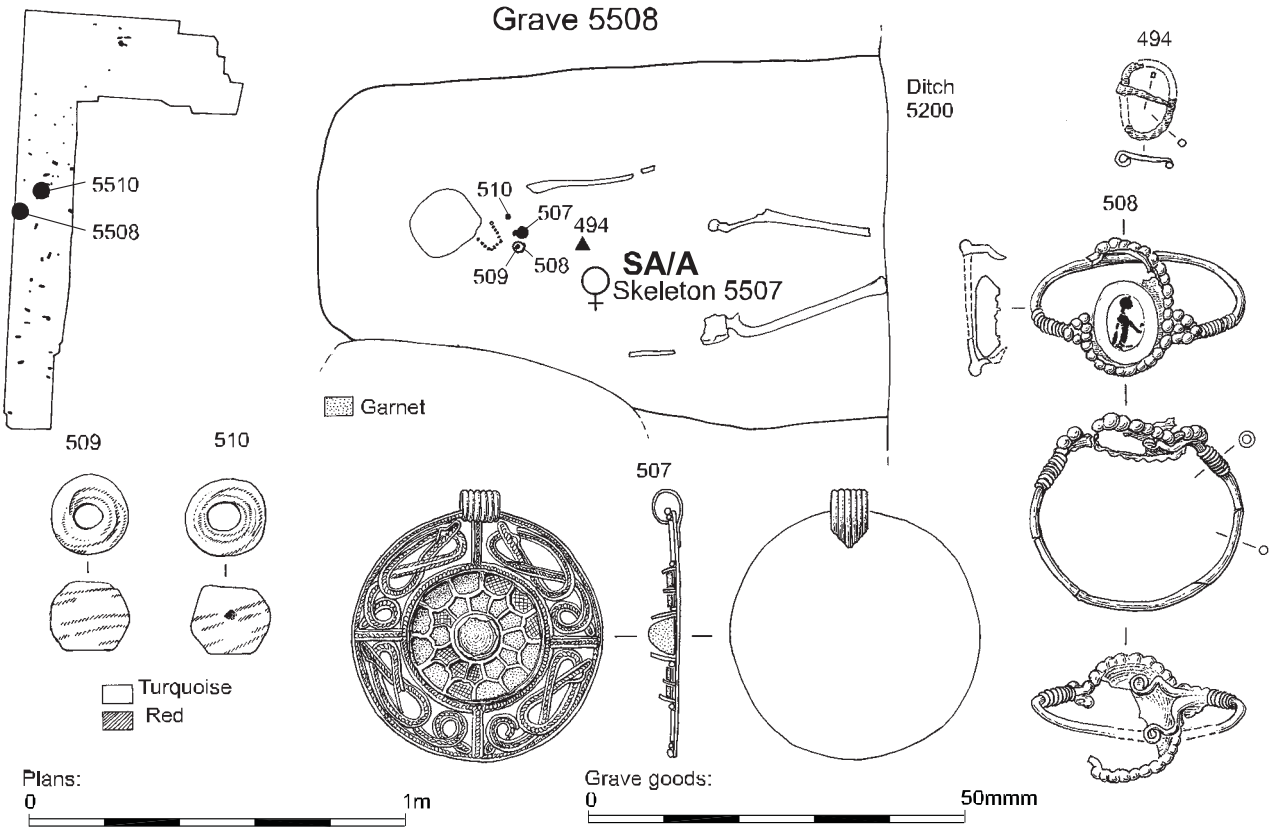
Figure 25 Inhumation burial 5488

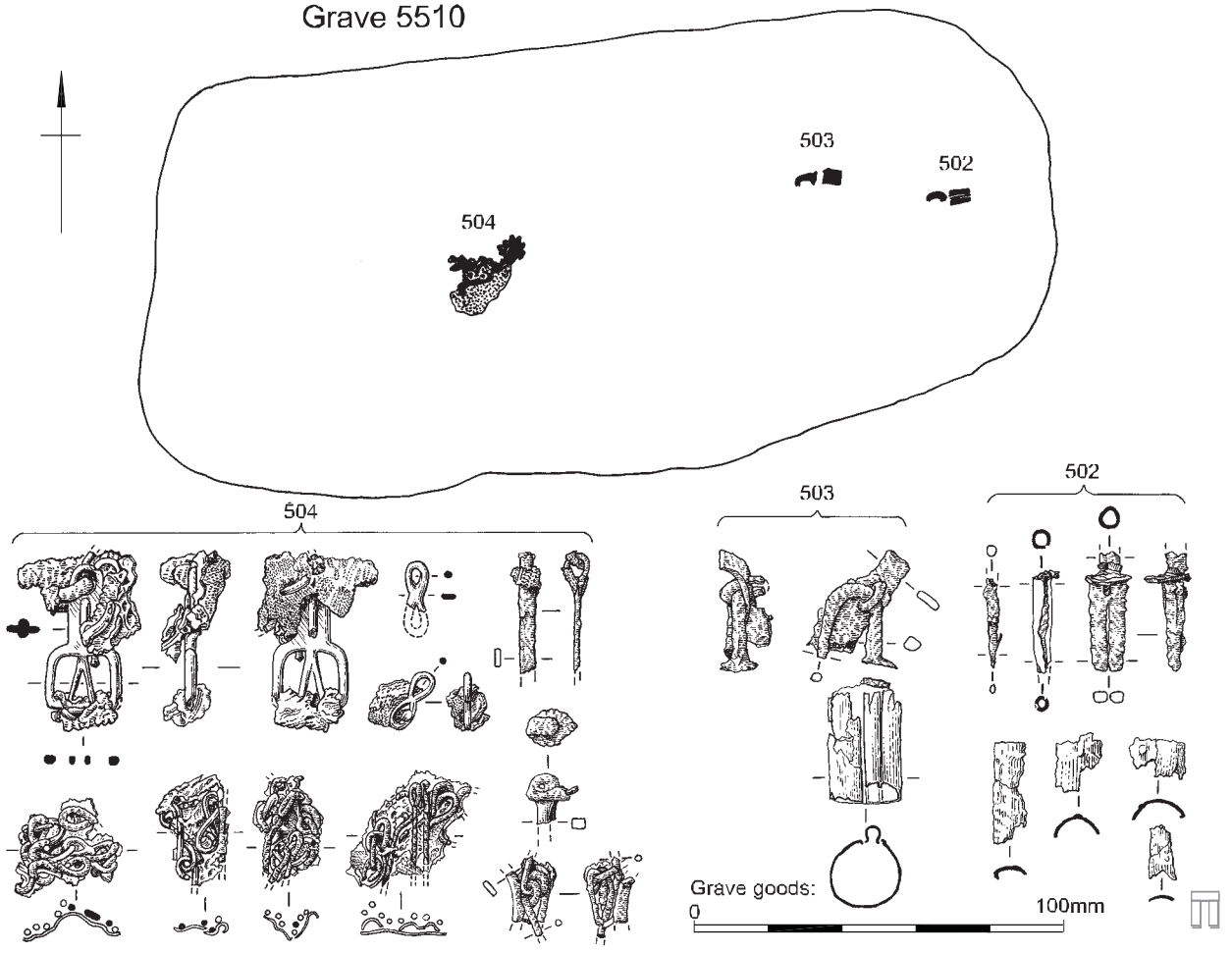
iron rivets and small sheet fragments with mineralised wood attached (items 451 and 452), were found on either side of the shield-boss, and are associated with the grip on the back of the shield.

Grave 5428 (Fig. 23)
This rather irregularly shaped grave, orientated very approximately south–north, had been heavily truncated along the eastern side by pit 5371 and a modern wall footing. Nothing remained of the skeleton, but on the basis of the position of the grave goods, it is assumed that the head was towards the south. An iron knife (item 479) and a spearhead (item 480), with the mineralised remains of a possible ashwood shaft attached, lay close to the southern end of the grave on the western side. The charred remains of what appeared to be part of a burnt plank were also found in this area of the grave, perhaps part of a coffin. Textile remains found adhering to the spearhead probably represent some form of wrapping, however the position of the body within the grave is unknown.

Grave 5488 (Fig. 25)
This grave was 2.05 m long, 1.29 m wide and 0.29 m deep with vertical sides and a flat base. It contained skeleton 5487, that of an adult aged between 20 and 25 years, possibly a female. This had been placed in a supine, extended position with the legs very slightly flexed to the left with the head to the west. The burial

Figure 26 (opposite) Inhumation burials 5508 and 5510


Grave 5508
5510
5508
Ditch
5200
510
507
494
509
508
SA/A
Skeleton 5507
Garnet
494
508
509
510
507
Turquoise
Red
Plans:
0
1m
Grave goods:
0
50mmm


Grave 5510
503
502
504
504
503
502
Grave goods:
0
100mm

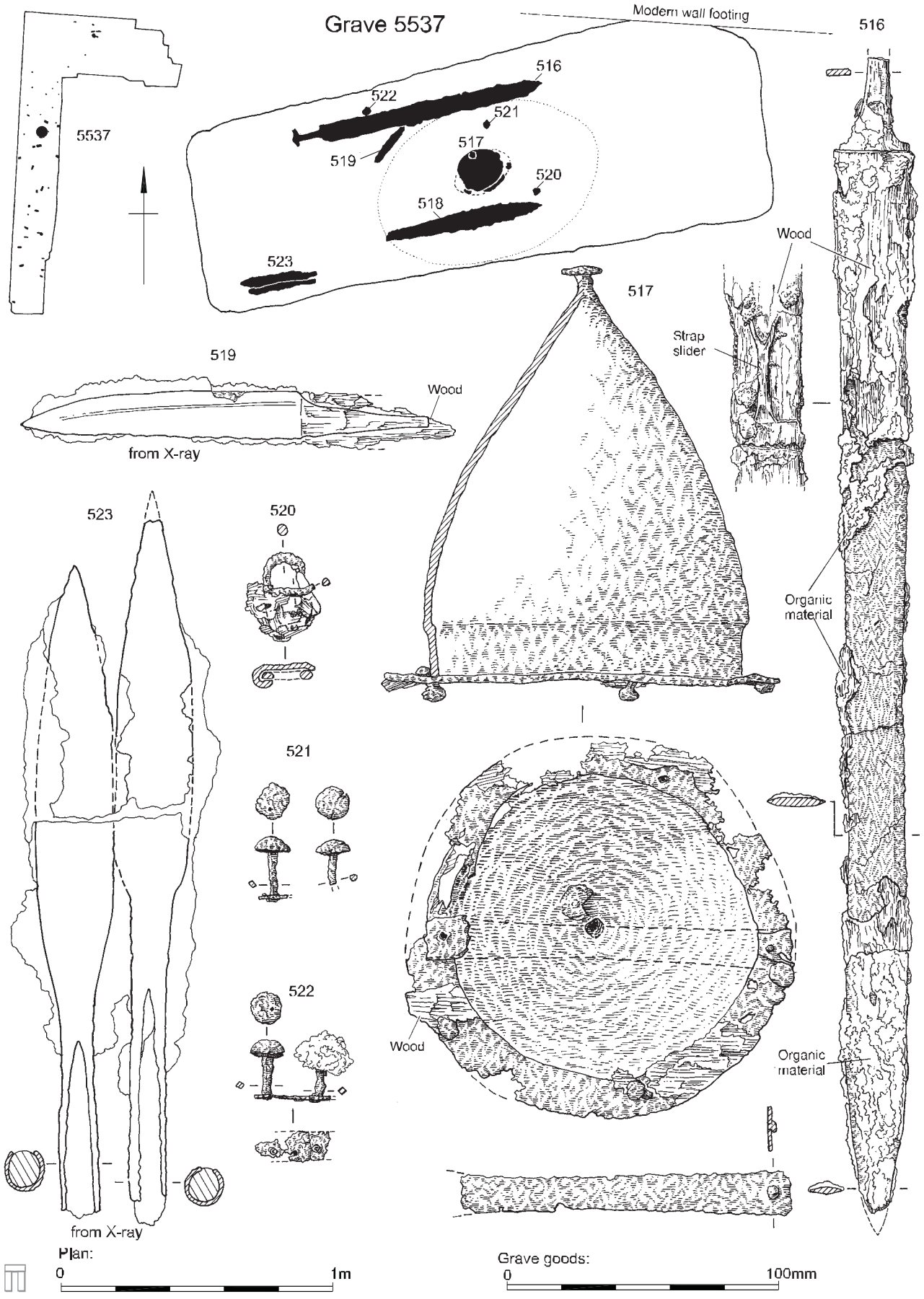


Figure 27 Inhumation burial 5537 (sword 516 shown at 1:4)

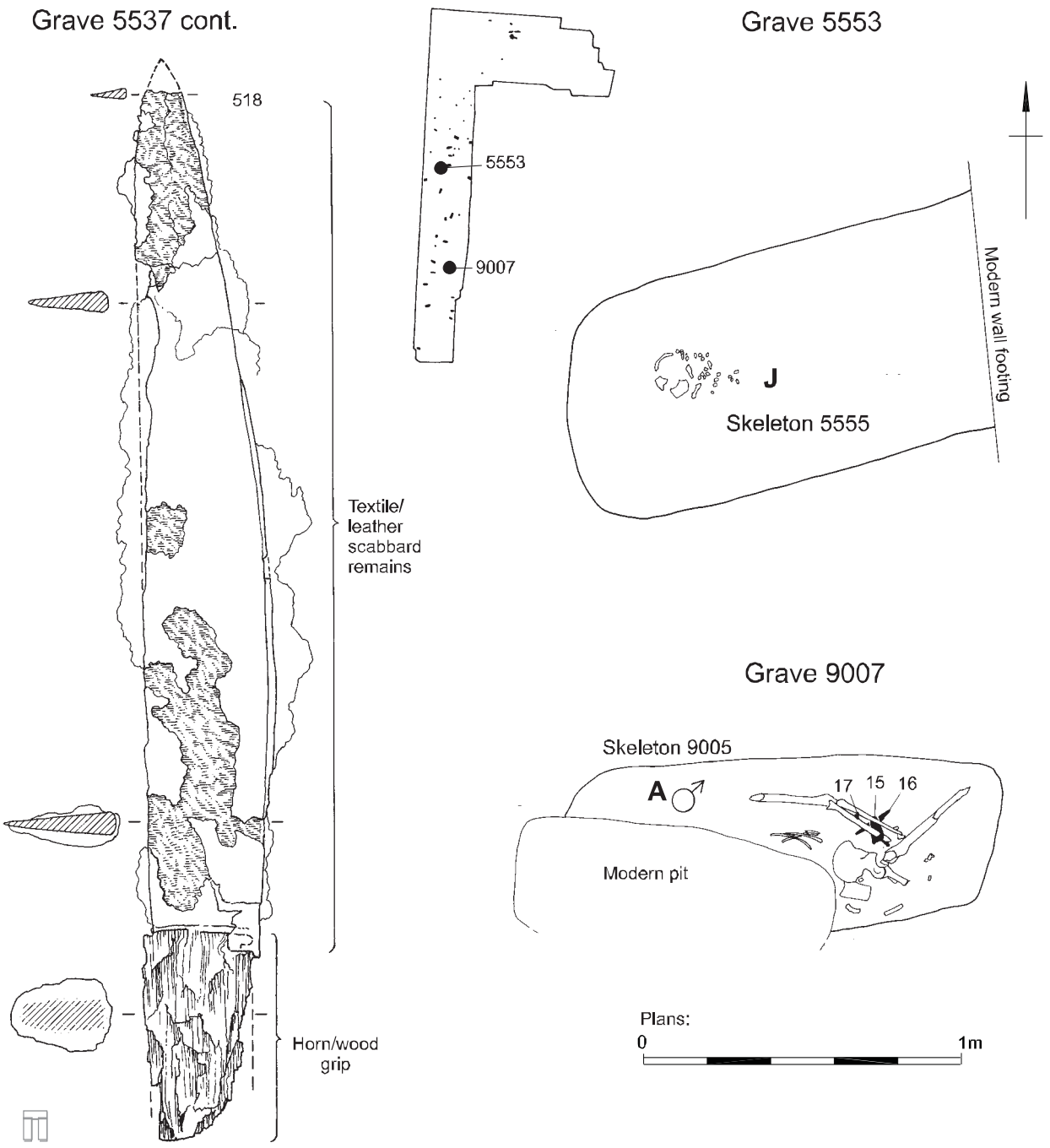


Figure 28 Inhumation burials 5537 (continued) (seax 518 shown at 1:3), 5553 and 9007

was accompanied by an iron spearhead (item 495) on the left side of the skull. An iron seax, with a horn handle (item 496) and the remains of a leather sheath, lay across the abdomen in line with the legs; a copper-alloy buckle (item 530) and fitting (item 531) were attached to the seax by corrosion. A slight staining, possibly representing some form of clothing, was noted over the abdominal area during excavation and two copper-alloy objects (items 497 and 498) associated with the staining were found in the waist area. An iron knife (item 481) and a fragment of glass (item 546) were recovered from the redeposited brickearth fill. Textile remains were found adhering to both the spearhead and the seax, but it is uncertain whether these represent wrappings or clothing.

Grave 5508 (Fig. 26)
Pit 5337 and medieval/post-medieval ditch 5200 had truncated this grave to the south and east respectively. The grave was 1.50 m (surviving) long, 0.95 m wide and 0.20 m deep with near vertical sides and a flat base. It contained skeleton 5507, that of an older

subadult or young adult female aged between 16 and 20 years. This was in a supine, extended position with the arms extended down the sides and the head to the west. Accompanying the burial was a gold pendant with garnet insets (item 507), a large silver intaglio ring (item 508) and two glass beads (items 509 and 510), all in the neck area suggesting that they were once on a necklace. An iron buckle (item 494) was recovered from the redeposited brickearth backfill of the grave from above the chest area.

Grave 5510 (Fig. 26)
This grave was 2.40 m long, 1.20 m wide and 0.40 m deep with vertical sides and a flat base. No skeletal remains survived. In the base of the grave, towards the eastern end, were two fragmentary copper-alloy and iron locks (item 502 and 503). In the centre of the grave was a copper-alloy and iron chain with a copper-alloy attachment – possibly a chatelaine (all item 504).

Grave 5537 (Figs 27–9)
This grave had been very slightly truncated on the north-eastern side by a modern wall footing, but was otherwise undisturbed, and was 2.10 m long, 0.79 m wide and 0.26 m deep with vertical sides and a flat base. No skeletal remains survived, but the position of the grave-goods suggests that the head would have been to the west. Accompanying the burial on the northern side of the grave was an iron sword with a horn grip in the remains of a wood and leather scabbard (item 516) and an iron knife (item 519); three small iron studs (item 522) were also recovered from this area. Along the southern side of the grave was an iron seax with a horn handle (item 518), also in the remains of a leather sheath or scabbard, and an oval-framed iron buckle (item 520). In the south-western corner were two iron spearheads (item 523), both with the mineralised remains of ash shafts attached. In the central area was an iron shield-boss (item 517) and two iron studs (items 521), possibly parts of the shield.

Textile remains found adhering to one side of the knife may represent clothing and the textile remains adhering to one of the spearheads probably represent some form of wrapping.

Grave 5553 (Fig. 28)
A modern wall footing had completely removed the eastern end of this rectangular grave, which was 1.30 m (surviving) long, 0.80 m wide and 0.34 m deep with vertical sides and a flat base. All that remained of the skeleton (5555), that of a juvenile of indeterminate sex aged between 8 and 11 years, were the teeth and a few fragments of skull towards the western end. No grave goods accompanied the burial.

Figure 29 View of inhumation burial 5537 from the east, with weaponry (2 m and 0.5 m scales)

Grave 9007 (Fig. 28)
The south-western side of this grave (excavated during the evaluation: SOU 942) had been completely removed by a modern pit and the remainder had been heavily truncated. The grave was 1.3 m (surviving) long, 0.50 m wide and 0.11 m deep with steep sides and a flat base. It contained skeleton 9005, that of an adult male aged 18 years or over, which was probably in a supine, extended position with the head to the west. This was accompanied by three possible iron objects, surviving only as corrosion products and unidentifiable. Item E16 may represent an iron knife and items E15 and E17 belt fittings. Both of these were located adjacent to the left hip, below the left arm/hand.

Graves excavated at SOU 20
Two further inhumations from this cemetery were excavated at SOU 20, immediately to the west of the West Stand, in 1975 (Holdsworth 1980, 35–9; see Fig. 9). Grave F183 contained virtually no skeletal remains, but did contain an iron seax, an iron spearhead and a copper-alloy buckle. Grave F288 contained the remains of an adult of indeterminate

sex aged between 25 and 30 years (Cook 1980), which was probably in a supine position with the head to the west. This grave also contained an iron spearhead and a copper-alloy buckle.

Skeletal Human Remains

by Jacqueline I. McKinley

Unburnt human bone was recovered from 35 contexts (Table 4). These comprised the remains of 19 inhumation burials and redeposited bone from the fills of pits (12 contexts), inhumation graves (two contexts) and layers (two contexts), mostly situated in the west of the site.

Age was assessed from the stage of skeletal and tooth development (Beek 1983; McMinn and Hutchings 1985), and the patterns and degree of age-related changes to the bone (Brothwell 1972; Buikstra and Ubelaker 1994). Sex was ascertained from the sexually dimorphic traits of the skeleton (Buikstra and Ubelaker 1994). Stature was estimated in accordance with Trotter and Gleser 1952; 1958. Platymeric (degree of anterior-posterior flattening of the proximal femur) and platycnemic (meso-lateral flattening of the tibia) indices, and femoral robusticity index were calculated according to Bass (1987).

Taphonomy

Condition

The condition of the bone was generally very poor, as reflected in the low percentage of skeletal survival (Table 4). The greatest percentage of bone recovered from a burial was *c*. 12%, with many comprising less than 5%, the worst that is found in Hamwic. The majority of the bone shows heavy surface erosion with loss in definition of morphological features. There was preferential destruction of trabecular bone, contributory factors to which – bone porosity and acidity of the burial environment – were outlined in the discussion of the condition of the cremated bone (above). The bone fragments which survived most frequently were elements of skull and the lower limb-bone shafts (Table 4), the former commonly including the teeth, the latter femur shaft. The greatest level of skeletal survival, 35%, was observed in the bone from grave 4425, disturbed and redeposited in the 8th century pit 4325, which was noticeably less degraded in parts than the bone from all of the other graves. In a few cases (3522, 3549, 4003, and 5143) the tooth crowns were masked by heavy deposits of iron pan.

There is no consistent link between the level of bone survival and the age or sex of individuals. The depth of the graves was of no significance in this respect, nor apparently was the presence/absence of a coffin/cover, though the bone from the two coffined burials was amongst the most poorly represented. Many of the graves contained the remains of items of copper-alloy and iron, as well as various other materials (Table 5), the presence/absence of which in the vicinity of individuals bones had very little or no effect on their survival. The graves were all cut through and backfilled with brickearth. The better preservation of the redeposited (after skeletalisation) bone from pit 4368, as well as the bone from the graves in the later cemetery – which clearly had darker fills – indicates that the matrix of the grave fill and, by inference, the acidity of the soil was a major factor in the level of bone preservation.

A variety of intrinsic and extrinsic factors may affect bone preservation (Henderson 1987). At the Stadium site, the intrinsic factor of the burial matrix was clearly of major importance, and this is likely to be the cause of the difference between the poor preservation in the early cemetery and the better preservation in the later, 8th century cemetery (Chapter 4). Extrinsic factors such as variations in the length of time prior to burial and undetected materials included in the burial environment may have been significant in the cases of intra-grave variations in both cemeteries. Elsewhere in Hamwic, human bone in a poor condition has also been observed where graves have been cut through and backfilled with brickearth, variations in the nature of the grave fills being significant for differential bone survival. Poor bone survival in the early graves at Cook Street (SOU 254, 567 and 823) to the south-west (McKinley and Garner 1993; Garner *et al.* 1997; McKinley 2001), for example, can be attributed to this acidic burial environment. In contrast, at Six Dials (SOU 31/SOU 258), to the north-west of the Stadium site, bone survival was particularly good in the 9th century graves cut into earlier pits and occupation deposits and backfilled with similar (less acidic) material (Andrews 1997, 198). At SOU 13, *c*. 250 m to the south of the Stadium site, the bone from the 81 mostly coffined 8th century burials was generally in good condition (Thompson unpubl.) and appears from the figures to have enjoyed consistently better survival rates (Morton 1992, figs 42–51). Although most of the graves were cut into the brickearth, the intensity of grave digging and the incorporation of some domestic debris resulted in fills that were darker than in the early graves from the Stadium site, reflecting a more mixed matrix (*ibid.* 124, pl. 5).

Demographic data

The remains of 19 individuals were identified from the inhumation burials, with a minimum of six others being represented amongst the redeposited remains recovered from pit fills (Table 4). Those identified include two immature individuals (10%) comprising

Table 4 Summary of results from inhumation burials and redeposited human bone, early cemetery

Grave	*Context*	*Deposit*	*% skel/no. frags*	*Skel. elem.*	*Age & sex*	*Pathology*	*Associations*
–	1188	fill of pit ?	1	l.	adult > 18 yr		
–	3138	layer	1	l.	subadult–adult >13 yr		
3520	3521	burial	*c.*10%	a.l.	adult >18 yr		with 3549
3520	3522	grave fill	4	s.	adult 20–30 yr		backfill around 3521 & 3549
3520	3549	burial	*c.*7%	s.l.	adult *c.* 25–35 yr		with 3521
4002	4003	burial	*c.*7%	u.l.	adult >18 yr		
4037	4085	coffined burial	*c.*1%	s.a.	adult >18 yr		
4102	4107	burial	*c.*8%	s.l.	adult *c.* 18–25 yr ?female		
4110	4112	burial	<1%	s.	subadult–adult >13 yr		
4202	4203	burial	*c.*1%	s.	adult *c.* 18–25 yr ?female	calculus	
–	4302	fill of pit?	1	l.	subadult– adult >13yr ??female		
4357	4358	burial	*c.*5%	l.	adult >18 yr		
–	4373	burials redep. in fill of pit 4368	*c.*35%	s.a.u.l.	1) adult *c.* 25–40 yr male 2) subadult *c.* 17–19yr	Schmorl's nodes –T11–12, L2; spondylolysis	
–	4375, 4452 4455–6	fills of pit 4325	15% *c.*23%	s.a.u.l.	adult >18 yr male	amlt; abscesses; periodontal disease; exotoses –femur shaft	
?	4459	burial	<1%	u.	adult >18yr ??male		
4493	4495	burial	<1%	s.u.	subadult– adult		inc. 5156=
–	4498	fill of pit 4447	*c.*1%	u.	subadult– adult		
4541	4555	burial	*c.*10%	s.a.u.l.	adult *c.* 18–30 yr ??male		
5119	5121	burial	*c.*12%	s.a.u.l.	adult *c.* 25–45 yr male	Schmorl's node – 1L	inc. surface finds 5119
5129	5130	coffined burial	*c.*1%	s.	subadult– adult *c.* 16–20yr ?female		
5142	5143	burial	*c.*8%	s.	adult >50 yr ?male		
5352	5353	burial	<1%	s.	subadult– adult *c.* 16–20 yr ??male		
5488	5487	burial	*c.*1%	s.1.	adult *c.* 20–25 yr ??female	mv – mandibular M3 5 cusps	
5508	5507	burial	*c.*10%	s.a.u.l.	subadult– adult *c.* 16–20 yr female		
5553	5555	burial	*c.*1%	s.	juvenile *c.* 8–11 yr		
–	6258	fill of pit 6263	1	s.	juvenile *c.* 6–7 yr	hypoplasia	
–	7041 & 7060	fill of pit 7040	9	s.l.	adult *c.* 40–55 yr male	calculus; hypoplasia; periodontal disease; pitting – r. temporo-mandibular; mv – unerupted supernumerary tooth	
9007	9005	burial	*c.*8%	a.u.l.	adult >18 yr male		

a younger (6–7 yr) and an older (8–11 yr) juvenile, and three older subadult/young adults (16–20 yr; 16%), one male and two female. The remains of a minimum of 17 adults (68%) were identified including three young adults (18–25 yr), all female; one young/younger mature (18–30 yr) male; three mature adults (25–45 yr) including two males; one older mature/older (40–55 yr) male; and one older male (>50 yr). Six other individuals were identified as only adult (>18 yr), including three males. Three subadult/adult individuals (>13 yr) were also identified. It was possible to sex 14 of the 20 individuals older than 16 years (70% of total), five of which were female (25%) and nine male (45%). All of the females identified were younger than 25 years, whilst only one of the males was within this age range, five being older than 25 years. The distribution of aged and sexed individuals is plotted in Figure 30b and c.

The excavated burials do not represent the totality of the cemetery population as the cemetery almost certainly extended to the east and west of the West Stand. The potential significance of the demographic results from the cremation and inhumation cemetery and the inhumations from the later cemetery (Chapter 4) must be considered in the light of a number of factors. As described, the recovered grave groups are unlikely to represent the total cemetery populations and the poor bone survival, particularly in the early inhumation cemetery, has imposed limits on the level of detail pertaining to age and sex of individuals. Consequently, whilst the individuals identified may present a representative sample of the whole, it is possible they do not.

On the basis of the available evidence, there appear to be demographic variations both between the contemporary cremation and inhumation cemetery populations, and between the earlier and later cemeteries. A higher proportion of immature individuals was identified from the cremation burials than amongst the inhumation burials of the same date (33% compared with 10%). Furthermore, the profile amongst the immature individuals was generally older within the inhumation burials which contained no infants and more subadult/young adults than the cremation burials. No infant-sized 'grave-like' features devoid of bone were excavated, though it is possible that the graves of such young individuals lay outside the excavated area. Only one potential older subadult/young adult was present in the cremated assemblage (*c.* 5%), compared with *c.* 26% of the population from the inhumation graves. It is difficult to derive any meaningful comment from the proportion of males to females from the cremation burials due to the small numbers (and only 50% of adults were sexed). However, a substantially higher proportion of males to females was represented amongst the inhumed remains (though this should be treated with caution as 30% were not sexed). It has been argued (Larsen 1999, 338) that demographic data from archaeological cemetery populations is a reflection of 'birth rate and fertility' as much as, if not more than, 'mortality', the presence of 'a relatively high number of young individuals ... [representing] more individuals entering the population through higher fertility.' This being so, it may be that the burials reflect two co-existing groups, one (practising cremation) comprising more active 'family' groups, the others (practising inhumation) representing slightly older families and more lone males. The later cemetery (Chapter 4) appears to illustrate a further shift with a predominance of females and older subadult/young adults, and few immature individuals, suggestive of a lack of active family groups.

Other cemetery groups within the area present a variable impression of demographic make-up. Immature to adult remains (35% and 55% respectively) were recovered from a 9th century cemetery at Six Dials in the north-west of Hamwic (Pay 1997) in a similar proportion to that from the early cemetery at the Stadium. At SOU 13 to the south, 73% of the (8th century) population was identified as adult and 27% immature, including six infants; only 61% of the adults were sexed, with 14 females and 22 males (Thompson unpubl.). No infant remains (0–5yr) have been identified from amongst the *c.* 22 (mostly 8th century) individuals recovered to date from the Cook Street area (McKinley and Garner 1993; McKinley 2001).

Skeletal indices

No skulls survived sufficiently intact to allow the calculation of cranial indices. It was possible to estimate the stature of only two males at 1.74 m and 1.75 m (*c.* 5 ft 8 ½ in). The results are within the upper range of 1.55–1.82 m observed in the 8th century cemetery at SOU 13 (Thompson unpubl.) and 1.58–1.76m recorded in the 9th century cemetery at Six Dials (SOU 31/SOU 258: Pay 1997), and above the means of 1.70 m and 1.67 m respectively. Whether this is sufficient evidence to suggest that the males buried in the early cemetery tended to be taller than their successors in the town is

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Key to Table 4

amtl = ante mortem tooth loss; mv = morphological variation; T = thoracic vertebrae; L = lumbar vertebrae; s.a.u.l. = skull, axial skeleton, upper limb, lower limb

open to question. The heights correspond closely with the mean of 1.74 m (5ft 8½ in) from the early Saxon cemetery at Apple Down, West Sussex (Harman 1990) and are above the range recorded from Alton, 1.61–1.70 m, mean 1.67 m (Powers 1985). They are also above or in the upper ranges of heights recorded from Portway, Andover (Henderson 1985) 1.64–1.81 m, mean 1.72 m. Whilst there are undoubted limits to the conclusions which may be drawn from such a small number of estimates, the results do contribute to suggesting a lack of nutritional stress in the individuals for whom height was estimated.

The platymeric index was calculated from three male femora; two were in the eurymeric range (readings 91–98.1) and one in the platymeric range (reading 75.6). The results suggest a lack of homogeneity within the group, though with such small numbers the significance of the variation is debatable. Comparable data from elsewhere in Hamwic is unavailable either due to lack of records or the poor condition of the bone rendering it impossible to take the required measurements.

Pathological lesions and morphological variations

Pathological lesions were noted in the remains of seven individuals, being limited in extent and distribution due to the poor condition of the bone. Most lesions were observed in the teeth and supportive structures. The aetiology of some conditions has been presented in the section on cremation burials (see above). A summary of the observed lesions is presented in Table 4.

Dental disease

A total of 90 teeth and 75 tooth positions were recorded from nine (erupted permanent) dentitions. Dental attrition was low, young adults showing only slight polishing of enamel and occasional slight exposure of dentine. Calculus deposits (tartar) were noted in the cervical region of two of the seven dentitions, deposits being slight in each case. Slight periodontal disease (gum disease) was also observed in two dentitions, one of which exhibited the only cases of ante mortem tooth loss and dental abscesses. The overall rate of ante mortem tooth loss was 2.7%, 3.1% for males; the overall rate for the dental abscesses was 2.7%, 3.1% for males. No carious lesions were observed. Slight dental hypoplasia was observed in all crowns from one dentition; such developmental defects in the tooth enamel form in response to growth arrest in the immature individual, the predominant causes of which are believed to include periods of illness or nutritional stress (Hillson 1979).

The suggested link between carious lesions and age commonly noted elsewhere (Miles 1969, fig. 8; Harman 1990, table 2.6) does not hold true for the Stadium site assemblage, the most extensive lesions being observed in young adult females from the later cemetery (Chapter 4). The relatively light attrition rates suggest a diet which excluded or was light in unrefined cereals and other coarse foods, and the absence of grits entering foodstuffs during preparation. The generally low rates of periodontal disease, caries and abscess lesions obtained suggests a diet not over-dependant on carbohydrates and inclusive of a good level of meat-based proteins (Hillson 1990, 283).

The variation in disease rates between the early and later (described below) cemeteries may be indicative of a dietary change, with increased reliance on carbohydrate foods in the latter phase, particularly for the females. It is possible that these young females represent a nutritionally deprived group such as servants or slaves, rather than the 'population' as a whole. However, disease rates from Cook Street (SOU 823: McKinley 2001) show close similarities to those from the later cemetery at the Stadium site, at 0.8% ante mortem tooth loss, 5.9% caries (higher in females) and 3% abscesses (higher in females). Together, this evidence might suggest that females during the 8th century may generally have suffered some level of nutritional discrimination. The rates from the 8th century cemetery at SOU 13 are generally higher at 15.2% ante mortem tooth loss and 8.5% caries (Thompson unpubl.); the results have not been broken down by age and sex, but there are not significantly more older adults in this population than at the Stadium site.

Trauma

There was non-fusion of the neural arch – spondylylosis – in the 5th lumbar vertebra from the redeposited burial (4373). The condition is believed to result from stress fracture in the immature spine and although often symptomless it may cause deep back pain (Adams 1986, 224).

Joint disease

Schmorl's nodes were recorded in four of seven vertebral bodies from two male burials (rate 57%). No pitting was observed in any of the 29 remaining joint surfaces recorded from the burials, with slight pitting in only one, a temporo-mandibular joint.

Morphological variation

Variations in mandibular molar cusp form was seen in one (14%) dentition. The enamel of an unerupted, supernumerary tooth was visible to the left of the midline in the anterior floor of nasal cavity from the adult male 7041; x-ray showed this to be a single cusp tooth with a short root.

Figure 30 Inhumation burials: distributions. a) location of graves, b) distribution by sex, c) distibution by age, d) distribution of grave goods by category

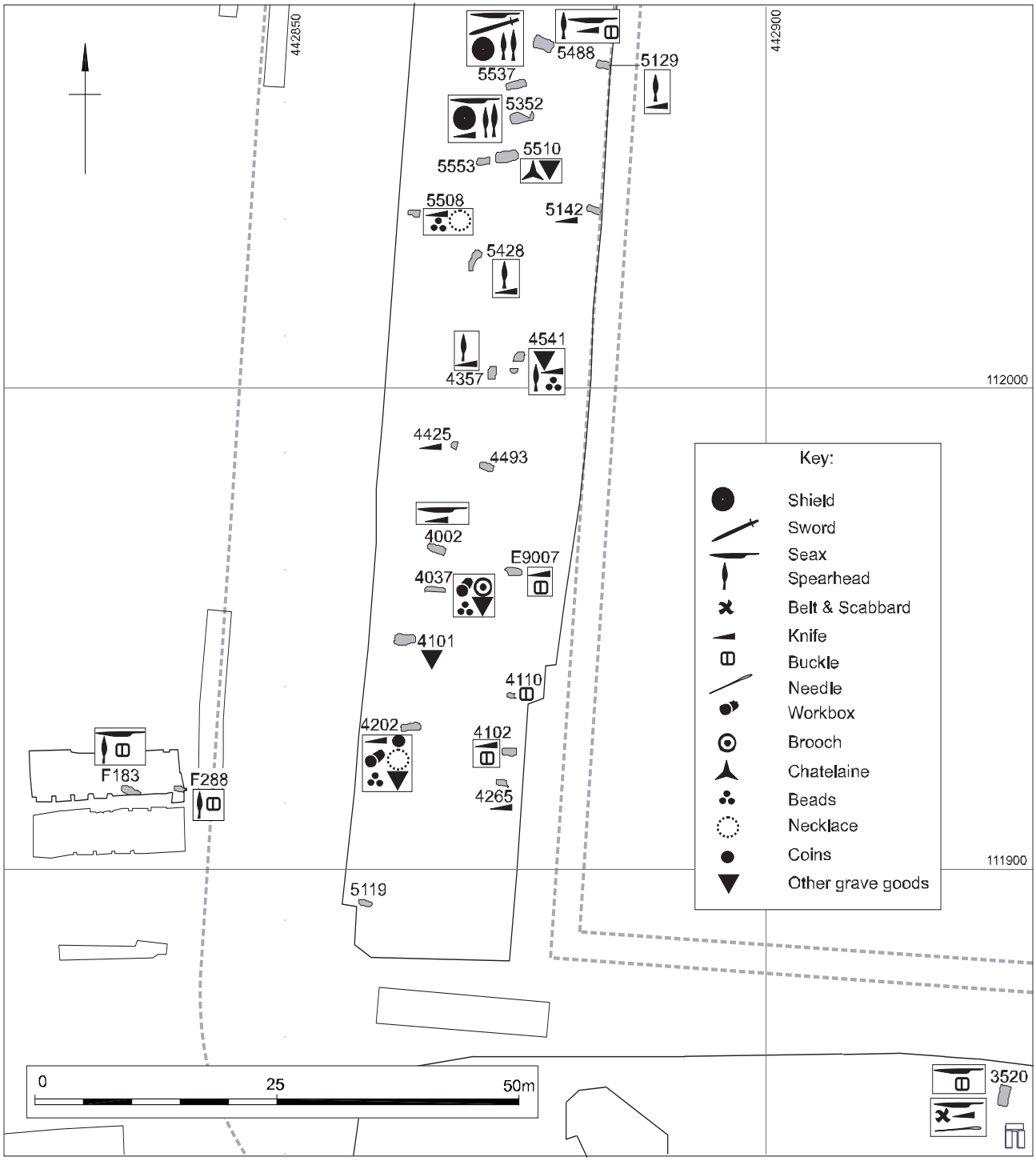

Figure 31 Detailed composition and distribution of the finds assemblages from inhumation graves in the early cemetery

Grave Goods From the Inhumation Burials

by Emma Loader, with contributions by Esther Cameron, Rachel Every, David Hinton, D.M. Metcalf, Martin Henig, and Penelope Walton Rogers

Nineteen of the inhumation graves (including the double burial) contained 78 objects placed as grave goods (excluding nails, small fittings, and undiagnostic fragments) or worn as part of the clothing in which the dead were buried. These objects form an important body of evidence, not just in terms of the chronological information they can provide, but also in the contribution they can make to an examination of such aspects as the status and cultural affinities of the individuals buried in the cemetery. Grave goods from the inhumation burials are illustrated in the catalogue of inhumation burials (Figs 13–29). The objects are divided into the following six categories:

- coins
- weapons, and their associated fixtures and fittings
- personal equipment
- personal adornment or dress
- containers
- miscellaneous objects, or those whose function is unknown.

Table 5 and Figure 30d summarise the objects present within each grave. A more detailed breakdown of the composition of each grave assemblage is shown in Figure 31.

Numbers of grave goods varied across the cemetery, although none of the graves had a large number of items (the maximum is nine, or seven counting each bead/pendant necklace, or set of belt fittings, as one item). Several burials were accompanied only by a knife or other single object (eg, a buckle). Three graves (4493, 5119, and 5553) contained no surviving grave goods. Two female burials can be noted as containing objects denoting wealth and/or status (4202 and 5508). Each contained a gold pendant; in the case of 4202 this was apparently worn on (or with) a necklace of silver bulla pendants and glass beads. This grave also contained a knife, a workbox, and a silver disc (the latter possibly inside the box). The subadult/adult female in grave 5508 also apparently wore a gold pendant round the neck, together with a Romano-British silver intaglio ring. A number of graves contained weapons, the most richly furnished being grave 5537, with sword, seax, shield, and two spearheads, as well as the usual knife and buckle. Also of note is the unusual double burial (3520) in the South Stand – each of its occupants was accompanied by a seax, one with a well-preserved and particularly noteworthy scabbard and belt suite, the other with a buckle and a small knife. The sex of neither of the individuals could be established from the surviving skeletal remains but they are assumed, on the basis of the grave goods, to have been male.

The relatively low level of accompanying grave goods at the Stadium site can perhaps be seen as part of a more widespread pattern observed towards the end of the early Saxon period, in which declining numbers of goods were deposited. This decline might be a response to a variety of economic, social, and religious factors (Boddington 1990; Geake 1997, 134–6; Penn 2000, 96–106). On the other hand, it is less usual for so few graves to have no objects at all.

The condition of the material recovered from the cemetery has placed limitations on its interpretation. In many graves the survival of skeletal remains was either minimal or non-existent, which means that the positions of objects in relation to bodies cannot always be determined, and that the correlation of grave goods with the age and/or sex profile of the cemetery is difficult. Furthermore, the iron objects in particular have suffered a high degree of corrosion – the iron objects from one inhumation burial (9007), for example, were reduced entirely to corrosion products which could not be identified to object type. That being said, there is still useful information to be gleaned here on the use of the burial space and the placing of objects within the graves.

Comparative Material

There is little in the way of comparative data from Hamwic itself. There are now several burial sites recorded within the Saxon town, including two graves excavated in 1976 at Melbourne Street (SOU 20), within the Stadium site, which are now known to belong to the early cemetery. These two graves are significant in that they are the only other burials so far found in Hamwic to contain weapons. Holdsworth (1980, 39) argued that these two were continental males, perhaps Christian Franks or, possibly, pagan Frisians. One burial (F183) produced a seax, discussed further below.

Of the other burial sites within Hamwic, there are two or three that are of relatively early date, belonging to the early 8th century, perhaps even slightly earlier. These comprise SOU 32 (Clifford Street) and SOU 34/SOU 43 (Golden Grove) to the west and south-west of the Stadium site respectively (see Fig. 2), and SOU 254 (Cook Street) on the south-west periphery of Hamwic (see Fig. 4). Grave goods from these burials are known, if only in small quantities (Morton 1992, 51; Garner 1993). Also, of potentially considerable significance is the large number (>100) of Saxon burials recorded from the Roman site at

Table 5 Grave goods from inhumation graves in the early cemetery

Grave	*Sex*	*Age (yr)*	*Weapons*				*Personal adornment*		*Personal equipment*					*Containers*			*Other objects*		
			Sword	*Seax*	*Shield*	*Spear*	*Pendant*	*Bead*	*Knife*	*Buckle/ belt fitting*	*?Girdle group*	*Needle*	*Pin/ key*	*Workbox*	*Casket*	*Pot*	*Coin*	*RB artefact*	*Misc. objects*
3520a	?	>18	-	1	-	-	-	-	1	1	-	-	-	-	-		-	-	-
3520b	?	25-35	-	1 +scabbard	-	-	-	-	-	5	-	1	-	-	-	1	-	-	Cu strips
4002	?	>18	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	Fe stud
4037	?	>18	-	-	-	-	-	2	-	-	-	-	1	1	-	-	-	1	Fe ring
4101	NSR		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Fe stud
4102	?F	18-25	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-
4110	?	>13	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
4202	?F	18-25	-	-	-	-	10	4	1	-	-	-	1	1	1	-	3	-	-
4265	NSR		-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
4357	?	>18	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-
4425	M	25-40	-	-	-	-	-	-	?1	-	-	-	-	-	-	-	-	-	-
4541	?M	18-30	-	-	-	1	-	3	1	-	-	-	-	-	-	-	-	-	Fe ring; Fe curved strip
5129	?F	16-20	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	Fe nail
5142	?M	>50	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
5352	?M	16-20	-	1	1	2	-	-	1	-	-	-	-	-	-	-	-	-	-
5428	NSR		-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-
5488	??F	20-25	-	1	-	1	-	-	1	1	-	-	-	-	-	-	-	-	2 cu strips
5508	F	16-20	-	-	-	-	1	2	-	1	-	-	-	-	-	-	-	1	-
5510	NSR		-	-	-	-	-	-	-	-	1	-	-	-	(2 locks)	-	-	-	-
5537	NSR		1	1	1	2	-	-	1	1	-	-	-	-	-	-	-	-	-
E9007	M	>18	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
		Total	1	6	2	9	11	11	16	12	1	1	2	2	2	1	3	2	

Bitterne Manor, a few accompanied by knives and one with a spear (eg, Cotton and Gathercole 1958, 30). Radiocarbon dates obtained from three individuals indicate a focus around the 7th century (eg, Southern Archaeological Services 1998), although a much wider range is possible.

Elsewhere in Hampshire, there are a number of burial sites, both inhumation and cremation, the evidence for which is summarised by Evison (1988, 48–50). From this she argued that new settlers arrived in the area early in the 5th century, bringing with them the cultural material and burial customs from the Saxon area on the continent, as seen, for example, at Alton (*ibid.*, 44). The evidence for burial in the 7th century within Hampshire has been recently summarised by Stoodley and Stedman (2001, 164–7). A few earlier cemeteries continued in use up to this period, such as Shavards Farm, Meonstoke (*ibid.*). Others appear to be new foundations, such as the 7th to early 8th century burial ground at Portway, Andover, which succeeded, after a period of disuse, an earlier cemetery (Stoodley, in prep; Cook and Dacre 1985). At Winnall, Winchester, the late 6th–early 7th century cemetery (Winnall I) appears to have been replaced by a second cemetery (Winnall II) which originated in the mid-7th century and continued into the mid-8th century (Meaney and Hawkes 1970). The cemetery at Worthy Down, also at Winchester, which originated in the late 5th–6th century and continued into the 7th century (Hawkes and Grainger 2003), probably served an entirely different settlement to that at Winnall. Slightly further afield, at Apple Down, West Sussex, cemetery 1 of early 6th–late 7th century date was succeeded by a separate, much smaller cemetery assigned to the late 7th–early 8th century (Down and Welch 1990).

Date Range

The grave goods can be relatively tightly dated with a probable range spanning the middle of the 7th century to the early 8th. Some have close parallels with objects recovered from other cemetery sites of this date, including Buttermarket, Ipswich (Scull in prep.), Harford Farm, Caistor St Edmund (Penn 2000), and the later phases of Dover Buckland (Evison 1987). The more closely datable finds include the seax and associated scabbard and fittings from grave 3520, the gold pendant and necklace of bulla pendants from grave 4202, and the garnet pendant from grave 5508.

The weapon groups confirm a mid- to late 7th century date, and the development of the weapon burial rite in the 7th century can be seen here. The occurrence of seaxes as grave goods increased during the 7th and 8th centuries and, although swords continued to be placed, their numbers decrease through this period. The tall, 'sugar loaf' shield-bosses, which may reflect a change to a more defensive use for the shield, were developed in the mid-7th century.

The absence of other groups of grave goods also supports the dating of the burials to the 'final phase' of the early Saxon period. Changes in dress such as the shift from the common use of pairs of brooches and strings of amber and glass beads, during the 5th and 6th centuries, to the use of single brooches, groups of wire rings, and bulla and disc pendants in the 7th century are reflected here. None of the female or possible female burials at the Stadium site was accompanied by brooches (with the exception of Grave 4037 which contained a Romano-British brooch found at the feet), although two gold pendants were found.

There are earlier objects included in the assemblage, including possibly the sword from grave 5537, although some objects may have been kept as heirlooms, scavenged or curated (most obviously in the case of the Romano-British fantail brooch and intaglio ring) and placed in the grave for an amuletic purpose. Apart from these few earlier objects, there appears to be no evidence of any chronological development within the cemetery as evidenced by the grave goods, although admittedly several graves contain objects (such as knives and buckles) which are not particularly closely datable. In other words, the graves excavated could relate to a single generation of burials.

Catalogue

Coins

By D.M. Metcalf

Two sceattas were found in grave 4202, and also a thin lamella of silver bearing the impression of the obverse of a third coin of the same type, namely Series B (Metcalf 1993, 94–105; see Fig. 67).

C1

Context 4203. Over chest area of inhumation in grave 4202. Item no. 329. 0.42 g

Much reduced, probably by corrosion and leaching processes, and is now no more than a sliver. Nevertheless, the remaining central part of the design is reasonably sharp and clear. The coin is of type BIB, ie, with a bust, not a head. The square outline of the bust, in Visigothic style, can just be made out. On the reverse there is a pellet in each lower angle of the cross, an annulet immediately to the left of the left arm of the cross, and an annulet at a rather higher level to the right. This eccentric configuration is matched on Rigold, BIB, 6 and BIB, 9. It is a little

doubtful, however, whether the coin is official, as there seems to be a cluster of four or five small pellets just to the right of the eye, in the field. Also, the sinuous outline of the bird's body, with a curve where one would have expected a straight, horizontal lower outline with a separate tail descending from it, is out of keeping. The quality of the original alloy is probably irrecoverable by scientific analysis because of the changes suffered by the coin while buried.

C2
Context 4203. Over chest of inhumation in grave 4202. Item no. 330. 0.83 g
Much reduced, cf. an expected 1.22 g or thereabouts, is apparently a copy of Type BIA. The obverse is in rather flat relief. (Analysis by XRF shows measured silver contents of 80%).

Lamella of silver
Context 4203. Over chest of inhumation in grave 4202. No item no. assigned. 0.08 g
The lamella of silver looks at first glance as if it might be the obverse surface of a coin that has completely flaked away. Careful inspection shows, however, that it is a piece of foil that has been pressed onto the obverse of a coin of Series B in order to receive its impression. Thus a bracteate-like object has been created. The incuse side is in considerably sharper relief than the positive impression. Perhaps the silver foil was hammered on top of a coin, with the upper side protected by a piece of leather or similar. The continuous profile of the nose and brow can be seen, and above that the line of the diadem with a V-shaped ornament at the front (lacking the usual prominent jewel).

The two coins suggest a date for the grave which may be as early as *c*. 685–90, and is certainly among the earliest dates for sceatta finds from Hamwic. Other grave-finds of just two thrymsas or two sceattas are known, eg, from Ipswich, Buttermarket cemetery. They probably reflect an earlier phase than the grave finds of eight sceattas seen in Kent and elsewhere.

Weapons
Nine graves produced weaponry, comprising spears, seaxes, shields, and a single sword, the richest containing five weapons (Table 6). While it might be assumed that all these graves were those of males, where sex could be determined, only two could be identified as male or possibly male, and two are possibly female.

The range of weapons confirms the relatively restricted date range of the inhumation cemetery, but has also produced interesting evidence, in the form of the single sword, for the curation of 'heirloom' objects.

The most common weapon type deposited was the spearhead, a widely observed pattern in early Saxon burials (Härke 1990, 25), and in four instances these constituted the only weapon type in the grave. The small number of graves does not allow a significant analysis of weapon combinations – only three graves produced multiple weapons, and the only combination that occurs more than once is that of spear, seax, and shield (two instances). Both these graves (5352 and 5537) contained a very similar group of weaponry: two spearheads (C2 or C3 type), a broad seax, and a group 7 shield-boss, with the addition of a sword in grave 5537.

Spears
Seven graves contained nine spears, with two graves (Grave 5352 and 5537) each containing two spears. Swanton's (1973) typology is used here to classify the spearheads; the majority have been identified as type C. The full list is as follows:

A: Two type C1 or possibly C2 (items 484/506; Fig. 20, and 480; Fig. 23). Type C1 became less popular during the mid-6th century, though examples from the later early Saxon period are known. Dickinson, however, argues that this date is inaccurate and that type C1 would be more accurately dated to the 7th century (Dickinson 1976, 297–8). The type has a small, leaf-shaped head of between 100 mm and 200 mm length with a split socket. Examples are often found in poorly furnished graves (Swanton 1973, 49), and this is true of the two graves in which they occur at the Stadium site (4541 and 5428). Type C1 has a relatively wide distribution, although not as wide as C2.

B: Five type C2 (items 367; Fig. 19, 339; Fig. 21, 446; Fig. 22, and 523 a and b; Fig. 27), a narrow, leaf-shaped blade, with split socket and blade ranging in length between 200 mm and 350 mm – three of these examples have shorter blades (367, 523 a and b). This type was in use throughout the early Saxon period, from the time of the earliest settlements through to the end of the 7th century. The type is common and is widely distributed over the country, and examples have been found across Hampshire and Wiltshire (Swanton 1973, 51–5; fig. 12).

C: One type C3 (item 447; Fig. 22), the largest of the leaf-shaped blades, measuring between 300 mm and 500 mm in length. This type emerged in the 6th century as a development of the C2 form, developed in importance throughout the 7th century and has a similar distribution pattern to C2, although it is less common in the Hampshire area, being mainly found in

Table 6 Weapon graves

Grave	*Sex*	*Age (yrs)*	*Weapons (no:type)*			
			Spear	*Seax*	*Shield*	*Sword*
3520	uncertain	>18	–	1: broad	–	–
	uncertain	25–35	–	1: broad	–	–
4002	uncertain	>18	–	1: narrow	–	–
4357	uncertain	>18	1:C	–	–	–
4541	?male	18–30	1:C1/C2	–	–	–
5129	?female	16–20	1:C2	–	–	–
5352	male	16–20	2:C2+C3	1: broad	1: Grp 7	–
5428	no skeletal remains		1:C1/C2	–	–	–
5488	??female	20–25	1:G1	1: narrow	–	–
5537	no skeletal remains		2:C2+C2	1: broad	1: Grp 7	1
Total			9	6	2	1

Kent. This example was found with a type C2 spearhead, and shows signs of damage.

D: One possible type G1 (item 495; Fig. 25), with a straight-sided, angular blade, split socket and a blade length of between 200 and 300 mm. This example is somewhat shorter (165 mm), but fits better into the type G1 class than into type E3. Type G1, however, is a 6th century type. Distribution is mainly concentrated in Kent and Suffolk, though one example is known from Broadchalke, Wiltshire (Swanton 1973, 99).

E: There were also single spearheads in each of the SOU 20 graves (Hinton 1980a, 74–5). These were too encrusted with corrosion products to allow classification by type in the published report.

The iron ferrule would have been attached to the shaft by means of a rivet, or rivets. Rivets can be seen in two spearhead ferrules, one at the top of the socket (grave 5129, item 339) and one at the base of the socket (grave 5428, item 480). No spear butt ferrules survive, and lengths of spears cannot therefore be calculated. Also absent from this assemblage are any other associated spear fittings.

Spears are the most commonly placed grave good after knives, and are usually attributed to male burials. In grave 76 at Shudy Camps, a female burial contained a type C2 spearhead, though this object has also been interpreted as a weaving batten (Lethbridge 1936, 23, fig. 11:3), and there are other instances where such objects have been interpreted in this way (Geake 1997, 60). At the Stadium site, one spear (grave 5129, item 339) was found placed on top of a coffin containing a female subadult/adult (16–20 years). Also accompanying this burial was an unusual serrated-edge knife (below, item 338). The type G1 spearhead (together with a seax) in grave 5488 accompanied another possible female. Only two of the burials with spears (4541 and 5352) could be either positively or possibly identified as males; the remaining three burials could not be sexed.

Spears are the one weapon placed with an individual regardless of age, unlike other weapons which show clear distinctions between ages of individuals (Härke 1992, 156), and is the most commonly placed weapon (Härke 1990, 25). Härke also notes that this object is usually placed on the right hand side towards the head, although at the Stadium site, as at Alton (Evison 1988, 91), the marginally preferred position was to the left-hand side. In every instance the spearhead was pointing upwards. Nine of the graves contained spearheads. In four of these (4357, 5352, 5428, and 5488, the latter possibly a female) they were placed to the left of the head and in two (4541 and 5537) they were placed to the right of the head. The spearhead recovered from grave 5129 (possibly a female) had been placed on the top of the coffin or vault, but was also on the right hand side near the head.

Both of the graves at SOU 20 contained spearheads. The spearhead in F183 appeared to have been placed across the neck or upper chest, unless this was due to post-depositional disturbance. This seems unlikely given the surviving depth of the grave (0.5 m) and suggests that the spearhead was not mounted on a shaft or the shaft was broken. In contrast to the other graves in the cemetery containing spearheads, the spearhead in grave F288 appeared to have been

placed in the centre of the grave, possibly between the legs with point towards the feet (Holdsworth 1980, 38), a burial rite that has more Frankish than Anglo-Saxon associations (eg, Evison 1987, 28).

Although the spearheads span a fairly restricted range in terms of types, there is more variation in size, presumably reflecting functional variety – spears could be used for throwing or thrusting. Within the type C2 spears, for example, the short blade of spearhead 367 in grave 4357 (116 mm) can be contrasted with that of spearhead 339 in grave 5132 (320 mm). For the paired spearheads, the two in grave 5352 (C2 and C3, items 446 and 447) are of widely differing sizes, while in grave 5537 (two C2s, item 523a and b) there is a slight size disparity overall but in fact the two blades are of the same length.

Textile remains were found on five spearheads (items 339, 480, 495, and 523a and b; below). In some instances these may represent wrappings around the weapons themselves; in others possibly the remains of the clothing of the dead. In grave 5129, spearhead 339 placed on top of the coffin, had traces of a coarse textile (probably wool) on and around the socket, possibly representing a wrapper of some sort. Spearhead 480 in grave 5428 was also associated with a probable woollen textile folded around the blade, and with a coarse textile made from hemp or low-grade flax around the socket. The twill on the socket of the spearhead 495 in Grave 5488 seems to be a similarly coarse plant fibre, and may have been part of a head-dress – the spearhead was found next to (but not touching) the skull.

Wood samples from inside the sockets of spearheads showed ash to be the predominant wood (items 447, 480, 523: two spearheads), with one example of hazel (item 367) (see below).

Shields

The two shield-bosses recovered are both of the tall 'sugar loaf' form (item 450, grave 5352; Fig. 22, item 517, grave 5537; Fig. 27) and have been identified as Dickinson and Härke's group 7 (1992, fig 14, b). Group 7 shield-bosses occur widely. In this country they are invariably associated with burials from the second half of the 7th century, and are found across the southern and eastern counties. Each boss had four iron rivets surviving in the flange, and both had grips surviving at the back, both of which have been identified as the common Anglo-Saxon type Ia1 (*ibid*., fig. 17) – a short grip, flat with straight-ended, expanded terminals. This is the type most commonly found across the country throughout the early Saxon period. Also associated with the shield-bosses were iron rivets and sheet fragments which would have held the grips to the board. In grave 5352, two sheet/stud fragments were found (items 451 and 452) on opposite sides of the shield-boss; their position indicates that they functioned as attachments holding the grip to the shield-board. Mineralised wood survives on the stud shanks, and the wood thickness represented is estimated at 8 mm. In Grave 5537 two domed studs (item 521) were found close to the boss and probably represent a shield attachment, either decorative, around the edge of the shield, or to attach the grip to the shield-board. Another pair of identical studs (item 522; still held *in situ* within a short strip fragment) could have had a similar function, although from their position these were not so obviously associated with the shield. Härke notes that domed studs are more frequently associated with later shield-bosses such as group 7 (*ibid*., 27). No other shield fittings were identified. In neither grave could the wood species of the shield board be identified (see below).

The function of the shield-boss varied according to form – the later 'sugar loaf' form is considered to be related more to defensive use compared to the early, shallower forms of bosses which were used aggressively (Dickinson and Härke 1992, 55). The development in shield-boss form from the 6th century coincided with an increase in shield-board size, and might suggest a shift in combat technique from individual to formation fighting – larger, heavier shields provided better cover, but were less useful for active fighting.

Though little or no skeletal remains were present in either of these two graves, both shields were apparently laid over the body, roughly in the waist/upper legs area; this is the usual position in the Saxon regions (Dickinson and Härke 1992, 65). Generally, they are only found in the graves of adults, rarely children. The individual in grave 5352 was a male aged 16–20, but there were no skeletal remains in grave 5537, the richest of the weapon burials.

Dickinson and Härke (1992, 68) note that shields were 'not normally associated with outstanding burial wealth'. Recent studies (eg, Geake 1997, 67), however, show that graves with the later forms of shield-bosses are often furnished with more elaborate grave goods, including hanging bowls and wooden vessels, but these did not get buried at the Stadium.

Sword

Only one sword was recovered (grave 5537, item 516; Fig. 27), with a double-edged, parallel-sided, pattern-welded blade, and the remains of the scabbard, in the form of mineralised preserved organic remains (textile and wood) along the length of the blade. The tip of the blade is missing, but the overall blade length can be estimated at around 0.78 m. The tang is broken off below the pommel, but the remains of the grip survive on the tang. The sword was apparently placed at the left side of the individual, although no skeletal remains survived. Mineralised organic

remains survived on the sword (see below). These revealed that the sword grip was of horn, while the scabbard was wooden, lined with skin and covered with calf leather.

The function of the sword is debatable. While some see these as fully functional weapons, capable of delivering over-arm slashing strokes or, for those with more tapering blades, thrusting strokes (eg, Hill and Thompson, in prep), metallurgical analysis has suggested that swords of the 5th–7th centuries were manufactured from a low-carbon iron which would have rendered them less serviceable as weapons (Tylecote and Gilmour 1986, 249). It may be, therefore, that some swords at least had a ceremonial rather than a purely military function.

The sword is predominantly an adult grave good, and is taken to be an indicator of wealth; Bone describes them as prestige goods: 'symbols of an aristocratic warrior class' (1989). The sword began to decrease in popularity as a grave good, and by the late 7th century had ceased to be so used (Härke 1992, 159). However, as Geake points out (1997, 72), documentary sources show that the sword maintained its prestige in the 7th century and the rarity of the sword may add weight to its importance as a grave good. Geake discusses the possibility of a rise in the status of the 'ancestral sword', an object that would have been inherited. This could be the case here, but there is no reason to support this and the fact that it is pattern-welded would indicate that it is later. The sword came from the richest weapon burial, where it was found with a seax (item 518), a shield (item 517) and two spearheads (item 523). The shield can be no earlier than the middle of the 7th century (above), while the seax is of late 7th–/early 8th century date; the spears are not so closely datable.

Seaxes

Six seaxes were recovered, four from individual graves (4002; Fig. 14, 5352; Figs 22 and 23, 5488; Fig. 25, 5537; Fig. 27), and two from the double burial 3520 (Fig. 13). All the seaxes found are single bladed with straight backs and short handles, a form introduced from Merovingian Francia in the 6th century, but in this country found predominantly in 7th–8th century contexts, replacing the sword as a grave good (Geake 1997, 14). Given this fact, it is interesting that one of the seaxes was found with a sword, in the richest weapon burial (grave 5537). Seaxes found in England are mainly insular varieties and not imports (Gale 1989), although one of them (item 179), from the double burial 3520, was accompanied by a scabbard and belt set which is almost certainly of continental origin (below). The seax found in grave F183 at Melbourne Street (SOU 20) was thought at the time to be a continental, possibly Frankish, item (Evison, pers. comm., cited in Hinton 1980a, 74–5). Subsequent reconsideration confirmed it as a continental weapon, of 8th century date (Evison pers. comm., cited in Morton 1992, 52). Scull (2001, 71) has more recently assigned a date range of AD 670–710 to this object.

Throughout the 7th century, the seax gained in popularity, while other weapons declined in their use as grave goods (Härke 1992, 159). As with other weapons, the seax is an adult grave good found in male graves, signalling wealth and status. Its function is considered to be not specifically as a weapon, and therefore should not be seen as a direct replacement for the sword, but as a hunting knife (Gale 1989).

Seaxes can be divided into three groups – narrow, broad, and long – and have been classified on the continent by Böhner (1958). Narrow seaxes, the most common form found in this country, date up to the later 7th century. Broader seaxes date to the turn of the 7th and 8th centuries; although mainly found on the continent, examples are known in English graves (Geake 1997, 72). The Stadium site seaxes fall into both groups, with two narrow (grave 4002, item 26; grave 5488, item 496) and four broad examples (grave 3520, items 179 and 180; grave 5352, item 449; grave 5537, item 518).

In most cases, the seax was found at the waist, on the right side of the individual. In the double burial 3520, that associated with skeleton 3521 (item 180) appeared to be on the right hip or a little higher, as were those in graves 5352 and 5537. In two graves (4002 and 5488) and F183 at SOU 20 they were placed across the centre of the abdomen. Textiles were found on two seaxes (item 179 in grave 3520 and item 496 in grave 5488: see below).

All six seaxes retained traces of handles (four of horn, one of wood, and one of wood veneered with horn) and five the remains of wood and/or leather sheaths or scabbards (see below), of which the most elaborate example came from grave 3520 (item 179). This seax was recovered complete with scabbard fittings and a belt suite. The scabbard is elaborately decorated with decorated copper alloy studs and was of wood lined with skin, and possibly covered with leather (see below). Small copper alloy pins (item 926: six illustrated) secured the edges of the scabbard, and the scabbard was decorated with five large studs (items 930–4), decorated with chip-carved interlacing knotwork, alternating with four smaller studs (items 936–9) decorated with crosses within single line borders. An example from Buttermarket, Ipswich, dated by reference to continental sequences to AD 640–70, provides an almost exact parallel for this scabbard and fittings (Cameron 2000, fig. 35a; Scull and Bayliss 1999, 82), and also for the associated belt suite, which is described below. The large studs are also paralleled at Tattershall Thorpe (Cameron 2000, fig. 35c), and these, along with the rest of the

scabbard and belt set, have distinct Frankish affinities (Hinton 2000, 58).

The decorated calf leather sheath of item 449 (grave 5352) is also of great interest, given the rarity of examples of decorated leather of this date, and the decorative techniques used (embossing and stamping), which contrast with the more common tooling used on published English examples of this date.

Item 26 from grave 4002 has part of what may be associated sheath/scabbard fittings, attached within corrosion products (seen on X-ray only); these comprise a looped object attached to a small suspension ring, in turn attached to a 'split loop'. Also associated, but separate, were two small 'split loops', linked by a small suspension ring.

Organic (non-textile) remains on weapons
by Esther Cameron

An assessment of mineralised organic remains on metalwork from the cemetery resulted in selective sampling of items from seven graves. The reason for sampling was to record in general the use of organic materials and to analyse in particular those used for sheaths and scabbards on bladed tools and weapons. Evidence for textiles on these finds is recorded elsewhere (see below).

Observations were made at different magnifications and the resulting identifications are presented in Table 7. Included in the table is a column entitled 'Id. status' which gives a confidence rating through the range 'possible', 'probable', and 'good' to indicate the strength of the evidence. An explanation of this approach and its significance in recording remains of skin and leather is published elsewhere (Cameron and Edwards 2004).

Among the outermost layers of mineralised remains on some weapons from graves 5352, 5488, and 5537 were layers of degraded textile. The sword and seaxes from these graves, for instance, seemed to have been loosely wrapped in woven fabric and further evidence of this practice in the burial rite at the Stadium site is recorded elsewhere (see below). A 7th century burial at Snape, Suffolk contained a sword showing similar evidence of textile wrappings (Filmer-Sankey *et al.* 2001, 107).

Sword and scabbard

Grave 5537; item 516: The grip of the sword, including the lower guard, was of horn. The tip of the tang is missing along with evidence of the upper guard and pommel. The use of horn for sword grips and guards was commonplace during the 5th–7th centuries, but this practice changed in the 8th century, when the lower guard tended to be made of metal.

The scabbard was made from two thin lathes of willow or poplar wood, lined with a haired skin and covered with calf leather, the fibre structure of which suggests a thickness of 2 mm or more. On the front a strap-slide with splayed terminals was carved from the wood. Parallels to this strap-slide on swords from Broomfield, Essex and from Wickhambreux, Kent are both from 7th century contexts (Cameron 2000, 36, fig. 11). In materials and composition this scabbard is characteristic of the early Anglo-Saxon era, but the thickness of the leather cover and the integral strap-slide are associated with the latter part of this period.

Seaxes and sheaths

These large knives were carried in sheaths or scabbards suspended horizontally, with the cutting edge upwards. Their sheaths were asymmetric in outline, being folded beneath the back of the blade and seamed along the cutting edge where buckles, straps and other fittings for suspension were also positioned. Sheaths commonly extended over much of the handle. In this report a distinction is made between sheaths which are flexible and scabbards which are not because they have a wooden component beneath the leather.

Grave 3520; item 179: The handle was of willow or poplar wood with an extra wedge of the same wood-type inserted between it and the iron tang. Of the scabbard only insubstantial traces survive, possibly of haired skin (lining) with wood, and other traces of what might be leather. Taken together these suggest a conventional construction such as that used for swords (see above), but the evidence is slight. Numerous copper-alloy nails and nine studs found with the seax formed part of the decorative design and construction of its scabbard. Although bare of organic remains themselves, their metal shanks indicate that the total thickness of the scabbard at its seamed edge was 8 mm. Two published 7th century seaxes from Ford, Laverstock, Wiltshire and from Buttermarket, Ipswich also used small nails at the sheath/scabbard edge, but from several aspects, including weapon size and associated metal fittings, the sheath from Buttermarket provides the closest parallel (Cameron 2000, 86, fig. 30 [Ford, Laverstock]; 124, fig. 35 [Buttermarket]).

Of particular interest is the identical use of studs on the suspension flap and the way it widens to accommodate them. The positions of metal fittings (items 927–9) suggest that there were three points of suspension on the sheath. Similar sheaths from 7th-century graves in Lent, Netherlands are published by van Es and Hulst (1991, graves 1972/15, 1972/20, 1975/14, 1975/20).

Grave 3520; item 180(a): The handle of the seax was of horn. The alder wood scabbard was covered with leather, 2 mm thick, and tooled decoration (parallel lines 0.5 mm apart) survives as a trace near the tip of the blade.

Grave 4002; item 26: The handle of the seax was of horn. Organic remains of the sheath /scabbard are beyond identification.

Table 7 Mineralised organic remains (non-textile) on metalwork from the early cemetery

Grave	*Item*	*Object*	*Organic remains*	*Function*	*ID status*
3520	179	seax	wood: willow/poplar (*Salix*/*Populus* sp.)	handle	good
			haired skin, leather, wood: sp. unknown	scabbard	probable/possible. Leather not confirmed by SEM
3520	180(a)	seax	horn	handle	good
			leather & wood: alder *(Alnus* sp.)	scabbard	good/probable
3520	180(b)	knife	horn	handle	good
			leather	sheath	good/probable
4002	26	seax	horn	handle	good/probable
			unidentified	scabbard	–
4357	366	knife	horn	handle	good
			leather	sheath	probable but not confirmed by SEM
4357	367	spearhead	wood: hazel (*Corylus* sp.)	shaft	good
5352	447	spearhead	wood: ash (*Fraxinus* sp.)	shaft	good
5352	449	seax	horn (veneer) & wood: willow/poplar (*Salix*/*Populus* sp.)	handle	good
			leather: calf	sheath	good
			?haired skin: sp. unknown	sheath lining	possible
5352	450	shield-boss	wood: sp. unknown	shield-board	–
5428	480	spearhead	wood: ash (*Fraxinus* sp.)	shaft	possible
5488	481	knife	deposit: wood	on blade	good
5488	496	seax	horn	handle	good
			leather	sheath	good
5537	516	sword	horn	grip	good
			wood: willow/poplar (*Salix*/*Populus* sp.)	scabbard	probable
			haired skin: sp. unknown	scabbard-lining	good
			leather: calf	scabbard leather	good
5537	517	shield-boss	wood: sp. unknown	shield-board	–
5537	518	seax	horn	handle	good
			leather: calf	sheath	good
			haired skin: sp. unknown	sheath lining	probable/possible
5537	523(a)	spearhead	wood: ash (*Fraxinus* sp.)	shaft	probable
	523(b)	spearhead	wood: ash (*Fraxinus* sp.)	shaft	probable

Grave 5352; item 449: The handle of the seax was of willow or poplar, veneered with horn. A decorated sheath of calf leather, 2.5 mm thick, possibly lined with a haired skin, may have had an extra thickness of leather along the spine of the blade where it is 5 mm thick. The rarity of surviving examples of decorated leather of this early date makes this sheath an item of outstanding interest (Fig. 32). Decoration is visible on one face only where it occupies an area 60 x 50 mm showing parts of three decorative fields, namely the front face of the blade-area and edges of the spine and suspension flap. A suspension flap is the area of a sheath that extends beyond the cutting edge of the blade. This feature, which accommodates the seam and attachment points, is more developed in some sheaths than in others, but when decorated is treated as a separate field. The fields, separated by a double border-line, are filled in the blade area by a double ribbon of interlace against a grid-like background; at the spine by two loops (at a fragmented edge); and at the other edge (where the suspension flap begins) by two more loops punctuated at intervals by pricked dots. In decorative terms this finds its closest parallels in a sheath fragment from Ozengell, Thanet, Kent (Cameron 2000, 126, fig. 34) but the techniques used, seemingly embossing and stamping (in which an embossed design is raised in relief by pressure applied from the underside; a tooled design is impressed into the grain surface of

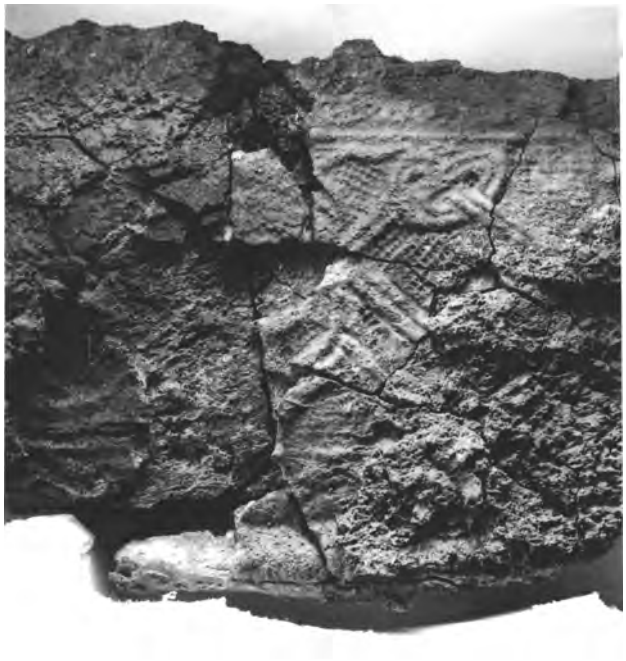

Figure 32 Detail view of decorated calf leather scabbard (item 449) on the seax from inhumation burial 5352

the leather by pressure from above), are unlike other published English examples of similar date, which are more commonly tooled (Cameron 2000, 51–2).

Grave 5488; item 496: The handle of the seax was of horn. The sheath was of leather, 2.5 mm thick, apparently unlined. Although fragmentary it survives in a curve over the back of the blade and extends, on one face, over the handle to leave only the end protruding.

Grave 5537; item 518: The handle of the seax was of horn. Its sheath of calf leather, 2–3 mm thick, curves over the back of the blade and extends slightly over the base of the handle although its full extent is unknown. Hair-like formations between the leather and the blade suggest that this sheath was lined with a haired skin.

Knives

The sheaths of 7th century knives published elsewhere show them to be constructed in similar fashion to those of seaxes, with the seam running along the cutting edge and the handle enclosed within the sheath (Cameron 2000, 49–56). Variations looked for included seams, decoration, the use of wood (for knife scabbards) or lining materials but in this case the level of preservation was a limiting factor.

Grave 3520; item 180(b): The knife handle was of horn. A sheath of leather, 1.5 mm thick, joined at the cutting edge, extended over the knife-back and along part of the handle.

Grave 4357; item 366: The knife handle was of horn. Sheath remains, probably of leather, were slight.

Grave 5488; item 481: This knife has traces of wood on its blade which may be evidence of a wooden scabbard.

Spears

Wood samples from inside the sockets of spearheads showed ash to be the predominant wood, with one example of hazel (Table 7).

Shield-bosses

Grave 5352; item 450: Traces of the wooden shield-board on the underside of the flange were too slight and poorly preserved to sample. A detached fragment of the flange has wood 8 mm thick, with no trace of any other organic remains other than a layer of degraded textile impressed into its underside. This dimension correlates with measurements of other shield-bosses of the 7th century. Anglo-Saxon shield-boards increase in average thickness from 6.5 mm in the 5th century to 8.5 mm in the 7th century (Dickinson *et al.* 1992, 47–8).

Grave 5537; item 517: Traces of the wooden shield-board on the underside of the flange were too slight to sample. No organic remains survived on the grip.

Personal equipment

Knives

Knives are the most common finds in Anglo-Saxon burials, and the Stadium site is no exception. Fifteen knives or possible blade fragments were recovered from 14 graves. A sixteenth knife was found in pit 4368, and is thought to have been redeposited in that context, having originated in grave 4425. Where possible, the knives have been classified according to Evison's typology (1987, text fig. 22). As Geake has noted, however, although this typology is routinely used 'it has not been tested against a wider sample, and its general applicability is doubtful' (Geake 1997, 25). All the knives are whittle tang forms, three of which have traces of organic handles. As with the spears, the generally poor condition of the iron made placing these objects into a typology difficult; five are too corroded for classification. Of those that have been assigned to a type the following were noted:

A: Five examples of type 1 (items 346; Fig. 19, 366; Fig. 19, 398; Fig. 21, 479; Fig. 23, 481; Fig. 25), a type with a curved back and curved cutting edge. This is a common form, with a date range from the 5th to the 7th century.

B: Three examples of type 2 (items 332; Fig. 17, 519; Fig. 27, 940; Fig. 13), a type with a straight back and curved cutting edge, again with a date range from the 5th into the 7th century.

C: Three examples of type 4 (items 338; Fig. 21, 385; Fig. 19, 448; Fig. 22), with a curved back and straight cutting edge, essentially of 7th century date.

One knife (item 338, Grave 5129; Fig. 21) has a serrated cutting edge, though the overall form of the

knife is similar to Evison's Type 4. No comparable knife has been found.

Two of the knives (graves 4202 and 4541) were on the left-hand side of the individual, well above the waist, near the shoulder. Seven were at the waist or thereabouts. Knife 940 in grave 3520a was on the right-hand side, in the vicinity of the waist or hip, with a seax. In graves 4002, 4265, and 5488 the knives seem to have been placed over the lower chest or stomach area. The position of the knife recovered from grave 4425 is unknown as this had been disturbed and was recovered, with a large part of the skeleton, from the base of a later pit.

Textiles were found on three knives (item 332 from grave 4202, item 338 from grave 5129 and item 519 from grave 5537; see below). The two different textiles observed on the knife from grave 5129 could represent, respectively, inner and outer garments.

Mineralised remains were found on three knives (grave 3520, item 180; grave 4357, item 366; grave 5488, item 481: see above). Two knives (items 180 and 366) retained evidence of organic handles (in both cases horn) and leather sheaths. The knife from grave 5488 had traces of wood on its blade, possibly evidence of a wooden scabbard.

Buckles and belt fittings

Like knives, and probably because many are associated with them, buckles are ubiquitous finds in burials throughout the early Saxon period. At the Stadium site, seven burials contained buckles, one (the double burial 3520) containing two. All are oval forms of either iron (three examples) or copper-alloy (four examples). The most distinctive is the 'shield-on-tongue' type, of which one example was found (item 181), associated with the belt fittings (and seax 179) in grave 3520 (above). The other seven examples are plain oval forms, one of which (grave 4102, item 252) has lost its tongue. Small simple buckles are a common find in late cemeteries, but whether this is because there was a decrease in the popularity of other buckles in uncertain (Geake, 1997, 79). In Hamwic, the relative paucity of other types of buckles suggests that this was the case. Only one buckle (the large iron buckle 186, from grave 3520) has a surviving plate; in this instance rectangular, doubled over and held in place with three copper-alloy rivets.

These buckles probably had differing functions. The smaller examples (items 252; Fig. 16, 254; Fig. 17, 494; Fig. 26, and 530; Fig. 25, plus one adhering to seax 449; Fig. 23) could have held straps of between 10 mm and 15 mm – too narrow for a belt but suitable for a strap, for example to support a knife sheath. This seems to be the case for item 252, which was found associated with a knife on the left side of the individual (grave 4102). Larger buckles (items 181; Fig. 13, 186; Fig. 13, and 520; Fig. 20) held wider straps or, more probably, belts. Item 181 formed part of an elaborate belt suite associated with seax 179 in double burial 3520, and buckle 186 may have performed a similar function associated with seax 180 in the same grave (compare Evison 1987, fig, 20; grave 33:5). Item 520 was found close to the tip of the seax (item 518) in grave 5537, but was more probably associated with the shield in that grave (item 517). Two buckles (grave 4110, item 254; grave 5508, item 494) were not apparently associated with any other objects.

Mineralised textiles were found on two buckles (items 181 and 186), both from double grave 3520 (see below). The textile on the front of the buckle on the right hip of skeleton 3549 (item 181) may represent an outer garment or cover, or perhaps a loose belted gown draped over on to the front of the belt.

The most elaborate belt fittings came from grave 3520, where they were associated with seax 179 and its scabbard. The belt suite comprised three copper-alloy belt mounts (items 927–9), a buckle counter-plate (item 175) and a complete oval 'shield on tongue' buckle (item 181). There is no sign of a buckle plate or rivets to accompany the buckle, but there are many examples of buckles in graves with no plates, including shield-on-tongue types (eg, Evison 1987, 87, and 277). The three belt mounts, which would have been spaced along the belt, are trapezoidal with lobed edges and are apparently plain, each held in place by three iron rivets; there are two lugs for attachment on the underside of each. The complete belt suite, of type Bern-Solothurn, is directly comparable with a belt set from Bülach 279 (Werner 1953, Abb. 6).

Only one other British parallel is known, from a grave at the Buttermarket, Ipswich (C. Scull, pers. comm.), although parallels on the continent are well attested, with a close date range of *c.* 640–70. The seax and associated scabbard and belt suite from the Buttermarket grave identify the burial as an individual from Frankish or Alamannic territory (Scull 2001, 68), and it would therefore be reasonable to assume that the individual at the Stadium site could also have been of this ethnic background. In both instances the seaxes are of the broad type.

Possible chatelaine group

This object (item 504), from grave 5510 (Fig. 26), comprises several elements: a number of figure-of-eight and S-shaped links forming a chain, with textile adhering to the back; a copper alloy object comprising a square, flat terminal divided into three sections, which has the remains of iron links through the sections; and part of a thin, loop-headed iron strip, possibly a key. These elements are thought to be part of some sort of chatelaine or girdle group, and were

found centrally within the grave (no skeletal remains survived); they could have been attached to a belt or held within a bag at the waist. Although comparable chains have been recovered from other cemeteries, for example associated with keys at Dover Buckland (Evison 1987, fig. 61, grave 157), and at Harford Farm, Caistor St Edmunds (Penn 2000, grave 19B, fig. 90:7F), it is more difficult to find parallels for the copper-alloy object. Long iron chatelaines are most commonly found in late 7th or early 8th century graves, though they do occur earlier (Geake 1997, 58).

?Key
A possible tool or key with a twisted shank and a suspension loop at one end (the opposite end is broken off) was recovered from the head end of grave 4037 (item 50; Fig. 16). It is similar to an object recovered from within a grave at Harford Farm, Caistor St Edmund (Penn 2000, grave 28, fig. 94:9c).

Needle
A small copper-alloy needle (item 935) was found with the scabbard and associated fittings (item 179) from grave 3520 (Fig. 13). Its inclusion in the grave is unusual, as needles are rare finds in burials of this period. They are occasionally found associated with small metal 'workboxes' or 'threadboxes', together with other needlework items such as pins and thread. Evison, however, notes the presence of a 'bodkin' in a grave at Lyminge, Kent, where it was apparently used as a pin to fasten a cloth wrapping on a spearhead (1987, 112).

Pin
A thin shank, possibly from a pin, in two fragments (item 333) came from grave 4202 (Fig. 17), from the waist area.

Personal adornment
'Bulla' pendants
A necklace was recovered from grave 4202 (Fig. 17), and comprised four silver 'bulla' pendants (small curved discs with a silver disc backing), and possibly two more of copper-alloy, four coloured glass beads, and a crescentic gold pendant.

'Bulla' pendants are known in Lombardic cemeteries of the late 6th century, and became fashionable in England during the 7th; they are found across the country, usually made of silver, as at the Stadium. A date range covering the second half of the 7th century perhaps extending into the 8th has been proposed (Geake 1997, 37). Examples are known from the Buttermarket, Ipswich (Scull and Bayliss 1999, 82; later 7th century graves 3659 and 4275), Harford Farm, Caistor St Edmund (Penn 2000, fig. 91: grave 22:1c) and Shudy Camps, Cambridgeshire (Lethbridge 1936, fig. 2, A1). They are associated with females, are frequently found as elements of necklaces, and may be placed with either adults or children. Geake (1997, 37) notes that it is the 'material and quality of the individual bulla, not the basic type' which can be taken as an indicator of status. The Stadium site examples, made of silver and found with a gold pendant would, therefore, suggest a high status for this individual.

Gold pendants
by David A. Hinton
Crescentic pendant (item 331) from Grave 4202: This object (Fig. 17; Cover) has been made by cutting the shape from flat sheet gold and rolling the ends so that they look like plain wires, coiling them inwards into asymmetrical spirals, and soldering to each a length of beaded wire to extend the spiral. A ribbed tubular loop has been soldered on, slightly off-centre so that when dangled the asymmetry is emphasised. The back differs only in that less care was taken to remove the solder from the loop's junction with the sheet.

In his preliminary British Museum report on this object, Barry Ager noted a similarity to a recent discovery at Wijnaldum, Friesland, a Frisian site that has produced a number of 7th century objects, including a die that provides evidence for metal-working there (Heidinga 1997, 36–8). The Wijnaldum piece has continuous wires forming the spirals, and is symmetrical. He also compared it to flat gold kidney- or mushroom-shaped pendants, such as occur in the coin-dated Wiuwerd hoard from the same part of the world (Mazo Karras 1985, fig. 4, nos 5 and 6; Webster and Brown 1997, pl. 53).

The only faintly comparable objects found in England are silver ones in Kent, as in the Buckland cemetery (Evison 1987, 56) outside Dover, at Faversham, Eastry and other sites, with a gold one from Gilton (Mazo Karras 1985, 164–5 and fig. 6, nos 3 and 4). Although the Wieuwerd hoard is dated to *c.* 630, Evison noted one in a grave of *c.* 700 in Germany (Evison 1987, 56), which would be closer to the suggested date of the Stadium site grave. The high gold content (approximately 90%, with 9% silver and <1% copper; the solder probably contains between 76 and 80% gold. Compositional analyses by Chris Salter, archive) favours an earlier date on analogy with the coins, but as is mentioned in the discussion of the other Stadium site pendant, royal treasuries may have kept higher-alloy objects in store, occasionally releasing them. Gold and garnet working took place at Wijnaldum between about 550 and 650; the pendant has not been published, although it figures on the cover of the first excavation report (Besteman *et al.* 1999, 111–9) and in a popular account (Carmiggelt 2000, 32).

As Ager suggested, it is very likely that this pendant is a Frisian import, which is perfectly in line with such things as finds of sceatta coins from the Low Countries. It is also in line with the possibility that the disc pendant (see below) was made in Frisia or by an itinerant with Frisian connections, and with the origin of the scabbard studs in Grave 3520. Identity signalling in the Stadium site cemetery could have been intentionally Frisian, or at least positively anti-Kentish.

Pendant with garnet-cloisonné and filigree decoration (item 507) from Grave 5508: This object (Fig. 26, Cover) is made from a gold disc surmounted by a ribbed suspension loop, tapering on the reverse side where it is (?reaction) soldered to the back of the disc. In the centre of the disc are two concentric circles of flat garnets around a circular bossed 'cabochon' garnet with a slightly flattened top held in a high collar that is inturned to hold the stone in place. The flat garnets are held on a lower plane into gold cells, the inner ring of 12 roughly wedge-shaped, the outer 12 roughly semicircular. Around the latter is an outer gold band, mostly set at a slight angle inwards and with the top lightly hammered to overlap the garnets; the inner gold cells do not seem to have been hammered on the top. The garnets are set above sheets of cross-hatched gold foil cut to fit into the cells. Around the perimeter of the garnet circle is a second plain vertical band surrounded by two beaded gold wires, a wider one at the base overlain by a thinner one. The outer sector of the disc is divided into four panels by short straight barriers of one beaded wire flanked by two thinner beaded wires soldered to it. There are further beaded wires along each panel's longer sides, and the whole is contained within a beaded wire running round the perimeter of the disc; that wire runs through the loop. Inside each quadrant is a series of discontinuous triple beaded wires that form interlaced snakes; each has a head identifiable only by the arching of an outer wire. The back is plain.

When buried, the disc was probably in very good but not quite mint condition. Both sides of the suspension loop are slightly rubbed away at the top, presumably from wear, but the ribbing on the back does not show similar rubbing, perhaps because the sides were deliberately shaved off to make the pendant hang better. The beading on the outer perimeter wire is very worn, in places having almost disappeared even on its inside edge. This is difficult to reconcile with the rest of the filigree; one of the higher central wires in the short barrier arms is quite rubbed, but equally exposed central wires of the snakes' bodies are hardly affected. Two short lengths of beaded wire are missing from the snake's body in the lower left quadrant, and others are lifting slightly. There is a very slight crack in the upper right quadrant. That damage could have happened either before burial, or as a result of pressure on the pendant in the grave. Any pressure can only have been slight, however, as when excavated the garnets were all still flush with the tops of their cells. Unfortunately the paste which would originally have filled the spaces between the gold disc and the underside of the foils had leached out, so that the garnets and foils are now loose.

Pendants are not especially unusual in 7th century graves in England; Geake noted a total of 75 in a sample of 353 burial sites (1997, 37–8). Only 19 were of gold, however, including five set with coins, and three bracteates with repoussé decoration. Ten were discs with filigree decoration, some with garnets, and therefore more comparable to the Stadium pendant. Some from the Lechlade cemetery have subsequently been published (Boyle *et al.* 1998, pl. 5.19), as have two from Harford Farm, Norfolk (Penn 2000, pls 27 and 28) and one from Westbury, Buckinghamshire (Mills 1995, 319–21). More locally, there is one that seems to have been a stray find from Pewsey, Wiltshire (Youngs 1992; there is a gold bracteate from Mere in the same county). None of the discs with filigree has snakes, and none has as many garnets as the Stadium pendant, although Youngs recognised a zoomorphic element on the Pewsey disc's suspension loop. That loop is very worn except on the back, and the disc also has a very worn outer filigree wire despite being in good condition otherwise, like the Stadium site pendant.

Flat garnets appeared in England in the mid 5th and 6th centuries. The cemetery at Breamore, Hampshire, had an imported buckle with garnets on the plate, and the same parish has yielded another import, identified as a Mediterranean bridle-fitting (Eagles and Ager 2002). Both pieces are copper alloy not gold, the latter perhaps the earlier of the two and as early as anything found in England with cloisonné garnets. Slightly more often found are brooches such as rosette types which are classified as 'continental related', since places of manufacture are uncertain (Parfitt and Brugmann 1997, 43–5). Most of those are from Kent, and the south of England has otherwise yielded very few garnets: they are on a buckle and its plate and on a stud from the Apple Down cemetery in Sussex (Down and Welch 1990, 102 and pl. 44), but there are no others recorded from the county (G. Thomas, pers. comm.). None has been found in an Isle of Wight cemetery (Geake 2002, 146–7; Ulmschneider 1999), but a gold object with garnets that might be a 7th century scabbard or sword fitting has been reported recently as found on the beach at Bembridge. In Dorset only a triangular cabochon garnet has been reported, from the cemetery outside Dorchester at Bradford Peverell (Keen 1977, 120), which may be like one from Mere,

Wiltshire (unpublished). In Hampshire, there have been the recent and exotic discoveries at Breamore (Eagles and Ager 2002, see above) and another east of Winchester (S. Worrell, pers. comm.) to add to the flat garnets in what is probably a Kentish buckle at Alton (Evison 1988, 18–20), a Kentish disc-brooch from Ampfield (Denford 1986) and a copper-alloy pendant and a copper-alloy brooch at Winnall II, outside Winchester (Meaney and Hawkes 1970, 10, 14, 33–6 and 39–42). In Winchester, cabochon garnets were found on the necklace buried in Brook Street (Hawkes 1990).

As Angela Care Evans noted in her preliminary British Museum report on the pendant from the Stadium site, the garnets are unevenly cut. Viewed under a microscope, some of the semicircular garnets seem to have smooth edges such as would be expected of wheel cutting, while the wedge shapes have been chipped. The most skilled cutting was done when garnets were readily available, as in the Sutton Hoo assemblage, and the quality of the work on the Stadium site pendant is more likely to be because it was assembled at a time when the supply was dwindling than because a less skilful lapidary was responsible.

Declining quantities of garnets can be observed after the first third of the 7th century (Hinton 2000, 86; Coatsworth and Pinder 2002, 132–48 for a recent summary of pastes and cutting techniques). Hawkes suggested that the garnet circles in the Winnall pendant had been taken straight out of a composite disc-brooch such as one from Milton, Oxfordshire (formerly Berkshire) (Meaney and Hawkes 1970, 39–40). The Stadium site pendant looks as though it may have taken the process a step further, by taking a selection of garnets and resetting them as well as could be done by someone who could not reshape them except by chipping at their edges.

The garnets in the inner circle could have originated as wedge shapes like those in the inner circle of the Milton brooch. The outer semicircles are, perhaps surprisingly, more difficult to find parallels for in England; there are none quite like them on any of the known composite disc-brooches, nor on the Kentish disc-brooches (Avent 1975). They could have come from 'continental related' rosette brooches, like one in grave 33 at Mill Hill in Kent (Parfitt and Brugmann 1997, 44 and fig. 31); they need not have come via Kent, but directly from the continent – as indeed could the inner ones, Visigothic as well as Frankish pieces being possible sources (eg, Webster and Brown 1997, pls 4 and 8). As rosette brooches would have been out of fashion by the beginning of the 7th century, the recycling of garnets from them is likely enough.

The goldsmith had to shape the cell walls to fit the garnets, which now makes them look crude, but was in fact skilled work. The loss of precision in the pattern is especially noticeable in the inner circle, though would not have been immediately apparent to anyone seeing the pendant from any distance. If the same man was responsible for the filigree, he was no mean practitioner. His snakes are not unlike those on some Kentish work, such as the Monkton brooch (Avent 1975, pl. 62), but none of the composite disc-brooches has the trick of creating a head by arching one of the wires. A similar device is used on a pyramid stud from Selsey, Sussex, though in that case both the outside wires arch out, so that the head is seen from above rather than in profile (Speake 1980, pl. 14e).

This has also been done on the buckle from Crundale, Kent, but with two granules filling the voids, to give the impression of eyes (Haith 1991, no. 6). The snake's body on the Selsey stud is much more tightly coiled than on the Stadium site pendant; more open knotting is seen on another Sussex gold item, a mount, from Apple Down (Down and Welch 1990, pl. 42B), but it is also on the Crundale buckle. It may just be coincidence that the Stadium's outer filigree wire and loop show wear like that on the Pewsey disc, but it is particularly strange that it is not the backs of the loops that are worn, and deliberate tapering of the sides is a possibility.

Geographically much further away, the same thing can be seen on the ribbed loop fitted to a gold pendant with ribbon filigree from a grave at Garton, Yorkshire – on which again the outer filigree wire is much more rubbed than the other wires (Loveluck 1996, 40). Although the amount of gold, 67.3%, in the alloy of the Pewsey disc is quite close to the Stadium's 68.3% (base) – 74.9% (wires) averaged range, its copper content of 5.3% is significantly greater than the latter's maximum of 3.5% (compositional 'semi-quantitative' analysis by Peter Northover; archive). Another difference is not only that the Pewsey disc did not have garnets, but an attempt to compensate for their absence was made by placing a domed metal stud rather than a cabochon stone at the centre. Its herring-bone filigree is also different (Youngs 1992).

With variations like these, the Stadium site pendant cannot be claimed as the work of a particular goldsmith operating in the Sussex–Solent area, let alone in Wiltshire, though that is nevertheless a possibility. He could have been Kentish, or Kentish-trained, though the overall pattern and some negative evidence such as the non-use of twisted wire filigree and of shells or other white material in the centre does not particularly point in that direction. The beaded filigree and the use of garnets have similarities to some of the work in the Frisian Wieuwerd hoard, coin-dated to the 630s, for instance (Webster and Brown 1997, pl. 53); other Frisian pieces with comparable filigree include a pendant from Cornjum

(Mazo Karras 1985, fig. 10, 1; the possibility of a Frisian connection was suggested by George Speake, writing *in litt.* without knowing of the other gold pendant, above).

The curvilinear bodies of the Stadium site pendant's snakes are typical of what is known as Salin's Animal Style II, usually attributed to the 7th century (eg, Geake 1997, 8). It is the second example from Hamwic, the other being on a bone mount, always assumed to have been made well before the settlement was established (Hinton 1982, fig. 3), though the Stadium material makes it more possible that it was co-eval with the foundation. Finer dating of Style II within the 7th century is bedevilled by such uncertainties as the date of the *Book of Durrow* (which may be as early as the 630s or as late as the 680s: Netzer 1999 for a recent statement). The ornament in that book shows that Style II animals were not out of place in a Christian context; the Stadium site pendant may well have them deliberately set within quadrants that form a Cross, to remind the wearer of the evil that threatens the Christian world. Or, as in the door jambs at Monkwearmouth, where they are also associated with a Cross pattern, the snakes may have been regarded as protective (Bailey 1996, 38–9). The two circles of 12 garnets might have been an allusion to the 12 apostles, as has been suggested of the garnets in St Cuthbert's Cross, also a 7th century personal object using recycled material (Coatsworth 1989). Certainly there is nothing to allow the tag 'pagan' to be attached to Grave 5508 on the basis of the pendant.

It is generally agreed that most of the gold in Anglo-Saxon jewellery derived from imported coins, the purity and availability of which declined during the 7th century. The latest histogram of 92 single coin finds – including four plated contemporary forgeries – peaks at about 40 in 600 to 650, with eight in each of the next two decades, four in the third, and none thereafter (Fitzwilliam Museum 2002). The alloy of the gold may give the Stadium site pendant a date of 610–35 on comparison with coins (see Brown and Schweizer 1973), but the decline of gold in the coinage need not have been exactly matched in objects, and royal treasuries probably kept some of the purer coins in store. The percentages are only a little higher than that of the Pewsey disc, attributed to manufacture towards the end of the 7th century (Youngs 1992, 150). The absence of garnets on that disc would suggest a later date than that from the Stadium, if it was not simply a matter of different individuals' access to the necessary stones. The Freston, Suffolk, pendant with a gold content of only 60% in its disc nevertheless had a garnet in its centre – but to complicate the matter further, its loop had a much higher reading, of 73% (West 1998, 40).

If *c.* 630–50 were to be speculated as the date of manufacture of the Stadium pendant, there is then an interim period of use before burial – perhaps only another ten years, since the degree of wear seems so equivocal? That would give a very approximate 'earliest-probable' date for the deposition, but does not preclude a slightly later date for the manufacture, or a longer interval before burial, so that grave 5508 could quite well have been more or less contemporary with the post-*c.* 685 grave 4202 with its sceatta coins.

Glass and amber beads

by Rachel Every

Eleven glass and one amber bead were recovered from four graves, all but two probably from necklaces given their position in the neck area of the individuals. Nine other beads, seven from pits, may have come from disturbed graves, but are considered below (Chapter 4). The graves contain monochrome beads of disc and biconical form, and polychrome beads of cylinder, globular, and disc form. Necklaces comprising numerous beads were common in the 6th century at the Dover Buckland cemetery, but are rare afterwards, limited to small numbers of, usually, other material types (such as amethyst or shell) and polychrome beads (Evison 1987, 66). The beads have been classified on the basis of colour, opacity, shape/form, diameter/size, and percentages of monochrome and polychrome examples in an assemblage, using the typology from the Dover Buckland cemetery (*ibid.*, text fig. 11), and Hirst's recent typology (2000).

There are two major necklace groups from grave contexts. The first, from grave 5508 (Fig. 26), comprises two opaque blue biconical beads (items 509 and 510), from either side of the garnet cloisonné pendant described above (item 507). A Romano-British silver intaglio ring (below, item 508) was also recovered with this group, in the neck area of a subadult or adult female (16–20 years).

The second necklace group, from grave 4202 (Fig. 17), consists of four translucent monochrome disc beads, two pale green and two pale brown (item 566), found with the crescentic gold pendant (item 331) and silver and copper alloy bulla pendants (items 567 and 568). Again, these items were found in the neck area of an adult female (18–25 years).

A yellow monochrome biconical bead (item 46) and a polychrome cylinder bead (item 47) were recovered from grave 4037 (Fig. 16), from the neck area of the individual (adult, sex unknown). The polychrome bead has combed trails in opaque red and white applied to an opaque yellow body (Evison 1987, text fig. 12, type D13; Hirst 2000, type P4).

An amber bead (item 505) came from grave 4541 (Fig. 20), together with two polychrome beads. The latter comprise one disc bead (item 511) with a single

marvered opaque white wave on a black body (Hirst 2000, type P7) and one globular bead (item 528) with marvered double crossing wave in opaque yellow, with spots in opaque white, on an opaque red body (*ibid.*, type P23b). At Dover Buckland both types have a currency of 575–675 (Evison 1987, table xv), and Geake notes that polychrome beads continue into the later 7th or 8th centuries (Geake 1997, 44).

In this instance, the amber bead was at the neck while the two glass beads were some distance away, towards the side of the grave to the right of the legs – they may have been held in a separate bag or purse. This was a probable adult male burial. Strings of amber beads were particularly common in the 6th century, although occurrences of one or two beads per grave continue into the 7th. Evidence from the Continent may indicate a cessation in the organised export of amber from the Baltic to western Europe in the 7th century, in which case amber, more rarely accessible, may have acquired increasingly amuletic connotations (Geake 1997, 47). The location of the two polychrome glass beads may also indicate an amuletic function in this instance, and the selection of polychrome beads is a common factor in so-called amulet collections such as these (*ibid.*, 44).

Intaglio ring

by Martin Henig

A large Romano-British silver ring with an intaglio inset (item 508) was recovered from grave 5508 (Fig. 26), where it appeared to have been hung round the neck, together with the garnet cloisonné pendant and two glass beads (items 507, 509–10).

The ring has a simple hoop of circular section with an oval box-setting for the bezel, set at right-angles to it, attached below by distinctive recurved volutes. This has a beaded surround at the base extending to three pellets on each side at the junction with the hoop. The shoulders are embellished with wrap-around wires.

The setting is a moulded glass intaglio, oval with bevelled sides; its appearance imitates onyx, displaying a pale upper surface on a dark ground. The device which is somewhat schematically rendered is the goddess Minerva facing to right (actual intaglio described), one arm outstretched and holding a victory(?), the other supporting a vertical spear and a shield which rests on a base line.

The ring is of a somewhat unusual form. Closest in many respects is a gold ring from Bignor Roman villa, Sussex (Henig 1982) with a complex bezel, with beading running around the upper edge, three pellets on each shoulder and with wrap-around wires. It has been thought to date from the late 3rd or early 4th centuries. Another gold ring from Corbridge, Northumberland (Charlesworth 1961, 31 no. 96, pl. iv, 13), likewise assigned to the 4th century, is similar in its hoop but lacks the wires and the pellets; the bezel, though larger than that of the Stadium site ring, has similar beading around the base of the bezel.

It should be noted that silver rings in the mid-2nd century Snettisham Roman Jeweller's Hoard, Norfolk (Johns 1997), already exhibit features such as shoulder-wires (*ibid.*,107–8, nos 289–99), and volutes (*ibid.*, 110, nos 308 and 309) though these latter are more obviously ornamental features here. At Snettisham, beaded surrounds are more apparent on pendants (*ibid.*, 114, nos 235–6). However, the employment of a low-grade glass intaglio in a silver setting on the Stadium site ring suggests that it dates from after the period when the quality of the gemstone setting was more important than that of the ring (Henig 1981), so the late Roman dating is virtually certain.

The intaglio features a well-known subject. The figure of Minerva is ultimately based on the Athena Parthenos and is reasonably well represented amongst cut stones on British sites (eg, Henig 1978, 214–5, nos 234–9). Minerva does not appear to be a common theme on low-grade glass imitations.

Quite a number of Roman intaglios, some in ring-settings, have been recovered from Anglo-Saxon period graves including examples from Howletts, Bekesborne and Milton-next-Sittingborne, both in Kent (*ibid.*, 159–61). At least by the 7th century, a Classical finger-ring or a gem might symbolise a new-found Romanitas, and even new-made jewellery like the pendants with beaded borders from the Canterbury St Martin's Hoard, one of which has a setting of a Minerva intaglio (*ibid.*, 214 and pl. xxxvii, no. 231; Webster and Backhouse 1991, 23–4, no. 5h), has a Roman feel to it.

Romano-British brooch

A Romano-British brooch of fantail form (item 48) was found in grave 4037 (Fig. 16), where it appears to have been placed within a container, probably a leather bag or purse, at the foot of the grave, along with an iron ring (item 49). The brooch is a 1st century AD type, and is one of the small collection of Romano-British objects found in Saxon contexts on the site; in this instance deliberate collection and curation is demonstrable.

Gold thread

by Penelope Walton Rogers

A small skein, or clew, of gold thread (Item 424; Cover) was recovered from a cess pit (5274) in the West Stand. The clew measures 20 x 9 x 4 mm and weighs a little over 0.6 g. The thread seems to have been wound in a criss-cross fashion around some sort of bobbin, although the bobbin itself is not visible. The x-ray shows the outline of a tube, 5 mm wide, running the full length of the object and it seems likely that a bobbin made of organic material such as

wood has decayed, leaving its imprint inside the spool of thread. As well as some loose threads, of which the longest is 80 mm, there are four thread ends visible in the spool, which implies it was not wound as one continuous length. This find has considerable significance because it is clearly thread intended for use in embroidery or tablet-weaving – both of which are crafts for which the Anglo-Saxons had an established reputation on the Continent.

The thread is 'spun gold' or gold filé, that is, a thin flat strip of gold which has been twisted around a core thread. EDXRF analysis by P. Clogg (full details in acknowledgements) revealed the metal to be a gold-silver alloy with an approximate concentration of silver around of 8–10%. The core has decayed away, leaving the gold strip as an empty spiral, approximately 200 microns wide. The strip of metal is parallel sided and has been cut – mostly very regularly – from sheet gold, 20 microns thick. The strips vary between 200 and 400 microns wide, but most are around 240 microns. There are manufacturing marks on the surface that appear to have been made by rolling out the sheet before cutting. The strips are sometimes cut parallel to these marks and sometimes at a slight angle to them. There is also one instance where the over-lapping join between two strips is visible. The strips have been spun in the S-direction and the helix angle is roughly 40° from vertical.

The Anglo-Saxons used gold thread for two main purposes: embroidery and brocading. In embroidery the gold was laid across the surface of the fabric and fastened, or 'couched', from below with a needle and fine yarn. In brocading, the gold was woven into the surface of narrow bands, as a supplementary weft thread that ran back-and-forth over the upper surface of the weave.

The earliest examples of gold brocading come from more than 25 6th century women's graves in Kent, with one further example from a 7th century man's barrow burial at Taplow, Buckinghamshire (Crowfoot and Hawkes 1967; and author's unpublished data). In these early graves the gold is not spun but simply used as a flat strip. The use of spun gold appears in the tomb of Queen Arnegunde at Saint-Denis, Paris (*ibid.*, 55–6; Werner 1964, 214), a burial recently redated to *c*. AD 600 (Périn 1991). This represents a return to Roman technology, for spun gold was used in Roman textiles (Alfaro Giner 2001) and a ball of spun gold thread has been found in a child's grave at Verulamium (St Albans) (Wild 1970, 131).

The earliest Anglo-Saxon examples of spun gold thread are to be found in the vestments of Saints Harlindis and Relindis in St Catherine's Church at Maaseik, Belgium (Budny and Tweddle 1984; 1985). These incorporate embroidery in coloured silk and couched gold, together with gold-brocaded silk tablet-weaving, and have been ascribed to southern England in the late 8th or early 9th century (Budny and Tweddle 1984, 66, 72). A gold embriodery among the relics of St Ambrose in Milan is also thought to be 9th century Anglo-Saxon (*ibid.*, 86). The gold-embroidered stole, maniple and girdle (maniple II), with gold-brocaded borders, from St Cuthbert's tomb at Durham are generally believed to have been made between AD 909 and 916, probably at Winchester (*ibid.*, 85; Plenderleith 1956; G.M. Crowfoot 1956; Coatsworth 2001). Excavated examples of gold thread include remains of bands and embroideries in five or six 9th and early 10th century burials at Old Minster, Winchester (Hughes 1990, 81); the remains of brocading from 10th–11th century Coppergate, York (Walton Rogers 1989, 314–5); and loose threads from 11th century Whithorn, Scotland (Walton Rogers 1994). All of these examples are manufactured in the same way as the Southampton example, as cut strips of gold twisted in the S-direction. In the Maaseik embroideries the core around which the gold was spun was cattle tail hair (Appleyard 1985, 361) and in the St Ambrose and St Cuthbert textiles it was a silk thread, but in the others it has decayed away.

Theophilus, writing in the 12th century, described how gold thread was made by cutting the metal strip and then spinning it around a silk core (*On Divers Arts* III, 77, Hawthorne and Smith 1979, 156). He mainly concentrated on the silver-gilt threads which came into use in the 11th century, but he also mentioned the use of pure gold 'among the rich'. The Anglo-Saxon examples are all relatively high-carat gold and only one, from Winchester, has proved to have less than 75% gold content (75% gold is the equivalent of 18 carat). The latest example with a high gold content is from a 12th century burial at St Gregory's Priory, Canterbury (Walton Rogers 2001).

The clew of gold thread from the Stadium site can, therefore, be dated by its technology to the 7th–11th/12th centuries. The cess-pit from which it was recovered lay close to the late 7th/early 8th century cemetery and it is possible that it is redeposited from a burial, although the 8th–/9th century date for the pit would make the thread contemporary with the tablet-woven bands and embroideries at Maaseik. There were probably several centres of production at this time, but there seems to have been a particular focus on Winchester. A review of the written sources has shown that this work was practised by women, especially those in convents (Budny and Tweddle 1984, 89–91). On the other hand, the gold thread these women used was probably made by male artisans, as it was in the Roman period (Wild 1970, 40). The Stadium find may have been produced by a goldsmith, but it was probably intended for the ladies of the royal court, or a female religious house in the area.

Textile remains
by Penelope Walton Rogers
Textiles were preserved on metalwork in graves 3520 (double burial), 4202, 5129, 5428, 5488, and 5537. The dating of the burials to the second half of the 7th–/early 8th century makes this small group of especial interest, because there is relatively little textile evidence from this period outside Kent. There are some late burials in Anglian cemeteries with a long date-span, such as Castledyke, north Lincolnshire (Walton Rogers 1998), and a small number of 7th century textiles in large single burials, such as the ship-burial at Sutton Hoo, Suffolk (Crowfoot 1983) and the bed-burial at Swallowcliffe Down, Wiltshire (Crowfoot 1989), but the Stadium site group seems to be the first collection of this date from the Sussex-Hampshire region.

Textile types
Textile remains were identified on ten iron objects, including weapons, knives, and buckles and on one copper-alloy buckle. Altogether there were traces of 15 different textiles on these objects, but they were not well preserved and full technical details could be recorded for only 11 and fibres identified in seven (Table 8).

The textiles have all the technical features that are typical of the Anglo-Saxon period from the 5th to the 10th century (Table 8). They are woven in tabby and 2/2 twill and two of the tabby weaves are 'repps' (graves 5129, item 338 and grave 5537, 523), where one system of threads dominates over the other, while two of the twills (graves 5129, 339 and grave 5527, 519) seem to have reverses in the twill diagonal, indicating a chevron or diamond pattern. Spinning is mainly Z x Z in the linens and Z x S in the wool textiles. Thread-counts range from a fine 28 x 16 threads per cm in a ZZ tabby from grave 5488 (496) to a coarse 7 x 6 per cm in a ZS twill from grave 5129 (339). The linens are mainly made from a fully processed plant fibre, almost certainly flax, but a coarse tabby weave on the socket of a spearhead (480) in grave 5428 has been made from a thicker, more sturdy fibre, either hemp or low-grade flax. The 2/2 twill on the socket of a spearhead (495) in grave 5488 is less well preserved, but seems to be a similarly coarse plant fibre.

The twill in grave 5488 is the only example in which a border has been preserved (Fig. 25). It appears to be made up of a fringe of loops, 80–100 mm long. Three loops are preserved, but one has fallen across the other two, so that the place where the loops join the main body of the textile is obscured. Each loop is made up of three or four threads, each thread being 2-plied, Z2Z, unlike the yarn of the body of the textile which is single Z. The most likely interpretation is that this is the cloth selvedge (the side border formed when weaving) and the weft (the yarn that the weaver works back and forth) has been allowed to run out beyond the weave, to form loops, which have been worked together into a fringe after the cloth has been taken from the loom. Most selvedges previously recorded from early Anglo-Saxon sites have been tubular in construction, or tablet-woven, or plain. This short looped fringe is an early example of a kind of border found on late Anglo-Saxon and Hiberno-Norse 'scarves'. These are fine wool and silk fabrics woven in tabby weave, in relatively narrow lengths. Their precise function is not yet known, but they bear a resemblance to the fabrics used for head-dresses at the same date (Heckett 1990, 92–96).

In all other respects the collection is typical of the 7th century, especially in the ratios of one textile-type to the other. Throughout Anglo-Saxon England there seems to have been a rise in the use of ZZ tabby for burial textiles during the course of the 6th and 7th centuries (Walton Rogers 1998, 275; 1999, 144–7). In the 5th–mid 6th century cemetery at Market Lavington, Wiltshire, for example, it represented 30% of the total (Walton Rogers in prep.), but at 7th century Dover Buckland cemetery it was 65% (based on data in Crowfoot 1987). The Stadium site group is small, but nevertheless fits the pattern, with five examples of ZZ tabby plus one ZZ tabby repp, out of 11 textiles.

The uses of the textiles
An interpretation of the clothing of the deceased can often be attempted, based on the arrangement of brooches, pins, and buckles on the body and the textiles associated with them. In the case of the Stadium site collection, however, many of the textiles are on weapons that were not in contact with the body (Table 8). In grave 5129, for example, the spearhead with textile lay on top of a coffin, while in grave 5488 the spearhead was next to, but not touching the skull. Several of the textiles on the weapons are unusually coarse for clothing fabrics (eg, the twill in grave 5129, with a count of 7 x 6 threads per cm) and probably represent wrappers of some sort. There is evidence for the wrapping of weapons in several cemeteries, such as West Heslerton, North Yorkshire (Walton Rogers 1999, 158) and Dover Buckland (Crowfoot 1987, 195).

Some tentative remarks may be made about clothing in other graves. In grave 5129 there is a fine tabby repp on one face of a knife (338), found on the left hip. Tabby repps are commonly found at the waist or hip in both men's and women's graves, sometimes behind the belt buckle, which implies that they are part of an inner, belted garment. The fine linen tabby on the opposite face of the knife probably represents an outer garment, such as a shawl or overgown. In grave 3520, the wool twill on the back of iron buckle 186 is more difficult to interpret. The buckle lay by the handle of the sword, to the right of skeleton 3521, where it probably belonged with a belt or strap placed in the grave with the sword. The linen tabby on the front of the shield-on-tongue buckle, 181, on the right hip of skeleton 3549 may represent an outer garment or cover, or perhaps a loose belted gown which has draped over on to the front of the belt.

Table 8 Summary of textile evidence by grave from the early cemetery

Grave	*Skeleton sex/age*	*Objects with textile*	*Fibre*	*Weave*	*Count/spin*	*Position of textile*	*Interpretation*
3520a	3521 ?/?	186 iron buckle	wool	2/2 twill	10/Z x 9S	On back of buckle to r. of body	
3520b	3549 ?/25–30	179 Fe seax	?	2/2 twill		On blade at r. hip; poorly preserved but similar to textile on buckle 186	
		181 Cua buckle	flax/hemp	tabby	16Z x 14Z	On front, at r. hip	
4202	4203 F/18–25	332 Fe knife	?	?twill	16/Zx16/Z	On blade outside leather ?sheath at l. side of body	
5129	5130 F/16–20	338 Fe knife	flax/hemp	tabby	20/Zx18/Z	On blade at l. hip	Poss. two linen garments with knife worn or placed between. Coarse textile on spearhead is probably a wrapper
			?	tabby repp	20/Zx10/Z	On opposite face to linen tabby	
		339 Fe spearhead	?wool	2/2/ diamond twill	7/Zx6/S	On & around socket, running under ?fleece on blade. On top of coffin	
5428	NSR M*/?	480 Fe spearhead	?hemp	tabby	10/Zx10/Z	On socket, presumed to be by head	
			?wool	tabby	10–14/Zx8/Z	On blade in diagonal folds	
5488	5487 ?F/20–25	495 Fe spearhead	?hemp	2/2 twill	12/Zx10/Z	On socket at l. of head; looped fringe representing cloth border	
			?	?	ZxS	On 1 face of blade	
		496 Fe seax	?	tabby	28/Zx16/Z	in two layers on blade at waist; ?fleece also present	
5537	NSR M*/?	519 Fe knife	?	?diamond twill	20/Zx20/Z	On 1 face of blade outside leather sheath ?at l. waist	
		523 2xFe spearheads	?	tabby repp	15/Sx?	On blade, assumed to be at r. of head	
			?	?	ZxS	Coarse textile on blade of same spearhead	

*NSR = no skeletal remains; * gender based on grave goods*

Containers

This category includes small containers, such as wooden caskets (whose presence is inferred from metal fittings and/or staining within the grave fill), metal workboxes (or 'relic boxes') and pottery vessels, as well as coffins (again indicated largely by staining).

Boxes

A possible wooden box or casket, represented by the remains of two barrel locks (items 502 and 503), was recovered from grave 5510 (Fig. 26); no skeletal remains survived but the locks were found at one end of the grave (east), possibly at the feet. Both objects are in a very poor condition – one is very fragmented and comprises a copper alloy casing with a simple iron mechanism. The locks were located approximately 0.4 m apart at the feet of the individual.

Similar locks have been recovered from graves at Harford Farm, Caistor St Edmund (Penn 2000, fig. 83: grave 7:1a and 1b), and Didcot, Oxfordshire (Boyle *et al.* 1995, fig. 93, grave 2:8). Although these locks are thought to be the remains of a container, no other evidence (bindings, nails, or hinges) for one were noted or recovered during the excavation of the Stadium site grave. If this was a box or casket, it is possible that it was of very simple construction, with sides jointed together rather than fixed using metal fittings (cf. Evison 1987, text fig. 18b). It is, of course, always possible that the locks made their way into the grave in some other way (for example, in a bag) other than on a box – not all padlocks from graves have been found with box or casket remains (Geake 1997, 83).

Distribution of these barrel locks seems to be concentrated in Kent. They do not occur in graves prior to the 7th century, and appear to be concentrated within the late 7th or early 8th centuries (*ibid.*, 82).

The presence of a second wooden box or casket (item group 328) is inferred from a patch of staining at the foot of grave 4202 (Fig. 17), within which were found a copper-alloy workbox and a silver disc (below). Associated iron fragments (not illustrated) may represent the fittings for the wooden box, while a copper-alloy fitting (item 328c) may belong either to the wooden box or to the workbox. Wooden caskets with iron fittings are the most common type of box found in 'late' cemeteries, and were still deposited in graves as late as the early 8th century (Geake 1997, 82).

Workboxes

Grave 4202 contained the remains of a small, undecorated, cylindrical copper-alloy workbox with a D-shaped handle and integral suspension loop (item 328a; Fig. 18). The main body of the container, which is 40 mm high and about 60 mm in diameter, is represented by fragments of thin, plain sheet. Other fragments form part of one or more strips, possibly belonging to a lid. The handle is attached to a hinge, and there is another small oval hinge joining one strip and one sheet fragment together. There are several perforations in both sheet and strip fragments, and one of those in a sheet fragment has a small split pin inserted through it. The precise construction of this container is uncertain, although it is probably close to an example from Sibertswold, Kent, a reconstruction of which is published by Evison (1987, text fig. 20).

The workbox may have contained a silver disc (item 328b; below), or this may have been merely associated with the container at the foot of the grave (above). There are five other examples of workboxes being found with wooden caskets (Geake 1997, 82).

Grave 4037 contained a number of copper-alloy fragments (item 45; Fig. 16) with mineralised preserved organic material (wood) adhering to one surface. The fragments are thought to derive from a similar small container, found at the foot of the grave, possibly within a leather bag with two other objects, a Romano-British fantail brooch (item 48) and an iron ring (item 49) – possibly a bag ring. Again, the precise construction of the container is uncertain, and it may not be an example of the type of object commonly classified as a workbox or threadbox (Meaney 1981, 185–6).

Sometimes referred to as relic boxes, sometimes as threadboxes, these small copper alloy 'workboxes' could have fulfilled a number of functions. Because some have been found containing cloth, pins and dresshooks, for example at Harford Farm (Penn 2000, grave 18), they are often referred to as thread-boxes. However, Crowfoot (1990) would argue that they are 'relic boxes', and that many either do not hold needles, or are too small to do so, being more likely to contain mementoes, as 'personal reliquary boxes'.

These boxes are only found in later 7th century graves in this country, although widely known on the continent from the early 5th century (Evison 1987, 106). There is some argument that there may be some sort of associated Christian symbolism, as some examples are decorated with cruciform designs, although this has recently been countered (Geake 1997, 34). There is no sign of any such decoration on the example from the Stadium site. Workboxes are generally associated with female burials, and found mainly with adults, though sometimes with children. Geake also notes that they are frequently found in graves also containing precious metals (1997, 35). This workbox is no exception, being recovered from a grave also containing two silver sceattas and a piece of silver foil with the impression of a third, a necklace comprising a gold pendant, silver bulla pendants and glass beads, as well as the silver disc which may have been within the workbox.

Coffins

Possible coffin stains were noted in two graves (4037; Fig. 16 and 5129; Fig. 21), and fragments of charred wood (sample 309) in a third (5428; Fig. 23). Graves 4037 and 5129 each produced a single nail (items 50 and 340 respectively), which may have been used in the coffin construction. The nail in grave 4037 was located near the head, together with a possible iron key (also item 50; above), while in grave 5129 the nail was found halfway down the grave, exactly on the line of the coffin stain. Single nails alone would not, of course, have been sufficient to hold the coffins together; Evison notes the relative scarcity of iron fittings associated with Anglo-Saxon woodwork and suggests that other woodworking techniques, such as jointing, must have predominated (1987, 100). Of course, single (and multiple) nails do not necessarily indicate coffin fastenings but may actually indicate reused wood.

Pottery vessel

A single pottery vessel was recovered from the inhumation cemetery, from double burial 3520 (Fig. 13), where it was placed between the feet of the two individuals. This is a rounded jar in an organic-tempered fabric (Timby 1988, fabric 1) in a fragmentary condition; both rim and base are missing. The vessel is internally burnished, and there are vertical tooled lines around the lower half. The dating and other aspects of this and the other pottery vessels from the cemeteries are discussed further elsewhere in this chapter.

Miscellaneous objects

Silver disc

Fragments of a silver disc came from Grave 4202 (Item 328b; Fig. 17), within the presumed area of a wooden container at the feet, and possibly originally inside a copper alloy workbox (see above). This item probably represents the remains of a silver bracteate, with beaded edge and beaded pattern. Insufficient remains of the inner design, however, to be certain of the identification, or to identify the potential design elements.

Iron rings and studs

Two iron rings were found (grave 4541, item 529; Fig. 20, grave 4037, item 49; Fig. 16). The ring from grave 4541 was found by the right arm of the individual, while the ring from grave 4037 came from the feet, where it was found with a Romano-British fantail brooch. Iron rings such as these are of debatable function. It has been suggested that they may have had some amuletic function (Brown 1977), although Evison has argued that such an explanation is unnecessary to explain the occurrence of ring-shaped objects in graves, since they could have had a simple functional purpose (1987, 119). One possible function is that of bag or purse rings. This may well be the case for the ring from grave 4037, perhaps forming part of a bag or purse in which the fantail brooch was deposited, although the diameter (*c.* 48 mm) falls below the range cited by Geake for known metal bag rings (58–118 mm) (1997, 80). The ring from grave 4541, with a diameter of 56 mm is also somewhat small for this purpose. Bags are found in 5th and 6th century graves and also in 'late' cemeteries, but are absent from early 7th century assemblages (Geake 1997, 81), and a late 7th or early 8th century date seems appropriate for the two possible examples from the Stadium site.

A single iron stud (item 25) came from grave 4002 (Fig. 14). It was in the waist area, in line with the (broken) hilt of a seax (item 26), perhaps forming part of associated fittings. A small domed iron stud of uncertain function (item 248) was the only object from grave 4101 (Fig. 16), which contained no skeletal remains.

Iron and copper-alloy strips

Two short lengths of curved iron strip from grave 4541 (items 465 and 466; Fig. 20), found at the foot of the grave, are of unknown function, as are two small copper-alloy perforated strips from the waist area of grave 5488 (items 531 and 497; Fig. 25). They may represent metal fittings from boxes.

Spatial Distributions and Extent of the Cemetery

Distributions

Distribution of cremation and inhumation graves

The cremation and inhumation graves form separate clusters though with an overlap (Fig. 9; cf Figs 12a and 30a). The most northerly inhumation graves discovered were graves 5488 and 5129, and five of the cremation graves lay to the south of these, with the remaining 13 being up to 34 m to the north. Similar, although more clearly defined, north/south divisions have been noted in other mixed cemeteries (eg, Alton, Orpington, Dover Buckland, Bergh Apton, and possibly Holborough, Kent; Evison 1987, 152–68), but this does not appear to have been the case at Apple Down, cemetery 1, West Sussex (Down and Welch 1990, fig. 2.4). The overlap of cremation and inhumation graves at the Stadium site indicates that if there had been a deliberate division in this cemetery then it was not rigidly enforced.

Distribution of sexed cremations

Only five of the 18 cremation burials could be sexed; these comprised one certain and two probable males (5023, 5124, and 7138) and two females (5108 and 5126). The distribution of these burials is shown in Fig. 12b, but no significant groupings can be discerned among such a small group.

Distribution of aged cremation burials

Ageing analysis of the cremated human bone identified the graves of three infants aged *c.* 3 years or less, two juveniles aged 8–12 years, and three subadults, aged 13–18 years. The remaining ten burials were all adults, ranging in age from 25 years or more to over 45 years. No obvious groupings could be recognised (Fig. 12c), with the possible exception of two subadults/adults and the two juveniles.

Distribution of cremation burials with grave goods/pyre goods

Pyre or grave goods were recovered from seven of the cremation burials, the distribution of which is shown in Fig. 12d. The most common pyre good was cremated animal bone, small quantities of which were recovered from five of the graves (5001, 5023, 5114, 5138, and 7152). A burnt ivory bag ring came from grave 5126, that of an adult female aged between 25 and 45 years, and a burnt bone medallion, decorated with a ring and dot motif, was recovered from grave 7138, that of an adult possible male age 45 years or older. Two of the graves contained tiny splinters of glass (5023 and 5137) and grave 5023 also contained

a small globule of copper alloy, all of which may represent the remains of pyre goods.

It is perhaps noteworthy that pyre/grave goods were recovered from six of the ten adult cremation graves, but from only one of the eight sub-adult, juvenile, and infant graves. The exception in the latter group was grave 5114, which contained the remains of a juvenile aged between 8 and 12 years accompanied by a small quantity of burnt animal bone. It may also be of note that grave 5114 contained one of the largest and more ornate urns.

Distribution of sexed inhumations

Analysis of the very badly preserved human bone from the 26 burials (including burials F183 and F288 from SOU 20) associated with the inhumation cemetery identified four males and one possible male, two females and three possible female skeletons (Fig. 30b). On the basis of the accompanying grave goods (Fig. 30d), two of the possible female skeletons (graves 5129 and 5488), both at the north end of the cemetery, may in fact be male. Grave 5488 contained a seax and a spearhead, along with a knife and a copper-alloy buckle, and grave 5129 contained a spearhead laid on top of the coffin/vault and a knife. Whilst female burials with spearheads are not unknown (Geake 1997, 68–70), they are rare, and seaxes are regarded as the accompaniments of exclusively male burials (*ibid.*, 72–4).

It should, however, be noted that there is a prevailing theory that the weapons buried, even with males, are done so symbolically to denote rank. It could, therefore, be argued that if a woman is buried with weapons it is a reflection of the rank of the individual rather than the sex. Another theory concerns the fact that some Norse literature points to the idea that being male or female is dependant on what you do and not what biological sex you are (P. Hill, pers. comm.; Shepherd 1979). It could be that in Saxon society the notion of gender was more fluid than we are familiar with today. For the purposes of examining the distribution of the sexed burials within this cemetery the skeletons from graves 5129 and 5488 are assumed, with due reservations, to be female.

Sixteen of the inhumation burials could not be sexed, due to the very poor preservation or complete absence of bone. Where the assemblage of grave goods accompanying the unsexed burials appears to be gender-specific (Geake 1997) a tentative sex has been assigned. Both skeletons in grave 3520, the skeletons in graves 4002, 4357, 5428, 5537, and the two inhumations from SOU 20 (F183 and F288) are assumed to be male on the basis of the weapons accompanying the burials. The skeletons in graves 4037 and 5510 are assumed to be female on the basis of the workbox buried in 4037 and the possible chatelaine and locks buried in 5510. The burials in graves 4101, 4110, 4265, 4493, and 5553 contained no gender specific grave goods and could not be sexed, further obfuscating any groupings.

Distribution of aged inhumations

In six of the inhumation graves (4101, 4265, 5428, 5510, 5537, and F183, the latter from SOU 20) no bone survived; consequently no estimate of age was possible. Figure 30c shows the distribution of the inhumations by age. There were no infant graves and only one juvenile grave, and of the remaining 19 graves, five were those of subadults or young adults, aged between 13 and 20 years.

Analysis of the surviving bones from the 14 adult graves identified only one skeleton, that in grave 5142, that was over 50 years old at death. Five graves (3520a, 4002, 4037, 4357, and 9007) contained skeletons which were 18 years or older at death; two graves (4102 and 4202) contained skeletons of 18–25 years; one (4541) an individual of 18–30 years; and one (5488) an individual of between 20 and 25 years. The remaining four graves (3520b, 4425, 5119, and F288, the latter from SOU 20) contained individuals over 25 years old, but all were 45 years or younger at death.

The complete lack of infant inhumation burials and only a single juvenile burial differs markedly from the cremation burials where 27% of the graves contained either infants or juveniles. The relative proportions of adult graves (70% of aged inhumation graves and 55% of cremation graves) and subadult graves (25% of aged inhumation graves and 16% of cremation graves) are clearly influenced by the very low numbers of infant and juvenile graves in the inhumation cemetery.

Distribution of grave goods

The general distribution of grave goods within the inhumation cemetery is shown in Figure 30d, with the composition of each grave assemblage shown in greater detail in Figure 31. This shows some, possibly significant, groupings within the cemetery. Of the four graves excavated which were orientated south-north, three (graves 4357, 4541, and 5428) lay within 12 m of one another and all were furnished with spears and knives. All four of the south-north orientated graves contained weapons, spearheads in the case of the small group in the West Stand and seaxes in the case of the double grave in the South Stand (grave 3520). Seven of the west–east graves contained weapons, four (5129, 5352, 5488, and 5537) lying close together at the north end and two adjacent to each other on SOU 20 (F183 and F288), with another (4002) apparently on its own.

It is also noteworthy that three of the graves most lavishly furnished with weaponry (graves 5352, 5488, and 5537) all lie within 10 m of one another and, along with grave 5510, appear to lie at the north end of a row aligned approximately north–south.

Extent of the Cemetery

The full extent of the cemetery is uncertain, but the northernmost cremation burial (7138) probably represents the northern limit, and graves 3520 and 5119 appear to represent the southern limit. The eastern limit must lie somewhere between the western limit of excavation in the East Stand and the eastern limit of excavation in the West Stand. Two inhumation burials on site SOU 20 (Holdsworth 1980, 38) may represent the western limit, but the very limited archaeological interventions and extensive modern disturbances to the west of the site means that this is very uncertain. Perhaps significantly, a relatively large 'blank' area was recorded at the southern end of an earlier watching brief on a pipe trench along the west side of the Stadium site (SOU 192). One explanation for the apparent absence of features is that this area fell within the early cemetery (where there were relatively few pits) and that, because of the graves 'invisibility', they were not identified in section (the trench had been dug before commencement of the watching brief).

With only two exceptions (graves 5134 and 5137), the cremation burials appear to be grouped at the northern end of the cemetery, with the inhumations extending to the south. It is tempting to see this as representing a linear or approximately oval-shaped cemetery that started as a cremation cemetery and gradually expanded southwards as burial practices changed from cremation to inhumation. Unless a more precise date range can be established for the cremation burials this remains speculative. Another possibility is that inhumation and cremation may have been practised contemporaneously, but deposited in distinct groups (see above).

The burials, both cremation and inhumation are relatively well-spaced, with little intercutting between individual graves, and two or possibly three north–south rows might be discerned amongst the inhumation burials.

Another feature of the inhumation cemetery worth remarking on is the absence of ring-ditches or penannular ditches around graves, particularly as these have been recorded elsewhere in Hamwic in relatively early cemeteries, dated to *c.* AD 700, at SOU 32 (Clifford Street) and SOU 254 (Cook Street). One penannular ditch was recorded at SOU 32 (Morton 1992, 171–9) and four at Cook Street (Garner 1993; 2001), as well as further afield at both Christchurch and Apple Down, and this is discussed further below.

Discussion: the Early Cemetery and its Place Within Southern England

by Nick Stoodley

The purpose of this section is to place the discoveries at the Stadium site in their wider context. This will involve comparing the early cemetery and its burial practices with contemporaneous sites, especially in Hampshire, but also in southern England. The significance of the early cemetery in terms of the dating, development and function(s) of Hamwic is considered further below in the final discussion (Chapter 6).

The Local Context: the Cemetery and Burial Practices

The cemetery was first encountered in 1975 at SOU 20 during work which recovered two weapon-burials (Holdsworth 1980, 38), and their proximity to the Stadium site discoveries leaves little doubt they once belonged to this burial ground. This suggests that the cemetery may have been of considerable size.

We know for certain that the cemetery was a mixed rite one: the excavation produced 18 urned cremation burials and 26 inhumation burials. The presence of both rites within the same cemetery should not elicit any surprise because dual ritual cemeteries are now a well-attested phenomenon in England, though it is often the case that inhumation was the preferred method of disposal (Table 9). However, it is notable that both Hampshire and West Sussex have produced examples where both rites were well established, the Stadium site apparently being another important addition to the list. It is more surprising that both rites were apparently being practised simultaneously at such a relatively late date. The dating of the inhumations hinges on the objects accompanying several burials, which are strongly suggestive of mid 7th to early 8th century dates of deposition. Particularly indicative are the two Series B sceattas, the gold garnet-cloisonné pendant, 'bulla' pendants, copper-alloy workbox, the scabbard studs, and the two shield-bosses that are of Härke and Dickinson type 7. Because of a lack of diagnostic objects (with the possible exception of the ivory bag ring), the cremation burials were dated by an entirely different method: charcoal from three burials was sent for radiocarbon dating, and provided dates centering on the 7th and 8th centuries (see Table 1). This is a finding which is of considerable importance because cremation is generally considered to be an early Saxon

Table 9 Proportions of inhumation and cremation burials in selected mixed rite cemeteries (UK)

County	*Cemetery*	*Inhumation v cremation (%)*	
Nottinghamshire	Cotgrave	100	0
Lincolnshire	Roxby	96	4
Cleveland	Norton	98	2
Northamptonshire	Wakerley I	99	1
Rutland	Empingham	99	1
Norfolk	Spong Hill	3	97
Suffolk	Westgarth Gardens	87	13
Warwickshire	Bidford	85	15
Oxfordshire	Berrinsfield	96	4
	Abingdon	56	44
Gloucestershire	Lechlade	88	13
Hampshire	Andover	45	55
	Worthy Park	73	27
Wiltshire	Pewsey	96	4
Kent	Orpington	75	25

method of disposal that gradually gave way to inhumation, and certainly by the later 7th century the country was believed to be inhuming. In fact, a lack of cremation is traditionally seen to be one of the determining characteristics of the 'final-phase' (Boddington 1990), a view which appears to be supported by the Hampshire evidence. The early cemetery of Portway East, Andover (Cook and Dacre 1985) saw both types of burial during the 6th century, and a similar state of affairs is observed in the late 5th and 6th century phases at Worthy Park (Hawkes and Grainger 2003) and Alton (Evison 1988). But the later sites of Winnall II (Meaney and Hawkes 1970), Ports Down I (Corney *et al.* 1969), Portway West (Stoodley, in prep.), and Snell's Corner (Knocker 1956) are inhumation only. However, the evidence from the Stadium site now demonstrates that this rather convenient chronological split is more apparent than real and should not be applied uncritically to mixed rite cemeteries which span the 6th and 7th centuries. It may now be necessary to reassess the evidence from cemeteries such as Worthy Park and Alton in which inhumation, at least, continued into the 7th century. High-precision radiocarbon dating of both cremation and inhumation burials in these and other cemeteries may require the suggested dating to be revised, in particular some of the cremations may be later than has previously been asserted. However, the possibility of 8th and 9th century dates raised by the radiocarbon determinations of some of the cremation burials at the Stadium site does not seem credible. At Apple Down, West Sussex, two cremation burials have been dated to the later 7th century on the basis of two miniature buckles and a garnet stud, and it is concluded that cremation and, in particular, un-urned deposition, continued as a burial rite in Sussex as late as the second half of the 7th century (Down and Welch 1990, 102, 106, 108, 110). Recent investigations at Weston Colley, near Micheldever, Hampshire revealed three cremation burials which might post-date a 7th century inhumation burial enclosed by a ring-ditch, though further work is needed to clarify this (pers. obs.). On the whole, however, there really is not sufficient evidence, except perhaps at Apple Down, to view cremation as a burial rite that continued through the 7th century outside of the Stadium site and which could be taken as a cultural trait linking the burial grounds in southern Hampshire.

There appears to be some attempt at zoning within the Stadium site cemetery with cremation predominating to the north. A similar, though again not an exclusive division can be observed at Portway East where the cremation burials are grouped in the western part of the cemetery. It seems that the different burial requirements of these communities necessitated this spatial separation, a separation that may also reflect chronological changes in the use of the cemeteries. For example, the Stadium site cemetery could have started with the cremation burials, followed by the inhumations, before the area was Christian, and continued for a short period after conversion and take-over by the West Saxons. Conversion may have come before Conquest, of course, though Bede suggests that the events would have coincided, presumably no later than Wight in 686, and perhaps at the same time as Meon and Sussex in the 670s or early 680s. The cemetery was not instantly abandoned, as some of the objects in the inhumation graves point to later dates, notably the two sceattas, even if newly minted.

However, any observations about the cemetery plan at the Stadium site are very tentative because of the large proportion of the site which remains unexcavated or had already been destroyed. Associated with the cremation burials was a pit full of pyre debris – another rare feature. Pyre *sites* have been recognised on the continent, for example at the cemetery of Liebenau, where a series of pyres each left a burnt circular area of between 3 and 4.5 m in diameter (Welch 1992, 67–9). Similar evidence, though only partially recovered, has been found in England at Sancton, Yorkshire (Timby 1993), while at Snape, Suffolk, a spread of burnt bones, fragmentary pottery vessels and burnt grave goods may reflect the

site of the pyre (Filmer-Sankey and Pestell 2001, 252–5). The use of pits for such debris is rare and may indicate that notions were held regarding cleanliness within the cemetery, perhaps even some formal policy of site management.

The cemetery had to some extent been affected by the development of the later, mid-Saxon settlement: over two-thirds of the graves had been disturbed by mid-Saxon pits as well as more recent features. This activity has partly obscured the original layout, and it is quite likely that a few graves were destroyed. For example, in at least one case a grave (4425) was encountered during the digging of a pit with the result that the skeletal remains were redeposited into that feature. At the Stadium site perhaps only a generation had passed before the settlement's encroachment on to the cemetery, and a similar situation occurred at other early cemeteries in Hamwic (eg, SOU 32; Morton 1992, 179), as well as at the Buttermarket, Ipswich. Here, encroachment was thought to have happened approximately 100 years later, in the early 9th century, after abandonment of the cemetery in the late 8th (Scull 2001, 67). However, subsequent radiocarbon dating has indicated that the Buttermarket cemetery was abandoned early in the 8th century, and settlement expansion over the cemetery took place in the first half or the middle of the 8th century (*ibid*., 74). This brings it closely in to line with the chronological sequence presented for the Stadium site. The reasons why this encroachment was allowed to happen in Hamwic, in living memory of the deceased being interred, may be bound up with changes to the political structure of this region in the later 7th century as well as changes in burial practise in the 8th century and is explored in further detail below.

It is clear that in the part of the cemetery available for study the graves were quite widely spaced. Indeed, the relatively low density of graves compares with the situation at the Buttermarket and is something that these sites share with contemporary rural cemeteries (Scull 2001, 71). This might suggest that the graves were originally marked by small barrows, a notion that is supported by the fact that there is no intercutting. However, no ring-ditches or penannular ditches were found around any of the graves, and it is considered extremely unlikely that all evidence of such features would have been destroyed. Elsewhere in Hamwic, penannular ditches have been found around one grave at SOU 32 (Clifford Street. Morton 1992, fig. 68) and three or four graves at SOU 254/SOU 823 (Cook Street. Garner 1993, fig. 2; Garner 2001, fig. 2), and their apparent absence at the Stadium site seems, therefore, to be genuine. One caveat might be that such features are often found on the peripheries of cemeteries, perhaps representing a late burial tradition in these cemeteries, and any examples at the Stadium site may, therefore, lie outside the excavated area. Two graves have evidence for a post of some description (below), but this does not seem to be the usual method of marking, unless of course this evidence has been lost.

Another interesting aspect of the cemetery plan is that it appears, at first sight, to demonstrate an apparently random arrangement of graves, an important feature which characterises early rural sites and which conflicts with the more regular arrangement observed in final-phase cemeteries. However, it is possible to discern two, perhaps three, north–south rows amongst the inhumation burials, which may extend to include some of the cremation burials. Analysis of burial plots within cemeteries elsewhere, where such plots can be identified, has suggested that they may belong to extended households or families, indicating the importance of kin-based relations in the early communities (Stoodley 1999b, 126–35). Could this social organisation still be important to the later 7th century group burying at the Stadium site?

Although the evidence was limited by very poor skeletal survival, it is possible that the Stadium site was the burial place of family groups, though there appear to be demographic variations between the inhumation and cremation cemetery populations (see discussion of the human remains, above). For example, there is a higher proportion of immature individuals identified among the cremation burials (33% as compared to 10%), and only one potential subadult was identified in the cremated assemblage (*c*. 5%) as compared to *c*. 26% in inhumation assemblage. The dearth of younger individuals, especially in the inhumation burials, might be a result of their concentration in a part of the cemetery that remains unexcavated. Zoning of immature individuals has been identified in several early Saxon cemeteries, for example the recently excavated burial ground at RAF Lakenheath, Suffolk, revealed such a concentration in close proximity to the well-known grave of a horse and his rider (Caruth and Anderson 1999, 244–50). A substantially higher proportion of males to females was represented amongst the inhumation assemblage, although no meaningful results could be obtained from the cremation burials. These figures relating to age and sex should be treated with caution, because of the relatively small numbers involved. However, it has been tentatively concluded above that

> '… (it) may be that the burials reflect two co-existing groups, one (practising cremation) comprising more active "family groups", the other (practising inhumation) representing slightly older families and more lone males'.

The cremation burials are not particularly informative, a result of the destructive nature of this rite. However, in general terms the evidence is compatible with other Hampshire sites: the lack of multiple individuals, animal remains within a deposit, and the scarcity of grave goods. In contrast, considerably more can be said about the inhumations and in many respects the practices are typical of what one would expect for the 5th–7th centuries. For example, the shape of the grave in most cases was rectangular or sub-rectangular, and all graves were of an adequate size to accommodate their occupants. Where the position of the individual could be discerned it was found that all were extended and supine, though some had their legs slightly flexed to one side.

Structural features within the graves were relatively uncommon: a burnt plank had been deposited in one grave (5428), while three interments (5129, 4037, and F288) had evidence probably pertaining to coffined burial, as deduced from dark stains around the grave edge. Grave structures such as the coffin cross-supports at SOU 32 (Morton 1992, fig. 70, grave 418) and SOU 254 (Garner 1993, fig. 6, grave 2423) may also differentiate these cemeteries from the Stadium site where none has been recognised. Two graves were furnished with an external structure: 5352 with two slots at the head end and 4002 also with a small slot at the head end; in all probability these supported a marker post of some description. In fact, the external marking of a grave position increased during the 7th and 8th centuries and became quite a regular feature of the mortuary landscape, as demonstrated at Hamwic (Morton 1992, 177 and 193, for examples of possible markers and superstructures) and by several Kentish cemeteries, for example Polhill (Philp 1973) and Broadstairs St Peters (Hogarth 1974). However, the relative low frequency of both internal and external grave elaboration compares well with other contemporary sites in Hampshire, the exception being Winnall II where 12 (26%) graves had evidence of wood or charcoal and 13 (28%) had stones placed in the graves. This also contrasts with the situation at the Buttermarket, Ipswich where the majority of graves contained timber structures (Scull 2001, 67). However, a feature that both the Stadium site and the Buttermarket have in common is the prevalence of westerly orientated graves (n=21 west at the Stadium site), followed by a smaller number of graves that shared a north–south alignment (n=5 at the Stadium site). A variety of different alignments is a feature more usually encountered in early Anglo-Saxon burial practice, such as Alton, and contrasts with the traditional image of standardised west–east orientation usually encountered in final-phase cemeteries, such as Winnall II and Chamberlains Barn (Leighton Buzzard II; Hyslop 1963).

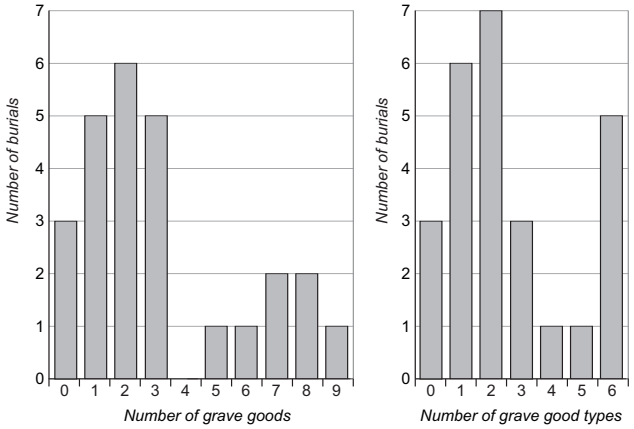

Figure 33 The number and range of grave goods in inhumation graves from the early cemetery at the Stadium

All the graves contained single burials apart from 3520, which was a contemporaneous double burial of two unsexed adults with weapons. Research into the multiple burial rite has demonstrated that this combination was one of the rarest: only 3% (n=5/165) of contemporary double burials involved two individuals accompanied by weapons (Stoodley 2002). Similar contemporary multiple burials involving individuals, both of whom were accompanied by weapons, can be cited from Dover Buckland (grave 96; Evison 1987) and Charlton Plantation (burials 59 and 60; Davies 1985). Given the rarity of this rite, it may be significant that this grave 3520 was sited in the southern part of the site, and is also one of the rarer north–south aligned graves. This may perhaps indicate that the manner in which these two individuals died was such that it required a special rite. Though regarding its spatial position, caution is advocated because a large area to the north and west of the grave remains unexplored.

An important difference which the Stadium site demonstrates to contemporary cemeteries both within the county and further afield is the very high proportion of burials that were accompanied by grave goods (88%: n=21; Fig. 33). This can be contrasted with the Buttermarket where only 42% (n=32) were accompanied by artefacts. The majority of burials, however, had only one or two objects, mainly knives and buckles, though a select few went to their final resting place with four or more different types. This pattern is comparable to the situation evidenced in contemporary cemeteries in the region (Fig. 34). The average number of different types for the Stadium site cemetery is three, which is only slightly higher than that recorded for the other contemporary cemeteries in the area: Winnall II: 2.3 (n=26), Snell's Corner: 2.4 (n=25), and Bargates, Christchurch: 2 (n=23).

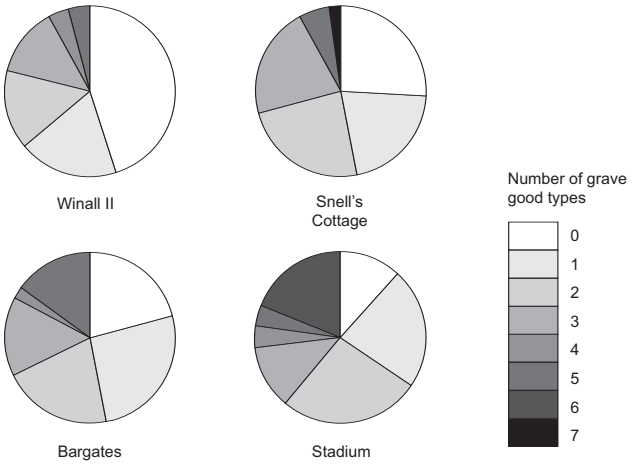

Figure 34 The range of grave goods in terms of occurrence in graves expressed as a percentage of the cemetery populations of contemporary cemeteries in the region

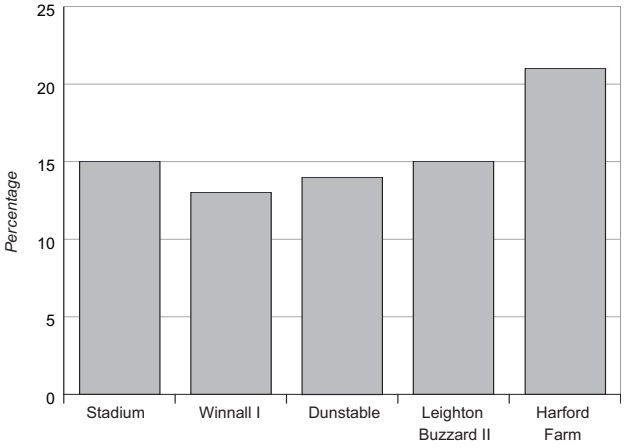

Figure 35 The proportion of burials with jewellery in selected contemporary English cemeteries

The relatively high proportion of individuals that were accompanied by weapons is highly significant (42%: n=10). As a percentage of the adult sample this is a comparable figure to that achieved by the male populations in the early Saxon cemeteries in Hampshire, for example the figures for Andover, Worthy Park and Alton are 60%, 56%, and 40% respectively. Although it was only possible to identify the sex of four of these weapon burials it is notable that two (5129 and 5488) were identified as possibly female (the other two were possibly male). The association of females and weapons is a very rare one indeed (Stoodley 1999b, 76), and of course the sex determinations for this pair are not definite, but there is some evidence that gender structures were becoming more flexible towards the end of the early period (*ibid*., 35). Grave 5129 is intriguing and certainly worthy of further comment because it belonged to a female of between 16 and 20 years who had been interred in a coffin on top of which a seax had been placed. This is the only example known to the author where a weapon had been placed on the top of a container and as such it raises some interesting questions about the gender identity of this individual. Placed as it was on top of the container, and not in direct association with the body, it appears to be making an indirect statement regarding a masculine aspect of this person's social persona.

All the weapon burials were of adults, a finding which is also compatible with the changes occurring to burial practice in the 7th century: tighter age-related constraints were now being applied with sub-adults becoming increasingly less likely to get such a burial (Stoodley 2000, 456–72).

In contrast to the weapon burials, there were only four burials accompanied by objects normally associated with females, but proportionally this is a very similar figure to that recorded in other contemporary cemeteries (Fig. 35). Three of these are adults, but only two were sexed: a female and a possible female. Two of the individuals were provided with wealthy necklaces: 4202 with a necklace consisting of a crescentic gold pendant, four silver and possibly two copper-alloy 'bulla' pendants, and four glass beads; and 5508 with a gold disc pendant decorated in filigree and garnets, a silver intaglio ring, and two glass beads. These wealthy necklets are typical of the fashions that became current during the late 7th and early 8th century (grave 4202 also produced two late 7th century sceattas). The workbox with 4037 and chatelaine with 5510 are also typical of female-related objects at this time. Overall, the character of the assemblages is not out of step with the higher-status female burials found at this time, although there are no silver wire rings as at Brook Street, Winchester, and no single cabochon garnet pendants. However, it is the weapon burials that are unusual in their wealth and which draw attention to this community.

The Regional Context: Southampton's Place in Central Southern England

The discovery of gold artefacts in two graves has understandably led to speculation about the status of the occupants buried at the Stadium site, and whether they pointed to the existence of high-status, or even royal, individuals who were directly responsible for the establishment of Hamwic (Smith 2000, 7). Although the garnet-inlaid pendant is certainly unusual in its wealth for Hampshire, it is not particularly outstanding when compared to the rest of the country. For example, gold filigree pendants are occasionally found elsewhere: two recently published sites at Harford Farm, Norfolk (Penn 2000) and Lechlade, Gloucestershire (Boyle *et al.* 1998) have

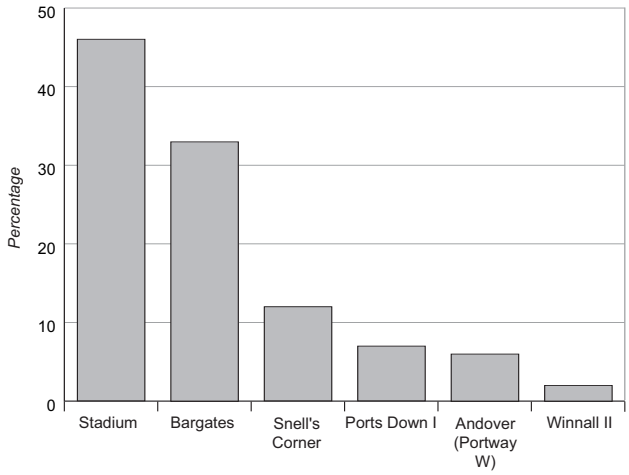

Figure 36 The proportion of burials with weapons in contemporaneous Hampshire cemeteries

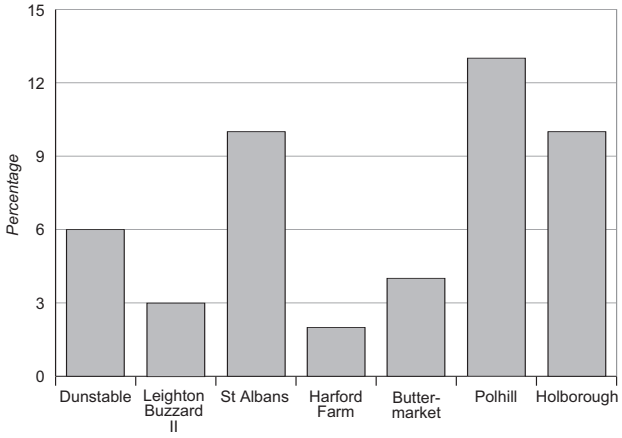

Figure 37 The proportion of burials with weapons in selected contemporaneous English cemeteries

both produced examples. These are rural sites, not known to be associated with any special type of settlement, and it can be argued that this type of jewellery was worn by the leading women in each community and would have replaced the paired gilt brooches and long necklaces that their predecessors wore in the 6th century. It is debatable whether this type of jewellery can be viewed as an indicator of a high-status settlement that buried its dead at the Stadium site in the later 7th and early 8th century. Recent work (by the writer) at Weston Colley near Micheldever in Hampshire has uncovered a 7th century female grave that may originally have housed a small chamber. She had the remains of a necklet, a purse collection at the waist and evidence for a possible box at the feet. The grave was surrounded by a ring-ditch, another sign of high social status, and further evidence to show that female status was signalled through investment in the grave structure in addition to portable wealth. Indeed, the former seems to have been more important, with the implication that the two females at the Stadium site with the necklaces need not have had wealthy assemblages to rank them alongside the males. More interesting is the crescentic pendant that has a direct parallel from the Dutch 'royal' terp at Wijnaldum, and may have been manufactured somewhere between 550 and 650 (see above).

Another characteristic of the Stadium site cemetery which underlines the special character of this group, and which really sets it apart from other contemporary burial grounds in Hampshire, is the weapon burials. To begin with the proportion of individuals interred with weapons (46%: n=10) is very high for Hampshire (Fig. 36). The only cemetery that can compare is that of Bargates, Christchurch (Jarvis 1983; 33%: n=9/27), which although strictly speaking now lies in Dorset is very close to the county boundary. However, this is not an entirely accurate comparison because Bargates dates from the late 6th century (though it had no very clear end-date) and this may go some-way to explaining the relatively high proportion of weapon burials. It is notable that this cemetery is sited in a very similar position to the Stadium site: on a low ridge of alluvial sand and gravel between the confluence of the rivers Avon and Stour. Furthermore, if the weapon burials at the

Table 10 Weapon burials and multiple weapon burials in selected (broadly) contemporary Hampshire cemeteries

	Spear	*Shield*	*Shield, spear*	*Seax*	*Seax, spear*	*Seax, shield, 2 spears*	*Sword, seax, shield, 2 spears*
Stadium	5	-	-	3	2	1	1
Bargates	2	2	3	-	-	-	-
Snell's corner	1	1	-	-	-	-	-
Ports Down I	-	1	-	1	-	-	-
Andover, Portway West	1	-	-	-	-	-	-
Winnall II	-	-	-	?1	-	-	-

Table 11 Composition of weapon assemblages in two East Kent cemeteries

Burial no.	*Spear*	*Shield*	*Sword*	*Seax*
		Dover Buckland		
56	●	●	●	●
93	●	●	●	●
27	●	●	●	
71	●	●	●	
131	●	●	●	
		Sarre		
207	●	●		●
64	●	●	●	
156	●	●	●	
190	●	●	●	
211	●●	●	●	

Stadium site are examined in more detail, it is discovered that the character of several of the assemblages marks this cemetery out as unusual (Table 10). In particular, the site has produced two burials that have complex weapon assemblages: 5352 with a pair of spears, a seax, and a shield and 5537 accompanied by a sword, seax, two spears, and a shield. The latter is a very rare combination indeed, and the author is not aware of any similarly equipped burials. Overall, this is the only late 7th and early 8th century cemetery in Hampshire that can boast weapon assemblages that consist of three or more different types.

However, this is not a finding that is restricted to comparisons just within Hampshire – elsewhere in England a similar situation is found. A representative sample of contemporary cemeteries from England has been consulted (Fig. 37), and it is notable that the site with the highest proportion of weapon burials at this time (Polhill in west Kent) falls considerably short of the total recorded at the Stadium site. In addition, in the majority of these cemeteries the assemblages are relatively modest in character: in almost all the sites only two different types are at the most combined. An isolated example is found at the Buttermarket grave 1306, which had amongst other objects a broad seax, shield, and two spears. But the only *area* in the country that has produced comparable figures to the Stadium both with regard to the number of weapon burials and the nature of their assemblages is East Kent (Table 11). This can be illustrated by focussing on the 7th century burials from two long-lasting cemeteries: Dover Buckland where 28% (n=21/74) of the latest burials were accompanied by weapons and Sarre (Brent 1863; 1866; 1868), which records an even higher proportion at 42% (n=14/33). The individuals interred in graves 56 and 93 at the large cemetery of Dover Buckland were given weapon assemblages very similar to grave 5537 at the Stadium site.

It is true that roughly comparable weapon burials have been found in Wessex, but they are confined to the class of isolated barrow burials mainly located in Wiltshire. For example, at Ford near Salisbury, a male was interred in a large grave with a hanging-bowl and possible wooden vessel, a pair of spearheads, a shield, and a seax, in addition to a comb and bronze buckle (Musty 1969). Furnished as they are by rare objects and complex weapon assemblages these individuals are usually interpreted as belonging to the elite, who by choosing such burial places were distancing themselves from the rest of society (Stoodley 1999a). The position of these monuments, the use of an earth barrow and the type of symbolism that they have (weapons and vessels) makes the drawing of parallels between them and the flat-grave community cemeteries difficult. Yet if this symbolism can be equated with an elite, which on the basis of the weapons seems only reasonable (Härke 1990), then a concentration of such burials at the Stadium site may indicate that the settlement served by this cemetery was home to a group of high-status individuals. Apart from the barrow burial at Oliver's Battery near Winchester (Andrews 1932), the 'buckle grave' at Alton (Evison 1988, 43–5), and a late 7th century weapon burial accompanied by a sword, spear, shield-boss (of Dickinson and Härke group 7), and a possible vessel at Meonstoke (Stoodley and Stedman 2001), the Stadium is the only site in Hampshire which can claim to have produced evidence which reflects the increasing social stratification witnessed throughout the country at this time. This is an assertion that may find support in the analysis of stature which has revealed above-average heights compared to the cemetery population at Portway, Andover and could possibly suggest a lack of nutritional stress in the two individuals for whom stature was calculated (see above).

4. The Mid-Saxon Settlement (8th–9th Century)

The vast majority of archaeological features recorded on the site relate to the 8th–9th century mid-Saxon settlement of Hamwic. These comprised five gravel surfaces, over 640 structural features (post-holes, stake-holes, beamslots, wall trenches, etc), more than 440 pits, 16 possible wells, eight graves, six hearths, and a large number of shallow, irregular features of uncertain origin. A single ditch recorded in one of the footings for the railway footbridge in the north-west corner of the site is also included in this group.

Large areas of the site were heavily disturbed by modern intrusions (see Fig. 6), most related to the buildings and structures associated with the former Gasworks (Figs 38 and 39). Furthermore, seepage from various of the gasworks structures had contaminated some otherwise undisturbed areas, usually with diesel, making the identification and excavation of features both difficult and unpleasant. Several late 18th or early 19th century brickearth 'quarries', usually shallow linear trenches cut into the surface of the brickearth, were recorded in the south-west of the site. As these were dug to obtain clean brickearth they generally avoided earlier archaeological features. However, sample excavation of these 'quarries' was undertaken to ensure that they did not obscure more ephemeral Saxon features, which may not have been recognised during the quarrying activity.

Dating the Settlement

It is suggested elsewhere (Morton 1992, 28 and 71; Andrews 1997, 13) that relatively intense occupation of Hamwic spanned a period of approximately 150 years. Occupation is thought to have begun around AD 700, expanded in the mid-8th century, and continued – in a gradually reduced state – until towards the end of the 9th century. After this, there is evidence for dispersed late Saxon settlement continuing in various parts of the former town. Even allowing for the slightly longer time-span suggested by the early cemetery at the Stadium site, the relatively short lifespan of Hamwic means that the chronological development is often not apparent, and this is also the case for the Stadium site. Radiocarbon dating is of little assistance, no timbers suitable for dendrochronological dating were recovered, and as all hearths and burnt surfaces identified were slumped into earlier pits, none was suitable for TRM dating.

The means of dating the occupation of the Stadium site, therefore, rests entirely with the finds. Objects which might be more closely datable within the mid-Saxon period were recovered from only a very small number of features, and in some cases are likely to have been residual. In a few cases, coin evidence enabled individual features to be more closely dated. For example, a penny (item 211) dated

Figure 38 View of the West Stand excavation area, looking north-west, showing modern footings

to the early 9th century was recovered from the secondary fills of pit 7163 in the North Stand, and another penny (item 358), dated to the late 8th century, was found in the slumped occupation debris in the top of pit 4470 in the West Stand. It is the pottery, however, that has provided the main, albeit broad, dating evidence for the vast majority of features.

In the context of Hamwic as it is thought to be dated (Timby 1988, 111ff) three ceramic phases (CP) have been distinguished. Early assemblages (CP1) are assigned to the end of the 7th century or the beginning of the 8th century to probably before the latter part of the 8th century. Late assemblages (CP3) are assigned to a period perhaps starting in the early 9th century and continuing through most of or all of the 9th century. A middle period (CP2) covers the intervening period which broadly spans the mid-8th to the early mid-9th century.

At the Stadium site a sample of pottery comprising the whole assemblages from 12 features (all pits or wells) was subject to detailed analysis by context (Fig. 40). Only two features, pit 2001 and well 10161, both of which were in the south of the site, produced pottery of ceramic phase 1, in both cases only from the early fills. Four features, pits 5037, 5157, 7269, and 7616, all in the north of the site, produced only pottery of ceramic phase 3. Five of the other features produced pottery of ceramic phases 2 and 3.

Overall, the vast majority of features containing dating evidence, principally pits and wells, produced pottery assemblages that could not be attributed to either the early (CP1) or the later (CP3) period. These features have, therefore, been assigned to the mid-mid-Saxon period (CP2). While some phasing within this period was possible on stratigraphic grounds, mainly in the form of intercutting features, such phasing is necessarily relative, as any sequence identified is unlikely to represent the entire life of the settlement.

The Limits of Hamwic

The extent of Hamwic has been the subject of investigation over a period of many years and Morton (1992, 29–30) discusses the evidence prior to the Stadium excavation. The Stadium site was assumed to lie close to the north-eastern limit of the settlement, close to or possibly straddling the boundary between the settlement and the marshes known to lie to the north. This uncertainty has at last been dispelled by the excavation at the Stadium site. However, even the most northerly excavation area within the site, approximately 100 m beyond the Stadium footprint itself, recovered evidence of occupation, in the form of two intercutting pits (8011 and 8012). It is clear, therefore, that the northern limit of the settlement is

Figure 39 View of machine clearance in progress in the South Stand area, looking north-west

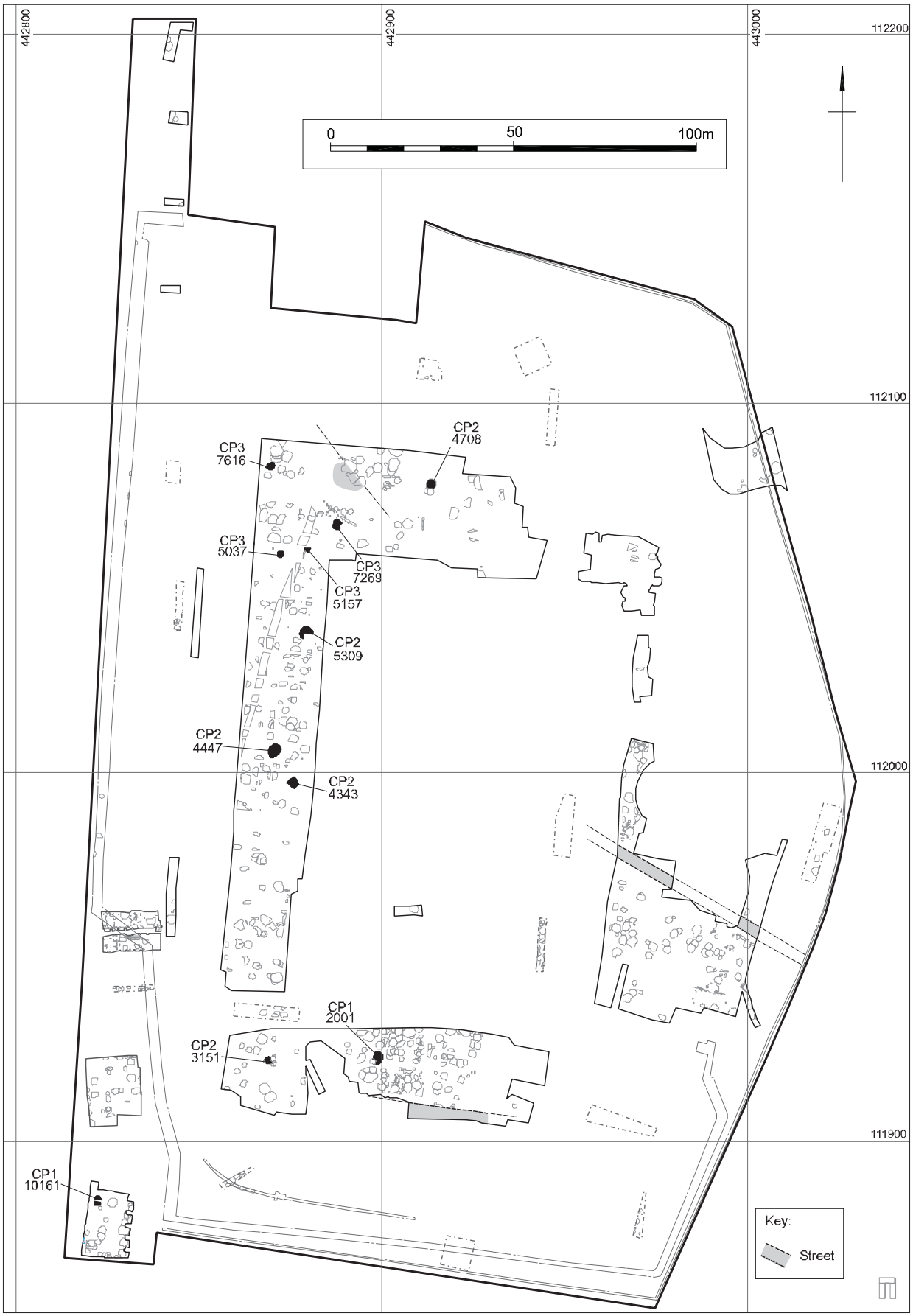

Figure 40 Location of pits selected for detailed ceramic analysis, indicating pits belonging to ceramic phase (CP) 1, 2, or 3

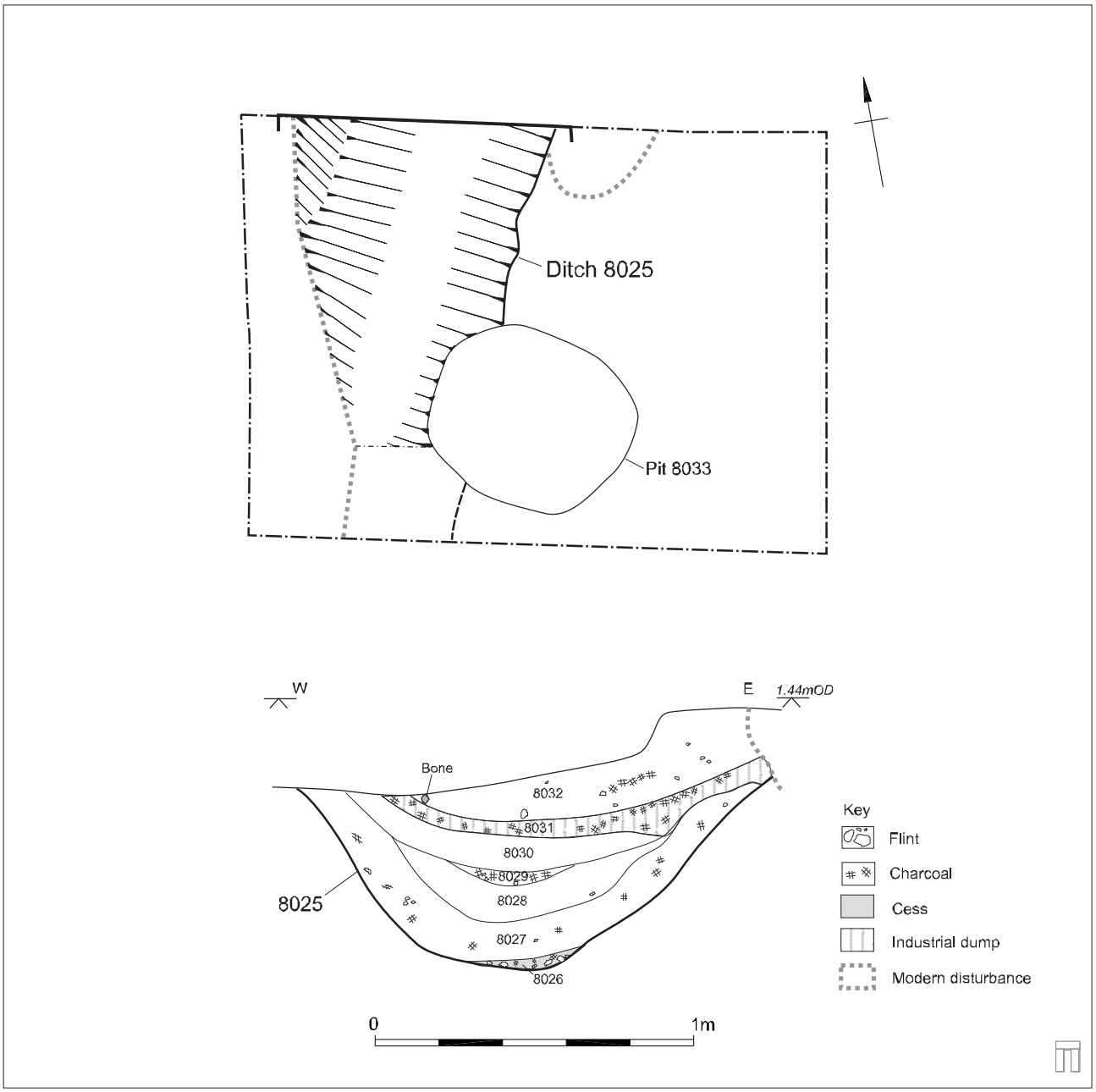

Figure 41 Plan and section of possible boundary ditch 8025

beyond the Stadium site, although negative evidence from various other investigations (see Fig. 2) suggests that this may not be far beyond, and almost certainly less than 100m. The limits of Hamwic as currently understood are indicated on Figure 77.

The only clear boundary-type feature lay towards the north-western corner of the site, in one of the footings for the railway footbridge. Here, aligned approximately north–south was a short length (*c.* 3 m) of ditch (8025), 1.45 m wide and 0.80 m deep with moderately sloping sides and a concave base (Fig. 41). The majority of fills appear to represent episodes of natural silting, but two small, localised cess deposits and a small dump of possible ironworking debris were also recorded. The only datable finds recovered from ditch 8025 comprised a few pieces of abraded Romano-British tile along with a small assemblage of animal bone, oyster shell, iron slag, and daub. The ditch cut a much truncated feature (8060, not illustrated), possibly a pit, which was undated, and was itself cut by mid-Saxon pit 8033. Ditch 8025 may have been a Romano-British field boundary, but it has been tentatively dated to the mid-Saxon period on the basis that the finds recovered are similar to assemblages recovered from other mid-Saxon features in this area of the site.

Sections of a large, early, settlement boundary ditch have been excavated on SOU 169 at Six Dials

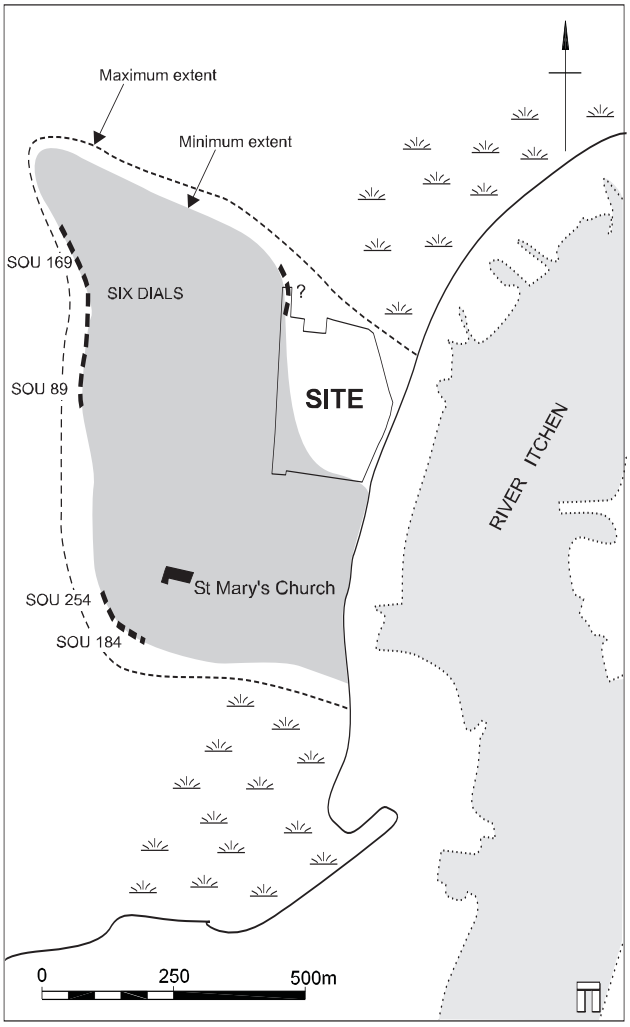

Figure 42 Location of ditch 8025. Also shown is the conjectured course of the western boundary ditch of the early mid-Saxon town, recorded in several earlier excavations

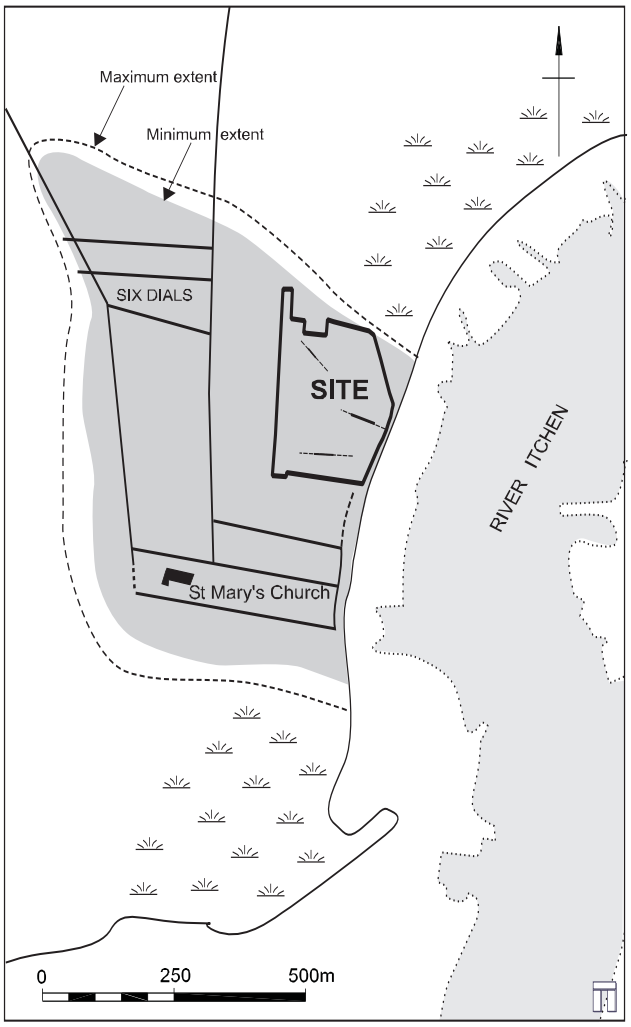

Figure 43 The gravel street and possible alleys or yards on the Stadium site shown in relation to the mid-Saxon street plan as conjectured by Morton (1992, fig 10d)

(Andrews 1997, 21–30) and its probable continuation to the south was recorded at SOU 89 (Morton 1992, MF2: A3–7). Possibly part of the same ditch, or another boundary feature, was recorded yet further to the south on SOU 184 and SOU 254/SOU 823 (the Deanery and Cook Street sites. Garner 1993, 82–4; 2001; Fig. 42). The form and dimensions of ditch 8025 are very similar to the boundary ditch excavated at SOU 254, but it is uncertain if ditch 8025 represented a boundary to the settlement rather than, for example, an internal boundary ditch as very little excavation was undertaken in the immediate vicinity. If it was a boundary, then it is possible that ditch 8025 marked the north-eastern limit of the early settlement of Hamwic (Fig. 42), prior to subsequent expansion in the middle of the 8th century which extended across the earlier, and by now abandoned cemetery. Alternatively, there may have been no physical boundary to the settlement to the north-east, with occupation petering out towards the southern edge of the marsh.

Streets and Alleys

Only one feature interpreted as a street was found at the Stadium site (Figs 43–5). This lay in the East Stand and was aligned approximately east-south-east to west-north-west, an orientation mirrored by the buildings in this area. It was approximately 3.50 m wide and 0.15 m thick, and comprised a single layer of firmly compacted, moderately sorted gravel (Fig. 44). There was no sign of rutting and no obvious repairs/resurfacing, perhaps suggesting that it was not a long-lived feature. A possible trample deposit, datable to the mid-mid-Saxon period, was partly sealed below the gravel surface. This trample deposit was bounded on the southern side by a post- and

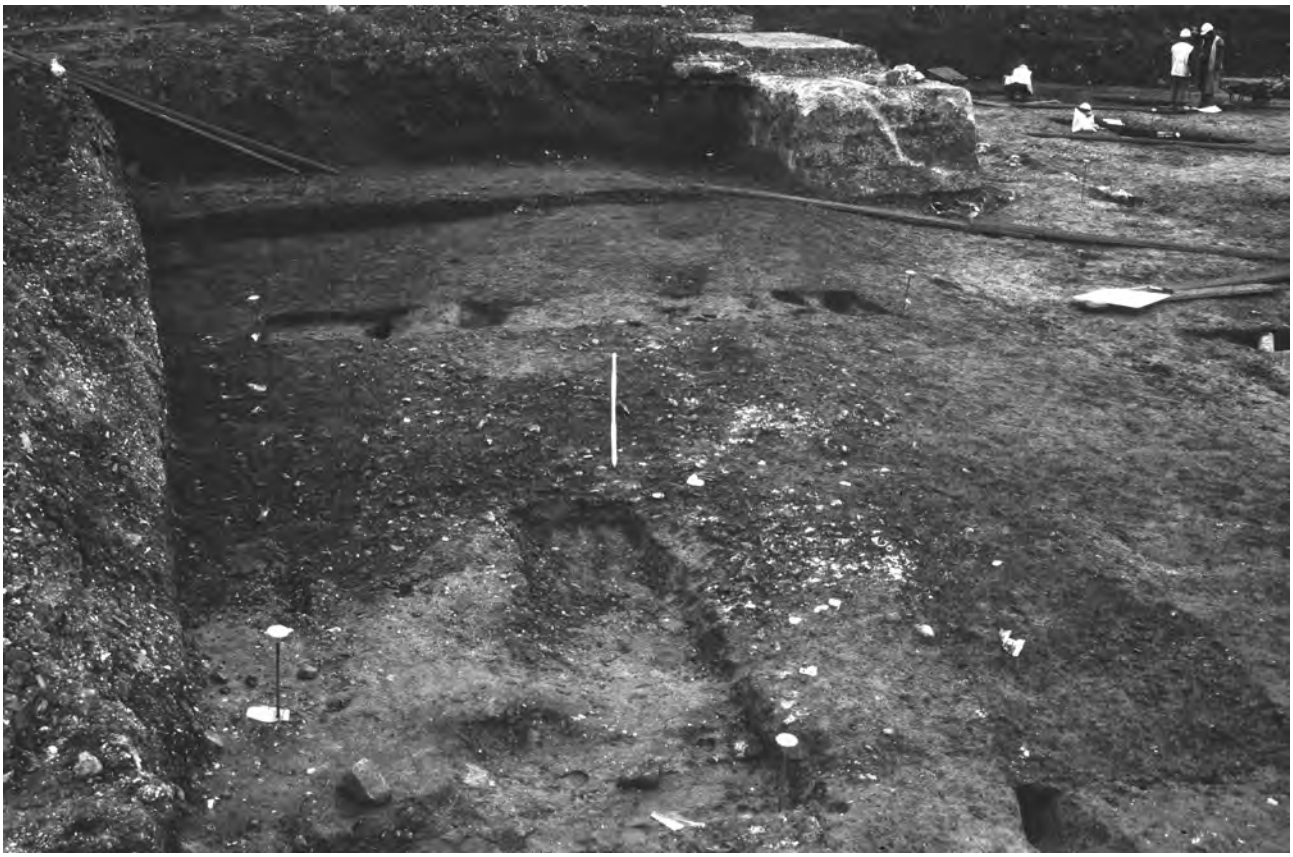

Figure 44 View of the gravel street in the East Stand area, looking south-east (2 m scale)

stake-built fence line, which suggests that a fence delineated the line of the street before the gravel surface was laid. Other examples of (initially) unmetalled streets have been recorded nearby at Melbourne Street (SOUs 4/5/6. Morton 1992, 79–80) and Six Dials (Andrews 1997, 34 and 36). There were no pits beneath the gravel or trample surface, and it has been noted that, in general, the streets are the only areas of Hamwic devoid of pits (Morton 1992, 34; Andrews 1997, 31). The gravel surface, though not the underlying trample deposit, gradually thinned to the west, petering out almost completely close to the western limit of excavation in the East Stand, where it was partly overlain by a possible hearth and associated deposits. No trace of this street, or a strip devoid of pits where it may have run, was located in the West Stand, indicating that it did not continue this far.

Two other possible street surfaces were found in the South and North Stands respectively, although not well preserved and of uncertain extent. The gravel surface in the southern part of the South Stand was partly delineated on its northern side by a row of post-holes which indicated an approximately east–west alignment; the southern edge lay beyond the limit of excavation. This surface overlay four pits and it is, therefore, unlikely that it represents a street, and an alley or yard surface is a more likely interpretation. The well-defined northern edge of this suggests that it marked a property boundary, in this case associated with a building represented by a group of beamslots and post-holes (structure 5, below).

In the North Stand a *c.* 7 m length of a gravelled surface was found, the north-east edge slumped into the top of a group of pits (pits 7583, 7808 and 7807). This surface was aligned roughly parallel to a building to the south-west, represented by beamslots and post-holes (structure 8, below). Again it is debatable whether this surface represents part of a street, and an alley or yard surface is considered more likely.

The most obvious, and arguably the most significant, boundary in this area of Hamwic is the River Itchen. Assuming that the strand or shore road (Morton 1992, SOUs 10 and 13: street 10; Fig. 43) continued to follow the western bank of the Itchen northwards, then the three surfaces or alleys identified at the Stadium site may all have been set out roughly perpendicular to it. Furthermore, it is possible that the street in the East Stand was linked to it, just beyond the site boundary.

The location of the early cemetery may also have affected the layout of streets and alleys in this area, certainly in the early period. It is clear that the one metalled surface interpreted as a street did not, as far as could be ascertained, extend as far as the cemetery, and certainly did not extend beyond it.

Figure 45 All pits producing more than 0.5 kg of iron slag, perhaps indicating the location of a smithy in the South Stand area

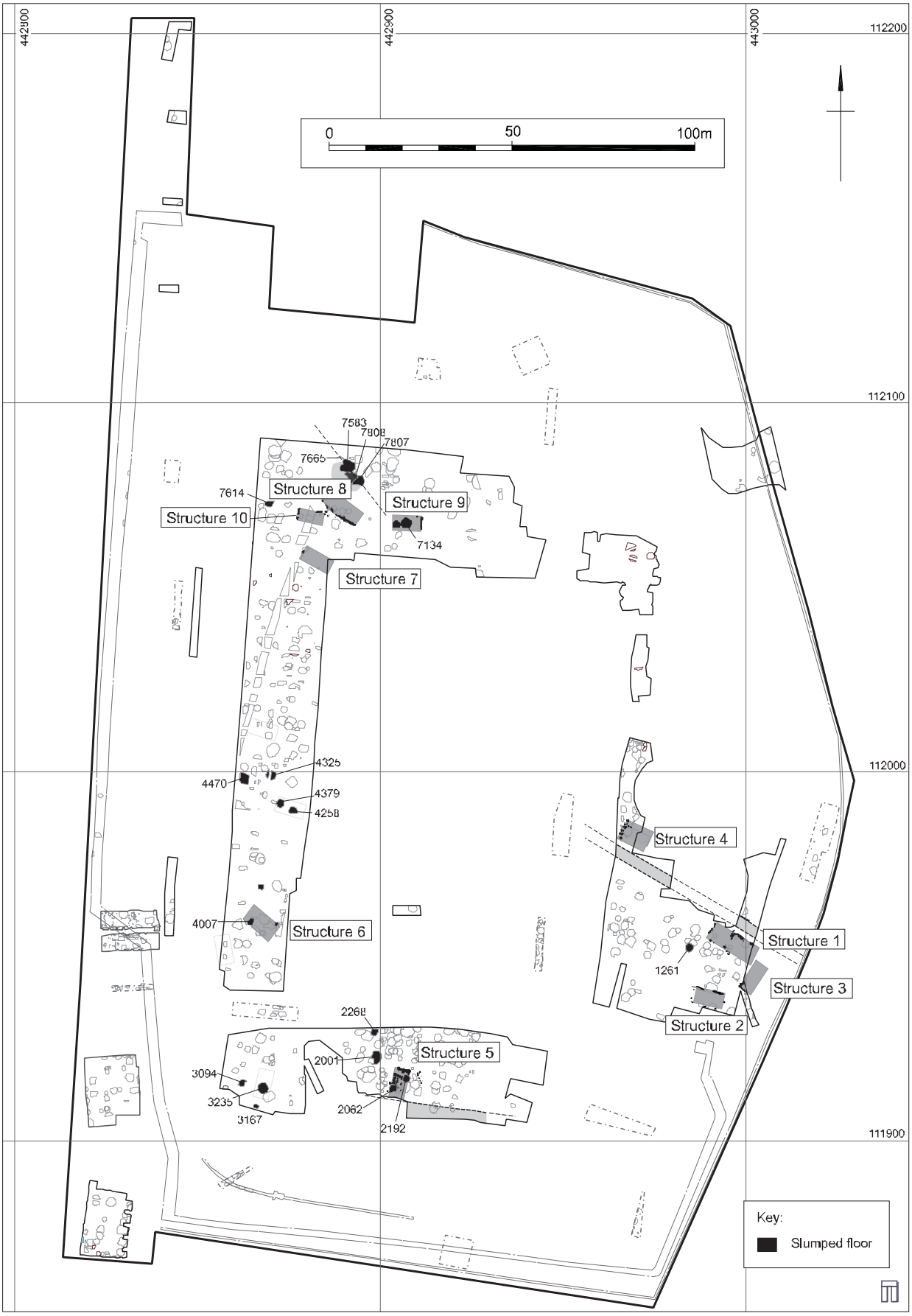

Figure 46 The location of Structures 1–10 and of contexts identified as floors preserved by their having slumped into pits

Properties and Boundaries

Very few clearly discernible fence lines, pit alignments or gravel surfaces which have been found delineating property boundaries elsewhere in Hamwic (Morton 1992; Andrews 1997), were recognised at the Stadium site. The approximately north–south aligned ditch (8025), close to the northern limit of the site and three gravelled surfaces, one interpreted as a street, have been discussed above. The most obvious pit alignment was the group of pits along the eastern limit of excavation in the sub-station area (SOU 1002), in the south-west corner of the site. In addition, several putative lines may be discerned within the relatively dense cluster of pits in the South Stand, and perhaps elsewhere, though these generally comprise only three or four pits.

Finds distributions can give some inkling of the size and extent of individual properties. For example, pits which produced in excess of 0.5 kg of iron slag appeared to form a large group in the South Stand (Fig. 45). This could perhaps be seen as indicating the location of a blacksmith's property, which would have been approximately 20–25 m wide and over 20 m long, fronting onto the southernmost metalled area, and perhaps associated with Structure 5 (see below). A more dispersed concentration of ironworking debris is also apparent in the north-west of the excavation area, although the property that this may represent is unclear.

Buildings

A total of 645 structural features comprising post-holes, stake-holes, and wall-trenches or beamslots were recognised during the excavation. Although many of these clearly represent the remains of buildings, later disturbances and the rebuilding or repairing of some of the structures mean that the full ground plan of most cannot be discerned. In a few cases, probable internal floor surfaces, which had slumped into the upper parts of earlier pits, indicate the location of former buildings, of which very few or no structural elements survived. Previous excavations in Hamwic have identified numerous buildings and ancillary structures, their construction usually involving post-holes, wall-trenches or a combination of the two methods. However, many of the buildings were represented by one or two wall lines only, with evidence for the other sides unclear or absent (Morton 1992, 41; Andrews 1997, 50). In a few cases, where the evidence was exceptionally well preserved, internal floor surfaces have been clearly defined, but corresponding negative structural features were not present, suggesting the use of sleeper beams resting on the ground surface (Andrews 1997, 49).

It was assumed that the majority of the buildings at the Stadium site would be approximately rectangular in plan, as has been the case for most of the buildings found within Hamwic (Morton 1992, 40–2), although the various elements rarely display any degree of regularity (Andrews 1997, 49–50). Consequently, in areas containing dense groups of post-holes and stake-holes, these were grouped in terms of dimensions in plan, depth and general morphology in an attempt to discern coherent structures. Only ten buildings or partial buildings were tentatively identified, all of which, where sufficient evidence survived, appeared to have been approximately rectangular in plan (Fig. 46). In the case of some of the buildings, other arrangements of structural features are possible, but the most likely layouts are presented in the drawings below.

It is probable that the majority of walls between the vertical posts of the buildings were infilled with wattle and daub. A relatively large quantity (5205 fragments weighing 10,542 g) of structural daub, identified by the presence of surfaces and/or wattle impressions, was recovered and is a common find on most excavations in Hamwic.

Three pits (336, 4007, and 10186; not illustrated) were surrounded by stake-holes which may represent structures, possibly wattle fences or small shed-like structures, or some form of superstructure. All three of these pits have been interpreted as cess pits or latrines, on the basis of their primary fills and regular form. Numerous stake-holes recorded elsewhere on the site, but with no patterns discernible in plan, probably represent similar, temporary structures and fence lines.

Structure 1

Several short lengths of wall-trench/beamslots and a large number of post-holes and possible stake-holes have been assigned to this structure in the south-east of the East Stand (Fig. 47). Intercutting between various features suggest that they probably represent a series of two or more structures superimposed, or a single structure which has been repaired, extended and/or possibly rebuilt. These appear to have been roughly rectangular structures, which fronted onto the gravelled street immediately to the north-east.

Because of the irregularities in the ground plan and later disturbances, the dimensions of the structure/s could not be clearly defined, but it could have been at least 12 m long and 5 m wide. It is also uncertain if the beamslots and post-holes towards the centre of the structure represent some form of internal division or the north-west end of one of the putative buildings. A small assemblage of mid-Saxon pottery was recovered from the fills of some of the

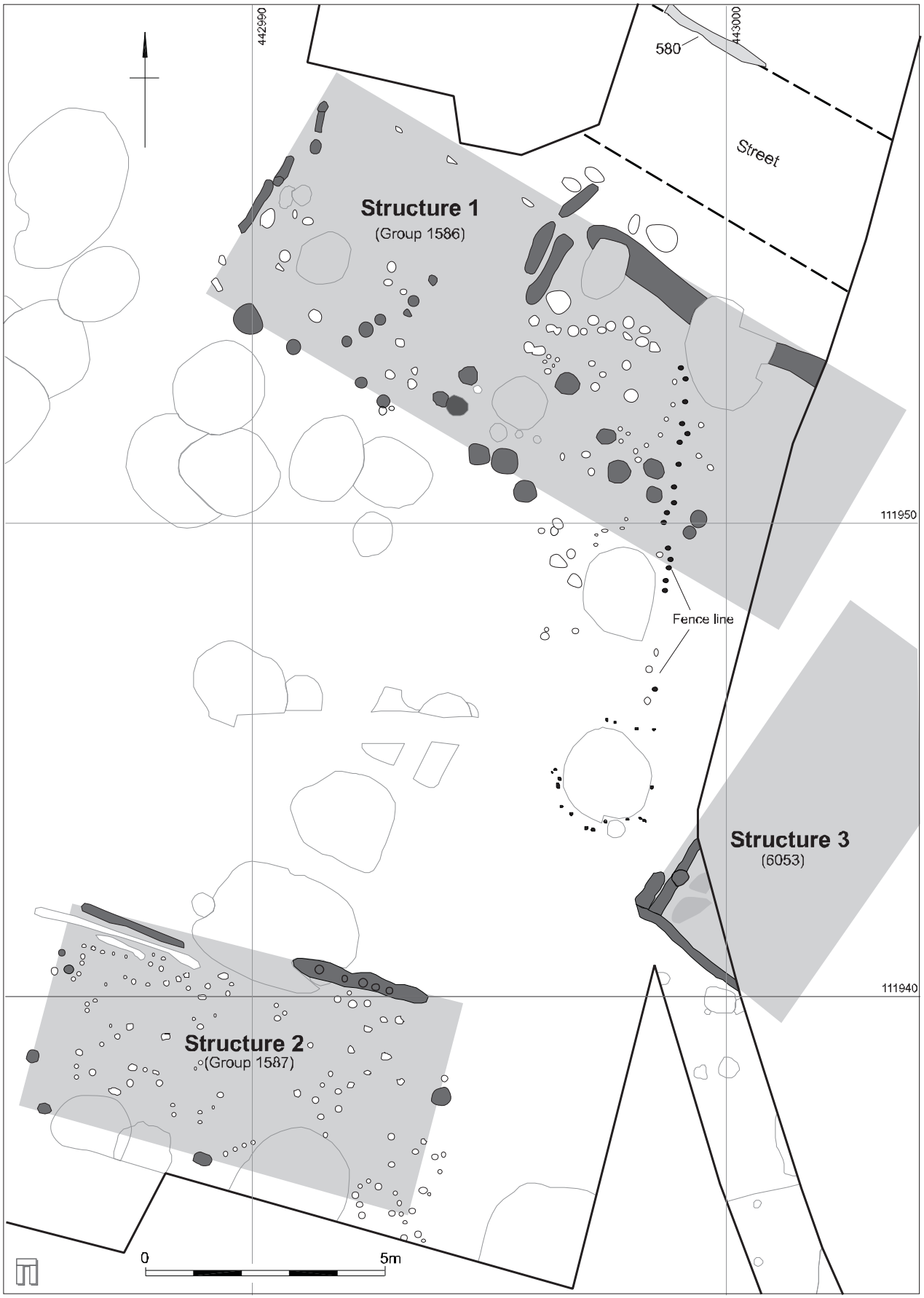

Figure 47 Plan of Structures 1–3

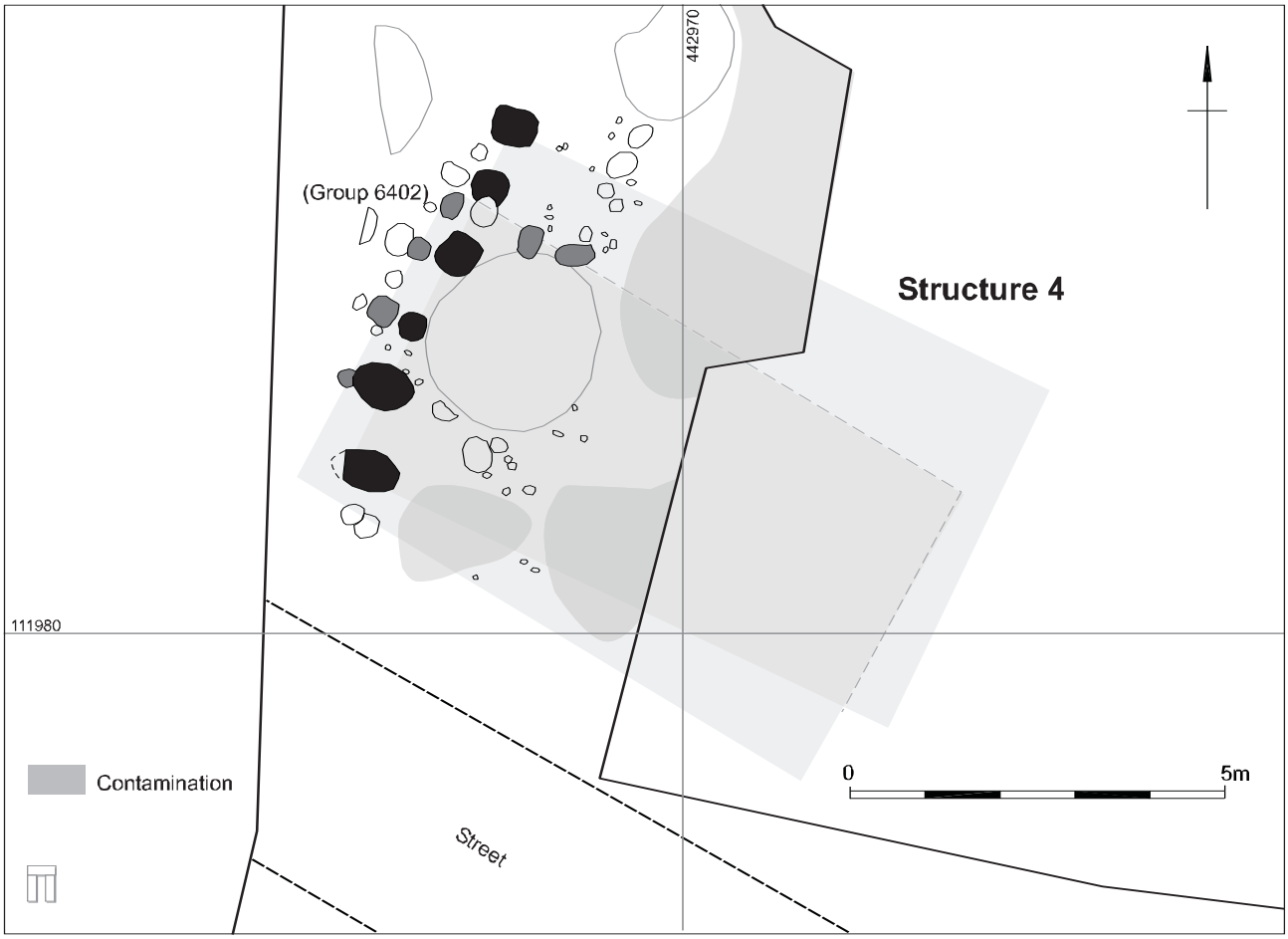

Figure 48 Plan of Structure 4

elements of the possible structures, but could not be dated more closely within this period. Some similarities might be drawn between this building(s) and structure 27 at Six Dials assigned to the early 8th century (Andrews 1997, 107–9 and fig. 48), although the latter does not provide a direct parallel.

The north–south alignment of stake-holes towards the eastern end of the structure is considered to represent a separate structure, possibly a fence line, on a different alignment to the possible building.

Structure 2

A large number of possible stake-holes, along with a few small gullies and post-holes, seemingly covering an approximately rectangular area roughly 8.5 m long and *c.* 4.5 m wide lay approximately 10 m to the south-east of Structure 1 (Fig. 47). None of the possible elements of the structure exceeded 100 mm in depth, and it is uncertain if this group of features represents a building or some more ephemeral structure.

Structure 3

This structure was recorded in an evaluation trench immediately to the east of the East Stand, and may have been contemporary with Structures 1 and 2 that lay to the west. Only the western corner of this building, comprising three beamslots and a single associated post-hole (Fig. 47) were exposed within the trench. Intercutting between these features indicates at least two phases of construction and or repair. Thin, irregular patches of sandy clay with charcoal inclusions were identified within the area bounded by the possible structural features, and it is possible that these represent the worn remnants of a floor surface. Structures 8 and 55 at Six Dials, both constructed in the late 8th/early 9th century, provide possible parallels for this building (Andrews 1997, 69–71 and 154–6).

Structure 4

A further group of post-holes and stake-holes were recorded in the East Stand, to the north of the street

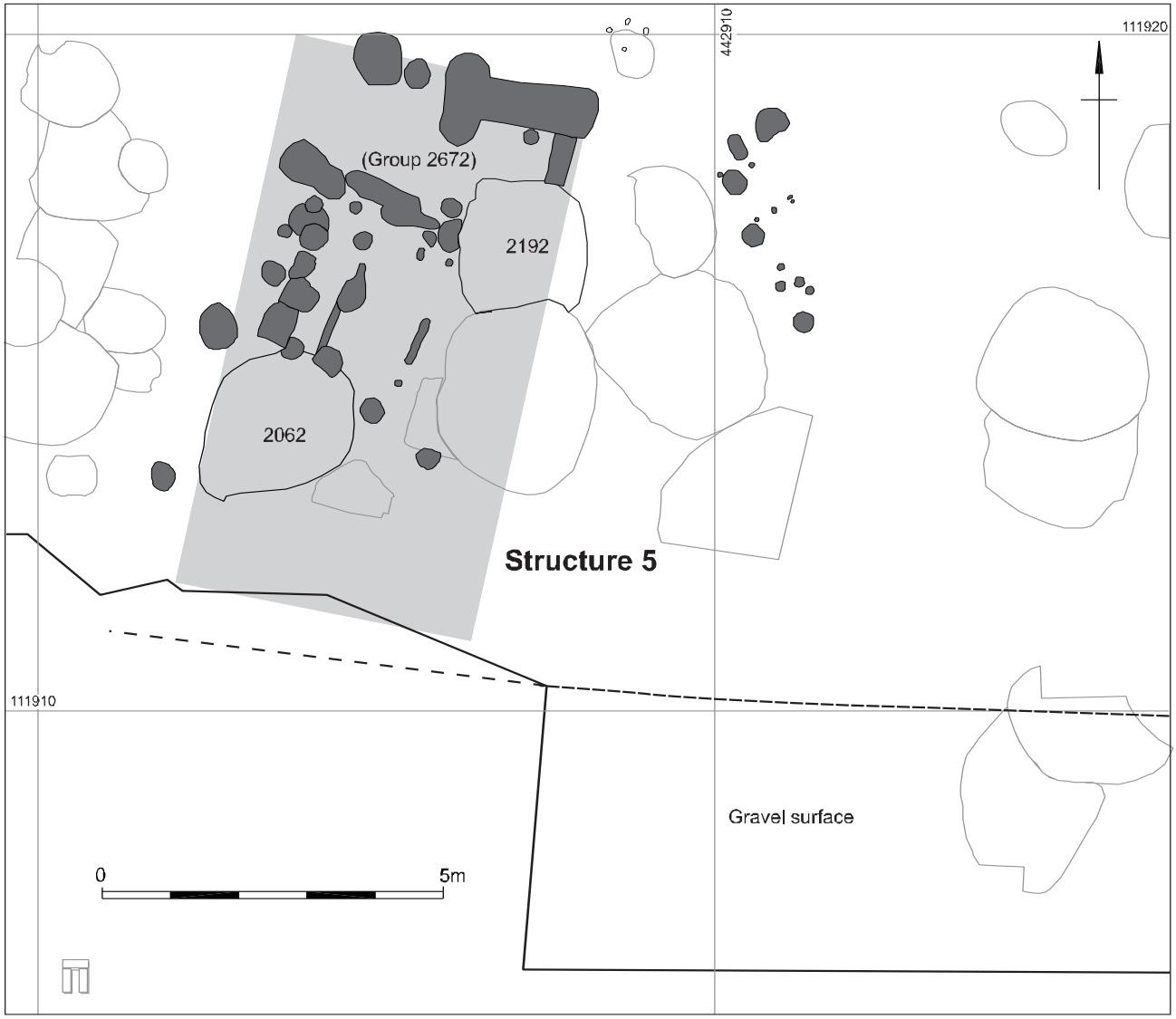

Figure 49 Plan of Structure 5

(Fig. 48). Six of the larger post-holes contained post-pipes, indicating that all represented settings for roughly square, vertical timbers 0.30–0.40 m wide. All contained similar gravel and clay packing and were between 0.17 m and 0.31 m deep with near vertical sides and flat bases. These formed a possible wall line at 90° to the line of the street to the south.

A second and possibly earlier wall line lay immediately to the west on a similar alignment, and comprised four post-holes 0.25–0.40 m wide and 0.13–0.25 m deep with steep to vertical sides and flat bases. A third possible wall line lay at 90° to the east of this, at the northern end, and may have been part of the same structure. Other possible alignments of negative structural elements were tentatively identified, but were far more irregular than those described above. All of the post-holes and stake-holes in this area were cut through a layer of redeposited brickearth (6260), as were the nearby pits.

While the two possible structures identified may represent parts of a substantial building or buildings, the ground plan/s could not be defined, in part because of heavy hydrocarbon contamination in this area. It is suggested, however, that these remains represent the western end of a structure, probably fronting onto the street to the south. An end wall comprising relatively large post-holes was also seen in Structure 16 (phases 1 and 2) at Six Dials, perhaps constructed in the earlier part of the 8th century (Andrews 1997, 87–90).

Structure 5

This structure lay in the central part of the South Stand and was represented by several short lengths of wall trench/beamslots and a number of post-holes and stake-holes (Fig. 49). Intercutting between the

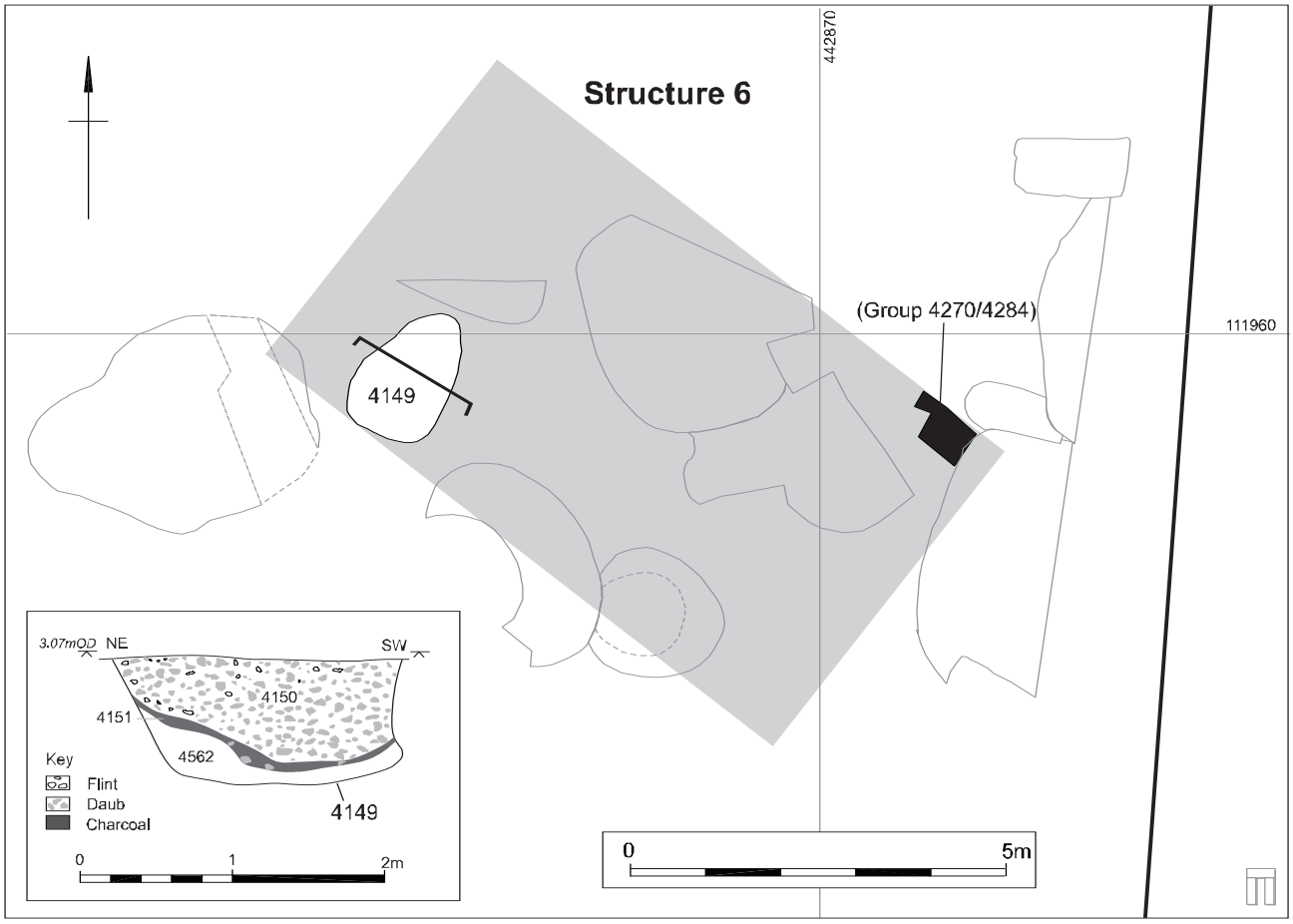

Figure 50 Plan of Structure 6, and section through a possible storage pit

various structural features indicates a series of two or more superimposed structures, possibly repaired, extended and/or rebuilt. No coherent ground plans are apparent, although they appear to have been roughly rectangular structures that may have fronted onto a gravel surface, perhaps a yard surface or alley, to the south. The dimensions of the possible structure/s could not be determined though they may have been 3–5 m in width and at least 7 m long, lying at 90° to the gravel surface. Slumped floor deposits in pits 2062 and 2192 may also have been associated with these possible buildings. A few metres to the east was a curvilinear arrangement of post-holes representing a separate but possibly associated structure. No parallel for this rather confusing arrangement of structural features has been identified amongst the structures at Six Dials, but the quantity of iron smithing slag in the vicinity (discussed later in this chapter, and Fig. 45) might indicate that at least one of the structures was a smithy.

Structure 6

A very short (0.90 m) length of possible wall trench or beamslot, approximately 0.35 m wide and 0.20 m deep with near vertical sides and a flat base, along with a possible return less than 0.20 m long, were all that survived of this putative structure (Fig. 50). Consequently, only an approximate orientation can be suggested and the dimensions are unknown.

The surviving structural remains contained relatively high percentages of charcoal and burnt animal bones, and the surrounding brickearth was scorched, suggesting that the possible structure had been destroyed by fire.

It may be significant that pit 4149, which lay within the probable footprint of the structure, contained very large quantities of charcoal and burnt daub with surfaces and wattle impressions. The pit, which was oval in plan with near-vertical sides and a flat base, is similar in dimensions and form to internal pits identified on other Hamwic sites (eg, Andrews 1997, 178–9). The charcoal was predominantly oak, but also included maple, hazel, holly alder and hawthorn, and the charred plant remains included large quantities of wheat and chaff, with lesser quantities of barley and oats. It is possible that the cereals represent the storage function of the pit or grain processing in the immediate area.

Figure 51 Plan of Structures 7, 8, and 10

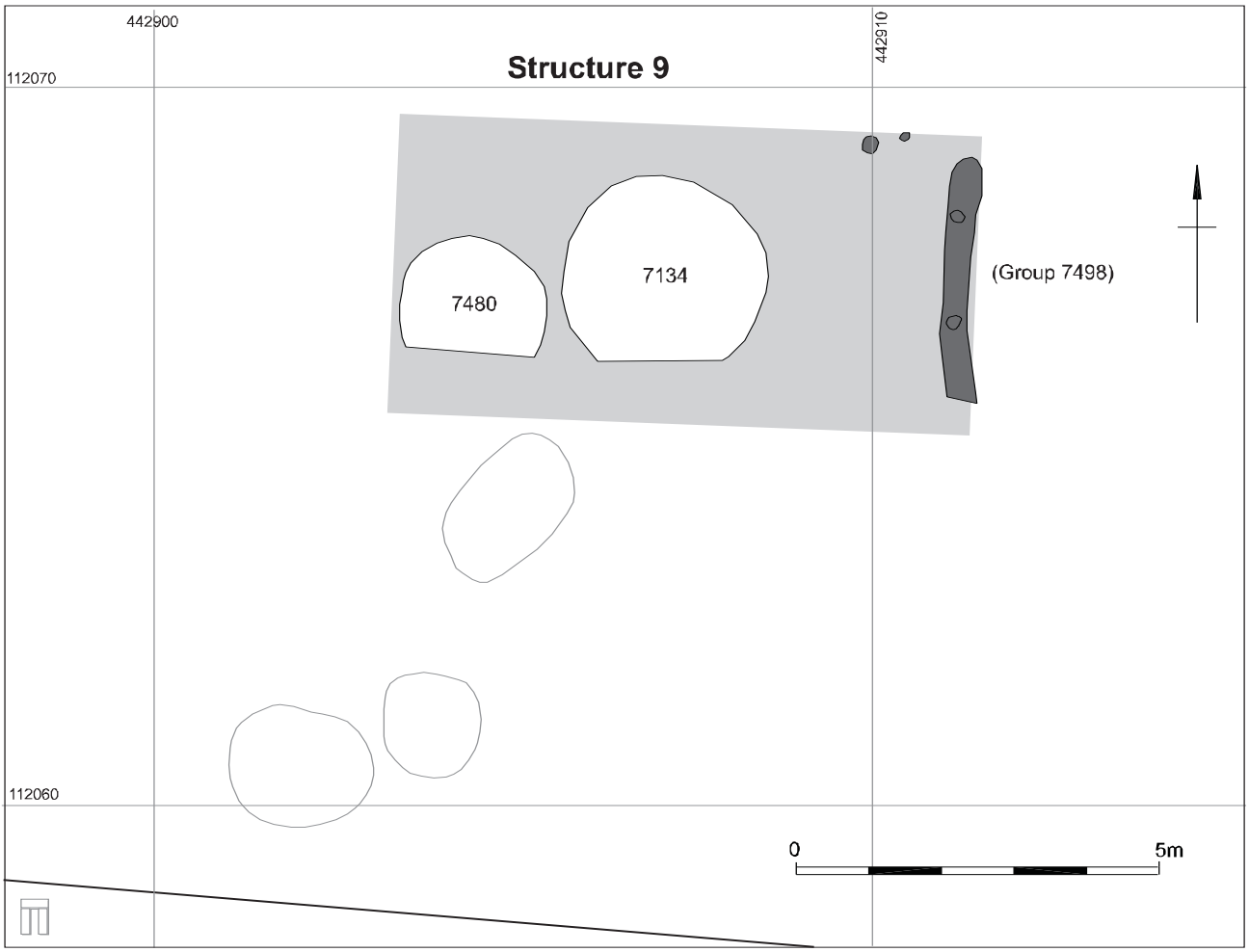

Figure 52 Plan of Structure 9

Structure 7

This was represented by a single 0.90 m length of possible wall trench or beamslot, close to the junction of the North and West Stands, where at least three other structures have been identified (Structures 8–10; Fig. 51). The wall trench or beam slot was approximately 0.40 m wide and 0.15 m deep with steep sides and a concave base. The dimensions of the possible structure are unknown and the orientation is only tentatively suggested on the basis of the absence of pits in the area to the east, where not disturbed by modern features.

Structure 8

A relatively large group of structural features was identified, but apart from a possible wall line represented by a wall trench and several post-holes, no coherent form was clearly discernible (Fig. 51). The wall line comprised seven post-holes 0.20–0.35 m in diameter and 0.17–0.25 m deep with vertical sides and slightly concave bases. They lay on a roughly north-west to south-east alignment that was continued to the west by the wall trench, and together formed a slightly curvilinear wall line. A short, irregular line of post-holes (7806) to the south may reflect some form of internal division.

The wall line may represent the north-eastern side of a fairly substantial building, but it could equally be the south-west wall line with the remaining post-holes being external features (as shown on Fig. 51). On the basis of the available evidence the building appears to have been roughly rectangular, approximately 11 m long and of un-certain width. This building may have been associated with an alley or yard on a similar alignment to the north-east represented by a slumped gravel surface in the tops of pits 7583, 7807, and 7808 (Fig. 46).

Although no datable finds were recovered from any of the various elements of the building, it is probable that it pre-dated pits 7163 and 7269. One of the secondary fills in pit 7163 produced a penny of

Ecgberht (King of Wessex, AD 802–39) and it is likely, therefore, that the pit was dug at some point from about 750 onwards.

The possible curved wall line, overall size, and potentially late date of Structure 8 may have parallels with a curved wall building at Six Dials (structure 29) broadly assigned to the first half of the 8th to the early 9th century (Andrews 1997, 110–2). Other parallels at Six Dials are structures 1 and 66, perhaps belonging to the first quarter and second half of the 8th century respectively (*ibid.*, 56–7 and 71–2).

Structure 9

This structure is represented by a shallow possible wall trench (7498), approximately 3.50 m long, 0.40 m wide and between 0.05 m and 0.09 m deep with irregular sides and base (Fig. 52). The southern end was truncated by a modern wall footing, but no trace of a continuation was found to the south of the wall footing. Two post-holes to the north-west might indicate the position of the north wall, though the evidence is slight. A 0.05 m thick layer of yellowish brown sandy mortar in the upper part of pit 7134 to the east might be interpreted as a slumped floor associated with this building. If this interpretation were correct, this structure would have been at least 6 m long and over 3.7 m wide.

A small assemblage of flint tempered and mixed grit tempered pottery, animal bone and burnt flint was recovered from the various structural elements, although not from the slumped floor. The pottery suggests that this structure may belong to the later phase of mid-Saxon occupation, however, dating based on so small an assemblage should be viewed with caution.

Structure 10

This possible structure was represented by a *c.* 3 m length of gully or wall trench which was 0.35 m wide and 0.12 m deep with steep sides and a flat base (Fig. 51). The orientation and dimensions of the structure are uncertain, and it could be that some of the structural features between 5 m and 8 m to the east were not part of Structure 8, but were associated with this possible building. No datable finds were recovered from any of the possible structural features.

Slumped Floors

Several possible internal floors (Fig. 46), occasionally with associated hearths, were identified slumped into the tops of 20 of the pits within the excavation area. These floors usually comprised well-compacted layers of clean, redeposited brickearth between 0.03 m and

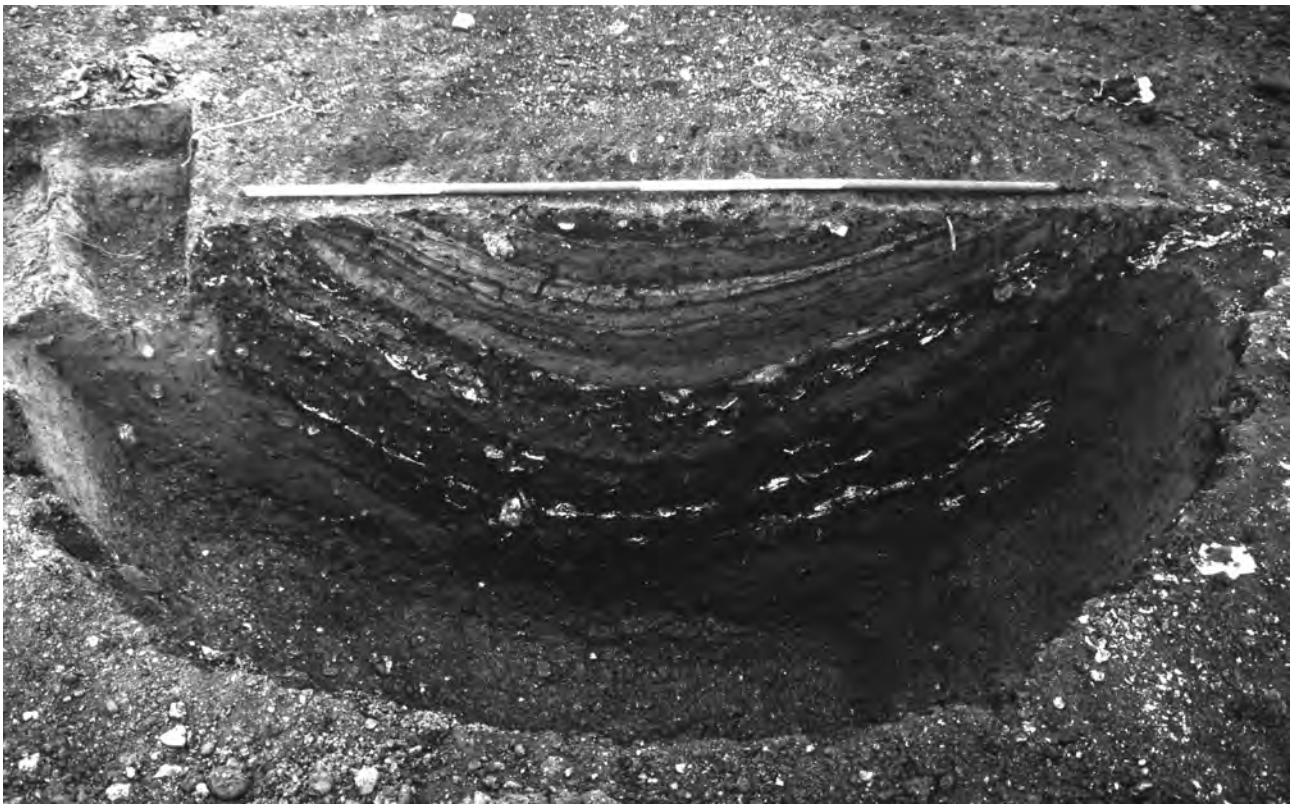

Figure 53 Sequence of floor surfaces preserved by having slumped into the top of an underlying refuse pit (pit 3235) (2 m scale)

Figure 54 View of excavation in progress in the East Stand area, looking south-west, showing half sectioned pits and the high water table

0.09 m thick. However, in pit 7134, which may have been associated with Structure 9, the floor had been constructed of mortar. In pits where slumping had been particularly pronounced, sequences of up to seven probable floor surfaces and associated occupation debris or levelling deposits were identified (Fig. 53, section through pit 3235). The majority of the probable slumped floors and associated deposits could not be related to structures represented by structural features. However, the distribution of these deposits across the excavation area indicates that structures were more numerous than the surviving structural features would suggest.

Pits and wells

Pits are the most common feature on nearly all excavations within Hamwic, and the Stadium site is no exception (Fig. 54). Although the density of pits is notably lower here than at the Six Dials to the north-west (Andrews 1997), it is somewhat higher than on some other sites, for example at Cook Street to the south-west (Garner 1993). Alan Morton (pers. comm.) has calculated that the pit/well density at Six Dials is approximately 3.4 times greater than at the Stadium site, and the Stadium site density between 2.3 and 2.9 times greater than at Cook Street. The pit/well density at Six Dials is the highest so far found in Hamwic and the density at Cook Street amongst the lowest. The significance of the variation in pit/well density which is likely to reflect a variety of factors, is considered further in Chapter 6. A total of 441 features interpreted as pits of mid-Saxon date (and a further 16 possible wells) were recorded during the course of the excavations at the Stadium site, the exact number dependent on how one defines a pit. In this case post-pits, shallow depressions and probable tree throws have not been included, and in general the pits at the Stadium site were similar to pit types well-attested by earlier excavations within Hamwic (eg, Morton 1992, 42–3; Andrews 1997, 174–9). Pits considered in detail in this section, and all wells, are shown in Figure 55.

The considerable depth of a few of the pits created safety problems. In some cases this was overcome by sectioning and recording a pit to a maximum safe depth, followed by machine excavation of a large 'stepped' trench to allow excavation to continue safely to the base of the pit. In cases where this method was not practicable the pit was sectioned and recorded to the maximum safe depth, and the full depth and sequence of deposits ascertained using a hand auger.

A large number of environmental bulk (20 litre) samples were taken from pit fills, in some cases to ask specific questions concerning the origin and nature of

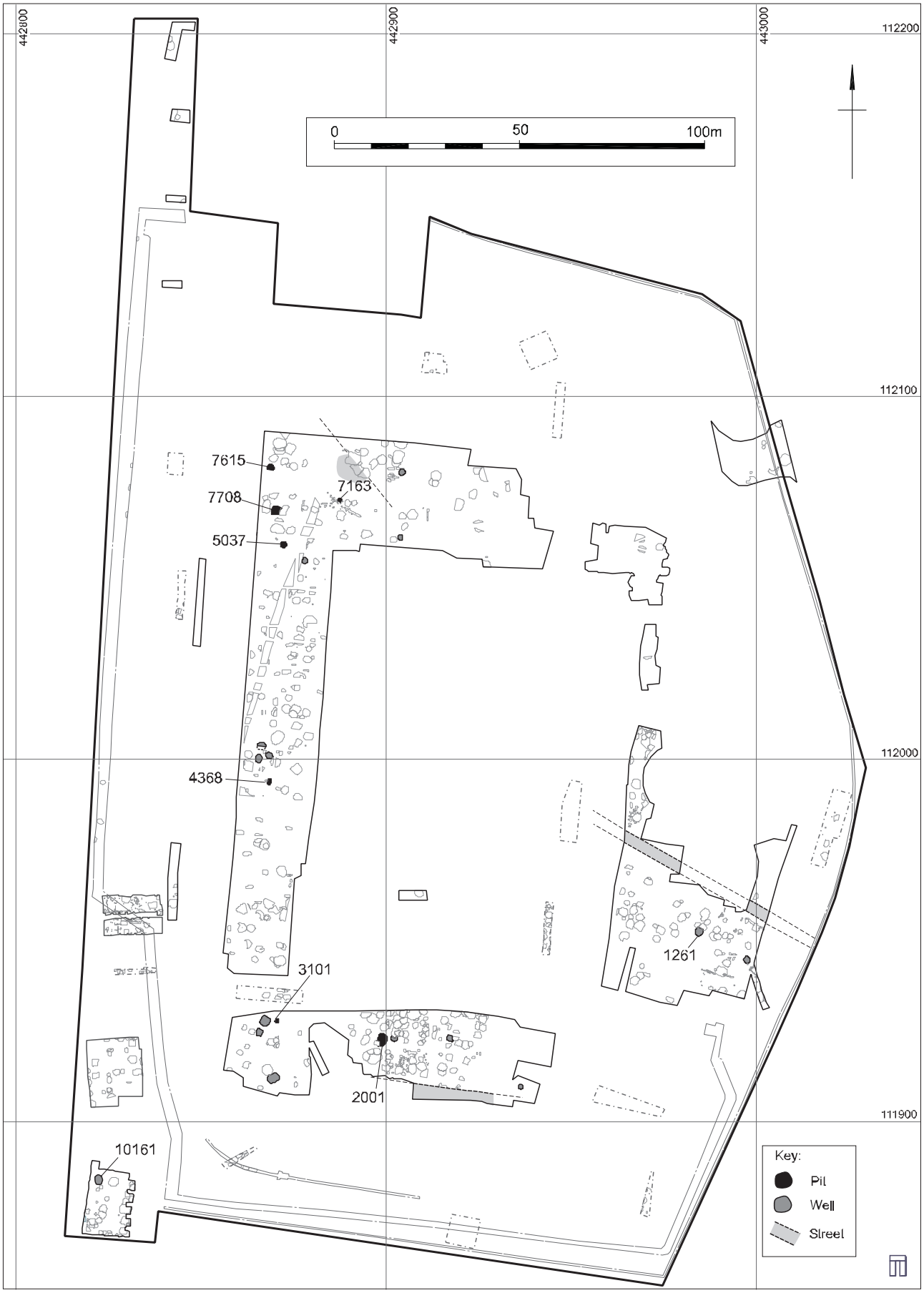

Figure 55 Location of pits described in detail here, and of all features identified as wells

a particular fill. In addition, suites of samples (3–10 bulk samples) were taken from 29 pits in order to examine their original functions and subsequent uses, to identify the formation processes of the various types of fills, and to examine any differences in local environment across the site. Suites of samples were taken from examples of the main pit types and from pits in all areas of the site. The various samples allowed the recovery of mineralised, charred, and (occasionally) waterlogged plant remains, charcoal, insect remains, and small animal bones (discussed below).

It seems likely that many of the pits represent the quarrying of brickearth and that rubbish disposal was a secondary or incidental function (Morton 1992, 45). They may have taken a long period to become filled up and estimates of 50 or more years (*ibid.*, 43) and 100+ years (Andrews 1997, 176) have previously been suggested for some examples. Sherds of medieval pottery found in the very top of some pits at the Stadium site (see below) indicate that in a few cases centuries might elapse before all surface trace of the pit had disappeared.

Large, deep, sub-circular pits, generally around 2 m in diameter and 1.5–2m deep, but sometimes considerably larger, with steep, irregular sides and rounded bases, were the most common type of pit on the site (*c.* 55%: n = approx. 246). This type of pit is commonest on most other Hamwic sites, although they may sometimes be shallower, their depths reflecting the variable thickness of brickearth in Hamwic which is thinnest close to the river and on the south-east edge of the town. These pits appear to have been used for the disposal of cess, 'industrial' debris, and domestic refuse; however, in the majority of cases the basal fill comprised redeposited brickearth. It is often uncertain whether these basal deposits were the result of deliberate dumping, the weathering and collapse of the top and sides of the pit, or natural silting. In one case, however, the basal fill can fairly confidently be interpreted as the result of deliberate dumping.

When pit 4368 (Fig. 56) was originally dug the excavator/s clearly disturbed an earlier grave (4425). It is presumed that they must have found some grave goods as the grave was almost completely emptied and, following this, the skeletal remains (representing two individuals) appear to have been dumped unceremoniously into the base of the pit along with a 0.5 m thick deposit of rather dirty brickearth. It is possible that this brickearth was contaminated with topsoil and/or rubbish deposits and was, therefore, unsuitable for use as daub or for ceramic manufacture, although the majority of the brickearth may have been removed for such purposes. Of course the redeposited brickearth may have been used to simply to cover the disturbed remains of the burials.

Few of the larger pits penetrated the gravels below the brickearth and none by more than 0.5 m; the gravel would have provided a convenient level at which to stop, as it is more difficult to dig through than the overlying brickearth. One advantage of digging down to the gravel is that, water table permitting, the liquid element of the cess/rubbish would drain away more easily. Pit 5037 (Fig. 56) penetrated the gravel by nearly 0.5 m. Whatever the original function of this feature, it was left open for a period following excavation and parts of the loose gravel sides collapsed into the base. It was then used as a latrine – perhaps its intended function, represented by deposits of concentrated cess that would originally have filled the pit to a depth of approximately 1.4 m. Following this it was used for the disposal of domestic debris as the organic contents subsided and compressed. Analysis of the pottery recovered from pit 5037 dated all of the fills containing pottery to ceramic phase 3 (9th century), suggesting that this pit may have filled relatively quickly.

Other pits clearly filled over longer periods and display a more varied history. Pit 2001 (Fig. 57), for example, a very large pit in the South Stand, may have been longer lived than most. Whatever its primary function, it was left open long enough after being excavated for a substantial part of the gravel and brickearth sides to collapse before a fairly substantial deposit of domestic debris was dumped into it. Following this there was a further collapse of the sides and a period of silting. At this point a possible lining (presumably timber) was constructed and a very mixed series of brickearth and rubbish deposits were backfilled behind the lining. The pit was then apparently used for a time as a latrine pit, represented by cess deposits in the base of the lined shaft, which was subsequently used for the disposal of probable domestic debris. Probably as result of subsidence and compression of the cess and rubbish fills, along with the decomposition of the presumed timber lining, the lining appears to have collapsed.

The resulting large depression was backfilled with a dump of marine shells, more domestic waste, and a fairly substantial deposit of cess before being eventually capped with a layer of brickearth and charcoal. The upper fills are probably the result of later slumping as the organic contents of the pit continued to subside and compress. At least one of these layers comprised a substantial deposit of ash or burnt chalk which directly overlay a possible slumped external surface, suggesting industrial activity in the near vicinity. Similar features to pit 2001 were recorded at SOU 11 (features 46 and 47; Morton 1992, 108–12) and were suggested to have been latrine pits (*ibid.*, 118–9). Features like this have not been found elsewhere in Hamwic and as far as we can

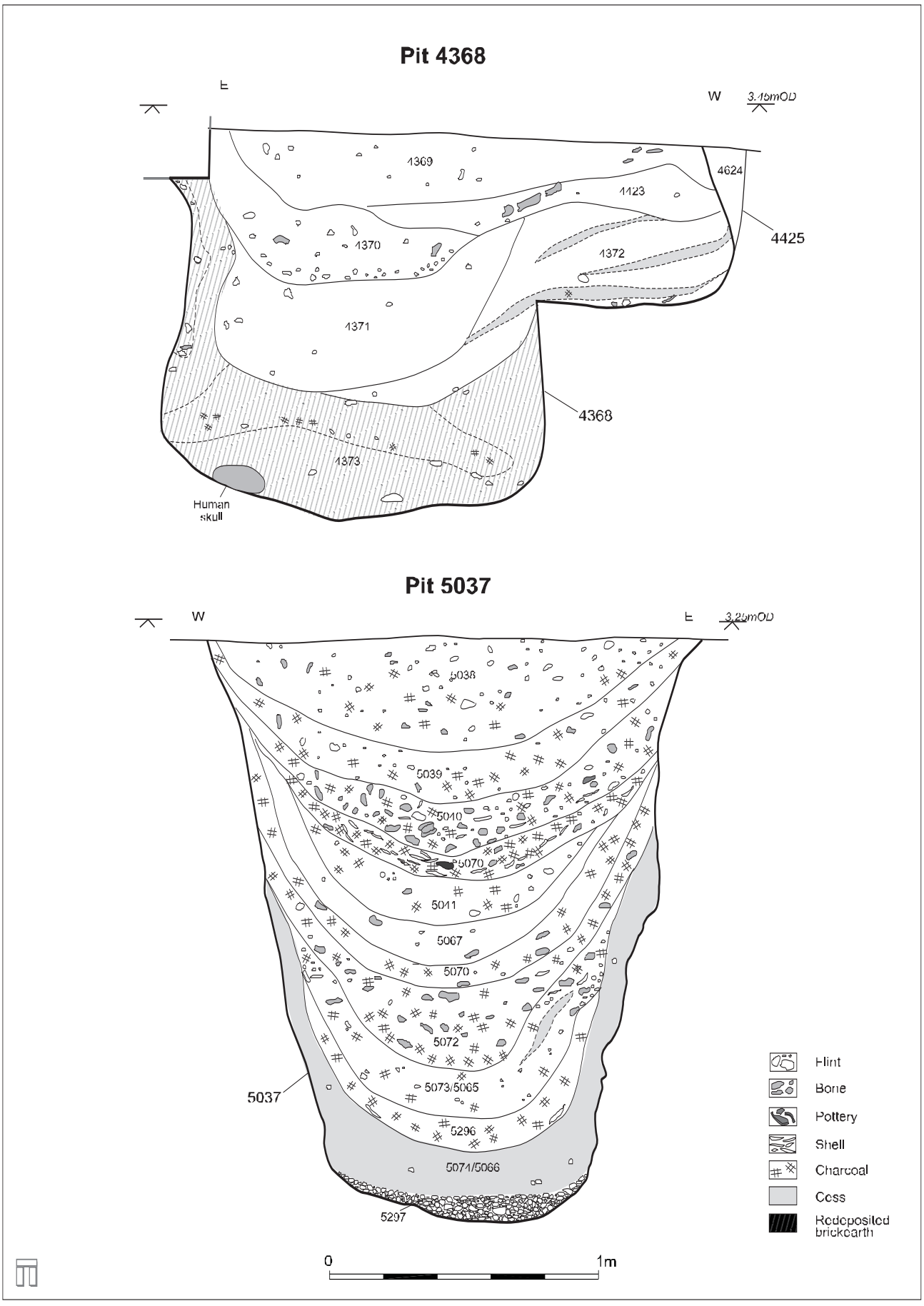

Figure 56 Sections through pits 4368 and 5037

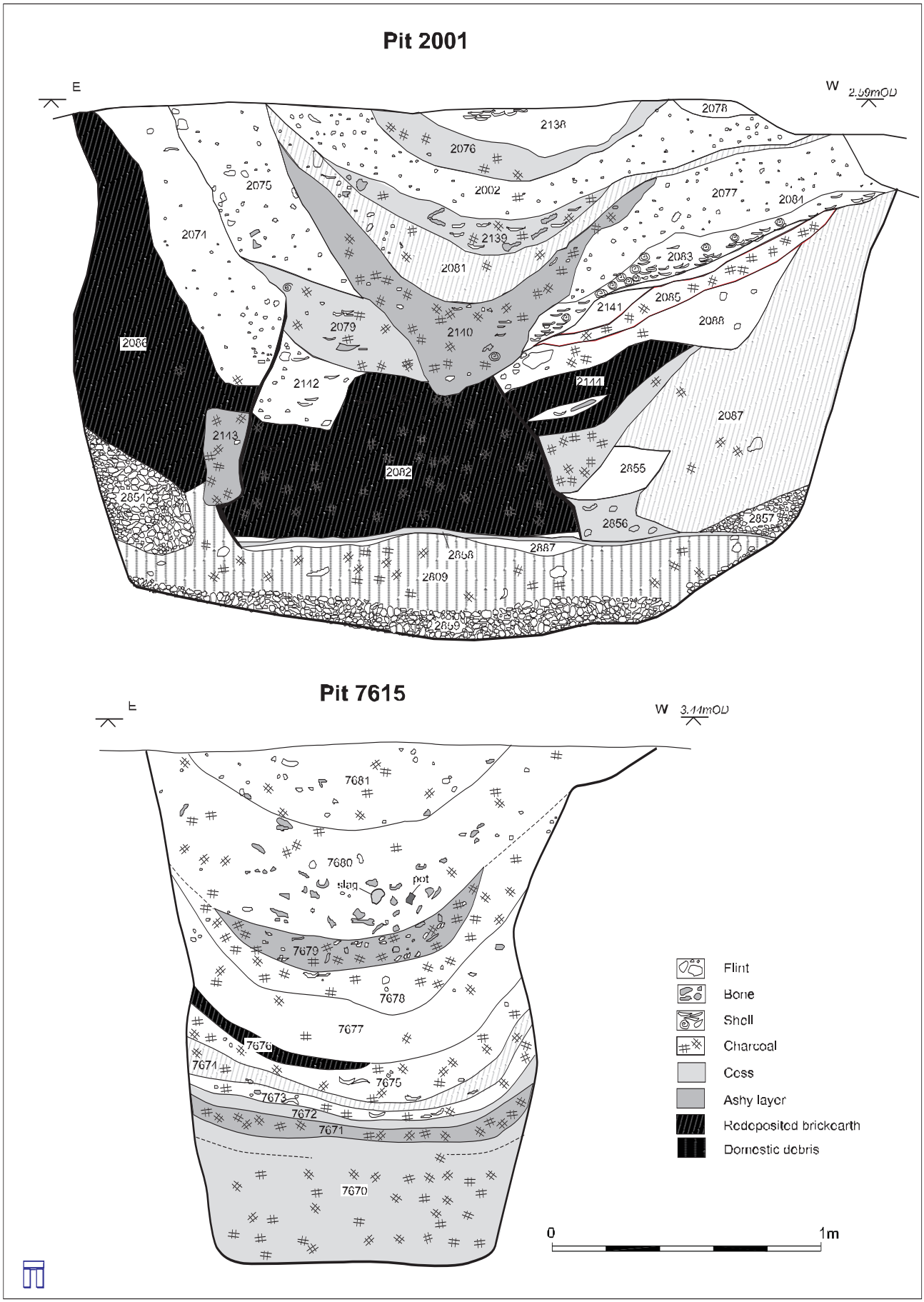

Figure 57 Section through pits 2001 and 7615

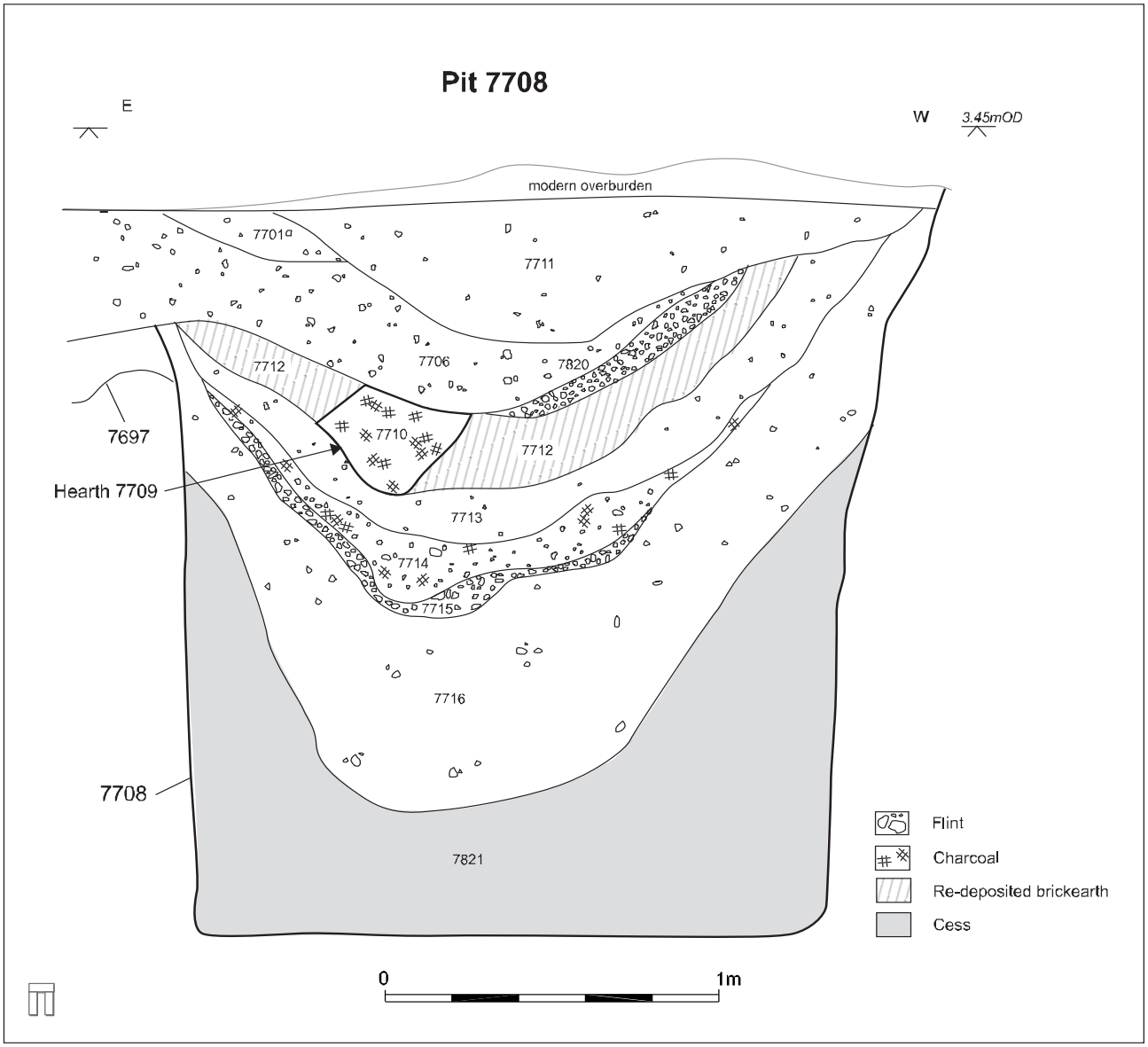

Figure 58 Section through pit 7708

tell from the excavated evidence, they are restricted to the eastern fringe of the town. Pit 1261 (see below), tentatively interpreted as a well, may have been a similar feature.

Possible industrial use of the pits is illustrated by pit 7615 (Fig. 57). The lower fills comprised alternating layers of ash with diluted cess and charcoal, perhaps most likely to represent some form of industrial process or the debris from it. A sample from one of these basal fills (sample 275) proved the richest on site in terms of charred plant remains and included quite a large quantity of oats with much smaller quantities of barley and wheat. Mineralised plant remains from the same deposit contained relatively large quantities of straw/reed/rushes and matted stem fragments, and the charcoal included large quantities of unidentified burnt bark, narrow roundwood and twiggy material, probably blackthorn, hazel and gorse/broom. The relatively high quantities of bark, which can be used in the tanning process, could suggest the recycling of tanning waste to supply low-grade fuel or possibly its disposal by burning, even if the pit itself was not used for tanning. The lower deposits were capped with a layer of redeposited brickearth *c.* 0.1 m thick, and above this were several dumps of probable domestic debris and a single, small layer of ash.

Less common (*c.* 12%: n = approx. 51) were relatively carefully dug, large, sub-rectangular pits, in general between 1.5 m and 2.0 m across and up to 2.5 m deep, some penetrating the gravels by over 0.5 m. Most had vertical sides and flat bases, often with traces of some form of lining, possibly wattle or planks. These may have served a number of functions,

with most excavators (Addyman and Hill 1968, 83, Barrett and Holdsworth 1980, 37–9; Andrews 1997, 174–5) interpreting them as cess pits, although a few (Morton 1992, 45–6) have suggested a storage function. In almost all examples on the Stadium site the basal fill comprised large deposits of what appeared to be cessy material with occasional charcoal or brickearth 'capping' layers, suggesting that these pits were probably used as latrines.

The environmental analyses undertaken on samples from the Stadium site, particularly a study of the mineralised remains (see below), demonstrates convincingly that the 'cessy material' has, in most cases, been correctly identified. A typical example of this type of pit is 7708 (Fig. 58) which, whatever its original function, was not left open to silt up and vertical grooves in the pit sides indicate that it was probably lined with timber or wattle. The basal fill comprised a very large cess deposit, which originally came to within 0.7 m of the top of the pit. This was overlain by a substantial dump of probable domestic debris, which was in turn overlain by a 0.05 m thick gravel capping layer. Following this, the pit was used for the disposal of more probable domestic debris before being sealed below a 0.15 m thick capping of redeposited brickearth. The upper fills are the result of later slumping, with the most notable of these being 7710, a small hearth either cut into the top of a gravel capping layer or surrounded by a gravel surface. A sample from this hearth contained large fragments of oak, mostly heartwood and smaller fragments of hazel, holly, and blackthorn. While this deposit clearly derived from the final use of the hearth, its function, whether domestic or industrial, is uncertain.

Although their use as latrines or cess pits may be a secondary function, the use of such deep, probably sometimes waterlogged features for storage seems unlikely. However, an industrial function, such as tanning, is possible. Although no definite evidence for this possible function was identified at the Stadium site bark, which can be used in the tanning process, was recovered from pit 7615 and may suggest that tanning was taking place either on or near the site. It should be noted, however, that other possible indicators of tanning, for example concentrations of horn cores or metapodial bones, have not been identified at the Stadium site or, as yet, elsewhere in Hamwic.

Whatever the original function of these large pits, it seems clear that many remained open for a considerable length of time, even if only as large depressions that appeared as the organic contents compressed and subsided. Pit 2001 (Fig. 57) in the South Stand and well 10161 (Fig. 60) in the sub-station area both produced pottery of ceramic phase 1 (*c.* AD 700–50) from their basal fills, and pottery of ceramic phase 3 (*c.* AD 800–50+) from their uppermost fills, indicating that they may have been open for as long as a century. It also seems probable that deposits of rubbish or industrial debris sometimes extended over more than one pit, indicating the dumping of debris into a general area rather than deliberate disposal into an individual pit. Such spreads of rubbish have often been recorded elsewhere in Hamwic (eg, Morton 1992, 42; Andrews 1997, 174).

Approximately 29% (n= approx. 128) of the pits on the site were somewhat smaller than those described above, and are comparable to those excavated at Six Dials classed either as internal storage pits, small external pits of uncertain function or pits dug for possible industrial use (Andrews 1997, 174–9). The internal pits were generally circular, oval or sub-rectangular in plan, between 0.5 m and 1 m in diameter and up to 1.30 m deep, and often contained stake-holes close to the sides of the base, suggesting that they originally had some form of lining. The external pits were generally slightly larger, up to 1.50 m in diameter and up to 1.50 m deep, varying from sub-circular to sub-rectangular to sub-triangular in plan. Andrews (*ibid.*, 179) suggests that some of these may have been a smaller type of cesspit, and the cessy basal fills of several examples at the Stadium site would support this interpretation.

Pit 7163 (Fig. 59) is fairly typical of this type of pit. The three basal deposits all comprised cess, which probably built up over a period of time rather than being the result of individual dumping episodes. These deposits were overlain by a fairly thick layer of possible domestic debris, from which the silver penny minted between 802 and 839 (item 211) was recovered. This was sealed below a large deposit of ash, and the pit then capped with a *c.* 0.10 m thick deposit of brickearth. The uppermost fill could be a second deposit of probable domestic debris, but seems more likely have been the result of later slumping. A second example, pit 3101 (Fig. 59), was left open for a short period while a *c.* 0.15 m thick layer of silt accumulated in its base. The remaining fills comprised cess deposits with possible capping layers of ash, though whether the pit was initially dug for cess disposal or served some other, perhaps industrial, function is uncertain.

A very few examples of what may have been 'industrial' pits were also identified, similar to examples at Six Dials (Andrews 1997, 179). These comprised possible hide soaking pits containing layers of burnt chalk, and possible hide smoking pits which contained sequences of hearths within their fills. Several pits produced substantial deposits of iron slag, but these pits were not directly associated with ironworking and had simply been used to dispose of the debris from smithing.

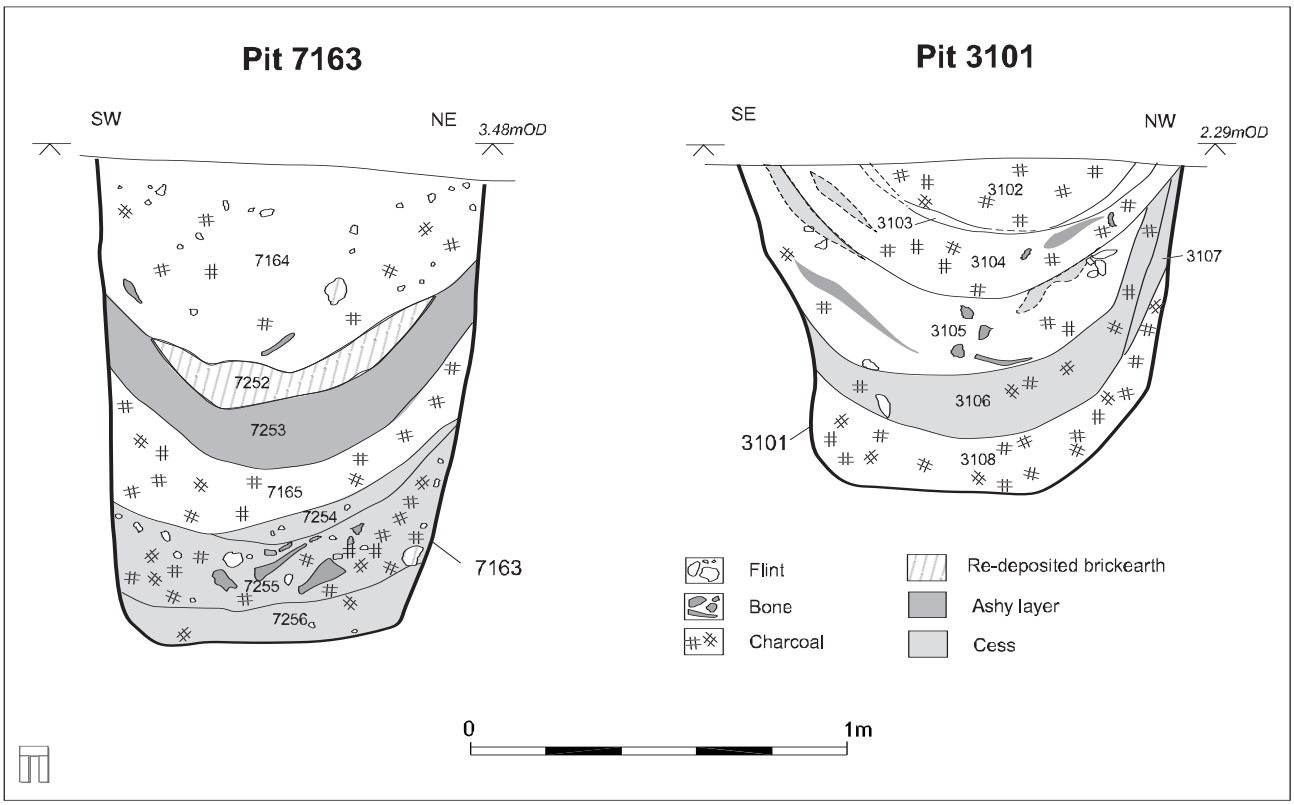

Figure 59 Sections through pits 7163 and 3101

Sixteen certain or probable wells were recognised during excavation (approximately 4% of the pit total), all penetrating the gravels to below the water table and containing evidence for a central shaft between 0.5 m and 1 m in diameter. The gap between the shaft and the side of the construction pit had generally been backfilled with re-deposited brickearth and gravel. The technique of well construction in Hamwic has been summarised by Morton (1992, 43) and Andrews (1997, 188) and is outlined here. This involved the excavation of a large pit (various shapes are recorded, but usually sub-circular or sub-rectangular) which penetrated the gravels to below the water table, although shallower pits were occasionally dug and a narrow shaft extended down to the required depth. The lining was then inserted or constructed from the base upward (usually circular, of wattle or staves (barrels), but sometimes square and timber-lined), backfilling around it as construction proceeded up to ground level. In all cases at the Stadium site the shaft was approximately circular and was presumably lined with wattle or barrels. No linings survived and could only be recognised as a thin dark stain between the backfill of the pit and the later fills of the shaft.

Well 10161 (Fig. 60), in the south-west corner of the site, was one of the earliest mid-Saxon features identified and is a typical example of the type of well recorded. After it fell out of use as a well, the shaft was used as a convenient hole in which to dispose of domestic debris, while the timber or wattle lining appears to have partially collapsed. The uppermost fills are probably the result of later slumping.

Feature 1261 (Fig. 60) has been tentatively interpreted as a well. It penetrated the gravel to below the water table and appeared to have a central shaft, although heavy contamination of this feature by diesel, which obscured almost all colour differences between the various fills, means that this interpretation is uncertain. It bears similarities to pit 2001, and features 46 and 47 at SOU 11, all of which are interpreted as latrine pits. Initially, a large pit was dug, some form of timber or wattle lining inserted, and redeposited brickearth packed around the outside of the lining. However, when the possible well fell out of use and the timber superstructure had collapsed into the base, it appears to have been utilised as a cess pit. Analysis of insect and waterlogged plant remains suggests that the basal fill of the shaft comprised a cess deposit, which was then capped with a substantial deposit of gravel and clay. As the fills subsided, overlying layers slumped into the top of the feature.

The distribution of the 16 possible wells identified across the site (see Fig. 55) is rather uneven, with two groups of three wells in close proximity to one another apparent in the centre of the West Stand and in the west of the South Stand. It seems unlikely that all the wells in these groups would have been contemporary, so this apparent grouping may be coincidental.

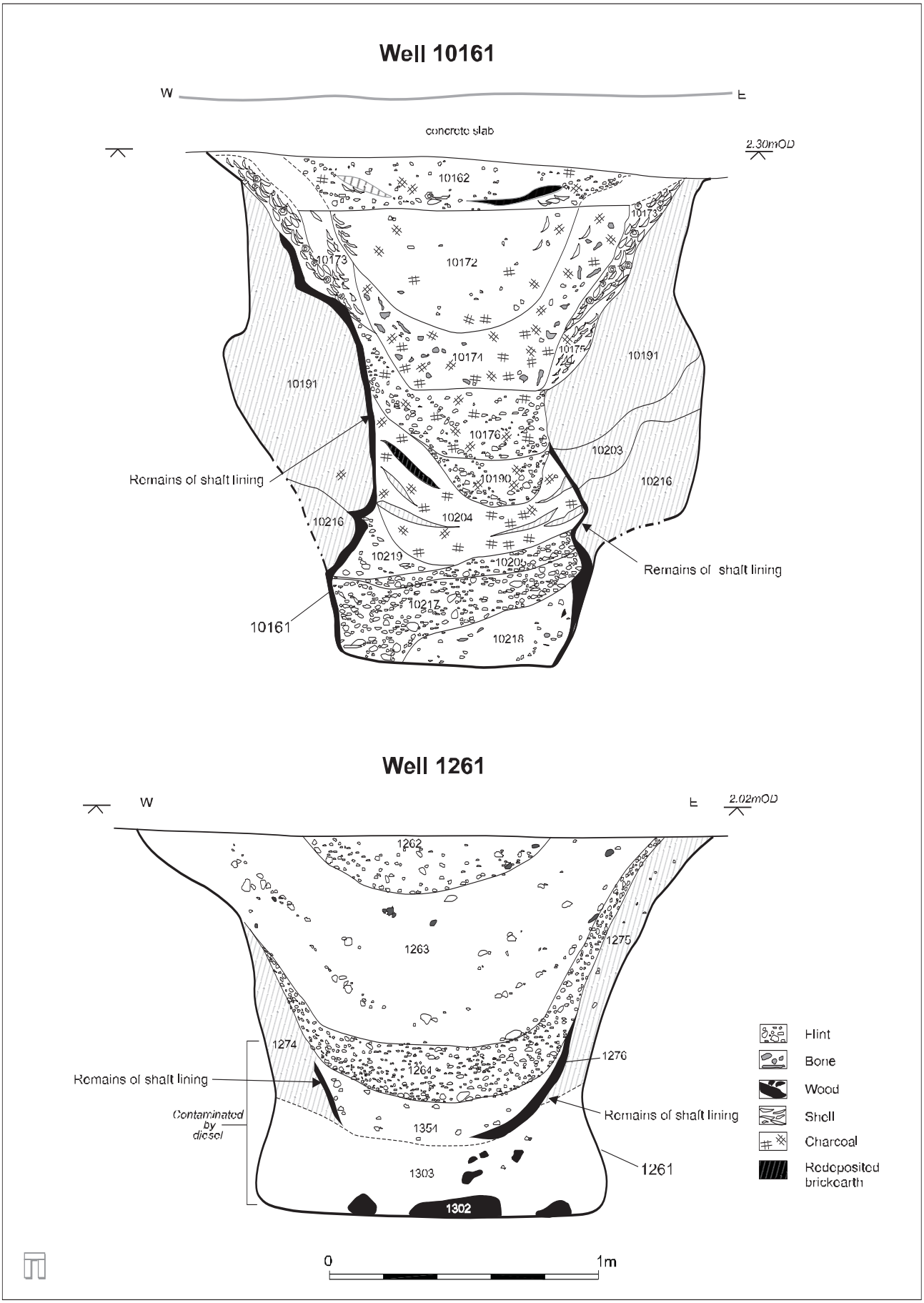

Figure 60 Sections through wells 10161 and 1261

However, other factors may have influenced their distribution, for example, variations in the local water table/geology may have resulted in certain localised areas being more favourable to the siting of wells than others. Alternatively their location could simply reflect the distribution of structures, activities or industries requiring a nearby source of water.

The Later (8th Century) Inhumation Cemetery

A compact group of seven unaccompanied inhumation burials and one outlier, towards the west end of the North Stand, have been dated to the mid-Saxon period (Fig. 61a and b). A radiocarbon determination of 1245±70 BP, cal AD 650–950 (NZA-14941) was obtained from bone from burial 7381 (in grave 7380; see Table 1). While it is possible that this group represents a third burial tradition within the early cemetery (see Chapter 3) this is considered extremely unlikely. The similarities between this group and other small cemeteries excavated within Hamwic (Morton 1992; Andrews 1997), the absence of grave goods, their apparent separation from the other burials, and the radiocarbon date range, together suggest that this was a later, 8th century, cemetery on the periphery of the settlement. Four of the graves had been partially truncated by later pits, but none cut any earlier features. This suggests that this cemetery represents the earliest phase of mid-Saxon activity in this area of the site, subsumed by subsequent settlement expansion.

In contrast to the early cemetery there was intercutting between several of the graves (7051 cut 7380, which in turn cut 7197) and they were more tightly grouped. The grouping suggests that they may have been buried in a well-defined plot, but no boundaries which may have marked the extent of this could be discerned.

The graves were aligned approximately west–east, varying between 90° and 123° east of OS north, and were roughly sub-rectangular in plan. The complete examples were 1.78–2.20 m long, 0.55–0.68 m wide and 0.09–0.30 m deep. None of the burials had grave goods, although small quantities of redeposited finds were recovered from some. These comprised a few sherds of Saxon pottery (mixed grit and sandy-tempered) from graves 7197 and 7432, a curved fragment of copper-alloy from 7051, a piece of Roman tile from 7383, and varying quantities of probably prehistoric burnt flint in 7051, 7270, and 7432. The base of one of the graves (7383) had been covered with a *c.* 0.03 m thick layer of gravel prior to the deposition of the body.

All of the bodies were in a supine, extended position with the arms crossed over the chest or pelvis (Fig. 62). Three of the burials were identified as female (graves 7380, 7383, and 7432), two as possible female (7194 and 7270) and two as male (7082 and 7197). The juvenile buried in grave 7051 was unsexed. The distribution of sexed and aged individuals in the later cemetery is shown in Figure 61c and d.

There is evidence that as many as seven of the burials may have been in coffins, on the basis of bone movement (graves 7194, 7270, 7432, and 7380) or their straight-sided (7197 and 7383) or parallel-sided (7082) disposition.

In general the skeletons in these graves were better preserved than those in the earlier cemetery, the reasons for this greater degree of bone preservation being uncertain. However, it was noted that the grave fills were generally darker in colour than those of the early cemetery, possibly due to more topsoil and subsoil containing small amounts of occupation debris being mixed in with the redeposited brickearth in the grave fill. Perhaps the inclusion of this less acidic material may have contributed to the better survival of the human bone, a suggestion supported by the fact that the backfills of the graves containing the two most complete skeletons (graves 7197 and 7380 were significantly darker than any of the other graves within this group (see also discussion above).

The layout of this small cemetery is curious. Burial is concentrated in a single row of five or six graves, three intercutting, with single graves to the east (7082) and west (7432) perhaps representing the beginning of new rows. The cemetery may have gone out of use before these rows developed further, or perhaps the burial site was constricted in some way though no evidence for this survived. The intercutting of several graves is paralleled at the larger 8th century cemetery at SOU 13 where at least five phases of burial are recorded (Morton 1992, 52), but the cemetery at the Stadium site is very much smaller, perhaps a family cemetery, abandoned when the family's use ceased. A comparable though earlier group might be cemetery 2 at Apple Down, West Sussex. This lay 150 m to the south of cemetery 1 and comprised a compact group of nine graves (some intercutting) with two outliers, in three rows, and dated to the late 7th–early 8th century (Down and Welch 1990, 13–14).

Skeletal Human Remains

by Jacqueline I. McKinley

Bone from nine contexts was subject to analysis. This comprised the remains of a small group of eight inhumation burials in the North Stand and redeposited bone from one adjacent pit fill. The

Figure 61 The later inhumation cemetery: a) location within the North Stand area, b) location of individual graves, c) distribution by sex, and d) distribution by age

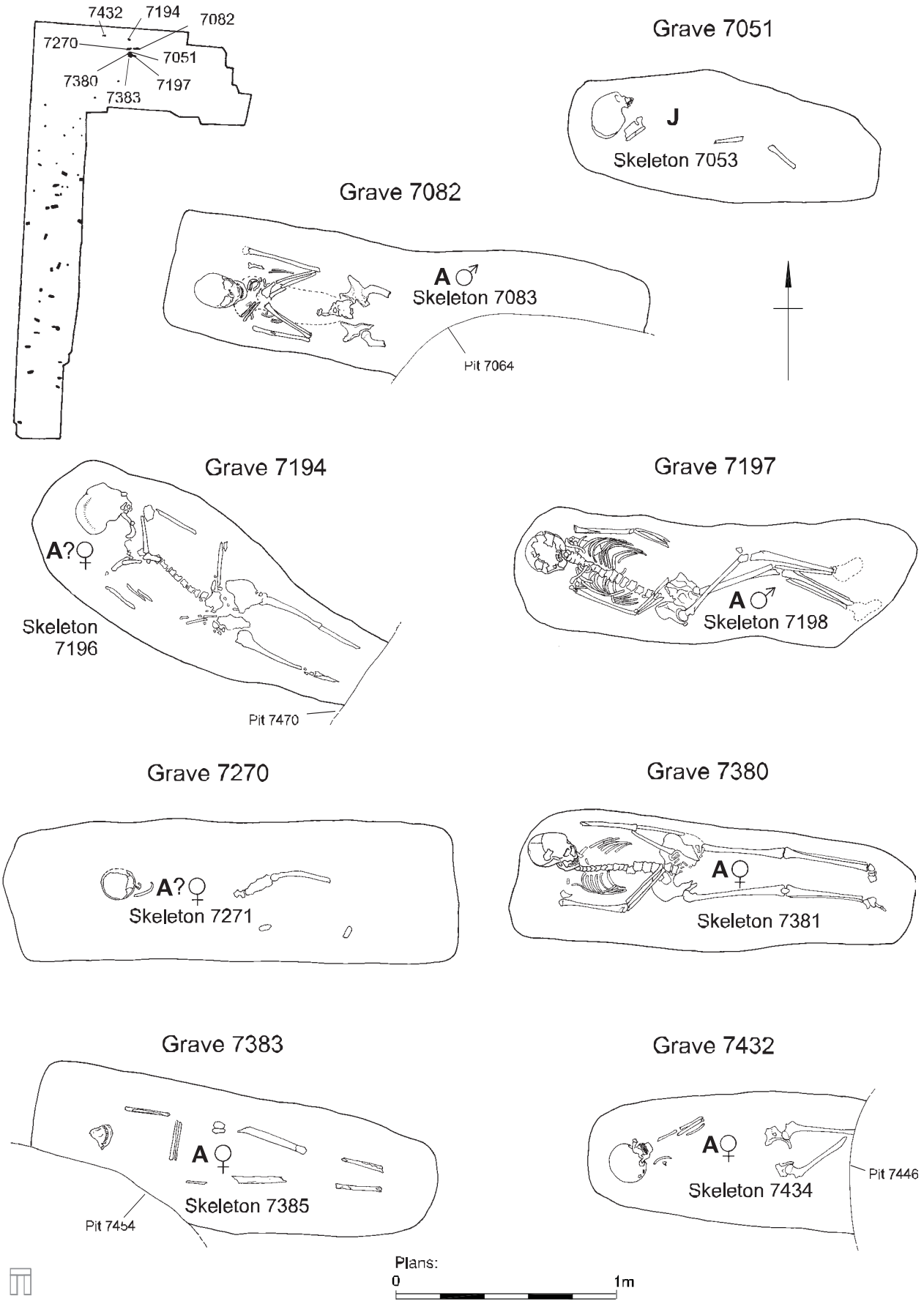

Figure 62 Inhumation burials in the later cemetery

methods of analysis are as described for the inhumation burials in the early cemetery (Chapter 3).

Taphonomy

Disturbance

The inhumation graves had a slightly more restricted range of depths (0.09–0.30 m) than their earlier counterparts, with a similar lack of correspondence between grave depth and bone survival (9% in shallowest, 6% from deepest). Disturbance was limited to minor truncation by later features which is unlikely to have removed much, if any bone. Redeposited bone was recovered from one pit in the area, but this did not derive from any of the extant burials, suggesting that some removal/disturbance of other graves had occurred in the vicinity.

Condition

The bone was generally in a poor condition, like that from the earlier graves. However, there was slightly more variability between and within individual burials where bones from some skeletal areas may be better preserved than others (eg, the carpals in 7083) or one side of a bone may be less degraded (eg, the endocranial (internal) surface of the skull from 7271). Skeletal recovery (Table 12) was generally much better than from the earlier graves, with a maximum of *c.* 75% and an average of 33%. As previously, there is no apparently consistent correlation between preservation and the individual mode of burial (ie, coffined/contained or not). The importance of the soil matrix to bone preservation has been outlined above, with particular reference to the fact that the grave fills around the two best preserved skeletons (7197 and 7380) were significantly darker than those of the other late burials. Other factors such as length of time prior to burial and undetected materials in the burial environment may also have affected bone preservation.

Demographic data and skeletal indices

The demographic data are presented in Table 12, and the distribution of aged and sexed individuals is plotted in Figure 61c and d. In summary, the burials comprised one young juvenile, three older subadults/young adults and five adults. Of the individuals that could be sexed, three were males, three were females, and two were possible females.

No skulls survived sufficiently intact to allow the calculation of cranial indices. It was possible to estimate the stature of only one female at 1.65 m (*c.* 5 ft 4¾ inch), which is very close to the mean of 1.64 m recorded from SOU 31 and SOU 258 (Pay 1997), and the 1.64m from SOU 13 (Thompson unpublished). Wider comparisons show the Stadium site female being in the upper range of 1.51–1.68 m (mean 1.58 m) from the early Saxon cemetery at Alton, Hampshire (Powers 1988) and the 1.54–1.65

Table 12 Summary of results from the later cemetery and redeposited human bone

Context/grave	*Deposit*	*%skel. /no. frags*	*Skel. element*	*Age and sex*	*Pathology*
7053/7051	burial	*c.* 9%	s.l.	juvenile *c.* 5–7 yr	calculus
7083/7082	burial	*c.*18%	s.a.u.l.	adult *c.* 18–21 yr male	hypolasia
7196/7194	covered/contained burial	*c.*10%	s.a.u.l.	adult *c.* 30–50 yr ?female	amtl; calculus; abscesses; caries; op – atlas
7198/7197	covered/contained burial	*c.*75%	s.a.u.l.	subadult-adult *c* 17–20 yr male	caries; mv – mandibular molars, all 5 cusps; wormian bones
7271/7270	covered burial	*c.*6%	s.a.l.	adult >40 yr ?female	
7303/7300	pit fill	4	1.	adult >18 yr male	
7381/7380	covered/contained burial	*c.*76%	s.a.u.l.	subadult-adult *c.* 17–20 yr female	caries; calculus; *cribra orbitalia*; mv – absence all M3
7385/7383	burial	*c.*40%	s.a.u.l.	subadult-adult *c.* 17–25 yr female	calculus; hypoplasia
7434/7432	burial	*c.*30%	s.a.u.l.	adult *c.* 18–25 yr female	caries; abscesses; periodontal disease; calculus; hypoplasia; mv – metopic suture

Key to Table 12

amtl = ante mortem tooth loss; mv = morphological variation; s.a.u.l. = skull, axial skeleton, upper limb, lower limb

m (mean 1.20 m) from the Portway, Andover, Wiltshire (Henderson 1985). This does at least suggest a lack of nutritional stress in the individual for whom height was estimated.

Platymeric and platycnemic indices were calculated from two female femora and one female tibia. One female femur fell in each range (88.4 eurymeric and 71.9 platymeric). The results suggest a lack of homogeneity within the groups, though with such small numbers the significance of the variation is debatable. The female tibia was in the eurymeric range at 83.6. Comparison within Hamwic is limited by the factors outlined for the inhumation burials in the early cemetery.

Pathological lesions and morphological variations

Pathological lesions were noted in the remains of seven individuals. As with the remains from the early cemetery, the extent and distribution of lesions was limited due to the poor condition of the bone. A summary of the observed lesions is presented in Table 12. The aetiology of some conditions has been presented in the early cemetery sections (Chapter 3).

Dental disease

A total of 118 teeth and 123 tooth positions were recorded within seven dentitions. Dental attrition was similar to that observed in the early cemetery dentitions. Calculus deposits were recorded in four of the seven adult dentitions and in the juvenile dentition; deposits were slight-moderate, the young adult females showing the heaviest deposits. Moderate periodontal disease was observed in one female dentition. A single female dentition showed ante mortem tooth loss (distal teeth), overall rate 2.4%, females 3.2%. The same individual was one of four to have carious lesions, with an overall rate of 5.9%, 7% female, 3% males. Lesions ranged from small cervical defects to total destruction of the crowns and separation of molar root branches. Dental abscesses were seen in two female dentitions, both of which had carious lesions, overall rate 4.1%, 5.8% female. Dental hypoplasia, up to 2–3 faint lines in all crowns, were observed in three dentitions, male and female being similarly affected. See Chapter 3 for a discussion of diet and health status in the early cemetery.

Metabolic disorders

Cribra orbitalia is generally believed to result from a metabolic disorder connected with childhood iron deficiency anaemia; the greater iron requirements of females and immature individuals often results in higher rates amongst these groups (Robledo *et al.* 1995). Four (2 pairs) female orbits survived, one pair with slight porotic lesions (only one orbit survived from the early cemetery, with no lesions). The figures are too low for meaningful comment.

Joint disease

Slight osteophytes (discussed in Chapter 3) were observed on only one (anterior atlas) of the surviving 125 joint surfaces (64 spinal).

Morphological variation

Wormian bones (discussed in Chapter 3) were observed in the remains of one burial (one of four lambdoid sutures). Non-fusion of the frontal suture (metopism) was observed in one of four frontal bones. Variations in mandibular molar cusp form was seen in one (17%) dentition.

The Artefactual Evidence from the Settlement

by Rachel Every, Emma Loader and Lorraine Mepham, with contributions by Phil Andrews, A.D. Morton, D.M. Metcalf, and J.P. Northover

The artefactual assemblage from the Stadium site can be added to the substantial body of data already recovered from sites previously excavated within Hamwic. Some of these site assemblages have been at least partially published (eg, Holdsworth 1980; Andrews 1997), while others have formed the basis of periodic reviews of the archaeological evidence for life in Hamwic (eg, Addyman and Hill 1969; Holdsworth 1976; Morton 1992). Certain categories of material, such as the pottery, metalwork, coins, and glass, have warranted specific detailed publication (Hodges 1981; Andrews 1988; Hinton 1996; Hunter and Heyworth 1998).

It is hoped that the assemblage from the Stadium site, fully quantified on a context by context basis by material type, following the Southampton City Museums recording system for finds, and data entered onto a relational database (Access), will form a valuable resource for future research. Full details of the non-cemetery assemblage are not published here. Specialist reports have been compiled for each material type, and these are available in archive. Table 13 gives the overall totals of all finds by material type, excluding artefacts from the cremation and inhumation cemeteries. A synthesis of the artefactual data is presented here, which considers the evidence for various broad aspects of life within Hamwic. Where appropriate, selected artefacts from the early cemetery assemblage will also be discussed in this section, and it is probable that a small number of artefacts recovered from settlement contexts represent objects disturbed and redeposited from inhumation graves in this cemetery. Where a cemetery

Table 13 Finds totals from settlement contexts, by material type

Material group	*Material type*	*No. pieces*	*Weight (g)*
Stone	flint	1586	35,899
	Stone	1038	154,457
	Gemstones	1	-
Clay	Burnt clay	578	10,542
	Daub	5205	158,445
	Lining	171	17,258
Ceramic	Other ceramics	432	52,856
	Pipeclay	22	68
	Pottery	5740	107,793
Glass	vessels	135	168
	objects	7	7
Metal	Coins	25	-
	Copper alloy	49	-
	Lead	2	-
	Gold	1	-
	Silver	2	-
	Iron	97	-
Mineral waste	Slag	1832	191,897
Vertebrate	Worked bone	159	

origin is likely, in the case of some of the beads for example, this is mentioned below.

Specific questions asked of the Stadium assemblage revolved around how far it confirms (or otherwise) the picture of everyday life in Hamwic built up from other sites in terms of the levels of crafts and industries, the evidence for traded goods, and the domestic trappings of the inhabitants. Given the apparently marginal location of the site, near the presumed north-eastern limit of the town, but close to the shoreline, the pattern of evidence here might be expected to contrast with evidence from sites closer to the centre of the town. In addition, the proximity of the waterfront, just beyond the eastern limit of the site, could also have had an influence on the types of activities conducted and, therefore, the types of objects found.

With reference to the copper-alloy objects, it might be remarked that the Six Dials assemblage (214 objects, less SOU 258; based on Hinton 1996) is notably larger than that from the Stadium (98 objects). Compared by area, the Six Dials assemblage is more than 12 times denser; compared by pit/well, it is nearly four times denser. These are statistically significant differences which, furthermore, cannot be identified when comparisons are made with sites in the south of Hamwic. For example, once the figures have been adjusted to allow for different methods of excavation, the Chapel Road East assemblage (SOUs 7, 8, 11, 14, 16, and 18: 10 objects) is not significantly different either by area or by pit/well number from the Stadium, and the Melbourne Street South (SOUs 4, 5, and 6) assemblage is not significantly different by pit/well number (area estimate not feasible).

Personal Items

The reports on the early cemetery assemblage in Chapter 3 present the evidence for this particular element of the human population of Hamwic, and the rites with which they were interred. The possibility is advanced in discussion below that not only was this an early group but that it represents an elite group, perhaps of Jutish rather than West Saxon origin. The burials in the cemetery, particularly the inhumations, were accompanied by a range of weapons and personal items from which something of the relative wealth, social standing and cultural affinities of this group can be inferred. To this evidence, although mostly later in date, can be added a small quantity of personal items recovered from the settlement, including jewellery and dress items, knives, and combs in a range of material types.

Jewellery

Beads were used for personal adornment, with evidence from graves that they were worn as necklaces (Chapter 3). Beliefs current at the time doubtless gave these items, particularly beads of certain materials including glass and amber, amuletic properties, protecting them from the 'evil eye' (Evison 1987, 66–7). To the 11 beads recovered from the early inhumation burials can be added nine more: seven glass, one amber, and one fired clay. The beads from settlement contexts were recovered from three pits (5339, 5346, 7133) and an overburden layer, all contexts within the West or North Stands, and may be from disturbed inhumation burials; they might just

have been chance losses, but beads in settlement contexts are rare in Hamwic.

The seven glass beads comprise one polychrome and six monochrome, occurring in five forms (Evison 1987, text fig. 11): biconical, coiled, cylinder, melon, and globular. The single polychrome bead is an opaque red biconical form with marvered opaque yellow intersecting arcs.

The opaque yellow coiled beads from pit 5339 (Fig. 63, 1–2) are unusual; one coiled bead, in black glass, is illustrated from the Dover Buckland cemetery (Evison 1987, fig. 11, grave 15:7a), but otherwise parallels are unknown. One of the examples from pit 5339 was found inside a cylindrical bead, but whether this was how it was originally worn or whether its position results from post-depositional movement is unknown.

The melon bead is a Romano-British type, and is presumably residual in this context, although there is always the possibility that this object had been found and deliberately curated during the Saxon period. Other Romano-British items have been found on the site, including objects deliberately placed as grave goods in the early inhumation cemetery.

Five beads came from one pit (5339); one polychrome and three monochrome glass (two coiled and one cylindrical) and one amber. The overburden layer produced one monochrome glass bead and one ceramic bead. The remaining two beads (both monochrome glass) came from pits 5346 and 7133 respectively.

Twenty-two objects of copper-alloy associated with personal adornment or dress were recovered from the settlement, all from pits. This part of the assemblage (together with the evidence from the inhumation cemetery) reflects changes in the dress of individuals during the Anglo-Saxon period – moving away from using pairs of disc or saucer brooches as fasteners on clothes, towards the use of single brooches and pins, many of which have been recovered from Hamwic.

Among the eight pins, polyhedral-headed forms decorated with ring-and-dot motif (type B) are predominant (three examples), with wrythen-headed types (type A2, two examples) also present (Hinton 1996). These are typical types found in the mid- and late Saxon periods, and comparable pins are found on sites throughout England (eg, Addyman and Hill 1969, 68; Waterman 1959, fig. 11; Leahy 2000, 71). The remaining pins were identified by the remains of shafts, though whether these are deliberately headless pins, incomplete pins, or unfinished objects is uncertain (see below).

Other jewellery includes brooches, bracelets, and rings, but none of these are common here. One complete bracelet (Fig. 63, 3) and two possible bracelet fragments were present, although none can be closely dated – this type of bracelet was common during the Roman period, but occurs only occasionally throughout the Saxon period.

Only four brooches were found: one Romano-British and three Anglo-Saxon. The Romano-British brooch is a 1st century AD dolphin type (Crummy 1983, fig. 6, 56). It is not uncommon to find Romano-British objects being re-used (or at least deliberately collected) and discarded or placed within Saxon contexts – there was another example in the early inhumation cemetery. All three of the Anglo-Saxon brooches are of interest here. The first is an equal-arm brooch of 'caterpillar' type (ie, with unexpanded arms), decorated with a ring-and-dot motif (Fig. 63, 4). At least two other 'caterpillar' types are known from Southampton, one from Hamwic and one from the Westgate site within the medieval walls (Hinton 1996, fig. 1, 254/811). This is a well-known continental brooch form, with a date range of 6th–9th centuries, although they do not seem to be found as far west as Hampshire before the end of the 7th century; the Westgate example suggests that the form continued to be worn into the 10th (*ibid.*, 3). The second brooch (Fig. 63, 5) is of an unusual lozengiform type, with incised interlace decoration. This type has recently been identified as of mid-Saxon date (H. Geake, pers. comm.). The interlace on the bow of the brooch is comparable to examples from the British Museum (S. Youngs, pers. comm.), and a similar example, although with ring-and-dot decoration, is known from Sedgeford, Norfolk (Faulkner 2000, 125). These lozengiform brooches can be dated to the 8th or 9th century and are probably fairly local in origin (J. Hines, pers. comm.). The third brooch consists of two sheet metal plates riveted together, and is decorated with a repeating cross motif set in diamonds of punched dots (Fig. 63, 8); no direct parallel for the decorative scheme has been found.

Two rings, both with flat, perforated terminals, are possibly rings from chatelaines (Fig. 63, 6). Penn (2000, 55) discusses the range of objects found as part of chatelaines and cites examples of large rings or 'bracelets' with hook and eye decoration, for example at Caistor St Edmund, Norfolk and Burwell, Cambridgeshire. Other objects that may originally have been part of a chatelaine are the two iron latchlifters or keys (below). Interestingly, only one of the graves in the early inhumation cemetery (5510) produced a possible chatelaine or girdle-group – these groups of objects, generally found with female burials, are generally considered to be indicative of the status of the wearer.

Belt fittings, strapends, and silver mount

Metal objects associated with belt fittings include two iron buckles (one square and one oval), and a small

oval copper-alloy buckle. The latter object is a common find on sites of this period, though they more frequently occur in iron rather than copper alloy, and are usually found in graves rather than discarded in rubbish pits. This may account for the relatively small number recorded from Hamwic.

A lozenge-shaped copper-alloy strapend (Fig. 63, 9) is comparable with Hinton's type C strapends – double-riveted, with flat, convex-sided shafts, animal mask terminals and plain reverses (1996, fig. 16), which have a wide date range from the 7th century, continuing in use through to the 10th. A second strapend is decorated with a ring-and-dot motif along its length.

A silver mount decorated with a ring-and-dot motif and incised lines (Fig. 63, 7) was recovered from pit 2001; the closest parallel from Hamwic appears to be a triangular mount in bronze (Hinton 1996, fig. 22:30/356). The interest in this object lies in its possible evidence for silver working. The object appears to have been deliberately cut across its widest end, perhaps as part of a recycling process. In addition, scratches on the upper surface have the appearance of being deliberately made in antiquity (rather than occurring as accidental post-depositional marks), and may be the result of testing of the object for its silver content. Presumably, therefore, it was not redeposited from a grave.

Needles and pins

There are six bone needles, three complete examples (one with two perforations at one point) and three with broken perforations and/or points. All of the needles are polished through use. They are often described as pig fibula pins (Oakley 1979) and occur throughout the Saxon period. They were probably used as both needles and weaving tools, but may also have been used as hair pins or possibly as dress pins in loosely woven garments (MacGregor 1985, 113). Recent work on the use of modified pig fibula pins suggest that although some were utilised as dress pins, these simple pins were also used as weaving tools (I. Riddler, pers. comm.). There are also five pins, two complete and three shafts tapering to a point. Their small diameters imply that they are pins rather than pin beaters/points.

Combs

The most common personal objects recovered were combs, not surprisingly as these were items of every-day use from the Roman period onwards. All the combs represented here are composite, (ie, made from several separate elements), mainly in antler; the processes used to manufacture these combs have been fully described (eg, MacGregor 1985, 74–5), and their manufacture in Southampton is well attested (below). There are fragments of a maximum of 41 combs, of which the 37 identifiable examples fall into two types, single-sided and double-sided. Iron rivets survive on several and a few are decorated. One example is unfinished. There was a slight, apparent concentration of combs in the areas of the South and West Stands.

The majority of the combs (33 examples) are double-sided, with incised decoration. This form is late Roman in origin, but continued in use into the medieval period and beyond (MacGregor 1985, 92). The single-sided comb was introduced in the 7th century and was in use alongside the double-sided form during the mid-Saxon period – in Southampton double-sided forms were still more popular at this period (Hinton 1980a). By this period double-sided combs had a tendency for both sets of teeth to be similar in size, not coarse and fine as seen in earlier examples (Oakley 1979, 308). Moreover, there is a chronological variation in size, double-sided combs made before the mid-7th century being generally less than 180 mm in length, while those made later were generally longer (Crummy 1988, 23). None of the Stadium site examples, however, survives to a measurable length, although the single unfinished example (Fig. 63, 11) can be estimated at *c.* 175 mm. This is a 'fish-tail' comb with a perforation at one end and simple linear incised decoration.

Four single-sided comb fragments were recovered, two of which have cross-hatched decoration. These have sometimes been assigned to the late Saxon period (eg, Oakley 1979, 308), although more recent work in Canterbury has indicated a 7th to early 8th century date to be more likely (Riddler 1991).

The construction of composite combs and their prolific decoration suggest use on human hair, perhaps to control lice (Oakley 1979, 308; MacGregor 1985, 73). The bone combs from Six Dials are interpreted as hair combs; weft-beating combs are not recognised in Europe from this period (Morton 1992, 57).

Knives

Thirteen complete iron knives were recorded, with a further 32 identified by the presence of blade and/or tang fragments (a total of 42 fragments). The poor condition of the iron makes identification of types difficult. Knives were classified , where possible, using Evison's scheme for the Dover Buckland cemetery assemblage (Evison 1987). Of the 13 complete knives, four were too corroded for classification. Three are of Evison's type 1, which is a common type with a date range from the 5th to the 7th century. Type 2 is possibly represented by one knife, with a similar date range to type 1. One type 3 knife and three possible type 4 knives are all 7th century types. The Hamwic knives from settlement contexts are very unlikely to be of 7th century date, and it seems probable,

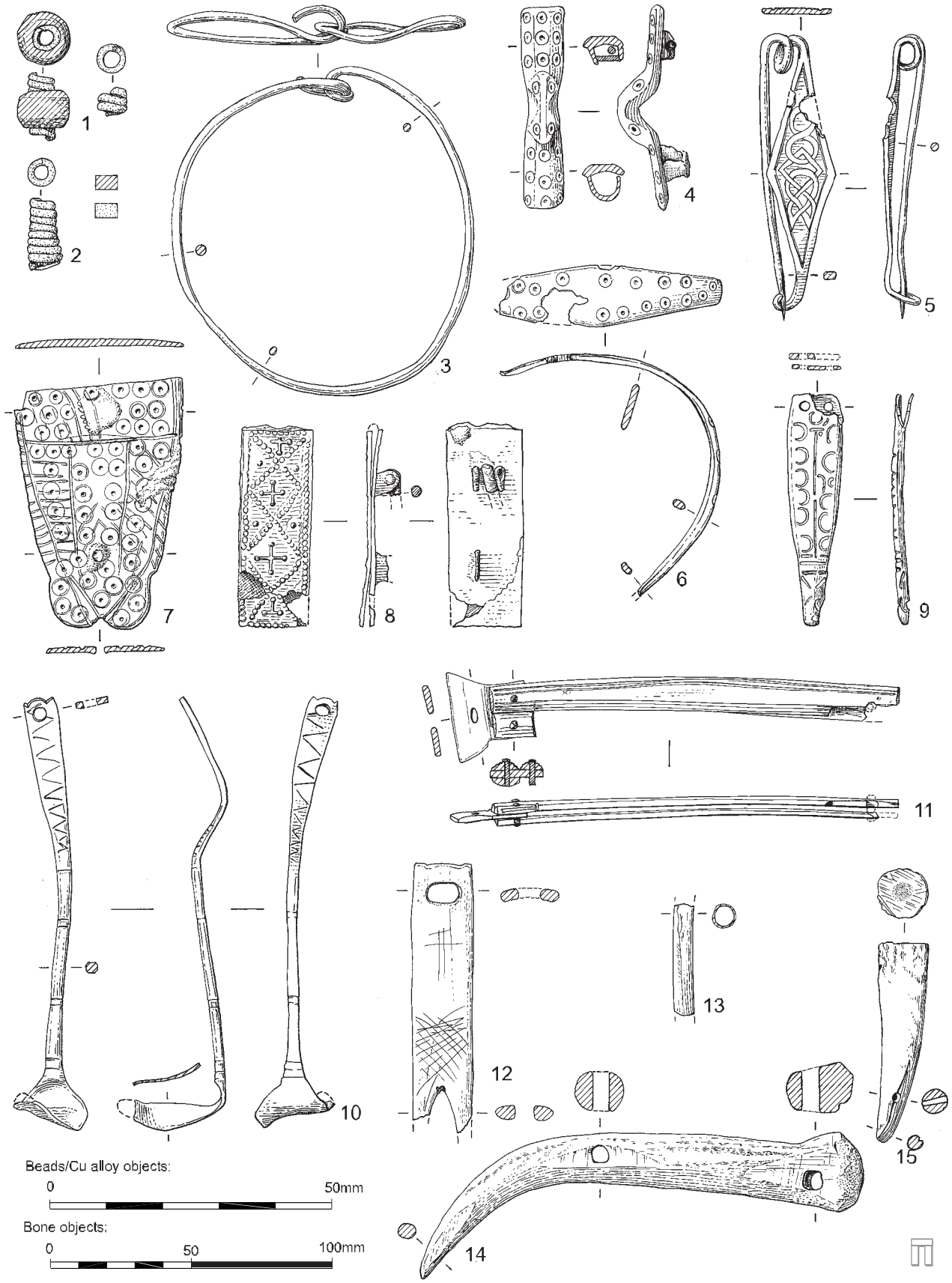

Figure 63 Finds from the settlement: personal items. Objects of glass, copper-alloy and bone

therefore, that the various types continued to be manufactured in to at least the early 8th century. As has been noted above (Chapter 3), the general applicability of Evison's typology is doubtful, but redeposition is a possibility for at least some.

One knife has evidence of copper-alloy or silver corrosion products on its surface, though it is not clear whether this is from a scabbard or from the blade. Another has a thin strip of white metal along the back of the blade on one side. This knife is incomplete, but the strip is probably decorative and is a relatively common feature, generally on knives of 9th rather than 8th century date.

Miscellaneous personal objects

A narrow, flat bone object with a perforation at one end and apparently forked at the other (Fig. 63, 12) could be an ornamented strip or perhaps a weaving tool. Similar examples of ornamental strips have been recovered from York (Waterman 1959, pl. 20: 3).

One highly polished cylindrical bone object has parallels with similar late Saxon objects, which have been suggested as possible mouthpieces for musical instruments, manufactured from goose ulnas (Oakley 1979, fig.141, WB103–4) (Fig. 63, 13).

Other miscellaneous bone objects include a possible cheekpiece (Fig. 63, 14), a type present in other Hamwic assemblages (Addyman and Hill 1969, 77), and a toggle (Fig. 63, 15), both made from antler. The toggle may also have been a 'fid' (see below).

Two other objects, both of copper-alloy, may be mentioned in this category: a spatula or 'spoon' (Fig. 63, 10) and a pair of tweezers. The spatula has a decorated shaft and a perforated handle, presumably for suspension, possibly as part of a girdle group, and there is a possibility that this object was redeposited from a grave. The function of these objects, of which other examples have been found in Hamwic, is uncertain, although the quantity found suggests a routine utilitarian role (Hinton 1996, 56, fig. 24).

Domestic Equipment

This category includes objects that were utilised in a domestic environment, such as eating utensils, lighting materials, and containers. This part of the assemblage is only poorly represented here, although it should be remembered that it must originally have included objects in organic materials (such as containers in wood and leather) which have not survived. Certainly, there are metal fittings here which may derive from such organic containers.

Utensils

A rather crudely made bone spoon with a broken shaft and a shallow bowl (Fig. 64, 2) is one of the very few examples from the site of domestic/eating implements. Saxon bone spoons are rare, although a few 6th/7th century examples are known (MacGregor 1985, 182). A cylindrical decorated handle (possibly from a knife) with cross-hatched design may fall into this category (Fig. 64, 3), as may a simple bone gouge (Fig. 64, 1).

The fourth item in this group is a Romano-British copper-alloy spoon bowl (late 3rd century to mid-4th century AD), recovered from a pit. This object probably represents re-use (or at least deliberate collection) of earlier material.

Lamps

A group of portable stone objects interpreted as lamps were recovered from various features, mainly pits, scattered across the site. Most of these lamps are in shelly limestone, with some in tufa, and are cylindrical with simple, hollowed-out central wells (Fig. 64, 4–6). None, however, shows any signs of burning or sooting. There are examples of similar stone objects from other sites in Southampton (Addyman and Hill 1969, fig. 33, 6), and ceramic examples are also known, although no pottery lamps were identified at the Stadium site. Little is known of the lighting arrangements in Saxon houses and, although a few fragments of window glass have been found in Hamwic, the known structures are unlikely to have been glazed (Hunter and Heyworth 1998, 26).

Containers

Several copper-alloy items may be components of organic (leather or wood) containers, for example boxes. They include a thin, perforated copper-alloy strip from pit 4325 and a folded copper-alloy strip, possibly a rim or edging, perhaps for a vessel, from pit 5309. Another possible fitting, circular with a small perforated terminal at one end, and perforations along one side, came from a slumped floor surface over pit 4325.

Three possible boxes were identified from the presence of their component metal parts. One iron object from pit 2442 may be a lock plate, and is similar to an object from a grave at Chamberlains Barn II, Leighton Buzzard, Bedfordshire (Hyslop 1963, fig. 7:7D). A second object (from feature 2657) could be the remains of a small container constructed of iron, though no parallel has been found. The third object (from pit 6162) is represented by two iron studs attached to a strip, and may derive from a wooden box. In addition, a copper-alloy lock (pit 2307) can be compared to that associated with a box or chest found in a grave at Harford Farm, Caistor St Edmund, Norfolk (Penn 2000, fig 83: grave 7:1a and 1b).

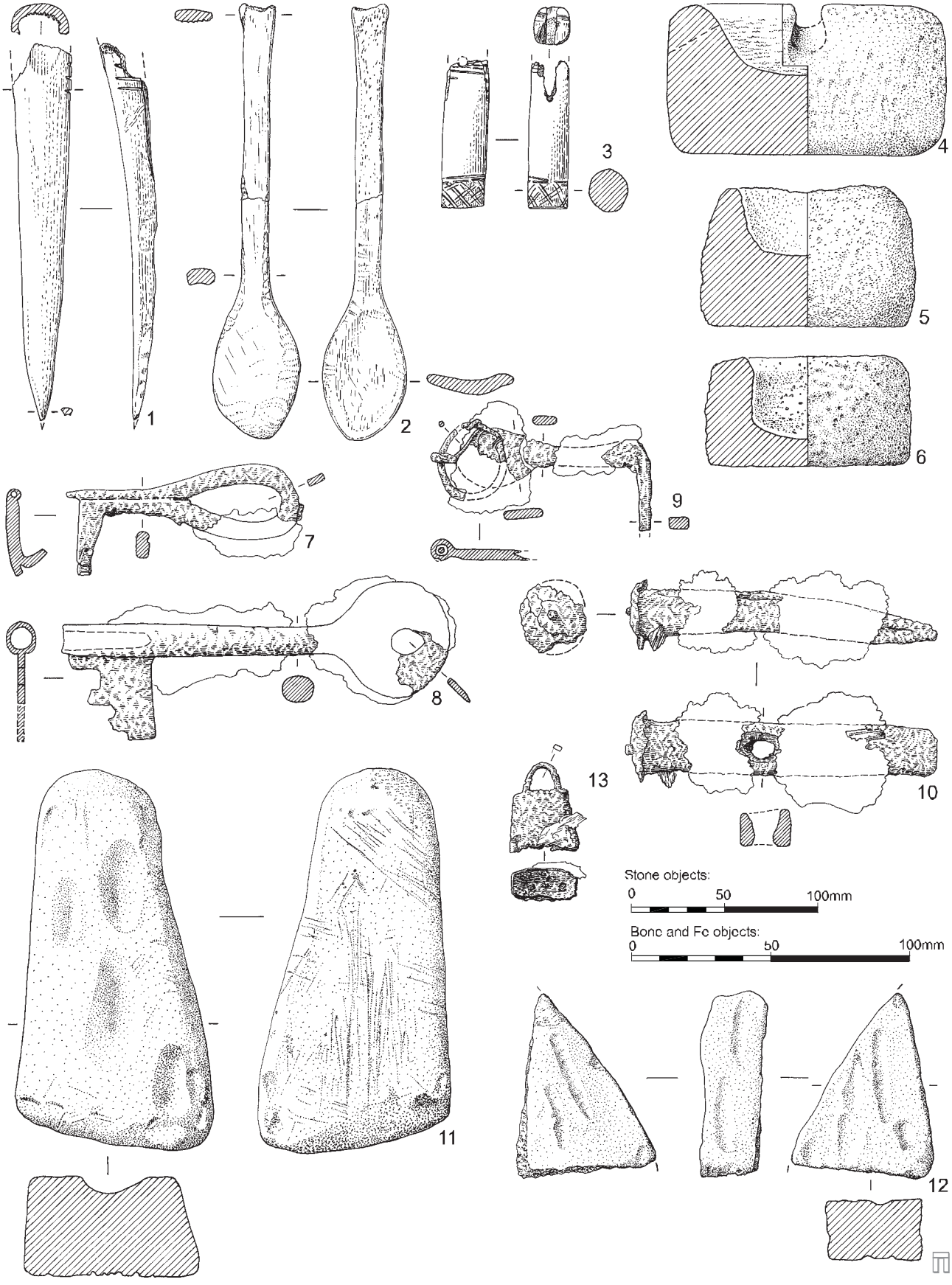

Figure 64 Finds from the settlement: domestic. Objects of bone, iron, and stone

Five thin iron handles, two of them twisted, probably derive from small buckets or similar containers (pits 2307, 2442, 2732, 5253).

It is possible that one or more of the containers represented by the range of fittings recorded here derive from inhumation graves in the early cemetery, and were redeposited in later pits.

Keys

Two complete iron keys were found (Fig. 64, 7–8), plus the bit from a third. The smaller of the two is similar to other keys found in Hamwic which have simple looped handles and single wards (Addyman and Hill 1969, fig 24:14 and 15). The larger example is of a form more akin to medieval keys, with a flat ring-shaped bow, hollow stem and bit with two clefts; this object, however, came from a mid-Saxon context (pit 6162).

Three further iron objects, two of which were found together in a trample layer below the street in the East Stand also fall within this category. These comprise a large T-shaped latchlifter, and an object, possibly a second latchlifter or key, with a right-angled shank and oval-shaped head, attached by a small loop to a suspension ring (Fig. 64, 9). These objects may originally have formed a single group, perhaps a chatelaine or girdle group, of which another possible example came from the early inhumation cemetery (grave 5510). The third object, from a pit in the North Stand (7133) comprises a thin shank with possibly part of the L-shaped or T-shaped head of another latchlifter.

Tools

Five metal tools, all of iron, were recovered and comprise two pairs of shears, a small hammer and two spatulate tools.

Both spatulate tools find parallels in an object from Wigber Low, Derbyshire (Geake 1997, fig 4.38). These objects are the most common tool placed in conversion period graves (*ibid.*, 93), have a date range from the 7th to early 8th century and may, therefore, represent redeposited grave goods at the Stadium site. Their use, however, is somewhat uncertain; Geake cites various possible uses including sharpening steels, knife blanks and firesteels.

The hammerhead (Fig. 64, 10), from a pit in the West Stand, has a square face – now round from burring through use, and a narrow rectangular cross-pein. It may have been used for iron smithing, although such a tool could have been associated with other crafts. There is evidence of iron working on the site (below), but the location of the hammerhead did not coincide with either of the observed concentrations of slag. It is perhaps best described as a small general-purpose hammer for which its owner may have had a specialised use (V. Fell, pers. comm.). Comparable examples were recovered from an Anglo-Saxon smith's grave at Tattershall Thorpe, Lincolnshire (Hinton 2000, 20 and fig. 11, 2) and from Thetford, Norfolk (Wilson 1976, fig. 6.6).

Shears are a relatively common find on Saxon sites and their function ranges from personal use (cutting hair, trimming beards) for smaller examples, to cutting cloth and shearing sheep for larger examples. The two pairs identified at the Stadium site are fragmentary, though are quite large at approx-imately 200 mm in length and were probably, therefore, associated with textile working.

Whetstones would have been everyday implements used to sharpen knives, etc. The 12 examples recovered from the Stadium site, all in fine-grained sandstones, are mainly bar-shaped with roughly rectangular cross-sections. Two are of triangular form, with worn hollows in various faces, and one example also has deep grooves on one face (Fig. 64, 11–12).

Miscellaneous objects

A small iron bell with a suspension loop, missing its clapper (Fig. 64, 13), finds a possible parallel in a similarly shaped bronze object from the Kingsland site (SOU 36: Hinton 1996, fig. 26, 36/117). Hinton cites the occurrence of (small) iron bells in graves of the 6th century or later, but notes that these objects do not necessarily have a religious function (*ibid.*, 62).

Pottery

by Lorraine Mepham

The complete pottery assemblage from the Stadium site, including pottery from both evaluation and excavation stages of fieldwork, comprises 6625 sherds (119,328 g), of which 6375 sherds are of Saxon date (early to late Saxon). This includes 885 sherds (11,535 g) from 19 vessels from the cremation and inhumation cemeteries (see Chapter 3) and 926 sherds (8950 g) of Late Saxon pottery (see below and Chapter 5). Table 14 gives the breakdown of pottery by chronological range.

The mid-Saxon pottery has been analysed as far as possible within the framework of the existing type series for Southampton (Timby 1988), and largely replicates, in terms of the range of fabrics and forms, ceramic data from other sites in Hamwic. The basic record for the entire assemblage comprises the quantification by fabric group (eg, Group I: organic-tempered), with the presence of diagnostic pieces noted but not quantified.

Detailed analysis

Detailed fabric and form analysis has not been carried out on the whole Saxon assemblage, but has focused on two groups of pottery – the vessels from the

Table 14 Chronological breakdown of the pottery assemblage

	Early Cemetery		*Settlement*		*Total*	
Date range	No.	Wt (g)	No.	Wt (g)	No.	Wt (g)
Later prehistoric	0	0	36	177	36	177
Romano-British	0	0	73	795	73	795
Saxon	885	11,535	5490	104,179	6375	115,714
Medieval	0	0	36	983	36	983
Post-medieval	0	0	105	1659	105	1659
Total	885	11,535	5740	107,793	6625	119,328

cemeteries (Chapter 3), and a sample of the remainder of the assemblage, which was presumed to derive from the settlement. The reasons for electing to analyse a sample centred on the fact that this is a relatively small assemblage in comparison with other Hamwic sites.

Few large groups of pottery deriving from single features – the overall pattern of pottery distribution across the site is one of small-scale deposition. Of the 367 features that produced pottery, only 60 yielded more than 25 sherds, and only 20 more than 50 sherds. The potential for examining any functional and/or chronological implications of the spatial patterning of the ceramic assemblage is therefore relatively limited, and it was considered that, in this respect, detailed analysis would be unlikely to refine significantly on the data gathered as part of the basic record.

A sample of at least 20% was considered to be of sufficient size to provide data on which to base meaningful statements about the settlement assemblage. The eleven features producing the largest groups of pottery were selected, resulting in a sample of 888 sherds (20,287 g), which equates to 19% of the total settlement assemblage by number and 21% by weight. These features (all pits or wells) were distributed across the site, although most fell within the area of the North and West Stands (Fig. 40). One fell within the substation evaluation area to the south-west of the main excavation area (SOU1002: pit 10161). Details of the pottery from the 11 selected features are presented in Table 17

Table 15 Mid-Saxon settlement features selected for detailed pottery analysis

Feature	*Fills*	*No. sherds*	*Wt (g)*
10161	10162, 10172–6, 10190–1, 10203–6, 10216–9	62	3044
7269	7249, 7275–84	62	1241
3151	3152–61, 3192	64	1443
2001	2002, 2074–9, 2081–8, 2138–45, 2266–7, 2809, 2854–9, 2887	69	2282
4343	4344–7, 4406–8, 4432	70	1543
7408	7409–23, 7482–6, 7575, 7589	72	928
5309	5310–12, 5314, 5430, 5435, 5437, 5439–40, 5442–3, 5445, 5447–50, 5453	75	2174
5157	5158–9, 5178–80, 5187	86	1345
7616	7617–9, 7717	95	1213
5037	5038–41, 5065–7, 5070–4, 5296–8	100	1801
4447	4448–51, 4496–9, 4505–8, 4523–4	133	3273
1277	1278, 1409	916	8738
Total		888	20,287

Fabrics

All of the fabric groups defined by Timby (1988) are represented at the Stadium site, with the exception of Group VII (calcite-tempered wares), and igneous wares (Group VIII) are present only in very small quantities. Table 16 presents a breakdown of the complete settlement assemblage by fabric group. One fabric type, represented by a single sherd, is not represented amongst the existing mid-Saxon fabric series, and does not appear to fit within any of the fabric groups; it contains prominent inclusions of iron oxide. Table 17 gives the proportions of the mid-Saxon fabric groups by number and by weight of sherds. It also includes overall percentages for Hamwic (calculated from Timby 1988, table 6).

Table 16 Breakdown of settlement pottery assemblage by fabric group

	Scan		*Detailed analysis*		*Total*	
Fabric group	*No.*	*Wt (g)*	*No.*	*Wt (g)*	*No.*	*Wt (g)*
Prehistoric	36	177	0	0	36	177
Romano-British	64	695	9	100	73	795
I: organic	168	2985	83	1959	251	4944
II: chalk	490	8818	148	2818	638	11,636
III: sandy	1120	18,495	179	3640	1299	22,135
IV: mixed grit	822	19,109	251	5208	1073	24,398
V: shelly	91	2153	0	0	91	2153
VI: flint	229	4636	79	971	308	5607
VIII: igneous	0	0	4	112	4	112
IX: imports	766	18,814	133	5389	899	24,203
Iron oxides	0	0	1	41	1	41
Later Saxon	9	163	917	8787	926	8950
Medieval	36	983	0	0	36	983
Post-medieval	105	1659	0	0	105	1659
Total	3936	78,769	1804	29,025	5740	107,793

The site produced a relatively high proportion of imported wares (see Table 17: 19.7% by number; 25.4% by weight). Fabric types identified include examples of Hodges' (1981) classes 11 (Seine Valley), 13 (East Belgium), 14 (black wares from various sources in northern France or the Meuse valley), 15 (greywares from various sources in northern France), 23 (Alsace) and 31 (source unknown), as well as one possibly related to Badorf ware (Timby 1988, fabric 201). Of these, the blackwares are the most common (54 sherds), followed by greywares (29 sherds).

Vessel forms

From the settlement assemblage, no complete profiles could be reconstructed, and amongst the partial profiles little variation was observed. Most of the coarseware vessel forms present are jars (a minimum of 358 examples, mainly in chalk, sandy, and mixed-grit wares), with either convex or rounded profiles, and everted rims (Fig. 65, 1–6). Several variants were defined, although these varied merely in minor variations of rim profile (details in archive); all find parallels within the published assemblages from Hamwic (Timby 1988, figs 2–8).

Only a few bowls were recognised (four examples, sandy and mixed grit wares); one very small example is classified here as a cup (mixed grit ware). There is a fragment of a slightly curving, tubular spout in a chalk-tempered fabric (compare Timby 1988, fig. 6, 108).

Imported ware forms likewise consist mainly of jars (minimum of 49 examples; parallels include Timby 1988, nos 197, 234–5, 264, and 274; Fig. 66, 1), with a smaller quantity of bowls (minimum of 12 examples; parallels include Timby nos 184, 186, 195, 199, 271), and pitchers (nine examples; Fig. 66, 2). Vessel totals, based on rim/handle sherds, for the settlement sample are given in Table 18.

Decoration

The incidence of decorated vessels is low. There are only seven examples of decorated coarsewares: five sherds stamped (three with 'hot cross bun' or 'clover leaf' motifs, one with open circles, and one with combined open circles and dots), one with furrowed lines and one with a finger impressed rim. All the stamped motifs are well known elsewhere in Hamwic, including the combination of circles and dots (eg, Hodges 1981, fig. 2, 5: 7), and have also been found on antler dies (Timby 1988, fig. 18). A small proportion of the imported wares are rouletted (whitewares, greywares, and blackwares).

Chronology

Earlier studies of the pottery from Hamwic (Timby 1988; Timby with Andrews 1997) have suggested that

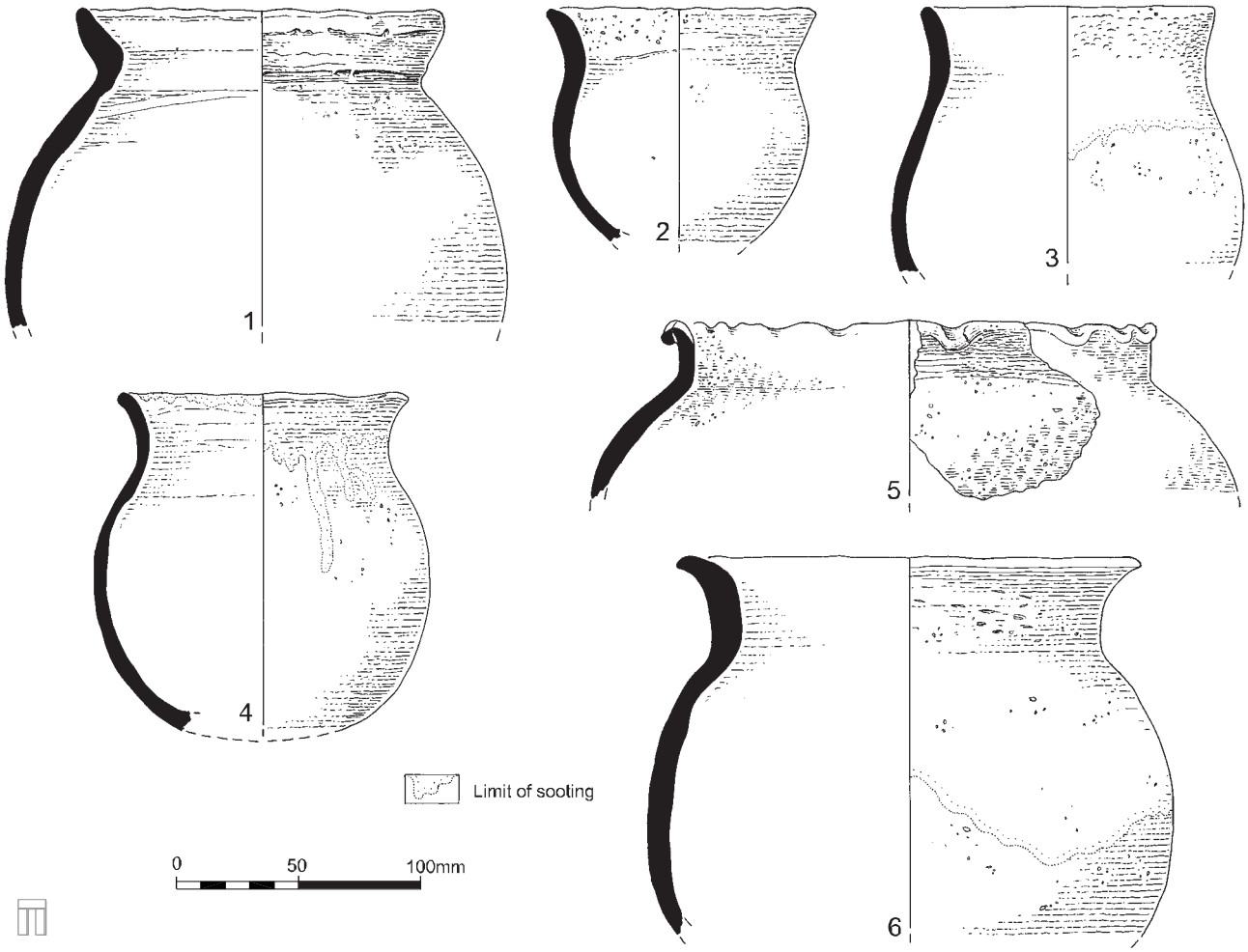

Figure 65 Finds from the settlement: pottery. Coarseware vessel forms

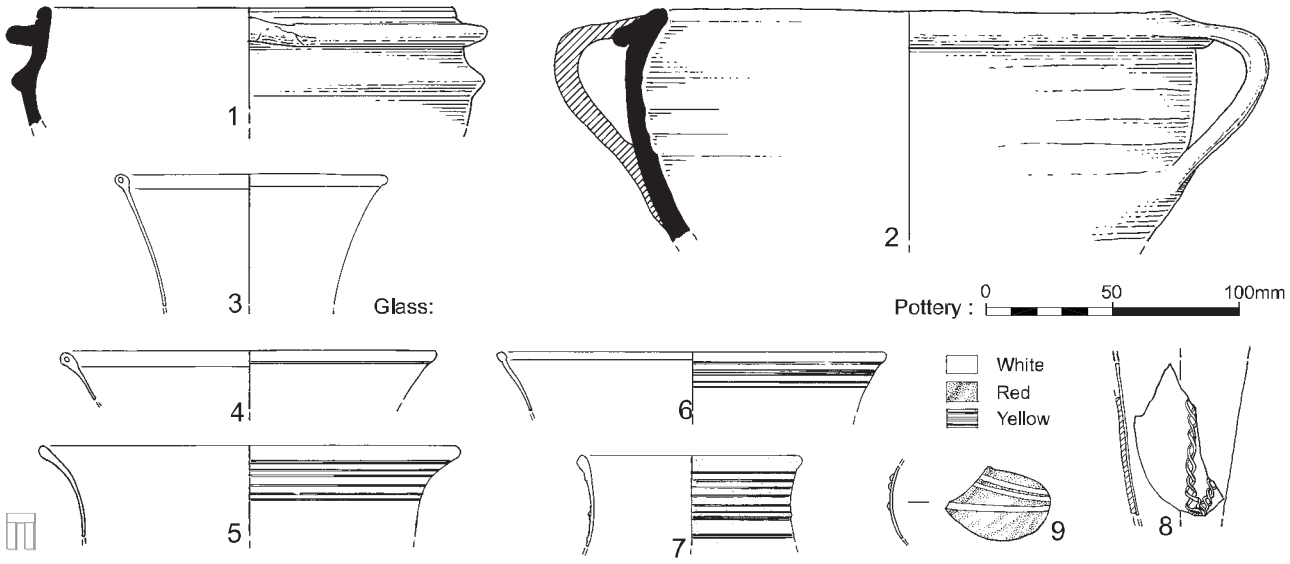

Figure 66 Finds from the settlement: imported pottery and glass

Table 17 Middle Saxon fabric groups (settlement assemblage)

Fabric group	*No. sherds*	*% by no.*	*overall Hamwic %*	*Wt (g)*	*% by wt*	*Overall Hamwic %*
I: organic	251	5.5	6.1	4944	5.2	7.0
II: chalk	638	14.0	17.0	11,636	12.2	14.9
III: sandy	1299	28.5	30.9	22,135	23.2	28.9
IV: mixed grit	1073	23.5	27.2	24,398	25.6	27.2
V: shelly	91	2.0	1.5	2153	2.3	1.6
VI: flint	308	6.6	1.8	5607	5.9	2.1
VII: calcite	0	0	0.1		-	0.2
VIII: igneous	4	0.1	0.1	112	0.1	0.1
IX: imports	899	19.7	15.2	24,203	25.4	17.9
Iron oxides	1	<0.1	-	41	0.1	-
Total	4564			24,356		

the mid-Saxon sequence can be broken down into three ceramic phases, each of which is very tentatively dated, as summarised below:

Ceramic phase 1 (end of 7th century–mid 8th century): organic-tempered wares predominate; imports (particularly blackwares) are present from earliest contexts

Ceramic phase 2 (mid 8th century–early/mid 9th century): sandy wares predominate; chalk-tempered wares appear; mixed-grit wares appear but are still a minor component. Imports are still present (particularly grey-wares) but make up a smaller proportion than in ceramic phase 1.

Ceramic phase 3 (early/mid 9th century–?10th century): mixed-grit wares completely dominate the assemblage; there are smaller quantities of shelly and flint-tempered wares; also locally produced stamped wares. A small quantity of imports is still present.

Timby also suggested that the 'late' wares could be broken into two periods, depending on the presence of certain imported types, such as Beauvais ware and other red-painted types which might be attributed to the later 9th or 10th centuries (1988, 114). These wares are absent from the Stadium site, which suggests that there is little here which can be dated later than around the middle of the 9th century.

The ceramic phasing, together with the coin evidence, and the few scientific dates that are available, has been used as the basis for the subdivision of the mid-Saxon occupation of Hamwic into

Table 18 Vessel form by fabric group (detailed analysis)

	Coarsewares				*Imports*		
Type	*I*	*II*	*III*	*IV*	*VI*	*IX*	*Total*
Jars							
Convex profile	-	2	3	3	-	-	8
Rounded profile	4	3	7	3	1	2	20
Profile unknown	-	-	-	-	-	1	1
Handled jar	-	-	-	-	-	1	1
Handled jar/pitcher	-	-	-	-	-	5	5
Bowls							
Flanged bowl	-	-	-	-	-	2	2
Total	4	5	10	6	1	11	37

'early' (CP 1), 'middle' (CP 2), and 'late' (CP 3), although it is recognised that it is impossible to be precise about the sequence (Andrews 1997, 13–14).

Using this sequence, then, all settlement contexts producing pottery have been phased. This must be recognised as a very crude indicator of date – in most cases quantities are far too small to be statistically viable. The quantity of other datable finds (such as coins) is low, and there is a relatively low incidence of stratigraphic relationships between features and deposits. Moreover, from the nature of the settlement assemblage (fragmentary, with mixed context groups comprising small parts of different vessels), it is apparent that pottery (and other materials) deposited in pits and other features represents secondary or even tertiary refuse, and therefore not necessarily contemporary with its final deposition. It must also be recognised that there may be a wide chronological difference between earliest and latest fills of pits – some of the pits at Six Dials, for example, may have remained open intermittently for up to a century (Andrews 1997, 174), and stratigraphic evidence from the pits on the Stadium site indicates that at least some of these features could have functioned over an equivalent timespan (see above).

Distribution

by A.D. Morton

In this section, all numerical data about the pottery from elsewhere in Hamwic are derived from Timby (1988), especially her tables 5 and 6, but are sometimes modified, where particular calculations are necessary, by the more detailed information published in the microfiche supplement. Where differences are stated to be significant or not, the statistical test used was chi-square ($\alpha = 0.05$). The statistical tests form part of the site archive, curated by Southampton City Museums.

Timby (1988, 120) stated that:

> 'By looking at both the range and the differing quantities of various fabric groups in individual features a pattern of archaeologically attested events through time is beginning to emerge for Middle Saxon Hamwic. This picture is still only an outline and many pieces of the "jigsaw" are still missing. Should excavation on the scale and level of detail undertaken in the Six Dials area be possible in the waterfront area, a number of the questions raised above may be answered.'

With the Stadium excavation, a large unit of land along-side the River Itchen has finally been investigated. The work can be understood, in Timby's terms, as an important piece of the jigsaw and it is appropriate to treat the evidence from the new site as a considerable augmentation and refinement of the Hamwic evidence.

In comparing data recovered from a diverse range of sites excavated to varying standards across several decades, Timby minimised the likely effect of these differences by comparing the relative percentages of discrete site assemblages. Despite criticism of the methodology for its not taking account of 'the relative size of each assemblage' (Brown 1997, 110), there still are advantages to be gained from using this form of comparison and it is followed below. Nevertheless, the objections also have validity and absolute numbers have been compared. This is a less straightforward matter than Brown indicates: the scores have first to be amended to take account of the size of an excavation or the density of occupation on a site. (This was not an option available to Timby, whose essay on the Hamwic pot was published well before the site-formation data appeared as Morton 1992 and Andrews 1997.)

Excavation size is largely a matter of calculating the area opened and amending the figure to take account of particular circumstance. For instance, at some sites parts were left unexcavated. Other sites consisted partly of a watching brief, from which lower rates of recovery can be expected, and those parts must be excluded from the calculation of area; with a corresponding deletion of any pot recovered from the watching brief. Partial excavation may also be a deliberate policy. Where pits were half-sectioned as a matter of course, most importantly at the Stadium and at Six Dials, the figures must be amended. In this case, rather than diminish the estimate of area, in practice it is simpler to double the size of the assemblages.

Although a reasonably accurate estimate of building numbers is possible on certain sites or certain blocks of sites, elsewhere – for instance at the Stadium – direct evidence of buildings is likely to have been lost to later disturbance. Other features then have to be used to calculate occupation evidence. Because of their much larger size, pits and wells are usually a more easily comparable feature of a site, and they may be taken as a general guide. Wells directly relate to occupation in the vicinity, though their existence will not predict the density of occupation. It is argued in this volume, as it has previously been argued by Morton (1992, 45), that many of the rubbish pits found on a site were initially dug to excavate a supply of brickearth, used for a variety of domestic purposes. For instance, Andrews (1997, 49) calculates that the brickearth excavated as two large pits would have been sufficient to produce daub for a building 10 m long and 5 m wide. The precise correlation of pits on site will differ according to local circumstance (Morton 1992, 45), and this has to be recognised. Also, small sites will tend to be more

sensitive to edge effect, where a larger proportion of pits will be incompletely exposed than on large sites, with a corresponding diminution of the recovered assemblage. Using pits and wells as a guide to occupation density does not allow the making of tight chronological distinctions because of the longevity of a pit fill: Morton (1992, 43) suggests that periods of more than 50 years may be represented and Andrews (1997, 176) suggests that these periods can be greater than 100 years. Nevertheless, provided allowance is made for local variation, pits and wells may be used as a broad indicator of occupation density on a site. In calculating the figures, pits not archaeologically excavated must again be deleted from the count, along with any pottery recovered from them. (Full details of these amendments are contained in the site archive).

Early wares

Timby (1988, 111) points out that:

> 'certain stratigraphically early contexts tend to contain a recurring pattern of fabrics. The most significant fabric group present is Group I, the organic-tempered wares.'

The evidence from the Stadium site does not contradict her conclusions and the distribution of Group-I wares has been looked at as a convenient guide to early mid-Saxon occupation here. In Hamwic as a whole, Timby found that Group-I wares formed 6% by sherd number of the entire assemblage and 7% by weight, but also stated that this density increased in sites 'adjacent to the waterfront' (*ibid.*, 117 and tables 5–6). She was referring specifically to many of the sites excavated around the eastern end of Chapel Road, some 500 m to the south of the Stadium and close to the River Itchen. Individual sites within that zone, such as SOU 8, produce very much higher amounts of Group-I wares (43% by sherd number of the site assemblage, 42% by weight), but individually these are small sites with small assemblages (a total of 196 sherds at SOU 8, weighing 2064 g) and it is clearly preferable to aggregate neighbouring sites into a larger unit. Doing this produces less dramatic figures, though the percentages remain significantly greater than the Hamwic mean. At the sites excavated around the eastern end of Chapel Road (SOUs 7, 8, 11, 14, 16, and 18), Group-I wares form 9% by sherd number of the assemblage, 11% by weight.

However, despite Timby's claims for a concentration of Group-I wares in this south-east corner of Hamwic, one should note that the Chapel Road East percentages are not significantly different from that at several inland sites: just south of the Stadium (Melbourne Street South, SOUs 4–6: 10% and 10%); and at Six Dials, some 300 m inland of the Stadium (7% and 8%). Rather than there being a tendency for the higher site percentage of Group-I wares at the waterfront, it appears to be spread across a number of different areas of Hamwic. There are some significant variations within this band (for instance at the Clifford Street sites, SOUs 15, 32, and 39, where Group-I wares are only 2% of the site assemblage by sherd number, 3% by weight). Nevertheless, it is arguable that across a number of zones in Hamwic, from inland sites in the north-west of the town to waterfront sites in the south-east, Group-I wares form a regular percentage of the site assemblage. (The smallness of the Clifford Street percentages, especially at SOUs 15 and 32, may be seen as a local anomaly: an early 8th century cemetery filled a sizeable part of SOU 32 and contemporary occupation of the site was constrained by that fact.)

A closely similar picture emerges if, instead of comparing percentages, one looks at the absolute quantities of pottery, but correcting them to allow for the density of other occupation evidence on each site. To the nearest whole number, at Chapel Road East, Melbourne Street South and Six Dials the mean number is five sherds per pit or well, with mean weights of between 70 g and 83 g. The differences are not significant. (Unfortunately, owing to their methods of excavation, the larger two of the three Clifford Street sites do not lend themselves to this method of comparison.)

However, neither of these tests provides information about the relative density of occupation at the various sites. A comparison of the absolute quantities, corrected to allow for the size of the area excavated, provides important information. Out of the site-blocks chosen it is possible to compare only Chapel Road East and Six Dials (a large number of unexcavated pits at SOU 6 makes it difficult to estimate a satisfactory site area for Melbourne Road South). At Chapel Road East, the amounts of Group-I wares per 100 m² are 27 sherds weighing 453 g. At Six Dials, significantly, the figures are nearly double that: 53 sherds weighing 828 g.

What these three groups of figures suggest is that the densest occupation in the early mid-Saxon period was centred around Six Dials, inland, in the north-west of Hamwic. There were other zones of early mid-Saxon occupation stretching as far as the riverside in the south-east, where qualitatively the occupation was similar to that at Six Dials, but was not as dense.

A very different picture is presented by the Stadium site, where Group-I wares are 5% both by sherd number and by weight of the site assemblage. Although significantly higher than at Clifford Street, the percentages are significantly lower than at Chapel Road East, Melbourne Road South and Six Dials. The mean quantity per pit/well is also significantly

lower than at those three site blocks: a fifth of the sherd number at Chapel Road East, Melbourne Street South and Six Dials; and between a third and a quarter of the weight. Where the site blocks permit comparison of the Group-I wares by site area, the Stadium site is again found to be significantly lower. At Chapel Road East Group-I wares are five times more common by sherd number, three times by weight; and at Six Dials 13 times more common by sherd number, eight times by weight.

The differences both in percentage terms and relative to the density of other occupation evidence indicate the relative scarcity of the Group-I wares at the Stadium and suggest that mid-Saxon occupation of the area was slow to establish. The comparison by area emphasises its absolute scarcity.

The distribution of early pottery at the Stadium provides further evidence. Twenty-five features produced only wares of Ceramic Phase 1, and although these were spread across most of the site (except for the North Stand area), none contained more than six sherds and most yielded only a single sherd. Two of the eleven features whose assemblages were studied in detail had wares of CP 1 in the lower fills (2001 and 10161). They were both at the southern end of the area. This distribution contrasts with the general spread features largely containing middle-phase CP2 wares (Fig. 40) and tends to suggests both that early mid-Saxon occupation at the Stadium was limited and that it was focused to the south. As may have been the case at Clifford Street, it is possible the cemetery was a constraining factor early in the 8th century at the Stadium site.

Late wares

Timby (1988, 114) states that:

> 'certain layers forming the uppermost fills of pits ... contain a recurring ... range of pottery fabrics. These tend to be heavily biased towards the mixed-grit wares, Group IV, and account for the greater part of the shell-tempered and flint-tempered wares (Groups V and VI respectively). ... The mixed-grit wares, Group IV, frequently contribute more than 50% by weight of the total assemblage from the later features.'

Timby (*ibid.*, 117–8) uses the distribution of Group-IV wares as a pointer to late occupation in Hamwic. She finds that, in Hamwic as a whole, they form a substantial 27% of the assemblage both by sherd number and by weight. At some sites, these percentages are considerably greater again (to take two examples, at SOU 32 they are 49% by sherd number and 44% by weight; and at SOU 34 they are 41% and 45%). As the sites with the larger percentages of Group-IV wares are located in the centre and north-west of Hamwic, Timby (*ibid.*, 117) argues that this signals 'a shift in the focus of Hamwic, perhaps hinting at a decline of the waterfront area'. However, it can be argued that the large size of the percentages at SOU 32 really reflects a correspondingly low percentage of early wares (see above); and again there are some large variations between neighbouring sites (at SOU 34, adjacent to SOU 35, the corresponding figures are 22% by sherd number and 28% by weight). Therefore it is clearly preferable to aggregate neighbouring sites into a larger unit.

The three site-blocks previously used produce small but significant differences. At Chapel Road East, Group-IV wares comprise 20% of the site assemblage by sherd number, 18% by weight; at Melbourne Street South the figures are 22% and 21%; and at Six Dials they are 27% and 26%. These figures do point to an increase from the south-east to the north-west, but that does not necessarily also imply a decline of the waterfont. On the contrary, the percentages can be read as indicating an absolute increase in the density of late occupation in the south-east of Hamwic near to the River Itchen: the percentages of Group-IV wares at Chapel Road East are roughly double those of the early Group-I wares.

Correcting the quantities recovered to take account of the density of other occupation evidence refines the picture of an absolute increase across Hamwic. At Chapel Road East, the mean figure per pit or well is 12 sherds weighing 198 g; at Melbourne Street South it is 11 sherds weighing 163 g; and at Six Dials it is 19 sherds weighing 274 g. The differences between Chapel Road East and Melbourne Street South are not significant; those between Six Dials and the other site blocks are significant. Comparison with the Group-I figures suggests an absolute increase of just over double across much of Hamwic, with a considerably greater increase in the north-west. The picture is similar to that suggested by Timby, except that there is no cause to believe that the waterfront area was being abandoned.

As already explained, correcting the quantities recovered by site-area allows a comparison between only the south-east and north-west. At Chapel Road East, the amounts of Group-IV wares per 100 m^2 are 52 sherds weighing 837 g. At Six Dials, the figures are significantly larger: 206 sherds weighing 2940 g. Comparison with the corresponding figures for Group-I wares provides a picture similar to that provided by the pit/well ratio. Again, an absolute increase of late wares over early wares at Chapel Road East is confirmed: the later figures are almost double the earlier ones. And again the Six Dials figures underline the fact that the greatest increase is in the north-west of Hamwic.

Whereas the Stadium in the early mid-Saxon period appeared to be virtually empty in comparison with other parts of Hamwic, the contrasts provided by the Group-IV wares are much less stark. Group-IV wares are 24% by sherd number and 26% by weight of the site assemblage, close to the overall Hamwic percentages. The percentages are slightly larger than at Chapel Road East and at Melbourne Street South, and slightly lower than at Six Dials (but all the differences are significant). However, a straightforward comparison of these percentages is of very little value here, mainly because the percentage of Group-IV pottery at the Stadium will be artificially inflated as a result of the Group-I percentage being very low. A more accurate picture will be gained by comparing the size of the site assemblage against the density of other occupation evidence, and against the area of the site. The mean number of Group-IV sherds per pit or well at the Stadium site is 5, weighing 107 g, significantly higher amounts than the mean number of Group-I sherds. Of course, the amounts per 100 m² at the Stadium are also significantly higher: 15 sherds weighing 337 g. In all cases, the Group-IV figures show a five-fold increase over the Group-I figures. This is a larger increase than is found at Chapel Road East, Melbourne Street South or Six Dials. Although the increase is a genuine one, and therefore points to a greater intensity of occupation, its importance must not be over-stressed. The Group-IV figures (corrected for pits and wells and for the site area) are still significantly smaller than at Chapel Road East, Melbourne Street South and Six Dials. In fact, many of the figures for Group-IV wares at the Stadium (corrected for pits/wells or for area) are similar to the figures for Group-I wares at Chapel Road East. One may conclude, then, that although there is a great deal more evidence for late mid-Saxon occupation at the Stadium, it remains comparatively low.

Further evidence is provided by the 11 features whose assemblages were studied in detail (Fig. 40). Unlike the two early features (CP1), which were located in the south of the site, and unlike the five middle-period features (CP2), which were spread across the site, the four features that largely produced late-phase pottery (CP3) are clustered in the north-west corner of the site. This may be taken as support for Timby's argument for a shift of the late wares to the north-west, but it is still a surprising pattern given the absolute increase of Group-IV wares in the sites to the south of the Stadium. Possibly it marks the retrenchment of occupation into discrete areas.

Imported wares

The classification of Group-IX (Continental-import) wares recovered from Hamwic was set out almost a quarter of a century ago (Hodges 1981, 14–38) and those definitions have not been critically rescrutinised although details have been refined (Timby 1988, 74). Certain late wares such as Beauvais ware and Tating ware are chronologically distinct, but as a generality Timby (*ibid.,* 117–8) suggests that 'the earlier deposits contain a greater percentage of imports' but also points out that the Group-IX wares 'span the entire period of occupation.' No attempt is made here to separate the imported wares from the Stadium into chronological groups. In the first place, the late imports are not present in the Stadium assemblage. In the second place, although the link between early contexts and imported pottery is true for Six Dials, for whatever reason (Andrews 1997, 207–8), nothing suggests that it is true for the entirety of Hamwic.

Timby finds that the Group-IX wares form 15% of the total assemblage by sherd number, and 18% by weight, and notes that site assemblages at many sites in the south-east of Hamwic are dominated by these wares. For example, at SOU 7 Group-IX wares are 66% of the site assemblage by sherd number and 71% by weight; and at SOU 16 they are 84% and 82%. Impressive as these figures are (probably demonstrating that whatever activity actually took place at those sites was dominated by the use of imported pottery), in themselves they do not necessarily indicate that commercial activity was focused on this part of Hamwic. As Brown (1997, 110) has pointed out, the absolute quantities of pottery are much smaller than the percentages might suggest. At SOUs 7 and 16, the total number of sherds is 154, weighing 2904 g. It would anyway give a more balanced picture to aggregate blocks of sites. At Chapel Road East, Group-IX wares are 20% of the group assemblage by sherd number, 23% by weight. At Melbourne Street South, the figures are 19% and 19%; and at Six Dials they are 13% and 15%. Though relatively small, the differences between the site blocks are significant, except for the percentages of sherd numbers at Chapel Road East and Melbourne Street South.

Although these differences tend to suggest a slight but significant bias towards the south-west, a different picture emerges when absolute figures are considered relative to the density of other occupation evidence, and to site area. At Chapel Road East, there is a mean of 11 sherds per pit/well, weighing 172 g; at Melbourne Street South a mean of ten sherds weighing 139 g; and at Six Dials a mean of nine sherds weighing 154 g. None of these differences is significant. A generally similar picture emerges when the size of sites is taken into account but, at Chapel Road East, the amounts per 100 m² are 59 sherds weighing 935 g; and they are nearly twice as great at Six Dials (102 sherds weighing 1657 g). The combined figures, then, suggest a substantively even

deposition of Group-IX pottery across Hamwic, but biased to the north-west, within the entire lifetime of the settlement. The slight increase of Group-IX wares in the site-assemblage percentages to the south-west evidently does not point to an absolutely greater commercial use of the south-west part of Hamwic, adjacent to the river. Instead, the increase presumably can be ascribed to the fact that those assemblages contain a lesser amount of other types of pottery (it has already been shown that these site blocks contain fewer Group-I and Group-IV wares).

Group-IX wares at the Stadium constitute 20% of the site assemblage by sherd number, 25% by weight. These are not significantly different from the percentages at Chapel Road East. By weight, the Stadium has a significantly higher percentage of imported pottery than at Melbourne Street South, but there is no significant difference in the sherd-number percentages. It appears, then, that the Stadium site fits reasonably closely into the pattern established by Melbourne Street South and Chapel Road, and one might conclude that, within the neighbourhood of the Stadium site, the use made of pots imported from the Continent is roughly the same.

However, as has already been demonstrated, the overall size of the pottery assemblage at the Stadium site is relatively small, and it follows that similar percentages do not signify a similarly large amount of Group-IX wares. The mean number of Group-IX sherds per pit or well at the Stadium site is four, weighing 106 g. These are significantly lower than at Chapel Road East, Melbourne Street South, and Six Dials (with one exception: the mean weights at the Stadium site and at Melbourne Street South are not significantly different). When a correction is made to allow for the size of the different site blocks, the difference is even more marked. At the Stadium site per 100m² there are 12 sherds weighing 334 g, significantly lower amounts than at Chapel Road East and Six Dials. The most likely conclusion to be drawn from these separate ways of calculating the figures is that, although the use made of imported pottery at the Stadium site did not substantively differ from other sites in the neighbourhood, there was actually a lower density of occupation which is reflected in the absolute quantities of Group-IX pottery used and discarded on the site.

The distribution of imports at the Stadium site shows one concentration in the South Stand (in the area of the highest density of pits), another at the western end of the North Stand, and a loose cluster across the East Stand. Apart from noting that there is no obvious concentration towards the waterfront, one may also suggest that the wide spread of Group-IX wares across the site mirrors that of their spread across Hamwic.

Conclusions

The arguments presented here about the nature of occupation in Hamwic derive from a comparison of the pottery recovered at three site blocks located roughly on an axis running inland and in the north-west at Six Dials down to the riverside area in the south-east at Chapel Road East. Where this axis most nearly approaches the Stadium site, at Melbourne Street South, unfortunately it is not been possible to make as many comparisons. Nevertheless, it has still been possible to make a straightforward comparison of site assemblages and to compare absolute numbers against occupation-density evidence.

It is suggested that, although early wares are extensively spread across Hamwic, their greatest density is at Six Dials, and this is possibly because denser occupation in the early mid-Saxon period was focused inland. It is also suggested that the existence of early cemeteries limited the areas that might be occupied at that time, and that this fact is at least partly responsible for the very low amounts of Group-I wares recovered from the Stadium. Their effective limitation to the south of the site probably reflects an off-site focus of occupation.

The late wares point to an absolute increase in quantity across all site blocks studied, but with the greatest density remaining at Six Dials. There is no cause to suppose a decline at any part of the settlement (the reverse seems more likely to be the case), though the particular distribution of Group-IV wares at the Stadium site may indicate a separation of occupation into less cohesive and more discrete groupings. With greater amounts of late wares recovered at the Stadium, the implication is that occupation density continued to increase there. Nevertheless, although there is an absolute increase in quantities, it remains the case that amounts at the Stadium site are significantly lower than at the other site blocks.

Previous discussions of the imported pottery recovered from Hamwic have been based on the perception that the material is concentrated in a small area adjacent to the river, and the suggestion has regularly been made that the pottery was being imported to serve a group of merchants residing in a localised part of Hamwic (Hodges 1982, 57–8; Timby 1988, 110; Morton 1992, 67). However, the evidence presented here strongly supports Brown's contention that imported pottery is spread throughout the settlement (Brown 1997, 110). One must be cautious in interpreting this fact. Because the Group-IX wares are generally not chronologically specific, in this case

effectively one is looking at perhaps two centuries of accumulated pottery-use, and such a time-scale may obscure shorter-term concentrations of Group-IX wares. For instance, as has already been noted, early contexts at Six Dials tend to contain more imported pottery than later ones. Nevertheless, the further evidence presented here for the wide spread of the imported pottery considerably weakens the usual explanation of the appearance of imported pottery in Hamwic, and equally strengthens the force of Brown's objections. At the Stadium site, the general pattern of use and discard of imported pottery appears to be repeated, but on a smaller scale, in accordance with the generally lower amounts of pottery recovered from the site.

Ceramic Building Material and Fired Clay

Most of the ceramic building material (brick and tile) recovered is of definite or probable Romano-British date, and includes identifiable fragments of *tegula* and *imbrex* roof tiles as well as combed flue tiles. This material was all recovered from mid-Saxon features and, given the small quantity of other Romano-British artefacts from the site, is likely to represent building material brought from nearby Roman sites (the main settlement at Bitterne Manor being little more than 1 km away) for re-use. The spatial distribution of other ceramics shows a general spread of material with no concentrations apparent.

A total of 5205 fragments (10.5 kg) of structural daub has been identified by the presence of surfaces and/or wattle impressions. The material is thought to derive largely from house structures, and almost all came from pits, with a large proportion (23% by weight) from pit 4152. This daub dump was recovered in association with a large number of loomweights (below) and is one of several similar, but smaller dumps at the southern end of the West Stand. Some of the fragments could be part of loomweights or hearth/oven lining, but the small size and condition of these prevent positive identification. A further 578 featureless fragments are of uncertain origin, although the majority are likely to be structural daub. One fragment of burnt clay from an ash dump in pit 2588 has slag attached, which is probably evidence of a dump from a smithing hearth, and other fragments may derive from domestic hearths or ovens. Overall, the spatial distributions of daub and of burnt clay are similar, with concentrations in the North, West, and South stands.

An additional group of ceramic fragments (with a total weight of 17.2 kg) has been classified as 'lining', and consists of generally undiagnostic fragments of fired clay with a reduced fabric and powdery texture. The material was recovered largely from pits, with slight concentrations in the North and South Stands, and is assumed to be fragments of kiln/oven lining or building material due to its relatively highly fired nature. One pit in the West Stand (4197) contained a group of large ceramic blocks, roughly rectangular in shape, in association with burnt clay fragments, and could represent kiln furniture from a disused kiln/hearth or oven. A second pit (4470) at the south end of the West Stand also contained a substantial amount of daub (many fragments with wattle impressions), and may represent the dumping of a collapsed kiln/oven.

Stone

The non-local stone assemblage comprising both unworked lumps and finished objects of mainly chalk, limestone, sandstone and lava stone, was imported into Hamwic from various sources within southern England, northern France (*Neustria*), the southern Low Countries and the Eifel region of Germany (Morton 1992, 65–6). The range of stone objects and stone types present at the Stadium site is representative of previous Hamwic assemblages (eg, Addyman and Hill 1969), and was fairly evenly spread throughout the North, South and West Stands with no apparent concentrations.

The most obvious example of non-local stone, and indicating long distance trading links, is the lava, of which approximately 11.5 kg was recovered from the Stadium site. The Niedermendig lava was probably transported via the Rhine to Dorestad and from there shipped to England, possibly using the same trading routes as the vessel glass. The lava stone, whether imported in blocks as ballast or as objects of trade (ie, as quernstones) may have remained in the town or passed to other settlements (Morton 1992, 66). Quern manufacture from imported lava stone blocks is certainly attested within Hamwic, at Six Dials (Andrews 1997, 240), and it is possible that some of the lava stone found at the Stadium site could be waste from quernstone manufacture. Of the quernstones identified four, very fragmentary examples are in Niedermendig lava, four in shelly limestone, three in coarse sandstone, one in limestone/tufa, and three in unidentified rock types. Other objects of stone, discussed above, include 12 whetstones (all fine-grained sandstones) and several lamps (in shelly limestone and tufa).

The remaining stone, all apparently unworked, comprises approximately 124 kg of limestone, sandstone and a few unidentified stone types, recovered from a variety of features. The larger pieces could represent ballast material dumped from vessels at the nearby waterfront, or material robbed from Roman settlements such as nearby Bitterne Manor

Table 19 Vessel glass by form and colour

	Pale blue	*Pale green*	*Turquoise*	*Pale brown*	*Clear*	*Dark green*	*Dark brown*	*Dark blue*	*Black*	*Red*
Tubular rim	8	4	-	-	-	1	-	1	-	-
Rounded rim	12	2	-	-	-	-	1	-	-	-
Base	3	2	-	-	-	-	-	-	-	-
Decorated body	6	-	-	-	-	-	-	-	1	1
Plain body	21	7	4	1	4	-	-	-	-	-

and possibly used for flooring, hard-standing or even thatch weights (Holdsworth 1980, 75). The unworked stone assemblage comes mainly from the South and East Stands, which are closer to the waterfront and, therefore, supports the suggestion that this may have been ballast material.

Glass

The Saxon glass assemblage from the Stadium site consists of 96 vessel fragments (168 g) including rims, bases, decorated and plain body fragments. These have been examined within the framework of the type series created for the Hamwic glass, which consists primarily of palm cup and funnel beaker forms (Hunter 1980; Hunter and Heyworth 1998). All the identifiable vessel forms from the Stadium site belong to this palm cup/funnel beaker series; there is no evidence here of the less commonly occurring forms seen elsewhere in Hamwic, such as tall beakers and squat jars. There are no reconstructable profiles, and attribution to vessel form has been made on the basis of rims and/or bases.

It should be stated here that in, absolute terms, the glass assemblage from the Stadium site is tiny. For example, the 96 fragments represent well under 10% of the Six Dials assemblage (1349 vessel and undiagnostic fragments, with a further 70 fragments from SOU 258). It is also less than the 111 (or possibly 147, including 36 subsequently lost) sherds from SOU 14, a site south of Chapel Road less than 2.5% of the area of the Stadium site and with approximately 40 times fewer pits (though these were fully excavated).

Forms

The rim types present comprise 14 tubular and 20 rounded forms. The tubular forms (folded or rolled over, creating an inner cavity: Hunter and Heyworth 1998, figs 4–5; Fig. 66, 3–4) have been demonstrated as deriving from palm cups and are, therefore, earlier in the sequence. At the Stadium site the rolled over forms (11 examples), potentially the earliest types, predominate over the folded forms (three examples). Rounded rims evolve from these and represent a later funnel beaker assemblage (*ibid.*, 8, figs 7–8); the whole sequence covers perhaps 200 years, from the 7th to the 9th century.

The bases of the palm cups and funnel beakers constitute the most durable vessel part; five bases were found at the Stadium site. Dimensions give a broad indication of vessel type – wider bases are more likely to belong to the palm cup forms and the narrower examples to funnel beakers. The base fragments from the Stadium site also display pontil wad marks measuring between 9 mm and 15 mm – again, dimensions may relate to vessel forms, and these examples fall at the narrower (ie, funnel beaker) end of the range defined by Hunter and Heyworth (1998, 14).

Colour

The colour of the glass can also be used as a guide to dating (Table 19). Typical early colours such as dark green and browns were later replaced by clear blue and greens; this change of colours occurred in Scandinavia at the end of 7th century, and coincided with a rise in the quality of glass, with fewer flaws (Hunter 1980, 68). A total of 30 (90%) of the rims from the Stadium site are of a light blue or light green colour, which is regarded as the 'norm' for the palm cup/funnel beaker series. Two rims represent the earlier tubular form in dark green and dark blue respectively, and there is one rounded rim in a dark brown colour. Of the 400 rims recorded from previous excavations in Hamwic (Hunter and Heyworth 1998), all but 14 (3%) are of light blue or light green colour.

Decoration

The assemblage contains a small number of decorated pieces (17 fragments – ten body and seven rim sherds), techniques including marvered yellow and white trails (six examples; Fig. 66, 5–7), unmarvered trailing (one example; Fig. 66, 9), reticella rods applied to rim (two examples) or body (three examples; Fig. 66, 8), simple applied trails of

the same colour as the vessel (four examples), and applied yellow blob (one example). All these techniques can be found elsewhere in Hamwic (Hunter and Heyworth 1998, figs 13–17; pl. 1–8). The assemblage from the Stadium site is very similar to those from Melbourne Street and Six Dials.

Provenance

The provenance of the glass found at Hamwic has not yet been established; the Continent seems the most likely source, although the possibility of a local origin has been postulated (Hunter and Heyworth 1998, 60–1). The vessel forms broadly correspond with Scandinavian examples, suggesting a similar source (Hunter 1980), although the evidence from the compositional analysis indicates a different source for the Hamwic palm cup/funnel beaker series to those from Scandinavia and Dorestad (Hunter and Heyworth 1998, 61). Interestingly, glass from a British source is argued to have been recovered at Helgö and Dorestad, but this source has not been identified at Hamwic (*ibid.*).

Distribution

The relatively small quantity of glass from the Stadium site makes any intra-site comparisons difficult and conclusions tentative. As at Six Dials, glass fragments were found in a general scatter across the site, with no apparent concentrations; there are, therefore, no conclusions that can be drawn here regarding differences in social status, since the distributions could easily have resulted from patterns of rubbish disposal (Andrews 1997, 218). However, at Six Dials it was suggested that glass vessels were in relatively common use, and that the fragments recovered in excavation represent parts of broken vessels that had escaped collection for recycling (not necessarily in Hamwic); the evidence was not interpreted as widespread evidence for glassworking (or rather reworking) on the site (*ibid.*, 216–7).

Turning to the rim types, some slight differences are discernible across the site. In particular, in the south-west part of the site the earlier, tubular rim forms outnumber the later, rounded rim forms by nine to four, whereas in the north-east part of the site the ratio is almost reversed at three to seven. This could be interpreted as reflecting early settlement, or a denser concentration of early settlement, in the south-west part of the site, similar to the pattern which appears to be suggested by the pottery.

At the Stadium site, features that contained both imported pottery and vessel glass are rare and dispersed, and the lack of association of the two material types may support the theory, advanced at Six Dials, that the differing distribution of the two imported material types suggests different sources and/or chronologies and, therefore, different trading patterns (Andrews 1997, 218).

Finally, the quantity of glass from the stadium site can be compared with the assemblages from other areas of Hamwic, as has been done with the pottery, relative to the site area and relative to the number of pits and wells. The same site blocks that have been used for the pottery were compared: Chapel Road East (SOUs 7, 8, 11, 14, 16, and 18: either 176 or 212 fragments, depending on the original number from SOU 14, see above) and Six Dials (1349 fragments, not including SOU 258) in terms of area; and these two site blocks plus Melbourne Street (SOUs 4, 5 and 6: 88 fragments) in terms of pit/well density. As before, the recovered amounts have been adjusted to allow for half-sectioning of some pits, and because SOU 14 produced a relatively large quantity of glass calculations have been made which both include and exclude it. The comparisons show that by pit / well the Stadium site assemblage is significantly less than at Melbourne Street South, which was itself significantly less than at Chapel Road East (including or excluding SOU 14), which in turn was lower than Six Dials. The same order is followed when the site blocks are considered by area, though Melbourne Street South cannot be estimated.

Coins

by D.M. Metcalf with a contribution by J. P. Northover

The excavations yielded 16 coins of the sceatta period (excluding the two grave finds), two early pennies, and seven Roman coins that may be 8th or 9th century losses. The question suggests itself how this assemblage compares with the coins previously found at Hamwic. Are they more of the same, or does the Stadium site show any local particularities? The commercial/non-commercial use of the site might, for example, have varied during the sceatta period, resulting in a higher rate of coin losses during some particular phase. Any such variation would be unlikely to be clear-cut: it may be no more than a tendency. Thus the enquiry quickly runs into statistical imprecision, involving small numbers to which relatively wide margins of variation attach. The 16 sceatta finds are too few to yield answers with a high degree of probability, the more so in that over 30 different types of sceattas have been found at Hamwic. The total of 18 Anglo-Saxon coins from the Stadium is significantly less than the 70 recovered from Six Dials (excluding SOU 258) in terms of distribution per area or per well/pit. On the other hand, there is no evidence that the Stadium total is significantly different from the totals at Melbourne

Table 20 EPMA of selected coins

Coin	*Sample*	*Type*	*Fe*	*Co*	*Ni*	*Cu*	*Zn*	*As*	*Sb*	*Sn*	*Ag*	*Bi*	*Pb*	*Au*	*S*
C2	S 1.3	Series B	0.04	0.00	0.01	0.66	0.03	0.00	0.00	0.00	80.00	0.09	0.76	1.46	0.05
C10	S 1.2	Celtic cross, eclectic type	0.16	0.01	0.06	61.22	2.39	0.07	0.09	4.31	29.71	0.03	1.27	0.59	0.10
C11	S 1.4	Series N	0.04	0.02	0.04	29.85	0.35	0.05	0.05	2.26	64.97	0.01	1.21	0.98	0.15
C15	S. 1.1	Series X, 'insular variant'	0.04	0.01	0.04	8.72	0.33	0.04	0.04	0.57	87.65	0.02	1.07	1.32	0.19
C16	S 1.5	As C15	0.21	0.00	0.01	3.91	0.22	0.10	0.10	12.98	45.09	0.04	1.93	0.77	0.12

Figures give approximate % composition of the listed elements, where the entire coin (including the unlisted impurities/corrosion) = 100%

Street South (SOUs 4–6) and Chapel Road East (SOUs 7, 8, 11, 14, 16, and 18)

The existing corpus, against which to assess the Stadium finds, comprises the 'antiquarian' finds (Pagan 1988); the post-war finds catalogued in Metcalf (1988); and four post-1985 sceatta finds not in that catalogue. The Kingsland hoard should be excluded from consideration because stray losses and hoards obey quite different laws. Two outliers of the Kingsland hoard ought probably to have been grouped with it. In sum, therefore, we have:

'antiquarian' finds (Pagan 1988)	22
Post-war finds (Metcalf 1988, catalogue nos: 1–91, 91 bis, 92–129) = 130	
Less 23 recte 25 Kingsland hoard coins	105
Post-1985 finds	4
Total	131

The locally-minted series H is strongly represented among these 131, with 12 single finds of Type 39 and 42 of Type 49: 54/131 = 41% of all the finds. From the Stadium we have four out of 16. To equal 41%, seven finds would have been needed. The difference is worth noting, but is not statistically significant. The so-called 'porcupines', which were minted in the Rhine mouth area, are the next most plentiful series, accounting for 14%. There was just one from the Stadium, against an expectation of two, again not significant. Series X (Danish coins plus local imitations) is the third most plentiful series, at 8%. The Stadium yielded three, or 19%, and one should at least make a mental note of that, because a study of finds of Series X throughout England has discussed the possibility that Danish merchants might have had their own quarters.

All the finds are of course very welcome in themselves. They fatten out the corpus, which is still much too small to do justice to the less plentiful types. A specimen of Type R2, for example, is welcome as the second specimen from Hamwic of an early East Anglian issue (Type R2 is now judged to have preceded R1) which is quite widely dispersed throughout England.

The opportunity was also taken to make chemical analyses of five especially interesting specimens among the Stadium finds. These supplement the analyses published by Northover (1988), and include two of the 'insular' copies of Series X, as a contribution towards better understanding of the chronological and functional relationships of the copies with the foreign prototypes. Northover, who has previously analysed some 60 Hamwic sceatta finds (*ibid.*), measured 13 chemical elements by electron probe micro-analysis (EPMA), including silver, gold, bismuth, lead, tin, and zinc (Table 20). Short comments are included in the catalogue below, where 'silver' refers to what would have been perceived as silver by the minters, namely silver plus minor amounts of gold, bismuth, and lead surviving in the cupelled metal.

So much for the sceatta period. As regards the early pennies, the coin of Offa is by a new moneyer for Hamwic. The coin of Ecgberht, king of Wessex, is of a scarce variety minted locally, and again is by a new moneyer.

Seven of the eight Roman coins recovered in the excavation are strong candidates to have been re-used, 8th century losses, although some could be merely residual. Whether they found a monetary use in the 8th and 9th centuries is impossible to know.

Coins from settlement contexts are catalogued below (Figs 67–8). The two coins from the early cemetery (C1 and C2, both sceattas of Series B) are catalogued in Chapter 3 (see Fig. 67).

Catalogue

Series E

To date there have been 16 finds of Series E from Hamwic (five of the primary phase, ie, up to *c.* 710/715, and 11 of the secondary phase.)

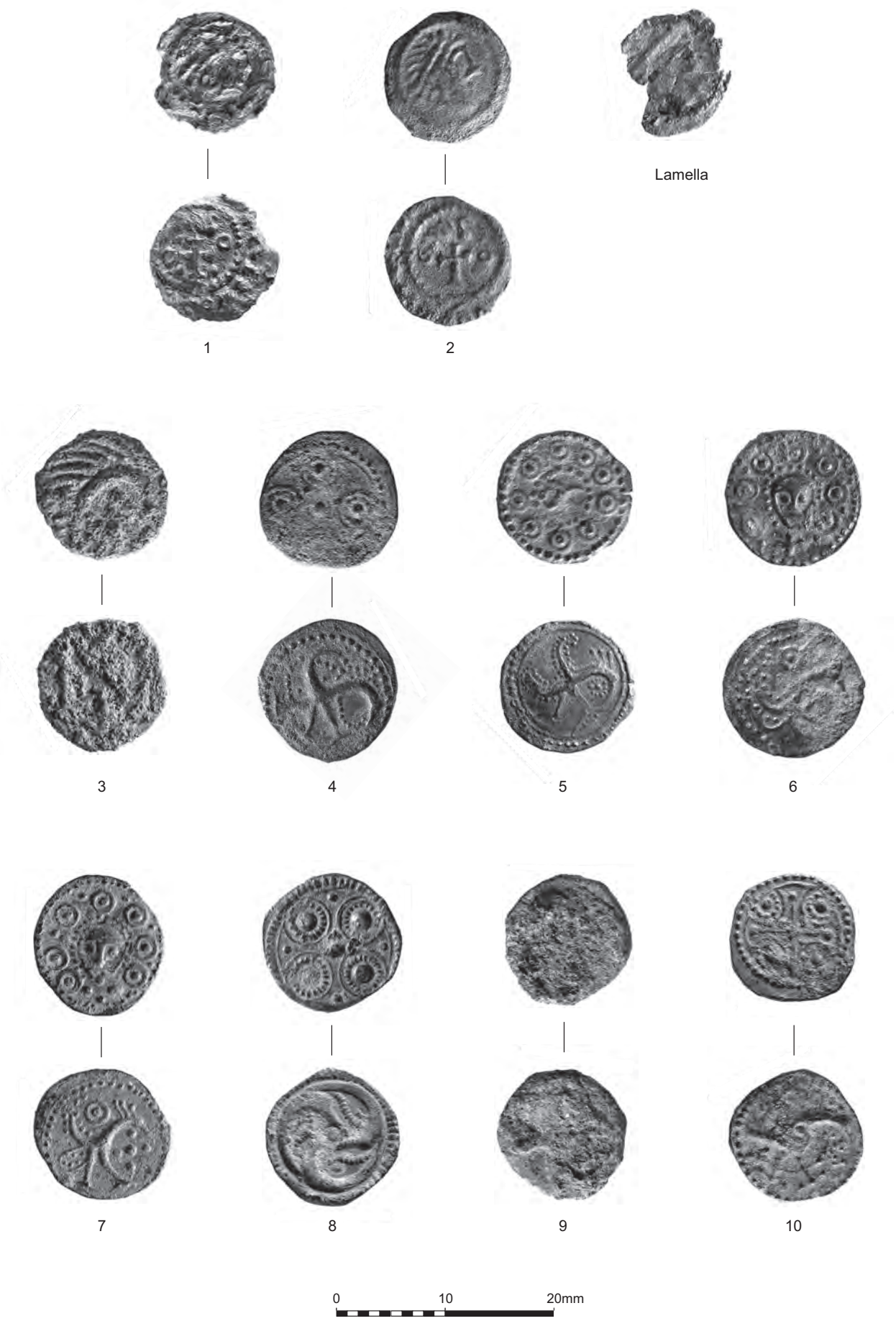

Figure 67 Coins 1–10. Scale 2:1

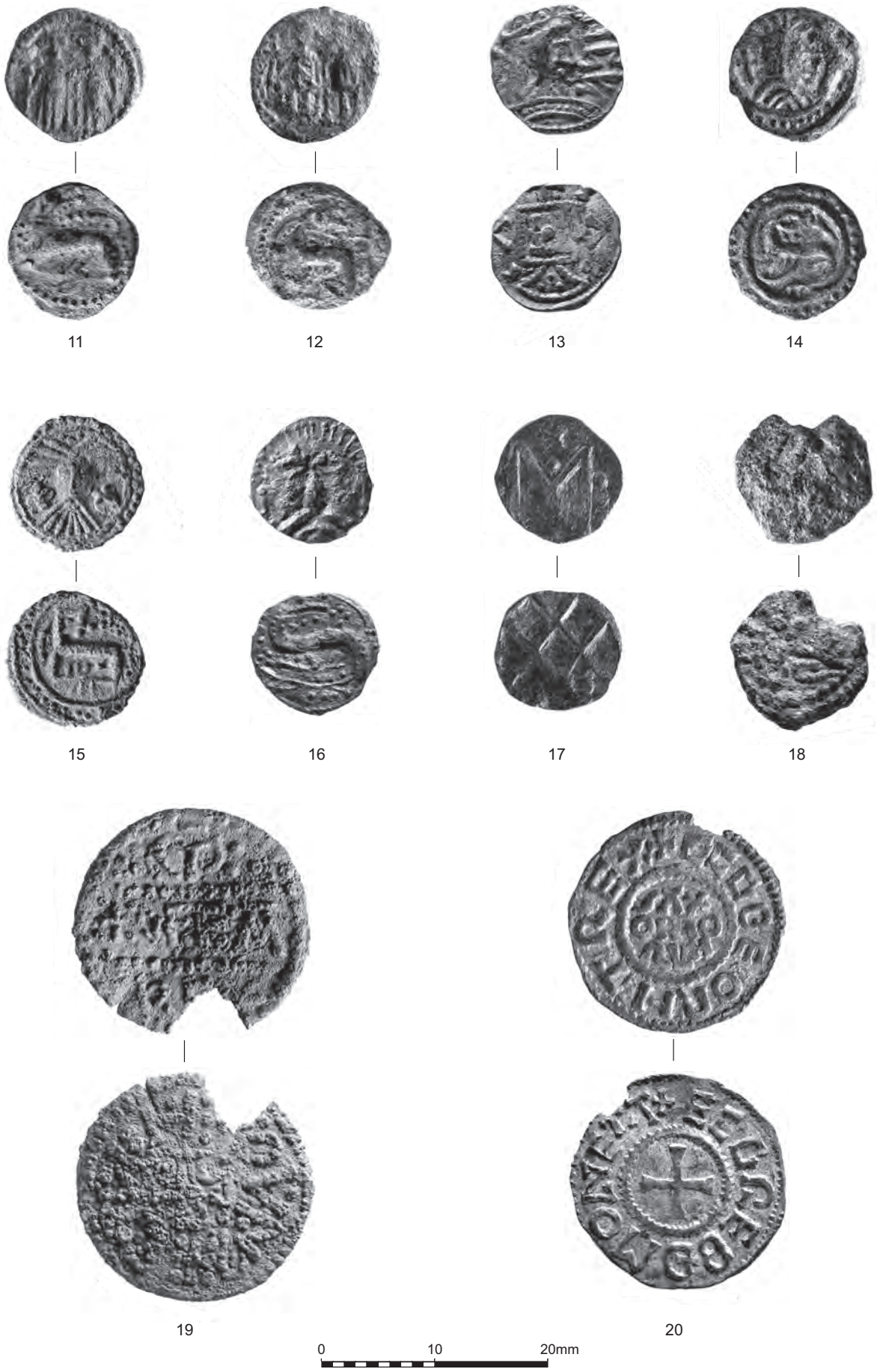

Figure 68 Coins 11–20. Scale 2:1

C3
Context 7356. Primary silting in pit. Item no. 236.
Obv. Porcupine Design. Under the curve of the 'porcupine' are four parallel straight lines.
Rev. Obscure. Traces of a character within the standard, at 45°.
The coin itself is encrusted and very obscure. An X-ray photograph, however, reveals the details described above, which are enough to say definitely that the coin is of the secondary phase, ie, after *c.* 710, and Frisian in origin.

Series H, Type 39
The earlier of the two main types minted locally. For a corpus of specimens, see Metcalf 1988, 39–40.

C4
Context 5195. Domestic rubbish. Item no. 403. 0.99 g.
Obv. 'Celtic cross with rosettes'.
Rev. Bird walking right, wing raised, pecks at chain of dots.
Cf. Metcalf 1988, nos 24.3 and 24.7. See also, from this same context and feature, catalogue nos. C11 and C16 below.

Series H, Type 49
The more plentiful of the locally-minted types. For a classification into varieties 1–6 based on secret-marks, etc, and for a corpus of specimens see Metcalf 1988, 41–7.

C5
Context 5334. Domestic rubbish; pit. Item no. 442. 0.78 g
Obv. Facing head, moustached, outlined with roundels.
Rev. Bird walking right, with raised wing, and head lowered as if pecking.
Type 49, variety 1a. Cf. Metcalf 1988, nos 35–7. Cf. a Roman copper coin, no. 454, from the same context.

C6
Context 4263. Domestic rubbish; pit. Item no. 292. 1.09 g
Similar.
Type 49, variety 2a, with kite-shaped face, and 7 roundels. Cf. Metcalf 1988, no. 65.

C7
Context 4498. Domestic rubbish; pit. Item no. 432. 0.89 g
Similar.
Type 49, variety 5a, but group of 5 pellets below head. Cf. Metcalf 1988, no. 78.5
Although listed by Rigold as part of Series H, Type 48 has a very different distribution pattern in England from Types 39 and 49. Hamwic is the most common provenance, but its mint-place remains problematic. There are just three specimens among the previous single finds.

Series H, Type 48
C8
Context 7637. Slumped occupation deposit; pit. Item no. 262. 0.90 g
Obv. 'Celtic cross' design, similar to Type 39.
Rev. Around central boss, a whorl of three animal heads.
Very closely grained rosettes and borders, otherwise similar to Metcalf 1988, no. 31.4.

C9
Context 4001. Modern overburden, West Stand. Item no. 390.
Similar.
The coin itself is completely obscure, but an X-ray photograph reveals the rosettes and the whorl of three animal heads.

'Celtic Cross with rosettes' eclectic type: London-related
Two specimens of a related type have been chemically analysed. They are seriously debased, and are of interest in that the silver is alloyed with scrap brass and in one case also bronze, no doubt in an attempt to improve the appearance of the coinage metal. Ashmolean 345 has 37% 'silver' with 8% tin (the remainder copper). No. 346 has 19% 'silver' with 3% tin and 10% zinc (the remainder copper).

C10
Context 4001. Modern overburden – West Stand. Item no. 223. 0.86 g
Obv. Pecking bird in vine, derivative of Series U, Type 23.
Rev. Celtic cross, with linear cross superimposed.
This coin is by the hand of the same die-engraver as a hitherto unique specimen found at Tilbury, and illustrated in Metcalf 1993, 430, section VIII). Its 'silver' contents are variable, averaging 31–2%, and with an addition of *c.* 2.4% zinc, which is certainly deliberate.

Series N
The stylistic range exhibited by this quite plentiful type raises difficult questions of attribution, which have not yet been resolved. One other Hamwic find has been chemically analysed.

C11
Context 5195. Domestic rubbish; pit. Item no. 417. 1.01 g
Obv. Two standing figures, holding long staffs or crosses.
Rev. Monster right, with head left.
For the exact style of this specimen, cf. BNJ 1974, pl. 1, 1–3. The 'silver' contents are *c.* 67%, with 2% tin. See also, from this same context and feature, catalogue no. C4 above, and no. C16 below.

C12
Context 3553. Silting; post-hole. Item no. 176. 0.79 g.
Similar.
No exact stylistic parallel for this coin has been found. The general outline of the monster is reminiscent of Series O, Type 40.

Series R
This series is certainly East Anglian in origin, and it is

unusual to find it at Hamwic. One previous find is also of Type R2.

C13
Context 4500. Domestic rubbish; pit. Item no. 460. 1.02 g
Obv. Bust right, with runic legend epa in front.
Rev. Square standard.
This is certainly a coin of Type R2, with runic epa inwards, and all details as Metcalf 1993, cat. no. 393.

Series X
The so-called 'Wodan/monster' sceattas were minted at Ribe, in Jutland. There are also 'insular' varieties that are in all probability English in origin. The series is conspicuously plentiful at Hamwic. In addition to the specimens published in Metcalf 1988, nos. 115–123, there is one more found since 1985 (SOU 254/1590). For a recent study of some 80 single finds from England, including all those from Hamwic (Metcalf in prep. in *Nordisk Numis. Aarskrift*).

C14
Context 7016. Domestic rubbish; pit. Item no. 6. 0.93 g.
Obv. Facing Head, with long moustaches. Cross either side.
Rev. Monster left, with head turned to right, biting its tail.
Barrett variety d (two pellets beneath the monster's chin). The style of this specimen is entirely acceptable as that of the Ribe mint. From evaluation SOU 942.

C15
Context 7240. Domestic rubbish; pit. Item no. 210. 1.12 g.
Similar.
An 'insular' coin of Barrett obverse variety D (note the group of three pellets above head, and the trident-like tip of the monster's tail. Cf. the Rotherhithe find, illustrated in Metcalf 1993, 288. XRF analysis shows very respectable 'silver' contents of around 90%.

C16
Context 5195. Domestic rubbish; pit. Item no. 423. 0.47 g
Similar.
Unlike the preceding coin, this is perhaps an unofficial or freelance copy. The 'silver' contents are only c. 48%, but with remarkable high tin contents of 13%. As that is against only 4% copper, the measurement for tin is presumably exaggerated by corrosion enrichment. The evidence for the use of scrap bronze is nevertheless strong. Zinc is virtually absent. Note the low weight. For the style of the facing head, cf. the Subjak sale, lot 89, and also the Kings Lynn find (Metcalf 1993, 138). The style of the monster seems to be based on Series O Type 40 or Series N Type 41 (note the group of four pellets, detached from the tip of the tail). In view of these stylistic affinities, the coin is in all probability English. See also, from this same context and feature, catalogue nos. C4 and C11, above.

Merovingian Series, Marseille

C17
Context 2466. Modern overburden, south stand. Item no. 100. 0.68 g.
Obv. Large Letter M
Rev. Lattice
Cf. Grierson and Blackburn 1986, no. 542. The date of issue is judged to be 720–35. Note that there were three specimens of this variety, and also other coins of Marseille, in the Bais board (dep. Ille-et-Vilaine; see J. Lafaurie nd, catalogue, no. 112). The implication might be that this specimen had reached Hamwic via the currency of northern France rather than in a single hop.

Uncertain sceatta or Merovingian coin
C18
Context 2206. Slumped occupation deposit; pit. Item no. 128.
Obv. Rectilinear design. (?)Box-shaped cross.
Rev. Linear design.
The coin itself is very obscure. The identification is based on an X-ray photograph. The design, so far as it can be made out, does not correspond with any obvious sceatta type. One wonders, therefore, whether it could be Merovingian, from the second quarter of the 8th century or thereabouts.

Offa, King of Mercia, 757–96
Nine single finds of coins of Offa from Southampton were published by Metcalf (1988, 52) and Pagan (1988, 60, 63–4).

C19
Context 4530. Slumped occupation deposit; pit. Item no. 358.
Obv. Three-line inscription, M / +OFFA / REX
Rev. 'Celtic' cross, with moneyer's name around, EALHMVND
Although the coin is severely mineralised, one can recognise enough of the design and legends to identify it securely as a specimen of Blunt (1961), Type 89, by the moneyer Ealhmund.

Ecgberht, king of Wessex, 803–39
Ecgberht's coins were mostly minted in Kent, but one small group of varieties is attributable to Wessex. The mint-place is usually cited as 'Winchester or Southampton'. Blunt, who published a corpus of Ecgberht's coins (Blunt 1958, 467–74), knew of six moneyers who worked in the Wessex mint, namely Beornheard, Bosa, Eanwald, Ifa, Tideman and Tilræd. The coin published here is unique, being by a new, seventh moneyer, (?) Ecgræd. The Wessex coins circulated widely in England. Bonser (1998, 216–18) records 30 single

finds of Ecgberht, of which six are from the Wessex mint, and these six are from the Ipswich area (Beornheard), Kent (Tideman), Royston (Eanwald), Southampton, the gaol site, 1825–55 (Tideman), Southampton, 71 Clifford Street (Tilræd), and Thetford (Ifa). For a regression analysis of the 9th century coins of this mint, which seems to have been closed *c*. 840, see Metcalf (1998, 192).

C20
Context 7165. Domestic rubbish; pit. Item no. 211. 1.28 g.
Obv. SAX /. ONIO / RVM in three lines. Around, ECGBEORHTREX.
Rev. Large Cross. Around, +ECGREBDMONETA.
The moneyer's name is mis-spelled, with a B and a crossed D (thorn).

Roman coins
Thirty-six finds of Roman coins were published in Metcalf (1988). There can be little doubt that most of them are 8th or 9th century losses. They had no doubt been found fortuitously. Whether they were put back into use as coins is debatable, since it is difficult to understand how they would have been tarriffed in relation to silver sceattas. The eight new finds are mostly of approximately the same size as sceattas. One (Item no. 397) is of a larger module, and pierced.

C21–27
Seven Roman coins
Mostly late 3rd/4th century. Item nos 35 (cast copy?), 94, 215, 360, 433, 454 (from the same context as cat. no. C5 above), and SOU 1002/28.

C28
Roman coin of larger module, and pierced. Item no. 397. Perhaps from a necklace, and possibly redeposited.

Crafts and Industries

Industrial or craft activities were an important feature of the settlement at Six Dials and indeed the rest of Hamwic, though there is nothing to indicate the zoning of particular industries (Andrews 1997, 205–6). Evidence from Hamwic suggests that textile working, bone working and other crafts were being undertaken within different properties across the town (Morton 1992, 57), although some industries, such as glass working, may only have had a relatively short period of activity within a single property. The evidence from the Stadium site concerning the distribution of such activities does not add significantly to what is already known as the amounts of material limit the potential of such a study. However, the relatively small quantities of most types of crafts and industrial debris may in itself be significant in characterising the nature of this part of the settlement.

Metalworking

Ironworking
by Phil Andrews
A total of 191.9 kg of ironworking debris was recovered from 330 contexts. This represents a significant quantity of material and provides evidence for ironworking on or in the immediate vicinity of the site. No metallurgical analysis of this material has been undertaken, but visual study suggests that all of it derives from ironsmithing. No certain evidence for ironsmelting was recovered and no clear evidence for other metalworking processes has been identified.

The ironworking debris is comprised largely of fairly dense but vesicular slag with no evidence of 'runs' to indicate that it was tapped from a smelting furnace. There are also at least 45 roughly hemispherical buns of slag ('hearth-bottoms') which formed in the base of smithing hearths. The majority of these are near-complete, but there are a substantial number of fragments amongst the remaining debris which probably derive from broken hearth bottoms. The complete hearth bottoms range in weight from 150 g up to 1590 g, and from 65 x 60 x 30 mm up to 150 x 100 x 80 mm in size. Two pieces of slag, both from context 511, retained the remains of a mineralised stick(s) that had probably been used to remove the semi-molten slag from a hearth. Some hearth lining was present, in generally small quantities, although more substantial amounts came from various pits in the north-west corner of the site. One piece from this area included the remains of a tuyère- or blow hole where the nozzle of the bellows entered the hearth. Soil sample residues from several contexts containing large amounts of slag were also rich in plate-hammerscale, another indication that smithing rather than smelting was undertaken on the site.

The debris was recovered almost entirely from pits, either disposed of directly in these features or redeposited from elsewhere. No *in situ* metallurgical features such as hearths survived. It is probable that some remains, for example floor surfaces and associated layers of ironworking debris, have been truncated, and other above-ground features such as waist-level hearths would not have survived. However, no small, sub-rectangular or sub-circular slag- and charcoal-filled pits such as those recorded in the two smithies at Six Dials (Andrews 1997, 223) were found at the Stadium site. Identification of individual structures on the site as smithies is therefore very tentative (below).

Seventy-three pits each produced more than 0.5 kg of debris, with 33 producing 0.5–1 kg, and three more than 10 kg (pit 7390: 11.1 kg; pit 7564: 21.6 kg;

and pit 2511: 26 kg). The distribution of material indicates two foci of activity – presumably smithies, one (?Structure 5) possibly restricted to a single property in the southern part of the site, the other (in the vicinity of Structures 7, 8, and 10) more dispersed towards the north-west corner (Fig. 45). These two areas also produced 19 and 16 of the hearth bottoms respectively. Virtually all of the hearth lining was found associated with smithing slag, with the majority coming from the north-west corner of the site.

The interpretation of the debris as deriving from ironsmithing is in line with that of other concentrations of ironworking debris recorded in Hamwic, for example at Six Dials. There, several hundred kilograms of smithing slag were recovered and two smithies identified, both located at street junctions (Andrews 1997, 222). No other smithies have been recognised in Hamwic, but ironworking slag is widespread on sites within the town in varying quantities. The available evidence, including that from the Stadium site, indicates that smithing was carried out in various properties at various times throughout the 8th and 9th centuries, and was not restricted to a specific area of the town. It would appear that the iron was smelted elsewhere, and Romsey, some 14 km to the north-west of Hamwic, is a likely source for at least some of the raw iron. Very substantial quantities of post-Roman smelting slag have been found there in a form characteristic of a certain type of early–mid-Saxon smelting furnace in this country (McDonnell 1988). The iron would have been brought to Hamwic in the form of blooms, bars, rods etc. for subsequent working, and this probably involved primary bloom smithing as well as the manufacture of iron objects. No scrap or offcuts of raw iron have been identified amongst the relatively small assemblage of iron objects recovered from the Stadium site, but a hammer (Fig. 64, 10) from a pit (4379) on the west side could have been used in ironworking.

Other evidence for metalworking

There is widespread evidence from other Hamwic sites for the production of non-ferrous objects at this time (Addyman and Hill 1969, 66), sufficient to suggest that metalworking quickly became one of the town's specialised craft activities (Hinton 1996, 97–8). The evidence from the Stadium, however, is slight and ambiguous. Amongst the copper-alloy assemblage there are flat, folded fragments, fragments of wire and miscellaneous objects that could represent the debris from metalworking, but no crucible fragments have been recognised. 'Headless' pins (ie, pins comprising only the shaft), may represent waste from pin production (*ibid*., 34–5), although equally they could have been subject to breakage, or could have been intended for use without heads (Addyman and Hill 1969, 68).

The presence of a goldsmith at the Stadium site, however, is a possibility, indicated by the recovery of a small clew of gold thread from a cess pit (5274). Its discovery in this context might suggest chance loss by a local artisan, but an alternative explanation for its presence is that it represents a redeposited grave good from a burial in the early cemetery. The significance of this find as evidence for high-status textile working is discussed below.

Glassworking

Sites within Hamwic have over recent years produced a substantial assemblage of vessel glass (Hunter and Heyworth 1998). There is, however, little to suggest that this represents anything more than the use of glass vessels in a domestic context, and evidence for glassworking is very slight. A small number of pottery sherds and pieces of stone have been found with glass droplets, residues or concretions adhering, with a concentration within SOU 169 at Six Dials (*ibid*., 60), and to these can be added one sherd from an imported vessel from the Stadium site (pit 2025), with a thin coating of glass and glass residue adhering to the external surface. This evidence, however, is not unequivocally associated with glassworking.

Even slighter evidence comes in the form of red glass (represented here by a single fragment from a decorated vessel: Fig. 66, 9). Glass of this colour is rare in this period and has previously been associated with possible glassworking sites, although this has subsequently been shown not to be exclusively the case (Hunter and Heyworth 1998, 35).

The source of the glass beads is unknown, although probable production areas for some distinctive or complicated designs are generally assumed, such as Helgö and Birka in Sweden and Dinas Powys in Wales (Evison 1987, 66). The raw material used in beadmaking was sometimes obtained from melted-down vessel glass (Guido and Welch 2000), but again the evidence from Hamwic – a few wasters and rods of a type diagnostic of secondary glassworking – is insufficient to indicate bead making in the town (Hunter and Heyworth 1998, 59).

Textileworking

The textile manufacturing evidence from Hamwic points to the preparation and weaving of wool, probably carried out at household level. The artefactual evidence consists of spindlewhorls (worked bone, stone, and ceramic), pin beaters/points (worked bone) and ceramic loomweights. One stone object has a perforation that may have enabled it to be utilised as a weight. Weaving at this period is assumed to have been carried out on a two-beam vertical loom, but no evidence remains of these looms except the weights, which have been discarded into pits (Morton 1992, 57).

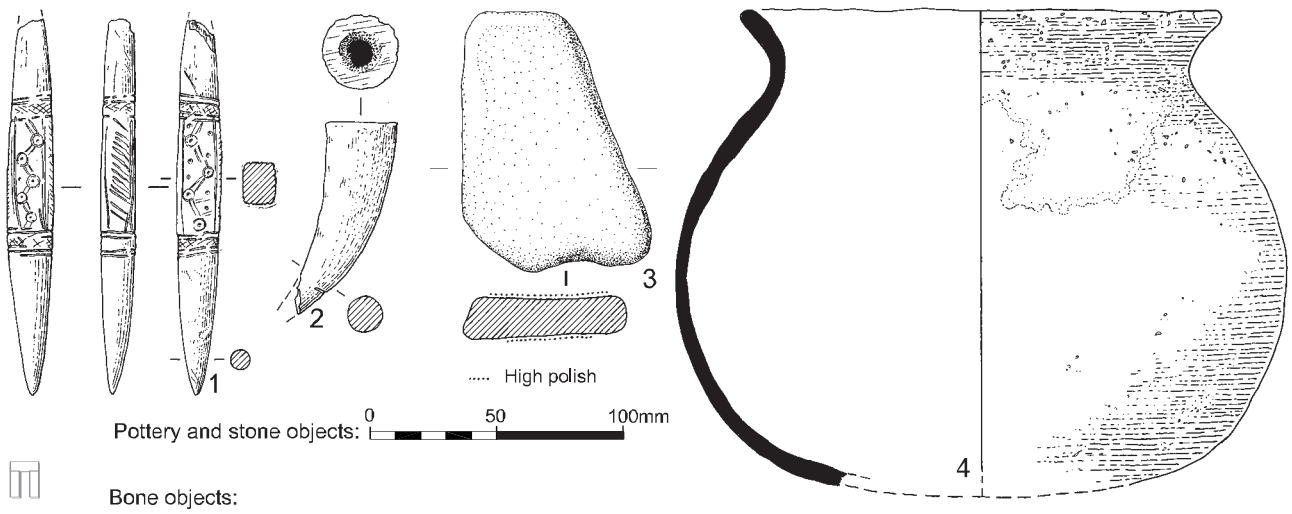

Figure 69 Finds from the settlement: craft. Objects of bone, antler, stone, and pottery

There are 148 ceramic loomweight fragments, all from weights of the annular form typical of the early/mid-Saxon period, and all made from a similar sandy fabric. A large proportion of these (41 fragments) was recovered from a single mid-Saxon pit in the West Stand (4152) which also contained a large quantity of daub (below). This single deposit could possibly indicate the location of a weaving hut or represent the dumped debris from that activity. The remaining loomweights came largely from other Middle Saxon pits in the North, South and West Stands, with the exception of two fragments which occurred as residual finds within inhumation graves in the North Stand (7270, 7380), and one fragment from a well in the West Stand (4069).

At least three loomweights, including one complete weight, were deliberately marked with finger impressions or were incised. These all came from pit 4152, and have comparisons with weights at Mucking, Essex, where the marks are interpreted as a sign of ownership or as a notation for the construction of a complex shed (Hamerow 1993, 68).

Also relating to textile working are nine spindle-whorls (made from bone and stone), recovered mainly from pits. These were largely recovered from the South Stand, but the numbers are too low to be significant. The shape and weight of the whorls vary, and this is likely to reflect differences in the weight and quality of the yarn spun (Øye 1988; Oakley and Hall 1979). Weights range from 3 g to 48 g, although the two extremes are exceptional – seven whorls fall within the range of 10–26 g. The smallest whorl (3 g) could have been used for spinning fine thread, while the whorls of the middle range are more suitable for wool. The heaviest weight (48 g) could have been used for plying yarn (Øye 1988, 54).

Other evidence of a textile industry comes from the recovery of nine points/pin-beaters. Four have transverse grooves, possibly caused by the friction against the warp during the weaving process (MacGregor 1985, 188). All are highly polished and one is decorated with an elaborate design of ring-and-dot motifs and cross-hatching incised on the central shaft (Fig. 69, 1). Five of the pin-beaters are 'cigar-shaped'. The remaining objects consist of broken points tapering towards one end. One of these points has a small groove from the point along the central shaft. These objects have been broadly categorised as points but were probably utilised as pin-beaters in the textile process.

The two pairs of iron shears recovered could have been used for cutting cloth and/or shearing sheep; the size of these examples (both approximately 200 mm in length) suggests that they were associated with textile-working.

Two antler tine tip offcuts, both polished through use, could be interpreted as points (Fig. 69, 2). Examples from York suggest they may be 'fids', which were used to open strands of rope for splicing (Waterman 1959, pl. 21: 16). These could be decorated and have shallow borings along their length, or could be hafted (see also Fig. 44, 15, which may be an unfinished 'fid', rather than a toggle).

Stone smoothers may be used as part of the finishing process in textile manufacture or used in leatherworking (Addyman and Hill 1969, 74, fig. 30). Many smoothers have been misidentified as whetstones, but only one such stone object in the Stadium site assemblage has evidence of polished surfaces (Fig. 69, 3).

Perhaps the most interesting and unusual evidence for textile working from the Stadium site is the small

skein, or clew, of gold thread recovered from a cess pit (5274) in the West Stand. It is possible, however, that this find was redeposited from one of the inhumation graves belonging to the early cemetery and does not necessarily reflect textile working using this material on the site.

Antler/bone and hornworking

Some evidence for antler/boneworking in the vicinity is provided by a relatively small assemblage of offcuts (90 pieces), the majority probably from comb manufacture. The quantities are much smaller than those recorded at, for example, SOU 14 (Chapel Road; Morton 1192, 150-2) and from pits at Six Dials which were taken to represent the debris from individual workshops (Riddler with Andrews 1997, 229). At Six Dials, it was suggested that some waste (along with domestic refuse) may have been disposed of elsewhere, possibly outside the town (Andrews 1997, 205). The excavated material (from pits and other features) is unlikely, therefore, to constitute the complete assemblage of debris.

There is evidence for both antler and bone being worked at the Stadium site – the majority of the offcuts being of antler (53 pieces, along with many small flakes and chips). There are also several horn cores with saw or cut marks indicating horn working. At Clifford Street (SOU 32) antler offcuts appeared to be more common in later 'area deposits', suggesting that the use of antler increased in Hamwic over time (Riddler 1992, 182), a trend also indicated by the material from Six Dials (Riddler with Andrews 1997, 230).

Several stages in the comb-making process are represented, from the initial cutting of beams and tines into lengths to the preparation of billets to make the individual elements of the combs (MacGregor 1985, fig. 42). Examination of combs and comb-waste from Hamwic has shown that these are usually of composite manufacture and material, with the tooth billets made of ungulate bone and the connecting plates of antler (Riddler in prep.). The production of comb billets results in distinctive waste offcuts; these are the sawn off proximal and distal ends of cattle and horse metapodia, and sometimes other elements such as the radius. This type of offcut was recovered from pits 5199, 6162, and 2001. Antler is preferred for long and thin items (eg connecting plates for combs) because of its flexibility, and where a large piece of material is required; where antler is readily available combs are often made entirely from antler.

The manufacture of other objects, such as pins, pin-beaters, handles etc., is less visible amongst the waste from the Stadium site, but one or possibly two unfinished spindlewhorls (one made from a cattle femur and one from a cattle metapodial) were recognised. Three of the antler tine tips show signs of polishing, but whether this was through use or in preparation for some other process is uncertain.

The overall distribution of off-cuts (from 23 features across the site) shows a slight concentration in the area of the West Stand. There is some evidence, however, that the waste from the different stages of boneworking might have been disposed of in separate areas, and that, therefore, different households (or workshops) might have specialised in different processes. Larger fragments, presumably from initial antler preparation, were concentrated in the West Stand, particularly in pit 5199, which produced nearly half of the total number of off-cuts (41 fragments, including 27 antler, plus a varied range of bone species/parts). Smaller billets occurred only in the East and South Stands. Cattle metapodials were confined to the West Stand. It should be remembered, however, that quantities are small throughout in comparison to other sites within Hamwic, and are insufficient to indicate bone working at anything other than a very small scale.

While the offcuts represent the bulk of the evidence for bone working on the site, there is also one unfinished object – a 'fish-tail' comb (see Fig. 63, 11). Overall, however, the evidence points to the discard of waste associated with the initial stages of boneworking, rather than the actual finishing of objects. While this might be explained by the fact that part-finished combs would not commonly be discarded, one might expect more examples.

Pottery manufacture

One possible example of an antler pot die was recovered (Fig. 69, 2). This would have stamped a negative circle on a pot, similar examples of which have been replicated (Briscoe 1981, fig.1.2). Several other dies have been recovered from Hamwic (Riddler 1988, fig. 18), and it is suggested that they may have been used for decorating either pottery or leather.

Unequivocal evidence of pottery production within Hamwic, however, remains elusive, at least for the mid-Saxon period, despite the assumption that most of the coarsewares were manufactured locally. Certainly there would have been suitable potting clays and other raw materials available in and around Hamwic (Timby 1988, 104; Timby with Andrews 1997). Production is likely to have been on a domestic or household level, but given the likely technology (firing of small numbers of vessels in simple clamp or bonfire kilns), would have left only ephemeral traces. Features interpreted as hearths, for example, with evidence for *in situ* burning, could represent such firing episodes (*ibid.*, 208–9).

For the late Saxon period, however, the Stadium site has one somewhat ambiguous piece of evidence to

offer, in the form of a single pit in the East Stand (1277) which produced a relatively large quantity of pottery (914 sherds; 8715 g) (see Fig. 76). This comprised sherds in a single fabric type (Southampton Fabric 900: Flint-tempered Sandy Ware: see Brown 1994), deriving from a series of vessels (a maximum of 30, with an estimated vessel equivalent (EVE) of 4.04) of very similar form (rounded jars with simple everted rims and rounded bases; Fig. 69, 4: see also Brown 1994, fig. 2,2). There appears to be a degree of standardisation here: for the 20 rims which are measurable, diameters ranged from 130 mm to 190 mm, although most are within the range of 140–160 mm (14 examples).

The deposition of such a quantity of fairly 'standardised' jars in a single feature and, moreover, one of the few positively identified 'late' features on the site, can be regarded as unusual, and perhaps requires some explanation beyond the simple disposal of domestic refuse. This could, perhaps, represent the failures from a single pottery firing episode, although there is no supporting evidence from the pottery itself in the form of apparent 'wasters' or firing faults of any kind, beyond a few sherds with slight surface spalling. This evidence contrasts with another group of possible late Saxon waster fragments from York Buildings, within the medieval town, which showed more definite signs of firing faults in the form of spalling and distortion (Brown 199, 131). Furthermore, several of the sherds from the Stadium site, particularly those from the lower parts of the jars, show signs of external sooting and internal residues indicating that they had been used prior to disposal.

The Environmental Evidence from the Settlement

Animal Bones

by Sheila Hamilton-Dyer

An enormous amount of animal bone has been retrieved over the past 25 years from excavations in Hamwic. Of particular note are the assemblages from Melbourne Street (87,000 specimens) and Six Dials (20% recorded: 50,000 specimens). Melbourne Street was published in 1980 (Bourdillon and Coy 1980) and a summary of the findings from Six Dials in 1997 (Bourdillon with Andrews 1997). Detailed examination of the deposition of bone and other material in a single pit from Six Dials was carried out by Colley (1983). In addition there are several synthesis papers and an M.Phil thesis by Bourdillon (1980; 1983; 1988; 1994). Some site reports and other works, such as the statistical appendix for Melbourne Street, have not been formally published but were disseminated among interested parties. This author has had access to almost all of these sources, and has been involved with several Hamwic projects including Six Dials.

It was felt that there was little point in committing resources to the repetition of these major works. Instead it was decided, after an initial assessment stage, and in consultation with all involved parties, that analysis should be undertaken on as representative a portion of the assemblage as possible. The main objectives of analysis were to:

- Establish whether settlement towards the north-eastern edge of Hamwic, as represented by the animal bone assemblage, was similar to that in the main area of occupation. Specifically, are there any clear differences in species proportions, ageing, disposal patterns, etc?
- Examine whether any of the deposits indicate specific activities, such as boneworking, tanning, etc;
- Detect chronological changes.

Approximately 10% of the bone assemblage was selected by choosing the major features (pits) across the whole site. This was not an entirely random selection as it targeted the largest groups of material and attempted to cover all areas of the site. Of the nine pits originally chosen pit 8033, at the most northerly limit of the site, was rejected at the secondary assessment stage as being too small (just 159 fragments in total) to usefully contribute to the analysis.

Methods

Species identifications were made using the author's modern comparative collections. All fragments were identified to species and element with the following exceptions. Ribs and vertebrae of the ungulates (other than axis, atlas, and sacrum) were identified only to the level of cattle/horse-sized and sheep/pig-sized, except in the case of clearly associated bones where ribs and vertebrae were assigned to species. Unidentified shaft and other fragments were similarly divided. Any fragments that could not be assigned even to this level have been recorded as mammalian only. Where possible sheep and goat were separated using the methods of Boessneck (1969) and Payne (1985). Recently broken bones were joined where possible and have been counted as single fragments. Tooth eruption and wear stages of cattle, sheep and pig jaws were recorded following Grant (1982). Measurements follow von den Driesch (1976) in the main and are in millimetres unless otherwise stated. Withers height calculations of the domestic ungulates are based on factors recommended by von den

Driesch and Boessneck (1974). Archive material includes metrical and other data not presented in the text and is kept on paper and digital media.

In comparison with the methodology used on the bones from the previous major assemblages, principally Melbourne Street and Six Dials, there are but minor differences and the method is essentially the same. In particular, the policy of 'total record' – ie, all fragments are counted and identified as far as reasonably possible and unidentified material grouped into size classes. Other archaeozoological workers have employed the method of recording a set group of elements and the use of zones (eg, Davis 1987, Dobney and Rielly 1988). While both methods have their drawbacks and benefits it was felt that the consistency of using a 'total record' method would be most likely to offer closest comparison with past work and eliminate differences caused by methodological variations. Various improvements and additions to the method of recording of bones have occurred since the Melbourne Street assemblages were studied. Some of these alterations were already being incorporated into the standard methodology by the time the Six Dials project was started, and there have been several more since. These have been employed in the current analysis but mainly supplement rather than supplant the earlier techniques. Additional elements include standardised recording of condition, fragment size and Whole Bone Equivalent (WBE). Some parts of the recording process have been dropped, in particular the time consuming weighing of bone by species and context. This did not seem to offer much of value commensurate with the effort, is affected by ground conditions, and was found to give inconsistent results at Six Dials (Bourdillon 1984).

In general MNI (minimum number of individuals) calculations were not attempted; it has often been suggested that this is of little value, particularly in complex assemblages of mixed disposal activities such as urban rubbish pits (O'Connor 2000). Many comparisons of counting were calculated at Melbourne Street and it was estimated that most of the bones in a pit could originate from different individuals and that the representative loss could be 90% or higher (Bourdillon 1979). Bone fits between pits also illustrate that MNI estimations for an individual pit are unreliable (Bourdillon and Coy 1980).

Material from sieved samples was available from all pits except 5199. Not every context was sampled and not all samples produced bone. Bone from the samples is largely discussed with that from hand collection.

Further details concerning the assemblage can be found in the archive, much of it comprising tabulated data including species distribution by context, anatomical elements and various measurements.

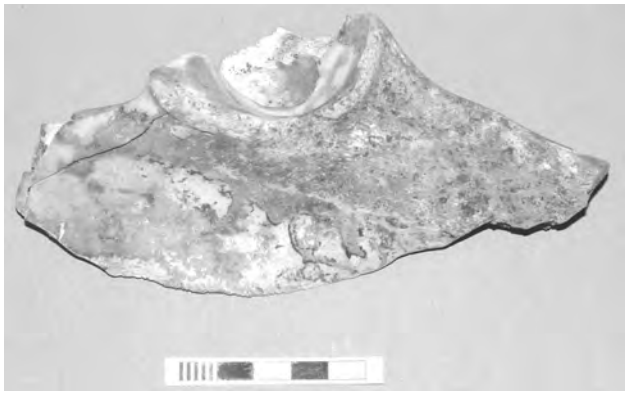

Figure 70 Cattle pelvis with staining showing the level of standing water in the burial environment. © S. Hamilton-Dyer

Results

A total of 9336 individual specimens was recorded from hand collection and a further 2008 from sieved samples. Almost half of the hand-collected bone (4099 specimens) was recovered from pit 4447. The smallest group of hand collected material is from pit 3151, at just 347 specimens. Material from sieved samples ranges from 16 specimens from pit 7446 up to 732 specimens from pit 2001.

As expected from previous work at Hamwic, the vast majority of the bone is of cattle, sheep, pig, and fragments of these size classes. The other domestic mammals, horse, goat, dog, and cat are present but at very low levels. Wild mammals are restricted to red and roe deer. Bones of domestic fowl and of goose (assumed to also be domestic) are a minor but consistent presence. Other bird remains are rare; they include one or two bones of woodcock, pigeon, and mallard (although this last could also be domestic). Fish bones were recovered from all of the features except 5199; these are mainly from the sieved samples, but are not frequent even in these. At 122 specimens there are fewer fish than bird bones. The identified species are eel, salmon, bass, mullet,

Figure 71 Sheep phalanx showing evidence of partial digestion. © S. Hamilton-Dyer

Table 21 Overall summary of species distribution by feature

Feature no.	*Horse*	*Cattle*	*Sheep/ goat*	*Pig*	*Red deer*	*Roe*	*Cattle-size*	*Sheep-size*	*Mam-mal*	*Dog*	*Cat*	*Fowl*	*Goose*	*Other bird*	*Fish*	*Total*
161																
No.	0	182	80	59	0	0	218	92	41	0	0	11	0	0	2	685
%	*0*	*26.6*	*11.7*	*8.6*	*0*	*0*	*31.8*	*13.4*	*6.0*	*0*	*0*	*1.6*	*0*	*0*	*0.3*	
% cattle, sheep, pig		56.7	24.9	18.4												no=321
2001																
No.	0	230	81	72	6	0	179	62	2	0	4	2	7	0	0	645
%	*0*	*35.7*	*12.6*	*11.2*	*0.9*	*0*	*27.8*	*9.6*	*0.3*	*0*	*0.6*	*0.3*	*1.1*	*0*	*0*	
% cattle, sheep, pig		60.1	21.1	18.8												no=383
3151																
No.	0	95	41	34	0	0	119	43	4	0	2	5	3	1	0	347
%	*0*	*27.4*	*11.8*	*9.8*	*0*	*0*	*34.3*	*12.4*	*1.2*	*0*	*0.6*	*1.4*	*0.9*	*0.3*	*0*	
% cattle, sheep, pig		55.9	24.1	20												no=170
4447																
No.	0	1079	257	308	1	2	1483	447	457	1	0	39	22	3	0	4099
%	*0*	*26.3*	*6.3*	*7.5*	*0*	*0*	*36.2*	*10.9*	*11.1*	*0.02*	*0*	*1.0*	*0.5*	*0.1*	*0*	
% cattle, sheep, pig		65.6	15.6	18.7												no=1644
5199																
No.	13	238	44	27	27	0	154	14	223	1	0	2	1	3	0	747
%	*1.7*	*31.9*	*5.9*	*3.6*	*3.6*	*0*	*20.6*	*1.9*	*29.9*	*0.1*	*0*	*0.3*	*0.1*	*0.4*	*0*	
% cattle, sheep, pig		77.0	14.2	8.7												no=309
6162																
No.	0	403	131	57	0	0	461	99	90	0	0	3	3	0	0	1247
%	*0*	*32.3*	*10.5*	*4.6*	*0*	*0*	*37.0*	*7.9*	*7.2*	*0*	*0*	*0.2*	*0.2*	*0*	*0*	
% cattle, sheep, pig		68.2	22.2	9.6												no=591
7163																
No.	0	71	14	19	0	0	191	82	17	0	0	3	5	0	0	402
%	*0*	*17.7*	*3.5*	*4.7*	*0*	*0*	*47.5*	*20.4*	*4.2*	*0*	*0*	*0.7*	*1.2*	*0*	*0*	
% cattle, sheep, pig		68.3	13.5	18.3												no=104
7446																
No.	0	129	124	116	0	0	255	257	212	1	1	18	8	9	34	1164
%	*0*	*11.1*	*10.7*	*10.0*	*0*	*0*	*21.9*	*22.1*	*18.2*	*0.1*	*0.1*	*1.5*	*0.7*	*0.8*	*2.9*	
% cattle, sheep, pig		35.0	33.6	31.4												no=369
Grand total	13	2427	772	692	34	2	3060	1096	1046	3	7	83	49	16	36	9336
Overall %	*0.1*	*26.0*	*8.3*	*7.4*	*0.4*	*0.02*	*32.8*	*11.7*	*11.2*	*0.03*	*0.1*	*0.9*	*0.5*	*0.2*	*0.4*	
% cattle, sheep, pig		62.4	19.8	17.8												no=3891

gurnard, and flatfish (probably all plaice). All of the taxa have been recorded from Hamwic previously. An overall summary of the taxa distribution by feature (including sieved material) is given in Tables 21 and 22.

Taphonomic considerations

Differential recovery, preservation, and other sources of taphonomic bias are an integral part of modern animal bone analysis. At Six Dials a major study of variability was undertaken in order to better

Table 22 Summary of species distribution from the sieved samples

Feature no.	*Cattle*	*Sheep/ goat*	*Pig*	*Deer*	*Cattle-size*	*Sheep-size*	*Mammal*	*Cat*	*Bird*	*Fish*	*Total*
161											
No.	8	18	7	0	61	25	157	0	3	10	289
%	2.8	6.2	2.4	0	21.1	8.7	54.3	0	1	3.5	
% cattle, sheep,pig	24.2	54.5	21.2								no=33
2001											
No.	29	31	59	18	60	86	409	2	25	13	732
%	4	4.2	8.1	2.5	8.2	11.7	55.9	0.3	3.4	1.8	
% cattle, sheep,pig	24.4	26.1	49.6								no=119
3151											
No.	3	11	4	0	11	19	67	0	11	32	158
%	1.9	7	2.5	0	7	12	42.4	0	7	20.3	
% cattle, sheep,pig	16.7	61.1	22.2								no=18
4447											
No.	21	19	11	1	79	53	273	0	19	17	493
%	4.3	3.9	2.2	0.2	16	10.8	55.4	0	3.9	3.4	
% cattle, sheep,pig	41.2	37.3	21.6								no=51
6162											
No.	0	4	0	0	12	9	55	0	1	1	82
%	0	4.9	0	0	14.6	11	67.1	0	1.2	1.2	
% cattle, sheep,pig	0	100	0								no=4
7163											
No.	9	5	12	0	49	30	116	0	4	13	238
%	3.8	2.1	5	0	20.6	12.6	48.7	0	1.7	5.5	
% cattle, sheep,pig	34.6	19.2	46.2								no=26
7446											
No.	0	0	0	0	0	5	11	0	0	0	16
%	0	0	0	0	0	31.3	68.8	0	0	0	
Grand Total	70	88	93	19	272	227	1088	2	63	86	2008
Overall %	3.5	4.4	4.6	0.9	13.5	11.3	54.2	0.1	3.1	4.3	
% cattle, sheep,pig	27.9	35.1	37.1								no=251

understand the bone assemblages. Similar considerations have been employed in this study.

In addition to written notes about unusual features (Fig. 70), the preservation condition of each bone or group of bones was routinely recorded to a set of standard criteria. This includes the amount and presence of erosion, burning, gnawing, and butchery amongst others. The proportion of loose teeth was also calculated as this can indicate poor preservation and/or residuality.

As expected, the sieved material does include a slightly higher proportion of small elements of the large animals, such as phalanges. The amount of such bone from sieving is small and the number of samples is not the same for each feature; these have, therefore, not been used in the anatomical tables.

The smaller taxa, and fish in particular, are likely to be much under represented simply because they are rarely collected by hand; the fact that most of the fish bones were recovered from the samples illustrates this point. The remains of the smaller taxa may also not survive as well as those of larger ones because they have a comparatively larger surface area exposed to attrition. Not all elements of the larger animals have the same chance of survival either, for example the smallest bones of the large animals are more likely to be eaten or removed by scavengers, and the softer parts of immature bones are more subject to both

Table 23 Condition of animal bone by feature (percentages)

Feature No.	*Unaffected*	*Butchered*	*Dog gnaw*	*Eroded*	*Burnt*	*Ivoried*	*Total no. excl. teeth*	*Total*	*pit vol. (m^3)*	*No. frags per m^3*
161	58.9	14.3	2.1	17.9	6.7	0.2	630	685	4.1	167
2001	49.0	31.3	4.1	14.8	0	0.8	629	645	5.3	122
3151	42.7	19.6	2.4	32.9	1.5	0.9	337	347	2.6	134
4447	57.5	12.2	2.5	26.9	0.4	0.6	3906	4099	6.4	641
5199	3.7	11.3	2.9	89.1	0.4	0	723	747	3.2	233
6162	47.0	18.3	3.4	31.1	0.2	0	1166	1247	2.7	462
7163	75.5	15.1	1.1	2.7	1.6	4.0	372	402	1.2	335
7446	62.9	11.8	0.9	21.8	1.8	0.8	1058	1164	2.9	401
Total	66.2	14.8	2.5	29.6	1.0	0.6	8821	9336	28.4	329

Calculations of condition exclude loose teeth and more than one state may occur for each bone

scavenging and to chemical attrition in the soil. The actual remains of dog are restricted to two jaws and a skull but their presence is shown indirectly by clear examples of gnawing on some bones, and sometimes evidence of partial digestion such as the sheep phalanx in Figure 71.

A summary comparison of the various condition states between the features is given in Table 23.

The condition of the bone shows no relationship to the bone density in pits, nor are there statistically detectable differences in taxa, loose teeth, or erosion between the upper, middle, and lower deposits in the pits. At Six Dials it was thought that more loose teeth ie, eroded and broken material, were found in some of the upper, probably slumped layers.

There does, however, appear to be a relationship between erosion and taxa; pit 5199 has a notably higher proportion of eroded specimens, unidentified fragments, and cattle bone. The number of sheep, pig, and sheep/pig size fragments is correspondingly low. Pit 7163 had the lowest incidence of erosion but little evidence of an increase in the small bones, but this was also one of the smallest samples at 402 bones and, therefore, the data are perhaps less reliable.

Species distribution

Cattle bones dominate the identified bones at 26% and are the most frequent taxa from each of the eight pits. The unidentified material is also heavily weighted in favour of cattle-sized fragments (32.8% of all the hand collected bone). As the amount of horse and red deer is negligible it is highly likely that these are all of cattle. Cattle forms 62.4% of the cattle/sheep/pig total, with sheep and pig at almost equal levels. In the sieved samples sheep and pig are better represented, as expected, but the larger carcass weight of cattle means that beef would still have been the major meat source. The amount of cattle in each pit varies, from 11.1% in pit 7446 to 40.7% in the upper layers of pit 2001. The results from some features at Six Dials had suggested that there might be a slight increase in the level of cattle from the later occupation at Hamwic, but it was recognised that this might be a peculiarity of the three late features examined. In the current group, both 7446 and the upper layers in pit 2001 have been dated to the mid mid-Saxon. The ratios of just the cattle/sheep/pig and cattle/pig are given in Table 24. Pit 7446 has the lowest proportion of cattle and 5199 the highest, the latter also dated mid mid-Saxon. The occurrence of the minor mammals, and of the bird and fish, is sporadic and difficult to observe changes. The highest level of bird and fish in the hand collected material occurs in pit 7446 and the lowest in pit 6162, both dated to the mid mid-Saxon. In the sieved samples, pit 3151 has the highest level, and is also of a mid mid-Saxon date. At Six Dials there was a little more antler, fish and wild bird from the two late dated pits, but this is not the case here.

Anatomical distribution

Almost all of the anatomical elements of the main taxa are present; the exceptions being some of the smallest elements such as carpals and peripheral phalanges. Distribution of elements for the three main taxa is given in Tables 25–7. Even for the larger bones of cattle there is an under representation of small elements. This is typical of almost all assemblages and can be for a variety of reasons; eg, the smaller elements are less likely to be seen in hand collection, and indeed there are a few more of these present in the sieved samples. The small elements and the most fragile ones are also subject to loss, both in the ground from chemical attrition but also from scavengers. The amount of visible gnawing at this site is not

Table 24 Ratios of cattle/sheep/pig and cattle/pig from selected features

Feature/date	*Cattle*	*Sheep/ goat*	*Pig*	*Total*
161 (early)	182	80	59	321
% cattle, sheep, pig	56.7	24.9	18.4	
%cattle, pig	75.5		24.5	241
2001 (early)	164	64	56	284
% cattle, sheep, pig	57.7	22.5	19.7	
%cattle, pig	74.5		25.5	220
2001 (mid)	66	17	16	99
% cattle, sheep, pig	66.7	17.2	16.2	
%cattle, pig	80.5		19.5	82
3151 (mid)	95	41	34	170
% cattle, sheep, pig	55.9	24.1	20.0	
%cattle, pig	73.6		26.4	129
4447 (mid)	934	211	289	1434
% cattle, sheep, pig	65.1	14.7	20.2	
%cattle, pig	76.4		23.6	1223
5199 (mid)	238	44	27	309
% cattle, sheep, pig	77.0	14.2	8.7	
%cattle, pig	89.8		10.2	265
6162 (mid)	403	131	57	591
% cattle, sheep, pig	68.2	22.2	9.6	
%cattle, pig	87.6		12.4	460
7446 (mid)	129	124	116	369
% cattle, sheep, pig	35.0	33.6	31.4	
%cattle, pig	52.7		47.3	245
4447 (mid-late)	145	46	19	210
% cattle, sheep, pig	69.0	21.9	9.0	
%cattle, pig	88.4		11.6	164
7163 (mid-late)	71	14	19	104
% cattle, sheep, pig	68.3	13.5	18.3	
%cattle, pig	78.9		21.1	90
Overall total	2427	772	692	3891
% cattle, sheep, pig	62.4	19.8	17.8	
% cattle/pig	77.8		22.2	3119

'Early', 'mid' and 'mid-late' refer to suggested sub-division of the mid-Saxon period. The first line of each entry is no. frags.

Table 25 Distribution of anatomical elements: cattle

Element	*Total*	*%*		*Total*	*%*
Skull	226	9.3	head & neck	702	28.9
Maxilla/ premaxilla	54	2.2			
Jaw	247	10.2			
Loose teeth	109	4.5			
Atlas	41	1.7			
Axis	25	1.0			
Sacrum	26	1.1			
Scapula	192	7.9	shoulder	192	7.9
Pelvis	187	7.7	pelvis	213	8.8
Humerus	183	7.5	foreleg	385	15.9
Radius	128	5.3			
Ulna	74	3.0			
Femur	195	8.0	hindleg	357	14.7
Patella	12	0.5			
Tibia	150	6.2			
Astragalus	45	1.9	feet	578	23.8
Calcaneum	66	2.7			
Other carpal/tarsus	30	1.2			
Metacarpal	122	5.0			
Metatarsus	127	5.2			
Phalanges	188	7.7			
Total	2427			2427	

particularly high, but many small elements such as toes and patellae may never reach the pits at all, and other bones may be so damaged that they are unrecognisable.

The anatomical distribution for sheep/goat is surprisingly similar to that of cattle; one might have expected fewer of the smaller elements, particularly the feet. There are some differences: for cattle the foot bones are spread between the elements, while for sheep there is a higher percentage of metapodia in comparison with the other elements and typically very few phalanges and carpals/tarsals.

Given the probable taphonomic loss it appears that the bones represent whole animals. It is very clear from the mixtures in the deposits and the butchery fragmentation that the pits did not contain whole carcasses, although disposal of adjoining bones, such as parts of an ankle, is sometimes evident. The distribution details vary from feature to feature but

Table 26 Distribution of anatomical elements: sheep

Element	*Total*	*%*		*Total*	*%*
Skull	95	12.3	head & neck	233	30.2
Maxilla/ premaxilla	17	2.2			
Jaw	84	10.9			
Loose teeth	19	2.5			
Atlas	13	1.7			
Axis	5	0.6			
Sacrum	4	0.5			
Scapula	57	7.4	shoulder	57	7.4
Pelvis	57	7.4	pelvis	61	7.9
Humerus	40	5.2	foreleg	139	18.0
Radius	79	10.2			
Ulna	20	2.6			
Femur	45	5.8	hindleg	139	18.0
Patella	1	0.1			
Tibia	93	12.0			
Astragalus	3	0.4	feet	143	18.5
Calcaneum	4	0.5			
Other carpal/tarsus	1	0.1			
Metacarpal	67	8.7			
Metatarsus	58	7.5			
Phalanges	10	1.3			
Total	772			772	

Table 27 Distribution of anatomical elements: pig

Element	*Total*	*%*		*Total*	*%*
Skull	54		head & neck	233	30.2
Maxilla/ premaxilla	28				
Jaw	88				
Loose teeth	40				
Atlas	7				
Axis	4				
Sacrum	1				
Scapula	49		shoulder	57	7.4
Pelvis	52		pelvis	61	7.9
Humerus	57		foreleg	139	18.0
Radius	40				
Ulna	41				
Femur	48		hindleg	139	18.0
Patella	2				
Tibia	52				
Fibula	13				
Astragalus	5		feet	143	18.5
Calcaneum	9				
Other carpal/tarsus	2				
Metacarpal	38				
Metatarsus	37				
Peripheral mp	9				
Phalanges	16				
Total	692			692	

none shows specific dumps of any one body area. Had these pits been used for separate disposal of slaughter waste one would expect a concentration of head and foot, especially for cattle. In a similar manner it might be possible to detect rubbish from a high status household if a pit contained bones only from the best cuts. This is not the case at this site, nor from elsewhere in Hamwic; the disposal seems to be undifferentiated right across the settlement.

For the minor species the number of specimens is too small for detailed analysis but would appear to be as expected; goat is mainly of horn cores, red deer is antler, horse is mostly foot bones. Birds are mainly represented by the sturdier elements of the wing and leg bones.

Butchery

Butchery marks were frequently observed on the material, although most fragments had no visible butchery. In all, 15.5% of the main domestic ungulate bones had marks that could be clearly seen to be a result of butchery processes. Many bones were also broken, but it is difficult to distinguish between other reasons for fracture and those resulting from a blow from an implement when the diagnostic part of the bone is not present. Where it was reasonably certain that damage, such as the axial splitting or spiral fracture of limb bones, was probably a result of butchery, it was recorded but many more probably went unrecorded. While some of the extant marks could be attributed to a fine blade, such as a knife, most were made by an axe or cleaver. A higher proportion of cattle bones than sheep and pig were butchered, in keeping with the larger carcass size and a greater need for division. The knife marks include

Table 28 Butchery data (percentages)

	Un-affected	*Butchered*	*Knife*	*Chopped*	*Axial*	*Total*
Cattle	74.5	25.5	1.7	11.5	8.9	2427
Sheep/goat	82.3	17.7	4.0	6.1	4.5	772
Pig	88.6	11.4	1.3	4.3	4.9	692
Cattle-size	90.0	10.0	0.2	9.7	0.1	3060
s/g/pig-size	90.2	9.8	0.1	9.6	0.1	1096
Total	84.5	15.5	1.1	9.4	3.6	8047

those made when removing the head from the spine, the toes from the foot, cheek and tongue meat from the head, and when disarticulating joints such as the shoulder and elbow. Knives were more commonly employed for the smaller sheep carcasses. The large joints of cattle, such as the distal humerus, were sometimes disarticulated by cleaver. More often the cleaver was used to sub-divide the portion and probably to expose the marrow. Blade marks identifying a particular instrument are sometimes visible. Unlike cattle and sheep the skin of the pig can be left on and, after singeing and scraping the bristles off, almost the whole animal can be utilised for food. There is ample evidence for the axial division of pig heads, all of which could be used but there are also sheep heads that have been chopped open, probably to access the brain.

The frequency of bones with butchery marks varied between the features, with pit 2001 having noticeably the highest proportion of butchered bones at over 31%; the other features ranged from 11.3% to 19.6% (Table 28). Many of these are cattle bones; all of the metapodia from this feature and many of the major leg bones have been axially split, or nearly so. Three of the atlas had also been chopped in half, and other chopped vertebrae were lumbars with the lateral processes removed on one side. Many of the ribs were chopped into short lengths. This feature is higher in the amount of cattle bones, which are generally more intensely butchered, but the frequency of butchery is higher too.

It is clear from the presence of bone-fits in 4447 (Fig. 72) that the bones were sometimes thrown away immediately after the butchery process. The femur, tibia, and humerus in question had all been split open, probably for marrow extraction after the meat had been stripped. They were then thrown away in the same disposal event so that they were recovered and recorded together. These were the most obvious joins;

Figure 72 Bone fit from pit 4447: evidence for disposal adjacent to the butchery site. © S. Hamilton-Dyer

there may well have been others that were missed, perhaps from adjacent fills for example. Axial splitting of cattle limb bones followed by rapid burial, was also described at Melbourne Street and the butchery styles noted there, and at Six Dials, are repeated here.

Ageing

There are two types of ageing evidence presented by the remains: tooth eruption and wear, and the state of epiphysial fusion of the longbones. Neither method can give precise ages, but only a general idea of the mortality profiles. The ages given below are, therefore, only an approximation.

The epiphysial fusion data and derived estimates of survival are given for cattle, sheep, and pig in Table 29. For sheep there is a gradual decline in survival percentage, but the data indicate that over half of the animals represented by these epiphyses survived to at least the 30 to 42 month stage. Beyond that age all the epiphyses are closed and give no further data. There is clearly little interest in lambs of the year for food as over 96% survived beyond 6 to 10 months and nearly 90% survived 12 months. However, not all of the bones of the youngest animals had extant epiphyses that could be recorded, and there were also two incomplete bones of neonatal lambs. Furthermore, the survival of the porous bones is not as good as the

Table 29 Epiphyseal fusion data and estimates of survival. Ages in months

Sheep/ goat	*% unfused*	*% fused*	*Cattle*	*% unfused*	*% fused*	*Pig*	*% unfused*	*% fused*
Age			*Age*			*Age*		
6–10	*96.2*	*3.8*	7–10	*93.8*	*6.2*	12	*66.9*	*33.1*
12	*88.9*	*11.1*	12–18	*86.4*	*13.6*	-	-	-
15–30	*76.1*	*23.9*	24–36	*54.9*	*45.1*	24–30	*25.5*	*74.5*
30–42	*51.4*	*48.6*	42–48	*49.6*	*50.4*	36–42	*9.1*	*90.9*

larger and more solid ones of adults and some of the younger lambs may not, therefore, be represented. The older lambs and animals just over a year old, however, should be quite well represented if present, yet these are few. Calves are similarly rarely recorded in the cattle bones, and there are just three bones of neonatal or very young calves with no recordable epiphyses. Again, most cattle survived their first year but the survival pattern changes after the 18 month stage; nearly 55% survived beyond 2–3 years but this is a significant drop from the 86% of the previous 18 month stage. Most of the surviving animals then continue beyond the 4 year stage. The pattern for pig is quite different; a third had already died before a year old and less than 10% survived beyond 3 years. Bones of piglets were present and of the six found only one had no epiphyses and could not be counted in the fusion tables.

Tooth data are likely to be more reliable than that from epiphysial fusion as the resistant tooth material survives well and protects the jawbone, and is also unattractive to scavengers and humans alike. The toothwear and eruption stages were recorded using Grant (1982). For sheep they were then grouped into age classes, one set following the groups used at Melbourne Street and Six Dials and another set following the slightly finer distinctions of Maltby (1993) which have been used by the author for recent work in Southampton (Table 30). Whichever grouping is used it is clear that the majority of the jaws are of fully adult animals with the third molar present. None of the jaws is of a very young lamb, and even those jaws of up to approximately two years are rare. Although there are subtle differences both groupings indicate that there were less animals culled in the very last class, representing animals over approximately four years. The overall result is similar to previous findings; the flocks were almost certainly composed of ewes and wethers kept mainly for wool. Those that proved to be poor breeders, or produced sub-standard fleeces, would have been culled after a few seasons to supply the demand for meat in Hamwic. With male lambs castrated and kept for wool production there would have been few surplus lambs for meat, but most of the mutton would have been of good eating quality and not of very aged animals.

Table 30 Toothwear and eruption data: sheep

Maltby stage	*1*		*2*		*3*		*4*		*5*		*6*		*7*	*Total*
No. jaws	-	-	1	2	1	-	1	1	11	8	21	3	14	63
Bourdillon stages	*0*		*1*		*2*		*3*		*4*		*5*		*6*	*Total*
No. jaws	-		1		1		4		14		27		5	52

Key to stages:

Maltby 1993

1. dp4 not in wear
2. M1 not in wear, dp4 in wear
3. M1 in wear, M2 not in wear
4. M2 in wear, M3 not in wear
5. M3 in wear, M1 not in heavy wear (Grant H)
6. M1 in heavy wear, M2 not
7. M1 and M2 in heavy wear

Bourdillon & Coy 1980; Bourdillon 1984

1. M1 not in wear
2. M2 not in wear
3. M3 not in wear
4. M3 coming into wear
5. M3 in full wear
6. M3 in heavy wear

Table 31 Summary measurements: cattle

	STADIUM									
Element	*Humerus*	*Radius*	*Scapula*	*Tibia*	*Astragalus*	*Calcaneum*	*Metacarpus*		*Metatarsus*	
	Bt	*Bp*	*GLP*	*Bd*	*GL1*	*GL*	*Bp*	*Bd*	*Bp*	*Bd*
Max.	80.2	88.2	81.2	87.5	68.2	148.0	67.7	67.2	45.4	56.3
Min	60.6	61.5	53.2	49.8	56.5	116.0	46.4	49.1	41.4	46.8
No.	27	22	21	28	42	23	14	17	7	13
Mean	68.4	74.1	64.4	56.9	61.8	128.8	56.0	56.8	43.8	50.2
	MELBOURNE STREET									
Mean	68.1	73.9	61.9	56.8	60.9	123.1	53.5	55.9	43.5	50.4

Measurement codes as per von den Dreisch (1976. Melbourne Street data from the statistical appendix; Bourdillon and Coy 1980 (see also Tables 32–4)

Few of the cattle jaws were complete, and only six had all four of the teeth used in most ageing techniques. Partial jaws and loose teeth offered 22 specimens over two years old, ie, with the third molar erupted or with the first molar well worn. Two are young, under six months, and at least 15 are between these two age groups. There are also seven jaws with extremely worn first molars and/or well-worn 2nd or 3rd molars; these are from animals more than approximately four years old. These results correspond fairly well with the fusion data, perhaps with slightly older animals represented. Although the dataset is not large, the results fit with previous findings.

Pig jaws were also rarely complete, and of those with suitable data, eleven contained a fully erupted third molar and were, therefore, estimated as over 20 months (using Habermehl's 1975 data for slow maturation). At least seven would have been between 13 and 20 months, with another seven at over 16 months. Only two could be recorded as under 8 months and seven under 13 months, the rest being too fragmentary for use. This data is somewhat at variance with the fusion which appeared to show a large cull of sub-adults, the remainder being mostly breeding stock. The discrepancy does not lie in the loose teeth, of which there are relatively few. Minor discrepancies of this type (though not with pig) were noted at Six Dials and offered as a good reason for using both methods for ageing. It is normal in assemblages to find that pig bones are mainly of young or sub-adult animals as pigs breed quickly and do not have secondary uses such as wool, milk, or traction.

The lack of young material from Hamwic has been noted before and the puppy bones found in a study of sieved material showed that those of lambs and piglets would also have survived (Bourdillon 1994). The inescapable conclusion once again is that, with a few exceptions, the occupants of the town were consumers and not involved in animal husbandry.

Table 32 Summary measurements: sheep

	STADIUM					
Element	*Scapula*	*Radius*	*Humerus*	*Tibia*	*Meta-carpus*	*Meta-tarsus*
	GLP	*Bp*	*BT*	*Bd*	*Bd*	*Bd*
Max	34.7	35.5	31.9	28.5	26.2	27.9
Min.	27.6	28.6	23.8	22.3	23.4	22.2
No.	26	36	26	35	13	20
Mean	31.7	31.8	28.3	26.3	24.9	24.1
	MELBOURNE STREET					
Mean	32.3	30.9	28.7	25.9	25.5	23.8

Biometrics

In spite of fragmentation, butchery and unfused epiphyses there are quite a number of bones that could be measured. Summary tables of the most frequent measurements are given in Tables 31–4.

Table 33 Summary measurements: pig

	STADIUM			
Element	*Scapula*	*Radius*	*Humerus*	*Tibia*
	GLP	*Bp*	*BT*	*Bd*
Max.	38.3	29.3	35.8	32.6
Min.	31	27.1	28.7	27.2
No.	22	11	11	12
Mean	34.9	28.5	31.3	30.2
	MELBOURNE STREET			
Mean	34.9	27.8	29.4	29.4

Table 34 Summary measurements: fowl

Element	*Humerus*		*Radius*	*Femur*		*Tibiot*		*Tarsometatarsus*	
	GL	*Bp*	*GL*	*GL (female)*	*GL*	*GL (female)*	*GL*	*GL (female)*	*GL*
STADIUM									
Max.	72.4	20.1	66.9	71.3	82.8	100.0	110.4	73.9	79.8
Min.	60.9	16.4	54.9	68.5	65.4	94.8	82.2	43.4	78.4
No.	9	7	6	4	3	9	4	5	3
Mean	65.6	17.3	60.5	70.2	72.6	97.8	103.5	63.2	79.1
MELBOURNE STREET									
Mean	65.3	17.9	56.5		73.8			65.2	79.5

Table 35 Withers heights: cattle and sheep

	No.	*Max wht*	*Min wht*	*Mean*	*sd*
Cattle					
Stadium	24	1.299	1.005	1.177	0.059
Melbourne St.	77	1.377	1.017	1.154	-
Sheep					
Stadium	48	0.672	0.546	0.618	0.027
Melbourne St.	184	0.709	0.501	0.614	

Other measurements are held in archive. As has been found before, the cattle and sheep in particular are a good size for the period, larger than Iron Age stock in England and also often larger than those reported from the medieval town. Individual values very rarely fall outside the Melbourne Street ranges, and the means are often almost identical.

Calculations of withers height estimations were also made for cattle and sheep (Table 35). For cattle these are exclusively from metapodia; the only complete fused limb bones present. There are more complete sheep bones and these include radii as well as metapodia. In both cases although the sample is much smaller than from Melbourne Street the range is similar and the mean is extraordinarily close.

Sex

Determining the sex of animals from single and often fragmentary bones is extremely difficult, nevertheless there are cases where the gender can be determined with some certainty.

Antlers are borne only by male red deer and, therefore, all of those used must have been from stags. In cattle, sheep and goats both sexes may carry horns, although those of females may be much smaller or even absent. The Saxon stock all seem to have been horned as a rule, and sexual dimorphism is most striking in the goats. All the goat horn cores are large and sabre-shaped and would have been from males. The situation is less clear for sheep and cattle; the horns of rams are usually clear enough, but typically few in number. The confusion arises when castration is employed; most of the cores in this assemblage could be either ewes or wethers. A similar situation exists for cattle and is made more difficult by the increased amount of fragmentation. In total there are only ten cattle horn cores, two of which are large, thin-walled and therefore probably castrate, the other eight probably female. There are no cattle pelvic fragments that include an undamaged pubis, and for sheep there are just six; four probably male/castrate and two female. For cattle the index of metacarpal width against length can be useful (Howard 1963). Of the eleven metacarpi with both measurements extant five have indices of 30 or below and fall into the probably female group. These also closely match those thought to be female from Melbourne Street (Bourdillon and Coy 1980, fig 17.17). The six values above are less clear, three are within the male/castrate group from Melbourne Street, two large but narrow ones are slightly outside, and one is very small but still classified male as it is quite broad.

Pig jaws develop sexual dimorphism in the canines, those of males remain open rooted and become large tusks. Sexing the jaw of young pigs is difficult and many jaw fragments do not have the required part; of the pig jaws at the stage of 2nd molar in wear, and at least the canine alveolus present, eight were classed female and 13 male.

Some of the domestic fowl bones also give evidence of sex. Well-spurred tarsometatarsi are assumed to be of adult males (although older females may also develop spurs occasionally). In hens several elements may be used as a temporary store for the calcium required for egg laying (Driver 1982). This medullary bone can be clearly seen in some of the bones (Fig. 73). There is a large difference between the number of hens in or near lay and all other birds

Figure 73 Medullary bone, indicating a female domestic fowl © S. Hamilton-Dyer

ie, females not in lay and males. This implies that most of the birds were hens. It seems probable that cockerels were mainly used while still immature but hens were kept for eggs and breeding and then eaten as required.

Health of the animals

Most diseases and conditions leave little or no trace on the bones; occasionally pathological changes and anomalies are visible, but only a small proportion of the bones in this assemblage show such changes. In general the animals appear to have been relatively well fed and healthy.

The conditions that are exhibited can be divided into four types: trauma, changes due to age and disease, developmental and nutritional abnormalities, and anomalies or variations from the norm. It is not always possible to decide on the reason for an abnormality and simple description must suffice.

Evidence of definite trauma is rare in the assemblage, although some animals may not have survived long enough for the healing process to begin. A number of cattle ribs were recorded as having a mid-shaft callus and in one case a slight warping. These are found in most assemblages and are likely to be healed fractures. The process of healing continues for several months after an injury and may leave a permanent mark. It is supposed that these fractures would have occurred from falls and, though initially painful, would not have had much outward effect on the animal. This is quite different in the case of the animal represented by the distal half of a tibia in pit 2075. There is a clear break in the shaft with a large callus around the area. The break had not fully united when the animal died or was killed and only one half of the bone was recovered. This was a relatively young animal, not yet two years old, and may have been killed because of this severe injury.

A pig tibia from 4451 shows a less severe injury; the callus on the shaft may be the result of breaking the fibula and the healing parts becoming fused together. A badly fractured tibia was recorded in the Melbourne Street assemblage; this and similar ones from Manching have been suggested as evidence for tethering by the back leg (Bourdillon and Coy 1980).

Several sheep 'elbows' exhibited the pathology commonly known as 'penning elbow'. Both the proximal radius (three examples) and the distal humerus (four examples), show ossification of the tendon attachments. This is probably due to repeated minor sprains and strains rather than a single trauma, and is likely to become more pronounced with age.

The eburnation seen on some joint surfaces may be more a result of age-related arthropathy rather than a specific injury or disease. The eburnation on one cattle acetabulum and two femur caputae indicate where the joint capsule has lost some of the protective fluid and cartilage, resulting in the bone surfaces damaging each other by rubbing. It is assumed that this would have been painful and these cattle would have been inclined to move less and more slowly than normal.

Slight eburnation on the metatarsal face of a cattle cuboid could be a result of weight carrying, such as might be involved in ploughing, or pulling carts. This might also explain the spreading or lipping found on the proximal border of a third phalanx, spreading and exostosis on a large first phalanx, depression on the palmar surface of a metacarpus, lipping of the proximal border in two metatarsi, and one metatarsus with a splayed distal as well as extra bone growth. Similar bones were found in an extensive study of modern draught cattle (Bartosiewicz *et al.* 1997).

Infection, perhaps after injury, is likely to be the cause of the large sinus at the base of a sheep horn core from pit 5199. This specimen was also very thin walled and slightly 'thumbed'. Several other sheep horn cores exhibited 'thumb' marks, though not as marked as that from pit 5199. These abnormal depressions on sheep horn cores are frequently reported and this descriptive term first used by Hatting (1975). Initially thought to affect only wethers, recent work has shown this to occur on ewes as well and may indicate a nutritional deficiency (Albarella 1995).

Several pathologies were observed on the jaws of the domestic ungulates. In one cattle jaw with well worn teeth the 2nd premolar has been lost and the alveolus partly infilled. In another case there is no trace of the position of the 2nd premolar and it is difficult to know whether it was ever present or represents genuine oligodonty. The absence of the final column of a 3rd molar is more clearly a developmental or genetic anomaly. All three instances of oral pathology for pig are from jaws with fully erupted and worn teeth. In two case roots are exposed beyond the bone and in one case the 2nd molar has been lost and the alveolus is in the process of infilling. These are quite likely to be from old breeding stock.

Figure 74 An unusual bifurcated neural spine in a cattle thoracic vertebra. © S. Hamilton-Dyer

There are five sheep/goat jaws with problems; these all have fully erupted dentition. In one case the 2nd premolar is missing, in the other four cases there is impaction of the 4th premolar on the first molar. Conditions such as 'broken mouth', where the incisors are lost, are not readily discernable as few fragments were of this area of the jaw and in any case these teeth are frequently lost post-mortem. The impaction of teeth has been noted before in Hamwic but otherwise the dental health of the flock has always appeared to be quite good, in contrast with some. Of course, gross pathology resulting in death in the field is unlikely to be detected as these animals will not reach the town.

Finally, in this relatively small list of abnormalities, is the occurrence of a cattle thoracic vertebra with a bifurcated neural spine (Fig. 74). Interestingly this condition is the normal situation in the humped zebu cattle, developed in Asia or India, but it has been seen as an occasional variation in European cattle (Clutton-Brock 1987). Indeed, the present author recorded this condition in an Iron Age calf from Oxford (Hamilton-Dyer 1993).

Bone and antlerworking

Offcuts from the working of bone and antler were found in five of the features examined: 2001, 4447, 5199, 6162, and 7446, and most of the larger pieces had clear saw marks. A summary of the species representation is given in Table 36.

The total amount of red deer from the site as a whole is 53 specimens, 34 from hand collection and 19 from sieved samples. All of these are of antler; no post-cranial red deer is present. This lack of meat bones of deer is typical for Hamwic, although more striking than at some sites where a few bones have been found, and all of the antler is working waste of some type. There are many small flakes or chips from the initial trimming stages; sometimes these are also sawn. Tine tips are frequent, as are small partial sections of beam and tine. Burr fragments are also frequent; these are mainly from shed antlers but also from skulls (ie, the animal had died or been killed). It has been suggested before that the bone and antler working craft at Hamwic utilised antlers mainly collected from the hinterland rather than a by-product of hunting and eating venison (Bourdillon with Andrews 1997). The total lack of post-cranial remains supports this supposition even, as here, when some of the antler is from killed animals and may have been supplied from those who were in receipt of game. At Hamwic, in common with other sites in southern England, many items also utilise waste bone from the domestic ungulates. Within the identifiable bone offcuts, the most commonly represented are cattle metapodials (eight examples). Other cattle parts represented include femurs (two) and scapula (one). Metapodials of horse (two) and sheep/goat (one) were also utilised.

Hornworking

Skulls and horn cores are waste resulting from normal slaughter and butchery and also, sometimes, from tanning. When, however, the horn cores have been cleanly chopped or sawn from the skull at the base these are almost certainly the waste product from working the horn itself. After the horn and its inner core have been removed from the skull the horn must be removed by boiling and/or rotting. The bony core can then be disposed of. Amongst the skull and horn core fragments there are several that had been deliberately removed from the skull (others may have been but had no definite evidence of saw or cleaver). These occur mostly in pits 2001 and 4447 with one or two from other features (see Table 36).

Table 36 Summary of the worked bone and antler from selected features (red deer from whole site)

	Horse	*Cattle*	*Sheep/goat*	*Pig*	*Red deer*	*Cattle-size*	*Mammal*	*Total bones*
Total	13	2497 (15)	860 (8/13)	785	53	3332	2134	9674
No. worked	4	14	2	5	53	1	1	90
% worked	30.8	0.6	0.2	0.6	100	0.03	0.05	1.1

Numbers in brackets = chopped/sawn horn cores (these are not included in the worked totals)

Cattle cores are the most frequent with 15 specimens; these are variable in size and form, as found at other Hamwic sites. The eight sheep horn cores are probably all from rams or wethers; although the ewes at Hamwic were mostly horned they would not have offered much of worth for working. The 13 goat horn cores are large and presumably all from males. They are from no more than nine animals and include three pairs, with two pairs from pit 4447 together with two singles. The three horn cores from pit 2001 are from different animals. Apart from two possible metapodia, these are the only remains of goat from the site – a total of 15 bones as opposed to 211 definitely of sheep. This is typical for Hamwic and it can be suggested that goats were kept in small numbers in the hinterland and the horns brought in specifically for working.

Supply of provisions

In common with other assemblages from Hamwic there is scant evidence for the utilisation of wild resources from the hinterland. Deer are the only wild mammal represented, and only the two bones of roe can be interpreted as being from meat. All of the red deer remains are pieces of antler and, sometimes, adjoining skull fragments. Antler was clearly an important resource for the comb-makers and seems to have been collected or traded specifically for the boneworking craftsmen. Venison may have been available only to the higher echelons of the society, and perhaps these people did not normally reside in Hamwic. Bird bones are better represented, even though taphonomic bias counts against the smaller ones. Almost all, however, are of domestic poultry rather than wild species; even the geese are likely to have been domestic, or at least tamed, and would not have been obtained by wildfowling. The area around Hamwic and beyond could have provided many waders, pigeons, and other birds and indeed these are commonly found in the deposits from the medieval town (Hamilton-Dyer in prep.). Fish are clearly under represented; most are from the sieved samples, which represent only a small percentage of the total deposits. They are also less likely to survive than large bones and, therefore, the use of marine resources (which includes shellfish), while minor in comparison with beef and other meat, was undoubtedly greater than these few bones might indicate.

The majority of the meat supply would have been from cattle, sheep, and pig, in that order as expected from previous analyses. The anatomical data indicate that whole animals were brought to Hamwic, most probably on the hoof. The remains do not represent the full range of stock in the field, only those that were brought in for slaughter. The few neonate cattle and sheep may be of those births occurring in penned stock, perhaps kept for supplying milk or awaiting slaughter. Pig remains are more likely to have included stock kept in town, but even here there are few of the very youngest. Some poultry may have been raised in the town itself, or on the periphery.

Discussion

In summary, the animal economy of the town was narrowly based but the meat supply was ample, derived principally from cattle and sheep already used for other purposes rather than bred specifically for young prime meat. Pig was also plentiful, and in this case there is the possibility that some were raised in the town. Domestic poultry provided meat, eggs, and feathers/dung. The use of wild resources was extremely limited, especially considering the rich potential of the woods, marshes and shoreline in the area. Marine resources were used – both fish and molluscs, but even allowing for taphonomic bias appear to have been substantially less important than domestic meats. This lends a little credibility to the record of St Wilfrid finding that people in Sussex did not know how to fish, recounted in Bede.

The biometrical data are extraordinarily close to the Melbourne Street values, and indeed other assemblages from Hamwic. This very strong consistency shows that the animals were from a single group of closely related animals, presumably from the immediate hinterland. The extremely large data set that has now been accumulated for Hamwic can be used as a baseline upon which other, smaller assemblages from the town can be checked, and illustrates the value of the collection of this standardised data over several decades. It is to be hoped that the metrical data from all the Hamwic sites can be made readily available to a wider audience; the measurements were (and continue to be) taken following the same methods and the combined amount offers a huge resource of great value to researchers.

Unlike the results from Six Dials and from Cook Street (Bourdillon 1984; 1993; 119), where there was some hint that more of the beef supplied in the early phases might have been from prime large cattle, there is no secure evidence of phase changes at the Stadium site. The results are, however, biased in favour of the mid mid-Saxon phase from which most of the bone comes.

Boneworking waste is present, but not in great quantities, although only a few of the pits at Melbourne Street and Six Dials were notable for large amounts of waste.

In general there is a consistency of results at the Stadium site, with insufficient evidence to show changes with time and certainly no obvious differences to indicate proximity to the edge of settlement. There is, however, an impression that individual features are perhaps slightly more variable

than elsewhere in Hamwic. When it is remembered that the assemblage as a whole perhaps covers two centuries, and that each pit may have been used over many months, years or even decades (Andrews 1997, 176), it would not surprising if some variation is detected. A single episode, perhaps a bucket of waste, could alter the individual assemblages, which are probably relatively small survivors of the original material. Various aspects of rubbish disposal and formation processes were discussed by Colley (1983) following the detailed recording and examination of the contents of a single pit at Six Dials. The surprise, if it can now be called that after the accumulation and repetition of data results, is that there is a notable homogeneity across Hamwic as a whole. This has been ascribed by Bourdillon partly to central organisation of provisioning in a planned town, but also to communal use of rubbish pits, both for domestic and for industrial waste disposal (Bourdillon 1988; 1994).

Despite what might seem a large amount of material the data set is still statistically quite small. The analysis, however, does not stand alone; in conjunction with the previous assemblages, especially those from Melbourne Street and Six Dials, statements can be made more positively than would otherwise be justified.

Marine Shells

by Sarah F Wyles

Marine shell was retrieved by selective hand collection, during sample processing, and from samples collected specifically from dumps of shell. The assemblage consists of 10,189 shells representing ten species, recovered from 244 features. More than half (52%) of the assemblage was recovered from dumps of shells, with 95% of the overall total retrieved from pits.

The predominant species is oyster (*Ostrea edulis*), forming 47% of the assemblage. This is followed by periwinkle (*Littorina littorea*) at 32%, mussel (*Mytilus edulis*), 10%, and cockle (*Cardium edule*), 9%. The remaining 2% of the assemblage comprises whelk (*Buccinum undatum*), carpet shells (Veneridae), sting winkle (*Ocenebra erinacea*), scallop (*Chlamys* spp.), Cowrie (*Trivia* cf *monacha*), and limpet (*Patella*).

The overall distribution pattern of marine shell across the site is generally the same for all the principal species, with individual dumps of specific species. Oysters represented at least 50% of the shells recovered from 164 features, but other species sometimes comprised the majority: periwinkles in 20 features, mussels in nine, and cockles in four. Although more left valves were retrieved than right valves, no significant distribution patterns for oysters could be discerned, and there do not appear to have been any definite areas of preparation or consumption. The shell varied in condition, and it is likely that there was some time lapse between consumption and final disposal in the pits for some of the more poorly preserved shells.

There is a major concentration of marine shell in the South Stand; 49% of the features containing shell lay in this area. These were also the 'richest' deposits, with 74% of the assemblage coming from these features at an average of 63 shells per feature. The West stand produced 11% of the shells (from 13% of the features with an average of 37 shells per feature), whereas the North Stand produced only 7% of the assemblage (from 13% of the features, average of 23 shells per feature. Although the East Stand was closest to the waterfront, it only produced 6% of the shells (from 18% of the features, average of 14 shells per feature).

The marine shell assemblage from the Stadium site is broadly similar to that from Six Dials to the west. Although the retrieval methods are not directly comparable, the main species are the same and occur in the same order of frequency. At Six Dials oyster was the predominant species forming 62% of the assemblage, while periwinkles comprised 34%, mussels 4%, and cockles only 0.5% (Winder 1985; 1992). The majority of the shells recovered are edible species, although the quantity of shells would seem to indicate that the shellfish were an addition to, rather than a significant part of, the diet at Hamwic.

All the species from the Stadium site are widely found on the South coast and have habitats in the middle or lower shore zones and below. Analysis of the larger assemblage from the Six Dials site suggested that 'a variety of both intertidal and sublittoral oyster beds, on hard and soft substrates, in Southampton Water and the Solent could have been exploited by the inhabitants of Hamwic, although intertidal beds in the Weston Shore and Hamble Spit areas would have provided the most convenient source of oysters' (Winder 1992, 58).

Charcoal

by Rowena Gale

A total of 17 charcoal samples was selected for analysis from early– and mid mid-Saxon contexts. These comprised 16 samples from pits and wells and one sample from a hearth. Very little previous work has been undertaken on the charcoal from Hamwic, and virtually nothing has been published (Biddle 1997). Charcoal analysis was, therefore, undertaken to obtain environmental data and evidence of woodland management, information on the economic

use of woodland resources to provide fuel, and to examine any evidence for spatial or temporal changes in the use of fuel.

All of the charcoal fragments came from bulk soil samples, and fragments measuring >2 mm in radial cross-section were considered for species identification. With the exception of samples 46, 47, and 94, the samples were large and included firm, well preserved charcoal. A 50% sub-sample was examined from the larger samples (ie, 20, 49,155, 157, 274, 275, and 342); the remaining samples were examined in full.

Samples were prepared for examination using standard methods (Gale and Cutler 2000), supported in washed sand and examined using a Nikon Labophot-2 microscope at magnifications up to x400. The anatomical structures were matched to prepared reference slides. When possible, the maturity of the wood was assessed (ie, heartwood/ sapwood), and stem diameters and the number of growth rings recorded. It should be noted that measurements from charred material may be up to 40% less than the living wood.

The charcoal analysis is presented in Table 37 and discussed below. Group names are given when anatomical differences between related genera are too slight to allow secure identification to genus level. These include members of the Pomoideae (*Crataegus*, *Malus*, *Pyrus* and *Sorbus*), Leguminosae (*Ulex* and *Cytisus*), and Salicaceae (*Salix* and *Populus*). Where a genus is represented by a single species in the British flora this is named as the most likely origin of the wood, given the provenance and period. However, it should be noted that it is rarely possible to name individual species from wood features alone, and exotic species of trees and shrubs were introduced to Britain from an early period (Godwin 1956; Mitchell 1974). Classification follows that of *Flora Europaea* (Tutin *et al.* 1964–80).

The anatomical structure of the charcoal was consistent with the following taxa or groups of taxa:

Aceraceae. *Acer campestre* L., field maple
Aquifoliaceae. *Ilex aquifolium* L., holly
Betulaceae. *Alnus glutinosa* (L.) Gaertner, European alder; *Betula* sp., birch
Corylaceae. *Corylus avellana* L., hazel
Fagaceae. *Fagus sylvatica* L., beech; *Quercus* sp., oak
Oleaceae. *Fraxinus excelsior* L., ash
Leguminosae. *Cytisus scoparius* (L.) Link, broom; *Ulex* sp., gorse. These taxa are anatomically similar.
Rosaceae. Subfamilies:
Pomoideae which includes *Crataegus* sp., hawthorn; *Malus* sp., apple; *Pyrus* sp., pear; *Sorbus* spp., rowan, service tree and whitebeam. These taxa are anatomically similar; one or more taxa may be represented in the charcoal.
Prunoideae which includes *P. avium* (L.) L., cherry; *P. padus* L., bird cherry, and *P. spinosa* L., blackthorn. In most samples the charcoal was consistent with *P. spinosa*, which can usually be distinguished from the other species by the broader heterocellular rays. Sample 155 included charcoal more characteristic of *P. avium.*
Salicaceae. *Salix* sp., willow, and *Populus* spp., poplar. In most respects these taxa are anatomically similar.
Ulmaceae. *Ulmus* sp., elm.
Taxaceae. *Taxus baccata* L., yew

A wide range of taxa was identified in all contexts, although oak heartwood was evidently the preferred and most frequently used fuel. Other species included maple, alder, birch, beech, holly, gorse or broom, the hawthorn/*Sorbus* group, blackthorn, willow or poplar, elm, yew and possibly cherry/plum. Gorse/broom, elm, and yew were rare in these features; gorse/ broom occurred in pits 7615 and 1381, elm was present in pits 2071 and 2511, and yew was only identified from well 1261. The apparent paucity of these three or four species could be attributable to spatial differences in use, although it is more likely to reflect local availability or, for elm and yew, their questionable performance as firewood. Both yew and elm need to be very well seasoned if they are to provide good quality firewood (Porter 1990; D. Norman-Blackmore, pers. comm).

Discussion

The charcoal from all but one of the 14 features examined related to the mid mid-Saxon phase, and there were no discernible differences between the character of any of the individual assemblages.

Charcoal recovered from *in situ* deposits in hearth 7709 (probably a domestic feature) was predominantly oak, mostly heartwood, although hazel, holly, and blackthorn were also present, perhaps having been used as kindling or as roundwood to boost the temperature of the fire. The origin of the charcoal dumped in pits and wells was, however, less certain. Some pit fills may have derived from 'industrial' processes (in pits 7040, 7397, 7615, and 2511), while others (pits 4149 and 4470) contained dumps of burnt daub, perhaps from episodes of destruction; other pits (2071 and 3101) contained cess mixed with charcoal and refuse. The similarity in the types of charcoal recovered from these various contexts suggests either that there was no distinction or preference in the selection of industrial or domestic fuel or, that both domestic and industrial fuel were intermixed and dumped in the same contexts. Charcoal has the ability to absorb odours, and it is possible that relatively large quantities of charcoal

Table 37 Charcoal from settlement features (no. frags)

Feature	*Pit 1381*	*Pit 2001*	*Well 10161*	*Well 1261*	*Pit 2257*	*Pit 3101*	*Pit 3101*	*Pit 4149*	*Pit 7002*	*Pit 7397*	*Pit 7615*	*Hearth 7709*	*Well 10161*
Context	*1398*	*2079*	*10174*	*1263*	*2256*	*3102*	*3104*	*4151*	*7010*	*7405*	*7671*	*7710*	*10218*
Sample	*94*	*49*	*10032*	*85*	*105*	*155*	*157*	*248*	*120*	*256*	*275*	*274*	*10039*
Middle Saxon phase	*early*	*early*	*early*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*
Acer sp.	-	3	4	1	3	2	2	1	4	2	-	-	-
Alnus glutinosa	-	-	1	2	-	2	3	1	3	4	25	-	2
Betula sp.	-	1	-	13	3	-	9	-	-	1	-	-	1
Corylus avellana	2	3	3r	2	-	10	6	3	8	3r, 2	8r	1	3
Fagus sylvatica	-	-	-	1	3	1	-	-	cf. 1	-	-	-	1
Fraxinus excelsior	1r, 1	-	10	8	13	5	5	-	2	-	-	-	2
Ilex aquifolium	-	3	1	-	1	-	1	2	-	6	2	1	-
Pomoideae	2	4	9	5	1	4	16	2	9	5	6	-	3
Prunus spinosa	-	-	3	1	1	1	-	-	2	1r	3r	-	1
Prunus sp	-	-	-	-	-	2	-	-	-	-	-	-	-
Quercus sp.	-	53h	21h, 3s	31h, 2s	14h, 2s	26h, 3s	23h, 4s	47h, 40s	36h	43h, 5s	28h	113h, 3s	31h, 2s
Salix sp./*Populus* sp.	1	-	2	-	-	3	-	-	-	1	-	-	-
Ulex sp./*Cytisus* sp.	1r	-	-	-	-	-	-	-	-	-	4r	-	--
Ulmus sp.	-	-	-	-	3	-	-	-	-	-	-	-	-
Taxus baccata	-	-	-	1	-	-	--	-	-	-	-	-	-
Other	-	1x monocot culm Ø 1mm	-	-	-	-	-	-	-	-	56 bark; 3 dicot.stems; 1 monocot stem	-	-
Comments	frags fairly sparse		-	-	-	50% sub-sample	50% sub-sample	-	50% sub-sample	large quantity bark	50% sub-sample	50% sub-sample	-

Key: h = heartwood; s = sapwood (diameter >20 mm or unknown)

were deliberately dumped with cess (in pits 2071 and 3101) to reduce the stench of sewage.

Concentrations of ironworking slag recorded in pits in the north-west and southern parts of the site indicate the presence of at least one ironsmithing complex. Although it is possible to fuel ironsmithing hearths with highly seasoned wood (J. Cowgill, pers. comm.), charcoal seems the more likely choice, and continuous ironworking activities would have consumed large quantities of charcoal.

Tanners or leather workers may also have been active in the vicinity of the site. Tanbark was best obtained from oak trees, although other species, such as birch, willow, poplar, rowan, and alder, have also been used (Edlin 1949; Prance and Prance 1993). The spring bark contains the highest concentrations of tannin, particularly in juvenile stems and branches (Clarkson 1974). Coppiced woodland provided the ideal source and, traditionally, tanners and charcoal-burners co-ordinated their work. Relatively high quantities of (unidentified) burnt bark were recorded from pits 7615 and 7397; both pits were located in the northern part of the site and were thought to have been associated with industrial processing. Although conjectural, this could suggest the recycling of tanning waste to supply low-grade fuel or possibly its disposal by burning.

Mineralised Plant Remains

by Wendy J. Carruthers

Mineralised plant remains can provide direct evidence of diet, as they are usually derived from faecal deposits. Most of the evidence has been recovered from Roman and medieval cess pits and garderobes, although some other highly organic deposits also produce material preserved by mineral replacement, for example, the Late Bronze Age 'mound' at Potterne, Wiltshire (Carruthers 2000).

Evidence from Saxon sites, however, is still rare, since few sites of this period have been extensively examined for mineralised plant remains. The analysis of cess pits from the Early Saxon site at Abbots Worthy in the Itchen Valley (Carruthers 1991) demonstrated the potential of this type of preservation. However, on this site only three pits contained mineralised cess remains, so it was uncertain how well these results reflected the Anglo-Saxon diet throughout the year. The importance of the samples from the Stadium site was that a large number of well-preserved mineralised deposits were available for study, making it much more likely that the results would provide an accurate representation of the every-day diet of the occupants of Hamwic.

An assessment of more than 400 bulk soil samples (Wessex Archaeology 2000) showed that 86 contained mineralised material in the flot. Because mineralised remains are usually too dense to float, both residues and flots need to be microscopically sorted. The residues of concentrated mineralised faecal material usually contain large proportions of pale brown, clinker-like concretions (mineralised frag-ments of faeces), so a rapid visual scan was undertaken in order to isolate the residues with the most potential.

Twenty-six samples were selected in this way for full analysis, and both flots and residues sorted under a low-powered microscope. Some of the mineralised remains were so numerous that they were not fully sorted or fully quantified. These consisted of bran and straw/rush/reed fragments, many of which were embedded in faecal concretions. Since it is impossible to translate 'number of bran fragments' or 'number of straw fragments' into a meaningful value (eg, relate the number of bran fragments to quantities of bread consumed), a rough quantification was considered to be adequate for comparative purposes. It should be noted that, although legume seed coat fragments were quantified, this material can be difficult to spot, so these figures are also only a rough guide to frequency.

Mineralised plant remains can be particularly difficult to identify because surface cell layers are often not preserved by calcium phosphate replacement (Green 1979; Carruthers 2000; McCobb 2001). Fruits and seeds, for example, are commonly found without their tough seed coats (testa) because these do not absorb liquid minerals so easily and are thus do not become preserved. Where preservation has not occurred, a general term 'embryo' has been used in Table 38 and the text. Because mineralised embyros often possess too few characters to be closely identified, the remains often had to be be loosely classified as 'type' or 'cf.'.

Notes on identification for some of the taxa found in the samples have been published (Carruthers 2000). For the remaining taxa, the more 'difficult' identi-fications (where the embryos look quite differ-ent from the entire seeds/fruits) are described in the archive report.

Of the 26 samples fully analysed, 21 were found to be productive, and the results from these samples are given in Table 38. Nomenclature and much of the habitat information follow Stace (1997).

The results from this analysis have provided a unique record of the Saxon diet at Hamwic. It is clear from the nature of the mineralised assemblages that the deposits studied contained either primary or secondary deposits of concentrated cess:

samples from pits: 2071 (context 2235), 2268 (contexts 2363 & 2403), 3500 (context 2574), 4470 (context 2876), 3151 (context 3160), 7446 (context 7450), 5037 (contexts 5296 & 5074), 10054 (context 10085), 10116 (context 10114), 10136 (context 10113), 10004 (context 10010), 10136 (context 10200), and 10197 (context 10199);

or more dilute redeposited cess mixed with other types of waste:

samples from pits: 996 (context 1000), 2389 (context 2393), 3101 (context 3102), 7163 (context 7255), 7615 (context 7671), and 10151 (context 10106).

Therefore, providing that the mineralisation had been reasonably unselective in the remains preserved, a direct record of the (plant) diet of the occupants of the site has been recovered at the Stadium site. This is extremely important, since both waterlogged and charred deposits are affected by differential preser-vation of important food taxa, in particular the legumes.

The state of preservation of many of the mineralised remains on this site was particularly good, with many of the woodlice surviving intact. A wide range of plant taxa was recovered, suggesting that preservation had not been selective to any great extent. On other sites the categories of plant remains that are less likely to be preserved are members of the Poaceae and Fabaceae (cereals and legumes),

Table 38 Mineralised plant remains

Feature	*5037*	*5037*	*996*	*2071*	*2268*	*2389*	*3101*	*3151*	*3500*	*4470*	*7446*	*7615*	*10004*	*10054*	*10116*	*10136*	*10136*	*10151*	*10197*	*2268*	*7163*
Context	*5074*	*5296*	*1000*	*2235*	*2363*	*2393*	*3102*	*3160*	*2574*	*2876*	*7450*	*7671*	*10010*	*10085*	*10114*	*10113*	*10200*	*10106*	*10199*	*2403*	*7255*
Sample no.	*299*	*298*	*18*	*107*	*127*	*132*	*155*	*192*	*142*	*186*	*252*	*275*	*10027*	*10005*	*10008*	*10009*	*10035*	*10016*	*10038*	*136*	*245*
phase within mid-Saxon period	*early*	*early*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid-late*	*mid-late*
food remains																					
Cereal bran & concretions	++	++	+	+++	+++	+	+	+	+++	++	++	+	+++	+++	+++	+	+++	+++	++	+++	++
Whole cf. wheat grains	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
large NFI cereal frags	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	2	-	2
Vicia faba L. (bean hilum)	1	-	-	3	5	-	-	-	2	-	-	-	8	21	-	-	-	-	3	7	-
cf. *Vicia faba* (hilum frag.)	-	2	-	5	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-
Vicia faba L. (whole bean seed)	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pisum sativum L. (pea hilum)	6	1	1	3	30	-	-	17	2	-	-	-	-	-	12	-	-	-	-	8	-
Whole peas, some crushed	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-
cf. Pea endosperm fg	3	-	-	-	1	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-	-
Legume testa frags	66	47	3	42	178	-	-	35	12	11	6	-	82	48	195	4	16	4	38	57	-
Pea/bean hilum	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	4	-
Malus sylvestris (L.) Mill, (apple pip frag.)	6	-	-	-	-	1	-	3	-	-	2	-	4	7	-	1	6	-	11	5	2
Malus sylvestris (L.)Mill, (apple pip, whole)	-	-	-	-	-	10	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Malus sylvestris/Pyrus communis L. (apple/pear embryo)	6	-	-	-	-	-	-	1	1	-	-	-	1	-	-	-	-	-	30	3	1
Rubus sect. *Glandulosus* (bramble seed coat)	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
Rubus sp. (bramble/raspberry embryo)	-	-	-	-	19	-	1	2	-	-	-	1	-	-	2	-	-	-	1	4	-
Sambucus nigra L. (elder seed)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	1
cf. *Alliaria petiolata* (M.Bieb) Cavara & Grande (gralic mustard) DH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Linum usitatissimum L. (cultivated flax)	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Brassica/Sinapis sp. (charlock, mustard etc.) ACD	6	-	3	1	6	-	24	29	1	1	1	-	-	-	6	1	-	3	2	13	15
cf. *Lepidium sativum* L. (cf. cress seed)	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anethum graveolens L. (dill embryo)	-	-	-	1	1	-	-	-	-	-	-	1	-	-	-	1	-	-	1	-	9
Coriandrum sativum L. (coriander embryo)	-	-	-	-	-	-	1	1	-	-	-	-	-	2	1	-	-	-	-	-	-
cf. *Foeniculum vulgare* (cf. fennel embryo)	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	1	-	-
cf. *Foeniculum vulgare* frag	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
crop weeds																					
Chenopodiaceae embryo (fat hen etc.)	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
cf. *Agrostemma githago* L. (cf. corn cockle impression) A	-	1	-	1	4	-	-	-	2	-	-	-	1	-	-	-	-	-	-	11	-
Caryophyllaceae NFI	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	1	1	-
Chrysanthemum segetum L. (corn marigold achene) AD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Cirsium/Carduus sp. (thistle embryo) CDG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Lithospermum arvense L. (corn gromwell embryo) AD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2

Feature	*5037*	*5037*	*996*	*2071*	*2268*	*2389*	*3101*	*3151*	*3500*	*4470*	*7446*	*7615*	*10004*	*10054*	*10116*	*10136*	*10136*	*10151*	*10197*	*2268*	*7163*
Context	*5074*	*5296*	*1000*	*2235*	*2363*	*2393*	*3102*	*3160*	*2574*	*2876*	*7450*	*7671*	*10010*	*10085*	*10114*	*10113*	*10200*	*10106*	*10199*	*2403*	*7255*
Sample no.	*299*	*298*	*18*	*107*	*127*	*132*	*155*	*192*	*142*	*186*	*252*	*275*	*10027*	*10005*	*10008*	*10009*	*10035*	*10016*	*10038*	*136*	*245*
phase within mid-Saxon period	*early*	*early*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	*mid-late*	*mid-late*
cf. *Plantago media* L. (hoary plantain) G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Rumex sp. (dock achene) CDG	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	2	-	3
Bromus sect. *Bromus* (chess caryopsis)	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	1	-	-
Vicia/Lathyrus spp. (small vetch/tare seed, 2-3mm)	3	-	-	-	1	-	-	-	1	-	-	-	-	-	4	-	1	-	-	-	-
Other																					
Carex sp. (sedge nutlet) MGd	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Cereal sized culm node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Chaerophyllum temulum L. (rough chervil mericarp) GHW	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Juncus sp. (rush fruit)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-
Labiatae *Marrubium*-type	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-
Poaceae NFI	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-
Straw/reeds/rushes & matted stem frags	+	++	++	+++	+++	+	+	+	+++	++	++	++	+++	+++	++	+	++	++	++	+++	++
Umbelliferae NFI	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pteridium aquilinum (L.)Kuhn (bracken frond frag)	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moss frags	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-
Millipede frags	60	6	-	22	2	2	-	8	5	2	10	2	16	15	26	9	6	1	21	65	4
'woodlouse' frags	30	3	-	9	2	-	-	8	4	14	38	1	2	48	87	33	12	1	16	32	1
fly pupae	-	-	1	-	-	-	9	-	-	-	2	2	2	-	-	-	-	-	5	2	-
Worm cocoons	1	-	1	1	-	-	-	-	2	2	1	1	1	1	-	-	-	-	2	-	-
'worm' frags	30	-	-	9	-	-	-	-	7	-	-	-	-	25	-	-	-	1	-	-	-
Rodent droppings	16	2	1	78	19	-	-	-	4	6	4	-	1	1	26	6	25	-	7	79	-
Nodule	-	-	9	2	-	-	-	-	-	-	1	-	-	1	-	-	-	-	1	-	-
sample volume (litres) :	10	10	9	10	10	10	10	10	10	5	10	10	10	10	10	4	10	10	10	10	10

Key:

NFI = not further identified
+ = occasional; ++ = several; +++ = frequent; ++++ = numerous
Habitat preferences: A = arable; C = cultivated; D = disturbed; G = grassland; H = hedgerows; M = marsh, waterside: W = woods; d = damp

particularly if whole. At the Stadium site even a few whole peas, beans and cereals were recovered, demonstrating the exceptional nature of the preservation.

Faecal material was indicated by the presence of large quantities of mineralised bran fragments, some of which were embedded in faecal concretions and some of which existed as small, curled fragments of bran. Cereal bran has a very distinctive cell pattern, although it cannot be identified to species level with a light microscope (Koeber Grohne and Piening 1980). Other factors indicative of cess were:

- the presence of large quantities of mineralised legume testa fragments (seed coat fragments, often including readily identifiable hilums)
- the presence of several other food remains (including fruits and seeds from apple, bramble, elder, and several spices as described below)
- the presence of frequent straw fragments, used to reduce odours and soak up liquids
- the presence of arthropods characteristic of sewage (below, insect remains)
- the low number of general weed taxa, that are usually frequent in midden or dung assemblages (Carruthers 2000, 78–9)
- The fact that mineralisation has taken place, indicating that levels of nutrients and moisture were very high when the remains were deposited.

Two of these points may provide evidence for the way that the faecal deposits were formed. It is interesting to note that non-edible 'weed' seeds were extremely rare, occurring as single records of a taxon in most cases. Experimental work carried out by the author showed that, even in a modern 'cleanly' prepared meal of wholemeal bread, tinned peas, apples and brambles, a seed of stinging nettle (*Urtica dioica*) found its way into the food and passed through the gut in an identifiable form. Thus, single records of weed seeds can easily be explained away as having been consumed as contaminants of the food. In no cases at the Stadium site were the remains from weeds such as stinging nettles and Chenopodiaceae present in even moderately large numbers. These weeds are indicators of nutrient-rich soils and they are often found growing around middens and cess pits. Their seeds are readily preserved by mineralisation and are easily identifiable. One of the waterlogged samples from a possible cess pit deposit did produce frequent stinging nettle seeds (sample 8/pit 58, see below), but this sample also produced a wide range of non-edible remains such as hazelnut shell fragments, weed seeds, mosses, and bud scales, indicating that non-faecal waste had also been deposited in the pit. The mineralised evidence suggests, therefore, that most of the pits were either covered, or were filled in rapidly so that there was insufficient time for weeds to grow around the features. Alternatively, the area could have been kept clear of weeds.

The other point of possible significance is that, in contrast with some mineralised deposits, very few mineralised fly puparia were present in the deposits, although millipede segments, woodlice fragments, worm cocoons, worm fragments, and rodent droppings were often frequent. All of these arthropods live in damp places and feed on rotting plant material. They crawl and are able to burrow into deposits, whilst air-borne flies tend to lay their eggs on the top of the food source. If the faecal material had been kept well-covered by dry straw, the flies may have been kept away whilst the other arthropods and vermin flourished.

Although there was very little archaeological evidence for structures around the pits, at least three cess pits (see above; none examined in this report) were thought to have been enclosed within stake-built structures which may have been wattle fences or small shed-like structures. Timber boring beetles were also recovered from some of the pits (below) and it was suggested that these may have fallen from wooden shelters over the pits. Presumably these 'sheds' would have provided some privacy while the pit was in use, but they only needed to be short-lived structures which could be removed once the pits had gone out of use. As such, archaeological evidence may not have been easy to detect. Some of the pits, (eg, 4470) contained quantities of burnt daub, and this could be the remains of structures that were burnt in situ. It is also possible that moveable structures which left no evidence in the ground were used, since cess pits can fill up fairly rapidly (particularly on damp soils with poor drainage) so a portable structure would seem to be the answer. The evidence implies that at least some of the pits contained primary deposits of cess from 'privy'-type structures, rather than secondary deposits of faeces cleared out from 'chamber pots', etc.

Spatial and temporal variations, and preservation

Looking at the spatial distribution of the 21 productive samples it can be seen that these are concentrated in the South Stand and sub-station area in the south-west corner of the site. At the time of sample selection attempts were made to achieve as even a distribution of areas and phases as possible. However, it soon became clear that the most suitable conditions for mineralisation to take place occurred in the southern part of the site.

It is difficult to determine whether the high occurrence of concentrated cess deposits in the southern area of the site was due to better preservation conditions, or because this area had been selected for the

location of cess pits. However, three features containing concentrated cess were found in other parts of the site – pit 7446 in the North Stand and pits 4470 and 5037 in the West Stand. The four samples that produced anaerobically preserved remains (out of five analysed 'waterlogged' samples, see below) all came from the southern part of the East Stand, closest to the River Itchen. Two were from cess pits and two from a well, but all four contained faecal waste. Mineralised remains were recovered from all five samples, but especially from the 'drier' of the samples from pit 10116 in the south-west corner of the site. It is possible that the eastern area was a little too waterlogged for full mineralisation to take place (as in a medieval faecal deposit at Jennings Yard, Windsor; Carruthers 1993), or that the good preservation of organic remains has diluted the mineralised material in the sample. It appears, therefore, that cess pits had been dug in all areas of the site, but deposition of faecal waste was also taking place in features dug for other purposes.

The predominance of mid mid-Saxon features over early and late mid-Saxon features also makes it difficult to compare the results across the phases. Fortunately, one early mid-Saxon feature (pit 5037) and one late mid-Saxon feature (pit 2268) produced well-preserved assemblages with which to compare the large number of mid mid-Saxon samples. The results suggest that very little change in diet can be detected over the three phases, since cereals and legumes predominate throughout, and hedgerow fruits were gathered in all periods. The non-native aromatic-seeded spices dill, fennel and coriander were not found in the early mid-Saxon pit 5037. However, since only two out of twenty-one samples came from this phase, and since eight of the mid mid-Saxon samples also did not contain these spices, too much significance should not be placed on this observation. In addition, coriander was present amongst the samples from a waterlogged early mid-Saxon pit examined (below; Table 41).

The Saxon diet

The most striking fact about the 21 productive samples was that they were all very similar. As might be expected for a cereal-based economy, cereal bran was the major component in all of the samples, although straw, rush, or sedge stem fragments were very frequent in some of the samples. It is likely that straw and/or hay had been used to soak up liquids and dampen odours, as noted above.

One observation of particular interest was the high frequency of legume testa (seed coat) fragments in 13 of the samples. Only four samples produced no legume remains, and these were all considered to be dilute, redeposited cess. Where hilums were present, peas and beans could be identified. Occasionally whole beans and peas were preserved. Peas were identified from 10 samples (all periods) and beans were present in 11 samples (all periods). Seven of the samples contained the remains from both peas and beans. It has often been suggested that legumes were of particular importance during the Saxon period, although the archaeobotanical evidence has rarely been recovered to support these assertions as both charring and waterlogging do not favour the preservation of legumes. This site has at last provided that evidence, and has demonstrated that, not only were legumes important throughout the mid-Saxon period at Hamwic, but that they appear to have been consumed on a regular basis rather than as a seasonal stop-gap.

Legumes preserve well when dried and can be eaten whole or ground into flour. They can be used in similar ways to cereals, sometimes being mixed with cereal flour to make bread (Tannahill 1975). The fact that large fragments of testa were present in most of the samples suggests that whole peas and beans had been eaten at least some of the time. Experimental work carried out by the author demonstrated that legume testa survives the passage through the gut extremely well, as do bran and seeds such as apple and bramble. Large quantities of these remains were recovered from a single meal, so if the mineralisation had occurred rapidly in the pits, before the remains had a chance to rot away, it would not take long to fill a cess pit with this type of material.

The range of other foods consumed was fairly limited in comparison with either Roman cess pits or medieval garderobe deposits. Native hedgerow fruits appear to have been consumed on a fairly regular basis. Apple seeds (possibly including pear, since the embryos are indistinguishable and pear/quince stone cells were recorded amongst the waterlogged remains, see below) were present in 12 of the samples. It is not possible to distinguish wild from cultivated apple seeds, and there is no direct evidence to prove that apples were being cultivated at this time. However, Roach (1985) suggests that they probably were being cultivated before the Norman Conquest, since there is documentary evidence from Europe in the form of Charlemagne's lists of fruit trees.

Bramble seeds (*Rubus* sp., possibly including raspberries, although this identification could not be confimed; no waterlogged raspberry seeds were recovered) were present in seven samples and elder-berries were found in two samples. It is possible that the occupants of Hamwic were still mainly collecting hedgerow fruits and nuts from local woods and fields, since few other orchard fruits were recovered. A few waterlogged plum stones were identified amongst the anaerobic assemblages, in addition to the native woodland/hedgerow plants, wild strawberry, and rose hip (see below). Orchard and vineyard cultivation

increased greatly during the medieval period with the establishment of the monasteries. It is notable that very few exotic, imported fruits such as fig and grape were recovered, even though they have been preserved as mineralised remains on some Roman and medieval sites. No fig seeds were preserved by waterlogging or mineralisation and only a few waterlogged grape pips were recorded, from early mid-Saxon pit 371. Grapes were cultivated in Britain in Roman times, and there is a slight possibility that they were grown in the Saxon period; grape pollen was found in Saxon contexts at Market Lavington, Wiltshire (Wiltshire, in prep.). Grape and fig are rarely found in Saxon deposits, although two mineralised fig seeds were recovered from faecal deposits at West Heslerton (Carruthers and Hunter in prep.). However, several non-native plants grown for their aromatic seeds were represented at the Stadium site, including cf. fennel, dill, and coriander. The seeds of these spices would have to have been purchased initially, but they could then have been grown on in pots, even in an urban setting, and they have also been found in Scotland on sites of this period. Stace (1997) notes that all three spices can occur as casuals, demonstrating that they will grow from seed in this country.

Another record of interest is that of *Brassica* sp./*Sinapis* sp. seeds. Although it is not possible to identify the naked embryos of these seeds to species level, and thus differentiate weed taxa from useful brassica species, the frequency of these remains in 15 out of 21 samples demonstrates that it was definitely being used as a spice, ie, mustard. None of the other 'weed' taxa is present in more than one or two samples, the most frequent being the possible impressions of corn cockle seed (six samples), a frequent arable weed that had probably been ground up with the cereals. Most of the waterlogged brassica seeds (preserved with intact seed coats; see below) were recorded as being the common arable weed, charlock (*Sinapis arvensis*). The seeds of this taxon are said to be pungent (de Rougemont 1989), but the only reference to usage found by the author was 'as a vegetable in the poorer parts of Europe' (*ibid.*). The Mediterranean species, white mustard (*S. alba*), however, contributes the 'hot' taste in the condiment, mustard. Its seeds are very similar to those of charlock, and they were used by the Romans as a spice. It is possible that, like the other introduced spices – coriander, fennel and dill, this plant was grown as a pot herb. The pungent taste in mustard is found in some Middle Eastern and Central Asian *Brassica* spp. including black mustard, (*Brassica nigra*) (Simmonds 1976) which grows in Britain today. It is unfortunate that, even when they retain their seed coats, the seeds of these useful spice and vegetable taxa cannot be easily differentiated.

Other possible occasional foods include flax (*Linum usitatissimum*) seed (one example only, but also present in four of the waterlogged samples) and a possible cress (cf. *Lepidium sativum*) seed. Flax seeds have medicinal benefits, being used for lung and digestive disorders (Lust 1974). When eaten whole, the seeds swell up and help to relieve constipation. Judging from the frequency of fig seeds in later medieval faecal deposits, constipation may have been a common problem at this time. Cress is an interesting find. It originates in Asia and has been recovered from an 8th–9th century deposit in Germany (Willerding 2000) but not yet from any British sites. Unfortunately, only one seed was recovered and Brassicaceae are hard to identify with certainty.

Many other foods including nuts, leaf vegetables and members of the onion family etc. could have been consumed, but these may not preserve well by mineralisation. The other assemblages (see below) provide evidence for some additional foods and spices, including lovage, opium poppy, cf. caraway, cf. leek, hazelnuts, sloes, plums, beet, and strawberry.

The documentary evidence (Tannahill 1975) suggests that the early medieval population was a 'plain-living society' consuming on most days of the year bread, water or ale, and soup or stew from a constantly-stocked cauldron. Savory puddings such as 'pease pudding', as mentioned in the old rhyme, could also be prepared in this way, suspended in the cauldron wrapped in cloth. Perhaps the rhyme was indeed a true reflection of the monotonous nature of the Saxon diet:

Pease pudding hot, pease pudding cold,
Pease pudding in the pot nine days old

Bourdillon (1994) comments on the basic and dull nature of the meat component of the diet at Hamwic, with very little input of wild animals to provide variety. She suggests that the uniform nature of the assemblages from different properties could be due to some form of communal waste disposal masking household differences. This could be true for some of the cess pits studied for this report, although the presence of structures around other pits indicates the direct input of material rather than redeposition. However, if 'latrines' were shared between households, some differences in their diet would be masked.

Comparisons with other sites in Hamwic

Previously published work on mineralised plant remains from Southampton is more scarce than that on charred and waterlogged material. There are some references to mineralised Saxon material in Monk's thesis (Monk 1977), and Green included a short note

on faecal samples from SOU 18 (Green in Morton 1992, microfiche 1, E3). In the latter report, the identification of plums, sloes, cherries, apple, and blackberry/raspberry from coprolites demonstrates the potential of these remains. Mineralised plant remains were briefly summarised, but not quantified, in the Six Dials report (Biddle 1997). These were said to include frequent testa fragments from pulses, soft fruit seeds and common fragments of rush stem - by the sound of it, a similar story to the Stadium site. Samples containing mineralised remains were said to be more common than samples producing charred material, and it was assumed that these represented cess deposits.

Unpublished reports written in the 1980s by Mick Monk, Frank Green, and Brian Biddle on Saxon and medieval sites in Southampton may become available in the near future (G. Campbell, pers. comm.). They include the examination of some mineralised faecal deposits, but these are mainly medieval in date (P. Andrews, pers. comm.). What is clear from these very brief reports on other excavations in Hamwic is that it is only in cases such as the Stadium site, where large numbers of faecal deposits were examined, that any detailed understanding of the range of taxa consumed and variability of diet (or rather, lack of it) can be obtained.

Charred Plant Remains

by Kath L. Hunter

Very little work has been undertaken on the charred plant assemblages from Hamwic in the past two decades, following Monk's pioneering and important work in the late 1970s (Monk 1977; 1980). The Stadium site, therefore, provided a rare opportunity to analyse such remains from a large site with a variety of mid-Saxon features. The aims of the analysis were to identify, quantify, and record the presence of charred plant remains from selected samples; to try to identify potential indicators of diet, industry and environment, and to see whether they provide evidence of different activities taking place across the site; and to try to detect changes through time.

Bulk soil samples, most of 20 litres, were processed using standard flotation techniques. The flots were collected using 1mm and 0.5 mm meshes and the residues using 5.6 mm and 2 mm sieves, and the resulting material assessed at Wessex Archaeology. This assessment identified 14 samples that were selected for analysis by the author. Following analysis of these samples, a second assessment of the remaining samples was carried out by the author and a further 12 samples were selected for full analysis. These samples came from a variety of early, mid- and late mid-Saxon date features, mostly pits, from across the site. The identification of the plant macrofossils was carried out using modern reference material and standard reference texts. (Beijerinck 1947; Berggren 1981; Jacomet 1987; Schoch *et al.* 1988), and the results are presented in Tables 39-40.

The nomenclature for the identification of the cereals follows Jacomet (1987) and the rest of the plant remains follow Stace (1997). For the purpose of this report the term seed includes achene, nutlet etc. The presence of other ecofacts and finds in the samples has also been recorded in the site archive.

Preservation

All 26 samples analysed produced some charred plant remains. However, some contained only a few, very poorly preserved cereal grains and/or weed seeds. These may represent residual charred material incorporated into features along with other general background debris lying around the settlement. Other samples, such as those from pits 7615, 7163, 4149, and 4470, contained well-preserved material including charred and silicified chaff (pit 4149). This may suggest that they had been subjected to less physical weathering, possibly because the contexts were sealed quickly after deposition and left relatively undisturbed until their excavation. As a result, the samples contained very well preserved chaff and seeds that might otherwise have been lost in less well preserved deposits. The presence of silicified chaff fragments from pit 4149 suggest that this material was subjected to the high temperature oxidising conditions which are required to burn out all the carbon and leave only the silica skeleton (Robinson and Straker 1991). Such conditions may be found in the embers of a bonfire or oven. Silicified remains are even more susceptible to physical damage than charred material.

The taxa represented and their uses

Cereal remains appeared in all of the samples analysed. However, the quality of preservation and quantity varied greatly.

Barley

The preservation of the barley remains varied immensely from sample to sample. Some grains were poorly preserved and vacuolated; this may have been due to the condition of the cereal prior to charring. This could include grains being green, that is, with the moisture content of the grain being too high for successful storage. This might lead to the need to dry it. The grain may also have started to decay due to inadequate storage conditions. Alterantively it could be due to the temperature and conditions of the actual charring process. The presence of detached barley embryos in the samples from pits 4470 and 4539 may suggest that the barley had started to

Table 39 Charred plant remains from early and late mid-Saxon contexts

					Early mid-Saxon							Mid-late mid-Saxon		
				Feature	*Pit*	*Pit*	*Pit*	*Pit*	*Pit*	*Pit*	*Ditch*	*Pit*	*Pit*	*Pit*
					1381	*1381*	*2001*	*2001*	*5037*	*6162*	*8025*	*2227*	*2257*	*7163*
				Context	*1396*	*1398*	*2076*	*2079*	*5296*	*6165*	*8031*	*2012*	*2010*	*7255*
Taxa	*Common name*	*Component*	*Habitat*	*Sample*	*96*	*94*	*78*	*49*	*298*	*61*	*323*	*112*	*110*	*245*
Triticum sp.	Bread wheat type	Grain	C		-	-	-	3	15	6	-	16	15	22
Triticum sp.	Wheat NFI	Grain	C		3	-	-	1	-	-	-	1	5	-
Hordeum sp.	Barley (hulled)	Grain	C		-	-	-	2	-	2	1	-	7	9
cf. *Hordeum* sp.	Barley	Grain	C		-	-	-	18	2	-	-	10	5	-
Avena sp.	Oat	Grain			-	-	1	53	-	-	-	-	1	-
cf. *Avena* sp.	Possible oat	Grain	C		-	-	-	5	1	-	-	2	-	-
Cereal NFI	Unident cereal	Grain	C		-	-	5		11	3	3	3	-	36
Triticum sp.	Free threshing wheat type	Rachis frag.	C		-	-	-	1	-	-	-	-	1	-
Hordeum vulgare cf. *var, tetrastichum*	Barley possibly 4 row lax ear hulled type	Rachis	C		-	-	-	3	-	-	-	-	-	-
Hordeum vulgare cf. *var, tetrastichum*	Barley possibly 4 row naked type	Rachis			-	-	-	1	-	-	-	-	-	-
Hordeum sp.	Barley	Rachis frag.	C		-	-	-	4	-	-	-	-	-	-
Avena sativa	Cultivated oat	Floret base	C		-	-	-	18	-	-	-	-	-	-
Avena fatua L	Wild oat	Floret base	Da		-	-	-	21	-	-	-	-	-	-
Avena sp.	Oat	Floret base			-	-	-	12	-	-	-	-	-	-
Avena/Hordeum sp.	Oat/ barley	Lemma/ palea frags			-	-	-	***	-	-	-	-	-	-
Secale cereale	Rye	Rachis frag.			-	-	-	1	-	-	-	-	-	-
	Cereal type	Culm node	C		-	-	-	7	-	-	-	-	-	-
Ranunculus sp.	Buttercup type	Achene			-	-	-	1	-	-	-	-	-	-
Corylus avellana L.	Hazelnut	Shell frags	SW		11	1	8	4	7	13	-	6	5	3
Chenopodium album L.	Fat hen	Seed	Da,n		-	-	-	1	-	-	1	-	-	-
Atriplex sp.	Orache	Seed	N		2	-	-	1	-	-	-	-	1	-
Persicaria maculosa/persicaria	Redshank/Pale persicaria	Achene			2	-	-	-	-	-	-	-	-	-
Rumex cf. *palustris* Smith	Marsh dock	Achene	Edges of ponds, ditches, marshy fields		-	-	-	43	-	-	-	-	-	-
Rumex cf. *crispus* L.	Curled dock	Achene			-	-	-	3	-	-	-	-	-	-
Rumex sp.	Dock type	Achene	DaGMSW		-	-	1	-	-	-	-	-	-	-
Brassica rapa ssp. *Campestris* (L.) Clapham	Wild Turnip	Seed	B		-	-	-	8	-	-	-	-	-	-
cf. *Brassica* sp.	Cabbage type	Seed			-	-	-	4	-	-	-	-	-	-
Anagallis arvensis L	Pimpernel	Seed	Da		-	-	-	-	-	-	-	1	-	-
Prunus spinosa L	Blackthorn	Stone	WS		-	-	-	-	-	-	-	-	2+9frags	-
Malus sylvestris	Crab apple	Seed			-	-	-	-	-	-	-	-	1	-
Crataegus monogyna. Jacq.	Hawthorn	Nut let	SW		-	-	1	-	-	-	-	1	-	-
Vicia faba var. minor L.	Broad bean	Seed	C		-	-	-	-	-	1	-	-	-	3
Vicia/Lathyrus sp. (4mm)	Vetch/pea	Seed	Da,C		-	-	-	1	-	-	-	-	2	3
Vicia/Lathyrus sp. (2mm)	Vetch/pea	Seed	Da,C		-	-	-	-	-	-	1	3	-	1
Pisum sativum L.	Garden pea	Seed	C		-	-	-	-	-	2	-	-	-	-

					Early mid-Saxon							Mid-late mid-Saxon		
				Feature	Pit	Pit	Pit	Pit	Pit	Pit	Ditch	Pit	Pit	Pit
					1381	1381	2001	2001	5037	6162	8025	2227	2257	7163
				Context	1396	1398	2076	2079	5296	6165	8031	2012	2010	7255
Taxa	*Common name*	*Component*	*Habitat*	*Sample*	96	94	78	49	298	61	323	112	110	245
cf. *Pisum sativum* L.		Seed			3	6	-	-	-	2	-	-	-	-
Large legume		Seed frags	C		1	-	-	-	-	-	1	-	1	-
Trifolium/Lotus sp. L	Clover/Birds foot trefoil	Seed			-	-	-	-	-	-	1	1	-	-
Apiaceae	Carrot family	Mericarp			-	-	-	3	-	-	-	-	-	-
Plantago lanceolata L.	Ribwort plantain	Seed	G short or grazed. Da		-	-	-	1	-	-	-	-	2	-
Galium verum L.	Ladies bedstraw	Nut let	G Esp.Calc		-	1	-	1	-	-	-	-	-	-
Galium aperine L.	Cleavers	Nut let	Da,H		-	-	-	-	-	1	1	-	-	-
Galium sp.	Bedstraws	Nut let			1	-	1	-	-	-	-	-	-	-
Sambucus nigra L.	Elder	Seed?	DWH		7	-	-	-	-	WL/C	-	1	-	-
Anthemis cotula L.	Stinking chamomile	Achene	Da, esp base rich heavy soil		-	-	-	11	-	-	-	-	-	-
Cyperus cf. *fuscus* L.	Brown galingale	Nut	By ponds and in ditches		-	-	-	1	-	-	-	-	-	-
Carex sp. (Trigonus)	Sedge	Nut	MBWG esp. damp/wet soils		2	-	-	-	-	-	-	-	-	-
Cyperaceae	Sedge family	Nut			-	-	-	1	-	-	-	-	-	-
Bromus sect *Bromus*	Brome	Caryopsis	C Da		-	-	-	-	-	-	-	-	-	-
Poaceae	Grass	Caryopsis			9	-	-	18	-	-	-	-	-	-
Unident	Rhizome/tuber frag.				-	1	-	1	-	-	-	1	3	-
Unident	Bread like frags				-	-	-	-	4	-	-	-	-	-

Key:

* = rare (1–5); ** = occasional (6–20); *** = frequent (21–100); **** = abundant (>100)

Habitat codes: A = aquatic; B = bankside; C = cultivated; D = disturbed ground; Da = disturbed ground including arable; Dch = ditch; G = grassland; H = hedge bank; M = marsh; S = scrub; W = wodland

germinate, and in one case (4470) the embryo was seen to have sprouted. The detachment of embryos can be a characteristic of the early stages of germination (Carruthers, pers. comm.). If germination was not desirable it would be necessary to halt the process. This may be the reason why the cereal came to be burnt, either accidentally during the drying process or deliberately through the burning of spoilt grain. There was no evidence of insect infestation in any of the cereal remains, which could have been another reason why the grain was destroyed.

The presence of apparently twisted grains in pit 4470 suggested that at least some of the barley was of a multi-rowed type (*Hordeum vulgare*). Palea and lemma fragments from some of the samples were well enough preserved to distinguish the abscission scar formed at the point where the spikelet joins the rest of the ear. These scars can be diagnostic, particularly in this case as they were present on some of the twisted grains. The shape of the abscission scars was more or less horseshoe-shaped, suggesting that the grains represented a lax-eared or four-row type (*Hordeum vulgare* cf. *var. tetrastichum*). However, as Jacomet (1987) suggests, there may be intermediates between the lax-eared and the dense-eared types. There may also be a variation in scar shape from different parts of the same ear. Although there was variation in the scar shapes from this assemblage, none exhibited the clear fold indicative of the dense-eared type.

A few barley rachis fragments were sufficiently well preserved to have characteristics suggesting the presence of lax-eared types of naked barley, with evidence of clearly stalked side florets, and hulled four-row barley where the stalked side florets are absent. Only two rachis fragments possessed evidence of the side florets, and it is unlikely that these represent a crop being utilised at this time. They could be a weed or a genetic anomaly within the varieties of hulled barley being grown. All but one of the well-preserved rachis fragments were relatively long and slender, suggesting lax-ear types rather than the more substantial dense-eared ones. Jacomet (1987) who documents these characteristics advises caution in using these criteria, but the preservation was significantly good and the characteristics clear enough to at least suggest differences in the barley chaff preserved in the assemblages from the Stadium site.

A few grains of possible naked barley were found in well 10161. Again, this is insufficient evidence to suggest that this type of barley was being grown as a crop. Samples from pits 2001 and 4470 also contained relatively large numbers of small, unattached palea and lemma fragments. It is probable that the majority of these are barley in origin. However, the presence of oat florets in the assemblage means the identification is not certain. Hulled barley has various potential uses such as malting, human food and animal fodder. The former ideally requires similar sized grain to ensure even germination of the crop. Jacomet (1987) suggests that two-row barley would be best for this, as it tends to have better uniformity of grain size and shape than the six- or four-row varieties. There is no evidence from the chaff remains to suggest the presence of two-row barley, but it is not possible to tell simply from the shape and size of the grains alone. The presence of identifiable chaff and twisted side grains suggest the presence of multi-rowed hulled barley in at least some of the samples. However, the presence of two-row varieties should not be ruled out.

Wheat

With the exception of samples from pit 4149 and 4470, there were relatively few wheat grains. Most of it was fairly well preserved and the majority appeared to be of a free-threshing type with a rounded shape. Although a few longer narrower grains were noted in the sample from pit 2257, it is not possible to say for certain if these were simply a natural variation of a free-threshing type or were a glume type. No diagnostic glume wheat chaff was found. Relatively few free-threshing type rachis fragments were noted, and only one was sufficiently well preserved to suggest an identification of a hexaploid type (bread wheat type) rather than tetraploid (macaroni/rivit type).

Oat

It is very difficult to distinguish the grains of cultivated oat from the wild form. However the abscission scars of the two types are quite distinct, with a sucker formation on the wild type and a rough break on the cultivated form. When floret bases are present it is possible to differentiate between the two types. The absence of the diagnostic chaff should not rule out the presence of either form. But this does mean that oat grains can only be identified only to genus level (*Avena* sp.). Of the 246 oat grains recovered from sample 275, only one identifiable floret base was present (pit 7615). It was of the wild type. Floret bases of the wild and cultivated types were present in pits 7397 and 2001 (context 2079).

Rye

Two grains of rye were recovered from well 10161 (context 10218) along with four grains, which were less well preserved and exhibited characteristics of rye and wheat grains. One rye rachis fragment was found in pit 2001.

Legumes

Broad bean (*Vicia faba*) and garden pea (*Pisum sativum*) occured in relatively small quantities in many of the samples. These probably formed part of the human diet. The low numbers of charred seeds

Table 40 Charred plant remains from mid mid-Saxon contexts

Taxa	Common name	Component		Feature	well	pit	pit	pit	pit	pit	pit	pit	pit	pit	pit	pit	well	well
					1261	2071	2511	3101	3523	3524	4149	4470	7002	7040	7397	7615	10161	10161
				Context	1263	2256	2775	3102	3528	3527	4151	4536	7010	7058	7405	7617	10174	10218
				Sample	85	105	133	155	180	176	248	342	120	232	256	275	10032	10039
				Habitat														
Triticum sp.	Bread wheat type	Grain	C		-	2	29	15	-	-	785	67	3	15	4	6	-	8
Triticum sp.	Wheat NFI	Grain	C		-	-	-	-	-	-	-	13	-	-	3	5	-	-
Hordeum sp.	Barley (hulled)	Grain	C		-	-	7	5	-	19	16	1323	2	16	9	67	3	-
Hordeum vulgare L.	Barley (hulled) lateral grains	Grain	C		-	-	-	-	-	-	-	4	-	-	-	-	-	-
Hordeum sp.	Barley cf. naked	Grain	C		-	-	-	-	-	-	-	-	-	-	-	-	-	2
cf. *Hordeum* sp.	Barley	Grain	C		1	-	-	-	-	1	-	700+	-	37	12	-	5	-
Avena sp.	Oat	Grain			-	-	-	1min	-	-	19	31	-	-	21	246	-	-
cf. *Avena* sp.	Possible oat	Grain	C		1	-	-	-	-	1	-	-	-	-	-	-	-	-
Secale cereale	Rye	Grain	C		-	-	-	-	-	-	-	-	-	-	-	-	-	2
cf. *Secale cereale*	Rye	Grain	C		-	-	-	-	-	-	-	-	-	-	-	-	-	3
Cereal NFI	Unidentified cereal	Grain	C		4	2	11	2	2	4	211	1000+	6	25	100+	-	11	-
Triticum sp.	Free threshing wheat type	Rachis frag.	C		-	-	-	-	-	-	19	2	-	-	-	1	-	-
Triticum sp.		Awn frag.			-	-	-	-	-	-	***	*	-	-	-	-	-	-
Hordeum vulgare cf.var, *tetrastichum*	Barley cf. 4 row lax ear hulled type	Rachis frag.			-	-	-	-	-	-	-	1	-	-	-	-	-	-
Hordeum sp.	Barley ?Lax eared hulled	Rachis frag.			-	-	-	-	-	-	-	4	-	-	3	-	-	-
Hordeum sp.	Barley	Rachis frag.	C		-	-	-	-	-	-	8	26	-	-	2	32	-	-
Hordeum vulgare cf.var, *tetrastichum*	Barley cf. four row lax ear hulled type	Lemma base			-	-	-	-	-	-	-	2	-	-	1	-	-	-
Hordeum sp.	Barley	Lemma base	C		-	-	-	-	-	-	-	-	-	-	-	2	-	-
Hordeum sp./*Avena*	Barley/oat	Lemma/pale frags			-	-	-	-	-	-	-	**	-	-	-	-	-	-
Avena fatua L.	Wild Oat	Floret base	Da		-	-	-	-	-	-	-	1	-	-	4	1	-	-
Avena sativa L.	Oat	Floret base	C		-	-	-	-	-	-	-	-	-	-	1	-	-	-
Avena sp.	Oat	Floret base			-	-	-	-	-	-	-	-	-	-	4	-	-	-
Avena sp.	Oat	Awn frag.			-	-	-	-	-	-	-	*	-	-	-	**	-	-
	Cereal type	Culm node	C		-	-	-	-	-	-	-	1	-	-	1	35	-	-
	Cereal type	Straw frags	C		-	-	-	-	-	-	-	-	-	-	-	22	-	-
	Cereal type	Embryo (sprouted)	C		-	-	-	-	-	-	**(1)	175	-	-	-	-	-	-
Ranunculus cf. *flammula*	Lesser spearwort	Achene	Wet places		-	-	-	-	-	-	-	2	-	-	-	-	-	-
Ranunculus repens/ acris/ bulbosus L.	Creeping/meadow/ bulbous Buttercup	Achene	damp GWD(a)		-	-	-	-	-	-	-	-	-	-	-	4	-	-
Ranunculus sp.	Buttercup type	Achene			-	-	-	-	-	-	-	-	-	-	3	-	-	-
Papaver somniferum L.	Opium poppy	Seed	Da		-	-	-	-	-	-	-	-	-	-	-	1	-	-

Taxa	Common name	Component	Feature / Context / Sample / Habitat	well 1261 1263 85	pit 2071 2256 105	pit 2511 2775 133	pit 3101 3102 155	pit 3523 3528 180	pit 3524 3527 176	pit 4149 4151 248	pit 4470 4536 342	pit 7002 7010 120	pit 7040 7058 232	pit 7397 7405 256	pit 7615 7617 275	well 10161 10174 10032	well 10161 10218 10039
Papaver sp.	Poppy	Seed capsule lid		-	-	-	1	-	-	-	-	-	-	-	-	-	-
Fulmaria officinalis L.	Common fumitory	Achene	Wa	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Corylus avellana L.	Hazelnut	Shell frags	SW	-	14	84	24	-	-	-	4	29	-	13	2	1	1
Urtica dioica L.	Common nettle	Achene	Da	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Urtica urens L.	Small nettle	Achene	DWSBnk	-	-	-	-	-	-	-	1	-	-	-	-	-	73
Chenopodium album L.	Fat hen	Seed	Da,n	-	-	-	-	1	-	1	-	-	2	44	-	-	-
Chenopodium sp.	Goosefoots	Seed	n	-	-	-	-	1	-	-	-	-	-	-	1	-	-
Atriplex sp.	Orache	Seed	n	-	-	-	-	-	-	-	1	-	2	1	392	-	-
Chenopodium/Atriplex sp.		Seed	n	-	-	-	-	-	-	-	-	-	1	-	162	-	-
Montia Fontana ssp *Fontana* L.	Blinks	Seed	Damp	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Stellaria neglecta L.	Greater stitchwort	Seed	Damp shady	-	-	-	-	-	-	-	-	-	-	4	-	-	-
Stellaria graminea L.	Lesser stitchwort	Seed	GW	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Cf. *Stellaria* sp.	Stichworts	Seed		-	-	-	-	-	-	-	1	-	-	1	-	-	-
Agrostemma githago L.	Corn cockle	Seed	Da	-	-	-	-	-	-	-	-	-	-	-	4	-	-
Silene latifolia Poiret	White campion	Seed	BWC	-	-	-	-	-	-	-	-	-	-	-	25	-	-
Polygonum arviculare L.	Knotgrass	Achene	Da	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Polygonum sp.	Knotgrasses	Achene		-	-	-	-	-	-	-	-	-	-	1	-	-	-
Persicaria maculosa/ persicaria	Redshank/pale Persicaria	Achene		-	-	-	-	-	-	-	31	-	-	2	-	-	-
Fallopia convolvulus (L.) Love.	Black bindweed.	Achene	Da	-	-	-	-	-	-	-	2	-	-	3	28	-	-
Rumex acetosella L.	Sheep's sorrel	Achene/tepal	G Acid	-	-	-	-	-	-	-	-	-	-	-	200+(2)	-	-
Rumex cf. Palustris Smith	Marsh dock	Achene	B ditches, marshy fields	-	-	-	-	-	-	-	-	-	-	31	-	-	-
Rumex sp.	Dock type	Achene	DaGMSW	-	-	-	-	5	-	1	-	-	-	4	-	-	-
Malva sp.	Mallow	Nutlet	DG	-	-	-	-	-	-	-	-	-	-	3	-	-	-
Viola sp.	Violet type	Seed		-	-	-	-	-	-	-	1	-	-	-	-	-	-
Brassica rapa cf.ssp *campestris*	Wild turnip	Seed	B	-	-	1	-	-	-	-	-	-	-	7	-	-	-
Brassica nigra (L.) Koch.	Black mustard	Seed	BD	-	-	-	-	-	-	-	-	-	-	-	2	-	-
Brassica sp.	Cabbage family	Seed pod frag.		-	-	-	-	-	-	-	1	-	-	-	-	-	-
Raphanus raphanistrum ssp. cf. *Raphanistrum* L.	Wild radish	Capsule with seed	Da	-	-	-	-	-	-	-	-	-	-	1	-	-	-

Taxa	Common name	Component	Habitat	Feature	well	pit	pit	pit	pit	pit	pit	pit	pit	pit	pit	pit	well	well
					1261	2071	2511	3101	3523	3524	4149	4470	7002	7040	7397	7615	10161	10161
				Context	1263	2256	2775	3102	3528	3527	4151	4536	7010	7058	7405	7617	10174	10218
				Sample	85	105	133	155	180	176	248	342	120	232	256	275	10032	10039
Erica/Calluna sp.	Heaths/heather	Capsule	Heath,W,bog, moor		-	-	-	-	-	-	-	-	-	-	7	-	-	-
Anagallis arvensis L.	Pimpernel	Seed	Da		-	-	-	-	-	-	-	-	-	-	-	1	-	-
Filipendula ulmaria Maxim	Meadowsweet	Achene	W		-	-	-	-	-	-	-	-	-	-	-	4	-	-
Rubus sp.	Brambles	Drupe with Seed			-	-	-	-	1	-	-	-	-	-	-	-	-	-
Rubus sp.	Brambles	Seed			-	-	-	-	6	-	-	-	-	-	1		-	-
Potentilla sp.	Cinquefoil type	Achene			-	-	-	-	-	-	-	-	-	-	2	1	-	-
Prunus spinosa L.	Blackthorn	Drupe and stone	WS		-	-	-	-	1	-	-	-	-	-	-	-	-	-
Prunus spinosa L.	Blackthorn	Stone frags	WS		-	-	1	-	1(18)	-	-	-	-	-	(3)	1	-	-
Malus sylvestris	Crab Apple	Fruit	H,W		-	-	-	-	-	-	-	-	-	-	-	1	-	-
Malus/ Pyrus sp.	Apple/Pear	Seed	C,WS		-	-	-	-	-	-	-	-	-	-	-	1	-	-
Crataegus monogyna. Jacq.	Hawthorn	Nutlet	SW		-	3	-	-	-	-	-	-	-	-	-	-	-	-
Cf. *Crataegus monogyna*. Jacq.	Hawthorn	Nutlet frags			-	-	-	1	9 (13)	-	-	-	-	-	-	-	1	1
Cf. *Prunus spinosa* / *Crataegus* sp.	Blackthorn / Hawthorn	Spine fragments			-	-	-	-	-	-	-	-	-	-	2	-	-	-
Vicia faba var. minor L.	Broad bean	Seed	C		-	-	-	-	-	-	-	-	-	-	-	1	-	-
Cf. *Vicia faba* var. minor L	Broadbean	Seed	C		-	-	-	-	-	-	-	-	-	-	1	-	-	-
Vicia/Lathyrus sp. (4mm)	Vetch/Pea	Seed	Da,C		-	-	-	-	-	-	-	1	-	-	-	20	3	1
Vicia/Lathyrus sp. (2mm)	Vetch/Pea	Seed	Da,C		-	-	2	-	4	-	-	4	-	-	1	64	-	-
Pisum sativum L.	Garden Pea	Seed	C		-	-	-	-	-	-	-	-	-	-	-	-	-	7
Cf. *Pisum sativum* L.		Seed			-	-	5	2	-	-	-	3	1	-	-	2	-	5
Large Legume		Seed fragments	C		-	-	-	-	-	-	-	-	3	-	-	-	-	4
Trifolium/Lotus sp. L	Clover/Birdsfoot trefoil	Seed			-	-	-	-	1	-	-	-	-	-	1	500+	-	-
Trifolium/melilotus sp. L	Clover/Medick	Seed			-	-	-	-	-	-	-	-	-	-	3	-	-	-
Linum cathartica L.	Fairy Flax	Seed	G esp.calcareous		-	-	-	-	-	-	1	-	-	-	-	-	-	-
Coriandrum sativum	Coriander	embryo	C		-	-	-	-	-	-	-	-	-	-	-	1	-	-
Foeniculum vulgare	Fennel	Mericarp			-	-	-	-	-	-	-	-	-	-	-	9	-	-
Aethusa cynapium	Fools Parsley	Mericarp	Da		-	-	-	-	-	-	-	1	-	-	-	-	-	-

Taxa	Common name	Component	Habitat	Feature	well	pit	pit	pit	pit	pit	pit	pit	pit	pit	pit	pit	well	well
				Context	1261	2071	2511	3101	3523	3524	4149	4470	7002	7040	7397	7615	10161	10161
				Sample	1263	2256	2775	3102	3528	3527	4151	4536	7010	7058	7405	7617	10174	10218
					85	105	133	155	180	176	248	342	120	232	256	275	10032	10039
Anethum graveolens	Dill	Mericarp			-	-	-	-	-	-	-	-	-	-	-	2	-	-
Apium sp.	Marshworts	Mericarp			-	-	-	-	-	-	-	-	-	-	-	4	-	-
Carum carvi	Caraway	Mericarp			-	-	-	-	-	-	-	-	-	-	-	1	-	-
Levisticum officinale	Lovage	Mericarp			-	-	-	-	-	-	-	-	-	-	-	3	-	-
Torilis nodsosa	Knotted Hedge-parsley	Mericarp			-	-	-	-	-	-	-	-	-	-	-	8	-	-
Daucus carota L.	Carrot	Mericarp	C,DG		-	-	-	-	-	-	-	-	-	-	-	4	-	-
Apiaceae	Carrot Family	Mericarp			-	-	-	-	-	-	-	-	-	-	4	44	-	-
Cf. *Stachys* sp. L.	Woundwort	Nutlet			-	-	-	-	-	-	-	-	-	-	-	-	-	9
Galeopsis/ Salvia sp.	Common Hemp nettle	Nutlet	Da(M) (W)		-	-	-	-	-	-	-	-	-	-	-	5	-	-
Prunella vulgaris L.	Self heal	Nutlet	G		-	-	-	-	-	-	-	-	-	-	-	2	-	-
Cf. *Thymus* sp.	Thyme	Nutlet			-	-	-	-	-	-	-	1	-	-	-	-	-	-
Cf. *Salvia* sp.	Claries	Nutlet			-	-	-	-	-	-	-	1	-	-	-	-	-	-
Laminaceae	Deadnettle Family	Nutlet			-	-	-	-	-	-	-		-	-	1	-	-	-
Plantago lanceolata L.	Ribwort Plantain	Seed	G short or grazed. Da		-	-	-	-	1	-	-	-	-	-	2	47	-	1
Veronica sp.	Speedwells	Seed			-	-	-	-	-	-	-	-	-	-	-	1	-	-
Odontites / Euphrasia L.	Bartsia/ Eyebright	Seed	Da G		-	-	-	-	-	-	1	-	-	-	1	3	-	-
Galium verum L.	Ladies Bedstraw	Nutlet	G esp.calc		-	-	-	-	-	-	-	1	-	-	2	11	-	-
Galium aperine L.	Cleavers	Nutlet	Da,H		-	-	-	-	-	-	1	-	-	-	6	12	-	2
Galium sp.	Bedstraws	Nutlet			-	1	-	-	-	-	-	-	-	1	-	-	-	-
Sambucus nigra L.	Elder	Seed?	DWH		-	-	-	-	-	-	-	-	-	-	-	6	-	1
Valerianella dentata Pollich.	Cornsalad	Nut	Da		-	-	-	-	-	-	-	-	-	-	-	1	-	-
Lapsana communis L.	Nipplewort	Achene	Da		-	-	-	-	-	-	-	-	-	-	-	2	-	-
Anthemis cotula L.	Stinking Chamomile	Achene	Da, esp base rich heavy soil		-	-	-	-	1	-	-	4	-	-	5	8	-	2
Eupatorium cannabinum L.	Hemp agrimony	Achene	BGW		-	-	-	-	-	-	-	-	-	-	-	2	-	-
Asteraceae	Daisy family	Achene			-	-	-	-	-	-	-	3	-	-	-	4	-	-
Eriophorum sp.	Cottongrass	Nut			-	-	-	-	-	-	-		-	-	1	-	-	-
Eleocharis palustris (L.) Roemer & Schultes	Common spike rush	Nut	A, shallow water. MG wet		-	-	-	-	-	-	-	1	-	-	19	11	-	-
Eleocharis sp.		Nut			-	-	-	-	2	-	-	-	-	-	-	-	-	-
Scirpus /Schoenoplectus sp.	Wood club-rush/club-rushes	Nut	Wet places		-	-	-	-	-	-	-	1	-	-	-	-	-	-
Carex sp. (Trigonus)	Sedge	Nut	MBWG esp damp/ wet soils		-	-	-	-	-	-	-	-	1	-	7	100+	-	-
Carex sp. (bi-convex)	Sedge	Nut	MBWG esp. damp/wet soils		-	-	-	-	1	-	-	9	-	-	8	100+	-	-

Taxa	Common name	Component	Habitat	Feature / Context / Sample	well 1261 1263 85	pit 2071 2256 105	pit 2511 2775 133	pit 3101 3102 155	pit 3523 3528 180	pit 3524 3527 176	pit 4149 4151 248	pit 4470 4536 342	pit 7002 7010 120	pit 7040 7058 232	pit 7397 7405 256	pit 7615 7617 275	well 10161 10174 10032	well 10161 10218 10039
Arrhenatherum elatis var. *bulbosum* (L) P.Beauv. Ex J.s&c.Presl	False oat grass/onion couch	Culm base	DaH		-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cf. *Danthonia decumbens* (L.) DC.	Heath grass	Caryopsis	Sandy or peaty often damp soil, usually acid		-	-	-	-	-	-	-	1	-	-	-	-	-	-
Anisantha sterlis	Barren brome	Caryopsis	Da		-	-	-	-	-	-	-	-	-	-	-	37	-	-
Anisantha sp.	Brome	Caryopsis	C Da		-	1	-	1	-	-	-	-	-	-	-	-	-	-
Poaceae	Grass	Caryopsis			-	-	-	-	3	-	2	2	-	-	26	-	-	-
Poaceae	Grass	Culm nodes			-	-	-	-	5	-	-	-	-	-	-	43	-	-
Poaceae	Grass	Leaf Frags			-	-	-	-	-	-	-	-	-	-	-	****	-	-
Allium cf.*porum*	Leek	Seeds			-	-	-	-	-	-	-	-	-	-	-	4	-	-
Iris pseudacorus	Yellow Iris	Seeds			-	-	-	-	-	-	-	-	-	-	-	3	-	-
Sphagnum sp.	Sphagnum moss	Leaf			-	-	-	-	-	-	-	-	-	-	-	-	-	1
	Moss	Stem frags			-	-	-	-	*	-	-	*	-	-	**	-	-	*
Unident		Rhizome/ Tuber frags			-	-	-	-	-	-	-	-	-	-	2	-	-	-
Unident		Bread like frags			-	-	*	-	-	-	-	-	-	-	4	-	-	-

compared with the cereals is probably due to the fact that the legumes do not need to be parched during their preparation so they would be less likely to be subjected to accidental burning in large quantities. Vetch/tare (*Vicia*/*Lathyrus* sp.) seeds were fairly numerous. They may represent a fodder crop or simply be weeds.

Herbs and spices

Coriander (*Coriandrum sativum*), lovage (*Levisticum officinale*), dill (*Anethum graveolens*), fennel (*Foeniculum vulgare*), and caraway (*Carum carvi*) are all culinary herbs that, although not native to Britain, may have been cultivated from seed as pot herbs. In the case of coriander, lovage, fennel, and dill the seeds and the foliage are both edible. Poppy and fennel also have medicinal properties. The crushed green seed capsule of some of the poppy family steeped in water may be used to alleviate earache. Fennel seeds can be eaten after a meal as a digestif. The plants of the opium poppy can seed readily and colonise rough ground, so it may have grown as a weed in some areas. This may be the case for the others, too, as many are now found naturalised in Britain (Stace 1997).

Wild/managed food resources

Hazelnut (*Corylus avellana*), blackthorn/sloe (*Prunus spinosa*), hawthorn (*Crataegus monogyna*), blackberry (*Rubus* sect. *Glandulosus*), elder (*Sambucus nigra*), crab apple (*Malus sylvestris*) and possibly pear (cf. *Pyrus communis*) all have fruit that could well have supplemented the human diet. Most would probably have required cooking to become palatable.

These plants may not have been deliberately cultivated for their fruit, but they could have been managed in the wild. All of these species can be found in hedgerows and wood margins, and these habitats would have been managed for stock control, shelter and for timber. Blackthorn, blackberry, and elder in particular can be very invasive. So they may have also been found growing as weeds close to or within the settlement and be subjected to periodic clearance. This could have resulted in the charring of fruit if branches were burnt. The plant remains from pit 3523 may represent debris from hedgerow management or scrub clearance.

Although the presence of nettles in an assemblage could be interpreted as representing a weed, it should be considered that they have a potential industrial use. Nettles have a relatively high potash content (the small nettle (*Urtica urens*) having a higher potash content than the common nettle (*Urtica dioica*)), which can be used to produce alkaline lye. Dickson (1999) outlines the process of lye production using seaweed, but it is possible that a similar process could be used with nettles.

> 'Water percolating through the burnt seaweed yielded a lye, used for cleansing and scouring. Fleeces were cleaned with lye and its use was an essential prerequisite for dyeing wool. If lime from burnt limestone was added to the water and ashes a caustic solution would be produced which was boiled or stirred with oil or fat to make soap. This soap could be used for fulling (cleansing and thickening) the cloth' (*ibid*.).

It should also be noted that the fibres from nettle stems can be used to make textiles (Gordon-Cook 1968). The plant also yields a green/yellow dye and the young shoots can be eaten. So it is possible that, although nettles were not deliberately sown, their presence may have been tolerated and possibly encouraged in some areas. Sedges (*Carex* sp.) and heather (*Calluna*/*Erica* sp.) may have been used for thatching and/or animal bedding. Examples of these types of plant remain were common in deposits from West Heslerton (Carruthers and Hunter, in prep.).

Arable weeds

Cleavers (*Galium aparine*), black bindweed (*Fallopia convolvulus)*, pimpernel (*Anagallis arvensis*), corn salad (*Valerianella dentata*), stinking chamomile (*Anthemis cotula*), nipplewort (*Lapsana communis*), and wild radish (*Raphanus raphanistrum* ssp. *Raphanistrum*) are indicative of disturbed and arable habitats. They may have been harvested accidentally with crops or deposited amongst rubbish. Monk (1980) records few arable crop weeds, but this may be a reflection of the paucity of cereals in the samples he examined. Fat hen (*Chenopodium album*) and orache (*Atriplex* sp) are commonly found in archaeological deposits. These plants prefer nitrogen rich soils such as those often associated with occupation and agriculture. They could represent a weed growing close to the area of cultivation, but could possibly be evidence of a fodder crop or even a potential food resource for people.

Corncockle (*Agrostemma githago*) is a weed that in the past was commonly associated with arable crops. The relatively large size of the seed meant that it was often retained with cereal grains as they were processed. The poisonous seeds were later removed by hand picking. The large seeds of black bindweed, wild oat and the seed capsules (mericarps) of wild radish could also potentially be retained with the cleaned cereal grain in this way.

Hay meadow

Pit 7615 produced a relatively rich assemblage of different plant species, some of which are indicative of grassland habitats. The presence of a significant amount of what appears to be grass type leaf fragments, with species such as ribwort plantain (*Plantago lanceolata*), clovers or bird's foot trefoils (*Trifolium*/*Lotus* sp.), selfheal (*Prunella vulgaris*), eyebright or bartsia (*Odontites*/*Euphrasia* sp.), lady's bedstraw (*Galium verum*), and sheep's sorrel (*Rumex acetosella*) suggest a hay meadow habitat. The presence of species found on damper soils such as sedges (*Carex* spp.), spike rushes (*Eleocharis* subg. *Palustres*), marsh dock (*Rumex* cf. *palustris*), and possibly yellow iris (cf. *Iris pseudacorus*) may suggest that there was a succession of vegetation from dryer conditions towards a water source such as a river or ditch. The seeds may have become mixed as the hay was gathered. It is also possible that the sedges and spike rushes were gathered separately for thatching or flooring, and they became mixed later as refuse.

Strewing herbs

The foliage and flowers of meadowsweet and lady's bedstraw are considered to be fragrant and may have been gathered deliberately to sweeten the air in buildings. They could, however, just have been gathered with hay.

Discussion

The relatively poor preservation of the charred plant remains in most of the features, apart from a small number of pits, suggests that the assemblage consists mainly of redeposited charred material. In this aspect it was similar to much of the charred plant remains recovered from West Heslerton, Yorkshire (Carruthers and Hunter, in prep.), where many of the Saxon features contained small quantities of poorly preserved grain with little or no chaff. However, samples from pits 2001, 4149, 4470, 7163, 7397, and 7615 at the Stadium site suggested that, when the right preservation conditions occurred, the potential for well-preserved plant and other organic remains was high. Thus, any observations on temporal and spatial changes in the charred plant assemblage from this site should be tempered by the obvious preservation bias that has occurred.

It is mainly from these few pits that it has been possible to identify plants that might have been linked to human activities such as animal husbandry, cooking and trade. Because the total number of samples looked at was relatively small, widely spread over the site and from different types of deposit, any comparisons between the plant assemblages is limited by these factors. However, the patterns of dominance of different cereal types over different areas may appear to suggest variation.

Wheat was generally under-represented in the assemblage, perhaps because it was being milled elsewhere and brought in to the settlement either as flour (Carruthers, pers. comm.) or as bread. A few charred organic fragments in some samples may

possibly have been from bread and pit 4149 within a building in the West Stand did contain a relatively large amount of wheat grains, with some wheat chaff along with a moderate amount of barley and oat. It might be that cereals were being stored and/or processed in the immediate vicinity, but the obvious preservation bias that has occurred on the site means that it is not possible to say if this was unique to this area and mid mid-Saxon phase. The small quantity of rye recovered might have been a weed growing amongst the other cereal crops or a relic of earlier crops.

The presence of barley chaff with some of the grain (eg, pits 7615 and 4470) suggests that it may not have been processed to the same extent as the wheat. This may be because it was charred at an early stage in the processing, or perhaps the assemblages represent animal fodder. The relatively large quantities of oat grains in some samples, particularly those containing barley, may indicate the presence of drage, a mixture of cereals (usually barley and oat), if the oats were not simply a weed contaminant. This mixture may have been intended for human consumption, although the high chaff content suggests it would have been unpalatable and so was probably animal fodder. Other potential fodder species were recorded in some of the features elsewhere. For example, relatively large numbers of grass leaf fragments with plant species commonly associated with hay meadow habitats were present in at least one feature (pit 7615), suggesting the presence of animal fodder.

Other potential food resources include legumes such as garden pea and broad bean, represented in all three phases of the site. Hazelnuts, blackberries, elder, and hawthorn are also likely to have been used to supplement the diet, perhaps gathered for individual use or traded, and a similar range of wild foods was recorded from earlier work on the charred plant remains from Hamwic (Monk 1980). The presence of the seeds from a variety of herb species (in pits 7615 and 7379), often under-represented in charred assemblages (eg, Monk 1980; Davis 2003), suggests both culinary and possibly medicinal plants were being used. They could have been seeds brought in and used directly, or grown to produce leaves and other plant parts. Many of the herbs are known or thought to have been cultivated in Roman Britain (Greig 1991), and their presence in Saxon contexts may testify to the continuation of such species within garden horticulture.

There is some slight evidence from the charred plant remains to suggest that different activities were taking place in different areas of the site. For example, the apparently poorer quality of cereals, not separated from the chaff and mixed with fodder, may suggest that the northern part of the site was more closely associated with stabling and animal husbandry than other areas of the site. Assemblages from other mid-Saxon sites at Lundenwic (Davis and de Moulins 1988; Davis 2003; Hunter 2004) and West Heslerton (Carruthers and Hunter, in prep.) have also produced assemblages where free-threshing wheat tended to be less abundant than oats and barley overall. However, the samples from Hamwic have a higher proportion of samples where wheat is the dominant cereal represented.

It may be significant that the samples from the mid- and late mid-Saxon phases in the South and West Stands produced more wheat than the North Stand. However, the single early phase pit (2001) from the South Stand produced little wheat but well-preserved barley and oats with chaff, and the single late phase sample (pit 7163) from the North Stand was dominated by wheat with no oat grains or any chaff. This might be an indication of chronological changes in activities in these areas. However, other factors need to be considered and, as mentioned before, these patterns might simply be due to the preservation bias and the relatively small number of features examined in detail.

However, of perhaps greatest importance is that prior to the Stadium site very little work had been undertaken on charred plant assemblages from Hamwic, with the exception of Monk's work more than two decades ago (Monk 1977), and virtually nothing has been published (Monk 1980). This assemblage, therefore, provides a unique record of the types of charred plant remains preserved at the site, and will provide a guide for future work on samples from Saxon Southampton.

Waterlogged Plant Remains

by Alan J. Clapham

Five samples from four features were analysed for waterlogged plant remains. Four of the samples were from mid mid-Saxon features (pits 58 and 10116, and well 1261: two samples) and the other from an early mid-Saxon pit (371). Three of the features (pits 58 and 371 and well 1261) lay in the East Stand, close to the waterfront, whilst pit 10116 was in the south-west corner of the site.

As the lower parts of these features were waterlogged it was assumed that they would contain waterlogged plant remains. The features were chosen as the most representative of the few waterlogged contexts on the site, and were analysed in full to gain information on environmental conditions and the use of the features. Waterlogged conditions are rarely encountered in Hamwic, and no waterlogged plant assemblages have been analysed in detail before. Therefore, the publication of the material from the

Table 41 Occurrence of waterlogged remains of cereals and other crops, fruits, herbs, and spices, and possible fibre and oil crops

		Feature	*371*	*58*	*1261*	*1261*	*10116*
		Context	*512*	*507*	*1303*	*1302*	*10114*
		Sample	*7*	*8*	*87*	*90*	*19008*
	Common name	*Phase*	*early*	*mid*	*mid*	*mid*	*mid*
CEREALS AND OTHER CROPS							
Waterlogged taxa							
*Hordeum vulgar*e	Barley		-	2	-	-	-
Bran fragments			-	1000+	1000+	1000+	-
Mineralised taxa							
Cerealia indet.			-	-	3	-	-
Bran frags			-	-	common	-	-
Lens culinaris	Lentil		-	-	-	1	-
Pisum sativum	Pea		-	-	2	-	2
Vicia faba hilum	Field bean		1	-	20	26	7+1 seed
Pisum sativum/*Vicia fabia* testa frags			-	-	115	63	36
FRUITS							
Waterlogged taxa							
cf *Ribes uva-crispa*	Gooseberry		1	-	104+60f	31+11f	-
Rubus Sect 2 *Gladulosus*	Bramble/blackberry		468+ 1000+ f	1000+	104+60f	31+11f	
Prunus domestica	Wild plum		1+54f	10+24f	11+157f	3+42f	-
cf *Cydonia oblonga*/*Pyrus communis* stone cells	Quince/pear		-	1000+	-	-	-
Malus domestica seeds	Apple		9+5mm +122f	21+93f	22+68f	49+108f	-
Vitis vinifera	Grape		3+13f	-	-	-	-
Mineralised taxa							
Malus domestica	Apple		-	-	7+20f	8+22f	3+4f
HERBS & SPICES							
Waterlogged taxa							
Papaver somniferum	Opium poppy		1	5	5	2	–
Foeniculum vulgare	Fennel		-	2	7+26f	8f	-
Apium graveolens	(Wild) celery		20+2f	68+21f	11	2+1f	-
Nepata cataria	Cat-mint		-	7+1f	-	-	-
Mineralised taxa							
Coriandrum sativa	Coriander		-	-	3+5f	-	1+1f
cf *Foeniculum vulgare*	Fennel		-	-	1	1	-
POSSIBLE FIBRE & OIL PLANTS							
Waterlogged taxa							
cf *Cannabis sativa*	Hemp		2+13f	6+32f	4+130f	7+65f	-
Linum usitatissimum	Flax		4	2+12f	23f	2f	_

Key to Tables 41–3: ch = charred; e = embryo; f = fragment; mm = mineralised matter; tub = tuber

Stadium site represents a significant step forward in the study of this aspect of the plant assemblage from the Saxon town.

The samples were originally processed using the standard Wessex Archaeology procedure for waterlogged remains, but were sieved again through a series of granulometric sieves by the author. Three of the samples (from pit 58 and well 1261) were heavily contaminated with diesel fuel oil and were subjected to additional treatment with a detergent to further clean the samples.

Each sample was then examined and the plant remains present picked out under a low-powered stereomicroscope (x 6.3 x 50). The plant remains were identified with reference to the modern plant collections housed in the George Pitt-Rivers Laboratory for Archaeological Science at the McDonald Institute of Archaeological Research, University of Cambridge. Nomenclature of the non-crop species follows that of Stace (1997).

Of the five samples, four (all from near the waterfront) produced waterlogged plant material, while the fifth (from pit 10116) produced mostly mineralised remains. Mineralised remains were also found in the other samples (see above).

The waterlogged plant remains are entirely consistent with the results of the insect analyses (below), which indicate that the samples were from cess deposits in pits or wells.

All five samples showed deposits of vivianite which is suggestive of cess material as is the presence of small fragments of cereal bran. In the four samples that contained waterlogged material, it was noticeable that the bran fragments were also accompanied by small pieces of corncockle (*Agrostemma githago*). Corncockle is a cornfield weed that has a large seed similar in size to that of cereal grains. Other large-seeded weed seeds, such as black bindweed, were also found, mainly as fragments. This suggests that the grain was not thoroughly cleaned before being ground, producing contaminated flour. The presence of black bindweed in the flour should present no problem, but corncockle is considered to be a poisonous seed.

Apart from the presence of bran fragments and the possibility of contaminated flour, there were over 100 other plant taxa representing a variety of habitats and food plants. These are discussed below and their occurrence is indicated in Tables 41–3.

Cultivated plants

Cereals and other crops

The only intact cereal grains recovered were two caryopses of barley (*Hordeum vulgare*) from pit 58. Bran fragments were very common in all samples except pit 10116. Although the bran fragments were not identified they can be said to represent the remains of flour in the form of either bread or gruel and were deposited in the features as cess.

Other crops present in the samples were preserved by mineralisation. These crops were legumes which included lentils (*Lens culinaris*), peas (*Pisum sativum*), and beans (*Vicia faba*). Both whole seeds and, in the majority of cases, hilums of both taxa were present as were testa fragments (Table 41).

Fruits

Fruits were well represented (Table 41), and the most common was apple (*Malus domesticus*). Apple was represented by large numbers of seeds (some of them mineralised) as well as core and skin fragments. Possible stone cells of either pear (*Pyrus communis*) or quince (*Cydonia oblonga*) were also found. Plum stones (*Prunus domestica* s.l.) were found in both early and mid mid-Saxon contexts.

Of special interest were the finds of grape pips (*Vitis vinifera*) and a possible gooseberry seed (cf *Ribes uva-crispa*) in early mid-Saxon pit 371. Grapes could have been grown in Britain, as they were first introduced and cultivated by the Romans, but the possibility of importation should also be considered. Whether the grape pips represent fresh or dried fruit is not possible to say.

Gooseberry is known to grow wild throughout northern and central Europe, although not in the United Kingdom. According to Vaughan and Geissler (1997), gooseberry was cultivated in Britain at least as early as the 16th century. This find may represent the earliest evidence for gooseberry cultivation in Britain, or it may indicate an import from Europe. It is not possible to determine if the seed represents the wild or a cultivated form of gooseberry.

Other possible fruit and nut finds are those that may have been collected from the wild. These include strawberry (*Fragaria vesca*), blackberry (*Rubus* subgenus *Rubus*), sloe (*Prunus spinosa*), dog rose (*Rosa* cf *canina*), and hazel nuts (*Corylus avellana*). The strawberry and hazel nuts may well have been grown in gardens and orchards, whilst it is more likely that the others were collected from the wild. Dog rose is very rich in vitamin C and may have been used medicinally.

Herbs and spices

Herbs and spices are well-represented in both the early and mid mid-Saxon phases (Table 41). These include opium poppy (*Papaver somniferum*), coriander (*Coriandrum sativum*), fennel (*Foeniculum vulgare*), and celery (*Apium graveolens*). Coriander and fennel were also found mineralised (above). These herbs and spices may have been used to flavour otherwise dull food, and possibly used to disguise the taste of some bread which may have tasted bitter due to the presence of the corncockle.

Table 42 Occurrence of weeds of arable and waste ground

		Feature	*371*	*58*	*1261*	*1261*	*10116*
		Context	*512*	*507*	*1303*	*1302*	*114*
		Sample	*7*	*8*	*87*	*90*	*19008*
	Common name	*Phase*	*early*	*mid*	*mid*	*mid*	*mid*
waterlogged taxa							
Ranunculus a/r/b	Buttercup		-	-	-	2+4f	-
Ranunculus sardous	Hairy Buttercup		6+1f	45+4f	-	-	-
Papaver hybridum	Rough Poppy		-	-	1	-	-
Papaver argemone	Prickly Poppy		-	1	1	-	-
Papaver sp.	Poppies		1	-	-	-	-
Glaucium flavum	yellow horned poppy		37+57f	-	-	-	-
Urtica dioica	Common nettle		47+13f	1223	26	14	-
Urtica urens	Small nettle		-	5+2f	2	1	-
Chenopodium rubrum	Red goosefoot		-	5	-	-	-
Chenopodium polyspermum	Many-seeded goosefoot		-	4	-	1	-
Chenopodium hybridum	Maple-leaved goosefoot		2	-	-	-	-
Chenopodium album	Fat hen		6+21f	35+29f	69+209f	71+100f	-
Atriplex sp.	Orache		2+6f	7+17f	13+15f+1e	4 1e	-
Stellaria media	Chickweed		1+3f	20+5f	2	1	-
Spergula arvensis	Corn spurrey		-	2+1	-	-	-
Agrostemma githago	Corn cockle		1000+f	+1000+f	100+	100+	-
Silene sp.	Campion		5	1f	-	1	-
Persicaria maculosa	Redshank		5f	-	1+2f	-	-
Persicaria lapathifolia	Pale persicaria		-	6+17f	2	2+7f	-
Polygonum aviculare	Knotgrass		5	13+8f	1	-	-
Fallopia convolvulus	Black bindweed		72f	2+43f	37f	90f	-
Rumex acetosella nutlets	Sheep's sorrel		-	2	-	-	-
Rumex crispus fruits	Curled dock		-	2	-	-	-
perianth segments			-	4	-	-	-
nutlets			-	9	-	-	-
Rumex conglomeratus nutlets	Clustered dock		4	5	-	-	-
Rumex obtusifolius fruits	Broad-leaved dock		4	1	-	-	-
perianth segments			-	1	-	-	-
nutlets			10+8f	4	-	-	-
Rumex sp. perianth segments	Docks		1+50f	2	5+9f	4f	-
nutlets			7+1tub	6+36F	-	-	-
Malva sylvestris	Common mallow		-	2f	1f	-	-
Brassica sp.	Cabbages		-	-	4f	4f	-
Sinapis arvensis	Charlock		2+157f	8+208f	199f	7+137f	-
pod fragments			69	-	-	1	-

Table 42 (cont.)

		Feature	*371*	*58*	*1261*	*1261*	*10116*
		Context	*512*	*507*	*1303*	*1302*	*114*
		Sample	*7*	*8*	*87*	*90*	*19008*
	Common name	*Phase*	*early*	*mid*	*mid*	*mid*	*mid*
Raphanus raphanistrum capsule fragments	Wild radish		-	151	14	52f	-
seeds			-	7f	-	-	-
Vicia/*Lathyrus* sp. Immature legume	Vetch/tare		-	1	-	-	-
Chaerophyllum temulum	Rough chervil		3	-	-	-	-
Torilis arvensis/nodosa	Spreading/knotted hedge parsley		3+132f	6+109f	-	2f	-
Solanum nigrum	Black nightshade		-	-	2	-	-
Lamium sp.	Dead nettle		-	1+1f	-	-	-
Galeopsis sp.	Hemp nettle		-	8f	-	12f	-
Odontites vernus	Red bartsia		1	-	-	-	-
Galium aparine	Cleavers		-	-	2+1f	-	-
Lapsana communis	Nipplewort		6+51f	2+9f	10+15f	3+7f	-
Sonchus arvensis	Perennial sow thistle		1	1	-	-	-
Sonchus asper	Prickly sow thistle		3+3f	2f	2	6f	-
Anthemis arvensis	Corn chamomile		-	-	1	1+1f	-
Anthemis cotula	Stinking chamomile		13+162f	43+219f	5+30f	4+77f	-
Senecio sp.	Ragwort		1	-	-	-	-
Mineralised taxa							
Chenopodium album	Fat hen		-	-	1	-	-
Sinapsis arvensis	Charlock		-	-	7+1f	-	-
Rumex sp.	Docks		-	-	-	-	2
Vicia sp.	Vetch		-	-	-	-	3
Scandix pecten-veneris	Shepherd's needle		-	-	-	5f	-
Apiaceae	Carrot family		-	-	-	-	6+1f
Lapsana communis	Nipplewort		-	-	-	1	-
Anthemis cotula	Stinking chamomile		-	-	-	1	-
Avena sp.	Oats		-	-	-	-	1

Cat-mint (or catnip) (*Nepeta cataria*) was also found. Today it is best known for its effects on cats, but in the past is more likely to have been used as a medicinal tea.

It is possible that all of the flavourings were grown in Saxon England, most likely in herb gardens, but the possibility of importation, especially of coriander, cannot be ruled out.

Fibre and oil crops

Two taxa possibly used as fibre crops were hemp (*Cannabis sativa*) and flax (*Linum usitatissimum*). Flax seeds and capsule fragments were found in both early and mid mid-Saxon phases, whilst hemp was only found in the early phase (Table 41). Although, it is most likely that these species were used for the manufacture of ropes and cloth, it is also possible that they were utilised for oil production. The seeds of both flax and hemp produce valuable oils, and linseed oil (from flax) may have been used either as a dietary supplement or as a lighting fuel. As different parts are used for the different products it is possible that they had a dual usage.

Table 43 Occurrences of woodland and scrub taxa, wetland, grassland and heathland plants, and plants typical of coastal or marine habitats

		Feature	*371*	*58*	*1261*	*1261*	*10116*
		Context	*512*	*507*	*1303*	*1302*	*114*
		Sample	*7*	*8*	*87*	*90*	*19008*
	Common name	*Phase*	*early*	*mid*	*mid*	*mid*	*mid*
WOODLAND AND SCRUB							
Waterlogged taxa							
Pteridium aquilinum pinnules	Bracken		-	-	-	1	-
Betula pendula	Silver birch		-	1	1	-	1
Betula pendula x pubescens	Hybrid birch		-	2	-	-	-
Betula sp.	Birch		-	1	-	-	-
Corylus avellana	Hazel		2f	121+1f(ch)	-	5f	-
Moneses uniflora/*Monotropa hypopitys*	One-flowered Winter-green/ Yellow Bird's-nest		2	4	-	-	-
Fragaria vesca	Wild strawberry		5	19	13	35	-
Rosa cf *canina*	Dog rose		-	1	-	-	-
Prunus spinosa	Blackthorn		1	13	12	-	-
Crataegus monogyna	Hawthorn		-	1+4f	-	1	-
Stachys sylvatica	Hedge woundwort		-	8+1f	-	-	-
Sambucus nigra	Elder		-	2+5f	-	-	-
Scirpus sylvaticus	Wood club-rush		4	2	-	-	-
WETLAND							
Waterlogged taxa							
Ranunculus flammula	Lesser spearwort		1	-	-	-	-
Persicaria hydropiper	Water-pepper		-	-	-	1	-
Rumex hydrolapathum nutlets	Water dock		-	4	-	1+1f	-
Salix sp.	Willow		1	-	-	-	-
Conium maculatum	Hemlock		14f	-	12f	2f	-
Menyanthes trifoliata	Bogbean		-	-	1f	-	-
Senecio aquaticus	Marsh ragwort		-	-	-	1	-
Alisma plantago-aquatica	Water-plantain		1	-	-	-	-
Juncus sp.	Rushes		3+2(ch)	8	3	-	-
Eleocharis palustris	Common spike-rush		1+1f	1	4	3	-
Eleocharis multicaulis	Many stalked spike-rush		1	-	-	-	-
Schoenoplectus lacustris	Common club-rush		1	2(ch)	2	-	-
Carex sp.	Sedges		-	1	4	10+9f	-
Typha sp.	Redmace		-	-	1	-	-

Table 43 (cont.)

		Feature	*371*	*58*	*1261*	*1261*	*10116*
		Context	*512*	*507*	*1303*	*1302*	*114*
		Sample	*7*	*8*	*87*	*90*	*19008*
	Common name	*Phase*	*early*	*mid*	*mid*	*mid*	*mid*
GRASSLAND							
waterlogged taxa							
Hypericum sp.	St John's wort		-	3	-	-	-
Trifolium sp. Petal fragment	Clover		1	-	-	-	-
Potentilla sp.	Cinquefoils		2	-	-	-	-
Linum catharticum	Fairy flax		-	-	-	1	-
Pastinaca sativa	Parsnip		4f	1+3f	-	-	-
Verbena officinalis	Vervain		-	1	-	-	-
Prunella vulgaris	Self-heal		-	2+1f	-	-	-
Plantago major	Greater plantain		1	1	-	-	-
Carduus nutans	Musk thistle		-	-	1+9f	1+2f	-
Cirsium sp.	Thistle		5f	4f	-	-	-
cf *Hypochaeris* sp.	Cat's-ears		-	-	-	1	-
Leontodon autumnalis	Autumn hawkbit		2f	4f	3f	1+1f	-
Taraxacum Sect. *Ruderalia*	Dandelion		2	1	-	-	-
Hieracium sp.	Hawkweed		-	-	-	1	-
Luzula sp.	Wood-rush		3	-	-	1	-
Large Poaceae >1mm	Large-seeded grasses		-	3	18f	2	-
Small Poaceae <1mm	Small-seeded grasses		41+1r+ 1cn	41	7	5	-
mineralised taxa							
cf *Phleum pratense* floret	Tmothy grass		-	-	-	-	1
Small Poaceae	Small-seeded grasses		3	-	1	3	-
HEATHLAND							
waterlogged taxa							
Erica tetralix leaves	Cross-leaved heather		3	-	-	3	-
Erica cinerea leaves	Bell heather		-	-	-	1	-
COASTAL OR MARINE							
waterlogged taxa							
Glaucium flavum	Yellow horned poppy		-	2f	-	-	-
Beta vulgaris	Beet		1+2 caps	1+1f	-	-	-
cf *Crithmum maritimum*	Rock samphire		1	-	-	-	-
Daucus carota	Carrot		1	-	-	-	-
Triglochin maritima	Sea arrowgrass		-	-	10+1f	11	-

Non-cultivated plants

There are several different types of environment represented by the remaining taxa. By far the largest group is that of arable and waste ground plants. Other habitats include wood and scrub, wetland, grassland, heath and coastal areas.

Arable and waste ground

This habitat group was represented by the largest number of taxa (44; Table 42). Most were preserved by waterlogging but some were mineralised. The majority of taxa are likely to have been cornfield weeds, while the rest could have grown in and around the site, wherever disturbed ground occurred. It is possible, as mentioned above, that the larger seeded taxa such as corncockle and black bindweed may have been ground-up with the cereal grains to produce flour. If so, this suggests that the final stages of crop processing (hand cleaning of the grain) may have been omitted entirely or carried out in a haphazard way. Perhaps this was because the grain was in short supply for flour production and that the larger weed seeds were deliberately left in to 'bulk out' the flour.

Wood and scrub

The presence of these taxa in the samples may indicate that there was some scrub or secondary woodland formation occurring on parts of the site that were abandoned (Table 43). However, it is perhaps more likely that it reflects the exploitation of local woodland.

The finds of birch seeds are also indicative of scrub development in the area, but being small, light and winged seeds they are ideally dispersed by wind and may have come from further away. It is interesting to note that seeds of silver birch (*Betula pendula*) and the hybrid (*B. pendula x pubescens*) suggests that downy birch (*B. pubescens*) was also present. As mentioned above, the other indicators of woodland such as strawberry, blackberry, sloe, dog rose, and hazel nuts may have been gathered for food.

The presence of bracken (*Pteridium aquilinum*) pinnules suggests that this material may have been gathered for use as either bedding or flooring material.

Wetland

There are 14 taxa in the samples which indicate that wet areas were present on or in the vicinity of the site, or that wetlands further afield were exploited (Table 43). These areas would have provided rushes, sedges and reeds which could have been used as thatch, flooring or bedding, as well as willow for wattles and withies. The banks of the River Itchen and Northam marsh immediately to the north-east of the site would have provided a very local wetland resource.

Grassland

Grassland taxa were also well represented in the samples (Table 43). It is most likely that the local grasslands were exploited for hay that was used as animal fodder, flooring or stabling and then discarded after use.

The presence of the parsnip seed (*Pastinaca sativa*) may suggest a foodstuff as the root can be used as an animal fodder or cooked vegetable. Parsnips have been cultivated since the Roman period, but good fleshy forms were not developed until the Middle Ages (Vaughan and Geissler 1997).

Heathland

The leaves of two heathland plants were represented, cross-leaved heath (*Erica tetralix*) and bell heather (*Erica cinerea*). These two species could have been used as bedding for animals or humans or even as a roofing material (Table 43).

Coastal

Of some interest are the taxa of coastal or maritime habitats (Table 43). These include yellow-horned poppy (*Glaucium flavum*), sea-beet (*Beta vulgaris*), samphire (*Crithmum maritimum*), carrot (*Daucus carota*), and sea arrowgrass (*Triglochin maritima*).

Yellow-horned poppy, sea-beet, samphire, and carrot are often found on shingle beaches and sea cliffs, whilst sea arrowgrass is usually found on salt marshes. This suggests that both types of maritime environment which occurred close to Hamwic were exploited An oil can be extracted from the seeds of yellow-horned poppy which can be used for illumination and as a soap, and it also has medicinal properties (Mabberley 1987).

Three of the other taxa are also well known as vegetables. In the past the leaves of samphire have been pickled as a savoury or cooked in butter as a vegetable (Vaughan and Geissler 1997) and it is still considered a delicacy in some parts of the country, such as East Anglia. Sea-beet is a common seashore plant and it is possible that the fleshy leaves were eaten as a vegetable. Sugar beet, beetroot and the leaf beets have all evolved from sea-beet (ibid.). It is not possible from the seeds to determine which was present at Hamwic, but it is most likely that the leaves of the wild sea-beet were eaten.

The identification of the carrot seed may suggest that the vegetable was present or that it is of the wild species and indicates maritime conditions. Modern day cultivated carrot seeds tend to be larger than their wild counterparts, and in this case the seeds are more typical of the wild type. The roots of the wild carrot are comparatively small, tough and pale-fleshed bearing little resemblance to the thick, fleshy, orange or red root of the cultivated carrot, which suggest that

Table 45 The Coleoptera (min. no. individuals)

Pit	*1261*	*1261*	*10116*	*371*	
Context	*1302*	*1303*	*10114*	*512*	
Sample	*90*	*87*	*19008*	*7*	
Sample vol (litres)	*5*	*5*	*1*	*5*	*species group*
Carabus sp.	-	1	-	-	
Nebria brevicollis (F.)	-	-	1	-	
Clivina collaris (Hbst.) or *fossor* (L.)	1	-	-	-	
Trechus micros (Hbst.)	-	1	-	-	
Bembidion obtusum Serv.	-	1	-	-	
Pterostichus melanarius (Ill.)	-	-	1	-	
Amara sp.	1	-	-	-	
Cercyon analis (Pk.)	1	1	2	1	7
C. atricapillus (Marsh.)	-	1	-	-	7
C. haemorrhoidalis (F.)	1	2	2	1	7
C. lugubris (Ol.)	-	-	1	-	7
Megasternum obscurum (Marsh.)	-	-	2	1	7
Acritus nigricornis (Hoff.)	-	-	-	1	
Hister cf. *merdarius* (Hoff.)	-	-	1	-	
Paralister sp.	-	-	1	-	
Ptenidium sp.	-	-	-	1	
Choleva or *Catops* sp.	-	1	1	-	
Omalium rivulare (Pk.)	-	2	1	2	
Coprophilus striatulus (F.)	-	-	-	1	
Platystethus arenarius (Fouc.)	1	2	-	-	7
Anotylus nitidulus (Grav.)	2	3	-	-	
A. sculpturatus gp.	-	2	-	8	7
Stenus sp.	-	1	-	-	
Leptacinus pusillus (Step.)	-	-	-	1	
Gyrohypnus angustatus (Step.)	-	2	-	-	
Philonthus sp.	1	1	-	-	
Tachyporus sp.	-	1	1	-	
Tachinus sp.	1	-	-	-	
Aleocharinae indet.	-	1	-	1	
Geotrupes sp.	1	-	-	1	2
Aphodius contaminatus (Hbst.)	-	-	-	2	2
A. granarius (L.)	-	-	-	1	2
A. rufipes (L.)	-	-	-	1	2
A. cf. *sphacelatus* (Pz.)	1	3	2	-	2
Calyptomerus dubius (Marsh.)	-	1	-	-	
Anobium punctatum (Deg.)	2	1	3	3	10
Ptilinus pectinicornis (L.)	-	-	1	-	4
Ptinus fur(L.)	-	-	-	3	9a
Cryptophagidae gen. et sp. indet. (not Atomariinae)	1	1	-	1	
Atomaria sp.	1	-	-	3	
Cerylon histeroides (F.)	1	-	-	-	4
Lathridius minutus gp.	-	1	-	3	8
Corticaria punctulata Marsh.	1	-	1	1	8
Corticariinae gen. et sp. indet.	1	-	-	1	8
Aglenus brunneus (Gyl.)	1	-	-	-	
Bruchus rufimanus Boh.	2	-	5	1	
Chaetocnema concinna (Marsh.)	-	-	1	-	4
Leperisinus varius (F.)	1	-	-	-	4
Totals	22	30	27	39	

the seed does not represent the edible type, although this cannot be ruled out.

If the sea-beet, carrot and parsnip seeds are of the cultivated types, then it is most likely that they were grown in garden plots within Hamwic.

Overall, it appears that the population of Hamwic enjoyed a varied diet of cereals, pulses, fruit, and vegetables which were flavoured with various spices. Many habitats within the vicinity of Hamwic were exploited to provide food, bedding and other useful raw materials. Trading was also important as possible exotic foodstuffs were imported.

Insect Remains

by Mark Robinson

Identifiable insect remains were noted in four contexts from three pits during assessment of the waterlogged plant remains. It was decided to analyse the insects from these deposits in full to gain information on environmental conditions and the use of the pits on the site.

Five litres from each of three samples from pits 371 (one sample) and 1261 (two samples) were washed over onto a 0.25 mm mesh and subjected to paraffin flotation to recover insect remains. The flots were washed in detergent, then sorted under a binocular microscope for insect fragments. One litre from pit 10116 was washed over onto a 0.25 mm mesh and sorted under a binocular microscope for plant and insect remains. The insects were identified with reference to the Hope Entomological Collections

Table 45 Other insects

		Minimum no. individuals			
	Pit	*1261*	*1261*	*10116*	*371*
	Context	*1302*	*1303*	*10114*	*512*
	Sample	*90*	*87*	*19008*	*7*
	Sample vol (litres)	5	5	1	5
Lasius niger gp.	worker	1	1	-	-
L. flavus gp.	worker	-	1	-	-
Apis mellifera L.	worker	-	-	1	5
Hymenoptera gen. et sp. indet.		2	1	-	-
Psychoda cf *alternata* Say	pupa	11	-	14	19
Sphaeroceridae gen. et sp. indet.	puparium	-	-	6	5
Diptera gen. et sp.indet.	puparium	1	-	89	5
Diptera gen. et sp.indet.	adult	1	1	-	-

at the Oxford University Museum of Natural History. The results are given in Tables 44 and 45, expressed as the minimum number of individuals of each species in each sample. Nomenclature of Coleoptera follows Kloet and Hincks (1977). Species groupings in Table 44 follow Robinson (1991, 278–81).

The insect results were entirely consistent with the botanical results, which suggested that the samples analysed were from sewage deposits within cess pits. All three pits contained pupae of *Psychoda* cf. *alternata*. The larvae of *Psychoda* feed on decaying matter, usually in water, and the common name of *P. alternata*, as the trickling-filter fly, has arisen because it is often abundant in the filter beds of sewage works. The larvae of this species also occur in rotting seaweed, disused farm feeding troughs, washings from animal cages and kitchen-sink U-bends (Smith 1989, 37). Unlike other members of the genus, the larvae of *P. alternata* readily live in dark habitats. The pupae are likely to have reflected conditions within the latrines, suggesting pools of foul organic liquid at the bottom. The liquid in the pits did not provide a suitable habitat for water beetles, but there were puparia of Sphaeroceridae (sewage flies) in the samples from pits 307 and 10116 whose larvae perhaps lived at the edge of the liquid.

The best-represented species group of Coleoptera in all of the samples was Species Group 7, beetles of a wide range of foul organic material, including dung. They included several species of *Cercyon*, *Platystethus arenarius,* and *Anotylus sculpturatus* gp. Other beetles of such habitats included *Omalium rivulare*, *Anotylus nitidulus*, and *Philonthus* sp. While it is possible that they were amongst refuse dumped in the pits, they could also have lived in those parts of the pit contents which had yet to become compacted below water level. The sample from pit 10116 contained numerous medium-sized unidentified puparia of flies whose larvae probably fed on the pit contents. This sample also contained the beetles *Hister* cf. *merdarius* and *Paralister* sp. which feed on maggots in foul organic material.

One beetle, *Bruchus rufimanus* (bean beetle), which was present in all three pits and represented by five individuals in pit 10116 is likely to have entered the pit in sewage. It is a pest of beans (*Vicia faba*, field bean) and adults are often present in dried beans used for human consumption. However, infestation only occurs as a result of an adult laying an egg on the developing bean after flowering and although adults emerge from beans in storage, they do not attack other dried beans.

Many of the other insects probably fell into the pits from various habitats in the settlement. Beetles which bore into structural timbers (Species Group 10) were represented by *Anobium punctatum* (woodworm beetle) and comprised up to 11% of the Coleoptera. It is possible they emerged from the wood of shelters over the pits. A few beetles which are generally regarded as indicative of naturally-occurring wood and trees (Species Group 4) were also present. However, they could also have been associated with timber buildings. *Ptilinus pectinicornis* would have been able to live in damp hardwood posts, while *Leperisinus varius* (ash bark beetle) could have emerged from recently-cut ash poles with the bark left in place.

Other beetles possibly associated with buildings included *Ptinus fur* (Species Group 9a) from pit 371, which feeds on a wide range of organic material in

indoor habitats such as crop-processing debris and food waste. The Lathridiidae (Species Group 9) which feed on moulds on damp plant material, such as old hay and thatch, were present in all the samples. There was a single example of *Aglenus brunneus* from pit 1261, which formerly flourished in trampled organic refuse in towns but is now very rare.

Scarabaeoid dung beetles (Species Group 2), mostly from the genus *Aphodius*, were well represented in all the samples. These beetles mostly feed on the individual droppings of domestic animals on the ground and are unlikely to have thrived in the latrine pits. However, it is possible they were attracted to the pits by their smell and then fell in. This would imply that domestic animals were being kept in the vicinity.

Another insect attracted to the pits was *Apis mellifera* (honey bee). A single head of a honey bee worker was found in the sample from pit 10116, and there were heads and other fragments of at least five workers from pit 371. The fragments were too large and numerous for them to have been consumed in honey or honeycomb. An occasional bee might be expected to fly into a pit by accident or debris from beekeeping could have been disposed of into a pit. However, it is thought most likely that the bees were visiting the pits to drink and some accidentally fell in. During winter, when bees are feeding on their stocks of honey, water is needed to dilute it. These results suggest that bees were kept in the vicinity of the pits.

There were few other insects of outdoor habitats, providing additional evidence that there were shelters over the pits. Ground beetles, such as *Nebria brevicollis* and *Pterostichus melanarius* and phytophagous beetles, such as *Chaetocnema concinna*, readily occur on weed-covered neglected areas within settlements.

The Plant Remains: Comparing and Contrasting the Assemblages

by Wendy J. Carruthers

A total of 246 environmental bulk (20 litre) samples and a further 25 samples for waterlogged and insect remains were taken from pit fills, including suites of samples (between three and ten samples) from 29 individual pits. amples were taken from examples of the main pit types and from pits in all areas of the site. The various samples allowed the recovery of mineralised, charred and (occasionally) waterlogged plant remains, charcoal, insect remains and small animal bones. The comprehensive programme of environmental sampling and subsequent analysis, never before undertaken in Hamwic, was aimed primarily at providing a more comprehensive understanding of the Saxon diet, the plant (and animal) economy of the settlement, and the local habitats exploited. It was hoped that the analysis might also provide evidence for any variations between different areas of Hamwic, differences in environment across the site, and the original functions and subsequent uses of individual features, particularly the pits.

Comparing the charred and mineralised plant assemblages

The charred plant assemblages do not necessarily closely relate to the mineralised ones since the origins of the material are somewhat different. Whilst the mineralised remains have an almost entirely human faecal origin, the charred remains may consist of burnt domestic waste, crop processing waste, animal bedding and fodder, destruction debris, and industrial waste. However, some of the food components of the charred assemblages, particularly the cereal remains, were subsequently to become contents of the mineralised assemblages. The results from the analysis of charred remains are, therefore, valuable in providing more detail about the range of cereals being used by the inhabitants, although the breakdown into animal versus human food is not always easy.

Six of the pits from which mineralised plant remains were examined were also analysed for charred plant macrofossils. These pits comprised: 7163, 7615, 5037, 4470, 3101, and 2071. In most cases the same contexts were sampled, but in two pits (4470 and 2071) different layers from the features were examined.

As may be expected, there was very little correlation between the two types of assemblage. In four of the six pits there was a negative correlation, ie, where the charred remains were rich the mineralised were poor (7615 and 4470 (different layers)) and vice versa (5037 and 2071 (different layers)). The other two pits, 7163 and 3101, produced moderate amounts of both mineralised and charred remains from the same deposits. In both cases legumes were present as charred but not mineralised remains, once again demonstrating that there was no relationship between the assemblages. The only information that this comparison provides is that charred domestic waste was not mixed with the concentrated faecal deposits (pit 5037) but it may, in some cases, have deliberately been placed on top of cess material to smother odours (pits 4470 and 7615).

One important lesson that can be learnt from this comparison is that preservation biases produce very different impressions of the importance of the different crops. For example, the mid mid-Saxon samples produced around 5000 charred cereal grains but only 59 charred pea, bean, and possible pea/bean fragments. Evidence from the mineralised plant remains, however, demonstrates that legumes were consumed far more frequently and widely than the charred figures suggest.

Table 46 Comparison of the mineralised and waterlogged assemblages

	Waterlogged (no. samples out of 5)	*Mineralised (no. samples out of 26)*
Opium poppy	4	-
Cannabis	1	-
Hazelnut shell	3	-
Beet	2	-
cf. Gooseberry	1	-
Wild strawberry	4	-
Sloe/blackthorn	3	-
Plum	4	-
Quince/pear	1	-
Hawthorn	2	-
Grape	1	-
Dill	-	3
Pea	-	14
Beans	-	15
Lentil	-	1
cf. Cress	-	1

Comparing the waterlogged and mineralised plant assemblages

Comparisons between mineralised and waterlogged assemblages from the same deposits can be valuable where the origin of the material is from a single source, eg, faecal waste. As with comparisons with charred assemblages, they can highlight preservational differences, and help to show where adjustments should be made when trying to characterise the original composition of the deposit. Waterlogged and mineralised taxa lists tend to be much more similar than charred and mineralised, or charred and waterlogged, because in general preservation has occurred *in situ*, rather than by vagaries of charring.

Only one of the five waterlogged features examined (pit 10116) was also sampled for mineralised plant remains. Unfortunately, this feature produced virtually no waterlogged material, so there were no cases at the Stadium site where a direct comparison between well-preserved waterlogged and mineralised assemblages could be made (Table 46). However, the two species lists (see Tables 38 and 41–3) show that there are many similarities between the assemblages. As has been noted above, full waterlogging may prevent mineralisation occurring (Carruthers 1993). However, deposits have been examined by the author where conditions of preservation have enabled both waterlogged and mineralised preservation to occur, sometimes producing seeds that possess mineralised embryos and waterlogged seed coats (eg, London City Ditch; Carruthers, in prep.). This intermediate state does not appear to have been found in the samples from the Stadium site, although all of the waterlogged samples produced some mineralised material.

The information from the waterlogged faecal remains does not change the observations made in the mineralised report with regards to the mid-Saxon diet. The inter-pit variation remains remarkably slight, with cereal bran probably being the predominant component (although this is difficult to quantify and translate into 'slices of bread'). Unfortunately, Fabaceae seeds are rarely preserved by waterlogging, so this aspect of the diet is totally omitted from the waterlogged samples. Considering how numerous the remains of peas and beans were in the mineralised samples, this again emphasises the importance of mineralised assemblages in providing a more balanced picture.

Fruit and spice remains were equally well-preserved by both mineralisation and waterlogging, although there were one or two minor differences between the assemblages. The recovery of numerous apple endocarp fragments in the waterlogged samples suggests that apples were even more important than suggested by the mineralised seed fragments. Bramble seeds were also abundant and widespread, indicating that hedgerow fruits were fully exploited and probably preserved for use out of season.

Minor differences in the edible plants listed may partly be the result of differential preservation, and it is notable that many of the taxa found only as waterlogged remains have thickened, 'woody' seed coats which do not preserve well by mineralisation. On the other hand, such differences may also reveal some differences in the diets of different people. For example, mineralised grape pips have been recovered from faecal deposits on other sites, so their absence from all but one sample examined is likely to be significant.

Many of the taxa in the waterlogged plant macrofossil assemblage are from non-edible weed species, such as docks and nettles. Although the seeds of these species are readily mineralised, these taxa were rare in the mineralised assemblages. This suggests that the seeds were not deposited amongst the nutrient-rich faecal waste, but entered the deposits later, when conditions for mineralisation were no longer present. Thus, the docks and nettles probably became established around the features following their abandonment, since they are perennials that rapidly colonise nutrient-rich waste-ground habitats. Some of the remaining waterlogged material may have been deposited in discarded waste derived from a variety of sources.

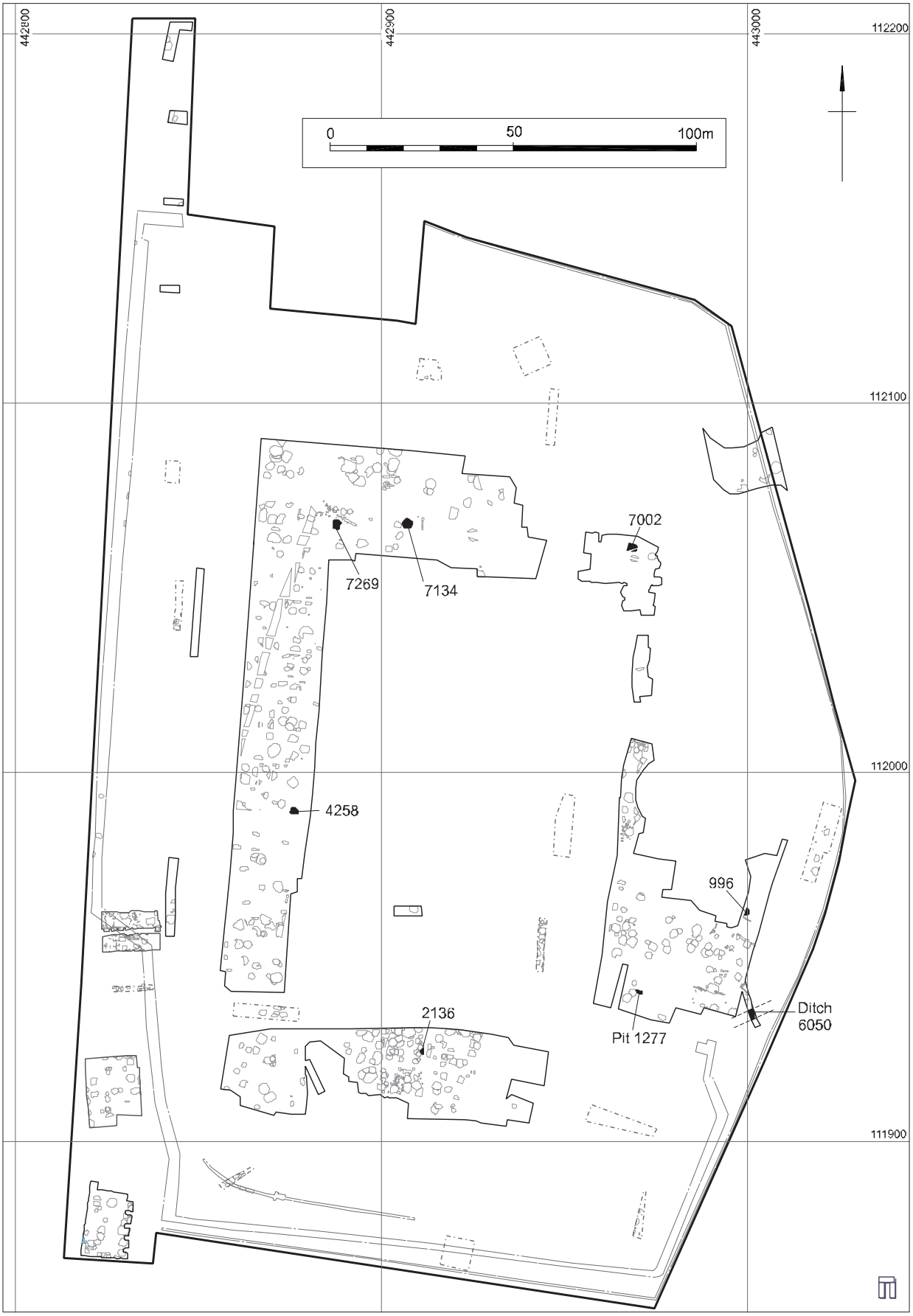

Figure 75 Location of pit 1277, ditch 6050, and other features with Late Saxon sherds in their upper (slumped) fills

5. After Hamwic

Late Saxon–early Norman (10th–11th century)

A single sub-rectangular pit (1277) in the East Stand has been dated to the 10th or 11th century on the basis of a substantial deposit of diagnostic flint-tempered sandy ware pottery (Southampton fabric 1000; Brown 1994) which comprised its primary fill (Figs 75–7). Pit 1277 was approximately 1.80 m long, 0.85 m wide, and 0.65 m deep with steep sides and a flat base, and the pottery in the bottom represented a maximum of 30 vessels (Fig. 77). This unusually large deposit of pottery is discussed in more detail above (p. 139), but its interpretation is equivocal. There is no clear evidence that the vessels represent wasters and there is some indication that some had been used. The remainder of the pit appears to have been deliberately backfilled with a fairly homogeneous deposit of possible domestic rubbish.

During the evaluation trenching a large ditch was encountered in trench 6, which lay immediately to the east of the East Stand. Ditch 6050 (Fig. 73) was approximately 3 m wide and 1.60 m deep with steeply sloping sides and a flat base, and was aligned roughly east-north-east to west-south-west. Pottery sherds from a spouted pitcher, datable to the 11th century, were recovered from one of the upper fills of the ditch, along with mid-Saxon pottery, worked flint, burnt flint, iron slag, and stone. This feature appears to correspond with the line of a broadly east–west field boundary recorded on a map of Southampton painted around 1600. However, it is uncertain whether ditch 6050 was a late Saxon feature containing residual mid-Saxon finds, perhaps maintained into the medieval period, or a medieval field boundary containing residual earlier material and possibly contemporary with ditch 5075 (see below). The possibility remains that pit 1277 and ditch 6050 were contemporaneous, especially as the ditch had clearly been gradually silting up for a considerable period of time before the 11th century pottery was deposited.

A few sherds of late Saxon pottery were also recovered from slumped deposits in the top of six other mid-Saxon pits (Fig. 73), suggesting some activity in the area, however, no further features of

Figure 76 View of the pottery dump in pit 1277 (1 m scale)

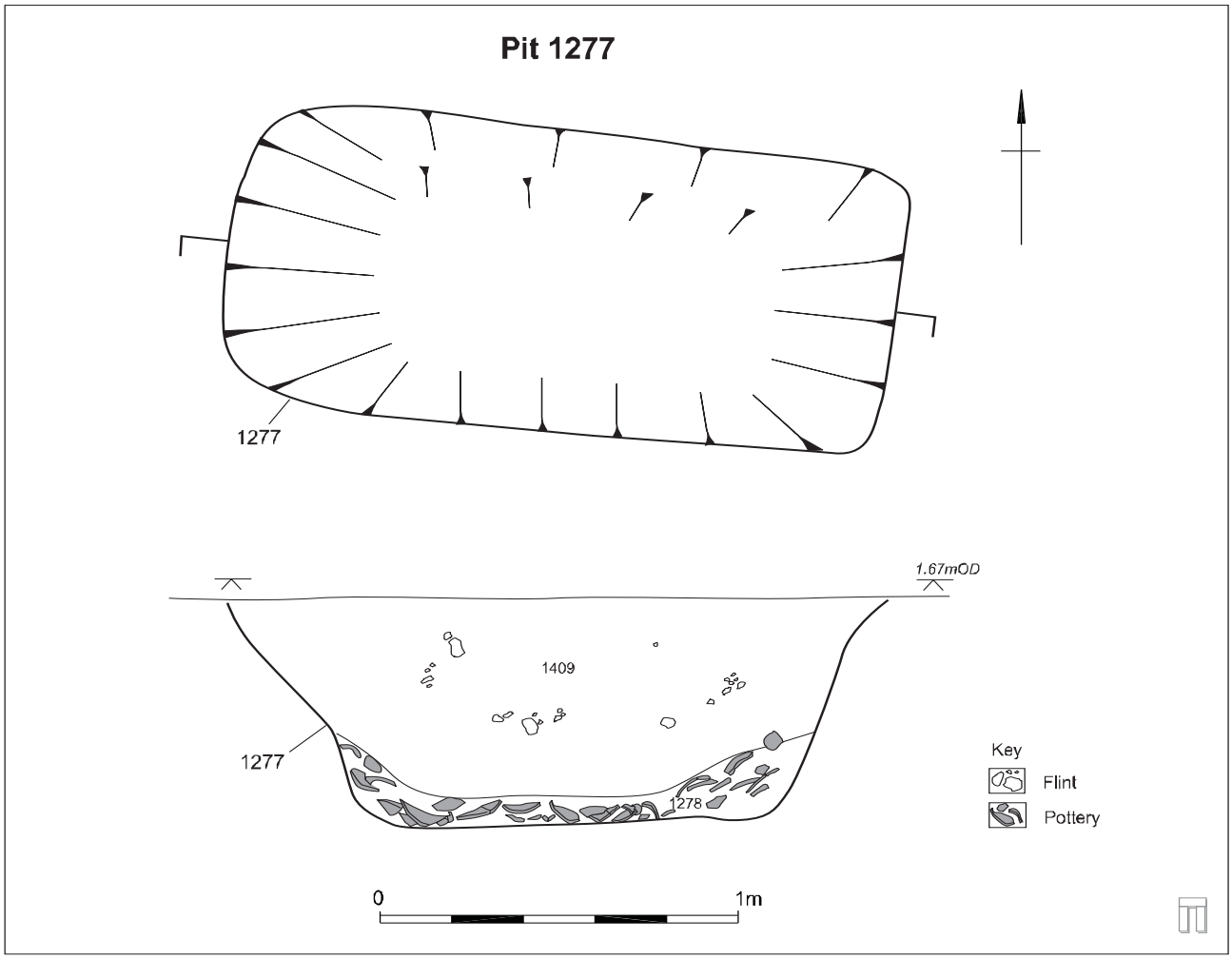

Figure 77 Plan and section of pit 1277, containing a large dump of pottery

this date were identified. The activities represented by these apparently isolated features and late Saxon pottery scatters suggest rather dispersed activity continuing in the area following the more general abandonment of the mid-Saxon settlement of Hamwic in the second half of the 9th century.

Medieval

A single pit (4095), which lay in the small trench excavated between the West Stand and SOU 20, was dated to the 12th century on the basis of a small assemblage of diagnostic pottery (Fig. 78). Similar pottery was also recovered from slumped deposits in the top of 14 mid-Saxon pits, suggesting at least some activity in the area during this period, with possible concentrations in the South Stand and towards the corner of the North and West Stands. The presence of this later material in these pits provides further evidence for the slow rate of subsidence in some mid-Saxon features, in these cases over centuries rather than decades.

A relatively substantial ditch (5075), at least 80 m long, which showed signs of recutting or maintenance in all excavated sections, was recorded in the West Stand. Although no clear dating evidence was recovered, it clearly post-dated the mid-Saxon pits in this area. A field boundary on a very similar alignment is depicted on a *c*. 1600 map of Southampton and it is probable that ditch 5075 corresponds with this feature and was established in the medieval or early post-medieval period. The possibility that it may have been contemporary with ditch 6050, perhaps recut as 6048, has been noted above.

Post-medieval and Modern

The southern edge of a very large linear feature of post-medieval date was recorded in the north-west corner of the site, in a footing for the new footbridge over the railway. On the basis of its location, orientation, size and dating, this feature clearly represented part of the Northam branch of the ill-fated Southampton and Salisbury canal, which was

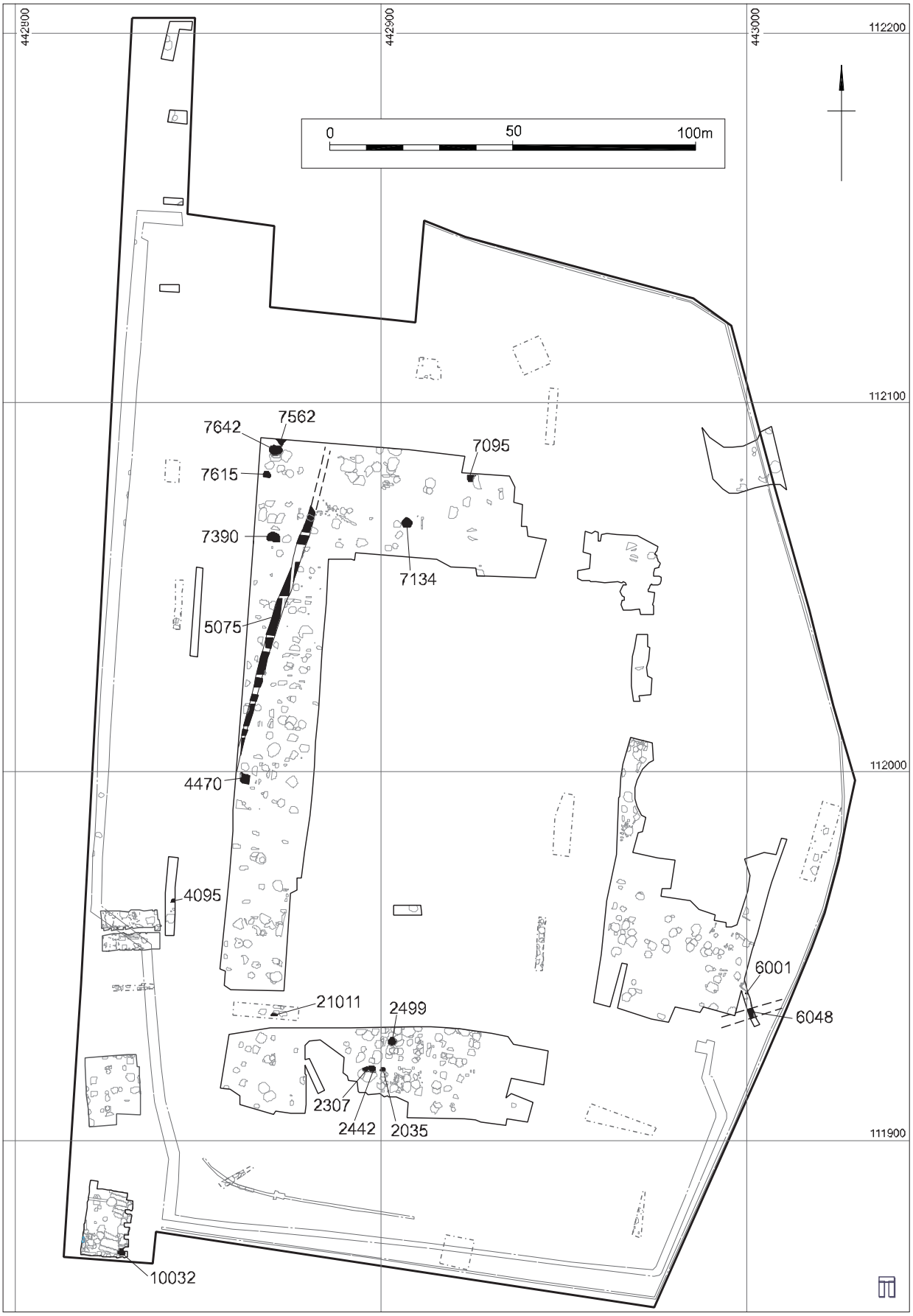

Figure 78 Pits producing 12th century pottery, and ?medieval ditch 5075

constructed in the late 18th century (Course 1977). It is unclear whether this section, which linked the main part of the canal with the River Itchen, was ever completed, and it was infilled during the 19th century.

Other post-medieval and modern features recorded on the site relate to early 19th century 'brickearth digging pits', 19th century houses and associated features, guano storage tanks and the extensive and substantial remains of the former Southampton Gasworks.

6. Concluding Discussion

by Phil Andrews, Vaughan Birbeck and Nick Stoodley

The Wider Picture: Southern England in the 7th Century

Southampton lies at the mouth of the river Itchen, and many sites dating from the late 5th–7th centuries, pre-dating Hamwic, are known from the upper Itchen valley, especially around Winchester. Hawkes (1989, 93–5) drew attention to this distribution, but since then discoveries made by metal-detector users have pointed to numerous other sites, both north and south of Winchester. For example, the separate discoveries of migration-period brooches at Shawford and St Cross probably attest the presence of previously unknown burial grounds (Stedman, in prep.).

The farms that these and other cemeteries served must have prospered during the more settled times of the 7th century, a factor which probably would have stimulated river-based trade in local produce. For example, the settlement at Abbots Worthy, in use from the 6th–8th centuries, has produced evidence for metal and bone working, the manufacturing of textiles, cattle breeding and cereal production (Fasham and Whinney 1991, 25–78). Given that the 7th century saw an increase in trading (Hinton 1990, 21–41), it is probable that this activity was not limited to subsistence agriculture but that a surplus was being generated which allowed its inhabitants to participate in marketing. Indeed, sceattas from the Itchen valley at Otterbourne, Twyford, Winchester and Cheriton indicate that a flourishing trading network was in existence by the end of the first quarter of the 8th century (Ulmschneider 2000, 152–72).

The Solent estuary would have afforded movement along the coast in a westerly and an easterly direction as well as permitting easy access to the Isle of Wight. The establishment of a putative royal estate at the head of the estuary (at Hamwic) can be explained as a response to an intention by the ruling elite to extract tolls at this excellent frontier point. It has been argued that the kings would not have been interested in trade itself, but were more concerned with the revenue that it could generate for them via tolls (Woolf 1999, 63–75). However, this is more likely to be true of the 8th century, rather than the 7th century when political units were small. For almost the whole duration of the Stadium site early cemetery's existence coinage would not have been the medium through which transactions were carried out and it is, therefore, highly probable that royal agents – perhaps sub-kings – would have regulated this trade on behalf of their ruler by taking a share of the produce for the king and also for themselves. In controlling trade in this manner the estate was certainly playing a central role in the maintenance of the élite and the economies around which they functioned, though it is questionable whether such estates had reached a level of social and economic development that would justify their description as central places.

Hamwic, though probably the largest may not, however, have been the only settlement which was performing such a role at this time. On the basis of the distribution of cemeteries in other river valleys, for example the Dever and the Meon (Stedman and Stoodley 2000), it can be argued that similar processes were taking place in southern Hampshire. Each river valley may have had its own elite settlement responsible for administering this tax. Furthermore, textual evidence in the form of the *Hodoeporicon* by Hugeburc can be interpreted to mean that a similar site to Hamwic (a *mercimonium*) may have existed at Hamblemouth by the 8th century (possibly the minting place of the Series H, Type 48 sceattas (Morton 1992, 59–61; 1999, 49–53)), and this could also have had its origins in a royal estate. While, across the Solent, there is very strong evidence for a major mid-Saxon economic centre in the Newport area of the Isle of Wight (Ulmschneider 1999). At present the evidence consists of metal-detected coins, which has led to it being interpreted as a major 'productive site' (*ibid.*, 31), and its location near the head of the Medina may be highly significant. The presence of early cemeteries within the area at Bowcombe Down (Arnold 1982, 89–96) and Carisbrooke Castle (Morris and Dickinson 2000, 86–131), both of which have produced wealthy and imported objects, is also noteworthy and points to an early centre of wealth with elite associations.

The presence of important economic centres is not the only evidence linking the Isle of Wight and southern Hampshire. Bede is quite clear about the political geography of southern England in the early Saxon period stating that southern Hampshire was part of a Jutish enclave with both the Isle of Wight and Kent. Confirmation of a 'notion of Jutishness' in Hampshire may find support in three place-names that include the element *Yte* 'Jute', and the 12th century Worcester chronicle which reports that the New Forest was still known as *Ytene* ('of the Jutes') (Yorke 1989, 90–1). Barbara Yorke takes the association further and argues that southern Hampshire was part of a Jutish/Kentish alliance that was intended to police the English Channel and guard

against Saxon pirates (Yorke 2002). The trade in local produce and the royal estates, through which it was administered, may have been easy targets for this piratical activity, located as they were at river mouths, and the safeguarding of these may have been just one of the functions of this alliance. In fact, the alliance may have been based on a political and economic desire to control the channel and trading within it, rather than an ancient Jutish heritage.

It should be remembered that Bede was writing (AD 731) not long after the closure of the Stadium cemetery and could in all reality have been provided, by Bishop Daniel of Winchester (appointed AD 705), with an accurate account of political alignments in southern England. However, archaeological proof of Bede's claim that southern Hampshire was a Jutish province has been hard to come by because, on the surface, the material culture of this part of the mainland has more in common with the neighbouring Saxons than the Isle of Wight and Kent in the 5th and 6th centuries. It certainly has yet to produce rich graves with Kentish and Frankish material like, for example, Chessell Down on the Isle of Wight (Arnold 1982, 13–72). Furthermore, the foreign artefacts from the Stadium site are varied and ambiguous in their connections, with both Frisia and Frankia represented, though the presence of these individual pieces could have resulted merely from overseas contact. What might prove useful is for a full reassessment of cremation burials in Hampshire and the Isle of Wight to be undertaken, because it may help to clarify whether this was a region-wide practice in the 7th century. It is notable that Bargates has a cremation burial that is possibly of late 6th or 7th century date (Jarvis 1983, 104), in addition to the late cremation burials identified by Down and Welch at Apple Down (1990), and the possible 7th century cremation burials at Weston Colley, Micheldever, Hampshire (N. Stoodley, pers. obs.).

Yet it has been shown that the weapon assemblages find quite close parallels in East Kent (Chapter 4) and there are similarities in the style of female costume within these three regions that may demonstrate the existence of a link. An analysis into the position of dress fasteners as found on the skeletal remains has identified that the types of dress worn, at the funeral at least, varied considerably between northern and southern Hampshire (Stoodley, in prep.). In the north of the region at the cemeteries of Andover and Alton the majority of adult females wore a garment that required pinning at the shoulder by a pair of brooches – evidence of the 'peplos' dress, the typical Saxon folk costume at the time. In contrast, a distinctly different style is found in the southern Hampshire cemeteries of Droxford and Worthy Park. Here, the arrangement revolves around a single brooch or pin, fastening a garment over the upper body and indicating a different costume style altogether, perhaps a separate tunic and skirt, or a dress that was not fastened at the shoulder but opened at the front and required pinning here. This difference in style may indicate that the communities in southern Hampshire perceived themselves as different from those in northern Hampshire and expressed this difference through the female costume. A similar style was also identified at Apple Down, which although in the modern county of West Sussex is close to the Hampshire border and deserves to be grouped with the southern Hampshire sites on the basis of the similarities in costume style.

Unfortunately this archaeological survey cannot be extended to the Isle of Wight's early Anglo-Saxon cemeteries because, although having a relatively large corpus of material, the great majority of it was retrieved during the 19th century and hence the level of recording is very poor (Arnold 1982). However, there are hints that a comparable female costume prevailed on the Island, and the brief description of Bowcombe Down grave 18 mentions that the button brooch was placed over the chest (*ibid.*, 92–3). Furthermore, it is very interesting that the well-known female burial from Chessell Down (grave 45) has, in addition to the brooches on the shoulder, a triumvirate arrayed up the chest (*ibid.*, fig. 48).

It may, however, be possible to identify parallels for the dress styles in the third of Bede's Jutish regions – Kent. In east Kent the costumes are more elaborate than in most other areas, but the reconstruction of costume styles at both Deal (Parfitt and Brugmann 1997, 46–8, especially fig. 16) and Dover Buckland (Evison 1987, 69, especially fig. 13) showing the fasteners arrayed up the body is in essence similar to our southern Hampshire style, but in Kent embellished with additional and also more elaborate brooches.

Up to this point the evidence is perhaps suggesting some notion of a shared ancestry between the three regions in southern England. The more modest evidence from southern Hampshire may indicate that its folk consisted largely of native people who had come under the dominion of Jutish agents from the Isle of Wight or Kent. Was it these putative people who were interred in the Stadium cemetery? The overseas contacts demonstrated in the scabbard and pendants would certainly not be out of step with such a hypothesis. However, recent research by the author has discovered similar costume styles in northern Jutland (Stoodley in prep.), which suggest that the common folk may have had a more direct contact with the Jutish homelands. At Hjemsted (Ethelberg 1986), out of 36 inhumations dating to the later 4th and 5th centuries only 25% (n=10) produced costume evidence in the form of metal fasteners, and only two had a pair of brooches. In fact only one of

these had the fasteners in a position that is compatible with the idea that they were fastening a garment over the shoulders. Similar findings have been found in the author's analysis of the contemporary, but much larger site of Sejlflod (Nielsen 2000) where 350 graves from two separate, though closely-placed, burial grounds were excavated. Here, 43 burials yielded costume evidence, but the majority had only a single brooch and in most cases these were found in an area that corresponds to the upper body. In addition, pins were often the sole fastener and were found over the upper body, similar to the situation in several burials at Apple Down and Worthy Park. Although further research into costume in Scandinavia and north Germany during the migration period is needed before the full relevance of this evidence to the topic of Jutish involvement in southern Hampshire can be evaluated, it is clear that these two sites exhibit a very different style of costume to that found in the Saxon homelands at this time (Böhme 1974, fig. 53).

The Beginnings of Hamwic

The archaeological investigation of part of an extensive cemetery dating to the second half of the 7th century, within the area that mid-Saxon Southampton occupied, is of the utmost importance because of the implications that it raises concerning the origins of Hamwic. Elsewhere in Hamwic, the general scarcity of 7th century material, the numismatic evidence, and the dates from dendrochronology (eg, Morton 1992, 26–8; Andrews 1997, 20–1) have not contradicted the claims that it was probably at some point during the long reign of Ine (AD 688–726, see Loyn 1962, 138) that the town was established. As Morton (1992, 26) has remarked, however, a period of almost 40 years is a conveniently long reign in which to accommodate most suggestions for the date that Hamwic was established. Until the discovery of the early cemetery predating the 8th century 'mercantile settlement', very little was understood archaeologically about the social, cultural or economic development of the Southampton area in the 5th–7th centuries. Whether Hamwic was the result of organic growth from earlier agricultural settlements, a foundation resulting from traders taking advantage of the increased political and economic security brought about by Ine's reign, or whether it was established by direct royal prerogative has been a matter of considerable debate (eg, Holdsworth 1980, 1; Morton 1992, 68–70).

Evidence for a small agricultural origin will be difficult to recognise, although a small group of what may be rural buildings and enclosures has been identified in the south-east corner of Hamwic at SOUs 16, 21, and 22. Morton (1992, 41, 58 and 154–66) calls the layout 'semi-rural' though there is nothing to suggest that it is not wholly rural. The structures are relatively dated to the beginning of a sequence of buildings, but otherwise cannot be closely dated. Although Morton does not argue this, a date as early as the 7th century cannot be excluded.

More recently the consensus has started to swing in favour of a royal foundation, the evidence provided mainly by place-name and documentary evidence. Mid-Saxon Southampton was known variously as either Hamwic or Hamtun, and both names coexisted throughout most of the period, probably referring to the one place (possibly the whole peninsula) in its different aspects (Rumble 1980, 19). But whereas Hamwic defines its trading function, Hamtun indicates that it had an administrative role to play. The earliest mention of Hamtun is in the *Anglo-Saxon Chronicle* in which there is a reference in 757 to King Sigebehrt being deprived of his kingdom but allowed to keep *Hamtun-scir* (Bately 1986, 57. See Morton 1992, 26–7 for a discussion of the entry). Morton (1999, 57–8, fig. 2) emphasises the significance of the fact that there was understood to be a *scir* attached to Hamtun, large and independent enough to be given to Sigebehrt.

He further advances the possibility that *Hamtunscir* in the mid-8th century was roughly equivalent to the Late Saxon Mansbridge hundred (*c.* 130 km^2), with the possibility that such an arrangement could have originated in the 7th century or earlier. A charter of Ethelwulf, which was probably signed in 840 '*in villa regali … quae appellatur Hamptone*,' (S 288/B 431), implies that the administrative aspect of the site was under royal control. Royal ownership in the 9th century does not necessarily mean that its origins can be traced back to a late 7th century royal vill or estate from which the later trading-centre emerged, but the mid 9th century reference tends to suggest a much earlier royal connection.

Thus, the importance of the early cemetery at the Stadium site is clear: from only playing a minor role in the debate about Hamwic's origins, archaeology is now able to provide us with detailed and important information about the events leading up to the establishment of the best known and best understood of England's mid-Saxon emporia.

The weapon burials at the Stadium site suggest that this community consisted of individuals of a different status to those inhabiting the majority of contemporary settlements in Hampshire at this time. The exact status of the Hamwic settlement will probably always remain elusive, but an idea that is compatible with the cemetery data is that it was a royal foundation controlled by royal representatives or 'reeves', in other words an estate. The function of these high-status settlements was to provide accom-

modation for the king and his retinue on a periodic basis in addition to serving as centres of taxation (Welch 1992, 45). The interpretation of cemetery data in such a social context is not a new idea: the late Sonia Hawkes made a case for the high number of weapon-burials at both Sarre and Dover Buckland as belonging to military establishments of the king's port-reeves (Hawkes 1982, 76). In addition, Barbara Yorke has argued that the administrative role provided by Hamwic may be traced back to a royal estate that was in existence by the middle of the 7th century (Yorke 1982, 80). The Stadium site cemetery provides the first archaeological evidence which might strongly support this suggestion. Of particular interest is the crescentic gold pendant which has a direct parallel from the Dutch 'royal' terp at Wijnaldum. Does this artefact indicate high-status contact with Wijnaldum in the 7th century, pre-dating the expansion of Hamwic and the development of regular continental trading links in the 8th century? The scabbard-studs suggest similar early contacts, in this case possibly Frankish, but the odd occurrence of single such suites at both the Stadium site and the Buttermarket, Ipswich, is one of the many things that makes discussion complex.

Despite the evidence from the early cemetery, archaeology has been unable to reveal any unambiguous settlement evidence that could be seen as belonging to a royal estate. But, as with any rural complex, such evidence might be difficult to identify and approximately 92% of Hamwic remains unexcavated. There are some hints that parts of the settlement may not have been involved in manufacture and trade, and intriguingly one area is close to the Stadium site cemetery. The site is SOU 47, situated less than 200 m to the north-west of the cemetery, and an area that seems to have continued in use into the 9th or 10th century after the settlement had been largely abandoned. Moreover, it has produced rare items that have not been found elsewhere within Hamwic, for example bronze spoons and forks.

It is also possible that the variety of burial practices that have been noted at SOU 32 (Clifford Street) – close to SOU 47, and at SOU 254/567/823 (Cook Street) on the south-western periphery of Hamwic, indicate variations in status which could be associated with an elite establishment (Scull 2001, 72). Taken together this evidence may indicate a non-urban administrative core (Morton 1992, 28). However, it is not possible to say whether this was the place where the putative 7th century royal estate would have been located.

Although it has been considered appropriate to date the known cemeteries in Hamwic to the 8th and 9th centuries (eg, Morton 1992, 53), Scull has recently argued that there are no reasons why the earlier ones (comprising SOUs 32/47, 34/43/48 and 254/823, as well as SOU 20) cannot be placed in the 7th (Scull 2001, 71). However, accompanying grave goods are rare and it seems that these cemeteries, although sharing similarities between each other, are quite different (in terms of grave good numbers and types, and in the absence of cremation burials) to the Stadium site early cemetery. They may be slightly later, but they may also represent different social groups. Also of potentially considerable significance in this respect is the large number of burials (somewhere between *c.* 80 and 180) recorded from the Roman site at Bitterne Manor (see Fig. 1), which radiocarbon dating suggests belong to the 7th and 8th centuries (Southern Archaeological Services 1998, and unpublished information). These were recorded during the 19th century as well as on more recent excavations, and are likely to represent only a fraction of a much larger number which may comprise more than one cemetery. Grave goods are rare, though a small number of knives and a spearhead have been recovered, the latter of Swanton (1973) type C2 which is long-lasting but mostly occurs in 7th century contexts (N. Stoodley, pers. obs.). There is also an unstratified earlier find of a disc-brooch of late 5th/early 6th century date (Hinton and Welch 1975, 205). This cemetery seems most likely to have been associated with Hamwic, perhaps with the earliest settlement on the site, and it may be significant that it lay within the Late Saxon Mansbridge hundred (see above). However, one cannot rule out the possibility that it served one or more settlements on the east side of the Itchen, or perhaps *Nordhunnwig* (Northam) recorded in documentary sources but yet to be discovered (Morton 1992, 76).

The position of two of the cemeteries within the area of Hamwic (SOUs 32/47 and 254/567/823), 500 m apart, might be interpreted as indicating the presence of several separate settlements predating the main period of occupation in the 8th and 9th centuries (Scull 2001, 72). However, no clear evidence for the existence of early settlement nuclei has been found in these locations within Hamwic (see below), and they may represent separate, early cemeteries around a single expanding settlement.

The Significance of the Early Cemetery

The nature of the grave goods and the burial practices strongly suggest that the inhabitants of the early cemetery comprised an elite group that may have been associated with a 7th century royal estate from which the later administrative functions of the site (Hamtun) can be traced. It is suggested that the royal estate was sited at the mouth of the River Itchen to regulate the trade in agricultural surplus that was

produced by the many farming communities in southern Hampshire, and particularly those of the Itchen valley and probably also the Test. Along with the documentary evidence, archaeology also indicates that southern Hampshire was part of a bipartite alliance with the other Jutish regions centred on the English Channel. The function of this may, in part, have been to protect the economic activities that linked these sites in the 7th century.

The physical appearance of the estate may not have differed much from the other rural settlements that existed in the region during the 7th century. Certainly, the Stadium site cemetery has several features in common with the earlier cemeteries in this region. The evidence from the organisation and layout of the cemetery, in addition to the presence of both cremating and inhuming elements to the population, indicates that in these aspects at least the burial ground was broadly similar to earlier rural ones. Is it possible that Hamwic grew out of an earlier royal estate, its longevity and stability a result of the strategically important position that it occupied, which discouraged relocation to a new site as witnessed throughout the country by many communities at this time? Of course it is possible that the Stadium site cemetery was associated with a newly-established and subsequently pre-eminent focus of settlement within the estate which succeeded earlier communities.

An explanation for the development of this estate into the manufacturing and trading centre of the 8th and 9th centuries may be sought in the political and military take-over of the region by the West Saxons in the late 7th century. During the 7th century, both southern Hampshire and the Isle of Wight were put under increasing pressure by neighbouring kingdoms. Wulfhere of Mercia, then overlord of Aethelwealh of the South Saxons, granted the South Saxon king the provinces of the Wight and the Meonwara as a reward for his conversion to the Christian faith, according to Bede, who recounts its subsequent conquest and annexation by the West Saxons in the second half of the 7th century (HE iv, 13; Colgrave and Mynors 1969; Yorke 1989, 89). Amongst other things, the attraction of Hampshire may have lain in the great opportunities for trade and its regulation that the area offered. It should not be overlooked that the coast to both the east and west cannot boast anything like the range of easily defensible natural harbours, rivers and inlets that southern Hampshire possesses, notably Portsmouth to the east, and Christchurch with Poole a little further to the west.

One reason which may have proved instrumental in the decision by the West Saxons to concentrate their efforts in Hampshire, as well as in the other counties south of the Thames, may have been the expansion of the Mercians into the Upper Thames during the 7th century – an action which would have effectively barred the West Saxons from using the River Thames (Yorke 1995, 62). Thus a major routeway which also allowed participation in trade with other English kingdoms as well as the continent was denied to them. It may therefore be of no surprise that the expansion of Hamwic and the development of trade and manufacturing only really began under West Saxon influence and the regaining of access through Surrey.

The main problem with the hypothesis that the origins of Hamwic can be traced back to a time when the region was under Kentish/Jutish leadership is that the conquest of the region by the West Saxons falls right in the middle of the period that the cemetery was in use. However, this is a relatively long stretch of time and most of the interments could have taken place before the arrival of the West Saxons in 686, though it could also be claimed that it is possible to associate at least some of the burials with the first West Saxons. Nevertheless, the similarities in the weapon-burials between the Stadium site cemetery and those from contemporary burial grounds in east Kent is suggestive of a link between the two areas. The fact that the cemetery was built over by settlement structures perhaps within living memory of the interred could also indicate that the resident West Saxons were trying to eradicate the memory of the old Jutish leaders. However, other (later) cemeteries were built over in Hamwic, and it may simply have been the case that they were forgotten or the presence of earlier burials was not respected during later expansion of the mid-Saxon settlement. This may have occurred when unaccompanied burial within a churchyard became more widely adopted in the 8th century.

Overall, the most important finding is that the discovery of a 7th century cemetery brings the origins of Hamwic into line with that of two of the other major English trading centres – London and Ipswich (Scull 2001, 67). Whether it will be possible eventually to claim that all English trading centres had been established through royal intervention remains to be seen, but the discovery of early high-status burials at both London and Ipswich is certainly suggestive of a similar model.

The Early Settlement

It seems almost certain that the early cemetery at the Stadium site, which pre-dates any of the other cemeteries yet found in Hamwic, represents the burial place of some of the earliest inhabitants. Previous work had suggested that the settlement of Hamwic began *c.* 700, although the possibility of an earlier beginning was allowed for (Morton 1992, 28; Andrews 1997, 13–4). The excavation at the Stadium

site now provides convincing evidence (from the existence of the early cemetery) that the settlement developed a decade or two before this, probably in the final quarter of the 7th century. However, despite the extensive excavations at the Stadium site no settlement contemporary with the cemetery has been identified there. It seems certain, therefore, that the earliest settlement lay elsewhere in Hamwic.

Of course, such a close juxtaposition of settlement and cemetery should not be expected, and one possibility for early settlement has been singled out above. This is SOU 47, less than 200 m to the north-west of the early cemetery at the Stadium site, which it is suggested may have been an early non-urban administrative core. However, the evidence is equivocal and derives entirely from discoveries made during 19th century brickearth digging. Other possibilities should also be considered, and perhaps there was more than a single early nucleus, possibly with different functions.

Morton (1992, 28 and 39) suggests that Six Dials may have been part of an early nucleus in the north-west of Hamwic, with possibly associated cemeteries to the south-east at Clifford Street (SOU 32/SOU 47) and the Stadium site, only a small part of which had then been excavated (SOU 20). A 'glass tumbler' was reported from a grave at SOU 49 in the 19th century, probably part of the same cemetery as that excavated at SOU 32, one of the burials from the latter producing a sceatta struck probably in the period 700–715 (Morton 1992, 179). Six Dials has produced a few finds which may date to before AD 700, and lies astride an early and important north–south street (St Mary's Street/Road) which is likely to have been a primary element within the settlement. A coin attributed to Aldfrith of Northumbria (minted 685–705) came from the bottom of a long structural sequence adjacent to the north–south street (Andrews 1997, 20). A substantial boundary ditch to the west of the street is also likely to have been a primary element of the settlement (*ibid.*, 20–1). Of particular significance is an imported pottery vessel found towards the base of the ditch. Timby (1988, 112) writes:

> 'The biconical form of this vessel and its roller-stamped design can be paralleled by a number of Continental examples from Merovingian cemeteries, generally south of the Ardennes in Belgium. ... The form is well-known from the 6th century AD ... It must be assumed that the Hamwic example belongs to the latter period of the 7th century. The roller design ... can be matched on a small number of other, very fragmentary sherds, from other Hamwic sites (for example SOU 1 F25). It is possible, therefore, that other contemporary blackware vessels of this tradition may be represented amongst the Hamwic assemblage, but the sherds are too fragmentary for their type to be recognised'.

SOU 47, like Six Dials, also lay close to St Mary's Road/St Mary's Street, and perhaps early settlement developed along this axial north-south street. The greater density of pits recorded at Six Dials compared with any other site so far excavated in Hamwic (Chapter 4), and the greater quantities of finds, specifically Group 1 pottery (organic-tempered wares), is likely to be of significance in this discussion of possible early settlement nuclei.

At the south end of St Mary's Street there is further evidence for early settlement, likely to date to *c*. 700 on the basis of the cemetery excavated at Cook Street (Garner 1993; 2001; Garner *et al.* 1997), and thus a little later than the cemetery at the Stadium site. A further probably early cemetery has also been partly excavated a short distance to the north-east of this (at SOUs 34/43/48) where, in the 19th century, a glass vessel was found apparently overlying the skull of one of the burials (Morton 1992, 51). Morton (1999, 56) has suggested that the area at the south end of St Mary's Street may have been the location of an early *monasterium* whose church, St Mary's, was subsequently recognised as Southampton's mother church (Morton 1992, 50–1; cf Hase 1975). It is possible that the Cook Street cemetery, or at least some of the (earlier) burials within it, was associated with this postulated *monasterium*. Morton has also suggested that this part of Hamwic was also where a port reeve's enclosure may have been located, ideally placed close to the waterfront and at a major street junction to superintend river and land traffic (*ibid.*).

Finally, the waterfront area itself (specifically the *wic hythe*, mentioned in a 10th century charter) is likely to have been a focus of early activity (Morton 1992, 63), if not settlement, though some occupation might be expected close to the landing shore, perhaps originating as a seasonal or occasional waterfront market. Early settlement in such a location has been postulated for both London (Cowie 2000, 189) and Ipswich (Scull 2002, 303–8), and there is some indication (depending on one's reading of the pottery, glass, and numismatic evidence) that the same may have been the case in Hamwic. The evidence is not yet conclusive, but the 'semi-rural' property (perhaps a farmstead) at SOUs 16/21/22 has been assigned a possible early mid-Saxon date (Morton 1992, 166), and there is at least one early structure at SOU 14, another at SOU 18, and early pits at SOUs 7, 8, 11, 14, and 18. The fills of the features do not really suggest intermittent or seasonal use, though it remains a real possibility that there was less dense occupation compared, for example, with Six Dials. Whether there was an early nucleus adjacent to what

subsequently developed as the 'commercial waterfront', or whether the town grew towards rather than away from the river as Morton (*ibid*., 39) suggests, remains to be demonstrated. One must hope for a future relatively large excavation to be undertaken on the shoreline itself (which has not yet been investigated) or on the adjacent 'dry land' where only small-scale investigations or watching briefs have taken place. Specifically, the area to the north of the junction of Chapel Road and Marine Parade holds the greatest potential for clarifying the matter of early settlement in this part of Hamwic.

One point that should be made here, particularly with reference to Six Dials where a large area of a potentially early nucleus has been examined, is that no evidence for earlier features, for example streets or buildings, on differing alignments to those in existence in the 8th and 9th centuries has been found. Furthermore, no buildings or pits have been found sealed beneath the street metallings which might indicate a precursor to the main phase of settlement. This is true for both the north–south and two east–west streets at Six Dials, indicating that they were primary elements in the layout of the settlement in this area (Andrews 1997, 31 and 36). An early cemetery clearly pre-dating a street, as appears to be the case in Lundenwic (Malcolm *et al.* 2003, cf figs 12 and 14), might provide the only good indicator of the existence of an early nucleus. Tantalising evidence for this has come from Chapel Road where one burial and redeposited human bone has come from sites on either side of the road, perhaps representing a single cemetery which predated the establishment of the street (Morton 1992, 38).

Overall, the significance of Hamwic's early development may be more complex than previously envisaged. Three possible early nuclei have been suggested (Fig. 79), though not all may have developed at the same time, and they may have had different functions. They may have been linked by an L-shaped arrangement of streets, with St Mary's Street/St Mary's Road perhaps pre-dating Chapel Road, and subsequent settlement may have spread from this in a broad north-easterly direction.

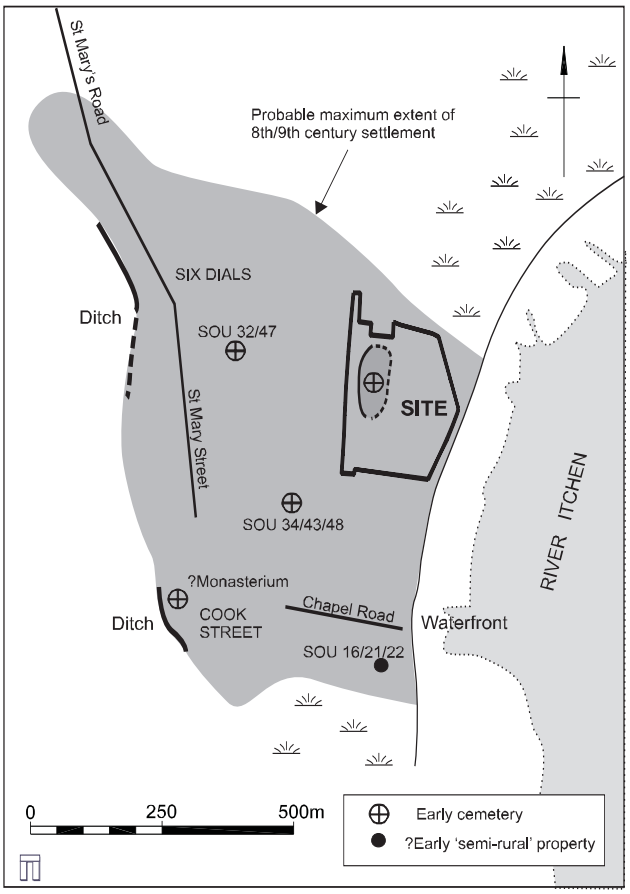

Figure 79 Hamwic: map showing early cemeteries and postulated foci of early settlement, superimposed on extent of 8th–9th century settlement as presently understood (partly based on unpublished information supplied by A. Morton)

Growth and Limits of the Settlement

The excavation has shown that mid-Saxon settlement probably extended over all of the Stadium site, an extent previously allowed for but not demonstrated (see Fig. 4), thereby increasing the known area of Hamwic from 42 hectares to 47 hectares (Fig. 79). As a result, it now seems certain that settlement covered most of the triangular area between the previously known limit of Hamwic, the River Itchen to the east and Northam Marsh to the north. The chronology of the settlement spread across this area does, however, remain somewhat uncertain. The great majority of settlement features on the site probably represent the expansion of Hamwic on a fairly *ad hoc* basis which Morton (1992, 54) suggests occurred around the middle of the 8th century onwards, 'with alleys, buildings, pits and wells established and abandoned in a seemingly haphazard sequence'.

Analysis of the pottery from selected pits which produced the largest assemblages has been undertaken, and could be used to suggest settlement developed across the site from the south-west to the north-east, beginning quite early in the 8th century and continuing into the 9th (see Fig. 40). However, more pits with more pottery would be required for this to be demonstrable. A further possibility, that of a west to east spread cannot be demonstrated either, because the early cemetery lay along the western edge of the excavation area and perhaps retarded settlement development in the vicinity for at least a generation. One must probably await future, large-scale investigation of the area of playing fields beyond the railway line to the west of the Stadium site to

better understand the chronology of settlement expansion in this area.

The quantities of pottery, imported as well as locally produced, are small in absolute terms, though recovered from a relatively large number (and volume) of features, mainly pits, on most Hamwic sites. This means that establishing chronological and other trends within the settlement sequence will always be difficult, a problem also encountered on the well-stratified sequence at the Royal Opera House site in Lundenwic (Malcolm *et al.* 2003, 141–3).

There is some variation in the distribution of imported wares at the Stadium site with slight concentrations apparent in the South Stand, at the western end of the North Stand and a loose cluster in the East Stand. However, there are no correspondingly high occurrences of organic-tempered wares which are chronologically early.

At Six Dials where some stratigraphic sequences provided sufficient pottery to be analysed, the evidence indicated a high proportion of imported pottery in early contexts compared with later deposits and it was also, therefore, taken to be a chronologically early indicator (Timby with Andrews 1997, 207). As such, it was used to suggest an early focus of activity in the waterfront area (Timby 1988, 116–8), perhaps reflecting its import and use (mainly) by foreign traders (Morton 1999, 55), although the absence of good stratified sequences precluded any investigation of chronological factors. Did, for example, the quantities of imported pottery change over time, or did the quantities in use vary between sites over time? Brown (1997) has recently challenged Timby's (1988) conclusions, which she saw as a step towards tackling questions concerning the chronological, economic and perhaps social significance of the imported pottery, but his conclusion that it had no significance seems unduly pessimistic in these respects. Perhaps over the large area excavated at the Stadium site the high proportion of imported pottery reflects a combination of both relatively early occupation (in the south-west part of the site) as well as the proximity to the commercial waterfront. However, there is no certain evidence that this extended as far north as the Stadium site, even in the later 8th century (but see below).

Variation in Occupation Density Across Hamwic

by A.D. Morton

The density of occupation can be expressed as the number of wells and pits in a given area. The measure is an approximate one that cannot easily distinguish chronological fluctuations (Morton 1992, 43), but, if a proper caution is applied, a comparison of the figures can be enlightening. Unless stated otherwise, all of the following differences are significant at $\alpha = 0.05$.

The greatest density of occupation evidence is at Six Dials, in the north-west of Hamwic (530 pits/wells in 4930 m²: Andrews 1997). The Cook Street sites in the south-west of Hamwic provide a much lower density of occupation evidence (23 or 30 pits/wells in 2150 m²: Garner 1993, Garner *et al.* 1997, Garner 2001). The contrast between these two inland sites is a striking one: occupation at Six Dials is between 7.5 and 10.1 times denser than at Cook Street. That it appears to be a real contrast is suggested by the high density also encountered at SOU 32, another site in the north-west of Hamwic (180 pits/wells in 2530 m²: Morton 1992). Pit/well density at SOU 32 is between 5.1 and 6.6 times greater than at Cook Street.

The existence of a well-marked early cemetery at Cook Street seems to have discouraged occupation of the site; but this incompletely explains the fewness of pits and wells there. A very similar cemetery also existed at SOU 32. It, too, appears to have had a dampening effect: the percentage of early mid-Saxon pottery in the SOU 32 assemblage is much lower than the Hamwic average, which suggests that occupation of the area was initially limited. The subsequent development at both sites, however, clearly demonstrates that the differences between the north-west and the south-west of Hamwic are due to functional differences. Dense occupation in the north-west would be consistent with previous arguments that this was a nucleus of the town that continued to be a focus of urban occupation (Morton 1992, 39 and 71). The much more open pattern in the south-west of Hamwic might be linked with earlier arguments for the presence of a *monasterium* there (*ibid.*, 50–1).

Basic similarities between SOU 32 and the Stadium site make it the least complicated way to compare the interior of Hamwic with this riverside site in the north-east of Hamwic. Development at both sites was initially constrained by the presence of an early cemetery. The subsequent occupation pattern appears similar and includes lines and clusters of pits. However, density at SOU 32 is 2.3 times greater than at the Stadium, where there are 457 pits/wells in 14,500 m². The implication is that, although both sites developed in a similar way, occupation was denser inland than it was at the Stadium site.

The waterfront in the south-east of Hamwic, often identified as the genesis of the town, provides some interesting contrasts. The basic pattern of features is similar to that in the north-west and at the Stadium site, again perhaps pointing to a similarity in occupation type. Just to the west of the river, the Chapel Road East sites (SOUs 7, 8, 11, 14, 16, and 18: Morton 1992) contain 66 pits/wells in 1175 m². Density at SOU 32 is 1.3 times greater than at Chapel

Road East (at Six Dials it is 1.9 times greater), and density at Chapel Road East is 1.8 times denser than at the Stadium site. None of these differences is significant in itself. Nevertheless, one might see a tendency towards a north-west–south-east axis, focused inland, with the Stadium site on the periphery of these developments.

Similar – but not precisely the same – patterns are suggested by the density of glass, copper-alloy objects, and imported pottery at different site-blocks across Hamwic (Chapter 4). At their simplest they indicate a two-fold division, with the north-west sites distinguished from the other areas looked at. A more complicated pattern suggests a north-west–south-east axis, with some evidence for a focus on the north-west, and with the Stadium in a peripheral position. Furthermore, the occupation evidence varies in both quantity and quality: the different quantities demonstrate not only that deep features are more common in certain parts of the town but also that actually more was thrown away into them than was the case elsewhere.

It is important to remember that one is drawing conclusions about a pattern developed over at least two centuries, which possibly masks periodic fluctuations in density. The early phase and late phase pottery distributions provide a slightly more detailed picture. And not the least important point to be made about the late phase pottery is that it is more commonly found throughout Hamwic than early-phase pottery. Where the absolute chronology of these phases is unknown, one must be cautious in making arguments out of the differing amounts, but the least one can say is that there is no evidence supporting the notion that Hamwic dwindled to its end. The decline appears to have been rapid, but some limited occupation did continue into the late Saxon period in a few areas (see below).

The Street System

Whatever the interpretations placed upon the high proportion of imported pottery at the Stadium site, it seems likely that for the most part it was a peripheral site in terms of the area of settlement in the 8th and 9th centuries. This peripheral location is perhaps best exemplified by the absence of an extensive network of streets and alleys over the substantial area excavated. Compare, for example, the smaller area uncovered at Six Dials which revealed three streets (Andrews 1997, fig. 13), and SOU 47 where 'six or eight streets' were reported during 19th century brickearth digging (Morton 1992, 34).

Only one area of metalling which can be confidently interpreted as a street was identified at the Stadium site, in the south-east corner, and this did not extend across the entire site but perhaps terminated after 100 m or so. It is suggested that this ran westwards from the waterfront, perhaps from a strand road which represented a later northern extension of that found at SOUs 10 and 13. At SOU 13 the street was constructed over an earlier cemetery dated to the first half of the 8th century, and by implication it might be suggested that the street at the Stadium site was relatively late, perhaps of mid-8th century date. From the limited area available for excavation, there is no evidence that it overlay earlier features, perhaps supporting the suggestion that there was little or no early occupation in the vicinity of the waterfront in this area. Like streets elsewhere, it seems to have been maintained and kept clear of rubbish, and no pits were dug through it, perhaps implying some central authority was involved in its establishment and maintenance.

Whether the settlement expansion represented by this street in the south-east corner of the site was a reflection of an extension of Hamwic's commercial waterfront to the north, or simply a general growth of settlement in this area cannot be demonstrated. Elsewhere, two metalled area seem to have been at best tracks or alleys of limited extent, and were possibly merely yard surfaces. Although the later truncation of mid-Saxon deposits by ploughing and other disturbances may have removed gravel surfaces elsewhere on the site, there is no evidence in the disposition of pits, for example, for the former existence of any other streets.

Properties and Buildings

There is very little clear evidence for properties at the Stadium site, particularly compared with Six Dials (Andrews 1997, fig. 20), and this probably reflects a real absence resulting partly from the lack of 'spatial structure' in this area which would be imposed by the existence of a street system. A few, short pit alignments have been identified, particularly towards the south-west corner of the site where the pit density is greatest, and to a lesser extent towards the south-east, but none are apparent to the north-east. This probably indicates irregular, piecemeal expansion across this area as the settlement grew, perhaps interspersed with open areas where animals may have been kept, pits dug and rubbish dumped. Where pit (and other) alignments have been identified they show a broad south-east to north-west trend approximately parallel (or at 90°) to the waterfront.

Only ten structures interpreted as buildings were recognised, although a few others might be represented by slumped floor surfaces in pits. The

periods of use of these buildings must be distributed over a period of at least 100 years and it is certain, therefore, that they were not all contemporary, though there is only one possible example of overlapping ground plans. The apparent absence of structures (though not slumped floors) in the area of the early inhumation cemetery (but not the area of the cremation burials) should be remarked on, if only to dismiss what may be a misleading observation; the burials did not prevent pits being dug in this area. Three of the buildings lay close to the street in the south-east corner of the site, and a further four lay together towards the north-west corner. Not all of these buildings were necessarily associated with domestic use, and it is clear that there were substantially fewer buildings than at Six Dials. There, 68 structures were identified, of which as many as 60 may have been domestic buildings (Andrews 1997, 49–50). The small number of buildings apparent at the Stadium site is also likely to be an indicator of its peripheral location, where occupation was probably spread over a shorter period and was less dense. Such evidence, however, is important for it shows differences within Hamwic, differences which can only be seen through large-scale excavation.

Evidence for the buildings was sometimes fragmentary and difficult to interpret, as is often the case in Hamwic (eg, Morton 1992, 41), but a few near-complete ground plans were recovered and the extent of others has been extrapolated. This has also proved the case elsewhere, for example Lundenwic, where in the case of insubstantial or incomplete ground plans a 'building template' has been imposed to indicate the likely extent of a particular building (Malcolm *et al.* 2003, 10). At the Stadium site, as at most Hamwic sites, the general absence of stratified deposits overlying the brickearth means that some structural evidence will have been lost to later truncation through medieval and post-medieval ploughing and more recent development. Probably there was never very much horizontal stratigraphy at the Stadium site, but at least some structural evidence such as floor surfaces is likely to have been lost. One other indicator that there may have been more buildings at the Stadium site than have been identified is the large number of pits.

A rough calculation gives a ratio of one building to approximately 46 pits and wells, whereas at Six Dials the ratio was nearer one to eight. Of course a variety of factors will affect the amount of pit digging, for example, the pressure on available space – probably greater at Six Dials, and the extent to which rubbish was disposed of elsewhere, either within the settlement or outside, for example in the river. Nevertheless, ten structures at the stadium site represent a much smaller number than one might have anticipated and attributing this to truncation alone is not a satisfactory explanation. Other factors that might account for the low number of structures are the peripheral location of the site and seasonality of occupation, or at least intermittent occupation. There is certainly evidence of less activity in the vicinity of the pits, based on the quantities of finds they contained as compared, for example, with Six Dials, so there may have been relatively few buildings, though probably not as few as ten.

There is very little evidence for structural sequences, and in only one or two cases can it be suggested that a building was rebuilt or replaced. This is generally the case elsewhere in Hamwic, though the structural sequences alongside the north–south street at Six Dials provide a notable and probably significant exception to this (Andrews 1997, 54). A similar picture may be emerging in Lundenwic, where the Royal Opera House excavations have also revealed a longer and more complex structural sequence adjacent to what appears to have been an important street, with shorter sequences away from this thoroughfare (Malcolm *et al.* 2003, fig 49 and 50).

The building plans recovered add little more to the Hamwic corpus, with both post and post-in-trench buildings represented, though what may have been a curved-wall building (Structure 8) is of some interest. In the general absence of property boundaries it is uncertain whether some buildings were parts of complexes (ie, in the south-east and north-west parts of the site) or whether they represented single, self-contained buildings as appears to have been the normal case in Hamwic. The street frontages appear to have been fully built up, and elsewhere some of the buildings fronted onto alleyways or had associated yards that were sometimes metalled with gravel. Morton (1992, 42) remarks that the buildings found in Hamwic were not characteristically 'urban' and compares them to buildings found on mid-Saxon rural settlements. It could perhaps be suggested that the rural building tradition with which the population was probably familiar was continued in this urban settlement.

Little can be added to what is already known about external appearances and internal arrangements (Morton 1992, 41; Andrews 1997, 49–55). The buildings were rectangular, constructed of timber with wattle and daub infill, and had either thatched or shingle roofs. The floors were usually made of redeposited brickearth, often with centrally placed hearths. The mineralised plant remains included frequent straw, reeds or bracken fragments that may represent material that was strewn across the floors, as well as roofing material. In addition to light provided by unglazed windows, the interiors of the buildings would have been lit by simple stone or pottery lamps.

Diet, Cooking, and Food Supply

The large animal bone assemblage and, particularly, the extensive environmental sampling and analysis undertaken at the Stadium site have provided a better insight into the diet of the inhabitants of Hamwic than has been possible before. The assemblage of animal bones is dominated by cattle and, to a lesser extent, by sheep already used for other purposes (traction and wool) rather than bred for prime young meat. These animals appear to have been brought into Hamwic on the hoof and slaughtered within the settlement. There is some evidence for the keeping of domestic fowl and geese within the settlement, and for the exploitation of marine resources, both fish and shellfish. However, these appear to have been a much less important aspect of the diet than the larger animals and, with the exception of fish and shellfish, the use of wild resources seems to have been extremely limited. This picture of animal exploitation is very similar to that from earlier studies of material from Melbourne Street (Bourdillon and Coy 1980) and Six Dials (Bourdillon 1980; 1984; 1997). However, possible differences were noted in the early phase at Six Dials and at Cook Street (Bourdillon 1993, 119–20), the latter perhaps reflecting the predominance of early features and the postulated *monasterium* in the vicinity.

Very few trustworthy figures allow comparison, though it might appear that the density of animal bone is significantly lower at the Stadium site compared to Six Dials (excluding sieved material, the figures are approximately 75,000 and 250,000 respectively).

The mineralised, waterlogged, and charred plant remains indicate that the vegetable aspect of the diet was rather varied, with cereals, pulses, fruit, and vegetables all being consumed, along with a wide variety of herbs and spices used for flavouring. Cereals, in the form of bread or gruel, and pulses appear to have formed the staple diet of the inhabitants, and this accords with documentary evidence (Tannahill 1975) which indicates that the Saxon diet comprised mostly bread and soup or stew. Wheat, barley, rye, and oats were ground to produce flour (Hagen 1992, 13), and this would probably have been carried out in the home using rotary hand querns, with unleavened flat bread or leavened loaves baked in ovens, on griddles or directly on a hearth. Both wheat and barley bread are known from documentary evidence, with wheat being regarded as superior; a mixture of wheat and rye, known later as maslin, was also popular for bread (Wilson 1973, 235). Bread was by far the most important component of the diet, accompanied where possible by meat, and would have been eaten with butter although dripping, new cheese or lard was also used (Hagen 1992, 71). Oatmeal, barley, and rye meal were all used in cereal pottage, which formed another important component of the Saxon diet. This was a thick porridge, often incorporating vegetables and sometimes meat. Peas, beans and other legumes were other staple crops, providing an alternative protein source to meat. These would probably have been dried after harvesting and stored to provide food all year round. They are known to have been used in broth and also to have been stewed with meat (Hagen 1992, 58). Ale was drunk in large quantities in the Saxon period, and may have been brewed with malt from any of the cereals found on the site, and possibly flavoured with aromatic herbs (Wilson 1973, 197), which have also been identified on the site. There is very little evidence for utilisation of wild resources to supplement the diet, although some of the hedgerow fruits noted in the plant assemblages, such as sloe, raspberry, blackberry, elderberry, crab apple, and hazelnut, were probably collected.

The remains of several honey bees were found among the insect remains, indicating that bee keeping was probably being practised on or near the site. Whether the honey, mead and wax produced was for local consumption or trade is uncertain, but Saxon bee-keeping is well-documented (Crane 1999, 251–2).

Evidence for food preparation and cooking at the Stadium site is sparse; a bone spoon, a number of knives and quernstone fragments being the only objects which can be associated with these activities. Cooking was probably carried out at the individual household level, presumably on small, simple hearths (often found within buildings) and in above-ground, possibly external oven structures, for which no *in situ* evidence was found. Sooting on some of the pottery jars indicate that these were used for cooking, in addition to storage and other functions, and some of the pottery bowls may have been used to serve food, although wooden vessels would also have been common.

Many of the inhabitants of Hamwic are likely to have been involved in manufacturing and would, therefore, have had to rely on the agricultural surplus of others for the majority of their foodstuffs. This would presumably have been produced by rural settlements in the immediate hinterland. The animal bone assemblage, in common with others from Hamwic, is fairly uniform – and distinctive in this respect, and this consistency shows that the animals were from a group of related animals, presumably from the hinterland (Chapter 4). It has been argued, on the basis of animal bone assemblages from elsewhere in Hamwic, that some external (royal) authority established the settlement, organised the collection of tolls through the port reeve, set up manufacturing production and arranged for the town

to be provisioned from a wider area (Bourdillon 1988, 190). These provisions perhaps came from resources controlled by that authority or otherwise procured, possibly through the redistribution of food rents (Hodges 1982, 139), or perhaps an early market existed, but too 'primitive' to offer a wide range of produce.

Environment

Like other parts of Hamwic, much of the area around the buildings at the Stadium site would have been pockmarked with pits at various stages of infilling, and covered with weeds such as nettles, thistles and docks. There were a considerable number of pits despite the area being peripheral within Hamwic and, on the basis of all available comparisons, having a lower population density than the north-west part of the town in the vicinity of Six Dials. The animal bone assemblage also provides some evidence that pigs, domestic fowl, and possibly geese were kept within the settlement, with perhaps more space available at the Stadium site than some other parts of the town for this purpose.

Analysis of mineralised and waterlogged remains confirms the presence of concentrated cess deposits in many of the pits and further indicates the presence of diluted cess in others. The insect remains also provide much detail on the various types of foul organic material within them. Some of the primary cess deposits were overlain by layers of charcoal or brickearth, presumably in an attempt to stifle the noxious smell; the remains of hay, straw, or reeds identified within many of the concentrated cess deposits may indicate that these materials were used for the same purpose.

The metalled surfaces of the alleys or yards at the Stadium site often overlay spreads of what appeared to be domestic rubbish or industrial/craft debris, perhaps revealing a rather casual attitude to rubbish disposal. While there is no clear evidence in the archaeological record for the presence of middens in Hamwic, there is some indication that domestic rubbish was simply dumped prior to its final disposal in pits. Where two or more pits appear to have been open at the same time deposits of domestic rubbish and other debris were often seen spreading between them.

Insects associated with other aspects of human settlement, including timber structures and indoor habitats, were also present. However, they comprise a rather 'primitive' synanthropic fauna as occurs, for example, on Iron Age settlements. Pests of stored grain were absent and there was a rather limited range of other synanthropic species, probably a reflection of the character of the mid-Saxon town.

The general impression gained from the archaeological remains is one of a rather dirty, unhygienic place with rubbish, food remains, animal and human faeces, and craft debris dumped indiscriminately in and around open pits. Despite possible attempts to damp down the smell of some of the deposits with charcoal, hay or straw and cappings of brickearth, the pungent aroma of decomposing organic material would probably have been a constant presence. The cleanliness of the main streets within Hamwic has been commented on (Andrews 1997, 38) and, while this may suggest the presence of some sort of central authority, it perhaps reflects an awareness of being part of a larger community, which appears distinctly lacking where the disposal of rubbish elsewhere is concerned.

The unhygienic conditions undoubtedly had a significant impact on the life expectancy and general health of the population. The digging of deep cess pits and rubbish pits, sometimes close to wells, is likely to have contaminated the water supply, and there would have been a risk of infection of even minor cuts and abrasions from the organic waste and faeces lying around the settlement. Food was exposed to infection from the same sources, and also by flies and worm infestation. Vermin attracted and sustained by the large quantities of food debris, would also have been agents of disease. In addition to the unsanitary conditions, some of the industrial processes like tanning could have further polluted the water supply. Overall, the picture gained of Hamwic is of a rather dirty, polluted, and unhealthy settlement, where disease and parasitic infection were daily hazards and the stench of rotting organic debris and faeces sometimes overpowering. The poor sanitation could perhaps be seen as the product of rural rubbish disposal methods continuing in an urban context; such methods may have been effective in a small rural settlement but could have created problems in a relatively densely populated settlement like Hamwic.

The abundance of oak charcoal at the Stadium site suggests that woodland in the vicinity was predominantly oak, with other species comprising beech, ash, field maple, birch, hazel, holly, and members of the hawthorn group. Cleared or abandoned areas may have been colonised by scrubby growth such as gorse, broom, hawthorn, and blackthorn. The felling of woodland during the early and middle phases of settlement at Hamwic could be anticipated to have been fairly drastic, and the possibility of importing (by water) timber from further afield may have been a practical proposition. Woodland in the vicinity of Hamwic may already have been enclosed and managed when the settlement was developing and, given the size and density of the town, the provision of fuel and other woodland commodities may only have been sustainable through the use of

managed woodland. In relatively highly populated areas, stands of woodland often survived only on land unsuitable for agriculture or where industry depended on a regular supply of fuel (firewood and charcoal). Charcoal-making, in particular, consumes vast quantities of wood – a ratio of approximately 1:6 (Percy 1864; Horne 1982).

Documentary evidence from the late Saxon period indicates that, in southern England, woodland industries formed a major element of the local economy (Hooke 1989; Berryman 1998). The woodlands not only provided timber and wood (for buildings, hurdles, basketry, tools, etc), fuel (charcoal and firewood), tar (a by-product of charcoal-burning), food (fruits, berries, fungi, etc), dyestuffs and wound-dressings (fungi), but also fodder, leaf litter and pannage. Management policies included protection from grazing by enclosure, and from theft and unauthorised activities by strictly enforced statutes. The frequency and extent of coppicing and felling was also regulated.

Craft and Industry

The archaeological record attests to a variety of crafts and industries that were undertaken within Hamwic (Morton 1992, 55–7; Andrews 1997, 205–6). Many of these crafts and industries are represented at the Stadium site, though the evidence is often slight, and the quantities of debris are very much smaller than at Six Dials. This also is likely to reflect the peripheral nature of the site, with a lower density of occupation spread over a shorter period. Its peripheral nature does not seem to have meant, however, that this is where noxious industries such as tanning were concentrated, though there is some possible evidence for this activity. Apart from two areas of ironworking, specifically smithing, (see Fig. 45), no clear association of crafts and industries with particular properties or buildings has been recognised.

Ironworking, represented by relatively large quantities of smithing slag, was clearly being carried out on the Stadium site. There is also some rather ambiguous evidence for copper or bronzeworking, represented by folded fragments of copper-alloy along with fragments of wire and other objects that could represent metalworking debris. The context and significance of the single small skein, or clew, of gold thread is less clear. If it was not from a grave then it could indicate that precious metals were being worked in the vicinity, or that embroidery or brocading (or at least the materials for it) was being produced for use elsewhere. The latter is perhaps more likely, and it is suggested (Chapter 4) that embroidering with such materials was usually practised by ladies of the royal court or female religious houses.

The animal bone assemblage indicates that cattle and sheep were brought to Hamwic on the hoof, and the frequent butchery marks observed suggest the likelihood that butchers were working on or in the vicinity of the Stadium site. Two possible hide-smoking pits were tentatively identified (cf. Andrews 1997, 236–7), but no tanning pits such as the complex found at the Royal Opera House in Lundenwic (Malcolm *et al.* 2003, 52). In fact, no certain tanning pits have been identified within Hamwic, though several pits at Six Dials associated with ash and burned chalk deposits have been interpreted as hide-soaking pits (Andrews 1997, 231–6). However, the charcoal analysis identified quite large quantities of burnt bark in some deposits, which might represent tanning waste, suggesting that leather manufacture may have been taking place on site. Bone, antler, and hornworking are represented by off-cuts and horn cores as well as unfinished items, and a number of loomweights, along with pin-beaters/points, needles, spindlewhorls, and shears indicate that textile manufacture was also an important craft if not exactly an industry.

Quern manufacture from imported Niedermendig lava stone blocks is attested elsewhere in Hamwic (Andrews 1997, 240), and some of the lava stone found at the Stadium site could be trimmings from quernstone production. There is perhaps some evidence, albeit indirect, for pottery manufacture in the form of a possible antler pot die, though no remains of the simple clamp kilns used to fire the locally produced pots have yet been identified in Hamwic. There is also slight evidence, in the form of a single pottery sherd with melted glass adhering, for glassworking. Other, important crafts such as carpentry and basket-making are certain to have been carried out within the settlement, but these have left little or no trace in the archaeological record.

The evidence from elsewhere in Hamwic, supplemented by that from the Stadium site, indicates that various crafts were being pursued in separate properties rather than larger units (or zones) devoted to a single industry (Morton 1992, 57; Andrews 1997, 205), a situation which has also been recognised in Lundenwic (Malcolm *et al.* 2003, 150 and 168). Many of these crafts and industries were probably interdependent. For example, the butchers, in addition to providing meat for consumption, would have provided animal bone for the bone and antler workers and skins for tanning. The bone and antler workers in turn were probably producing tools for the weavers and clothworkers, while the smiths may have been producing the rivets needed in the manufacture of bone combs as well as tools such as shears and knives for other trades. Overall, what is clear is that crafts and industries were an important feature of Hamwic, producing large quantities of objects and

materials (eg, textiles) both for internal consumption as well as local or long distance trade.

Trade and Commerce

Artefactual evidence for regional and international trading contacts is widespread within Hamwic (eg, Hodges 1981; Timby 1988; Hunter and Heyworth 1998), and the Stadium site has added to this with a relatively large assemblage of imported pottery and a small collection of vessel glass, along with objects of non-local stone. The imported pottery from the Stadium site originated from a number of sources in northern France and the Low Countries, and the glass assemblage is likely to include imports from the continent. The non-local stone assemblage includes limestones, sandstones, and chalk probably deriving from a number of sources in southern England, northern France, and the Low Countries. The most distinctive, however, is the Niedermendig lava which comes from the Eifel region in Germany and would have been transported via the Rhine to Dorestad, from where it was shipped to England either as finished or part-finished quernstones. Other materials which must have been brought in to Hamwic include metal: silver for coins, copper-alloy for a variety of personal items, and iron for a range of domestic, craft, and agricultural uses. Iron is likely to have been obtained from nearby, perhaps Romsey in the Test valley, but the other metals would have come from further afield, though at least some would have been recycled within the settlement. Some types of imported materials or items have not survived, furs and silks for example, as well as foodstuffs and wine which may have been brought to Hamwic in pots and organic containers.

The coin assemblage from the Stadium site indicates contacts, though not necessarily direct, with other English kingdoms and the continent, with coins originating from Ribe in Jutland, the Rhine mouths area, East Anglia and possibly London. A single example of a Merovingian coin, probably minted in Marseille, was also recovered from the Stadium site; however, it is more likely that this coin reached Hamwic via northern France rather than through direct contact with southern France. The remainder of the coin assemblage appears to have been minted locally, the Series H (Type 49) issue within Hamwic itself. The coins provide the best evidence for commercial activity, and the assemblage from the Stadium site, all recovered as single finds, supports the earlier view that they represent stray losses from a very large number of transactions rather than a store of wealth (Metcalf 1988, 17; Andrews and Metcalf 1997, 214–5).

The pattern of long-distance trading links, the volume of trade involved and the significance of this trade in the economy of wics and other mid-Saxon settlements has been the subject of much discussion over recent years (eg, Anderton 1999). Morton (1999) has questioned the role of long-distance trade in the mid-Saxon economy, with particular reference to Hamwic, and suggests that this aspect of the settlement has been overemphasised. For example, in surviving contemporary documents Hamwic is never referred to as an emporium, and only in one text as a place of trade, where it is called a *mercimonium*. This might be translated as a town where buying or trading could legally take place, but gives no clear indication as to the scale and nature of the trading activity (Morton 1999, 51). However, no-one disputes the evidence that long-distance trade did take place, as is demonstrated by the imported objects found in Hamwic, or that there was close links with its hinterland. Perhaps the difference is that long-distance trade was on a smaller scale and less extensive than has previously been supposed and that its hinterland was more modest (Morton 1999, 48). Nevertheless, Hamwic and towns like it represented new and unusual phenomena in the Anglo-Saxon landscape of England, and 'industrial' and craft production was an important feature of these settlements though not necessarily producing large numbers of goods destined specifically for long-distance trade. Trade is likely to have been attracted to Hamwic as the town grew and flourished, perhaps further stimulated by a *monasterium*, and regulated through tolls levied by a port reeve established nearby in the vicinity of the waterfront.

Certainly, the waterfront area in Hamwic is likely to have been a focus of commercial activity, but not indisputably the principal or earliest focus, which may have been an inland market place, a role which has been suggested for Six Dials. It has been suggested that what was thought to be a high proportion of imported pottery in the vicinity of the waterfront was a reflection of the area having been a traders enclave (Morton 1992, 67–8). However, statistical analysis indicates that the proportions of imported pottery are not significantly greater in the waterfront area, although this is clearly the route by which the pots entered Hamwic. The pottery was possibly brought in to Hamwic by the traders for their own use rather than for sale (Hodges 1982, 57–8), some perhaps originally used as containers for foodstuffs and wine. Nevertheless, its widespread occurrence suggests that at least some found its way into use by other inhabitants elsewhere in the town, a supposition borne out by the distribution of glass and lava quernstone fragments throughout the settlement.

Some imported goods such as the pottery are easily recognisable in the archaeological record,

though others are likely to be less visible, and all of the main exports – wool, cloth, and hides, as well as the oft-cited slaves and hunting dogs, are largely invisible. We are dependent on archaeological evidence for their production and limited documentary evidence to attest to their importance. The availability of agricultural goods represents a growth in production in the hinterland which provisioned Hamwic, and it was this growth that provided surpluses for export. Nevertheless, as Hinton (1999, 30) has remarked: 'Saxon Southampton did not become an essential part of the kingdom of Wessex. It existed to export surpluses and had no role to play if there were no surpluses to export, or markets to receive them'. Lack of a role can be seen as the major contributing factor to Hamwic's decline and virtual disappearance in the 9th century, a sequence mirrored in the contemporary *wics* of London, Ipswich, and York.

The End of Hamwic and Later Settlement

Evidence from the Stadium site supports the view that much of the settlement had been abandoned by the middle of the 9th century, or possibly a little later, as suggested by both Morton (1992, 70) and Andrews (1997, 255). This can be seen largely as a result of a rapid decline in Hamwic's fortunes following Viking disruption of the trading networks and the threat, perceived and in 840 real, of a Viking attack on the town itself. With no role to play in the changing political and economic climate of the late 9th century, and occupying a low-lying and open site which could not easily be defended, the town was effectively rendered redundant. Such depopulation and abandonment, coupled with a move or at least subsequent use of a new site, discussed in some detail by Morton (1992, 70–7), has also been recorded at other wic sites, for example Lundenwic (Malcolm *et al.* 2003, 121–4). The similar, mid–late 9th century date for these events indicates that their decline was a response to adverse political and economic factors that were not unique to Hamwic.

There is evidence in Hamwic, however, that occupation did continue on a much reduced scale in a few isolated areas. The waterfront remained in use into the late Saxon period and beyond (Morton 1992, 72), and some settlement perhaps continued as late as the 10th century at Six Dials (Andrews 1997, 248–9) and in the vicinity of St Mary's Street and St Mary's Road. There is also evidence for late Saxon occupation at the Stadium site, but this does not appear to represent continuity from the mid-Saxon period.

Apart from a scatter of late Saxon pottery in slumped deposits in the top of a few pits, the evidence comprises a single relatively substantial ditch and a pit. While this material attests to some limited activity at the Stadium site, the nature of this activity is uncertain. The ditch could have been of mid-Saxon or possibly even medieval date, and at approximately 3 m wide and 1.6 m deep appears rather large to have been merely a field boundary, but too small to have served a defensive function. However, a possible recut suggests that it was maintained and was probably a significant land division, perhaps established following abandonment of the mid-Saxon settlement. Furthermore, its location and alignment appears to correspond with the line of a broadly east–west field boundary recorded on a map of Southampton painted around 1600. An apparent dump of as many as 30 pots in a pit nearby may have been contemporary with the ditch, though it is impossible to be certain. The assemblage is curious and it is difficult to suggest an explanation, particularly as some of the vessels appear to have been used (for cooking?) and do not, therefore, represent wasters from a kiln.

The new settlement of Southampton, 'New Hampton', was probably established in the early 10th century, on the higher ground by the River Test less than 1 km to the south-west of Hamwic (Morton 1992, 73–5). This date broadly corresponds with both the general abandonment of Hamwic and the re-emergence of Winchester as an important rural settlement which, as Yorke (1984, 66) argues, may have taken over the role of an administrative centre after the middle of the 9th century. The new settlement was small (*c.* 6 ha), and clearly did not represent the refounding of a town of the same importance that Hamwic had been. Though defended by at least one phase of ditch and bank, it was probably not the site of the Alfredian burh – Roman Bitterne Manor (perhaps *Clausentum*) is a more convincing candidate (Morton 1992, 73–4), and evidence suggests that, initially at least, trade was not an important feature of its economy. However, it was this settlement that subsequently developed into the important and prosperous medieval port of Southampton, while the former site of Hamwic remained largely as agricultural land. The only significant settlement was a small suburb at the south end of St Mary's Street, close to St Mary's church, and a chapel and perhaps a scatter of other buildings around the waterfront and river crossing to the eastern shore of the River Itchen.

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Hamwic (mid-Saxon Southampton) has been the subject of excavations since the 1940s, and is the most extensively investigated and best understood of the English *wics*. This report publishes the results of the largest excavation yet undertaken in Hamwic, which preceded Southampton Football Club's move to a new stadium in 2001. This has increased the known area of the settlement to almost 50 hectares, but more importantly has shed light on the origins of Hamwic. A mixed rite cemetery included cremation burials which may date to the mid-7th century, at least half a century later than others known in the region, and an unusually high proportion of accompanied inhumation burials of later 7th century date, many with weapons in sometimes complex assemblages. These burials may represent an elite group associated with a 7th century royal estate from which the later administrative function of Hamwic developed. The similarities with weapons burials in east Kent suggest that the origins of Hamwic might be traced back to Kentish/Jutish leadership, before the arrival of the West Saxons in *c*.686 and the transformation of the estate into a major manufacturing, market and trading centre.

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