A MIDDLE-LATE SAXON AND MEDIEVAL CEMETERY AT WING CHURCH, BUCKINGHAMSHIRE

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An archaeological excavation was undertaken on the site of a former school at Wing, Buckinghamshire, which lay immediately south of the church of All Saints, a probable minster founded in the middle-late Saxon period. The recovery of the remains of 77 individuals has shown that the churchyard once extended south of its present boundary. Radiocarbon dating of human bone, as well as pottery evidence, indicates that the cemetery was in use from the mid-eighth century. There were orderly rows of graves aligned north-south and a possible east-west division between two zones, and the area was bounded by a ditch. There was a mix of adult males and females but there were few juveniles or young adults, although some shallower graves may have been lost. Unlike many contemporary cemeteries, there was little use of placed stones within the graves, but at least half of the adults had probably been interred in wooden coffins. The majority of the burials had been made before the Norman Conquest, but a few later burials cut across the row system as either isolated individuals or in small clusters, probably family groups. The latest burials were interred in the later 12th to early 13th centuries. By this time a few domestic features had appeared within this part of the cemetery, largely in areas devoid of graves. They suggest that this area was underused in the post-Conquest period, perhaps reflecting the decline in importance of the church itself. In the 13th century the boundary ditch was filled in and there was more intensive domestic use of the area, perhaps with ancillary buildings to a nearby residence. Thereafter, there was little activity and the area was under grass immediately before it was developed for a school in the 1850s.

Introduction

In 1999 the site of a former school at Wing, Buckinghamshire (NGR SP 8807 2254; Figs 1 and 2) was to be redeveloped for housing. The area comprised 0.25 ha of land within the core of the Saxon and medieval village, and immediately south of the churchyard of All Saints church, a probable minster church founded in the middle-late Saxon period, with a surviving apse over a crypt at the east end (Fig 3).

During construction of the school in the mid-19th century it had been reported that human skeletal remains had been discovered (Ouvry 1858, 111). More recently, in the 1960s more than 30 burials had been found during the construction of bungalows along Church Walk, immediately to the east of the churchyard. With these indications that the churchyard had once been more extensive, an archaeological evaluation comprising a desk-based assessment and trial excavation was requested by Buckinghamshire County Council Archaeological

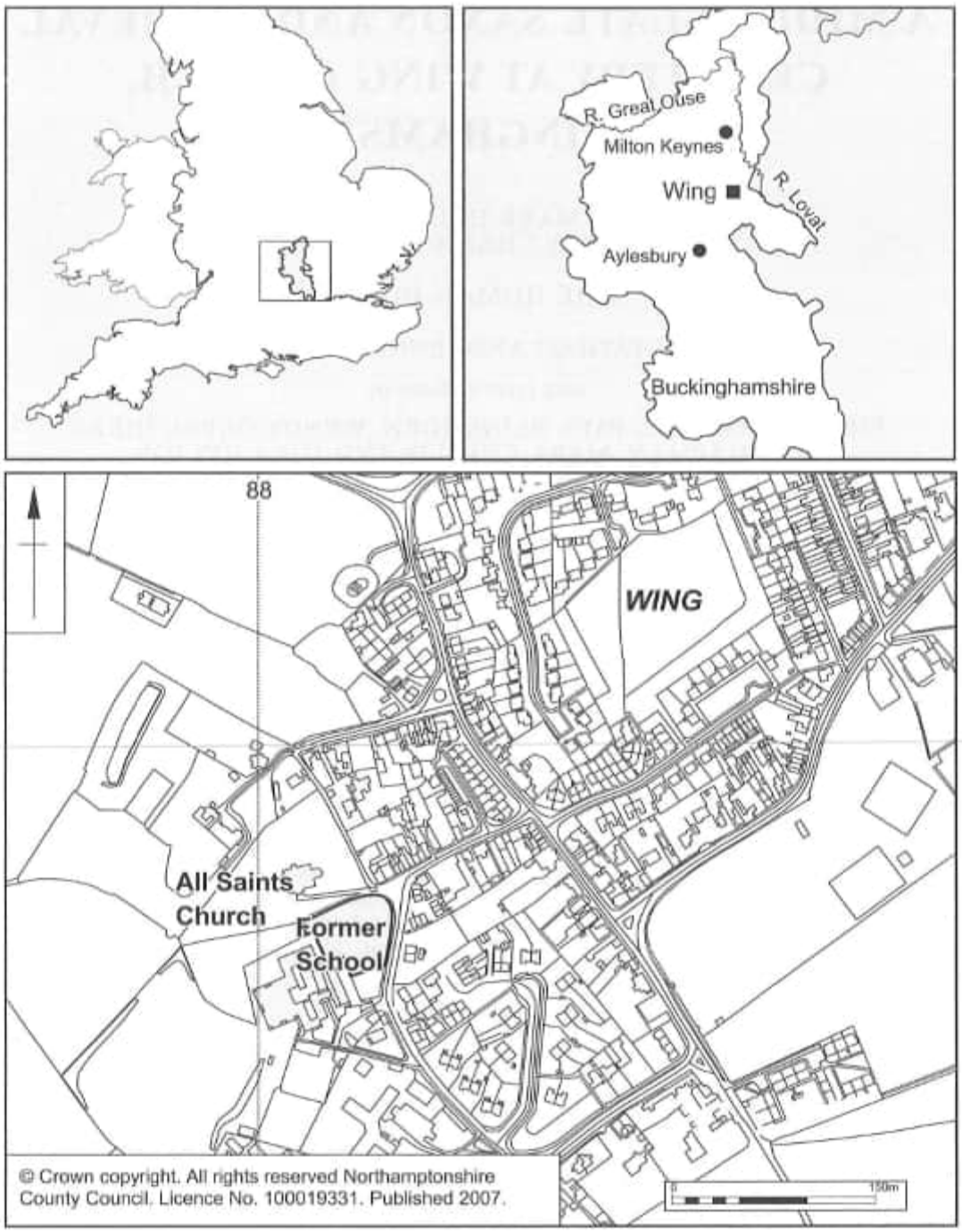


FIGURE 1 Site location at Wing, Buckinghamshire

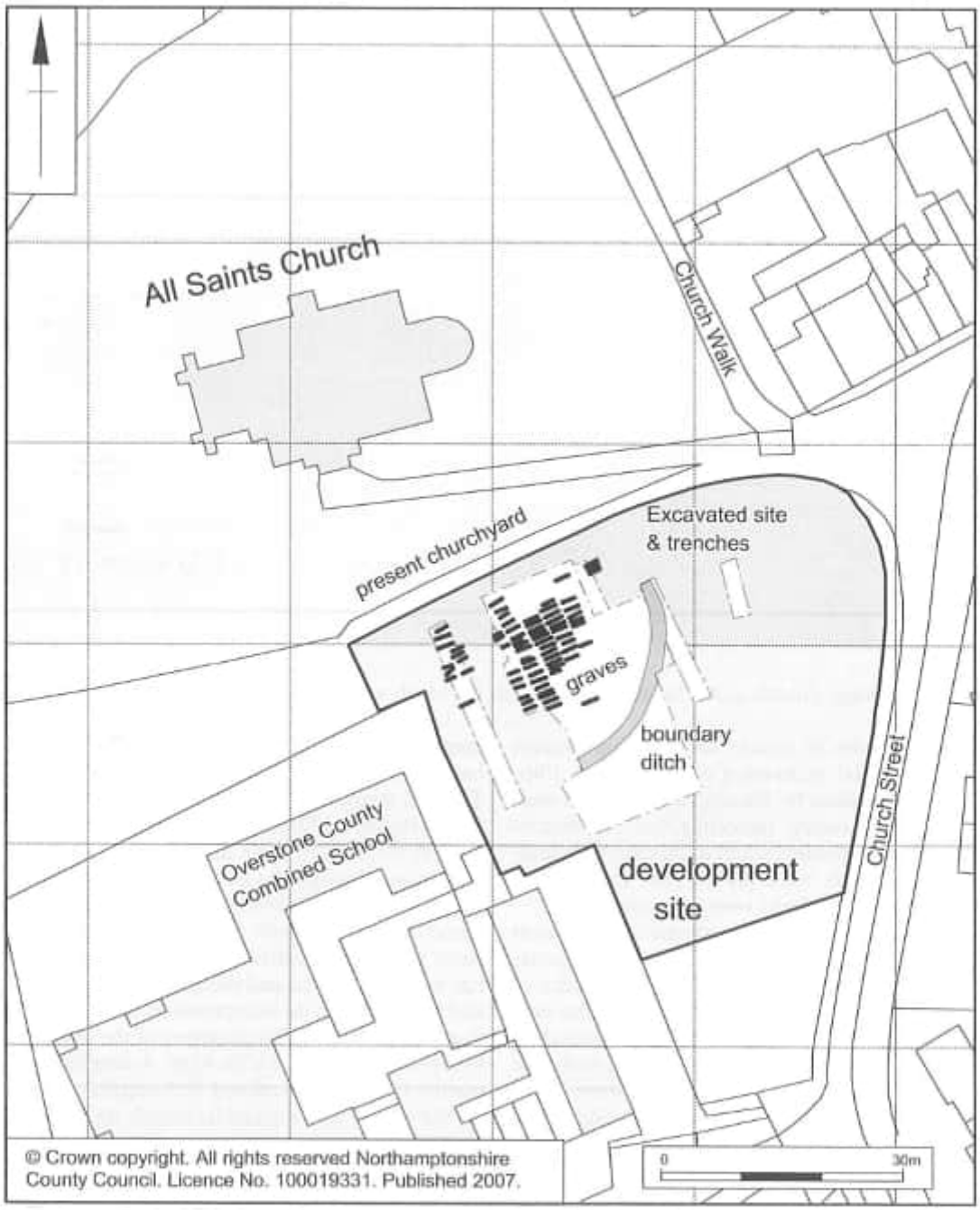


FIGURE 2 All Saints church Wing, and the Saxon cemetery and boundary ditch

FIGURE 3 Wing, church of All Saints, viewed from the south with the Saxon apse to the east (right)

Services in order to inform the planning process (NA 1998). Trial excavation confirmed the 19th-century observation by locating rows of east-west aligned graves, clearly indicating that the churchyard had once extended south of its current boundary. These burials were left *in situ*. In addition, medieval ditches and pits were encountered.

Planning permission for residential development of the plot was granted, subject to the implementation of a programme of archaeological works to excavate the area within the footprint of the proposed buildings, while burials in the surrounding parts of the site were to remain undisturbed. The excavation was carried out in May and June 1999, immediately prior to development. The excavation was made the subject of an episode in the BBC television series *Meet the Ancestors*. Filming took place over several days and involved the participation of pupils from the adjacent school. In addition, tours of the site were provided for interested local residents.

Following completion of the excavation, an assessment report and updated project design was prepared (NA 2002), and approved by Buckinghamshire County Council Archaeological Services. The full analysis and reporting was completed in 2005 (Holmes 2005). The original report is available in the county Sites and Monuments Record and online through the Archaeology Data Service (ADS) library of developer-funded archaeology reports (grey literature). That report has formed the basis for this published version, but the material has been condensed and reorganised by the editor, and some additional interpretation of the evidence is also proposed. A full gazetteer of the burial data will also be deposited with ADS. A detailed examination of the historical and architectural evidence for the village of Wing and its church was compiled by Richard Gem, the academic advisor to the project. This is included in the archive report, available in the SMR and through ADS.

LOCATION AND TOPOGRAPHY

The village of Wing is situated on the northern margin of the Vale of Aylesbury, lying 10km (6

miles) north-west of the scarp of the Chiltern Hills. It sits on the southern end of a spur of high ground, above the 120m contour, flanked to the west and south by a tributary stream that flows into the River Lovat, which flows northward to the River Great Ouse. Modern development has extended the village northward along the ridge, and away from its original core (Fig 1).

The development site was bounded to the north by the churchyard of All Saints Church, to the east by Church Street and to the west by Overstone County Combined School, the replacement for the Victorian School (Fig 2). At the time of the excavation, the site was open ground following the demolition and levelling of the former school.

Historical Background

The church of All Saints has been studied since the 19th century, and the dating of its fabric is still debated. Richard Gem has suggested a late 7th century or early 8th-century foundation for the first stone church. The importance of the church is that it probably was a minster and as such would have furnished both administrative and pastoral functions for the region, rather than just for the immediate village or parish.

In the late 9th and early 10th centuries Wing appears to have formed one of a number of royal estates on the west bank of the River Lovat and close to the boundary with the Danelaw, although always lying within notional 'English' territory. Wing's distinctive crypt may have housed relics and thus have been a place of pilgrimage; its remodelling in the late Saxon period may point to expansion due to increased popularity. The Norman Conquest brought with it a degree of change when the church and its lands were granted to an alien priory, the Abbey of St Nicholas at Angers.

Wing manor passed through the hands of various landowners in the Middle Ages, each one leaving traces on the development and fabric of the church. The donation of the church to an alien priory at the time of the Conquest, however, left little evidence in the church fabric and it is only in the 13th century and later that subsequent lords of the manor started to endow alterations to the church.

A Glebe Terrier of 1607 refers to a vicarage associated with the churchyard and as the current vicarage at the north-west of the church has fabric dating back to the 16th century it is likely that the reference is to this building (Mike Farley pers comm). The earliest map evidence showing the development site is the Inclosure Map of 1798 (BRO/IR/30/1). The plot is described as 'Homestead (Earl of Chesterfield)', and the boundary with the churchyard was as it is today. A number of buildings are depicted, one of which was adjacent to the churchyard boundary. On an estate map of 1817 the plot had become 'Orchards Yards' and only a single building, located outside the development area, survived. A water colour by the Revd JG Joyce of *c* 1848 depicts the area as open pasture, grazed by sheep (Mrs Maureen Brown, Wing Historical Society pers comm). A school was built on the site in the 1850s, and had been enlarged by the end of the century. It was demolished in the 1990s to make way for housing development.

Methodology

The excavation was limited to the area affected by the footprints of two proposed dwellings, an area measuring approximately 30m north-south by 20m east to west, 0.05 ha in extent, not including the trial trenches (Figs 2 and 5). To the east, the excavated area joined two of the trial trenches, and further unexcavated burials lay in a detached trench to the west.

Overburden was removed using a 360° excavator fitted with a toothless ditching bucket, and all other excavation was by hand (Fig 4). A 2.0m wide easement was allowed so that all burials wholly or partly within the building footprint could be fully excavated, while burials beyond this, and only partly within the excavated area, were left *in situ*. The burials were exhumed, stored and analysed under the terms of Home Office Licence A1847. The site archive, including the human remains, will be deposited with the Buckinghamshire County Museum, Accession number 1999.34.

Summary of Site Chronology

The major periods of activity are tabulated below (Table 1), and are described in detail in the following sections. Where possible, the results of the specialist studies have been incorporated directly into the period overviews.

FIGURE 4 The cemetery area at the beginning of soil stripping with mechanical excavator and dumper

EARLY/MIDDLE SAXON ACTIVITY

Six sherds of undecorated pottery found in grave fills and other later features can be assigned to a broad early/middle Saxon date (AD 450–850), and another two sherds were found during the evaluation. There are too few sherds to indicate extensive early Saxon period settlement here pre-dating the establishment of the church. The sherds could all be part of a single middle Saxon assemblage along with five sherds of Ipswich ware and two of Maxey-type ware (Blinkhorn below), associated with the foundation of the church.

THE MIDDLE TO LATE SAXON CEMETERY, 750–1100 AD

The origin of the cemetery, c 750 AD

It has been suggested that the first stone church at Wing was built in the late 7th or early 8th centuries. A cemetery would have been attached to this church but as the excavated area lies 20m and more from the building, it is unlikely to have been the first area utilised for burial. Despite this, the dating evidence from both pottery and radiocarbon dating of the burials themselves indicates that burials were being made in the excavated area as early as the mid-8th century (Fig 2).

The recovered pottery includes two sherds of Maxey-type ware and five sherds of Ipswich ware. The Maxey-type ware could have an origin as early as the mid-7th century but use of this pottery continued in parallel with Ipswich ware, which is dated AD 725/50–850. The earliest of the five radiocarbon dates on burials lies between the mid-7th and late 9th centuries (Burial G53, 660–890 Cal AD, 95% confidence, 1257+/-54BP, Wk-11241).

TABLE 1 Summary of site chronology

Period	*Activity*
Early-Middle Saxon activity (AD 450–750)	Church constructed (Late 7th-early 8th century)
Middle-Late Saxon (AD 750–1100)	South-eastern corner of cemetery in use with well-ordered zone and row structure and a ditched boundary
Medieval (AD 1100–1200/50)	South-eastern corner of cemetery given new boundary ditch but only limited use for burial, with small groups and isolated burials
	Some secular activity away from burials
Medieval (AD 1200/50–1500)	Boundary ditch at south-eastern corner abandoned, and south-eastern corner of cemetery abandoned More intensive domestic activity across former corner of cemetery
Post-medieval (AD 1500–1850)	Secular landholding
Victorian and modern (AD 1850–2000)	The school

The early/middle Saxon pottery
by Paul Blinkhorn

A small quantity of early/middle Saxon undecorated, hand-built pottery can be broadly dated AD 450–850. There are three fabrics: fabric 1: fine sand, 4 sherds, 13g; fabric 2: quartz and ironstone, 1 sherd, 8g; fabric 3: quartz and chaff, 1 sherd, 2g. These fabrics are typical of the hand-built Anglo-Saxon pottery of the south-east Midlands, and can be paralleled at numerous sites in the region, such as Pennyland, Milton Keynes (Blinkhorn 1993). There is one very small and slightly everted rimsherd (not illustrated).

Ipswich Ware

Middle Saxon, slow-wheel made ware, was manufactured exclusively in the eponymous Suffolk *wic*. It probably had a currency from the second quarter of the 8th century to the mid-9th century at sites outside East Anglia. There are two main fabric types: Group 1: hard and slightly sandy to the touch and Group 2: hard, sandy and mostly dark grey in colour, with a scatter of large quartz grains (up to *c* 2.5mm) making them quite rough to the touch and giving rise to the term "pimply" Ipswich ware (Hurst 1959, 14).

There are five sherds, 127g, MNV = 0.17, from four vessels, including a pitcher (Fig 26, 1) and a large jar (Fig 26, 2). This is typical of assemblages from outside East Anglia, which tend to comprise a much greater proportion of pitchers and large jars than sites inside the kingdom (Blinkhorn in prep).

Maxey-type Ware

The exact chronology is uncertain, but it is generally dated AD 650–850 (eg Hurst 1976). Wet-hand finished, reddish-orange to black surfaces, with abundant Jurassic fossil shell platelets up to 10mm. Vessels are usually straight-sided bowls with simple rims, and/or 'bar-lugs'. There are two rimsherds possibly from the same vessel, 34g, MNV = 0.18 (Fig 26, 3).

Illustrated early/middle Saxon pottery (Fig 26)

1. Ipswich ware. Rim sherd and handle terminal from a pitcher. Fabric group 1. Orange-red with grey surfaces. Fill of rectilinear pit 328
2. Ipswich ware. Base sherd from a very large jar, fabric group 2, although with little visible quartz. Grey with orange-red core margins. Fill of grave G58

3. Maxey-type ware. Dark grey fabric with purplish-brown surfaces. Fill of grave G49

The middle Saxon pottery in its regional context

The most significant ceramic from this site is the Ipswich ware, which not only confirms that the site had a middle Saxon, probably 8th-century component, but also that it was involved in the burgeoning trade network of the period. It also places the church amongst a growing corpus of religious sites that have produced such pottery.

Ipswich ware has by far the widest distribution of any native pottery type of the period, occurring across eastern England from York to Kent, with the river valleys of the south-east Midlands showing the greatest penetration of the ware inland. The ware is present at high-status sites within its distribution, but cannot alone be taken as an indicator of high status, although the further from the production centre it is found the more likely this is; religious sites such as monasteries and churches are particular *foci* (Blinkhorn in prep). In the south Midlands, however, it seems that many sites where it has been found were not of the highest status, but were probably supplying utilitarian goods such as grain and raw iron to the emporium at Ipswich (Blinkhorn 1999). In Buckinghamshire, there are six other findspots of the ware: Pennyland (Williams 1993), Westbury-by-Shenley and Wolverton in Milton Keynes; Aylesbury (Farley 1976) and Lake End Road, Maidenhead (Foreman *et al* 2002). Of these the Prebendal, Aylesbury is a minster site and Lake End Road may be connected to the royal estate at Old Windsor. There are also sites which have produced Maxey-type ware but not Ipswich ware, such as Chicheley (Farley 1980).

The situation is similar in nearby Bedfordshire. Six find-spots are known (Blinkhorn in prep) of which only Bedford may have had status during the middle Saxon period.

The churchyard boundary

A curvilinear ditch (219) defined the south-eastern corner of the early cemetery (Fig 5). It was best preserved to the east, where it had been excavated in a trial trench. Here the ditch had a steep, almost V-shaped profile with a rounded base, and was 1.80m wide by 1.25m deep. Within the main excavation area it had been heavily truncated by later pits and a full profile could not be obtained (Fig 7, Sections 1 and 2, 219).

The ditch fill was an undistinguished mid-brown sandy clay with frequent gravel inclusions (250). To the east, in the evaluation trench, the lower fill of the ditch contained two sherds of early/middle Saxon pottery and three sherds of Ipswich ware, indicating its probable 8th to 9th-century origin, although four sherds of medieval sandy grey ware from the upper fills suggest that it remained partially open until at least the later 11th century.

No direct evidence was recovered for the former presence of an accompanying internal bank, but the absence of early burials immediately inside the ditch has been taken to suggest that one may have been present but was later levelled.

The cemetery

The remains from a total of 77 individuals, including complete *in situ* and disarticulated or redeposited examples, were recovered from the cemetery. The first burials were in a well organised row structure, which will be discussed later. The orientation of the graves, at around WSW-ENE, is comparable to the alignment of the church (Fig 2 and Fig 6). Some graves were up to 20° from the general alignment, but these were all later graves, of interments made when use of the cemetery had declined to the occasional burial which showed little respect for the earlier row system.

A further 23 graves were identified, but not excavated, around the margins of the main excavation area and in the detached trial trench to the west. Many more should survive within the unexamined parts of the western half of the development site (Figs 2 and 5). Aside from a single small piece of human jaw bone, from the fill of the later cemetery boundary ditch 61, all of the disarticulated human remains lay within the circuit of the boundary ditch.

The contemporary ground levels across the cemetery had been truncated to greater or lesser degrees. At best the graves were up to 0.40m deep, but some of the *in situ* burials were level with the truncated ground surface and only partially survived. It is, therefore, likely that some shallower graves had been totally lost, perhaps accounting for some of the apparent gaps in the rows of burials. This may also be relevant in relation to the low number of juveniles recovered, as these may have been interred in shallower graves. The graves were typically sub-rectangular with straight sides and either roughly squared or rounded ends. The *in situ*

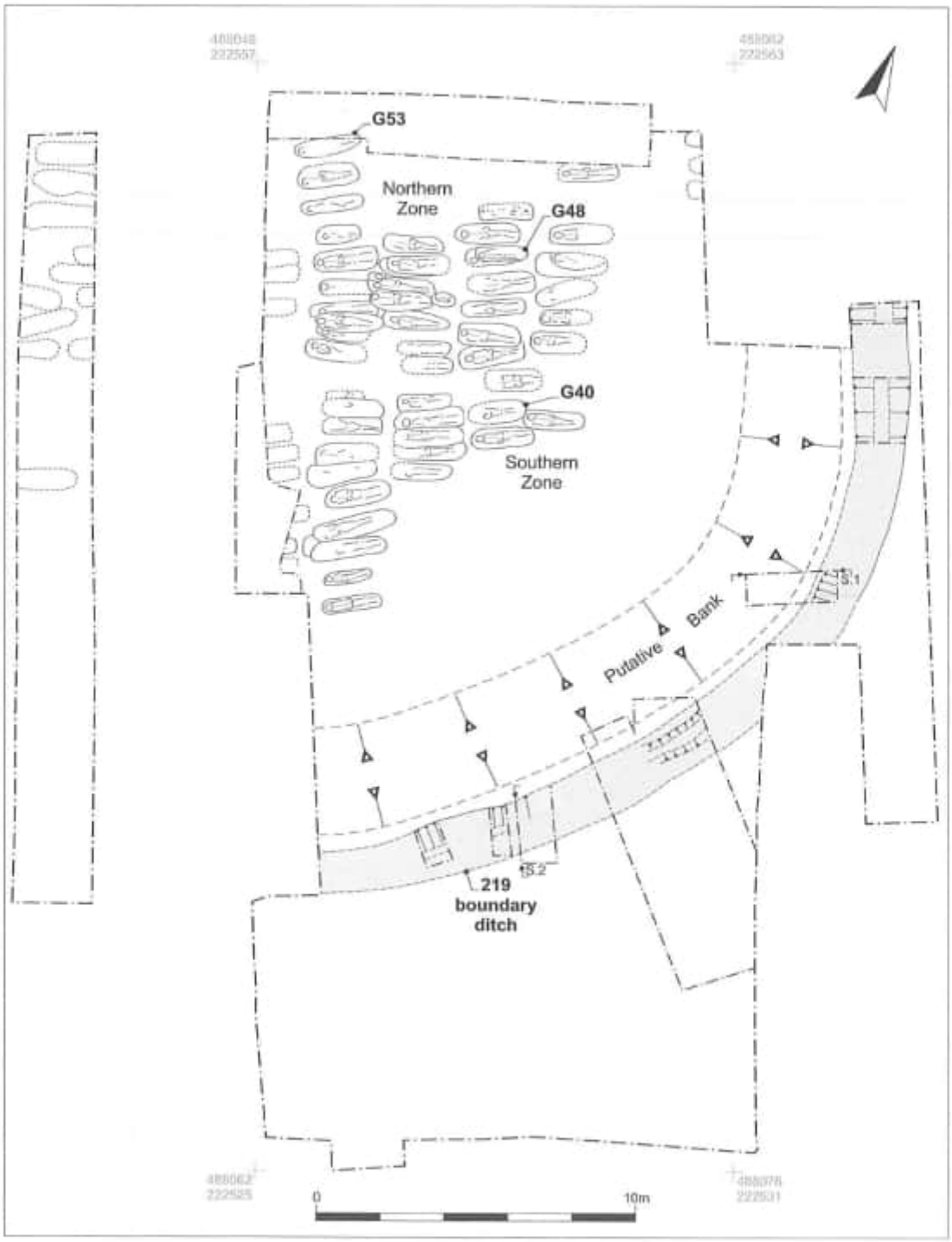


FIGURE 5 The middle to late Saxon cemetery and boundary ditch (750–1100 AD)

FIGURE 6 General view of the excavated cemetery showing excavated graves; looking east with the church to left north (left)

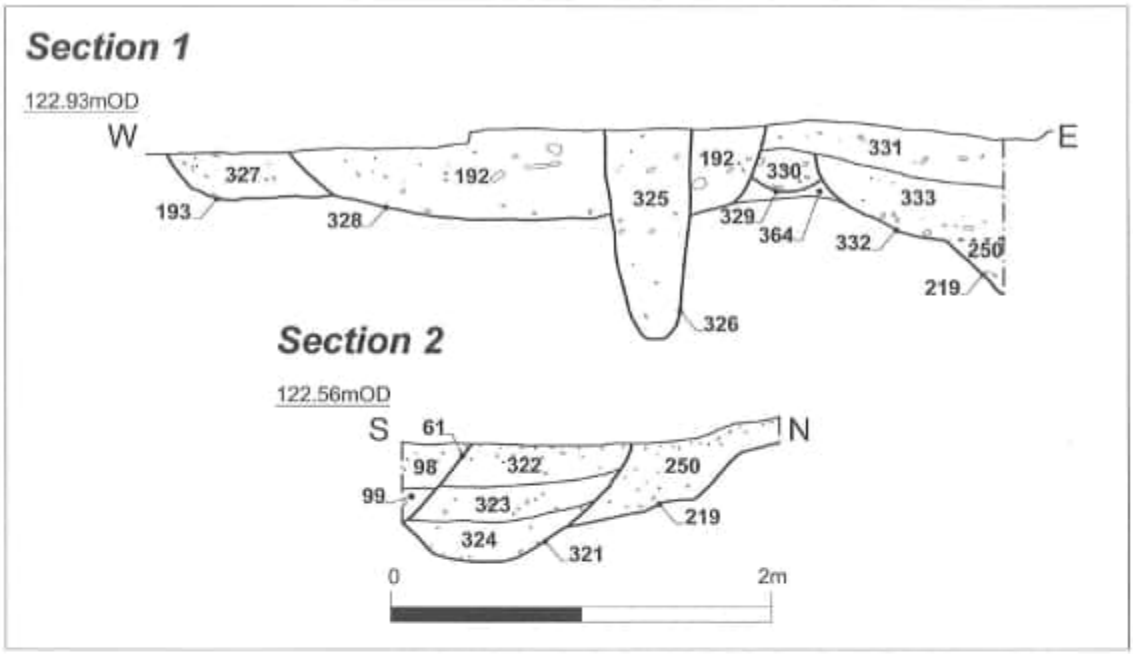


FIGURE 7 Sections of the cemetery boundary ditch (location on Fig 5)

burials were all supine with the head to the west.

The development of the cemetery to the mid-11th century, comprised a steady infilling of the row structure together with a few later burials that respected the row structure but partly disturbed earlier graves. The analysis to be presented later, will suggest that these were probably family groups and not casual later use, with a number of them probably the burial of a wife or husband over, or closely adjacent to, their previously deceased partner.

THE MEDIEVAL CEMETERY, 1100–1200/50 AD

The south-eastern part of the cemetery remained within the churchyard following the Norman Conquest, and a new broader boundary ditch was provided. The row structure of the cemetery was probably largely full by this time and usage was far less intensive, with no direct disturbance or reuse of the row structure.

A new cemetery boundary

In the post-Conquest period, probably the late 11th or early 12th century, the original boundary ditch, (219), was filled in and a broader flat-bottomed ditch (61) was dug to the immediate south (Fig 8). There may have been a hiatus between these two events. To the south, a large oval pit (321) cut the fills of the early boundary ditch, but was truncated by the later ditch (Fig 7, Section 2). However, it is possible that the pit had been dug on the inner lip of the new ditch, and the ditch edge subsequently eroded back into the pit fills.

The new boundary ditch (61) was broad and flat-bottomed, cutting through the natural sand and gravels. Its base was 1.90–2.70m wide by 0.45–1.05m deep, broadening and deepening towards the east (Fig 9, Sections 3 & 4: Fig 10). The edges may originally have been quite steep, but they had eroded, so that the ditch was from 4.0m to 6.0m wide at ground level. To the east, in the trial trench, the ditch was recorded as only 0.25m deep, although it is possible that it had not been fully excavated. The plan suggests that the ditch did not turn northward, and it may have terminated just to the east of the excavated area. An eastern boundary for the cemetery may have been provided by a partial recutting (332) along the inner edge of the eastern length of the original ditch (291) (Fig 8).

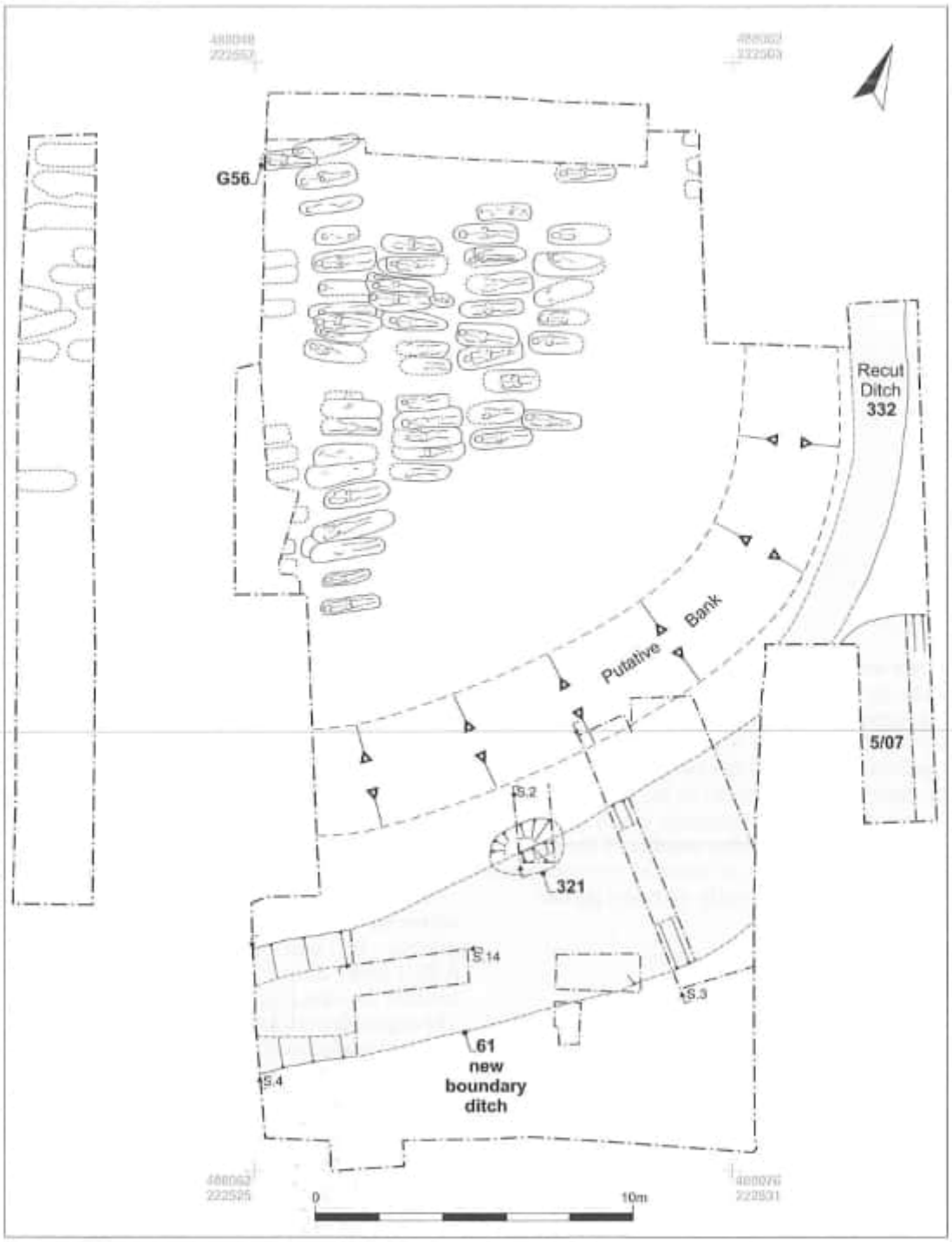


FIGURE 8 The late Saxon cemetery, the new boundary ditch (c1100 AD)

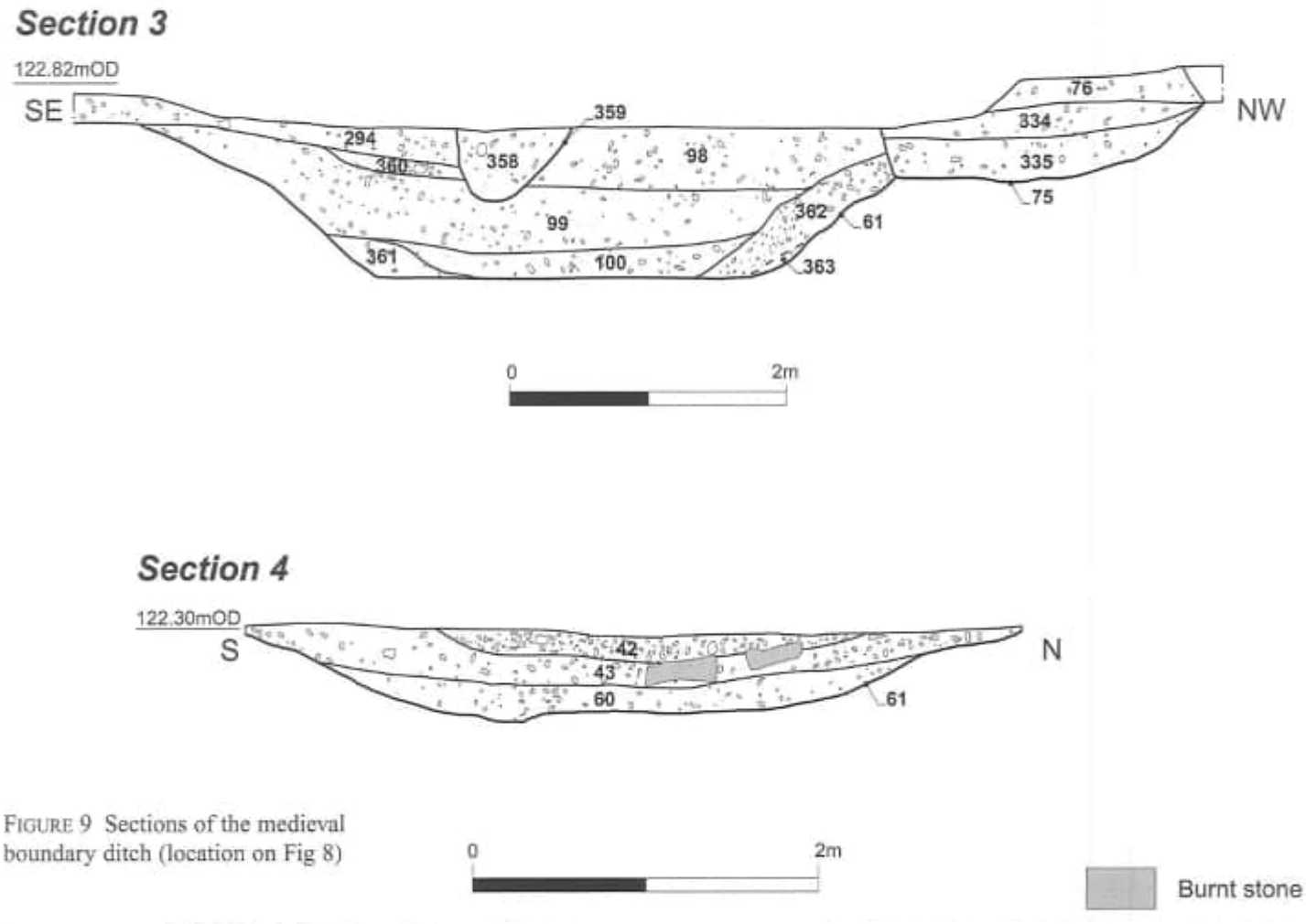


FIGURE 9 Sections of the medieval boundary ditch (location on Fig 8)

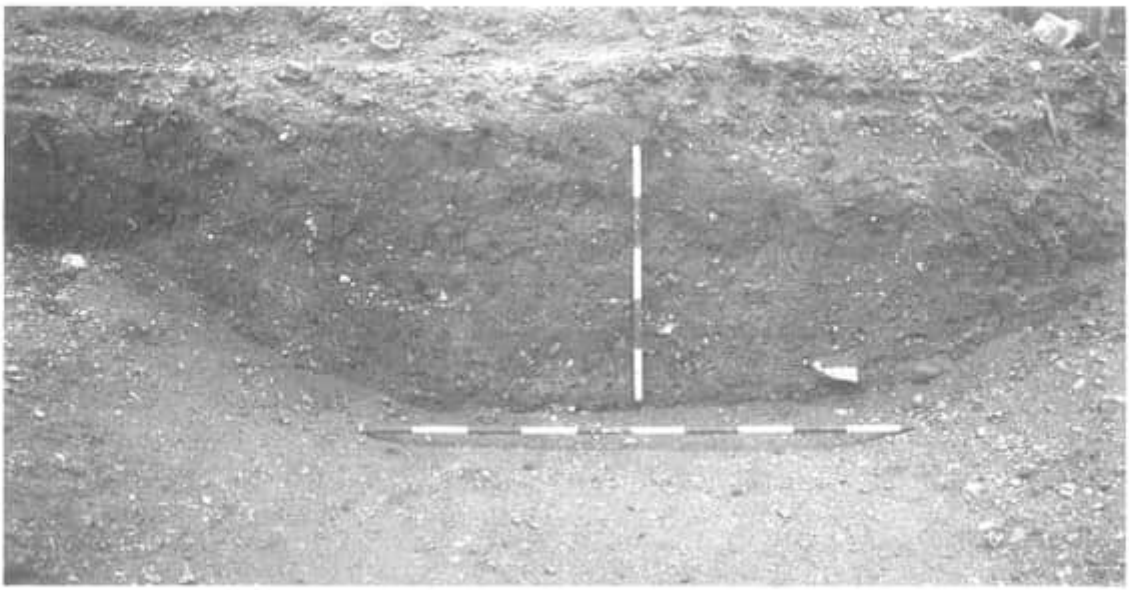


FIGURE 10 Section of later cemetery boundary ditch, 61, western end looking east

It is unlikely that the material from ditch 61 was cast up as internal bank, as both a sunken-featured building and some late graves, lay close to its inner edge (Fig 11). It is more likely that the ditch material formed an external bank, which could account for an observed asymmetry in the secondary ditch fills (see below).

The eroded edge indicates that the ditch was initially left to silt naturally. There was steeply-angled slumping against part of the inner edge (Fig 9, Section 3, 362). A small piece of human jaw bone came from the primary silting (100).

The secondary fill (99), of greyish-brown sandy loams was thicker on the southern side, suggesting that more soil was coming in from outside the cemetery, perhaps as a result of either erosion of an adjacent external bank or the deliberate levelling of such a bank. The final fill was a similar greyish-brown sandy loam (98). The new ditch had fallen out of use by around the end of the 12th century.

The medieval use of the cemetery

There is no evidence that any of the graves in the rows were as late as the 12th century. Later graves occur as a small number of scattered and isolated individuals and a single group of four burials. These either cut across the earlier rows or lay in previously unoccupied areas to the south, including the area that may have been occupied by an internal bank when the original boundary ditch (291) was open (Fig 11). This decline in the usage of this outlying part of the cemetery may be associated with a decline in the importance of the church following the Conquest.

Radiocarbon dating has confirmed that at least two of the burials post-dating the rows, belonged to the post-Conquest period, spanning the early 11th to mid-12th centuries (Burial G21; 1010–1220 cal AD, 95% confidence, 934+/-52BP, Wk-11238 and Burial G32; 1040–1270 cal AD, 95% confidence, 857+/-46BP, Wk-11239).

In the northern part of the central area, two intercutting graves G27, largely removed by G21 (a radiocarbon dated burial), cut across the row structure. A little to the south, a cluster of four intercutting graves, G20 under G46, and G31 and G32 (a radiocarbon-dated burial), also cut across the row structure, and may have formed a small family plot (Fig 11).

To the south of the rows a few scattered burials are probably contemporary with the new boundary ditch. Burials G64 and G61 are an isolated pair of burials (Fig 11). Further south, there was a short row of four burials (unexcavated) and three burials to the

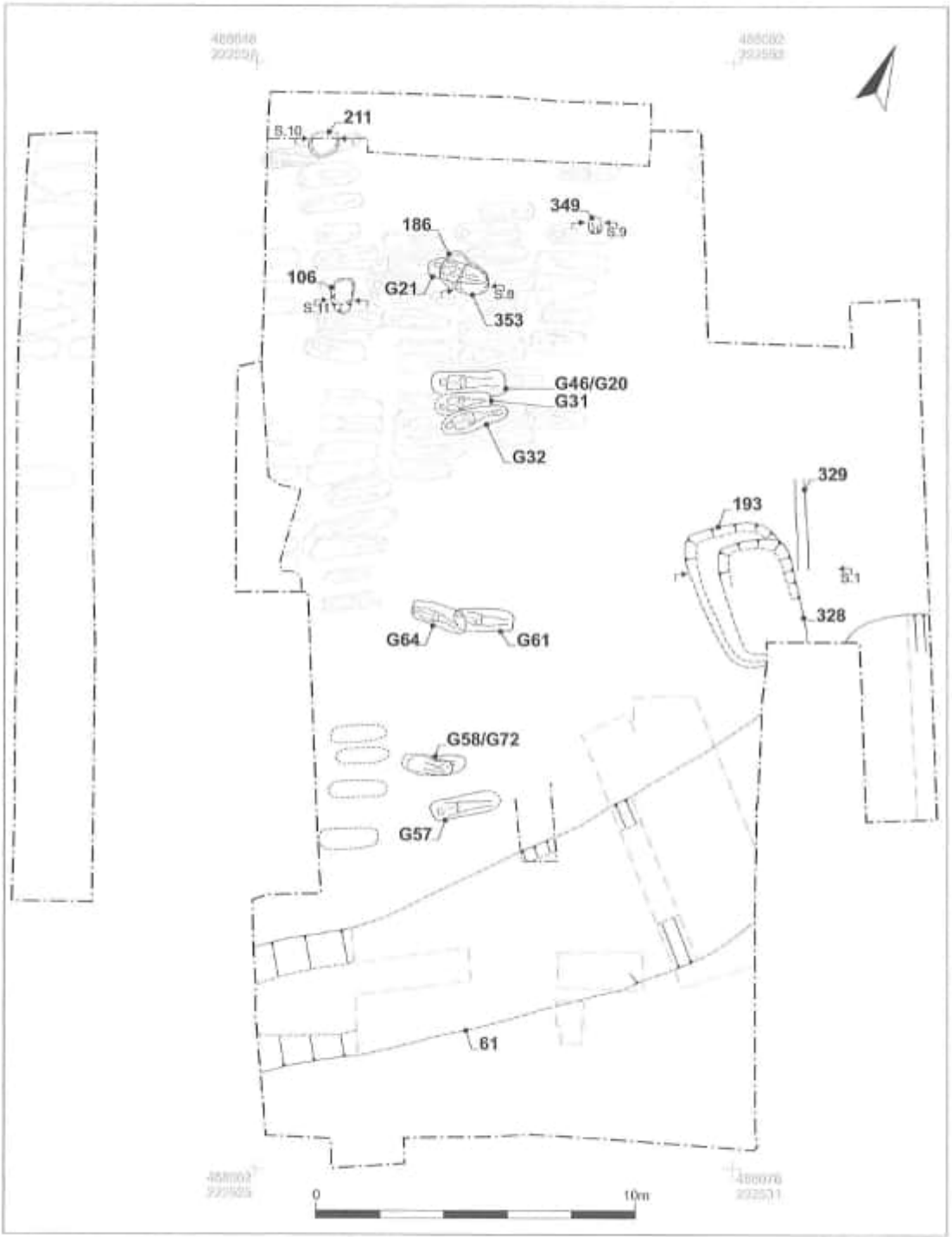


FIGURE 11 Medieval use of the cemetery (1100–1200/50 AD)

east (G72, G58 and G57). These all lay immediately north of the boundary ditch, in the area of the postulated bank accompanying the original ditch (219), and have been interpreted as of probable medieval date and contemporary with the new boundary ditch (61), although none has been directly dated.

The radiocarbon dating of burials and the pottery dating of features which post-date the filling of the cemetery boundary ditch, suggest that the cemetery had fallen out of use during the first half of the 13th century.

Domestic Activity in the Cemetery, 1100–1200/50 AD

While the area remained within the cemetery, there was also some domestic use of it, largely in parts devoid of graves.

Post-pits

In the northern part of the site there were a number of large pits or post-pits (Fig 11, 349, 211, 106 and 186/353). These cut several graves in the rows, suggesting that the graves were either no longer visible or that there was no compunction about disturbing burials. A late burial, G21, which is radiocarbon dated to between the early 11th and mid-12th centuries, post-dated a pair of intercutting post-pits (186/353), indicating that the pits were cut within the later lifetime of the cemetery. A small, isolated pit (349), 0.4m in diameter by 0.8m deep, was cut up to 0.3m below the base of the grave that it cut through, G74 (Fig 12, Section 9). The others were larger, at around 1.0m diameter and 0.50m deep, cut 0.20–0.40m below the bases of the graves (Fig 12, Sections 8, 10 and 11). The three larger pits at the northern edge of the site (211, 106 and

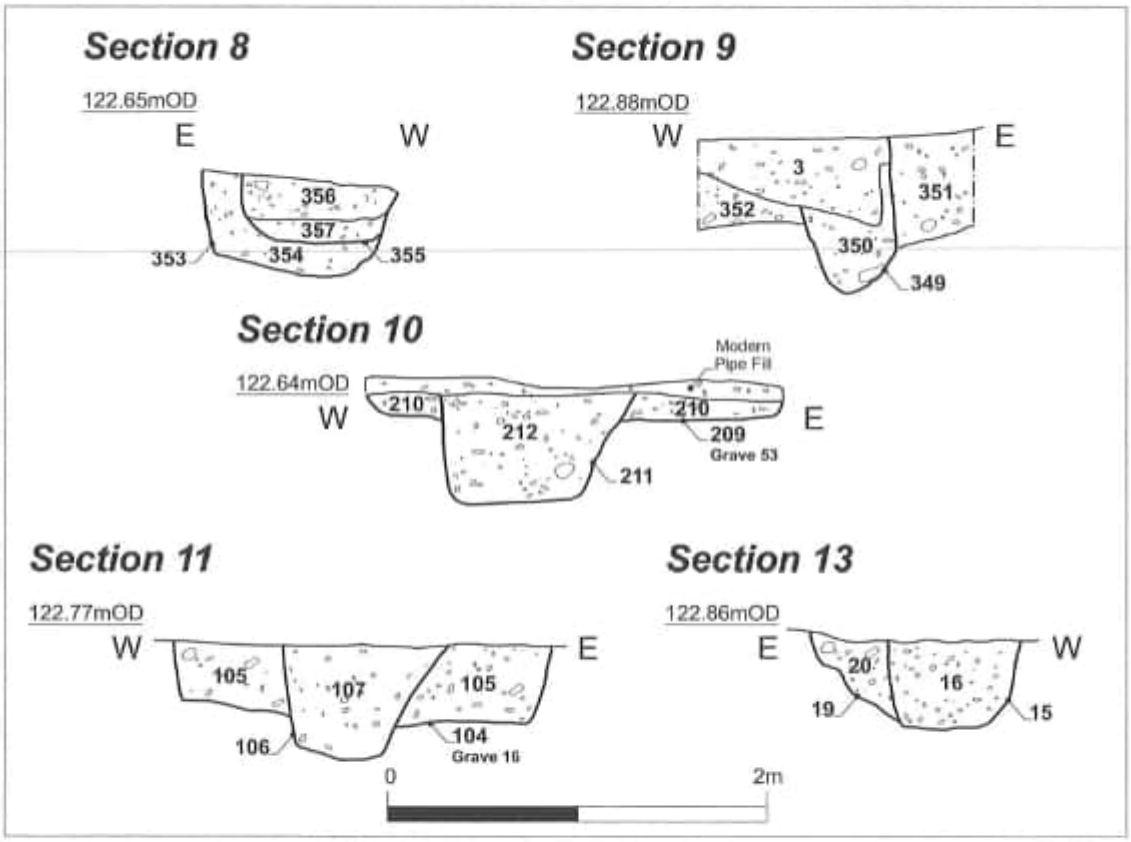


Figure 12 Sections of medieval postholes (location on Figs 11 and 19)

186/353) were spaced at 4.0m east-west by 4.5m south-north. The rectilinear arrangement suggests that they might have formed the southern end of a post-built timber building that extended northwards beyond the edge of the excavation.

Gully and sunken feature

Immediately inside the later boundary ditch, but well away from any burials, there was an area of domestic activity (Fig 11). The earliest feature here was a length of shallow, U–shaped gully (329), which cut through a layer of redeposited natural (364), perhaps a remnant of a levelled bank. Above it there was a further layer of redeposited natural (331) (Fig 7, Section 1). This soil layer was cut by a large sub-rectangular flat-bottomed pit (193), 4.6m long by 3.2m wide and 0.47m deep, with a flat base. The fill of mid-brown sandy clay, contained 80 sherds of red sandy ware, indicating a date in the 12th century. It was later re-cut to a slightly smaller size (328), 3.8m long by 2.2m wide (Fig 11). There was no evidence of its use, but it is suggested that it was some form of small building. This same area was to continue to be a focus for activity in the 13th century (see below), following the backfilling of the cemetery boundary ditch.

Soil layers

There were remnant soil horizons across part of the site. These might have been introduced to level the site or they may just have been part of the natural accumulation of soils within the cemetery; a grave earth. Within the central part of the site, the soil was cut by some later burials and other later features, and comprised mid greyish-brown sandy loam up to 300mm deep. Elsewhere, isolated patches of redeposited natural sands and gravel suggest that areas within the cemetery may have been levelled, possibly as a precursor of secular use.

Animal bone from the boundary ditch and soil layers by Philip Armitage

All of the animal bones from boundary ditch 61, apart from nine horse teeth (eight upper cheek teeth and one upper incisor) from a single adult horse, are discarded domestic (kitchen/table) food waste. From the composition of this waste it appears that beef formed the dietary staple with mutton and pork consumed in smaller quantities. Domestic fowl supplemented this basic diet.

A soil layer (129) yielded an intact metacarpus of a domestic pig, with an estimated shoulder height of 0.715m. Another soil layer (121) contained a single oyster shell in addition to cattle, sheep and pig bone fragments. The fill of post-pits 106 and 186 produced small quantities of food (beef, mutton and pork) bones.

The Organisation and Development of the Cemetery, 750–1200/50 AD
by Andy Chapman with Mark Holmes

The row and zone structure

As only a corner of the whole cemetery was excavated, little can be said about the overall organisation of the cemetery. The evident ordering of the excavated graves in north-south rows is likely to have occurred over the whole cemetery, but elsewhere this early pattern will have been overlain by a mixture of later independently established rows and perhaps sporadic individual graves and family plots showing little respect to earlier patterns of organisation (Figs 5 and 13).

Five closely spaced, well-occupied rows lay partly or fully within the excavated area. To the east there was a gap wide enough for a further row (but unoccupied within the excavated area) and a further row in the north-east corner of the excavated area may have been the easternmost row in this part of the cemetery. To the west, in the detached trial trench, there were the ends of two further rows. There would be room for another complete row between this trench and the main site (Fig 5).

It is also suggested that there was a west-east division, lying 4.0m south of the northern end of the site, marking the presence of internal zones within the cemetery (Fig 13). The linear boundary between the majority of the excavated burials, which formed part of a southern zone, and burials in the northern part of the excavated area can be traced across the area from west to east. In the separate trench to the west (Fig 5), the northernmost three graves were in a row offset from the two rows to the south. In the main excavation area four of the five rows did not continue northward while the easternmost row did not continue southward (Fig 13).

The northern burial zone, with a southern boundary some 25m from the church, would perhaps have been part of a primary zone of burials

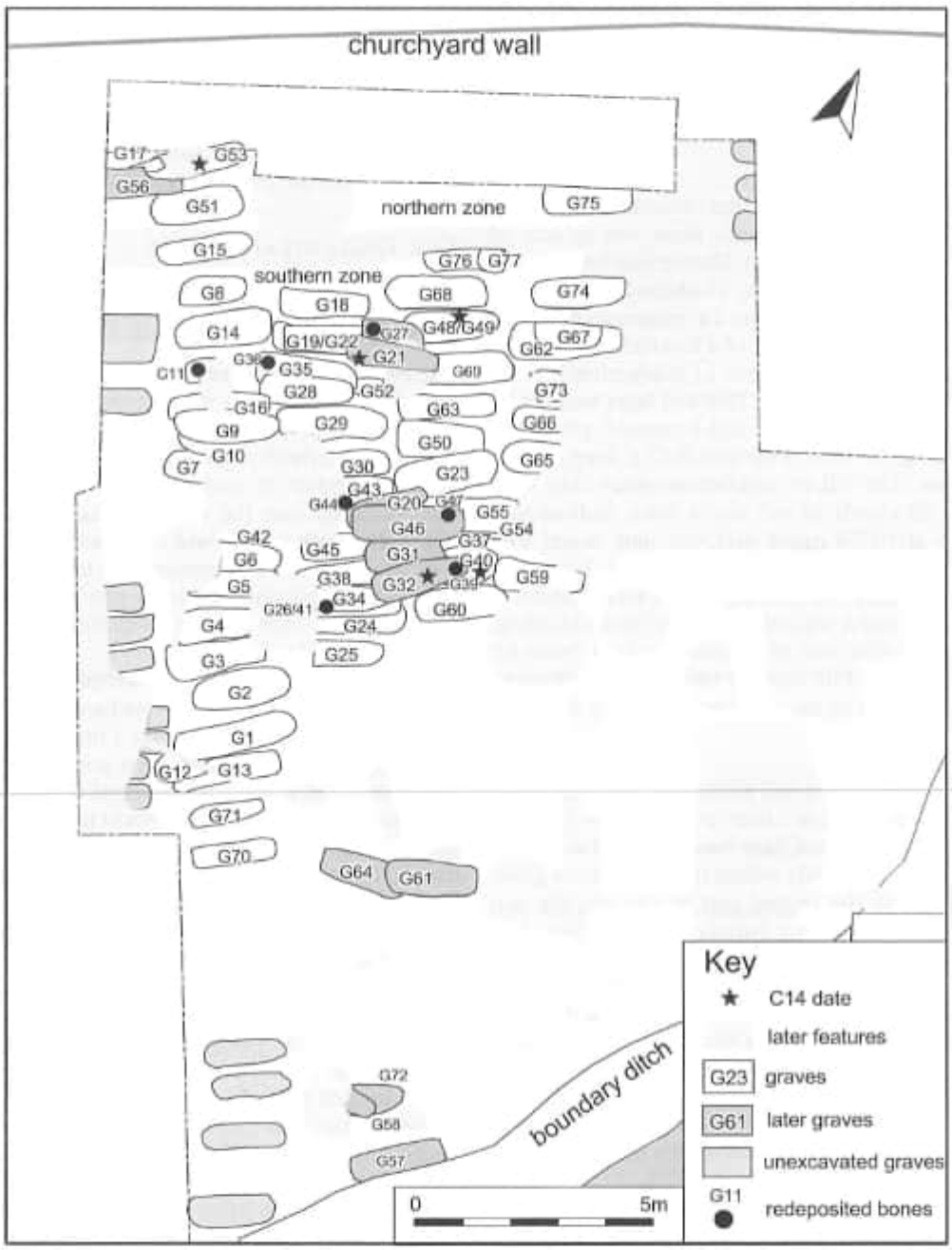


FIGURE 13 The graves in the cemetery

clustering around the minster church and the relics that were presumably held in the crypt at this time (Fig 2). The only burial in this zone that was radiocarbon dated, G53, is the earliest of the five dated burials from the site, and was probably interred during the 8th to early 9th centuries (660–890 cal AD, 95% confidence, 1257+/-54 BP, Wk-11241). This suggests that the southern zone may perhaps have been a later extension, showing respect for the rows in the northern zone, and necessary, perhaps, due to rapid filling of the zone to the north. Two early burials within the southern zone have given radiocarbon dates spanning the mid-8th to mid-11th centuries, indicating that it came into use no more than about a century later than the northern zone (Fig 13: Burial G40; 760–990 cal AD, 95% confidence, 1160+/-49 BP, Wk-11240 and Burial G48; 880–1050 cal AD, 95% confidence, 1050+/-50BP, Beta-132755).

Use of the northern zone did not cease completely, as a burial in the north-western corner of the site (Fig 13, G56), which did not respect the row structure, is of the late 10th century or a little later, as a silver penny of Aethelred II lay beneath it, where it may have been deliberately placed. Grave goods, such as coins, are not unknown from mid - late Saxon cemeteries (Hadley 2001, 96–7).

Although it is suggested that the southern zone was an extension to the burial area, there is no indication of a physical boundary between these two zones, so the extension must have been within the churchyard boundary as defined by the ditch to the south and east.

Disturbance of earlier graves

As noted above, two graves within the rows of the southern zone have been radiocarbon dated to the mid-8th to mid-11th centuries, indicating that the rows in the southern area had been largely filled by the mid-11th century.

Many of the burials had been disturbed to a greater or lesser extent. The majority of this disturbance occurred in the post-medieval to modern period, after this part of the cemetery had been turned to secular use. However, some later burials lay almost directly or partially over an existing grave (Table 2 and Fig 13). In one instance (Fig 13, G48 over G49) the later burial has been radiocarbon dated to 10th to mid-11th centuries (G48: 880–1050 cal AD, 95% confidence, 1050+/-50 BP, Beta-132755), indicating that it was not a result of reuse of the area in the post-Conquest period. It is therefore suggested that these near-directly overlying insertions were probably within known family graves/plots and occurred within no more than a few decades of the original interment,

These overlying graves also display a clear pattern involving burials of opposite sexes (Table 2). Of the seven instances involving adults, five (5/7, 71%) are of a male and a female; with three females succeeding males and two males succeeding females. In another example a female succeeded an adult of indeterminate sex. In a single example there are two male burials (1/7, 14%).

It can be suggested, therefore, that these instances had most probably involved a wife or husband being buried above their deceased partner, with the females dying more often slightly later.

TABLE 2 Age and sex distribution of overlying graves

Later Burial			*Earlier burial*		
No.	*Sex*	*Age*	*No.*	*Sex*	*Age*
G12	Female	30–35	G13	Male	30–35
G09	Male	35–40	G10	Female	45+
G19	Male	30–35	G22	Male	25–30
G28	Female	35–45	G35	Male	25–30
G34	Female	45–50	G38	Male	35–45
G54	Male	45–50	G55	Female	35–40
G67	Female	35–40	G62	Adult	–
G48	Juvenile (female)	10	G49	Adult	–
G77	Juvenile	1	G76	Female	30–35

FIGURE 14 Burial of child aged 10, G48, overlying and disturbing an adult burial, G49

This interpretation is supported by the ages at death, as in three of the five examples the later burial is of an individual some 5 to 15 years older than the underlying burial, and in only one instance is the second individual clearly younger. The burial of two males, one above the other, might have been of brothers or, given a suitable time delay, of a father and son.

There are two instances where infants or juveniles have been inserted into an adult's grave. In one case the original burial was female and in the other the sex was not determined (Fig 14, G48, aged 10, over G49).

In a few instances disturbed bones had been carefully collected for reburial within a later grave. The coffined burial of an adult male, G35, contained an intact skull, placed within or perhaps on the coffin, at the western, head-end of the grave. The skull did not appear to come from a burial disturbed in digging the grave, and must be presumed to have come from elsewhere in the cemetery. One of the post-Conquest burials, G46, had cut the head-end of a much earlier burial, G55, and the skull and mandible had been reburied at the foot-end of the new grave. Another post-Conquest burial, G21, had cut an earlier burial, G27, and the disturbed long bones had been placed in a stack below the later interment.

Posture and grave furniture

All burials lay supine and extended with the head to the west. The arms were typically straight by the sides (18 examples from 32: 18/32, 56%). There were slight variations with either both hands across the thighs (10/32, 31%), the left hand on the thigh (3/32, 9%), or right hand on the thigh (1/32, 3%).

There were no shroud pins or coffin nails to indicate whether they had been in shrouds or were coffined, and no soil stains of coffins were recorded. However, body posture can be used to infer the mode of burial. In order to examine the possible occurrence of burials that had been coffined, shrouded or clothed, the body postures were classified to one of four groups, partly based on the classification used for the cemetery at Furnells manor, Raunds, Northamptonshire (Boddington 1996, 35–48):

1. Parallel-sided with bone tumble (arms at side, legs parallel, vertebrae and ribs displaced, skull rolled and long bones displaced at joints); taken to imply a probable coffin burial (eg Fig 15, G23 and Fig 16 , G68)
2. Parallel-sided and undisturbed (arms at side, legs parallel, skull upright, no other bone displacement); which could apply to burials clothed or loosely shrouded but with some coffined burials also showing little bone displacement (eg Fig 17, G60)
3. Tightly parallel-sided (arms close to sides and feet together); taken to imply a probable shroud burial, although a narrow coffin could produce the same result
4. Non-parallel (legs or arms splayed or folded); taken to imply a probable clothed burial, although for limited splaying a loose shroud could produce the same result (eg Fig 18, G31 and G32)

FIGURE 15 Burial G23, showing bone tumble on torso, indicative of a coffined burial

FIGURE 16 Burial G68, showing bone tumble on torso and legs, indicative of a coffined burial

Of 70 burials that were partly *in situ*, 41 were sufficiently intact to classify.

Classifying body posture does not by itself necessarily provide a clear definition of the mode of burial. Bone tumble is, however, strongly indicative of coffined burials, as a void around the body provides space for such movement to take place (Figs 15 and 16, G23 and G68). Based on this criteria, it is suggested that 20 burials from the 41 classified (20/41, 49%) were probably in coffins.

A further 18 burials (18/41, 44%) have been classified as parallel-sided and undisturbed. A lack of rib, vertebrae and long bone displacement might indicate an absence of space for body movement, implying that the body was either clothed or loosely shrouded. However, not all coffined burials show significant bone movement. The waterlogged cemetery at the Augustinian fri-

FIGURE 17 Burial G60, showing limited bone movement, although head rolling may suggest this was also a coffined burial

ary at Hull, Yorkshire, for example, has burials of this type within surviving coffins (Hadley 2001, fig 38). It is therefore difficult to assign this group to a specific mode of burial; some examples are marginal and exhibit some movement, such as head rolling (eg Fig 17, G60) or limited movement of the rib and vertebrae. The estimate that at least half of all the burials were in wooden coffins is therefore a minimum number, as further examples are likely to be in the group showing little bone tumble.

Of the twenty probable coffined burials, twelve contained males (12/20, 60%), five females (5/20, 25%), two juveniles and one is unsexed. The use of wooden coffins, therefore, appears to show a bias towards males. The spatial distribution shows coffined burials occurring along all four of the excavated rows, but with a greater number in the northern halves of the rows. It is notable that none of the later burials that either cut the row structure or lay scattered to the south, were certainly coffined burials.

There were no examples of group 2, tightly parallel burials, as would be expected from a body tightly bound into a shroud. If shrouds were used they must have been loose, so that the body could assume the same supine posture as if clothed or in a coffin.

Only three burials had non-parallel posture (group 4) with arms flexed so that the elbows protruded slightly, suggesting that they were either clothed or loosely shrouded. Two were late burials, G31 and G32, which lay side by side, perhaps indicating that burial practice had changed, although neither would be considered to have excessively splayed arms (Fig 18).

Many cemeteries of similar date have elaborate arrangements of stone within graves. At Raunds, Northamptonshire (Boddington 1996) these ranged from single pillow-stones beneath the head to elaborate arrangements around and over the head, and around and over other parts of the body. At the extreme, graves could be almost fully lined with rough-hewn stones, with large slabs both under and over the body. At Wing there is little evidence for this practice. Only one grave, G14, contained a possible 'pillow' stone. There were also no other 'special' graves, such as charcoal burials.

Given the later truncation of ground levels on the site, it is not surprising that there was little evidence for the presence of any above-ground grave markers, such as upright stones or postholes for timber markers. The only possible example was a small pile of limestone pieces at the foot end of a grave, G46, which was part of the medieval family group that crossed the original row structure.

FIGURE 18 Burials G31 and G32, with slightly splayed arms; suggesting they were clothed or loosely shrouded

The cemetery population

There is a balance of male and females within the population (26 males and 25 females, with 13 undetermined), and there does not appear to be any significant patterning in their distribution within the cemetery. All rows contained a mix of male and female burials. Of the more isolated burials to the south of the rows, three are female (G61, G64 and G72) and only one male (G57), which lay adjacent to the later boundary ditch (Fig 13). The balance of females to males in the most isolated location may reflect their social exclusion, but the sample size is too small for this to be certain.

In their study of the human bone, Tatham and Wakely (Appendix) have pointed out the low representation of both infants and, more surprisingly, younger women within the cemetery. Evidence from other graveyards of this period, such as Raunds, Furnells (Boddington 1996), shows that infants may be buried in special locations, such as below the eaves of churches; the practice of *sub-stigillatio*, washing the innocents with water sanctified by its passage across the church roof. It is possible that the under-representation of children at Wing can be explained by a combination of burial elsewhere and perhaps the loss of shallow graves to later truncation. The two infant burials within the cemetery (G52, aged 2 and G77, aged 1) were located at the foot of other graves, perhaps the graves of close relatives, and did not occupy their own space within the cemetery rows.

The distribution by age, apart from the infants, showed no patterning. Children aged 10–17 (ten examples) occupied positions within the row structure in the same fashion as adult burials. Younger adults (18–30 years) are present in very small numbers, only three males (G22, G35 and G69), although a number of poorly preserved female burials could not be aged. No explanation can be offered for this discrepancy; a higher proportion of female to male burials would be expected within this age range due to the dangers of death in childbirth.

The most numerous group in the cemetery were mature adults aged 30–50, with 40 examples; four individuals were considered to be over 50 years of age. The analysis of stature is of particular interest, as both the male average of 1.76m (5' 9.25") and the female average of 1.63m (5' 4") are not only markedly higher than in other contemporary populations but are closely comparable to the modern British population. This suggests burial of an affluent and well-fed group, perhaps reflecting the status and prestige of the minster church. They were also relatively long-lived and exhibited diseases associated with ageing, such as osteoarthritis, Diffuse Idiopathic Skeletal Hyperostosis (DISH) and Paget's disease. A quarter of the adults had healed fractures, with males twice as liable to such injuries as females.

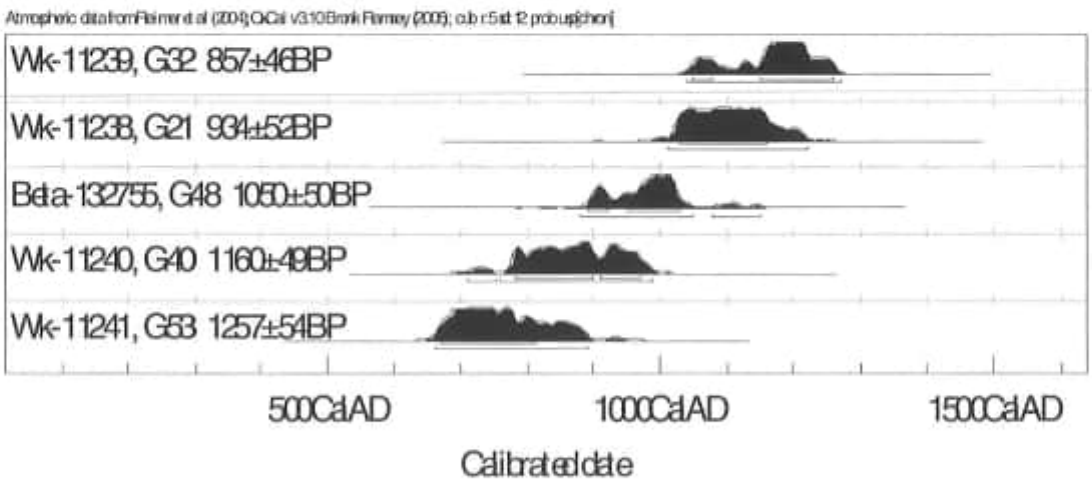
Radiocarbon dating of the cemetery

The chronology of the cemetery is based on five radiocarbon determinations (Table 3 & Fig 13), along with the evidence from artefacts within grave fills and general stratigraphic relationships with other dateable features. An initial radiocarbon sample was taken from burial G48 at the request of BBC television in order to furnish a date for their

TABLE 3 Radiocarbon dating of human bone

Laboratory No. (Technique)	*Burial*	*Conventional radiocarbon age BP*	*C13/C12 ratio*	*Cal AD 68% confidence (95% confidence)*
Wk-11241 (Radiometric)	G53	1257+/-54	-22.1 o/oo	670–810 (660–890)
Wk-11240 (Radiometric)	G40	1160+/-49	-22.2 o/oo	780–900 & 910–970 (760–990)
Beta-132755 (AMS)	G48	1050 +/-50	-20.3 o/oo	890–920 & 950–1030 (880–1050)
Wk-11238 (Radiometric)	G21	934+/-52	-22.2 o/oo	1030–1160 (1010–1220)
Wk-11239 (Radiometric)	G32	857+/-46	-22.1 o/oo	1050–1080 & 1150–1260 (1040–1270)

Calibrated using OxCal v3.10 Bronk Ramsey (2005)



programme *Meet The Ancestors*. The sample was processed by Beta Analytic Inc, Miami, Florida, USA using the AMS technique. The other four samples were selected in discussion with Dominique de Moulins of English Heritage, Regional Scientific Advisor, and were taken from skeletal material chosen on the basis of stratigraphic and spatial relationships within the cemetery. These samples were analysed by the Radiocarbon Dating Laboratory, University of Waikato, Hamilton, New Zealand using standard radiometric techniques.

Artefacts from the Graves and Boundary Ditches by Tora Hylton

A range of residual pottery and other finds was recovered from the soils used to backfill the graves after deposition of the body (Table 4).

Table 4 Datable artefacts from grave fills

Grave	*Material (Quantity)*
G6	Ipswich ware (1 sherd)
G18	Early-Middle Saxon pottery (1)
G19	Early-Middle Saxon pottery (1)
G30	Reduced Sandy ware (1)
G35	Early-Middle Saxon pottery (1)
G43	St Neots ware (1)
G49	Maxey ware (1) Shelly ware (1)
G48	Maxey ware (1)
G51	Reduced Sandy ware (1) (intrusive ?)
G54	Cotswolds (1), Reduced sandy ware (2)
G58	Ipswich ware (1)
G56	Silver penny 979–985AD (1)
G61	Horseshoe 11th–12th century (1)
G65	Saxon bone comb (1)

The Anglo-Saxon penny **by Mark Curteis**

A hammered silver Anglo-Saxon penny (North 1980, 766), although not itself rare, is an unusual site find. It may have been deliberately placed beneath burial G56. The issue was produced in quantity, perhaps to form part of Danegeld payment, and is frequently found in Scandinavian hoards containing Anglo-Saxon coins. The reverse legend is rare; normally MONETA is shortened to MO, but here is presumably inscribed in full because of the short name of the moneyer. The limited wear would suggest a short circulation life.

Obv : +AETHELRED REX ANGLOX;
Rev : +ODA MONETA EFER[]
Aethelred II (978–1016), silver penny, First Hand type (979–85)
Moneyer: Oda; Mint: York; Condition: SW/SW; Diameter: 20mm; Weight: 1.54g

Other artefacts

Other artefacts from grave fills include a fragment of a tooth-segment from a double-sided composite bone comb (not illustrated), probably residual within the fill of grave G65 rather than deposited at the time of burial. Bone combs are usually furnished with both fine and coarse teeth, but in this instance there is little to distinguish between the sizes of the teeth, a trait observed by MacGregor (1985, 92) on Saxon combs. The teeth are 12mm long and slightly worn. Ferrous staining close to the remains of a perforation, indicate that the rivets for securing the connecting-plates would have been of iron.

A horseshoe from the fill of grave G61 is incomplete, only the heel and part of branch survives. Its sinuous wavy outline and the presence of rectangular nail holes with countersinkings, indicates that it is part of a Norman shoe, Museum of London Type 2b (Clarke 1995, 86), generally dated to the 11th and 12th centuries. The heel is furnished with a 'thickened' or 'upset' calkin, which would have helped to prevent the horse from slipping on soft ground.

Two objects were recovered from the later boundary ditch (61); part of a human mandible and a fragment of a lava quern. Both had probably been displaced during backfilling of the ditch in the 12th century.

Animal Bone from the Graves by Phillip Armitage

The total of 90 pieces of animal bone found scattered in grave fills are probably largely redeposited food debris, subject to post-depositional disturbance resulting in fragmentation of the bones, especially the less robust elements such as maxillae and lower jawbones which produced a noticeably high frequencies of isolated teeth of cattle, sheep and pigs. In addition to bones of domestic livestock, there is a single red deer first phalanx from grave G64. This could also be discarded food debris, from the consumption of venison, or a by product of the tanning trade – as the foot bones were sometimes left in the deerskins supplied to tanners in the medieval period.

The presence of field vole in the cemetery – a femur from grave G48 – indicates the site had probably been covered with dense grassland, the preferred habitat of this species (Evans 1977, 189).

Measurements of the domestic fowl bones from cemetery contexts indicate these birds to have been scrawny (bantam-sized) – and generally smaller than their counterparts from medieval Aylesbury (George Street site) documented by Jones (1983). The fill of grave G55 contained four oyster shells in addition to bones of cattle, sheep, pig and domestic fowl.

Medieval Domestic Activity, 13th Century

By the early to mid-13th century burial within the excavated part of the cemetery had ceased and the boundary ditch (61) had been filled in. It is assumed that a new boundary to the churchyard, most probably along the line of the present cemetery boundary wall, was created at this time. Within the bounds of the former cemetery area, a rectangular sunken-featured building (365) was constructed (Fig 19). It almost directly overlay earlier similar structures (193 and 328). A number of pits and postholes and a stone-lined well lay around the structure, partly overlying the former ditch. The pits and the well produced pottery dated to the 13th century and the burnt fills within the sunken building were sealed by a soil horizon containing the only pottery recovered from the site that is dated to the 14th century, indicating that building had fallen out of use by the end of the 13th century.

The building was small but associated finds include a stirrup, a mortar and parts of lava querns, while the bone assemblage shows a diet that included a range of fish and meat, certainly well above a subsistence level. This suggests that the building and the pits were ancillary to a more substantial domestic focus, perhaps a relatively high-status residence. The excavated building may have served as a detached kitchen, although it seems small for this function, and it was perhaps even more specialised, for example a drying or smoking house.

Sunken-featured building

The building comprised a rectangular hollow (365), 4.80m long by 2.80m wide and up to 0.25m deep (Fig 19 and Fig 20, Sections 5 & 6; Fig 21). The western side of the hollow had an irregular gentle slope while the eastern side was vertical. On the eastern edge of the hollow a small pile of limestone pieces (242) may have formed a post-pad. To the south of this, a single limestone fragment (377) may have served a similar function. Nails within the ash filling the hollow may have come from a timber superstructure, but there is a lack of other walling material such as daub, although a few tiles that may have come from the roof.

At the southern end of the hollow was a hearth (66), 0.95m long by 0.90m wide, damaged by later activity (Fig 22). It comprised red peg roof tiles (see Chapman below) and pieces of limestone set on edge in a clay matrix, which was generally burnt red. At the south-eastern corner of the structure a small slot (160), 1.60m long by 0.29m wide and 0.05m deep, was filled with a charcoal-rich loam. The floor of the hollow was scorched a red-orange colour, and the entire hollow was filled with alternating layers of black ash and charcoal, with a few burnt stones (Fig 20, Sections 5 & 6). Against the south-western side of the structure there was a 0.2m thick layer (103) of charcoal-rich soil with roughly linear boundaries that might reflect the dimensions of an associated working area.

Interpreting the form and function of the structure is problematic. The burnt base and the fills of black ash and charcoal might suggest that it had been burnt down. However, the hearth and the alternating layers of ash and charcoal imply that these deposits had probably accumulated during the lifetime of the building, suggesting that it had a specialised use, perhaps as a drying or smoking house.

The burnt debris contained a large amount of calcined sheep-bone fragments and charred peas, and there were fish bones from the hearth and some of the nearby pits; all of these could have been remains of foods that had been dried or smoked in the building. Armitage has suggested (see below) that the fish formed part of the diet of well-fed inhabitants, implying that this insubstantial building was just an ancillary structure to a more substantial domestic focus.

The postholes and pits

To the west and south-west of the building there were a number postholes (138, 140, 127, 383, 374 and 376), which did not form a coherent pattern (Fig 19).

To the north and west of the building there was a scatter of pits (Fig 19). These avoided the main group of burials, suggesting that there was still an awareness of the then abandoned cemetery.

The deepest of these features was a circular pit (337), 2.15m diameter by 1.32m deep (Fig 20, Section 7). It had a complex sequence of fills derived from both natural silting and deliberate dumping. Part of a stirrup came from an upper fill (342), and the fills also contained Brill/Boarstall ware dated to the 13th century. An adjacent small area of black charcoal-flecked loam (204), which had accumulated in hollows above graves, G55 and G54, con-

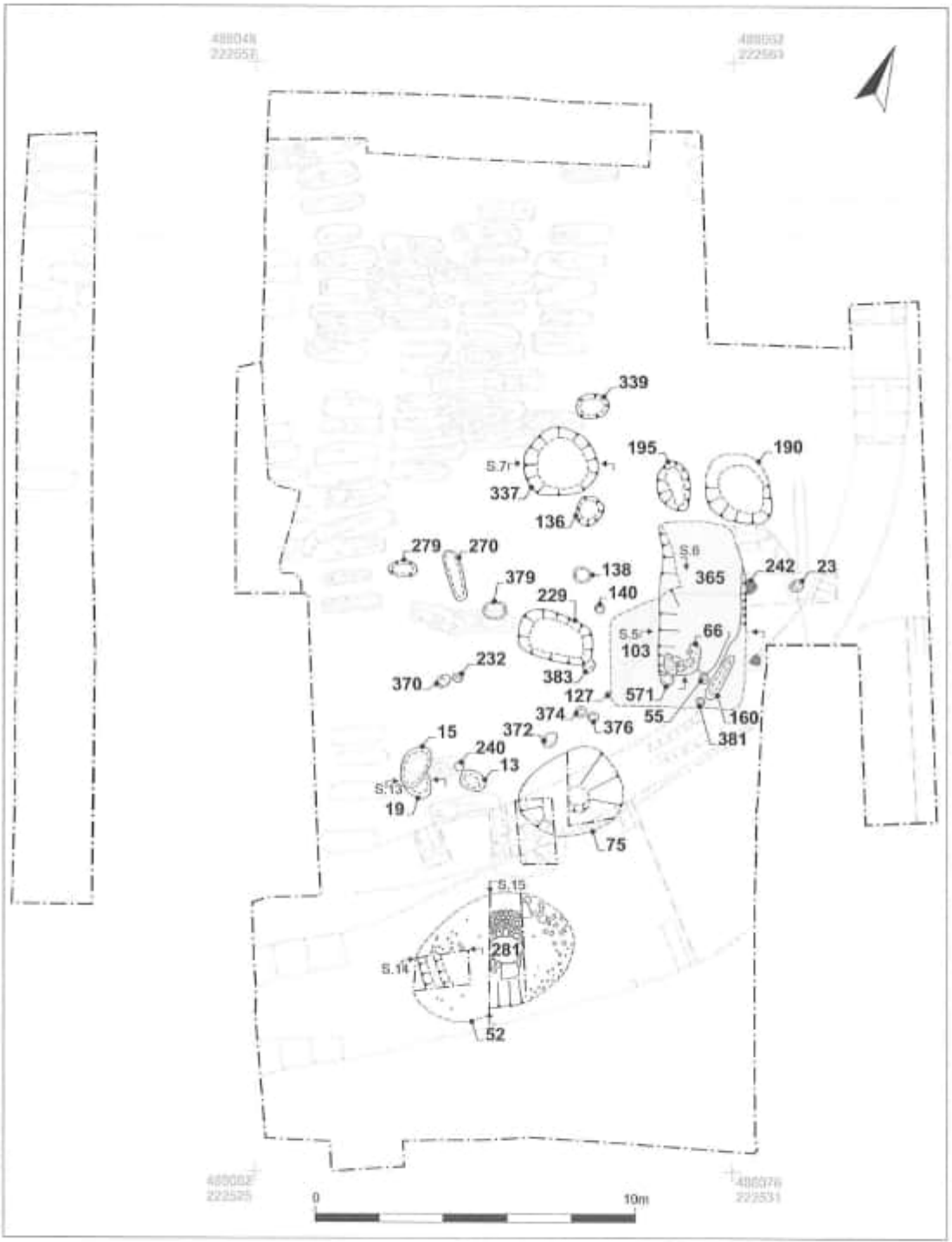


FIGURE 19 The medieval domestic activity (13th century)

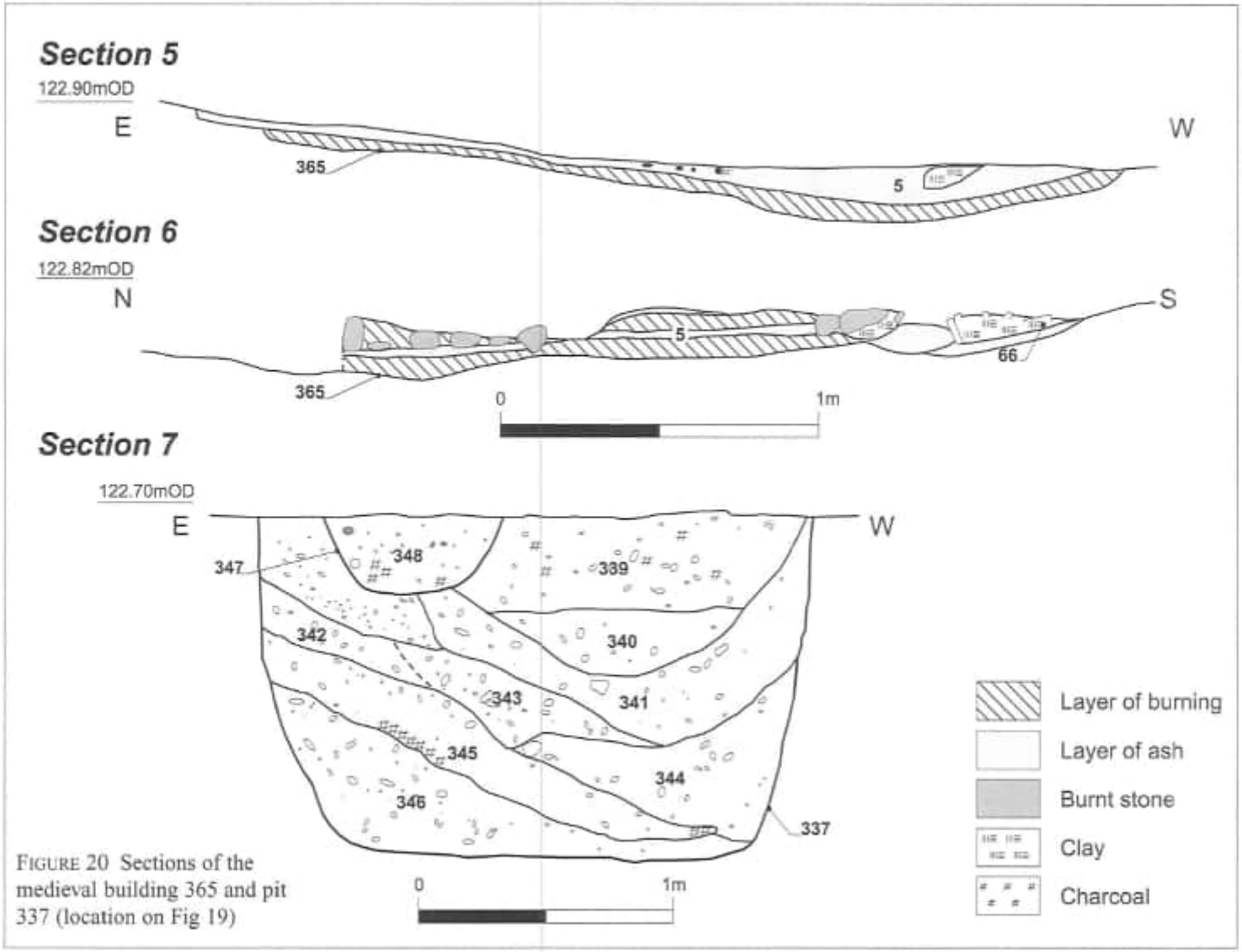


FIGURE 20 Sections of the medieval building 365 and pit 337 (location on Fig 19)

FIGURE 21 Medieval building 365 during excavation, showing the dark, burnt fills, looking south

FIGURE 22 The pitched-tile hearth, 66, within building 365

tained further Brill/Boarstall ware and sherds of Potterspury ware, dated to the late 13th century.

A broad pit to the east (190) was only 0.30m deep, with a fill of greyish-brown sandy clay with occasional flecks of charcoal. An adjacent pit (195) of similar depth was filled with charcoal-rich loam containing numerous pulses and grains, similar to charred plant debris from the nearby building (see Carruthers below). There were two other large pits. One of these (229), was 2.30m long by 1.40m wide and 0.40m deep, with a fill of greyish-brown sandy loam. The other (75) had clayey primary and upper fills, but the secondary fill contained charcoal.

Two smaller pits or large postholes (15 and 19) lay to the south, and pit (19) contained a quantity of roof tile (Fig 12, Section 13).

The well

A well (281) was constructed within the backfill of the former boundary ditch, 61 (Fig 19). The construction pit (52) was 5.00m in diameter and 1.80m deep, with a central shaft continuing below this. The wellhead, 2.20m in diameter, was lined with large limestone blocks. The stone-lined shaft was 0.90m in diameter (Fig 23). The upper part of the shaft was excavated until the inflow of water became too great, but auguring showed that it contained no organic fills and continued 0.95m below the current water table into the natural underlying gravels (*c* 119.90m OD). Half of the wellhead lining was later removed, see below, and the fill of the shaft was excavated. It contained a large quantity of reduced sandy wares, indicating that it had fallen out of use within the 13th century.

The late 13th-century boundary ditches

Two ditches (166 and 120) ran southward from the sunken-featured building (Fig 24). They may have overlapped with the later use of the building, but they were still open in the later 13th century when the building and pits had fallen out of use.

The western ditch (166) was 1.40m wide by 1.00m deep, with a U-shaped profile (Fig 25, Section 16). The eastern ditch (120) had a more complex history. It was recut (122) and may have formed a new boundary (Fig 25, Section 17). Both ditches terminated to the north above the filled-in cemetery boundary ditch. The western ditch was

FIGURE 23 The medieval stone-lined well, 281

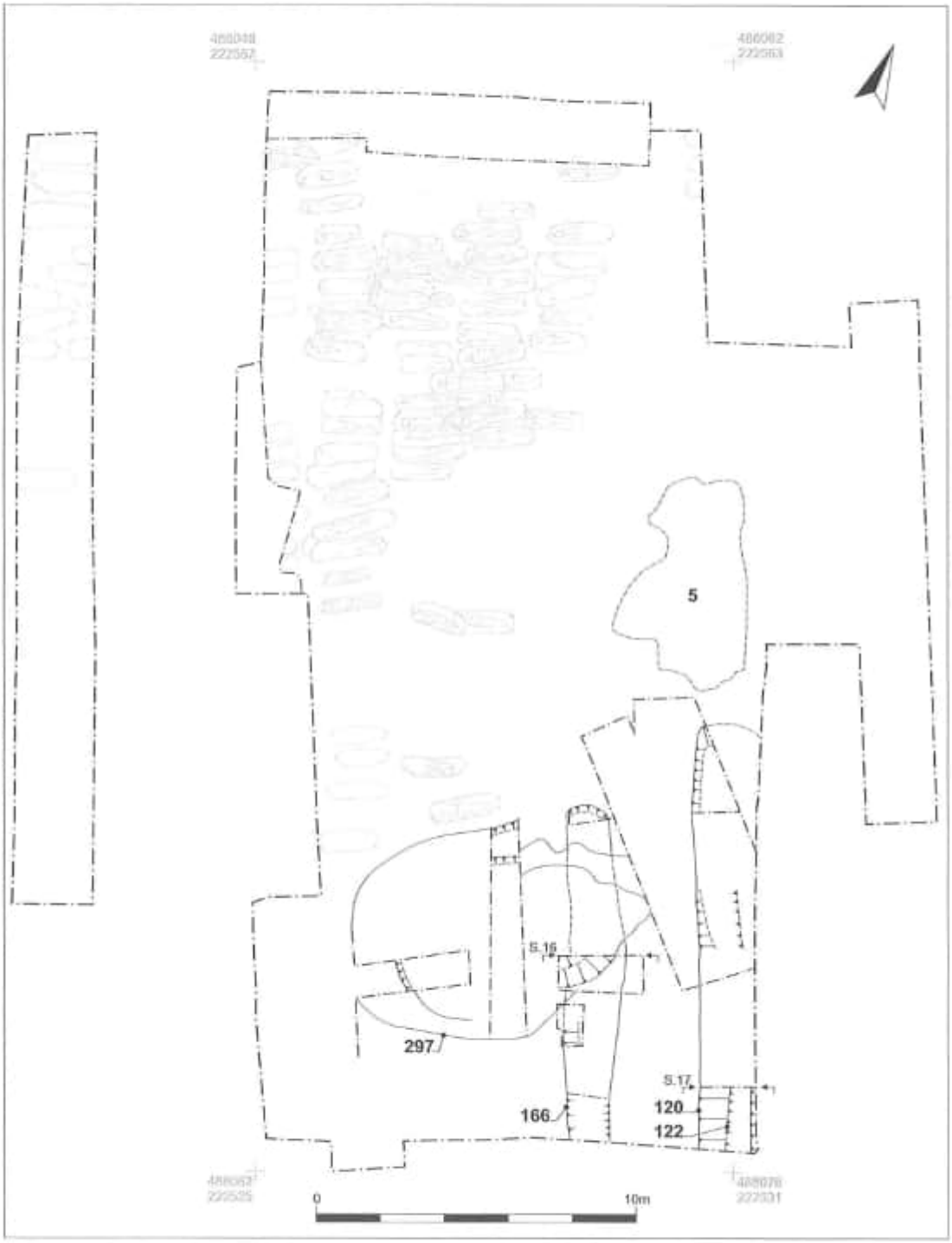


FIGURE 24 The late-medieval boundary ditches

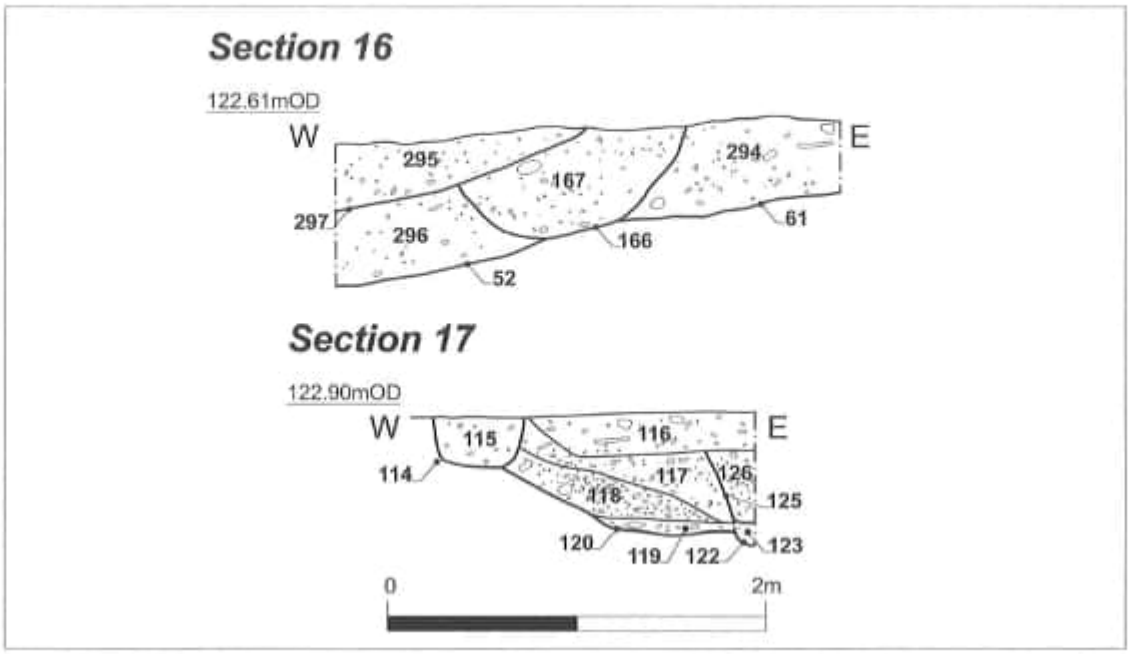


FIGURE 25 Sections of late-medieval boundary ditches (location on Fig 24)

cut by a large robber pit (297) excavated to enable the stone-lined wellhead to be removed (Fig 24 and Fig 25, Section 16).

THE LATE SAXON AND MEDIEVAL POTTERY by Paul Blinkhorn

All the late Saxon and later pottery are well-known types and have been recorded using the coding system employed by the Milton Keynes Archaeological Unit (eg Mynard and Zeepvat 1992; Zeepvat *et al* 1994). The following fabric types were noted:

St Neots Ware Type T1 (MK **SNC1**): *c* AD 900–100 (Denham 1985). Main forms small jars with sagging bases, a few lamps are known. 6 sherds, 23g, MNV = 0.06

St Neots Ware Type T2 (MK **SNC1**): Late Saxon-medieval *c* AD 1000–1200 (Denham 1985). Wheel-thrown. 1 sherd, 15g, MNV = 0.03

Cotswolds-Type Ware (MK **MSC1**): *c* AD 795–1150 (Mellor 1994) slow-wheel made. Mainly 'barrel' jars with triangular rims or more shouldered examples with high everted rims, bases usually sagging (Fig 26, 4). 119 sherds, 1462g, MNV = 0.96

Oxford Ware: *c* late 11th – 14th century (Mellor 1994) Hand-built and wheel-thrown vessels. Only jars, and no glazed vessels from this site, despite being common elsewhere. 9 sherds, 487g MNV = 0.09

Flint-Tempered Ware (MK **MS29**): 12th? – 13th century. Until now, only cooking pots known, but a jug handle occurs at Wing (Fig 26, 5). 2 sherds, 31g, MNV = 0

Brill/Boarstall Ware (MK **MC9**): *c* AD1200–1600? (Mellor 1994). Wheel-thrown. Applied rouletted strips common, sometimes in red-firing clay, rosettes and spirals also occur. Usually 'three-decker' or baluster jugs (Fig 26, 6), puzzle jugs also known. Jars, bowls etc at end of medieval period. Later vessels plainer, including full range of medieval and early post-medieval vessels types. 98 sherds, 1803g, MNV = 1.19

Grimston Ware: 13th – 15th century (Leah 1994). Wheel-thrown. Mainly glazed jugs (Fig 26, 7), plain (13th century) or highly decorated (14th century). Face jugs a speciality, highly decorated vessels often have painted and applied strips and scales with iron slip. 2 sherds, 143g, MNV = 0

Potterspury Ware (MK **MC6**): AD1250/75?-1600?. Wheel-thrown. (Fig 26, 8). Patchy glaze on exterior of jugs and interior of base of bowls, usually glossy green. Bowls often have incised wavy line, jugs finger-grooved on shoulder. Jars, bowls and pitchers common, but cisterns, cups, pipkins, costrels, bottles, chafing dishes, dripping pans and lids known from later kilns. 19 sherds, 988g, MNV = 0.36

Shelly Coarseware (MK **MC1**): AD 1100–1400. Hand-built/wheel-finished. Products of numerous known and many unknown kilns on the Jurassic limestone of west Northamptonshire and east Bedfordshire: virtually impossible to differentiate products of individual kilns. Full range of medieval vessel types, especially jars and bowls and 'Top Hat' jars. Rarely decorated, although rectangular-notched rouletting and wavy lines sometimes occur. Jug handles sometimes slashed, stabbed and/or with thumbed edges. Large storage vessels occasionally have thumbed or, rarely, rouletted/stamped applied strips (Fig 27, 9–11). 124 sherds, 2100g, MNV = 1.65

Minety-Type Ware: Limestone gritted glazed ware. Mid 12th-15th century (Mellor 1994). Manufactured in north-east Wiltshire, but with wide distribution across the south midlands. Wide range of domestic vessel types, including aquamaniles. 1 sherd, 8g, MNV = 0

Medieval Grey Sandy Ware (MK **MS3**): Mid 11th – late 14th century, common in assemblages in region during 12th-13th century. Possibly manufactured at Great Brickhill, Buckinghamshire. Jars, bowls, jugs and skillets known (Fig 27, 12–16). 1130 sherds, 15576g, MNV = 5.04

Catalogue of illustrated late Saxon and medieval pottery (Figs 26 and 27)

4. Cotswolds-type ware. Rim sherd from a jar. Dark grey fabric, leached and 'corky', orange-brown surfaces, sooting patch on outer rim.
   Grave G58
5. Flint-tempered ware. Greyish-orange fabric with dark grey surfaces.
   Pit 190
6. Brill/Boarstall ware. Handle and rim from jug. Grey fabric with buff surfaces, exterior glossy green glaze over vertical stripes of brown slip and body clay.
   Layer 204
7. Grimston ware. Rod handle from jug. Dark grey fabric with orange-brown surfaces and thin, patchy white slip, with poor quality sage-green glaze on outer face.
   Backfill of well robber pit 297
8. Potterspury ware. Full profile of large bowl. Brick-red fabric with grey core.
   Layer 204
9. Shelly Coarseware. Rim sherd from large jar. Orange fabric with grey core.
   Grave G59
10. Shelly Coarseware. Rim sherd from jug. Grey fabric with pale brown surfaces.
    Grave G58
11. Shelly Coarseware. Jug handle. Grey fabric with orange surfaces.
    Backfill 295 of well robber pit 295
12. Grey sandy Ware. Rim sherd from jar. Pale grey fabric with dark outer surface.
    Grave G59
13. Grey Sandy Ware. Rim sherd from jar. Uniform grey fabric.
    Ditch 61
14. Grey sandy Ware. Rim and handle from jug. Uniform grey fabric.
    Ditch 61
15. Grey Sandy ware. Rim and handle from jug. Uniform grey fabric.
    Ditch 61
16. Grey sandy Ware. Handle from jug. Uniform grey fabric.
    Pit 190

Chronology

The medieval assemblages have mainly been dated to the 12th and 13th centuries. The major medieval wares at the site, Reduced Sandy ware, Shelly ware and Cotswolds-type ware, can be dated to the 11th century or earlier, but the dearth of St Neots ware, which is common on sites of the 11th century in the south midlands, indicates that the medieval activity

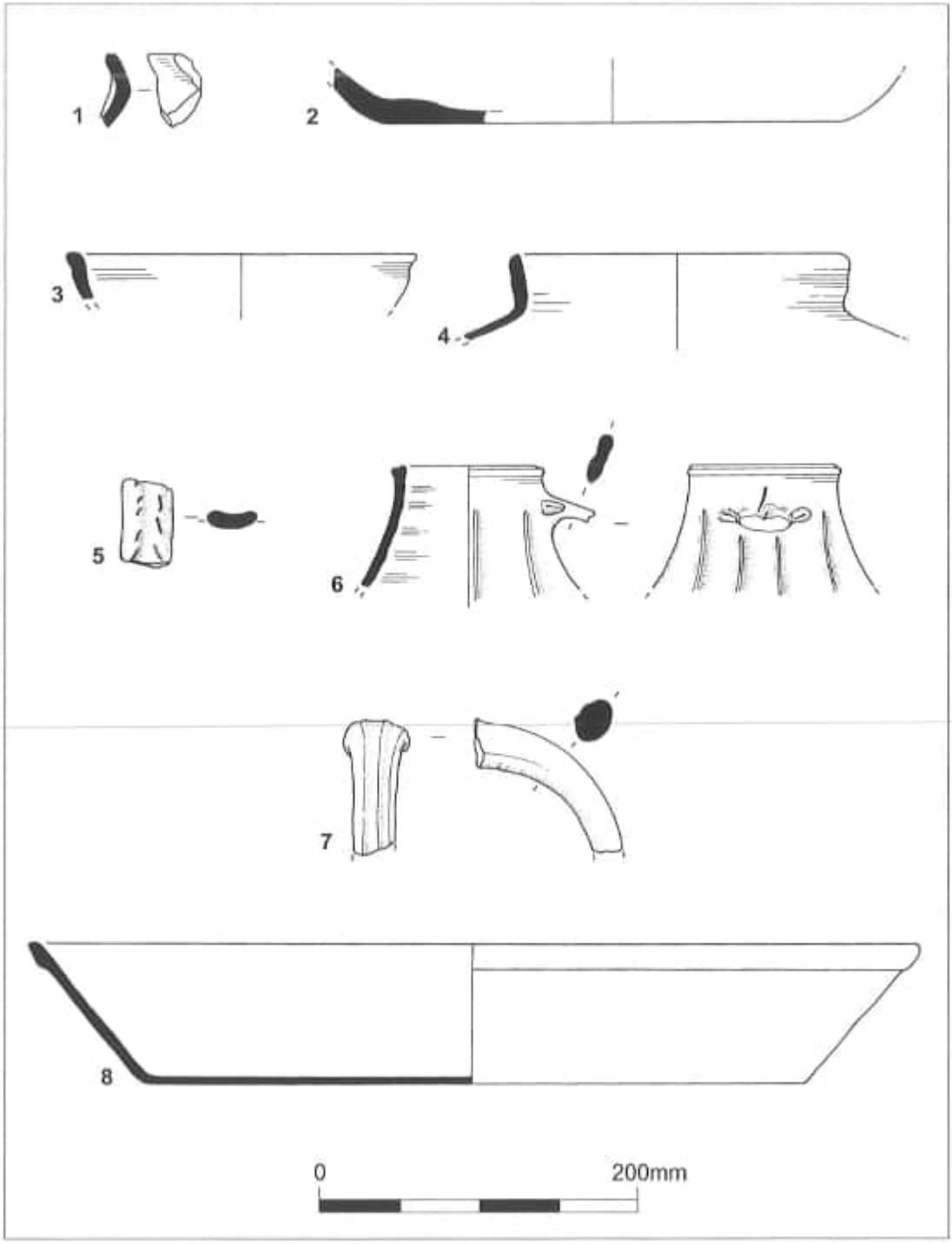


FIGURE 26 Early-Middle Saxon pottery, 1–3 and medieval pottery, 4–8

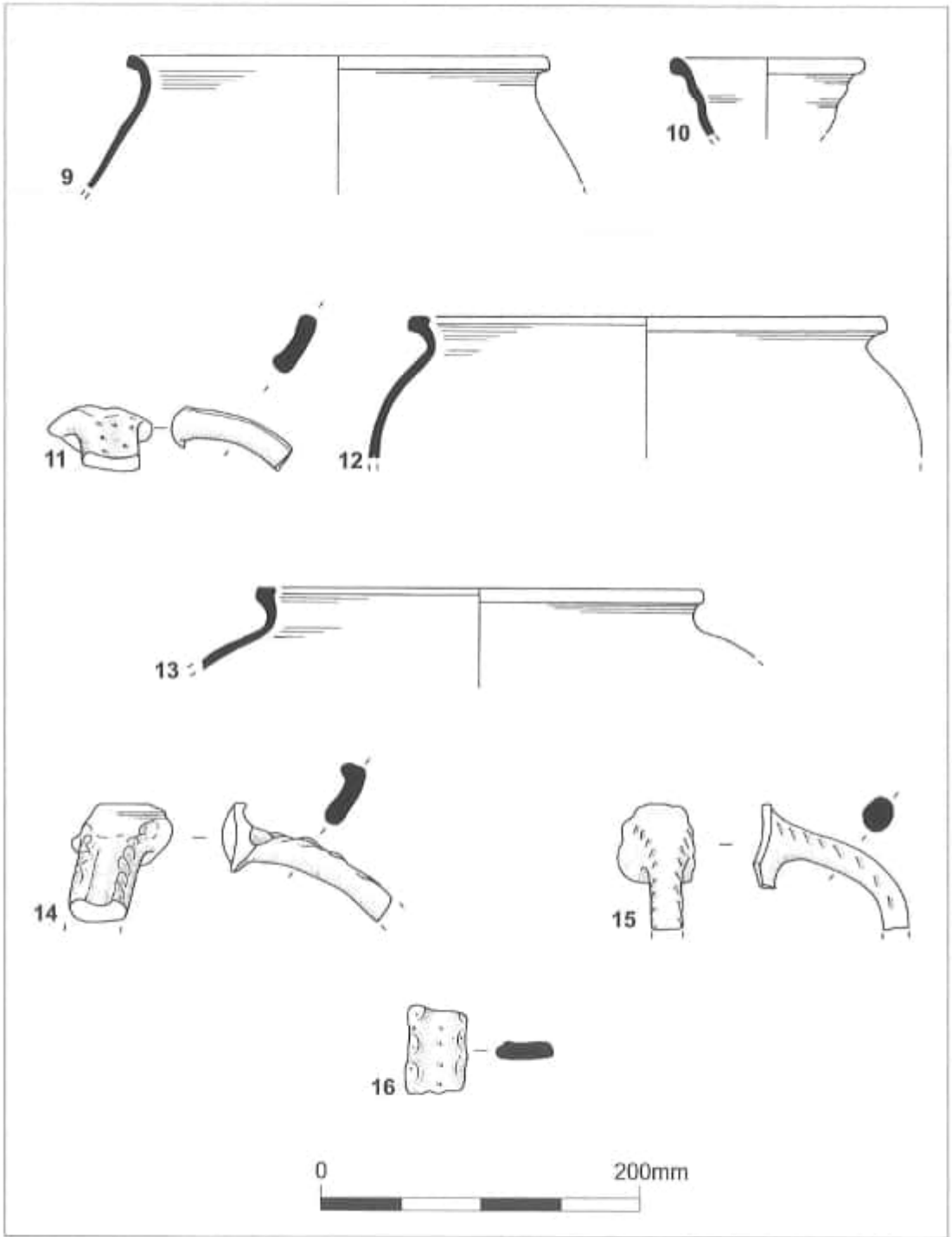


FIGURE 27 Medieval pottery, 9–16

began after that time and before the arrival of Brill/Boarstall wares in the 13th century. Certainly, the amount of Reduced Sandy ware present matches 12th- rather than 11th-century assemblages in the region. At Great Linford the material comprised 34% of the 12th-century assemblage and 45% of the 13th-century groups, but only 5% of the 11th-century material (Mynard 1994, 45). The 12th-century assemblages relate to the domestic activity that lay within the medieval cemetery. The pits that were contemporary with the sunken-featured building (365) also contained Brill/Boarstall wares, indicating a 13th-century date for the features post-dating the infilling of the cemetery ditch.

The dearth of Potterspury ware, which is common at sites in the area, is a good indication that activity had all but ceased by the beginning of the 14th century. At Bradwell Bury, Milton Keynes, it comprised 24% of the entire assemblage (Mynard 1994, 45). A single group may be of 14th-century date, based on the form of one of the Brill/Boarstall vessels present, and this came from a remnant soil layer (4), which overlay the burnt fills of sunken building 365.

Vessel Use

The earlier assemblage is dominated by jars, with bowls and jugs becoming commoner through time, a pattern that is fairly common on medieval sites. The complete lack of jars in the later 13th-century groups is due to the small assemblage size, as only two groups of pottery of that date were noted, one of which is rather small while the other is dominated by a single Potterspury bowl (Fig 26, 8) and large fragments of two Brill/Boarstall jugs (Fig 26, 6).

The Finds from the 13th-Century Building and Associated Features

by Tora Hylton and Pat Chapman

1. A mounted lock from the fill of ditch 120 is missing most of the lock plate but much of the internal mechanism survives (Fig 28, 1). It is a post-Conquest type, operated by rotating a key to lift the tumbler and throw the bolt (Goodall 1990, 1005). The X-ray shows that the plate was secured by round-headed rivets. The internal mechanism is corroded in the open position and comprises a hasp aperture, a sliding bolt (69mm long) with two projections on the underside, two U-shaped staples securing the bolt, a key-guard and a P-shaped spring/tumbler. The keyhole is not visible. The dating of locks excavated in London (Egan 1998, 104) suggests that those with P-shaped springs were in use in the late 13th -15th centuries (*c* 1270–1400).
2. Part of a stirrup came from the fill of pit 337. It has a sub-circular cross-section and a flattened footrest, which curves slightly upwards. Although incomplete, the angle of the side of the stirrup indicates that originally it would have been of trapezoidal form, most probably with a loop at the top for attaching the strap (Fig 28, 2). It displays similarities to a 14th-century example from London (Ward-Perkins 1940, fig 25, B3).
3. An iron arrowhead from building 365 has a triangular blade with the tip missing, perhaps as a result of damage through impact (Fig 28, 3). It has a triangular blade with flat cross-section and a slight thickening along the central rib. The socket is open almost to junction with blade. Arrowheads with relatively flat cross-sections were probably for use with a long-bow (Goodall 1990, 1070; resembling Jessop 1996, fig 1, Type MP 1 and Museum of London Type 2; Ward-Perkins 1940, fig 16). This type is generally classed as being used for both hunting and military purposes. They are found in contexts dating from the 11th –15th centuries, and similar examples have come from a 12th-century context at Goltho Manor, Lincolnshire (Goodall 1987, fig 160, 176) and a 13th/14th-century context at Winchester, Hamshire (Goodall 1990, fig 344, 3994).

A rim sherd from a limestone mortar, 220mm in diameter, from slot 160 in building 365, has a flat rim and the sides taper from top to bottom (not illustrated). The exterior appears to have eroded and the internal surface displays signs of extensive use. Of the nine nails from the building, most were probably from the timber superstructure. Seven are wedge-shaped with a tapering profiles (length: 31 - 40mm), a type which would have been hammered into wood to leave the head flush with the surface of a timber. Two nails were retrieved from the fill of the well. There are fragments from four grey and vesicular lava querns, which would have been imported from the Mayen-Niedermendig area of

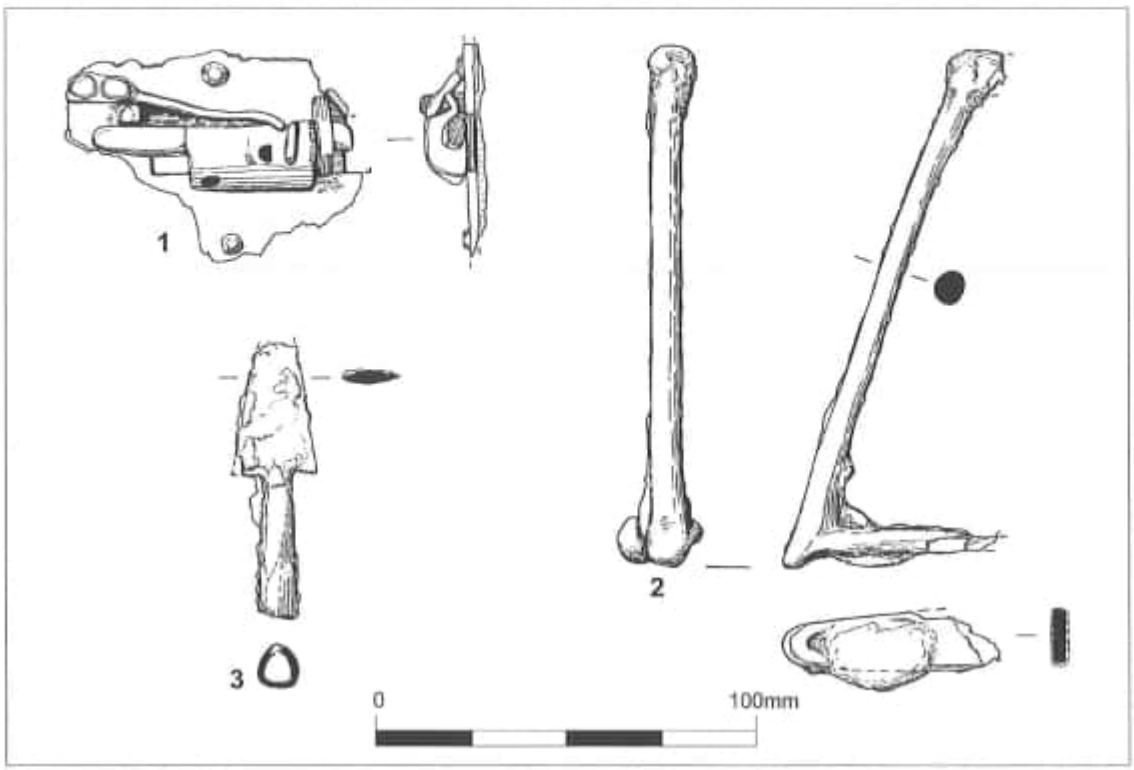


FIGURE 28 Medieval finds, 1–3

Eiffel, Germany. One piece is from a 12th-century context, two are from the backfill of the 13th-century well and one was unstratified. They comprise parts of an upper stone and a lower stone and two are too fragmentary to be determined. They are from stones 27–70mm thick and each has a single well-worn grinding surface, but no other distinguishing features are evident.

The medieval roof tile from the hearth (66)
by Pat Chapman

None of the roof tiles used to form the pitched base of the hearth (66) in building 365 was complete. They are typically 14–16mm thick and the three sherds with remnant peg holes indicate that they had paired holes, tapering from 14mm to 10mm in diameter, situated near the upper corners. The tile fabric and colour varies between hard, sandy dark red and slightly finer sand, orange to red brown, generally with fine inclusions but with occasional larger flint up to 5mm or bigger. Many of the tiles have traces of mortar adhering to them, indicating that they had been reused in the hearth, where they became burnt and blackened. There is also a single fragment of ridge tile in a dark red fabric, with the surface over-fired to a dull purple.

THE ANIMAL BONE FROM THE 13TH-CENTURY BUILDING AND ASSOCIATED FEATURES
by Philip Armitage

The hand-collected animal bone elements/fragments have been augmented by small bone elements/fragments extracted from sieved soil/environmental samples. For most periods there are only small quantities of bone, and only the material from the 13th-century building and associated features are considered in detail.

TABLE 5 Hand-collected animal bone (NISP)

Species	*No.*
horse *Equus caballus* (domestic)	0
cattle *Bos* (domestic)	58
sheep *Ovis* (domestic)	212
pig *Sus* (domestic)	16
red deer *Cervus elaphus*	0
goose *Anser anser* (domestic)	4
domestic fowl *Gallus gallus* (domestic)	5
Total identified	**295**
Unidentified mammal	**48**

TABLE 6 Animal bone from sieved soil samples (NISP)

Species	*No.*
cattle *Bos* (domestic)	2
pig *Sus* (domestic)	1
common shrew *Sorex araneus*	4
domestic fowl *Gallus gallus* (domestic)	3
cod *Gadus morhua*	2
herring *Clupea harengus*	13
eel *Anguilla anguilla*	5
perch *Perca fluviatilis*	1
frog *Rana temporaria*	4
Total identified	**35**
unidentified:	
mammal	213
bird (wild spp.)	7
fish	53
Total unidentified	**273**

Two sub-assemblages of bone extracted from sieved soil from the fill (194) of pit 195, are the remains of small wild faunal species (one mammalian and one amphibian), and provide a glimpse of the site environment. The *common shrew* is represented by an atlas vertebra, a scapula, an innominate bone and a femur. Based on the habits favoured by this animal; thick grassland and bushy scrub (Corbet 1977, 50), it indicates the presence of dense ground cover in the vicinity of the building. The pit presumably acted as a pit-fall trap into which this animal fell whilst foraging in the area and being unable to climb out, died there. At least two *common frogs* are represented by a skull fragment, two dorsal vertebrae and a urostyle. As discussed by O'Connor (2000, 17), frog skeletal remains may represent animals attracted by flies swarming around piles/deposits of organic refuse.

The main meat-yielding species in the food debris from the pit fills comprised beef as the dietary staple with pork of secondary importance and mutton/lamb making up the balance (by weight (1298g): cattle 74.1%; sheep 6.9%; pig 19.0%). The food debris from the well-fill (52) also showed beef as the principal staple meat, with mutton/lamb and pork consumed in lesser amounts (by weight (1278g): cattle 93.3%; sheep 3.8%; pig 3.1%). Consumption of at least one sucking pig is indicated by an immature mandible in pit 337. Intermixed with the food refuse in the well infill, were the skeletal remains of at least one adult horse (aged 11 – 12 years at time of death) – comprising a fragmented skull (including ten upper cheek teeth) and parts of the right and left lower jawbones (including five lower cheek teeth), and the shaft of a metatarsal bone. Small quantities of domestic fowl and goose were also present.

Both the pit and hearth deposits also provide evidence for diet diversity in the eating of a wide variety of both marine and freshwater fish; cod, eel, herring and perch (Table 7). Both dried cod and salted herring in the medieval period and "especially before 1350 [were] cheaper than meat and an important source of protein in the diet of the peasantry" (Woolgar 2000, 39) and preserved (salted) herrings in particular "rarely appear on the menus of the nobility" who instead preferred the more expensive freshwater fish and freshly caught marine fish (see Wilson 1989, 24). Although the eating of freshwater fish, such as the perch, was generally connected to high status in the medieval period owing to strict regulations against common folk exploiting these resources in rivers, streams and ponds, this stricture apparently did not apply to eels which were widely available (see Wilson 1976, 36).

In summary, the overall diet of the inhabitants who utilised the excavated building and the associated pits and the well may be described as one of solid sufficiency and diversity with nothing to suggest an impoverished situation or lifestyle. It is most likely that this derives from a household of reasonable wealth, which supports the interpretation of the excavated buildings as ancillary structures to a larger domestic focus.

TABLE 7 The fish bone elements from the 13th-century building and pits

Species	*Pit 195*	*Pit 337*	*Hearth 66*
Cod	2 caudal vertebrae	–	–
Eel	4 vertebrae	1 vertebrae	–
Herring	10 vertebrae, 1 scale	–	2 vertebrae
Perch	–	–	1 scale

THE CHARRED PLANT REMAINS FROM THE 13TH-CENTURY BUILDING AND ASSOCIATED FEATURES
by Wendy J Carruthers

Soil samples taken from the small timber building and from two nearby pits, were processed by Northamptonshire Archaeology staff using standard methods of floatation. A 250 micron mesh was used to retain the flots and a 1mm mesh was used to hold the residues. All five samples produced quantities of well-preserved charred plant remains, and have been fully analysed.

The sample from pit 195 was so rich in charred cereals that a sub-sample of a quarter by volume was separated off and fully sorted for charred remains, although the small, unidentifiable fragments of cereal grain were still too numerous to count. The presented results are therefore a gross underestimate of the actual number of grains present, although the relative proportions should be roughly correct (Table 8). The rest of the sample was rapidly scanned at low-power magnification for large economic plant remains, such as peas and beans, for chaff fragments and for additional weed taxa (Table 9).

In the presentation of the results, nomenclature and most of the habitat information follow Stace (1997).

State of preservation and identification

Most of the charred plant remains were well preserved, although vacuolation of the free-threshing wheat grains made them vulnerable to fragmentation, so accurate quantification was difficult. Many of the grains had also oozed sap and become crumpled during the charring, suggesting that they had fairly high moisture content prior to being burnt. There were no obvious signs of sprouting to suggest that the grain had spoilt during storage through being too moist. It is likely, therefore, that the grain had become charred fairly shortly after being harvested.

Free-threshing wheats – both hexaploid (bread-type wheat, *Triticum aestivum*-type) and tetraploid (rivet-type wheat, probably *T. turgidum*) free-threshing wheats were identified in the sample from pit 195 (Table 8). Judging from the diverse morphology of the wheat grains, both types of wheat were represented in at least two, if not all, of the samples. However, grain morphology is too variable to be used for identification purposes (Jacomet 1987). Several well-preserved rachis fragments from pit 195 confirmed the presence of both forms of wheat in roughly equal quantities. However, only a few rachis fragments were identifiable to species level, so it is not possible to be certain in what proportions the wheats were cultivated. In addition, it is possible that both species are not equally well preserved by charring.

The relatively recent development of identification criteria for tetraploid wheats (Hillman, in Moffett 1991) has lead to the gradual increase in sites producing this taxon, possibly from as early as the late Saxon period into the medieval period. The main concentration of sites is in the midlands, and these are usually 12th to 14th-century in date. In most cases, both bread-type (*T. aestivum*-type) and rivet-type (*T. turgidum*) wheats were being cultivated.

Burnt material from hearth 66 within building 365

Samples from beneath (221) and from the centre (61) of the hearth, produced the fewest cereal grains and legumes and the highest proportion of weed seeds (Tables 8 and 9). The dominant weed taxon in both was medick - fragments of veined pod adhering to a few of the seeds suggested that black medick (*Medicago lupulina*) was the species present. This is a common weed of grassy places and rough ground.

Since several of the other weed taxa present occupy a similar range of grassy, disturbed habi-

tats, these remains may represent burnt hay that had been used as tinder to start fires. The very small seeds of medick may have fallen through cracks in the hearth and accumulated beneath it, after being burnt from their pods. The few cereal grains and possible peas from both samples could have been thrown on the fire as waste.

Burnt material from building 365

The sample from lenses of burnt material (69) within the sunken-featured building produced a large quantity of free-threshing wheat, mixed with small amounts of barley, oats and rye, a little chaff and several weed seeds (Table 8). This sample was much less pure than the sample from pit 195, as the following figures show:

Percentage of wheat:barley:oats:rye:

79:3:12:6	Ash (69) in building 365
97:1:1:1	Pit 195

Ratios of cereal grains: legumes: chaff: weed seeds

134: 4: 1: 21	Ash, building 365
118: 1: 3: 9	Pit 195

Rivet-type wheat was positively identified from this sample. The few rachis fragments present did not display the characteristics of bread-type wheat, but this is probably due to poor preservation, and it is considered likely that both taxa would have been present.

There would have been several benefits to growing both types of free-threshing wheat. The differences in their growth habits, such as the very long straw of rivet-type wheat (useful for thatching), its awns (offering protection from birds), later date of maturing and resistance to several diseases (Percival 1948), would have allowed farmers to 'hedge their bets' if both crops were grown in a single year. Percival (*ibid*) suggests that most rivet wheats are only hardy enough to survive winter in southern England, but that they can be the most productive of all of the wheats. The uses to which the two cereals were put would probably have been different, as bread-type wheat has a high gluten content which gives a much lighter loaf of bread, whilst rivet-type wheat is much more suitable for making biscuits. It seems to make more sense, therefore, to keep the crops separate rather than growing them as a maslin, due to the mixed tiller height, time of maturation and culinary properties of a maslin. It is possible that rivet was grown on the heavier ground and in places that lodging and birds were a problem, such as by hedgerows and on windy ridges, whilst bread wheat was grown on the more favourable ground.

Smaller quantities of hulled barley, oats and rye were recovered from the more productive samples, providing evidence of minor crops which may have been grown more for fodder than for human consumption. A few grains from these crops are often found even in fairly pure grain deposits, because volunteer plants can grow on in a crop of wheat as relicts of earlier crops. The flour from some of these crops, however, may have been used to make bread in poor years, or mixed in with wheat flour. It is interesting to note figures quoted by Percival (1948) for bread consumption in the 18th century in southern England; 89% ate wheat bread, 9% ate rye bread and 2% ate barley bread. In some parts of England and Wales the consumption of other grains was much greater, as the national average was only 63% for wheat bread. The growing of rivet wheat in southern England may have played some part in this increased consumption of wheat.

Peas (cf *Pisum sativum*) and field beans (*Vicia faba* var. *minor)* were notably frequent in this sample. Charred peas and beans are usually only found in small quantities as, unlike cereals, they do need to come into contact with fire during their processing. Where a large number of legumes are preserved by charring it is likely that either an accident has occurred or a crop has been deliberately destroyed due to pest infestation or disease.

Legumes are useful crops not only because they are a valuable source of protein and store well, but also because they often possess nitrogen-fixing bacteria in their root nodules and so can help to restore soil fertility when included in a crop rotation program. It has long been noted that legumes became especially important from the Saxon period onwards, but recent excavations in Saxon Hamwic, which produced both mineralised faecal and charred deposits, have demonstrated that their importance is even more under-represented in charred assemblages than was originally thought (Carruthers, in preparation). This is also likely to be true for the medieval period.

The fairly high proportion of weed seeds recovered from this deposit is mainly attributable to the

large number of small vetch/tare (*Vicia/Lathyrus* sp.) seeds present (Table 9). Unfortunately this group of taxa is difficult to identify unless hilums are present, and in this sample only a few seeds were identifiable as cf. hairy tare (*Vicia* cf. *hirsuta*), a common annual weed of rough ground and grasslands. Therefore, there is no clear evidence for the cultivation of common vetch (*V. sativa*) as a fodder crop on this site, unlike other medieval rural sites in southern England, eg Eckweek, Avon (Carruthers 1995). Cultivated vetch seeds are larger than most of the seeds found in this assemblage, so, despite the lack of identifiable characters it is unlikely that a crop plant is represented. As with peas and beans, vetches are useful as part of a crop rotation program, so it is possible that their presence as a weed of arable was tolerated, since their seeds are edible and the roots may help to restore fertility to the soil. Wild annual vetches such as hairy tare, may survive quite well as arable weeds, particularly if crop rotation is practiced including a period of fallow.

Pit 195

This sample came from a charcoal lens in the fill (194). This exceptionally productive sample (988 fragments per litre, Tables 8 and 9) consists of a fairly clean deposit of burnt free-threshing wheat that includes both bread-type wheat and rivet-type wheat in apparently equal quantities. Since only a few of the rachis fragments were identifiable to this level, no great emphasis should be placed on the proportions of each taxon. The fact that both taxa are present, however, is of interest because it either means that the two wheats were being grown as a maslin after all (which does not seem to be a useful practice), or that the deposit consists of a mixture of burnt wheat crops (which is not the most obvious explanation for a lens of clean grain in a pit). Perhaps the processed crops were being stored close to each other before being accidentally burnt, or the remains originated from an oven being used to dry both types of wheat.

Peas and field beans were frequent in this sample as in the sample from within the building (365). It is possible that this rich lens of charred crop plants had come from the building.

As with the sample from the building, small-seeded weed vetches/tares were the most frequent crop contaminants. Larger seeded vetches (3–4mm) were more frequent in this sample, including a possible cultivated vetch seed (*Vicia* cf. *sativa*). There is tentative evidence in this sample, therefore, that vetches were being cultivated for fodder. The few other weed taxa present were typical weeds of cultivated and disturbed soils, including the arable weed cornflower (*Centaurea cyanus*), corn cockle (*Agrostemma githago*) and an indicator of heavy, damp soils, stinking mayweed (*Anthemis cotula*).

Pit 337

As the full flot was not available for study, little can be said about the sparse remains of 37 grains that had been sorted from the flot (not tabulated). Slightly more were from oat than wheat, and rye was also identified. No chaff was present, and only a few vetch/tare and possibly large legume fragments were recorded. It is possible that some smaller items were lost with the flot, so this record should be considered incomplete.

General conclusions and comparisons with other sites

Although only a few samples were examined from this site, the good preservation in the samples from building 365 and pit 195 make the results significant. The assemblages have provided a useful record that is typical of medieval rural sites in southern and central England, eg Eckweek, Avon (Carruthers 1995). Both bread-type and rivet-type free threshing wheats were the principal crops grown, with smaller amounts of barley, oats and rye being used as fodder and probably also for human consumption in leaner years. Peas and beans were important additions to the diet, and fodder vetches may have been grown. Although it is difficult to prove, crop rotation involving cereals, legumes, vetches and fallow periods were probably in operation. There is little evidence for the exploitation of wild hedgerow fruits and nuts from this site, since only three fragments of hazelnut shell were recovered from one sample. Unless fruit stones and nutshells have been burnt in domestic hearths, the chances of finding evidence for this aspect of the diet in charred assemblages are not good. Some sites that produced larger numbers of samples, such as Eckweek, Avon, have provided evidence that wild foods were important to the rural economy. Imported luxury foods, however, tend to be much more rare.

TABLE 8 Charred plant remains (cereals, legumes and chaff)

TAXA	*Context –* *Feature –*	*61* *Hearth* *66*	*221* *Hearth* *66*	*69* *Ash in building*	*194* *Pit* *195*
Cereals and legume crops					
Triticum aestivum-type/*turgidum* (free-threshing wheat grain)		25	8	652	1809
Hordeum vulgare (hulled barley grain)		–	3	27	15
Avena sp. (oat grain)		7	7	95	26
Avena/Bromus sp. (oat/chess grain)		–	–	–	4
Secale cereale L. (rye grain)		–	–	47	21
Indeterminate grains		9	46	917	365
cf. *Pisum sativum* (cf. pea seed)		5	3	42	8 [16]
Vicia faba var. *minor* (field bean seed)		–	–	13	11 [42]
Chaff		–	–	–	
Triticum turgidum-type (rivet–type wheat rachis fragment)		–	–	2	8 [17]
Triticum aestivum-type (bread-type wheat rachis fragment)		–	–	–	9 [17]
Triticum aestivum-type/turgidum (free-threshing wheat rachis frag.)		–	2	7	26 [42]
Hordeum sp. (barley rachis)		–	–	1	1
Secale cereale (rye rachs frag.)		–	1	2	–
Cereal-sized culm nodes		–	2	1	6

KEY
[ ] = number in whole 10 litre sample (quarter sampled, remainder scanned)

A POST-MEDIEVAL DITCH AND PIT, 1500–1850 AD

The medieval settlement had been abandoned by the end of the 13th century, although the presence of a little 14th-century pottery in a soil horizon over the levelled building suggests that the adjacent domestic focus continued in use for a while. Through the remainder of the 14th century and the 15th century there was no direct activity within the excavated area.

In the 16th century, a shallow boundary ditch ran east-west across the northern part of the site, 4.0m south of the current churchyard boundary. It may perhaps have been related to a hedged boundary. A large pit cutting the boundary ditch contained the articulated part-skeletal remains of a calf.

All of these features were overlain by a layer of brown sandy loam which covered the entire site, and presumably represents the accumulation of subsoil during through the post-medieval period when the site was apparently given over to pasture. A George I farthing, dated 1724, was found within the topsoil.

THE SCHOOL, LATE 19TH TO 20TH CENTURIES

A school was built on the site in the late 19th century, and stood until the 1990s when it was demolished to make way for new housing development.

Prior to excavation, the site had been levelled and cleared of building remains, although a few remnants of walls, a cellar and two brick-lined wells were found during excavation.

TABLE 9 Charred plant remains (weeds)

TAXA	*Context –* *Feature –*	*61* *Hearth* *66*	*221* *Hearth* *66*	*69* *Ash in building*	*194* *Pit* *195*
Weeds					
Ranunculus acris/bulbosus/repens (buttercup achene) DG		2	1	1	–
Corylus avellana L. (hazelnut shell fragment) HSW		–	–	3	–
Atriplex patula/prostratee (orache seed) CD		1	2	–	1
Chenopodiaceae (embryo) CD		–	–	1	–
Agrostemma githago L. (corn cockle seed) A		–	1	–	2
Polygonum aviculare L. (knotgrass nutlet) CDo		1	1	1	1
Fallopia convolvulus (L.) A.Love (black bindweed achene) AD		1	–	–	–
Rumex acetosella L. (sheep's sorrel achene) CEGa		–	1	4	–
Rumex sp. (dock achene) CDG		4	13	22	12
Viola sp. (violet seed) GSHW		1	–	–	–
Raphanus raphanistrum L. (wild radish capsule frag.) CD		–	–	3	–
Vicia cf. *hirsuta* (L.)Gray (hairy tare seed) DG		1	1	3	–
Vicia/Lathyrus sp. (small-seeded vetch/tare, c.2mm) CDG		9	10	112	88
Vicia cf. *sativa* (common vetch seed)		–	–	–	1
Vicia/Lathyrus/Pisum sp. (vetch/tare/pea seed, 3–4mm) CDG		6	–	–	25
Pisum/Vicia/Lathyrus sp. (large seeded legume frag.) CDG		–	–	86	27
Medicago lupulina L. (black medick seed + pod frag.) DG		–	18	–	–
Medicago sp. (medick seed) DG		78	466	8	4
Bupleurum rotundifolium L. (thorow-wax mericarp) Ac		–	1	–	–
Stachys sp. (woundwort nutlet) DGHW		–	1	–	–
Plantago lanceolata L. (ribwort plantain seed) Go		–	–	2	–
Rhinanthus sp. (yellow rattle seed) AG		–	1	–	–
Galium aparine L. (cleavers nutlet) DH		–	4	–	–
Centaurea cyanus L. (cornflower achene) A		–	1	–	1
Centaurea/Cirsium/Carduus sp. (knapweed/thistle achene) DG		–	2	–	–
Anthemis cotula L. (stinking mayweed achene) ADh		–	–	3	[+]
Eleocharis subg. *Palustres* (spike-rush nutlet) PMd		–	–	1	–
Carex sp. (trigonous sedge nutlet) GM		–	1	6	–
Carex sp. (lenticular sedge nutlet) GM		–	1	4	[+]
Bromus sect. *Bromus* (chess) CG		5	2	15	1
Poaceae (indeterminate grass caryopsis) CDG		1	3	3	–
TOTAL		156	603	2084	2472
Sample volume (litres)		10	20	20	2.5 [10]
Fragments per litre		15.6	30.2	104.2	988.8

[+] = present in scanned material

Discussion

The excavated corner of the cemetery served Wing church in its role as a Saxon minster and subsequently in its Saxo-Norman parochial role. Burial commenced in the excavated area around the middle of the 8th century, perhaps only a few decades after the establishment of a stone-built minster church in the early 8th century. Initially the church would have exercised its monopoly on soul-scot, attracting burials from a wide area, and the area immediately south of the church must have filled quite rapidly, possibly due to the early development of the site as a cult centre. As areas to the south and east of medieval churches were most favoured for burial (Rodwell 1989, 146), to accommodate more there was an expansion south towards the churchyard boundary ditch.

Medieval statutes required cemeteries to have defined boundaries: a ditch or bank, a wall or hedge, primarily to prevent animals from wandering in and disturbing the burials (Daniell 1997, 110), and early royal minsters, such as Aylesbury, were often located within their own precinct enclosures (Blair 1988, 44). The initial success of the ditched boundary at Wing in excluding the secular world may be indicated by the absence of late Saxon pottery from the site.

Since Wing is likely to have been a minster church, in the middle and late Saxon periods it would have been drawing burials from a wider region than it would as a simple parochial church. This may be reflected in the excavated burials, where at least a half of the adults were interred in wooden coffins, indicating that they were from families of some status. These individuals were also of considerable physical stature and enjoyed a relatively long life compared to those in contemporary urban cemeteries. This suggests that the importance of the church was such that much of the available space in the desirable southern part of the cemetery, right out to the churchyard boundary, was the resting place for people of more than average wealth.

The decline in the use of the south-eastern corner of the cemetery in the post-Conquest period may reflect a change in the fortunes of the church. This was probably a result of the Norman rejection of the sainthood of the individual venerated at Wing; part of a widespread re-assessment of local saints and cult sites (Hadley 2001, 40). With the church reduced to being an ordinary parish church, and attracting only local burials, the focus for burial may have shifted to a reuse of the core area nearer the church. The well-organised row structure at the margins was ignored as it was redundant and unnecessary, in an area that became a neglected corner of a churchyard perhaps now too big for its church. As a result this corner only attracted the occasional isolated burial and a small family plot.

As a consequence of this neglect, a few secular features and a small building were allowed to encroach on the margins of the churchyard, at least where there were no evident graves. Buildings within churchyards were not unknown and might include houses for priests, bakehouses or residences for the religious such as anchorites or other contemplatives (Hadley 2001, 176). However, secular use of space in cemeteries was frowned upon although it clearly happened quite frequently as this was recognised as an increasing problem in the Middle Ages (Daniell 1997, 112–13).

By the mid-13th century the cemetery boundary ditch had been abandoned, and the cemetery evidently contracted northward, probably to the present day boundary. This allowed further secular use of the area. Expansion into former church land was not uncommon. At Addingham in Yorkshire, where the cemetery went out of use in the 11th - 12th centuries, the manorial centre spread over the former burial ground (Adams 1996).

The sunken-featured building at Wing was a minor structure, but it probably formed part of the kitchen provision to a substantial adjacent residence. A comparable small building, also with a hearth, is known from Olney (Thorne and Walker 2003, 47) and Building 2 at Bradwell Bury, Milton Keynes (MK623), although smaller, had similar burnt debris within it (Mynard 1994, 9). It is suggested that these deposits derived from the use of the building as a drying or smoking house. At Wing, the food debris from the deposits within the building and the nearby pits comprised carbonised cereals and legumes, and also a range of marine and freshwater fish. The larger animal bones came from cattle, sheep and pig as well as some geese and domestic fowl. The range and the nature of the food stuffs indicate that the occupants of the area enjoyed a diverse diet, and a relatively high status would also be suggested by the stirrup.

By the early 14th century this former part of the cemetery was largely abandoned, perhaps as a

result of the contraction or abandonment of the adjacent residence, and was to remain neglected or pasture until the expansion of local settlement in the 19th century and the construction of the school.

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Appendix: The Human Bone
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The results of the anatomical and palaeopathological examination of the skeletal material are presented and, as far as the evidence permits, interpretations are provided. References have been kept to a minimum, with emphasis on more general works wherever possible to provide accessibility to interested non-specialists. A full paper archive of the observations and numerical data will be held in the project archive.

Structure of the population

The excavated material comprises 77 complete or partial individuals. In addition there were fragments of up to 26 other individuals which were so incomplete that age and sex was often impossible to diagnose.

The preservation of the skeletons was in general good enabling accurate and relatively detailed analysis. Some skeletons had, however, suffered damage from the construction of the overlying former school resulting in fragmentation of many limbs and the more delicate bones such as the skull, the ribs and the pubic symphysis. Many also showed erosion or loss of bone extremities, reducing the extent and value of detailed metrical analysis.

Gender was determined morphologically according to six cranial markers (Buikstra and Ubelaker 1994): the brow ridge, the orbital margin, the mastoid process, the nuchal crest, the angle of the mandible and the mental prominence. These cranial markers were used in conjunction with two pelvic criteria: the greater sciatic notch and the sub-pubic angle. Additional reliable markers were found in the diameter of humeral and femoral heads (Bass 1987). Only in four very incomplete skeletons was sexing impossible; they were recorded as indeterminate.

Of the 76 identifiable individuals 63 (82.8%) were adults, with 28 females (36.8%), 31 males (40.7%) and 4 adults of indeterminate sex (5.2%). There were 13 (17.1%) sub-adults with ages ranging from 1 to 16–18 years (Table 1). Skeletons of very young infants were absent, indicating that they had been buried elsewhere within the cemetery.

Four criteria were used to age adults: dental attrition (Brothwell 1981 and 1989); morphological changes in the pubic symphysis (Todd 1921; Katz and Suchey 1986) and the auricular surface (Lovejoy *et al* 1985; Meindl and Lovejoy 1989) of the pelvis; and cranial sutural obliteration (Meindl and Lovejoy 1985). Fusion of the epiphyses and dental eruption (Ubelaker 1989) were used to age individuals below the age of 18 years. In almost all cases it was possible to apply more than one ageing method to each skeleton, thereby avoiding reliance on a single age determinant.

The age distribution of the population (Table 2) indicates the most common age of death was 35–40, but there is a relatively even distribution through the ages of 30–50, with a minority of the population surviving beyond this (4/76, 5.2%). One curiosity is the absence of younger women in the age range 18–30, where there might have been

Table 1 Structure of the population by gender

Gender	*Female*	*Indet.*	*Male*	*Juveniles*	*Total*
Number	28	4	31	13	76
(percentage)	(36.8%)	(5.2%)	(40.7%)	(17.1%)	

TABLE 2 Age distribution of the population

Age	*Total (%)*	*Male*	*Female*	*Ind*
0–18	13 (17.1)	–	–	–
18–25	1 (1.3)	1 (3.2)	–	–
25–30	2 (2.6)	2 (6.4)	–	–
30–35	11 (14.4)	5 (16.1)	6 (21.4%)	–
35–40	15 (19.7)	9 (29.0)	6 (21.4)	–
40–45	11 (14.4)	6 (19.3)	5 (17.8)	–
45–50	10 (13.1)	5 (16.1)	5 (17.8)	–
50+	4 (5.2)	3 (9.6)	1 (3.5)	–
Adult	9 (11.8)	–	5 (17.8)	4 (5.2%)
Totals	76	31	28	4

expected to be a significant number dying in or as a result of childbirth. As with the absence of infant burials, this might indicate that this group had been buried elsewhere.

The ages of the 13 juveniles were estimated by dental eruption, long bone diaphyseal length and epiphyseal fusion (Brothwell 1981; Bass 1987; Scheuer and Black 2000). As with the adults more than one method was used for each skeleton if preservation permitted. This shows a general spread through the years 1–18, but an absence of infants dying at around birth or in the early months, and only two examples less then 6 years old would also be less than would be expected in a population at this period (Table 3).

TABLE 3 Age at death of juveniles

Individual (burial number)	*Age at death (years)*
G77	1
G52	2
G8	6–8
Inhumation II	8
G48	10
G73	10–11
G45	11
G71	12
G70	13
G16	14–15
G66	15
G25	16–18
G17	juvenile

Metrical and non-metrical analysis

Stature

The stature of the adults has been estimated using the regressive height formulae of Trotter and Gleser (1958). However, as the long bones of many skeletons were fragmented, making precise indication of height impossible, only 29 individuals, 18 male and 11 female, were measured (Table 4). The femur was used in preference but other bones such as the tibia and the humerus were used when the femur was too damaged.

TABLE 4 Stature estimates for adult males and females

Gender	*Male (18) m (ft ins)*	*Female (11) m (ft ins)*
Average	1.76 (5' 9.25")	1.63 (5' 4")
Tallest	1.92 (6' 3.5")	1.69 (5' 6.5")
Smallest	1.62 (5' 3.75")	1.53 (5' 0.25")

Non-metric variations

Non-metric variations (NMV) or traits, are anatomical variations which are congenital but not pathological. Their aetiology is partly genetic and partly the result of non-genetic factors such as nutrition and body size (Berry and Berry 1967; Finnegan 1978; Rösing 1984; Hauser and De Stefano 1989). Their genetic component means that to some extent they represent the degree of genetic variability in a population. In isolated communities, such as islands, particular traits can become unusually common (Miles 1989). The most strongly geneti-

cally determined traits can in some cases be used to establish family links (Rösing 1986). The non-metric traits found in Wing, as identified from descriptions in Brothwell (1981) and Mays (1998), are tabulated in order of highest to the lowest incidence (Tables 5 & 6).

TABLE 5 Incidence of post-cranial non-metric variation

Post-cranial, non-metric variation	*Incidence*
Talar facets	23
Calcaneal facets (x 2)	21
Poirier's facet	19
Acetabular crease	15
Vastus notch	5
Septal aperture	5
Sternal aperture	1
Third trochanter	1
Os trigonum	1
Posterior atlas	1
Lateral atlas	1
Supra-scapular foramen	1
Extra lumbar (L6)	1
Unfused sternal segment	1

TABLE 6 Incidence of cranial non-metric variation

Post-cranial, non-metric variation	*Incidence*
Wormian bones	15
Parietal foramina	9
Supra orbital foramen	9
Mastoid suture	5
Torus maxillaris	5
Torus mandibularis	4
Torus palatinus	3
Extra cusps molars	3
Frontal foramina	2
Zyg-facial foramina	1
Enamel pearl	1
Infra-orbital foramen	1
Shovel-shaped incisor	1

Palaeopathology

Paget's Disease (also known as osteitis deformans)

One case of Paget's disease (G57, adult male, aged 50+) was diagnosed. Paget's disease is caused by an imbalance in the activity of osteoclasts and osteoblasts. As a result, the bones are thickened and seemingly paradoxically, weakened, making them prone to fractures. The disease affects predominently those in middle age or older (Wells and Woodhouse 1975; Stirland 1991; Meunier1998).

Hypertrophic Osteoarthropathy

Three cases (G14, male, 35–45; G22, male, 25–30 and G54, male, 45–50) were diagnosed as being consistent with hypertrophic osteoarthropathy (also known as pulmonary hyperostosis or pulmonary osteoarthropathy) as described by Rothschild and Rothschild (1998). It is present as symmetrically distributed subperiosteal new bone deposits on long bones. It occurs in association with chronic chest disease, both pulmonary and cardiovascular. Its presence shows a strong correlation with a history of chronic chest infection (e.g. tuberculosis) in skeletons of recent date, where the medical history of the individual is known. In archaeological and recent material it may occur concurrently with subperiosteal bone deposition on the visceral aspect of the ribs. This change too has been proposed as an indicator of chronic chest disease (Ortner and Putschar 1981; Wakely *et al* 1991; Rothschild and Rothschild 1998).

Osteoporosis

There were three suspected cases of osteoporosis; a condition, often age-related, where bone mass is reduced, with decreased cortical thickness and a decrease in the number and size of the trabeculae of cancellous bone (Roberts and Wakely 1992; Roberts and Manchester 1995). The result is an increased incidence of fractures. The lumbar vertebrae of one of the suspected osteoporotic individuals (G10, probably female, 45+) were sent to the Department of Rheumatology at the Leicester Royal Infirmary to be DEXA scanned, where the diagnosis was confirmed.

Periostitis

It is still a matter of debate as to what causes periostitis. It is seen as a fine layer of new bone on

the outside (subperiosteal) surface of the affected bones. The tibia is the most frequently involved bone. It has been regarded as a consequence of lack of vascularisation (Roberts and Manchester 1995) which could be caused by a chronic disease, or poor circulation due to cold and damp conditions. Tibial periostitis can also be caused by diseases, for example hypertrophic osteoarthropathy (see above), leprosy and syphilis, or by minor trauma where bone lies close to the skin. Among the Wing skeletons 17 individuals (17/50, 34% of identifiable adults) showed mild to moderate tibial periostitis. Two other skeletons had periostitis and bone resorption in the hand (G9, male?, 35–40) or the foot (G38, male, 35–45) bones. While such changes can occur in leprosy this diagnosis could not be confirmed.

Cribra orbitalia

Twelve individuals showed evidence of cribra orbitalia. The lesion appears as a perforated area in the eye socket, and is caused by the body attempting to increase its red blood cell count by expanding its bone marrow. The lesion is a response to anaemia which occurs when the quantity or quality of red blood cells which carry oxygen throughout the body drops. Amongst the most common causes of anaemia are lack of iron in the diet (insufficient green vegetables or red meat), continual loss of blood, from for example parasite infections, or chronic diarrhoea which may prevent the absorption of iron from food (Stuart-Macadam 1991). At Wing a third of adults presented with cribra orbitalia (10/33, 30%: 5 male and 5 female, all aged over 35), and two juveniles (G16, age 14–15 and G71, age 12).

Enamel hypoplasia

This presents as lines which are visible to the naked eye on teeth (usually incisors and canines) due to deficiency in the structure of the tooth enamel. Each line represents a halt in growth due to extreme stress on the body, usually an acute infection during childhood. Therefore the incidence of enamel hypoplasia gives us a good estimate of the prevalence of childhood infectious diseases in a community (Roberts and Manchester 1995; Wakely, James and Morgan in press).

In the collection 17 individuals showed evidence of having enamel hypoplasia. This included 14 adults (14/36, 39%; 8 male and 6 female) and three juveniles. It could be present as one single very faint line or as to three or four substantial ones. One must bear in mind, however, that only individuals with teeth present and with relatively complete tooth crowns can show evidence of enamel hypoplasia. Even when the teeth are present, the enamel hypoplasia can be hidden by particularly severe calculus, or destroyed by extreme tooth attrition.

Measurement of the distance of a line of linear hypoplasia from the cemento-enamel function provides an estimate of the age at which the stress occurred (Rose *et al* 1985; Hilison 1986). It was possible to quantify the linear hypoplasia on 13 of the individuals. The measurements were made usually from the lower canine (in one occasion the first upper premolar) from the cementoenamel junction to the midpoint of the hypoplasia. Data from a variety of sites shows that usually the lines appear during the post-weaning period, sometime between 18 months and 4 years old (Rose *et al* 1985). At Wing, however, the lines appeared much later. Only one individual had a marked line at 3.8 years, two individuals had lines between 4.7 and 5 years and in the fifteen others, the lines were between the ages of 5.7 and 6.4 years, with a strong prevalence between 6 and 6.2 years. In cases where there were more than one line, and the lines were separated by only two to three months.

Burial G48, which was the subject of a television episode of the *BBC*'s *Meet the Ancestors,* had very distinct and typical enamel hypoplasia. DNA testing carried out for the *BBC* indicates that this was the skeleton of a girl and tooth development aged her at around 11 years old at death. Her canines showed two types of enamel hypoplasia: the linear and the pitted type. She had three marked periods of linear hypoplasia, twice around 6 years and at 6.3 years. Pitting occurred later. She must have recovered after those periods of ill-health as the later tooth development proceeded normally.

Dental diseases

Dental pathologies were identified from descriptions given by Hillson (1986) and found to be common in the Wing population, which included 46 skulls with recordable teeth survival, of which 36 were adults (Table 7).

TABLE 7 Incidence of dental pathology

Pathology	*Incidence (%)*
Calculus	46/46 (100%)
Periodontal disease	38/46 (83%)
Caries (adults)	19/36 (53%)
Abscesses (adults)	14/36 (39%)
Enamel hypoplasia	17/46 (37%)
Tooth rotation	10/46 (22%)
and crowding	5/46 (11%)

One must bear in mind that it is possible that some individuals may present only one or all features of dental pathology (Table 7). Only individuals with fully erupted teeth were included.

Calculus

Also known colloquially as tartar; a brownish deposit which builds up around the base of the teeth, resulting from poor dental hygiene. Calculus is one of the main causes for periodontal disease. As calculus traps food remains, it can be useful for dietary reconstruction (Hillson 1986). It is difficult to record archaeologically with total accuracy because it often flakes off the tooth during post-excavation processing. All examples observed, including 10 juveniles, showed some signs of calculus, indicating the generally low standard of oral hygiene.

Periodontal disease

This is usually an inflammatory response in the soft tissues of the gums to irritation by deposits of calculus along the margin of the gum. It can lead to receding gums. In severe cases, it can cause loosening and ultimate loss of teeth as the bone of the alveolar process is resorbed. Periodeontal disease was only slightly less common than calculus with most adults and many juveniles displaying some symptoms of the disease.

Caries and abscesses

This is a localised, progressively destructive disease of the teeth which starts on the enamel. The initial demineralisation ends in cavitation and direct bacterial invasion. The incidence of caries is a useful tool in diet reconstruction as there is an association between increased caries frequencies and the consumption of foodstuffs rich in sugar and other carbohydrates (Powell 1985 and Hillson 1986). The resulting cavity may also cause an abscess to develop by allowing infection to penetrate into the tooth pulp. Caries was limited to adults (19/36, 53%) where it occurred in half of the population, with abscesses only slightly less common in the adult population (14/36, 39%). Abscesses indicate spread of infection from the pulp chamber into the periapical tissues following excessive attrition or dental caries. They are identified archaeologically by the presence of a drainage channel through the bone of the maxilla or the mandible to the outside.

Rotation and crowding

The sample generally showed good tooth alignment, with only 10 individuals with tooth rotations and five with overcrowding, especially on the mandible.

In addition to the common changes and diseases, there were impacted wisdom teeth (G4), retained deciduous canines (G38), an ectopic supernumary tooth in the palatine suture (G16) and a large periapical cyst (G9).

Degenerative Joint Disease

Osteoarthritis

This common condition is characterised by erosion of the articular cartilage, which may be age-related or secondary to trauma or other conditions including possible occupational factors. The cartilage becomes soft, frayed and thinned, with eburnation of subchondral bone and outgrowths of marginal osteophytes. This results in pain and loss of function. It mainly affects the weight bearing joints and is more common in older persons (Ortner and Putschar 1981; Roberts and Manchester 1995). At Wing, 27 individuals out of the 63 adults (27/63, 42.8%) showed some signs of arthritis (Table 8). The joints most commonly affected were the spine and the hips.

TABLE 8 The location and incidence of arthritic lesions

Location	*Incidence*
Spine	19
Hip	15
Shoulder	5
Knee	3
Elbow	2
Wrist	2

Although the majority (59.2%) of osteoarthritis sufferers in the sample had the lesions on only one joint, six individuals (22.2%) had it at two different sites, three individuals (G21, G54 and G63) at three different sites and two individuals (G4 and G61) had osteoarthritis at four different sites.

Not included here are burials G5, G12, G23, G38 and G64 who developed osteoarthritis most probably secondary to an injury. Also, burial G56 who probably suffered from DISH (Diffuse Idiopathic Skeletal Hyperostosis) and osteoarthitic lesions in four different joints.

Schmorl's nodes

Schmorl's nodes occur as a result of pressure from intervertebral disc on the superior or inferior surfaces of the vertebral bodies. In Wing, 18 individuals (18/41, 45% of adults) had Schmorl's nodes (Gs 1, 10, 18, 22, 23, 28, 32, 34, 38, 46, *50,* 53, 54, 55, 63, 69, 75, 76). They are especially commonly found in individuals who have been engaged in heavy manual work, particularly lifting, from an early age (Merbs 1983; Roberts and Manchester 1995). The occurrence was more common in males (11/22, 50%) than females (7/19, 37%).

Osteochondritis

This is an inflammatory condition affecting cartilage (Miles 1989; Roberts and Manchester 1995). It can be seen in the spine as crescent-shaped lesions on vertebral bodies and in limbs, where it is known as osteochondritis dissecans. Osteochondritis dissecans is a complete or incomplete separation of a portion of joint cartilage and underlying bone. It may be associated with epiphyseal aseptic necrosis. At Wing there are three cases involving the spine (burials G35, male 25–30; burial G63, male, 50–60 and burial G67, female, 35–40), three cases on the proximal phalanx of the big toe (burial G2, female, 35–45; burial G19, male, 30–35 and burial G59, female, 45) and one case (burial G22, male, 25–30) on the distal end of the femur. Repeated trauma, sometimes occupation-related, is a commonly cited underlying cause for osteochondritis dissecans in limb joints (During *et al* 1995).

Enthesopathy

Enthesophytes, also called osteophytes, are projections or spicules of bone at sites of tendinous or ligamentous attachments. These are usually representative of repetitive physical stress (Angel 1949; Bridges 1989). They are commonly present on the humerus, probably caused by lifting and carrying loads. Two individuals (burial G5, male, 45–50 and burial G32, male, 30–35) showed signs of enthesopathy. Other signs of strenuous physical activity seen in the legs were increased prominence of the muscle attachments, the most common site being the linea aspera on the femur. Platymeria (flattening) of the superior part of the femur and platychemia (flattening of the tibia) (Lovejoy *et al* 1976; Bridges 1989) have also been associated with muscular activity (not assessed in Wing sample).

Diffuse Idiopathic Skeletal Hyperostosis (DISH)

DISH is a generalised spinal and extra spinal articular disorder characterised by calcification and ossification of ligaments, particularly of the anterior longitudinal ligament of the spine and tendon attachments elsewhere (Rogers and Waldron 1995). It is distinct from ankylosing spondylitis or degenerative joint disease. One case (burial G56, male, 45–50) showed the characteristic of this disease. Large, well-nourished adult males are the most susceptible group (Roberts and Manchester 1995). DISH can cause considerable disability as the spine becomes joined by osteophytes into a rigid rod, and movement at other joints is restricted by osteophytes.

Fractures and dislocations

Fractures can only be definitely diagnosed in skeletal material if they occurred early enough before death for healing to be seen. The type of fracture most commonly found was that of the ribs, which were usually multiple, followed by the clavicle, the fibula, the humerus and the femur (Table 9). Most fractures can be attributed to occupational injuries. The fractures of the distal fibula (burials G2 and G38) are typical ones. These could have occurred while walking on uneven ground, fields for example, and turning the foot over in a fall (Dandy and Edwards 1998).

Fractures of the femoral neck are now common in older (post-menopausal) women as a result of osteoporosis (Dandy and Edwards 1998). The affected individual in this case is possibly female (burial [G30]), so osteoporosis may be a contributory factor in her injury. In general, however, fractures were nearly twice as common among adult males (9/31, 29%) as among females (5/28, 18%), with a quarter of the population affected by frac-

TABLE 9 Distribution and incidence of fractures

Fracture	*Incidence*	*Burial (side)*
Ribs	4	G5(L), G14(U), G31(L), G54(R)
Clavicle	2	G5 (R), G22 (R)
Fibula	2	G2 (L+R), G38 (L)
Humerus	2	G4 (L), G75 (R)
Femur	2	G13 (R), G30 (R head)
Metacarpals	1	G38 (L) x 2
Parry	1	G30 (L)
Radius	1	G1(L)
Mandible	1	G4 (L)
Spine	1	G5(L1)
Tibia	1	G76 (R)
Acetabulum	1	G68 (R)

tures (14/59, 24%)(Table 11). Ten individuals had suffered only a single fracture, but three men had double fractures and a woman (burial G30) with a fractured femoral neck also had a parry fracture of the left ulna and radius.

Dislocations can only be recognised if they remain unreduced for the rest of the victim's life and result in bony remodelling of the joint (Wakely 1993; Wakely 1996). There are a number of dislocated shoulders and hips (Table 10).

Table 10 Distribution of dislocations

Dislocation	*Incidence*	*Burial (side)*
Shoulder	2	G4 (L), G63 (L)
Hip	2	G64 (partial, L), G68 (R)

Of the 16 (21.0%) individuals with fractures, 11 (68.7%) had only one fracture or type of fracture (eg ribs and metacarpals), three (18.7%) individuals had fractures at two different sites and two (12.5%) individuals, burials G4 and G5, had fractures at three different sites.

Spondylolysis

This condition is a fracture of the vertebral arch, which results in separation of a vertebra across the pars interarticularis. Some individuals may be particularly at risk because of a pre-existing weakness of one or more vertebral arches. It most commonly occurs in the lower lumbar spine, and may be associated with a sudden concentrated stress on the spine as in lifting or pulling a heavy load (Merbs 1983). There were two cases: burial G14 (male, 35–40) which affected a supernumerary sixth lumbar vertebra, and burial G20 (male, 40–45) which affected the fifth lumbar vertebra. In both individuals the separation was bilateral.

TABLE 11 Incidence of fractures and dislocations per individual

Burial (sex, age)	*Incidence of fractures*	*Location (side)*
G1 (male, 40–45)	1	Radius (L)
G2 (female, 35–45)	1	Fibula (L+R)
G4 (male, 35–45)	3	Humerus (L) Mandible (L) Dislocated shoulder (L)
G5 (male, 45–50)	3	Lumbar vertebra L1 Clavicle (R) Ribs (R)
G13 (male, 30–35)	1	Femur (R)
G14 (male, 35–40)	1	Ribs (unsided)
G22 (male, 25–30)	1	Clavicle (R)
G30 (female?, 35–40)	2	Femur head (R) Parry (L)
G31 (female, 40–45)	1	Ribs (L)
G38 (male, 35–45)	2	Metacarpal (L, x2) Fibula (L)
G54 (male, 45–50)	1	Ribs (L)
G63 (male, 50–60)	1	Dislocated shoulder (L)
G64 (female, 35–40)	1	Partial dislocation hip (L)
G68 (male, 45+)	2	Acetabulum (R) Dislocation hip (R)
G75 (ind., adult)	1	Humerus (R)
G56 (ind., adult)	1	Tibia (R)

Other pathologies

One adult male (burial G1) had a benign bony tumour (osteoma) in the roof of the left orbit. The *Meet the Ancestors* skeleton (burial G48) showed premature closure of the lambdoid and sagittal sutures of the skull (craniosynostosis). If she had lived to maturity she may have exhibited some degree of malformation of the whole skull due to compensatory growth at other sutures to accommodate brain growth.

Conclusion

The excavated sample is too small and embraces too long a period (potentially some 500 years) for detailed demographic or statistical analysis. However, some very general conclusions can be drawn concerning the buried individuals, and broad comparisons made with other contemporary populations in Southern England. Metrical analysis, too, was limited, by the incompleteness of some skeletons and the poor condition of many of the long bones, particularly their extremities.

Although the lives of these individuals were undoubtedly demanding, it was apparently no more so than in other comparable sites. Such stature assessment as was possible indicates that most individuals surviving into adulthood grew to a stature greater than that of their contemporaries at other localities in Southern or Central England, and indeed comparable to the modern population (Table 12).

TABLE 12 Comparison of height estimates from Anglo-Saxon and medieval cemeteries
(Data from Powell 1996; White 1988; Henderson1985; Wells and Cayton 1980)

Cemetery	*Mean height*	
	males (m)	*females (m)*
Raunds Furnells, Northants	1.67	1.62
St Nicholas Shambles, London	1.73	1.57
St Helen on the Walls, Fishergate, York	1.69	1.57
North Elmham, Lincs	1.72	1.58
Wing, Bucks	**1.76**	**1.63**
Modern British (1981)	1.74	1.61

A person's adult height is the end result of a complex interplay of genetic and non-genetic factors. Nutrition and general health during childhood are important determinants of whether one will reach one's genetic potential for growth (Sinclair 1985). Poor preservation in the Wing material as well as other Anglo-Saxon and Saxo-Norman cemeteries limits the number of measurable skeletons and so the degree to which the mean heights calculated are truly representative of the whole population. In Wing four male skeletons measured over 1.80m, and three females over 1.67m. These individuals were clearly well enough nourished and healthy enough as children to attain a stature fairly close to their genetic potential.

The sub-adults apart, most of the individuals lived at least into middle age, although the absence of females of child bearing age suggests that this group may have been excluded from this part of the cemetery. Of the ageable individuals 23.3% reached a skeletally or dentally assessed age of at least 45 years. This should be compared with 12.7% at St Nicholas Shambles (White 1988). 8.9% at Fishergate, York (Stroud and Kemp 1993) and 22.8% at Raunds (Powell 1996). Juvenile (under 18) mortality in the four sites is 17.1% at Wing, 22.2% at St Nicholas Shambles, 34.3% at Fishergate and 47.4% at Raunds. Since Wing and Raunds are both rural sites, while St Nicholas Shambles and Fishergate represent large conurbations, mortality patterns must be related to something more complex than simply population density alone. However, the low juvenile mortality for Wing is likely to be much lower than the expected value as a result of the absence of infant burials and a low proportion of younger child burials. Local events such as food shortages or epidemics of childhood disease can all elevate child mortality figures but are not at present accessible from skeletal data.

The palaeopathological record from Wing provides additional evidence of individuals who had lived to an advanced age. Examples of diseases associated with ageing, including osteoarthritis, DISH and Paget's disease were all identifiable in the excavated material.

The skeletal remains of the people of Wing show evidence indicative of a physically demanding lifestyle. Simple visual examination of the long bones in both sexes shows well defined muscular and ligamentous attachments on the long bones, a feature which a wide body of opinion links to the habitual level of physical activity undergone by an individual, though not necessarily to any particular activity or occupation (Bridges 1989; Dutour 1986; Larsen 1997; Knusel 2000). The existence of Schmorl's nodes in the spines of 45% of the adults with spines preserved suggests that a high proportion of individuals suffered some degree of trauma to the intervertebral discs of the spine, perhaps caused by stresses such as heavy lifting from a relatively early age (Merbs 1983).

The majority of older individuals showed evidence of osteoarthritis, most frequently in the hips

(25% of lesions) and the facet joints of the spine (19.7 % of lesions). Only those skeletons presenting at least two out of the three skeletal signs of this condition (marginal lipping, porosity and eburnation of the articular surface), have been positively diagnosed (Rogers and Waldron 1995). Even those without fully developed osteoarthritis had some marginal lipping of one or more joints. The interaction between age, sex, genetics, activity and environment in the aetiology of osteoarthritis in a particular individual, or joint, is not simple or fully understood (Rogers and Waldron 1995; Rogers 2000). For example, in the case of the spine Chapman (unpublished M Phil Thesis, University of Leicester 2003) has shown by analysis of 300 skeletons from the medieval cemetery at Abingdon, Oxfordshire, that in both sexes the number of individuals, and the number of vertebrae per spine, showing osteoarthritic changes increases with age. He also found that spinal osteoarthritis appears to have an earlier age of onset in males than in females. Whether such differences are entirely physiological, the consequence of sex differences in workload, or a combination of both, cannot be determined by skeletal analysis alone, but require epidemiological studies of modern populations with known medical and occupational histories.

The position is perhaps best summarised by Larsen (1997). He argued that "Generally the more mechanically demanding the lifeway the greater the prevalence of osteoarthritis and other degenerative pathological conditions related to activity", while not implying that a specific activity or occupation can be attributed to an individual on the basis of changes in his or her joints. Likewise Waldron (1994) warns us that "Given a skeleton with osteoarthritis of the hip, and given that we believe that farmers have a substantial predisposition to develop the disease here - a relative risk of 9, say - this still leaves us unable to say whether the skeleton before us was that of a farmer or one of the thousands of non-farmers who might have had it."; a point especially relevant in the context of a rural settlement such as Wing.

Another potential indicator of the level of strenuous physical activity undertaken by a community, is the number of fractures and dislocations identifiable in the skeletons. The majority of those observed in the Wing material can occur in falls and other accidents (Ortner and Putschar 1985; Larsen 1997; Dandy and Edwards 1998): fractures of the lower leg, femoral neck, clavicle, humerus and forearm (Roberts and Manchester 1995; Larsen 1997). In Wing 18 individuals had suffered but survived major injuries such as fractures or dislocations, some multiple.

Some fractures are generally accepted as archaeological evidence of deliberately inflicted injuries. These include the 'parry' fracture of the distal ulna, resulting from the victim's attempt to shield their face from a blow by raising an arm (Roberts and Manchester 1995). Most craniofacial fractures, too, until the industrial revolution and the invention of fast transport and machinery, would have been the result of interpersonal conflict, with or without weapons (Wakely 1997). The existence of one of each of these non accidental injuries in the Wing sample shows us that sometimes disputes were settled violently.

Some indications of diet can be gained from the condition of bones and teeth. Dental health in adults at Wing was generally poor, the high proportion of adult individuals exhibiting caries, periodontal disease, antemortem tooth loss and deposits of calculus indicating a coarse, high carbohydrate diet, probably one in which cereals predominated, leading to little or no oral hygiene. Such a picture is typical of other sites of this period. Also typical is the generally good condition of the dentition in the children.

Serious dietary deficiency diseases such as rickets and osteomalacia, were not seen. Rickets, due to deficiency of vitamin D, is rare in cemetery populations from the pre-industrial era, though cases have recently been identified in the medieval rural cemetery of Wharram Percy, Yorkshire (Ortner and Mays 1998) but becomes common after the 18th century. Approximately 80% of the body's requirement of vitamin D is synthesised in the skin in the presence of ultraviolet light from the sun, the remainder is dietary. Deprivation of both vitamin D rich foods and daylight in the growing industrial towns, makes rickets a relatively frequent finding among skeletons from this period, as at Holy Trinity, Coventry (1776–1893) (J Wakely pers comm).

Cribra orbitalia is often assumed to represent skeletal evidence of anaemia, especially in childhood (Stuart Macadam 1991), with a further assumption that the anaemia is diet-related, due to a deficiency of iron. However, the situation is undoubtedly more complex. Even if the iron content of the diet is perfectly adequate, continual

blood loss from intestinal parasite infections or poor iron absorption due to diarrhoea can lead to anaemia. There is also the possibility that the iron balance of the body can be disturbed by chronic infection with any pathogen (Auflierheide and Rodriguez-Martin 1998). Recently Ribot and Roberts (1996) have suggested that cribra orbitalia should be regarded less as an indicator of the iron status of an individual, than as a non specific indicator of 'biological stress', i.e. an overall state of poor health, without a specifically definable cause.

Infectious disease presents a particularly difficult problem for palaeopathological diagnosis because the majority of infections either produce no skeletal changes or only non- specific lesions, such as periostitis. According to Manchester and Roberts (1995) over 90% of the infectious disease in the living population does not enter the archaeological record. However, indirect skeletal evidence of infections can be seen in the so called 'nonspecific stress indicators'. The presence of enamel hypoplasia in the permanent dentitions of seventeen individuals, shows that children were subject to recurrent acute infections from which they recovered, often to live into adulthood, though some died young.

Of particular interest are the three individuals (burials G19, G22 and G54) showing skeletal evidence of chronic chest disease, in the form of periosteal lesions on the ribs, as well as hypertrophic osteoarthropathy on the long bones. As Rothschild and Rothschild (1998) explain this phenomenon may accompany any long-term cardiovascular or respiratory condition affecting the supply of oxygenated blood to the extremities. Congenital heart disease and chronic respiratory infections are among the most common. Children born with congenitally abnormal hearts would have been unlikely to have survived into adulthood in an Anglo-Saxon or Anglo-Norman society, so we are probably justified in attributing the lesions seen in these three skeletons to chronic chest infection.

Overall, then, the skeletal material from Wing presents evidence of individuals from hard-working rural communities, successfully subsisting and surviving the hazards of malnutrition, accident and disease of medieval life. Broad comparison with other sites of similar periods and character show Wing to be typical in the pattern of health and disease in the population, as presented by a limited sample of their skeletal remains.

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Gazetteer of Excavated Burials

Notes: See Figure 13 for plan showing all numbered graves. See discussion of the cemetery population for definitions relating to burial posture and its relationship to the mode of burial. The Femur lengths are given (Fe) when these have been the basis for the estimate of stature (height).

Burial	Sex	Age	Height (m)	Condition	Posture	Mode of burial
1	Male	40–45	–	Intact	Parallel/ tumbled	Coffin
2	Female	35–45	1.68	Intact	Parallel/ undisturbed	All Possible
3	Female	Adult	–	Torso only	parallel	–
4	Male	35–45	1.76	Torso only		????
5	Male	45–50	1.77 Fe 0.485	Intact	Parallel/ tumble	Coffin
6	Ind	Adult	–	Largely lost	–	–
7	Female	40–45	1.55	Torso only	parallel	–
8	Juvenile	6–8	– Fe 0.254	disturbed	–	–
9	Male	35–40	1.70 Fe 0.497	Intact Over G10	Non–parallel	Shroud/ Clothes
10	Female	45+	–	Disturbed Under G09	Parallel/ undisturbed	All Possible
11	–	–	–	redeposited	–	–
12	Female	30–35	–	Largely lost Over G13	–	–
13	Male	30–35	–	Disturbed Under G12	parallel	–
14	Male	35–40	1.79 Fe 0.479	Intact	Parallel/ Some tumble	Coffin?
15	Female	30–35	1.65 Fe 0.45	Intact	Parallel/ Some tumble	Coffin?
16	Juvenile	14–15	–	Intact	Parallel/ undisturbed	All Possible
17	Juvenile	??	–	Largely lost	–	–
18	Female	30–35	1.66	Intact	Parallel/ undisturbed	All Possible
19	Male	30–35	–	Intact Over G22	Parallel/ tumble	Coffin

Burial	Sex	Age	Height (m)	Condition	Posture	Comment
20	Male	40–45	1.72 Fe 0.464	Upper torso lost	parallel	–
21	Female	50–60	1.59 Fe 0.426	Intact	Parallel/ undisturbed	All Possible
22	Male	25–30	1.77 Fe 0.488	Disturbed Under G19	Parallel	–
23	Male	35–40	1.73 Fe 0.468	Intact	Parallel/ tumble	Coffin
24	Male	35+	–	Legs only	–	–
25	Female	16–18	–	Legs only	–	–
26	Male	40–45	–	Redeposited in G34	–	–
27	Female	40–45	–	Redeposited long bones	–	–
28	Female	35–45	–	Near intact Over G35	Parallel/ undisturbed	All Possible
29	Male	35	1.79 Fe 0.494	Intact	Parallel/ Some tumble	Coffin
30	Female?	35–40	–	Legs/pelvis only	–	–
31	Female	40–45	1.54 Fe 0.405	Intact	Non–parallel	Shroud/ Clothes
32	Male	30–35	1.79 Fe 0.495	Intact	Non–parallel	Shroud/ Clothes
33	Female	45–50	–	Redeposited in G32	–	–
34	Female	45–50	1.53 Fe 0.400	Intact Over G38	Parallel/ undisturbed	All Possible
35	Male	25–30	1.67 Fe 0.443	Intact Under G28	Parallel/ tumble	Coffin
36	Male	30–40	–	Redeposited in G35	–	–
37	Female	adult	–	Legs only	–	–
38	Male	35–45	1.84 Fe 0.515	Disturbed Under G34	–	–
39	Female	adult	1.66 Fe 0.452	Redeposited in G37	–	–

Burial	Sex	Age	Height (m)	Condition	Posture	Comment
40	Female	30–35	–	Legs only	–	–
41	Ind.	Adult	–	Redeposited in G34	–	–
42	Ind.	Adult	–	Largely lost (=G6?)	–	–
43	Male?	30+	–	Legs only	–	–
44	Female	45–50	–	Largely lost	–	–
45	Juvenile	11	–	Intact	Parallel/ Some tumble	Coffin?
46	Male	45–50	1.76 Fe 0.481	Intact	Parallel/ undisturbed	All Possible
47	Male	35	–	Redeposited in G46	–	–
48	Female	10	–	In grave G49	Parallel/ tumble	Inserted in coffin
49	—	Adult	—	Disturbed Under G48	Parallel/ tumble	Coffin
50	Male	35–40	1.83 Fe 0.512	Intact	Parallel/ tumble	Coffin
51	Female	30–35	–	Intact	Parallel/ tumble	Coffin
52	Juvenile	2	–	Intact	Parallel/ undisturbed	All Possible
53	Male	35–40	1.92 Fe 0.548	disturbed	–	–
54	Male	45–50	1.66	Torso only Over G55	Parallel/ undisturbed	All Possible
55	Female	35–40	1.63	Near intact Under G54	Parallel/ undisturbed	All Possible
56	Male	45–50	1.62 Fe 0.423	Intact	Parallel/ undisturbed	All Possible
57	Male	50+	1.84	Intact	Parallel/ undisturbed	All Possible
58	Female	adult	–	Legs only	–	–
59	Female	45	1.67 Fe 0.457	Intact	Parallel/ Some tumble	Coffin?

Burial	Sex	Age	Height (m)	Condition	Posture	Comment
60	Male	50–60	–	Intact	Parallel/ undisturbed	All Possible
61	Female	40–45	1.68	Intact	Parallel/ Some tumble	Coffin?
62	Ind.	Adult	–	Skull Under G67	–	–
63	Male	50–60	1.70 Fe 0.457	Intact	Parallel/ tumble	Coffin
64	Female	35–40	1.69	Intact	Parallel/ undisturbed	All Possible
65	Male	40–45	–	Intact	Parallel/ undisturbed	All Possible
66	Juvenile	15	–	Torso only	Some tumble	Coffin?
67	Female	35–40	–	Disturbed Over G62	–	–
68	Male	45+	–	Intact	Parallel/ tumble	Coffin
69	Male	20–25	1.81 Fe 0.503	Intact	Parallel/ tumble	Coffin
70	Juvenile	13	–	Intact	Parallel/ undisturbed	All Possible
71	Juvenile	12	Fe 0.311	Intact Under G70	Parallel/ undisturbed	All Possible
72	Female	Adult	–	Legs only	–	–
73	Juvenile	10–11	–	Largely lost	–	–
74	Male	40–45	–	Torso only	tumble	Coffin
75	Female?	35?	1.61 Fe 0.435	Intact	Parallel/ tumble	Coffin
76	Female	30–35	1.61 Fe 0.434	Disturbed Under G77	–	–
77	Juvenile	1	–	Over G70	–	–