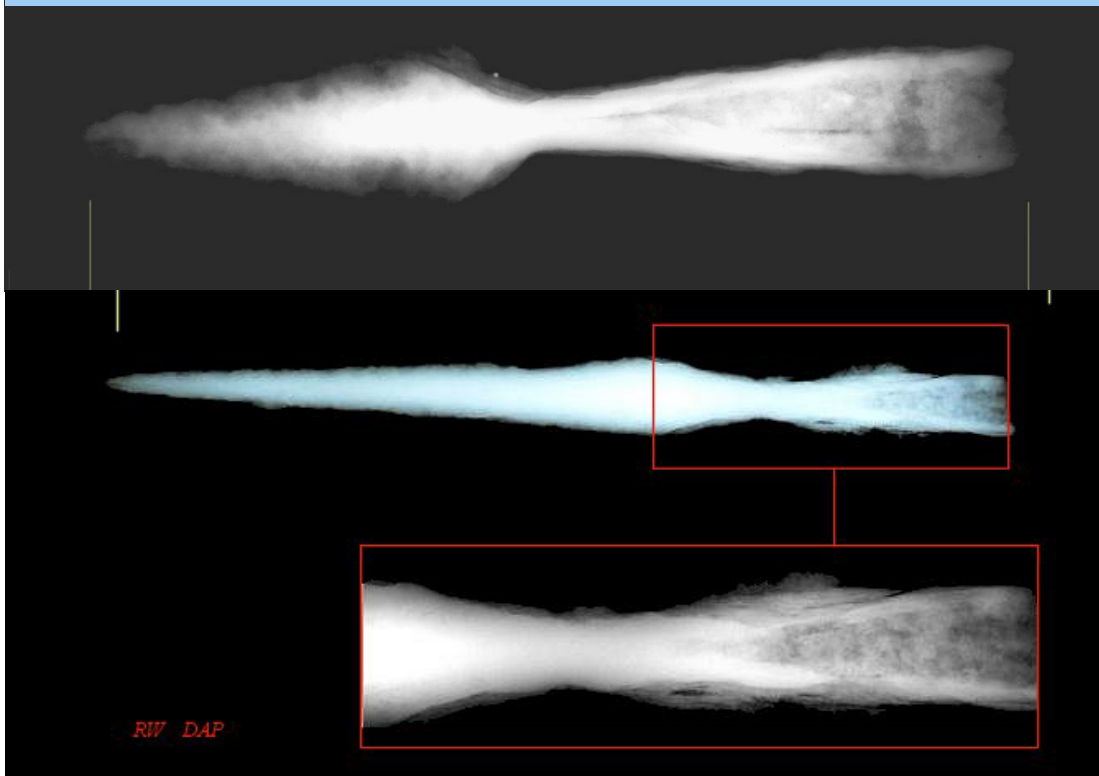




Northamptonshire Archaeology

Anglo-Saxon and medieval settlement at the
former Post Office Training Establishment
Wolverton Mill, Milton Keynes, Buckinghamshire
Excavations 2004



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Report 11/50

March 2011



NORTHAMPTONSHIRE COUNTY COUNCIL

NORTHAMPTONSHIRE ARCHAEOLOGY

MARCH 2011

**ANGLO-SAXON AND MEDIEVAL SETTLEMENT
AT THE FORMER POST OFFICE TRAINING ESTABLISHMENT
WOLVERTON MILL, MILTON KEYNES
BUCKINGHAMSHIRE
EXCAVATIONS 2004**

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QUALITY CONTROL

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OASIS REPORT FORM

PROJECT DETAILS		
Project name	Wolverton Mill, Milton Keynes, Buckinghamshire	
<p><i>A single sunken-featured building is dated to the 5th century, but further sunken-featured buildings and probable post-built houses may only have come into use in the 7th or early 8th centuries. A small pit containing an unusual hoard comprising two iron spearheads and a seax, much of a lava quern, two bone combs and a woolcombing heckle, was probably a contemporary deposit. In the middle Saxon period, perhaps the mid 8th century, a large rectangular ditched enclosure was created and later remodelled. Only the northern end lay within the excavated area, but the southern end had been located in previous excavations, suggesting that the enclosure was 200m long by 150m wide, encompassing some 3ha. It may have served as an animal corral for an estate centre. Some ditches to the north may have been contemporary boundaries, but it was difficult to differentiate these from a system of linear boundary ditches introduced in the late Saxon period, the 10th century, presumably as part of the setting out of the medieval village of Wolverton. The late Saxon ditched boundaries and the hollow-way shared the same alignment as the middle Saxon enclosure, but did not impinge upon it, suggesting either continuity of function or at least of status. The late Saxon/Saxo-Norman domestic activity comprised a number of small post-built houses, with associated cess pits, set within plots with ditched or fence sub-divisions. There were also two wells, one of which was near a malting/drying oven and evidence that flax working was carried out. Settlement here was abandoned by the end of the 12th century, although some pit digging continued to the 14th century, related to the nearby core of medieval Wolverton. A sequence of boundary ditches alongside the hollow-way can be traced through to the present day. Some limestone quarrying took place in the 17th-19th centuries, but otherwise the site had been utilised as farmland.</i></p>		
Project type	Excavation	
Site status	none	
Previous work	Evaluation BCMAS 1992, OAU 2002, geophysical survey	
Current Land use	Housing	
Future work	No	
Monument type/ period	Anglo-Saxon and medieval settlement	
Significant finds	Early/middle Saxon finds from pit (inc spears, seax, lava quern and combs)	
PROJECT LOCATION		
County	Buckinghamshire	
Site address	Wolverton Mill, Milton Keynes	
Study area	1.4 ha	
OS Easting & Northing	4802 2409	
Height OD	70-78m aOD	
PROJECTCREATORS		
Organisation	Northamptonshire Archaeology	
Project brief originator	Milton Keynes Council, Archaeology Officer	
Project Design originator	NA	
Director/Supervisor	Alex Thompson (nee Thorne)	
Project Manager	Antony Walsh	
Sponsor or funding body	Bloor Homes	
PROJECT DATE		
Start date	March 2004	
End date	June 2004	
ARCHIVES	Location (Accession no.)	Content (eg pottery, animal bone etc)
Physical	2004.13	Pottery, animal bone, flint, fe and cu finds, querns
Paper		
Digital		
BIBLIOGRAPHY		
client report (NA report)		
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**ANGLO-SAXON AND MEDIEVAL SETTLEMENT
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WOLVERTON MILL, MILTON KEYNES, BUCKINGHAMSHIRE
EXCAVATIONS 2004**

ABSTRACT

Northamptonshire Archaeology carried out an archaeological excavation in advance of a housing development. A single sunken-featured building is dated to the 5th century, but further sunken-featured buildings and probable post-built houses may only have come into use in the 7th or early 8th centuries. A small pit containing an unusual hoard comprising two iron spearheads and a seax, much of a lava quern, two bone combs and a woolcombing heckle, was probably a contemporary deposit. In the middle Saxon period, perhaps the mid 8th century, a large rectangular ditched enclosure was created and later remodelled. Only the northern end lay within the excavated area, but the southern end had been located in previous excavations, suggesting that the enclosure was 200m long by 150m wide, encompassing some 3ha. It may have served as an animal corral for an estate centre. Some ditches to the north may have been contemporary boundaries, but it was difficult to differentiate these from a system of linear boundary ditches introduced in the late Saxon period, the 10th century, presumably as part of the setting out of the medieval village of Wolverton. The late Saxon ditched boundaries and the hollow-way shared the same alignment as the middle Saxon enclosure, but did not impinge upon it, suggesting either continuity of function or at least of status. The late Saxon/Saxo-Norman domestic activity comprised a number of small post-built houses, with associated cess pits, set within plots with ditched or fence sub-divisions. There were also two wells, one of which was near a malting/drying oven and evidence that flax working was carried out. Settlement here was abandoned by the end of the 12th century, although some pit digging continued to the 14th century, related to the nearby core of medieval Wolverton. A sequence of boundary ditches alongside the hollow-way can be traced through to the present day. Some limestone quarrying took place in the 17th-19th centuries, but otherwise the site had been utilised as farmland.

1 INTRODUCTION

Bloor Homes submitted a planning application to Milton Keynes Council for residential development at the former Post Office training establishment at Wolverton Mill, Milton Keynes, Buckinghamshire (NGR SP 802 409, Fig 1). The site lies adjacent to Great Monks Street, immediately south of Stratford Road and is about 1km south of the River Great Ouse.

The Archaeological Officer, Milton Keynes Council, indicated that the remains discovered in evaluation would not be preserved *in situ*, and Northamptonshire Archaeology was commissioned by Bloor Homes to record archaeological deposits before the development took place. This comprised an open area excavation of c1.4ha which took place between March and June 2004. As a public footpath and associated hedge boundary was to be retained within the new development, the excavation was divided into two areas, set either side of the footpath (Fig 2). The excavation did not examine areas where the ground had been previously disturbed by roads, buildings and services.

The excavations were directed by Alex Thompson (née Thorne) and were managed by Antony Walsh. Alex Thompson prepared the first draft of the excavation report, which was revised by Charlotte Walker. Further copyediting and revision has been carried out by Pat Chapman and Andy Chapman. The site archive will be deposited with Buckinghamshire County Museum, Accession Number. 2004.13 (Site Code: WM04).

2 BACKGROUND

2.1 Geology by Steve Critchley

The underlying geology comprises flat-bedded shelly limestones and marls or mudstones of the Blisworth Limestone Formation, part of the Middle Jurassic Great Oolite Group. Some of the limestone beds were more competent, standing out down the slope as zones of rubbly, blocky limestone resulting largely from periglacial fracturing. Some former solution or tree hollows and a post-glacial colluvial palaeochannel were filled with a reddish-brown soil containing quartzite pebbles and gravel derived from the glacial sands and gravels that occur upslope of the site (see Fig 5).

2.2 Topography

The excavation was conducted within two adjacent plots of land divided by a wide ditched and tree-lined boundary which appears to follow a former medieval/post-medieval hollow-way, now a public footpath (Fig 2). The main area of excavation lay within a plot of wasteland adjacent to the Post Office training buildings and north of its access road. The deep terracing for the Post Office buildings formed the western edge of the excavation. The northern site boundary was formed by a tree belt, including a cottage and its grounds. The Stratford Road separates the site from Old Wolverton deserted medieval village. The smaller site was within a triangular plot of land in the angle of Great Monk's Street and the Stratford Road. The ground sloped down evenly from the south-east to the north-west, with a drop of 8m (78.1m to 70.0m aOD).

2.3 Archaeological background

The Wolverton Mill area has seen a long sequence of archaeological evaluation and excavation. To the south, excavation in 1972 (unpublished) and 1991 located a Bronze Age round barrow and the south-east corner of the large middle Saxon enclosure (BCM 1991). A more extensive area was subject to trial trench evaluation in the early 1990s leading to the excavation of the entire southern end of the middle Saxon enclosure (BCMAS 1992, Carstairs 1992 & TVAS 1994). The northern part of the site was subject to desk-based assessment and evaluation in the early 2000s (OAU 2002a & b).

Prehistoric

The only indications of prehistoric settlement comprise a scatter of Mesolithic flint 350m to the south, and Neolithic flints recovered approximately 1km south by Oxford Archaeology Unit (OAU 2002a, 4). The nearest evidence of prehistoric activity was a ploughed-out ring ditch dating to the Late Neolithic/Beaker period situated 200m to the south, excavated in 1972 and 1992 by Buckinghamshire Council Museum (BCM 1991). Postholes, pits and finds dating to the Bronze Age, and broadly contemporary with the ring ditch, were found in the adjacent excavations by Thames Valley Archaeological Services (TVAS 1994).

Roman

There is limited evidence of local Roman activity. A possible Roman enclosure was recorded below part of the middle Saxon enclosure in 1994 (TVAS). A geophysical

survey carried out on this site had identified possible large areas of early Roman quarrying, but sample excavation in 2002 recorded sterile colluvial deposits that had accumulated by natural silting (OAU 2002b, 17).

Saxon

The southern end of a large middle Saxon enclosure was excavated in 1972 (unpublished) after being identified from aerial photographs. Between 1991-2 trial trenches and a further open area excavation recorded additional areas of the enclosure and further, possibly later gullies within it (BCMAS 1992; Carstairs 1992). The excavation of the southern end of the enclosure was completed in 1994 (TVAS). Although the area of the enclosure north of these excavations has been destroyed by the industrial buildings, the 1969 aerial photograph shows that the ditches continued into the current site area. No structural features were found within the enclosure. The 1994 excavation recovered a single piece of heavy slag, probably a piece of hearth or furnace bottom, but there was no direct evidence for primary metalworking on the site.

Excavation by Northamptonshire Archaeology in 2003 did not locate the expected western arm of the enclosure ditch, perhaps suggesting the presence of a wide entrance (Taylor 2006). A substantial ditch was the first of several phases of Saxon/Saxo-Norman boundaries, indicating that there was later incursion onto the middle Saxon enclosure (Taylor 2006).

Evaluation on the northern part of the site in 2002 established the presence of a long sequence of occupation, including a Saxon sunken-featured building and later pits and ditches, with little activity from the medieval and post-medieval periods (OAU 2002a & b).

An extensive Saxon cemetery, comprising at least 81 inhumations, has been excavated by Archaeological Services and Consultancy Ltd (ASC) to the east in 2007 (SMA 2009, 19). The grave goods, such as spearheads and beads, indicate a 7th century date for the cemetery. These burials formed part of the broader landscape that had developed prior to the creation of the middle Saxon enclosure (Fig 1).

2.4 Historical background

Wlverintone probably derives from the Saxon place name meaning *Wulfhere's settlement* or *clearing*. According to legend Wulfhere settled some time after Cathwulf's invasion of Buckinghamshire in 571 (Hyde 1945, 7). Wolverton lay within the Kingdom of Mercia. At some time in the reign of King Edward the Elder (901 to 925 AD) Wolverton was apparently an outpost of the invading Danish forces at Bedford. It was probably destroyed by the marauding Viking army, led by Sweyne, who passed through this area of the country in 1010 (at the time of the Norman Conquest it was on the highway between Bedford and Buckingham; *ibid*).

The first historical document which relates directly to Wolverton is the Domesday Survey (Williams and Martin 2002, 418):

*Buckinghamshire XLIII The Land of Mainou the Breton in Seckley Hundred
Mainou himself holds Wlverintone. It is assessed at 20 hides, and there are 5
ploughs. In desmene [are] 9 hides and there are 5 ploughs; and 32 villains with
8 bordars have 10 ploughs; and there could be 5 more.*

*There are 10 slaves, and 2 mills rendering 32s 8d, [and] meadow for 9 ploughs.
In all it is worth 20s; when received £15; in TRE £20.*

*This manor three thegns held. One of these Godwine, a man of Earl Harold had
10 hides and another, Thorir, a housecarl of King Edward had 7½ hides, and*

the third Ælfric, a man of Queen Edith [wife of King Edward] had 2½ hides. All these could sell to whom they wished.

Hyde (1945), Croft and Mynard (1993) have both summarised the medieval history and landscape of Wolverton, from which the following summary is compiled. The history of the manor gives an idea of the changes at a high social level which may have affected the site, although it is not possible to define which part of the manor lands the site was situated in.

Prior to invasion, it appears that Wolverton was held freely by several influential people, and after its confiscation in 1066, Maino the Breton held this manor and the fifteen others granted to him in Buckinghamshire from his motte and bailey castle at Wolverton, 1km north-east of this site, which Hyde suggests was on the site of an earlier Saxon fortification. It is not specified if the associated church was a new, Norman build or whether it was built on the site of an existing Saxon building. Maino's son Meinfelin became sheriff of Bedfordshire and Buckinghamshire and founded the Benedictine Priory at Bradwell, to which Wolverton Church and much land in the south of the parish was granted shortly after 1135. The manor passed to the de Longueville family in 1351 at which point it ceased being a barony. A new manor house, which was built near the castle in c 1240, was reported as being in disrepair soon after 1349, possibly as a result of the Black Death sweeping through north Buckinghamshire and which severely affected Bradwell Abbey. The manor house was rebuilt in 1586, but parts of the earlier manor were still upstanding in 1711. The manor was sold in 1713 to John Radcliffe who bequeathed it to the University at Oxford. These structures were demolished in 1718.

Hyde suggested that by the 13th century the villagers were becoming less tied to the estate, but were freer to choose other occupations, based on local names although there was no record of a smith or smithy (1945, 11 and 24). In the 15th century the medieval field layouts started to undergo change when 25 acres of common land was enclosed to make parkland for the de Longuevilles for hunting. This land was sited between Old Wolverton Turn, Warren Farm and Wolverton House, and seems to have included the site area. This was the first of several successful bids for such land, to the fury of the villagers and was followed by continuous challenges to the rights of tenure amounting to 120 acres by 1526.

These factors eventually resulted in early enclosure of the land in 1654, and the division of former desmone land into five farms - Manor, Warren, Stonebridge, Stacey Hill and Brick Kiln Farms. The costs of enclosing fields was high, particularly for smaller plots, and this combined with the dispossession of the villagers of their right to the land contributed to the abandonment of the surviving village on the north side of the Stratford Road. The remaining villagers settled in Home Park to the east of the vicarage and the abandoned area became known as Old Wolverton.

A detailed study has been made of the medieval landscape of Wolverton (Croft and Mynard 1993, 179-184). Wolverton lay on the route east from the castle towards Stantonbury, and thence to Newport Pagnell and ultimately to Bedford.

There is a discrepancy between the published map of the medieval field systems and the detailed earthwork survey of the remains north of the Stratford Road (Croft and Mynard 1993, figs 75 and 77). The former clearly shows the road to Stratford (Fig 3a, dashed line) but not the prominent forked hollow-way leading south-east towards the site, north-west towards the Mill and east towards the village centre (Fig 3a, solid line). It seems likely that this main route heading towards the Mill equates with the known but

unlocated medieval *Le Mylneway* (Millway). The northern half of that route has since been removed by ridge and furrow earthworks, suggesting that these fields, which are likely to have been meadows adjacent to the River Ouse, were put into arable use later in the medieval/post-medieval period. It seems unlikely that the Stratford Road followed the course reproduced here in the medieval period, but it must have been remodelled to this form sometime prior to 1740. The hollow-way crossing the site is certainly part of the medieval road pattern that has been retained until the present day.

All the known settlement earthworks and the accompanying open fields in the parish were mapped (Croft and Mynard 1993, figs 75 and 77). These show that the nearest surviving area of settlement were three crofts adjacent to the castle, at the western end of a c 1.5km long linear village settlement with the castle and church at its centre. Most of the main site area was under cultivation in the open field system. There is no evidence to suggest whether the smaller site area to the east of the hollow-way was also part of a wider medieval field or not. Extant documents suggest that in the early 13th century the village operated a two field system, and may support Hyde's suggestion that many of the late field names represent a late expansion of arable fields to incorporate poorer land.

Although there is no Enclosure Map, field names are recorded on the 1742 map (now lost) and a Tithe map of 1840 (Fig 3b, after Hyde 1945, 13 and Croft and Mynard) which shows the landscape after enclosure. The Stratford Road was established and the main site area lay south of it within *Black Hill* field, west of Warren Farm, divided from the smaller site area in *Bar Race* by a main route between the fields. Black Hill may be one of the medieval field names and it is suggestive of former settlement. The neighbouring field, *Ardwell Sheep Rails* is suggested as being a late established field, part of a wider belt of poor ground to the southern side of the Stratford Road [Old English *aeord*: rough or broken ground] and as such may have been pasture until a late date (Hyde 1945, 12). There were no buildings other than the Church and Vicarage (established in 1534) and although the forked route to the Mill had fallen out of use, the back route in the field to the north of Kiln Close has survived.

The Provisional Edition 1814 Ordnance Survey Buckinghamshire Sheet (Fig 3c, The British Library digital scan Reference 229 CO203-0,) shows that there was a regrowth of settlement with new structures in the north-east corner of the site area and along the eastern Stratford Road frontage, even though the village focus had irrevocably moved away. The fields remained unchanged.

Between 1881 (First Edition 1881 Ordnance Survey Buckinghamshire Sheet IX.II 25" Series, not illus) and 1967 (Fig 3d, published as fig 74 in Croft and Mynard 1993) the site was in a form close to today with a new plot formed in the angle between the two site areas. The hollow-way had become wooded. A tramline ran along on the south side of the Stratford Road between 1887 and 1926. With the introduction of the railway, the Stratford Road was extended to the east, bypassing the area of the church.

3 THE EXCAVATED EVIDENCE

3.1 Excavation methodology

The site was stripped by a 23-tonne mechanical excavator fitted with a toothless bucket, under supervision of an archaeologist. The eastern field was excavated in March 2004, and was used to store subsoil from the main excavation area from April to July 2004. A 4m-wide exclusion zone was left on either side of the boundary between the two site areas in order to allow the public footpath to continue operating. The south-western end of the excavation was buried below at least 2m of overburden and machine stripping ceased once the limit of the surviving archaeology had been located.

The visibility of features across much of the western half of the main site and most of the northern area was good where the underlying geology comprised limestone, and only required cleaning to define small postholes. The eastern half of the main site received extensive cleaning in order to enhance the definition of features, as few were readily apparent where they were cut into palaeochannel fill. All features were sampled by hand to determine their date and character, with the exception of what was thought to be a deep quarry pit, which was extensively sampled by machine.

3.2 Summary of site chronology

The dating for the phases of activity is primarily based on the recovered pottery and other finds together with stratigraphic sequences (Fig 4 and Table 1).

Table 1: Summary of site chronology

Period	Episodes and main features
Prehistoric and Roman activity	Palaeochannel Residual Neolithic/Bronze Age flint Residual Roman metal finds
Early Saxon settlement (5th century)	Sunken-featured building
Middle Saxon settlement and enclosure (7th/8th to mid 9th centuries)	Sunken-featured buildings and post-built structures. Pit with seax, spearheads etc Large sub-rectangular enclosure, possibly a stock corral External boundary systems/enclosures
Late Saxon/Saxo-Norman nucleated settlement (mid 9th to 12th centuries)	Creation of rectangular ditched plots as part of a nucleated village settlement, with post-built structures, pits, wells and a malting oven, with adjacent trackway and open fields to the south
Medieval open fields (early 13th-14th centuries)	Settlement abandoned, but a few pits suggest nearby occupation. Major boundaries retained, particularly the hollow-way,
Post-medieval to recent	Boundaries adjacent to the hollow-way maintained, and area lying within two large enclosed fields 17th-19th centuries, quarrying for limestone possibly associated with building of neighbouring properties.

3.3 The prehistoric and Roman periods

Earlier prehistoric

A palaeochannel, 28-48m wide, crossed the north-eastern side of the site (Fig 5). The channel was c300-450mm deep, and the edges of the deposit were irregular and shallow, with tree root holes along its southern margin. This spread of material largely equates with the large geophysical anomalies which were postulated in 2002 as being areas of Roman quarrying (OAU 2002b).

A cluster of tree root holes, filled with material similar to those by the palaeochannel, lay on the western part of the site (Fig 5). It is possible that the area between was a marginal wet or marshy zone, devoid of tree growth.

Later prehistoric (c 4000 – 3000BC)

A small flint assemblage broadly dates to the Neolithic/Bronze Age, and may, in part, be contemporary with the ring ditch to the south (Fig 2). The flint was distributed sparsely across the site, with two pieces from the surface of the palaeochannel at the eastern end of the site.

Romano-British

There are two residual finds of copper alloy objects and four coins.

3.4 Early Saxon settlement (5th century AD)

A sunken-featured building (SFB) 144, produced the only four sherds of decorated Saxon hand-built pottery from the site, indicating that it dates to the middle of the 5th century. The absence of any decorated pottery dated to the 6th century may also suggest that it had fallen out of use by the end of the 5th century.

The structure was rectangular, aligned west-east, measuring 3.70m by 3.30m, but somewhat irregular to the east (Figs 7 and 8). The base was largely flat but uneven, due to the limestone geology, and it had survived to 0.2m deep. The two postholes 152 and 154, which would have supported the roof, were slightly to the south of the central axis. The fill comprised dark greyish-brown silty clay with frequent limestone fragments, charcoal flecks, pottery and animal bone. There were few charred plant remains, excepting occasional wheat and oat grains.

The absence of comparable pottery associated with any of the other SFBs or the scatters of postholes may suggest that SFB 144 was an isolated structure, marking the small-scale beginnings of settlement, but the other SFBs and the postholes produced only a little plain pottery, broadly dated to the early/middle Saxon period (450-750AD), so the precise chronology remains uncertain. The other SFBs and the postholes scatters might have been part of a more extensive early settlement, but they could also mark a resumption of settlement in the 7th century, when decorated pottery was no longer being produced, perhaps only shortly prior to the appearance of the middle Saxon enclosure, and it is this interpretation that is presented below.

3.5 The middle Saxon settlement and enclosure (7th/8th-9th centuries)

The settlement

The new episode of settlement comprised a sunken-featured building, SFB 468, either another sunken-featured building or a pit, 1256, and perhaps three post-built structures, 1257, 1159 and 839, although these all comprised clusters of postholes with little definition of distinct wall lines.

SFB 468, to the south-west, had been truncated by later ditches, but was 3.50m long by at least 2.20m wide and 0.20m deep; a central posthole had survived at the eastern end (Fig 6). The fill of the hollow was compact reddish-brown silty clay containing animal bone, pottery, charcoal flecks and limestone pieces.

A cluster of postholes, 1257, to the north of SFB 468, was possibly the remains of a post-built structure (Figs 6 and 9). They occupied a rectangular area about 6m long and 4m wide, but wall lines could not be defined. The postholes were generally 0.10-0.30m in diameter, with a single example measuring 0.60m, and 0.10-0.19m deep. To the west a circle of heavily burnt clay on a base of limestone pieces, truncated by a pit, was probably a hearth, 512. An archaeomagnetic sample failed to provide a date and only a single posthole contained early/middle Saxon pottery. A nearby cesspit, 465, may have been contemporary. The fill had the typical greenish hue of mineralised faecal matter and the northern downslope side of the cut was ringed by a green leached stain.

An SFB or pit 1255 lay c70m to the east (Fig 6). It was rectangular, aligned north-south, and measured 2.40m by 1.65m and 0.15m deep. The fill was similar to that in the other SFBs but lacked the limestone. It contained a single sherd of early/middle Saxon pottery.

A scatter of postholes, 1159, covering an area of c 5.5m by 5.0m lay midway between SFB 468 and SFB/pit 1255 (Fig 6). A more extensive scatter of postholes, 1258, lay to the west, covering a roughly rectangular area over 9m wide. Beyond that was a possible fence line, running south-west to north-east and at least 12m long with posts c2m apart.

To the north a further possible post-built structure, 839, was between 6.5m and 8.0m long and 2.7m wide (Fig 6). Some sinuous lengths of gully, 323 and 393, also appeared to be contemporary with the early settlement features.

While early pottery was sparse, in the western half of the site there was a small pit 506 that produced an exceptional assemblage of finds dated to the early/middle Saxon period, the 5th/6th–7th centuries, perhaps indicating that settlement in the area, if not actually on the excavated site, had been continuous (Fig 6). It seems most likely that this assemblage had been buried no later than the 7th century or perhaps early 8th century. A single small abraded sherd of St Neots ware recovered from the pit, which could imply burial several centuries later, but this sherd might have been contamination from later activity.

The pit was 1.19m long by 0.79m wide and 0.25m deep, with steep sides and a flat bottom (Figs 10 & 11). The fill contained parts of the upper and lower stones from a lava quern, set against the northern side of the pit, and part of a third stone; as well as two broken bone combs, along with two iron spears and a broken seax, a woolcomb heckle and other pieces of scrap ironwork, all in the southern half of the pit (see Figs 28-34 and Appendix 1). The spears were covered in straw when buried. The fill also contained a little iron slag, fuel-ash slag and part of a smithing hearth bottom. The spears and seax would be appropriate grave goods for a man and the combs would be appropriate for a woman, but the incorporation of parts of a quern and even some smithing debris, although this may have been accidentally within the soils used for backfilling the pit, are a curious combination. They may have formed the prized possessions of a single family, perhaps as a cenotaph marking their deaths.

The middle Saxon enclosure

A new landscape, dominated by a large rectangular enclosure, was created in the middle Saxon period, with the northernmost ditches cutting SFB 468. Only the very northern end of the enclosure lay within the excavated area, but previous excavations have shown that it was aligned north-west to south-east and measured up to 211m long and 155m wide, enclosing nearly 3ha (Figs 2 & 6). Middle Saxon pottery (Ipswich and Maxey ware) from the fills of the enclosure ditches indicate that it had been excavated by the mid-8th century. From the excavation at the southern end of the enclosure bone from the base of the ditch has given radiocarbon dates of 680-890 Cal AD (95% confidence, 1245+/-35 BP, GrA-27203) and 690-890 Cal AD (95% confidence, 1223+/-28 BP, OxA-14200) (Preston 2007, 112, table 7), which also indicate that the enclosure was in use through the 8th century.

The northernmost end of the enclosure was defined only by a narrow gully, 347/337, up to 0.45m deep with varying profiles and fills, although a later recut of the eastern arm, with a terminal at the northern end, 359, was 1.10m wide and 0.80m deep (Fig 6). A curving ditch, 280/349, to the immediate south of the northern arm was closely contemporary. The shallow depth of the ditch to the north may suggest that hedges or fences were also used to define the boundaries of the enclosure.

The ditches generally contained infrequent pottery but plentiful animal bone, the greater percentage of which was sheep/goat. An iron key for a barrel padlock, from ditch 280, an iron nail and a spindlewhorl, give an indication of domestic activities for which there is no structural evidence, although contamination from the later more intensive periods of domestic occupation is a possibility.

External boundaries/enclosures

Sometime after the formation of the middle Saxon enclosure, a series of short curvilinear ditches and longer linear ditches were set out to the east and north of the enclosure, respecting both its location and alignment (Fig 6). These ditches contained early/middle Saxon pottery, but this was concentrated near the SFBs and was therefore residual from the earlier settlement. There was also some middle Saxon pottery, from the ditches nearest to the enclosure, which would appear to be indicative of contemporary activity taking place outside the enclosure.

To the east of the enclosure there were two closely parallel curving ditches, 384 and 436, and associated linear ditches, 550 and 906. A similar arrangement of ditches, though Bronze Age in date, has been interpreted as a 'race' and drafting gate, used in general husbandry practices for sorting and separating livestock (Pryor 2006). Similar arrangements are still in use today and would almost certainly have been used during the Saxon period. The presence of such a feature may suggest that large numbers of animals were being handled in an area immediately adjacent to the large enclosure.

A 20m-wide arc of ditch, 1221, was very different in character to the preceding shallow gullies and the fills were unusual as they contained very frequent charcoal and burnt clay flecks, but the only finds comprised frequent animal bone and domestic items including a bone comb.

The rectilinear pattern of ditches to the north of the enclosure may have formed a small rectangular enclosure, 30m wide. The western arm comprised ditches aligned north-west to south-east, 119/110 and 787, with a small central entrance. The eastern arm, 1113, joined the southern arm, 954. There was a broad, 4m-wide entrance at the south-western corner and the addition of ditch 504, may have been associated with the needs of stock management, in creating an elongated funnelled entrance.

To the west, a single isolated oval pit, 678, contained early/middle Saxon pottery.

3.6 Late Saxon/Saxo-Norman village (10th-11th centuries AD)

In the 10th century new linear boundary ditches were established and then refurbished and modified through the 11th century, forming a series of rectangular plots some of which contained small post-built houses (Fig 12). They probably formed minor elements of settlement at the periphery of the larger village of Wolverton, which lay to the north. The new boundary systems avoided the middle Saxon enclosure while respecting its alignment, indicating that even though its function may have ceased, its former importance was still recognised.

The complex sequence of ditches that flanked the modern footpath show that the hollow-way was in existence by the 10th century, if not earlier. It too respected the north-west to south-east alignment that had originated in the middle Saxon period. The modern footpath therefore displays some 1200 years of landscape continuity.

The hollow-way boundaries

The earliest surviving ditch to the south of the hollow-way, 1207, was 1.00m wide and 0.60m deep. Pottery dating to the Saxo-Norman period came from the upper fill. Ditch 1207 was partially recut to the west and was later replaced by a new ditch, 395, which was up to 1.73m wide and 0.45m deep. The fill contained few finds other than a whittle tang knife and the key for a barrel padlock (SFs18 and 61). At some stage there may also have been a fenceline 1052, parallel to the ditch.

Parallel ditches a little to the south, 884, 1181 and 1191, appear to be broadly contemporary. Five small postholes, 1262, may have formed a small timber structure, and this area was separated from area to the north-west by a series of short transverse gullies, 925 and 929.

To the south of the hollow-way boundaries, the prevailing ditch alignments were disregarded by one ditch, 897, which cut obliquely across them (Fig 13). It is suggested that this feature was probably short-lived, as both earlier and later systems respected the typical north-west to south-east alignments.

The northern buildings

Within the western half of the northern area there were two smaller areas of domestic activity; a post-built hall, 955, and a more dispersed scatter of postholes and pits, 986, set within a complex of ditches, 943, 1070, 1111 and 886, forming a small rectangular enclosure, 23m by 17m.

Structure 955

A group of postholes, some of which were intercut, defined a rectangular building aligned north-east to south-west, c6.5m long by 3.6m wide (Figs 13 and 14). The west wall comprised a rough line of closely-spaced postholes, no more than 1m apart, but the probable east wall only partially survived. Only one posthole contained *in situ* limestone post-packing. Many of the postholes cut through a layer of compact orange-grey-brown silty clay, 985, containing frequent small gravel and limestone pieces. This deposit lacked finds and may have been a remnant of ancient subsoil within a natural hollow.

A narrow slot, 982, which ran across the width of the building but terminated beyond the eastern wall, either held a partition wall or was a shallow drain. If the latter, it

would suggest that the building may have held livestock. To the south a shallow pit, 1007, flanked by two postholes contained burnt clay flecking.

Four of the postholes contained fuel-ash slag, 974, 976, 1023 and 1076, and two produced quantities of oats.

A shallow cess pit, 945, lay to the south-west (Fig 13). Its fill, with distinctive olive-green mottling indicative of cessy deposits, also contained the largest quantity of oat grain. To the north there was a pit, 900, that contained burnt clay and a large amount of flax seed.

Structure 986

This was a rather dispersed collection of postholes and pits, from which no convincing building plan can be created (Fig 13). At the northern extremity there was a shallow sub-circular pit, 913, lined with pale cream-coloured clay into which limestone fragments were laid (Fig 15). In places the clay was burnt red, yet the stone was unaffected by heat. The remains of an upper clay structure may have been backfilled into the feature, which also contained ashy material. To the east, pit 941, was unusual, as it was substantially larger than other features in this area, being 1.0m in diameter and 0.48m depth.

The southern boundaries

A major boundary system lay 20-25m to the south of the ditches adjacent to the hollow-way. To the east there was a length of linear ditch, 923, that showed minimal later refurbishment, probably because of the lack of nearby domestic activity (Fig 13). In the centre of the excavated area the boundary comprised a succession of broad ditches, 687 and 652. Further west the alignment was continued by ditch 220. At its eastern end, ditch 220 curved into a southward projecting arm, 763, which formed a partial eastern boundary to the focus of domestic activity. Close to the southern terminal, 781, of ditch 763 there was a small rectangular setting of postholes, 1259, measuring 2.0m by 2.5m, which may have been a small outbuilding, or perhaps even some form of gateway within an eastern boundary for which further physical evidence had not survived (Fig 13).

To the south-east the earliest boundaries were a series of intermittent gullies 367, 316 and 377. These early boundaries were all set well beyond the boundaries of the middle Saxon enclosure and this southern area was largely devoid of activity through the 10th and 11th centuries, apart from a group of large but shallow hollows, 520, and a nearby small pit, 528, with a charcoal-rich fill. In addition, a pit, 399, cut into the fill of one of middle Saxon enclosure ditches contained a stone deposit and burnt clay, which may have been the remnant of an oven.

The southern building and domestic activity

The focus of domestic activity occupied an area measuring 33-35m north-south by 25m east-west, taking up the western end of the excavated area (Fig 13). It was bounded by ditches 220/763 to the north and east and ditch 265 to the south. There was a post-built house, 100, to the north, with a nearby well and cess pits. To the south a fenceline, 1256, divided the domestic centre from an area containing a malting oven and another well.

Structure 100 was a post-built domestic house (Fig 14). The main group of postholes/post-pits defined a room only 4.5m long by 3.5m wide. However, further postholes to the north-west may have been remnants of a second room, suggesting that the building was up to 8m long.

Two lengths of the neighbouring gully contained slag, and fuel-ash slag was present in a single posthole of the building, but no other evidence was found for iron smithing despite extensive sampling. To the south-west there was an extensive scatter of postholes and pits, perhaps occupying an open yard. A small pit containing hearth debris, 656, sat in the top of some larger pits (Fig 16). Many of the postholes retained limestone slabs from former post-packing, and there were occasional examples of post-pads or limestone slabs in the bases of features. There were frequent occurrences of burnt grain within the fills.

Ten metres to the south of the building there were two cess pits, 765 and 767, with the fills showing the characteristic greenish-yellow (Fig 13). Both contained frequent pottery and bone.

Five metres to the south-east of the building was a well 125 (Fig 13). This was a substantial feature, up to 3.00m diameter and 1.65m deep. Only the lower 0.40m retained the near vertical sides, 1.0m in diameter, and the upper sides had collapsed (Figs 17-19). The lower fill (1107) comprised natural collapse and silting, and the uppermost layers were of post-medieval date. On excavation, the watertable was high enough to enable clear water to percolate into the base of the feature, and side collapse occurred frequently during and after periods of heavy rain, but was no surviving organic material in the fills.

Twenty metres to the south of the building there were two large pits, 710 and 807. Pit 710 was 1.40m deep containing successive dumped layers, which incorporated the articulated remains of many small trapped amphibians/rodents. The uppermost fill was a capping of compact, rammed clean limestone. Pit 807 was only 0.55m deep.

At the northern end of the area to the south-west of fence line, 1256, there was a well, 102, and a malting oven, 254.

The well, 102, was 1.65m deep, cutting into the natural clay layer below the limestone (Figs 13, 17 and 20). The upper sides were eroded but the bottom 0.80m was 0.80m diameter and vertical-sided with a flat base. The lower fill was waterlogged and full of organic matter, including twigs. The steeply angled fills above this derived from deliberate backfilling.

The malting oven, 250, was 3.75m long by up to 0.90m wide and 0.30m deep (Fig 21). The stokehole lay at the northern end, 0.87m in diameter, and the fire had been set within the opening of the flue, which was 1.20m long and 0.30m wide (Fig 22). This opened into a deeper chamber, 1.70m long by 0.75m wide and up to 0.30m deep (Fig 23). The earliest fill, 253, contained frequent charcoal flecks and was probably the remains of the last firing. The oven superstructure had been dismantled, with burnt and unburnt clay, and limestone, 251, filling the northern end of the feature. The malting oven has produced an archaeomagnetic date of c970-1020 AD (Fig 24, Appendix 3). A very similar earth-cut malting with a long flue linking the stokehole and the chamber at West Cotton, Raunds, Northampton, was dated to early 12th century, with the first stone-built ovens in use from the later 12th century (Chapman 2010, 111-112, fig 4.36). The survival of a large deposit of sprouted carbonised barley grain left no doubt as to the primary function of the oven.

To the south of the malt oven and well there was a cluster of 14 postholes in a 4m by 4m (Fig 13, 284). The postholes varied from oval to circular, and most were filled with sterile yellowish-brown silty clay. To the south there was small circular pit with

reddened-blackened cut sides, indicative of burning *in situ*, and a fill containing much charcoal and burnt clay flecks.

Structure 1267

In the excavation area to the east of the hollow-way there was a scatter of 22 postholes in an area measuring 19m by 11m, 1267 (Fig 12). A nearby pit, 5, contained a deposit of burnt daub and charcoal.

3.7 From village to field (12th to 14th centuries)

The hollow-way boundaries

The major land division that bounded the southern side of the hollow-way was moved slightly to the north, and from the 12th to 14th centuries there were at least five recuts. At the north-western end the ditches turned westward before terminating (Fig 25).

The ditches ranged from 1.4-3.7m wide and 0.56-0.90m deep with U-shaped profiles. All had silted naturally with soft or compact dark grey clayey silts, and some contained large limestone pieces and gravel nodules. There was little dating evidence, being distant from any contemporary occupation. An area of trampled or churned natural, 1149, on the north-eastern side of one of the ditches in an area that had not been truncated by post-medieval features, may have been the edge of the hollow-way deposits.

The domestic area

Domestic occupation came to an end during the 12th century, with the latest features comprising a new southern boundary ditch and a scatter of large pits containing domestic rubbish. This marks a contraction on this southern margin of the medieval village, with the area taken into the open field system. The smaller area to the north-east of the hollow-way was partly used for quarrying.

Eight postholes of timber building 100 contained 12th-century pottery, indicating that the building was still in use during the final episode of pit digging. The eroded upper half of well 125 was backfilled with substantial deposits of earth and stone at this period (Fig 15).

To the south of building 100 there were some 15 pits, several of which were substantial. The upper sides of many were weathered indicating that they were open for some time. There was often side collapse between layers of fill that contained lenses of charcoal and limestone, some of which was burnt. Pottery and bone were found throughout.

To the south-west the extent of the domestic area was redefined by a new gully, 121 (Fig 25). There was a series of other gullies on parallel alignments, but these all terminated in the western corner of the site, perhaps suggesting that more intensive domestic occupation was continuing nearby. In one of the ditches, 115, a human skull had been placed in the upper fill (Figs 25 and 26). The lack of lower jaw suggests that it was at least in an advanced state of decay and was not an intact head when deposited.

In the area north-east of the hollow-way, two gullies, 25 and 79, 0.80m wide and 0.50m deep with V- or U-shaped profiles, may be boundaries dating to this period. A small pit, 94, 1.30m diameter by 0.40m deep, contained 13th-century pottery. At the east end of the plot three large and intercut quarry pits were used to exploit the limestone natural; presumably for local building work. The pits were up to 12.70m wide

and at least 1.90m deep, and were backfilled with re-deposited clay and limestone, interleaved with silts. The few finds included 13th-century pottery.

3.8 Post-medieval features

The last phase of activity on the main site during the post-medieval period was the re-definition of the boundary ditch system adjacent to the hollow-way (Fig 25). This ditch, 1223, was dated by clay tobacco-pipes, and there were surface finds of post-medieval ironwork and musket balls. As no ditches contained more recent material, it is assumed that the ditch was eventually replaced by hedge lines at the time of enclosure.

To the north-east, two quarry pits, 60 and 87/90, were dug in the 17th and 19th centuries to extract the limestone for local building work (Fig 25). The pits were 2.60-4.00m wide and 1.00m-1.80m deep. All were backfilled with lenses of re-deposited natural interleaved with silty lenses with limestone, tile, pottery, clay tobacco-pipes and ironworking tap slag.

4 PREHISTORIC AND ROMAN FINDS

4.1 The flint by Alex Thompson

Twenty-one pieces of worked flint were recovered, all were residual. The assemblage contains an equal proportion of tools and debitage, including two notched flakes and two utilised blades, which are generally characteristic of earlier Neolithic assemblages. Two end scrapers and one side scraper are very irregular, and the latter has an additional notch on the opposing side. They are not closely diagnostic, and may date anywhere from the later Neolithic/early Bronze Age through to the later Bronze Age.

Although there are no cores, the presence of primary waste flakes shows that flint working was occurring on site. The raw material used was entirely the local naturally occurring small gravel and slightly larger flint nodules. The flint is a fairly good quality grey-brown colour, some with cherty inclusions, and is of a moderate size.

4.2 The Roman finds by Tora Hylton and Ian Meadows

A small number of Roman finds are residual in deposits post-dating the late Saxon period. A complete copper alloy finger ring has the shoulders of the hoop decorated with mouldings either side of a circular bezel, setting now missing. It displays similarities to a 2nd-century example from Gadebridge Park, Hemel Hempstead (Neal and Butcher 1974, fig 60, 115). Part of a tinned copper alloy Hod Hill-type brooch came from the subsoil. The upper part of the bow comprises a circular disc with annular grooves flanked by three transverse mouldings, with a single protruding wing on each side. The lower part of the bow tapers to a rounded knobbed foot. Four Roman coins, identified by Ian Meadows, are dated to the 3rd and 4th centuries. They comprise a barbarous radiate of the late 3rd century and three House of Constantine issues of the 4th century.

5 THE SAXON AND MEDIEVAL POTTERY by Paul Blinkhorn

The pottery assemblage comprised 1,509 sherds with a total weight of 15,316g. The estimated vessel equivalent (EVE), by summation of surviving rimsherd circumference was 8.87. The range of pottery types shows that there was activity at the site during the 5th century, and then from the 8th to the 12th centuries, but very little thereafter.

The early Saxon assemblage includes some of the earliest Anglo-Saxon pottery known from the south-east midlands. When combined with the pottery from previous excavations nearby, the middle Saxon Ipswich ware comprises the largest known assemblage of Ipswich ware from Buckinghamshire.

5.1 Analytical methodology

The pottery was initially bulk-sorted and recorded on a computer using DBase IV software. The material from each context was recorded by number and weight of sherds per fabric type, with featureless body sherds of the same fabric counted, weighed and recorded as one database entry. Feature sherds such as rims, bases and lugs were individually recorded, with individual codes used for the various types. Decorated sherds were similarly treated. In the case of the rimsherds, the form, diameter in mm and the percentage remaining of the original complete circumference was all recorded. This figure was summed for each fabric type to obtain the

estimated vessel equivalent (EVE).

The terminology used is that defined by the Medieval Pottery Research Group's *Guide to the Classification of Medieval Ceramic Forms* (MPRG 1998) and to the minimum standards laid out in the *Minimum Standards for the Processing, Recording, Analysis and Publication of post-Roman Ceramics* (MPRG 2001). All statistical analyses were carried out to the minimum standards suggested by Orton (1998-9, 135-7).

5.2 Fabrics

Early/middle Saxon hand-built wares

These comprised 276 sherds with a total weight of 3,262g. The estimated vessel equivalent (EVE), by summation of surviving rimsherd circumference was 1.63. The following fabric types were noted:

F1: Granite. Sparse to moderate sub-angular granite up to 2mm, free flakes of biotite mica and quartz grains. 15 sherds, 127g, EVE = 0.12.

F2: Fine quartz. Moderate to dense sub-angular quartz less than 0.5mm. 77 sherds, 507g, EVE = 0.27.

F3: Sandstone. Sub-angular limps of sandstone up to 2mm, some with calcitic cement, free quartz grains up to 1mm, rare to sparse sub-rounded calcareous material up to 2mm. 47 sherds, 355g, EVE = 0.34.

F4: Coarse quartz. Moderate to dense sub-angular quartz up to 2mm. 35 sherds, 971g, EVE = 0.29.

F5: Chaff. Moderate to dense chaff voids up to 10mm, few other visible inclusions except for rare quartz or sandstone grains up to 1mm. 27 sherds, 306g, EVE = 0.36.

F6: Quartz and chalk. Sparse to moderate sub-rounded quartz up to 1mm, rare to sparse subrounded calcareous material up to 4mm. 44 sherds, 627g, EVE = 0.15.

F7: Chaff and quartz. Sparse to moderate sub-rounded quartz up to 1mm, sparse to moderate chaff voids up to 5mm. 17 sherds, 211g, EVE = 0.07.

F8: Ferruginous sandstone. Sub-angular limps of orange sandstone up to 2mm, free quartz grains up to 1mm, rare to sparse sub-rounded calcareous material up to 2mm. 14 sherds, 161g, EVE = 0.03.

The range of fabric types is typical of sites in the region, such as Milton Keynes, Pennyland (Blinkhorn 1993). The granitic wares, which occur in small quantities on many early Anglo-Saxon sites in the county are likely to have originated in Leicestershire, where outcrops of Mount Sorrel granite are known in the Charnwood forest area (Vince 1995). Clays in that area, with distinctive acid igneous rock inclusions, have been exploited since the Iron Age.

Middle Saxon

Ipswich Ware, AD 725-850 (Blinkhorn forthcoming.) Middle Saxon, slow-wheel made ware, manufactured exclusively in the eponymous Suffolk *wic*. The material probably had a currency of AD 725/740 - mid 9th century at sites outside East Anglia. There are two main fabric types, although individual vessels which do not conform to these

groups also occur:

F95: GROUP 1: Hard and slightly sandy to the touch, with visible small quartz grains and some shreds of mica. Frequent fairly well-sorted angular to sub-angular grains of quartz, generally measuring below 0.3 mm in size but with some larger grains, including a number which are polycrystalline in appearance. 11 sherds, 220g, EVE = 0.11.

F96: GROUP 2: Like the sherds in Group 1, they are hard, sandy and mostly dark grey in colour. Their most prominent feature is a scatter of large quartz grains (up to c2.5mm) which either bulge or protrude through the surfaces of the vessel, giving rise to the term "pimply" Ipswich ware (Hurst 1961). This characteristic makes them quite rough to the touch. However, some sherds have the same groundmass but lack the larger quartz grains which are characteristic of this group, and chemical analysis suggests that they are made from the same clay. Three sherds, 141g, EVE = 0.

F97: Maxey-type Ware. Exact chronology uncertain, but generally dated c AD 650-850 (eg Hurst 1976). Wet-hand finished, reddish-orange to black surfaces. Soft to fairly hard, with abundant fossil shell platelets up to 10mm. Vessels usually straight-sided bowls with upright, triangular, rim-mounted pierced lugs. 18 sherds, 276g, EVE = 10.

Late Saxon and later

Where appropriate, this pottery was recorded using the alphanumeric coding system of the Milton Keynes Archaeological Unit type-series (eg Mynard and Zeepvat 1992; Zeepvat *et al* 1994). The numeric codes prefixed with 'F' are those used in the pottery database for this site (in archive).

F100: SNC1: *St. Neots Ware*, c AD900-1100. 98 sherds, 1,077g, EVE = 1.76

F200: SNC1: *St. Neots Ware*, c AD1000-1200. 356 sherds, 2072g, EVE = 1.37

F205: MS19: *Stamford Ware*, c AD900-1200. 2 sherd, 3g, EVE = 0

F301: MSC1: *Sandy and Shelly ware*, late 11th – mid 13th centuries, 13 sherds, 95g, EVE = 0

F330: MC3: *Medieval Shelly ware*, AD1100-1400. 314 sherds, 3172g, EVE = 2.09

F360: MS3: *Medieval Grey Sandy Ware*, Mid 11th–late 14th centuries. 350 sherds, 3210g, EVE = 1.24

F329: MC6: *Potterspury Ware*, AD1250 – 1600. 7 sherds, 97g, EVE = 0.21

F324: MC9: *Brill/Boarstall Ware*, AD1200-?1600. 2 sherds, 4g, EVE = 0

F1000: *Miscellaneous 19th and 20th-century wares*, 112 sherds, 1193g

In addition, the following wares, not covered by the type-series, were also noted:

F207: *Cotswolds-type ware*: c late 10th-early 13th centuries. Oxfordshire fabric OXAC (Mellor 1994). Slow-wheel made. Fairly hard, dark blue-grey to black fabric with moderate sub-rounded white pink and grey quartzite up to 1mm. Sparse to moderate calcareous material, including ooliths, up to 2mm. Rare haematite up to 1mm. Mainly 'barrel' jars with triangular rims or more shouldered examples with high everted rims, bases usually sagging. Probably manufactured at a number of sources in the Cotswolds region. 30 sherds, 371g, EVE = 0.36.

F300: *Oxford ware*. Oxfordshire fabric OXY (ibid) c late 11th–14th centuries. Abundant sub-angular quartz with some rounded clay pellets and occasional polycrystalline quartz. Handmade and wheel-thrown vessels, including glazed tripod

pitchers. 5 sherds, 73g, EVE = 0.

5.3 Chronology

Early - early/middle Saxon

The dating of the Anglo-Saxon hand-built pottery is entirely reliant on the presence of decorated sherds. It seems that the Anglo-Saxons generally stopped decorating such wares around the beginning of the 7th century (Myres 1977, 1), but it cannot be said with certainty that an assemblage which consists of only plain sherds is of 7th century date. Usually, decorated pottery only comprises around 3-4% of domestic early Saxon assemblages, as was the case at sites such as West Stow, Suffolk (West 1985) and Mucking, Essex (Hamerow 1993).

Only four decorated sherds of hand-built pottery were noted at this site. One of them, from context 98 (SFB 144), had just a fragment of an incised line, and is impossible to date other than to the broad early Anglo-Saxon period, but the other three all appear to be exceptionally early in date. They all occurred in SFB 144, in contexts 147 (x2) and 149. The two sherds from 147 (Fig 27, 3-4) both have raised curvilinear decoration (*Stehende Bogen*) incised with slashing, a scheme typical of the highly-decorated *Buckelurnen* of the 5th century (Myres 1977, 31-4). The other sherd (Fig 27, 5) is from a carinated bowl with slashed and linear decoration. This vessel form, the *Schalurne*, is thought to be amongst the earliest Anglo-Saxon pottery in the country, and is very rare in the region. They generally date from the 5th century, although later examples are known. It would appear therefore that the SFB at this site must date to around the middle of the 5th century.

It also seems likely that there was little significant activity at this site during the later years of the 5th century and the whole of the 6th century. This period is typified, in the case of the former, by bossed pottery, then in the case of the latter, stamped decoration. Both these techniques are completely absent from this site, despite the fact that they are well-known at other sites in Milton Keynes, such as Pennyland (Blinkhorn 1993).

It is impossible to say with any certainty if there is 7th-century activity at the site. Assemblages of entirely plain pottery occurred in a number of features, but most of the groups comprised only a few sherds, and so cannot be dated other than to within the broad early/middle Saxon period (E/MS, AD450–850).

Middle Saxon and later

Each pottery assemblage was given a seriated Ceramic Phase (CP) date, based on the range of wares present, and adjusted according to the stratigraphic evidence (Table 2).

Table 2: Ceramic Phase dating scheme

Ceramic Phase	Defining Wares	Chronology
Middle Saxon (MS)	Middle Saxon	AD650-850
Late Saxon (LS)	F100	10th century
Saxo-Norman (SN)	F200, F205, F301	11th century
Medieval (M1)	F330	12th century
Medieval (M2)	F324	Early – mid 13th century
Medieval (M3)	F329	Mid13th – 14th century

5.4 Pottery occurrence

The pottery occurrence per ceramic phase (Table 3) shows that there was activity at the site from the early Saxon to the 12th century, with pottery deposition all but ceasing before the beginning of the 13th century.

Table 3: Pottery occurrence per ceramic phase, all fabrics

Phase	No sherds	Wt sherds (g)	EVE	Mean wt (g)
ES	103	2135	0.69	20.7
E/MS	68	431	0.16	6.3
MS	35	488	0.24	13.9
LS	47	354	0.34	7.5
SN	344	2265	2.52	6.6
M1	750	8016	4.29	10.7
M2	1	2	0	2.0
M3	38	370	0.63	9.7
Total	1386	14061	8.87	

In most cases, the occurrence of the main fabric types per phase appears to reflect their generally accepted chronology, and residuality is fairly low. The exception is the material from phase M3 (mid 13th – 14th centuries). Only 370g of pottery were recovered from features of that date, and nearly 52% (by weight) is Anglo-Saxon, and thus residual, showing that there was little activity at the site at this time.

The whole assemblage was generally scattered, with only two vessels reconstructed to a full profile (Fig 27, 1 and 2), and no cross-fits were noted between features or even between contexts within the same feature.

Illustrated pottery (Fig 27)

- 1 Full profile of jar. fabric 360. Grey fabric with orange and dark brown scorched and sooted outer surface. Extensive lime scaling on inner lower body and base pad. Context 241, pit 242
- 2 Full profile of large bowl. F330. Grey fabric with brown surfaces. Outer surface extensively and evenly sooted. Context 909, post-pit 999

Table 4: Pottery occurrence per ceramic phase, major fabrics, expressed as a percentage of the phase total, by weight

Phase	Hand built	Ipswich	F97	F100	F200	F207	F360	F330	F329	Phase Total (g)
ES	99.6%	-	-	-	-	-	-	-	-	2135
E/MS	99.3	-	-	-	-	-	-	-	-	431
MS	33.8	46.9	19.3	-	-	-	-	-	-	488
LS	4.8	0	25.4	62.4	-	-	-	-	-	354
SN	9.0	3.1	0	25.7	51.0	5.5	4.0	-	-	2265
M1	3.2	0.7	0	3.4	10.5	3.1	38.3	38.8	-	8016
M3	13.5	0	24.9	0	13.8	0	12.7	12.2	23.0	370

5.5 Fragmentation analysis

As with pottery occurrence, the data for the mean sherd weight of the major fabrics per phase is largely what would be expected for a site with this chronology in the region (Table 5). However, there are anomalies, such as the fact that both F97 and F100 have their greatest mean sherd weights in phases in which they were residual.

This is not an uncommon occurrence, and is due to small quantities of large sherds occurring in later features.

Table 5: Mean sherd weight per ceramic phase, major fabric

Phase /fabric	Hand built Weight (g)	Ipswich	F97	F100	F200	F207	F360	F330	F329
ES	20.9g	-	-	-	-	-	-	-	-
E/MS	6.4	-	-	-	-	-	-	-	-
MS	7.9	38.2	11.8	-	-	-	-	-	-
LS	3.4	0	10.0	7.4	-	-	-	-	-
SN	5.2	14.2	0	11.2	5.6	7.8	6.1	-	-
M1	8.2	26.5	0	17.2	6.2	17.6	13.5	10.1	-
M3	5.6	0	92.0	0	4.6	0	5.9	11.3	17.0

5.6 Vessel use

The pattern of vessel occurrence per phase is as generally would be expected (Table 6). The Saxon hand-built assemblage comprises entirely simple jars and bowls, as does the middle Saxon assemblage. Spouted pitchers, one of the features of the Ipswich ware industry, are completely absent, although sherds did occur in some of the earlier excavations at this site (Blinkhorn 2002b). The late Saxon and Saxo-Norman assemblages are dominated by jars, with St. Neots ware inturned-rim bowls not uncommon, but the period also sees the introduction of cylindrical jars, a specialist cooking vessel of the late Saxon to early medieval period (Blinkhorn 1999b). Phase M1 sees the introduction of large bowls with upright rims in fabric 330, a typical trait of the period, while at the same time inturned rim bowls fall from use. Jugs first appear in the M1 phase, but are never common, although the figure of 19% for phase M3 is fairly typical of assemblages of that date in the region, despite the small assemblage size.

Table 6: Vessel occurrence by EVE, expressed as a percentage of each phase assemblage

Phase	Jars	Bowls	Jugs	Cylindrical Jars	Phase total
ES	88.4%	11.6	0	0	0.69
E/MS	100	0	0	0	0.16
MS	70.8	29.2	0	0	0.24
LS	67.6	17.7	0	14.7	0.34
SN	77.4	21.0	0	1.6	2.52
M1	78.6	14.0	1.2	6.3	4.29
M3	81.0	0	19.0	0	0.63

5.7 Pottery from sunken-featured building 144

This feature produced 76 sherds of hand-built pottery (1,666g, EVE = 0.43), representing over 51% (by weight) of the hand-built pottery from the site. As is often the case with such features, all the pottery appears to be the product of secondary deposition, comprising largely individual sherds from different vessels, with few cross-fitting fragments. In this case, it was not possible to find any joins between the different excavated quadrants, indicating that the pottery was material from elsewhere used to back-fill the hollow rather than being pots which were used in the structure during its lifetime. The chronology suggested by the decorated pottery aside (see above and Fig 27, 3-5), the assemblage appears unexceptional, comprising

fragments of jars (eg Fig 27, 6–7) and a small bowl (Fig 27, 8) with simple rim forms, along with a base sherd from a large jar (Fig 27, 9).

Illustrated pottery (Fig 27)

- 3 Decorated bodysherd. fabric 2. Uniform black fabric with highly burnished outer surface. Raised curvilinear decoration pressed out from the inside. Context 147, SFB 144
- 4 Decorated bodysherd. F1. Dark grey fabric with browner surfaces, outer surface highly burnished. Raised curvilinear decoration applied to the outside of the vessel. Context 147, SFB 144
- 5 Bodysherd from carinated bowl with incised decoration. F3. Uniform black fabric with burnished surfaces. Slashing on the carination, and a fragment of an incised line on the neck. Context 149, SFB 144
- 6 Jar rim. F4. Black fabric with burnished outer surface. Context 149, SFB 144
- 7 Jar rim. F7. Black fabric with burnished outer surface. Context 149, SFB 144
- 8 Bowl rim. F6. Black fabric with burnished outer surface. Context 149, SFB 144
- 9 Base sherd. F4. Black fabric with burnished outer surface. Context 149, SFB 144

5.8 The assemblage in its local and regional context

Background

Analysis of the pottery from other associated sites at Wolverton Mill showed a similar range of wares (Blinkhorn 2007b), although early Anglo-Saxon decorated pottery was represented by just one stamped and incised sherd from an assemblage of 239 sherds. It shows that there was activity in the vicinity of those sites during the sixth century, but also that its focus is likely to lie outside the excavated area. Evaluation by Northamptonshire Archaeology (Blinkhorn 2006) produced 16 sherds (77g) of early/middle Saxon handmade pottery, including a decorated sherd with curvilinear decoration of probable 5th century date, and also a sherd of Ipswich ware (21g).

The other nearby sites also produced an assemblage of middle Saxon pottery, including nine sherds of Ipswich ware and 60 of Maxey Ware. This means that Wolverton Mill has produced 24 sherds of Ipswich ware, the largest assemblage in Buckinghamshire. The area covered by these sites appears to have been somewhat peripheral from the late Saxon period onwards. Just 16 sherds of late Saxon and Saxo-Norman pottery were noted, and only 38 sherds of medieval material from the 12th century. Potterspury ware is more numerous, but the assemblage still only comprised 56 sherds. The evaluation excavations by Northamptonshire Archaeology produced mainly late Saxon pottery, but also small quantities of medieval wares from the 12th century, giving a generally similar ceramic profile to the main excavations under consideration here.

In the evaluation of the area including the present site (Blinkhorn 2002b) almost all of the pottery was of late Saxon to 12th century date (Table 7), with just a single late medieval sherd. This generally reflects the pattern seen here for that period. The pottery occurrence per phase from the evaluation is shown in Table 7.

Table 7: Pottery occurrence by number, weight and EVE, evaluation excavation

Date	No	Wt (g)	EVE
10th - 11th centuries	18	184	0.49
Mid 11th – 12th centuries	2	41	0
12th century	69	553	0.49
Total	89	778	0.98

Early Saxon

The decorated sherds from the SFB are worthy of some comment, as they appear very early in date, and are from vessel types which are not common in the region. The *Buckelurnen* have very few parallels, and are mainly known from cremation cemeteries. In Bedfordshire, four examples excavated in the 19th century or earlier, are known from Sandy (Kennett 1970, fig 6, 1-4) and another occurred at a cemetery in Luton (Kennett 1973, fig 1, 5). Northamptonshire has produced a small number (Myres 1977), but by far the majority of known examples are from East Anglia and Lincolnshire, with outliers in other counties.

The incised carinated bowl, the *Schalurne*, is of a type which is perhaps even rarer. These vessels have a similar distribution to *Buckelurnen*, although very few are known from the south-east midlands. An example from Bedfordshire, probably the Sandy cemetery, was found sometime around the middle of 19th century or earlier (Kennett 1970, fig 8, 12), and a vessel from the Luton cemetery could be placed in the same category (Kennett 1973, fig 1, 3). Fifth-century pottery is otherwise very rare in the county, although there are finds of material of that date from cemeteries at Kempston and Dunstable, and finds from a settlement at Puddlehill are said to be similarly early (Bilikowska 1980, 28-30).

Such pottery is perhaps even rarer from settlement sites in Milton Keynes and the south-east midlands generally. The site at Bancroft Villa produced 192 sherds of hand-built pottery, of which nine were decorated in 5th-century styles, including fragments from four different *schalurnen* (Blinkhorn 1994a, fig 294, 1-4). A similar date was given to the assemblage of 11 decorated sherds (out of 391) from Berrystead Close, Caldecotte, which included a *Schalurne* with a slashed carination (Blinkhorn 1994b, fig 13, 13). Other assemblages of early Anglo-Saxon pottery have been noted at other sites in the city, such as that from Pennyland (Blinkhorn 1993), but they all date to the later 5th or 6th centuries.

Further afield in the county, a large assemblage of over 2,000 sherds was excavated at Walton, near Aylesbury (Farley 1976). The decorated pottery is said to have indicated that the site was occupied in the 5th and 6th centuries, but there were no obvious *Buckelurne* or *Schalurne* fragments present.

In Northamptonshire, a single SFB at Stoke Doyle near Oundle produced a carinated *Schalurne* (Pearson 1994), and excavations at King's Meadow Lane, Higham Ferrers (Blinkhorn 2007) produced a small assemblage of pottery of that date. The group included several carinated vessels, including one with slashing, similar to the example from this site. A single possible carinated bowl sherd was noted at St. John's Square, Daventry (Blinkhorn 1996-97), but no other pottery of this date is known from the county at this time.

The hand-built pottery assemblage from this site, when combined with the material from the Northamptonshire Archaeology and Oxford Archaeology evaluations and Thames Valley Archaeological Services excavations, comprises 532 sherds (4,961g,

EVE = 2.67). As noted, the Walton excavations (Farley 1976) produced around 2,000 sherds, and Pennyland (Blinkhorn 1993) produced 1,966 sherds, but otherwise this is the largest assemblage from the county of Buckinghamshire. It would seem by the chronology of the pottery from Wolverton Mill that yet more Anglo-Saxon discoveries have yet to be made, as the 6th-century core of this settlement has not been found.

Middle Saxon

The middle Saxon pottery from this site is one of a growing number from the region. It is uncertain if hand-built pottery continued in use in the period AD650-850, although it is often found at sites with Ipswich and Maxey wares, which are undoubtedly of middle Saxon date. The data in Table 5 shows that the mean sherd weight of hand-built pottery from middle Saxon features is considerably lower than that from early Saxon features, but it is higher than that from features of early/middle Saxon date, ie those which have hand-built pottery but no decorated wares. The mean weights from the features of those dates does not greatly differ from those for the same wares in late Saxon and later phases, when they were undoubtedly residual, so it is entirely possible that all the hand-built pottery from the 7th century onwards is residual.

The situation is similar from the other Wolverton mill sites; the mean sherd weight of the hand-built pottery from middle Saxon features (6.9g) is similar to that from the early/middle Saxon features (5.1g), but nowhere near as large as that from the early Saxon features here. Some areas of the south midlands have produced compelling evidence that there was an hiatus in the use of hand-built pottery in the middle Saxon period, such as Eynsham Abbey (Blinkhorn 2003) and Yarnton (Blinkhorn 2004), both in Oxfordshire, but the picture is far from clear in this area of the region. Certainly, at the Wolverton Mill sites, taphonomy may be a factor. The early Saxon pottery assemblage is mainly from an SFB, whereas the later/undated hand-built material is from post-built structures or ditches, with the former particularly rarely yielding large assemblages or large sherds due to the nature of the features involved.

The Ipswich ware and Maxey ware assemblages from this site are a useful addition to the growing corpus of such pottery in the region. The assemblage of 24 Ipswich ware sherds from all the Wolverton Mill sites is, as already noted, the largest in Buckinghamshire, although the period assemblage is somewhat fragmented, with just one small rimsherd in each middle Saxon fabric, and no other feature sherds. In Milton Keynes, six sherds of Ipswich ware occurred at Pennyland and, Westbury-by-Shenley produced two (Hurman and Ivens 1995). Elsewhere in the county, the Prebendal Manor at Aylesbury produced 12 sherds (M Farley pers comm), and five occurred at Wing Church (Blinkhorn 2008). The assemblage from Lake End Road, Maidenhead (Blinkhorn 2002) is perhaps the most interesting from the county. It produced only three sherds of Ipswich ware, but 18 sherds of middle Saxon continental imports, including the extremely rare Tating Ware, the only finds of imported continental pottery from the whole of Buckinghamshire. The middle Saxon ceramic profile is generally very different to the other known contemporary sites in the county, but is similar to the material found at many Thames Valley sites in the hinterland of *Lundenwic*, the middle Saxon emporium at London (Blackmore 1988; 1989).

The rest of the Ipswich ware sites in the county, Wing Church and the Aylesbury Prebendal Manor aside, seem typical of many rural sites which have produced such pottery in the south and east midlands. They appear to have been farming communities of unexceptional status, but were wealthy enough to have been able to have indulged in limited trade. For example, it is suggested that the middle Saxon site at Pennyland was specialising in stock production. This has been dealt with at

length elsewhere (Blinkhorn 1999b), with the suggestion that there was a change in the middle Saxon period in the midlands from broad-based subsistence economy to a more specialised production of a limited range of commodities, a surplus of which was traded. It seems likely that the settlement excavated here is of that type.

Large assemblages of Ipswich ware are equally rare in Bedfordshire. A heavily-disturbed site at Tempsford produced 56 sherds of Ipswich ware (Blinkhorn 2005), and the Midland Road area of Bedford has produced an assemblage of around 20 sherds (Baker and Hassall 1979). Small quantities of Ipswich ware have been found at a number of sites around the town and in the Ouse Valley generally.

The Maxey ware is a pottery type that is more common than Ipswich ware in the south-east midlands, but large assemblages are still rare. In Milton Keynes, a single sherd was noted at Pennyland, six were noted at Great Linford (Pearson 1992) and one at All Saints' Church in Milton Keynes village (Mynard and Zeevat 1992, 184-5). A site at Chicheley near Newport Pagnell, (Farley 1980) produced 77 sherds.

In Bedfordshire, Tempsford (Blinkhorn 2005) produced 155 sherds of Maxey ware but other than these, most sites produced just a few sherds. Bedford has produced bar-lug vessels (Baker and Hassall 1979, fig 94, 110-13), although the exact amount is unknown.

Late Saxon and medieval

The 10th-century and later pottery is typical of sites in the south-east midlands. It is dominated by shelly wares, in the first instance the St. Neots types, and later the medieval shelly wares. The presence of a small assemblage of Oolitic ware is worthy of note. The most likely source of this is the Cotswolds region (Mellor 1994), and this, along with a small number of sherds of Oxford ware shows that there was trade with the site from the west around the time of the Norman Conquest. Such pottery is fairly rare in the Milton Keynes region, and suggests that the site may have been relatively wealthy at that time.

6 THE SAXON AND MEDIEVAL FINDS by Tora Hylton, with Andy Chapman

6.1 Introduction

A small group of domestic artefacts were recovered from early/middle Saxon deposits, c5th/6th-7th centuries, and of particular interest is the presence of an intriguing array of finds found in a shallow pit. However, the majority of finds were recovered from late Saxon and medieval deposits.

The artefactual evidence in the 8th-11th centuries not only implies a rural community with access to trade routes, but also a slight change in status. There is evidence for metal working, and tools for textile manufacture and cereal production. There are a small number of finds from medieval features, but with the exception of a single horseshoe, most of the finds appear to be either residual from earlier periods or intrusive. The post-medieval finds were recovered from quarry pits excavated during the 17th-19th centuries.

There are 88 individually or group recorded finds in eight material types. Of that number four were recovered by metal detector from unstratified topsoil and subsoil deposits.

Twenty-six iron objects (excluding nails and small fragments) were submitted for X-ray. This was undertaken by David Parish of Buckinghamshire County Museum Conservation Service. This not only provided a permanent record, but it enabled identification and revealed technical details not previously visible, for example two iron objects are coated in a non-ferrous metal. Further work was undertaken on four objects to clarify details visible on the x-ray, determine the presence of mineral preserved organics and remove any loose corrosion products (see Appendix 1). No stabilisation was carried out.

6.2 The finds by period

Early/middle Saxon (450-750AD)

There is a group of finds from around the SFBs and another group from pit 506, comprising 12 objects, including weapons, a quern and toilet equipment.

A semicircular piece of copper alloy sheet, possibly a fragment from a Roman plate brooch, came from SFB 144. A barrel padlock key (Fig 28, 8) and a structural nail, came from enclosure gully 280, adjacent to SFB 144. A bone spindlewhorl, from middle Saxon enclosure ditch 359, was made from the head of a humerus of a large ungulate (pers comm Karen Deighton). There are fragments from three antler combs, all early/middle Saxon (450-750AD). One small fragment of a connecting-plate was recovered from ditch 1221.

Illustrated finds (Fig 28)

- 8 Key for barrel padlock, iron. Sub-circular bit with centrally placed aperture, bit set laterally to square-section tapered stem, which terminates in a rearward facing loop. Length: 106mm. SF61, boundary ditch 395

Pit 506

Of particular interest is the presence of two complete spearheads (Fig 32, 17, 18), part of a blade from a seax (Fig 32, 19), two bone combs (Fig 28, 4, 5), and joining pieces from a rotary quern (Fig 33). In addition, the pit produced a woolcomb heckle (Fig 31, 12), a corner bracket (Fig 28, 6) possibly from a box, together with two nails of a type used on timber and four undiagnostic fragments of metal.

It seems to be a strange combination of artefacts to find in a shallow pit only 250mm deep. It is worth noting that the most interesting items, namely the spearheads, seax, combs, heckle and box fitting are all types of objects that are typically deposited as part of an assemblage of grave goods, particularly in the 6th/7th centuries. There is no evidence for the presence of human bone within the deposit. Therefore it is possible that this small group was re-deposited within a small pit after burials had been disturbed. During the cleaning of the objects, it was noted that the spearheads not only retained fragments of mineralised wood but also mineralised straw, possibly suggesting that the artefacts were carefully laid on a bed of straw (see Appendix 1).

Combs

The combs, although incomplete and fragmentary, are fairly well preserved. The double-sided composite comb is long and narrow, c 255mm in length, comprising two end-plates, about eight tooth-plates and two connecting-plates secured by nine iron rivets. The comb and the connecting-plates, rectangular with squared terminals and the backs chamfered on one side, are simply decorated with panels of four incised transverse grooves. One side is decorated with eight panels and the other with just two, one on each terminal. The teeth are gradated and are in line with the end of the connecting plate (Fig 28, 4 and Fig 29). Only one of the connecting-plates has the ubiquitous equi-distant notches created during the cutting of the teeth, suggesting that the comb had been repaired, rather like an example from York (MacGregor *et al* 1999, fig 893, 7951). Stylistically this comb displays similar characteristics to middle-Saxon combs of the 7th and 8th centuries, rather like examples from Cresswell Field, Oxfordshire (Dodd 2004, fig 15.8, 23) and the more local Pennylands, Milton Keynes (Riddler 1993, fig 58, 40).

In contrast, the small fragment of a single-sided comb is an extremely fine piece of work, beautifully decorated and the teeth are very finely cut (8-9 per 10mm). It comprises one end-plate and fragments of two connecting-plates secured by an iron rivet and there are vestiges of a further two close set rivet holes c 5mm apart (Fig 28, 5, and Fig 30). The end-plate flairs out and its upper edge is in line with the top edge of the connecting plates. The curvature of the connecting-plate indicates that the comb would have had a plano-convex profile rather like examples from York (MacGregor *et al* 1999, fig 884, 7544).

The connecting plates are ornamented, each side with different motifs; one side is decorated with a repeated zig-zag motif at the terminal, followed by fretwork, and the other side is decorated with alternating panels of four transverse grooves and crosses (the rivet has been placed in the centre of the cross). The terminals of the connecting plates follow the same angle as the outside edge of the end-segment. Tiny cut marks on the lower edge of the connecting plate indicate that the teeth were sawn *in situ*. The style of the comb and the decorative styles employed are of mid-late Saxon date and may be paralleled by examples from Anglo-Scandinavian deposits in York (*ibid* 1999, fig 888, 7592).

Heckle

The heckle is manufactured from a piece of sheet metal, which originally would have been folded around a rectangular wooden block (now missing). Heckles were used for preparing, carding, wool and bast fibres prior to spinning into thread. The open edges of the sheet meet on one of the upper longitudinal edges and the terminal ends have been turned down and folded over each other. All the teeth are missing, but the presence of two rows of circular/sub-circular holes, 11 holes in each row, indicate the number and the position of the tapered iron rods (Fig 31, 12). Rectangular-headed two-row combs are well known from the 7th and 8th centuries

and similar combs are known from the continent and Scandinavia (Walton Rogers 1997, 1720). Traces of mineralised wood are present on the surface (pers comm David Parish, conservator). Such objects are not common, but a similar form of wool comb has been recovered from Coppergate, York (Ottaway 1992, fig 212, 2273).

Spears and saex

The spearheads are complete; they represent differing forms of the same generic type, 'Angular blades' as devised by M.J. Swanton (1974) in his corpus of pagan Anglo-Saxon spear types. Both examples have blades with lozenge-shaped cross-sections, angles that are positioned at the lowest part of the blade near the junction of the socket, short solid necks and a cleft socket. The main difference between the two examples is the length of the spearhead and the relative proportions of the blade to the socket. The smallest has a socket which is longer than the blade (Fig 32, 18), the other has a blade which is longer than the socket (Fig 32, 17).

Chronologically the earliest type represented is a Swanton Type H2, it has an angular blade furnished with a slight concave curve just above the angle (Fig 32, 17). Blades with this feature are, according to Swanton, characteristic of pagan Anglo-Saxon spear types and are commonly recovered from burials, like the example from Portway, Andover (Cook and Dacre 1985, fig 52, Grave 28, 1) which dates to the 6th century. The spearhead is 335mm long, the middle/upper end of the range for H2 types, which are 220-350mm long. Spearheads of this type are found in their greatest numbers in 6th-century deposits, particularly in the Upper Thames Region (Lucy 2000, 48) and were superseded some time in the second half of the 6th century (Swanton 1974, 20).

The other spearhead may be compared to a Swanton Type E2 but displaying slight affinities to a Swanton Type F2 because of the length of the socket. This spearhead is 205mm long, at the lower end of the range for E2 types (200-350mm). The distribution of blades of this type is generally the midlands and northern England (ibid, 11). Swanton suggests that they are a long lasting type that was in use into the late Anglo-Saxon period.

The blade fragment appears to be part of a single-edged knife/short-sword; although incomplete it is probably part of 'narrow' seax as distinguished by Evison (1961, 227-30) and the main form found in England during the 7th century (Lucy 2000, 51). Only around half the blade and tang survive providing a total length of 208mm (Fig 19: 19), therefore it is difficult to gauge how long the blade would originally have been. The width of the blade (39mm) and the thickness (10mm) suggest that it would have been quite a substantial weapon. Such objects would have been used for hunting and/or fighting and their presence is a sign of status.

Querns by Andy Chapman

There are two joining pieces from an upper stone and four joining pieces from the lower stone, weighing 7.23kg, of a well-used lava quern (Figs 33 and 34). The lower stone is 425mm in diameter and 27mm thick, and the central spindle hole, 43mm in diameter, is surrounded by a slightly raised area. The upper stone varied from 440-470mm in diameter, creating an irregular overhang over the lower stone. It varied from 32mm thick at the centre to 19mm thick at the circumference. The central eye is up to 70mm in diameter, but tapers in to match the diameter of the spindle hole in the lower stone. There is no raised collar, as on many Saxon lava querns (Watts 2002, fig 14), and the handle socket had not survived. Both grinding surfaces are well worn, but with dimpled tool marks still prominent. On the non-grinding surfaces there are tool marks made with a chisel-ended implement.

The remaining part of the lower stone weighed 5.1kg, and the complete lower stone would have weighed around 7.5kg. The remaining part of the upper stone weighed 2.1kg, and the full stone would have weighed around 6.5kg. The full set would therefore have weighed around 14kg, although as the stones were perhaps half their original thickness, when new the quern may have weighed about 28kg. The dimensions are typical for Saxon lava querns, which range from 400-530mm in diameter and from 40-60mm thick.

Pit 506 also contained a large fragment for the bottom stone of a quern or millstone in excess of 500mm in diameter, with a central eye c100mm in diameter. It is fashioned in a fine-grained stone, possibly Millstone Grit, but all surviving surfaces have been blackened by burning.

Slag by Andy Chapman

Numerous pieces came from pit 506, weighing 900g, comprising a mixture of fuel ash slag and miscellaneous ironworking slag, sometimes with fired clay hearth/furnace lining adhering to them.

Illustrated finds from pit 506 (Figs 28-32)

- 4 Double-sided composite comb, bone. Incomplete, 2 tooth segments and some teeth missing. Length c 255mm, height 45mm, thickness 16mm. SF42, pit 506
- 5 Single-sided composite comb, bone. Incomplete; only one end segment and parts of both connecting plates. On one side of the end segment there is a faint groove inline with the top of the teeth, this indicates where the filing of the end-segment commenced, prior to the cutting of the teeth. Measurements - End segment: Length 40mm, height 30mm, connecting plate thickness 6.5mm. SF52, pit 506
- 6 Corner bracket, iron. Incomplete, one terminal missing. Shaped plate with perforated terminal, forged at an angle of 90 degrees. Length: 80mm SF39, pit 506
- 12 Heckle (woolcomb), iron. Almost complete, one terminal missing. Two small extant tacks indicate how the sheet would have been secured to the block. One side is furnished with two rows of circular/sub-circular holes. Length (incomplete) c100mm, width 25mm, depth 20mm. SF53, pit 506
- 17 Spearhead, iron. Complete. Vestiges of the original wooden shaft are still visible in the socket (most probably ash *Fraxinus excelsior*). Conservation comment: traces of highly mineralised wood fragments contained in corrosion (Appendix 1). Complete length 335mm; blade length 220mm, width 32mm; socket length 130mm, width 25mm, length of opening 115mm. SF36, pit 506
- 18 Spearhead, iron. Complete. Cross between Swanton Types E2 and F2. Conservation comment: traces of highly mineralised wood fragments contained in corrosion, but also traces of mineralised straw (Appendix 1). Complete length 205mm; blade length 100mm, width 37mm; socket length 105mm, width 27mm. SF41, pit 506
- 19 Blade (Seax), iron. Incomplete, part of blade missing. Single edged blade with triangular cross-section. Tang central to back of blade and cutting edge with stepped shoulder. Back of blade horizontal with cutting edge widening towards tip. Tang with rectangular cross-section. Conservation comment: traces of highly mineralised wood fragments contained in corrosion, but also traces of mineralised straw (Appendix 1). Blade length (incomplete) 158mm, width 30-39mm, thickness 10mm; Tang length 50mm. SF42, pit 506

Middle Saxon (7th/8th-9th centuries)

An iron pin, from the western end of gully 838/652, comprises a flat sub-rectangular perforated head surmounted on a circular sectioned, hipped shank tapering to a point (Fig 28, 1). This pin is stylistically distinct and it appears to be a crude example of a style of dress-pin with a flat head with two perforations that dates to the 8th/9th centuries. One of the perforations still retains a fragment of what may be a link from a chain, suggesting that originally this pin might have been one of a pair, which would have been connected by a small linked chain; such pins would have been used to fix cloaks or other outer garments.

One complete iron barrel padlock key with a shaped bit and long stem that broadens towards the rearward facing hook, came from a middle Saxon enclosure ditch 280 (Fig 28, 7). The bit parallels Goodalls Type A (1990, 1005), with bits set laterally to the stem. Keys of this type were in use from the pre-Conquest to the post-medieval period.

Illustrated finds (Fig 28)

- 1 Pin, iron. Complete. Patches of a non-ferrous coating are visible on the X-ray, revealing the presence of two grooves at the junction of the head and the shank. Length: 85mm, width of head: 13mm, length of head: 27mm. SF45, boundary ditch 838/652
- 7 Key for barrel padlock, iron. Length: 115mm. SF29, enclosure ditch 280

Late Saxon/Saxo-Norman (10th to 11th centuries)

Finds from the earliest phase include a knife blade fragment from gully 1066 in Area 6. The later finds were concentrated in the most densely occupied area, a series of pits in the vicinity of Structure 100.

There are two shield-shaped plates with bar mounts attached, one from late Saxon ditch 395 and the other residual within a post-medieval boundary ditch 1223. Each comprises a plain rectangular bar mount attached to a shield-shaped plate by a single rivet (Fig 28, 2). The plates are also riveted and the rivets on each are furnished with either circular or square roves. Similar examples have been recovered from London (Egan 1991a, fig 103, 732). Recent evidence suggests that they were put at the ends of straps, possibly to function as closures for pin-less buckles. In London, 'strap-clasps' as they have been termed, are generally recovered from contexts dating from the late 13th through to the 14th-15th centuries, but at Wolverton, one was recovered from a 10th-11th century context, suggesting that they may well have been in use from an earlier date.

A side-link for joining the rein to the snaffle link came from pit 741, close to Structure 100. It has double-loops, one at each end and an expanded 'boss' on the shank between the loops (Fig 31, 15). This style of side-link dates to the 9th and 10th centuries and similar examples have been recorded in Thetford (Goodall 1984, fig 138, 258-61), as well as in Scandinavia. This style of side-link is generally pre-conquest but they may be found in 11th to 12th-century deposits.

A shale spindlewhorl came from cess pit 659, associated with Structure 100 (Fig 31, 13). A combined spatulate and point-ended pin-beater (Fig 18: 14), came from the fill of well 125. Pin beaters of this type were used to separate coarse threads that catch on each other when the shed is changed with the vertical two-beam loom, which was introduced during the 9th century.

A single buzz-bone from gully 319 was manufactured from a complete pig metatarsal. The perforation has been cut from both sides (diameter 5mm) and displays signs of wear. In recent years they have been interpreted as a buzzing, spinning toy (Lawson and Margeson 1993, 213-4 and MacGregor 1985, 102-3).

A complete iron barrel padlock key, with a shaped bit and long stem tapering to a rearward facing hook came from boundary ditch 395 (Fig 28, 8). The bit parallels Goodalls Type A (1990, 1005), with bits set laterally to the stem. Keys of this type were in use from the pre-Conquest to the post-medieval period.

The horseshoe from early/middle Saxon boundary ditch 876, has a sinuous/wavy outline, a feature created during the punching of the counter sunk depressions and is often referred to as a 'Norman' shoe. Horseshoes of this type date to the 11th-12th centuries and generally have three holes on each branch, the terminals are tapered and one of the branches has a calkin, which helps to prevent the horse from slipping on soft ground. A worn fiddle-key nail, 36mm long, came from 10th/11th-century pit 476. Nails of this type would have been used with the 'Norman' shoe.

Three whittle tang knives came from boundary ditch 395 and gullies 522 and 1066 (Fig 31).

Illustrated finds (Figs 28 and 31)

- 2 Strap-clasp, copper alloy. Rectangular bar mount with D-shaped cross-section attached to shield-shaped plate by a single rivet. The plate is also riveted and both rivets are furnished with square roves. Length, 17mm, width, 11mm. SF24, boundary ditch 395, 10th-12th centuries
- 9 Whittle-tang knife, iron, end of tang missing. Cutting edge slightly concave displaying signs of wear. Blade-length 68mm, width 14mm, thickness 5mm; Tang-length (incomplete) 25mm. SF18, boundary ditch 395
- 10 Whittle-tang knife, iron, end of tang missing. Tang central to blade with sloping shoulder. Blade-length 47mm, width 10mm, thickness 3mm; Tang-length (incomplete) 34mm. SF 44, ditch 522
- 13 Spindle-whorl, shale, bi-conical with central waisted perforation, drilled from both sides. Diameter 37mm, height 15mm, diameter of perforation 10-11mm. SF57, cess pit 659
- 14 Pin-beater, bone, curved profile with sub-rectangular cross-section, worn cancellous tissue vesicles visible on one side. Surfaces highly polished through wear. Length (point missing) 105mm. SF17, upper fill of well 125
- 15 Side-link, iron, vestiges of non-ferrous coating visible on X-ray. Length (incomplete) 72mm, width 34mm. SF73, pit 741

Medieval period (12th to 14th centuries)

There is a small D-shaped buckle-frame with integral tongue-shaped plate, and a tapered strip decorated with a roughly engraved motif of chevrons, flanked by marginal grooves. The motif is similar to that on a buckle plate from London and dated 1350-1400. Both are unstratified and date to the medieval period.

A small copper alloy rotary key for operating mounted locks on caskets/boxes was residual within topsoil deposits. It has a ring bow with a decorative moulding beneath and a hollow-tipped stem like Goodalls Type 9 (1990, 1033). It has features generally seen on 15th-century examples.

A fine-grained lathe-turned limestone spindlewhorl came from 12th-century pit 947, and a heckle tooth came from pit 809.

The horseshoe is an example of a late medieval shoe (not illus), it was found in the upper fill of ditch 1235. It has rectangular nail holes, three on each side and resembles Clarks Type 4 (1995, fig 89, 274).

A whetstone manufactured from a fine-grained siltstone was recovered from a medieval quarry pit 69. It has a rectangular cross-section, tapers slightly towards the top, where a vestige of a lateral recess indicates that originally this piece would be pierced for suspension. A whittle-tang knife came from pit 895.

Post-medieval

A scale-tang knife came from the upper fill of well 125. The back of the blade of the scale-tang knife is horizontal and the cutting-edge curves to the tip (Fig 31, 11). Mineral preserved organics are present on the surface of the knife. Scale-tang knives date from the 14th century onward.

Two musket balls were recovered from the upper layers of a series of boundary ditches to the north 1227, 1235.

Illustrated finds (Fig 31)

- 11 Scale-tang knife, iron, terminal of tang missing. Slight thickening/bolster at junction of blade and tang. X-ray reveals presence of two perforations on tang for attaching scales. Blade-length 104mm, width 14mm, thickness 3mm. SF 19, well 125

Residual finds

A fragment from an annular brooch (Fig 28, 3), had been manufactured from a white metal, possibly pewter. Part of a rectangular copper alloy mount, ornamented with transverse grooves and gilding, would have been used to strengthen and/or visually enhance items manufactured from leather (Fig 31, 16). Its size suggests that it may have been used as a decorative mount for leather horse equipment rather decorated dress accessories. Both items were recovered from topsoil.

Illustrated finds (Figs 28 and 31)

- 3 Annular brooch, pewter. Incomplete, pin and half of ring missing. D-shaped cross-section with vestige of constriction for the pin. Decorated with plain equidistant bosses and a punched motif of oblique incisions in the interspaces, giving the impression of a chevron/plated motif in the interspaces. External diameter: c 38-40mm Width of frame: 5mm Height: 2mm. SF4, topsoil
- 16 Mount, copper alloy. Rectangular mount with two rivet holes (one rivet extant). Length (incomplete) 22mm, width 9mm, thickness 2mm. SF8, topsoil

6.3 Querns by Andy Chapman

A weight of 11.4kg of pieces from lava querns was recovered. Of this total, 7.23kg comprised substantial parts of a pair of upper and lower stones from pit 506, which also contained the only quern fragment in a stone other than lava (see description of finds from pit 506).

The remaining 4.17kg of lava comprised fragments measuring no more than 150mm and sometimes further fragmented. Two pieces are from features dated to the early/middle Saxon (5th to mid-8th centuries), but a majority are attributed to the late Saxon period. A further two pieces in features of medieval date and a single find from a post-medieval context are probably residual in these contexts. These pieces are all

from lava querns closely comparable to the example from pit 506. A few fragments from upper stones exhibit central eyes of the same simple form, and none possesses any additional features. The majority are from querns that have been heavily used with the thickness typically 25-35mm, although one piece has a minimum thickness of only 17mm. The original thickness is indicated by a single piece from an upper stone that is 60-65mm thick, and retains part of the central eye. This indicates that the stones were typically reduced to around half of their original thickness before they became unusable, and sometimes less than this.

The lava used for these querns would have been imported, presumably from the sources in the Eifel region of Germany (Watts 2002, 33). This stone was used for querns in the Roman period and in the middle and late Saxon periods lava is the most common stone type. Trade in lava querns is also documented through the medieval period, but by this time querns were being manufactured in a wide range of more local stone types.

6.4 The ironworking slag by Andy Chapman

A total of 1.75kg of ironworking debris was recovered. The majority of this was as either single pieces or up to four pieces, typically weighing less than 100g and only occasionally as much as 150g. Only a single context produced a larger group, with numerous pieces, weighing 900g, coming from pit 506. The material comprises a mixture of fuel ash slag and miscellaneous ironworking slag, sometimes with fired clay hearth/furnace lining adhering to them. The character and the small quantities recovered would be appropriate to a minor episode or episodes of iron smithing. A small cluster of material from the vicinity of Structure 955 comprises only small pieces of fuel ash slag.

6.5 The ceramic building material by Pat Chapman

The fired clay

Of the 141 pieces of fired clay, weighing 4880g, the majority, 53 fragments, weighing 4225g, was from pit 5, in the smaller excavation area, dated to 10th-11th centuries. About one third of these fragments have wattle impressions, c15mm in diameter. Two fragments have convex outer surfaces that have been roughly smoothed and combed and one still retains a finger mark.

Medieval/post-medieval ceramic roof tile

Twenty-one fragments of ceramic roof tile, weighing 1269g, come from the boundary ditches alongside the footpath. There are no complete dimensions, and only one instance of a perforation, and no nibs. They are typically 12-15mm thick and mortared on both sides.

7 THE HUMAN BONE by Hari-Anne Jacklin

A human cranium was found in ditch 115, which is dated to the 13th or 14th centuries (Fig 26). There was no indication of the deliberate placing of the skull and no associated skeletal remains were found. The osteological analysis follows standard accepted methodologies as described by Bass (1987) and Brothwell (1981).

A reliable estimation of age cannot be established, but based on the degree of cranial suture closure and the stage of tooth development (White 1991) and wear (Brothwell 1981), an age of 30-35+ years is tentatively suggested. The estimation of the sex as male is based on the analysis of the supraorbital ridge and the one surviving mastoid process. The teeth show the individual enjoyed a good state of dental health with no cavities and very little calculus (dental plaque). The dental attrition suggests that he ate a relatively coarse diet with little, if any sugar.

8 THE ANIMAL BONE by Karen Deighton

A total of 12.7kg of animal bone was recovered by hand. Identifiable and unidentifiable bone fragments were separated and the latter were excluded from further analysis. Bones were identified with the aid of reference material (Schmid 1972; Cohen and Serjeantson 1996). Identifiable material from flotation samples was included in the analysis.

Quantification uses minimum anatomical unit (MinAU) (Halstead 1985) and the following are recorded for each bone element: context, element, taxon, proximal fusion, distal fusion, side, fragmentation, preservation, presence and nature of cut marks and sex where appropriate. Ribs and vertebra were counted and noted, but not included in the quantification, as their multiple nature could lead to quantification bias. Fusion is after Silver (1969). Tooth wear for ovicaprids follows Payne (1973), tooth wear for cows follows Halstead (1985) after Payne (1973). Tooth wear for pigs follows Grant (1982) and Bull and Payne (1982). A study of bone texture and bone morphology was used to define any neonatal bone. Pathologies are described after Baker and Brothwell (1980). The identification of butchery and gnawing is after Binford (1981). Measurements follow von den Driesch (1976) and are those suggested by Dr P Halstead and P Collins (pers comm)

8.1 Preservation

Fragmentation was high, only between 13.8-18.6% of bones were whole. This was possibly due to compaction in the soil although heavy-handed butchery techniques should not be ruled out. Surface condition was reasonable with low frequencies of canid gnawing (9.3-10.8%). This all suggests that burial after deposition was fairly rapid, with low levels of burned material (0.3-1.9%). Evidence of butchery was sparse, at only 0.8-1.9%, although possible evidence of dismembering was noted on a small ungulate mandible hinge and a partial ovicaprid with possible evidence of pole axing was present.

8.2 Taxonomic distribution

Table 8: Summary of species by period

Species / centuries	Prehistoric-Roman	5th-mid 9th	Mid 9th – 11th	Early 13th-14th	Post-medieval	Total
<i>Equus</i> / Horse	-	10(4.8%)	11(3.7)	6(2.8)	-	27
<i>Bos</i> / Cattle	-	48(23)	75(25)	55(25.9)	1(20%)	179
<i>Ovicaprid</i> / Sheep/goat	2(50%)	101(48.5)	115(41.2)	104 (49)	4 (80%)	326
<i>Sus</i> / Pig	2 (50%)	18(8.6)	30(10.7)	20 (9.4)	-	70
<i>Cervid</i> / Deer	-	3(1.4)	-	-	-	3
<i>Canid</i> / Dog	-	2(0.9)	9 (3.2)	5(2.3)	-	16
Amphibian	-	5(2.4)	14(5)	5(2.3)	-	24
Small mammal	-	3(1.4)	4(1.4)	2*(0.9)	-	9
Rabbit / <i>Oriictolargus</i>	-	2(0.9)	20(7.1)	15(7)	-	37
Fish / <i>Piscis</i>	-	-	1(0.3)	-	-	1
Total	4	192	279	212	5	693

*1house mouse

Table 9: Bird taxa by period

Period (centuries)	<i>Gallus</i> Chicken No/%	<i>Anser</i> Goose No/%	<i>Galliform</i> Chicken family No/%	<i>Corvid</i> Crow No/%	<i>Avis</i> indet Indet bird No/%	Total
5th-mid 9th	9(56)	2(12.5)	1(6)	-	4(25)	16
Mid 9th – 11th	13(65)	1(5)	4(20)	-	2(10)	20
Early 13th-14th	14(35)	10(25.6)	-	6(15.3)	9(23)	39

Cattle were utilised for meat, milk, traction and hides. The species has a seven times higher meat yield than sheep and four times higher than pig. Sheep/goat was used for meat, milk and wool. It was not possible to make distinctions between the sheep and goat bones for this assemblage. It is the most common animal on the site. Pig was husbanded for meat only but has wider dietary tolerances than cow or sheep. For instance it can forage in woodland or feed on stubble. Horse was used for transport, traction and hides. Dogs were kept for herding, guarding and hunting. Occasionally skins were used. The size of a dog humerus and radius from (551), gully 838, suggests a large animal.

Rabbit could be intrusive due to the burrowing habits of the species. "Coneys" were not introduced to the country until the 11th century. Originally from the Iberian Peninsula they did not adapt easily to the damp climate, having to be cosseted in specially constructed warrens. Rabbit meat and "rabbiting" were therefore initially the preserve of the wealthy until the species naturalised and its numbers increased and spread. Chicken was used for meat and eggs and sometimes feathers. No eggshell was recovered from sieving. Chicken is the most common bird species. Goose has the same use as chicken, however, it has a higher meat yield. Crow is a pest or a commensal species, feeding on waste found on or near settlements. Amphibian in this instance is frog or toad and could be intrusive. House mouse is also a commensal species. The single fish bone recovered from the site could not be identified to species.

8.3 Ageing

The early/middle Saxon period had four sheep/goat neonatal bones. Four young cow and four young sheep bones were also noted. Only three cattle mandibles were available for ageing of which only one could be assigned to a single age category

showing an animal of 18-30 months (wear stage (WS) D). Twelve sheep/goat mandibles were suitable for ageing, however, only four could be assigned to single age classes. These showed two elderly animals (WS I), an animal of 2-6 months (WS B) and an animal of 1-2 years (WS D). A single pig mandible could not be assigned with any certainty.

The mid 9th to 11th centuries had two cattle and two ovicaprid neonatal elements. Three young cattle and two young pig bones were also observed. Only two cattle mandibles were available and only one could be assigned to a single age class, suggesting an elderly animal (WS M). Twelve sheep mandibles were available and seven could be assigned, two elderly animals (WS I), one animal of up to 2 months (WS A), two of 1-2 years (WS D) and two of 2-3 years (WS E). No pig mandibles were available from this phase.

The early 13th to 14th centuries had four ovicaprid elements. Three cattle mandibles were available and two could be assigned representing elderly animals (WSM). Nine sheep mandibles were available, five could be assigned, three were elderly (WSI) and two were between 1-2 years (WS D). Only a single pig mandible was assignable suggesting an animal of 0-7 weeks (WSA).

8.4 Pathologies

A Bos metacarpal with exostosis (excess bony growth) at the proximal articulation was noted from context 260. This suggests possible arthritis.

8.5 Discussion and conclusion

Sheep/goat dominates all periods, followed by cattle then pig with smaller numbers of horse and dog. It is not possible to draw any firm conclusions relating to kill off patterns for the major domesticates due to the paucity of data available. The ovicaprid assemblage (5th-14th centuries) only was large enough for body part analysis. The bones were compared to Brain's (1981) preservation index to establish any over representation and Binford's (1981) utility index to suggest a reason. Some temporal change is apparent. The results suggest that the early/middle Saxon shows a prevalence of forelegs whereas the late Saxon/Saxo-Norman shows a prevalence of lower limbs, and the 12th to 14th centuries show a prevalence of hind legs. The meaning of these results is unclear and without more material further interpretation is difficult.

Little difference in terms of preservation (eg amount of gnawing, fragmentation etc) is seen between phases. This possibly suggests that the treatment of refuse does not change significantly though time (see preservation above). Species composition is similar for all phases although deer appears only in the early/middle Saxon and fish only in the late Saxon/Saxo-Norman. Crow is only seen in the 12th-14th centuries. Percentages of major domesticates also remain fairly consistent. Horse and dog remain consistently low through to the medieval period.

Spatial distribution of bone is considered in broad terms only owing to the small size of the assemblage. The early/middle Saxon material was largely recovered from enclosure ditches, which suggests these were used for refuse. For the late Saxon/Saxo-Norman the only significant concentration was in ditch 675/652. The remainder of the material was evenly spread through the 9th to 11th-century features. For the medieval period a small concentration was noted from a large pit, 947, in the north of the central area of the site, again suggesting its use as a refuse pit. The rest of the material was spread evenly across the site. No difference in

preservation between features was observed.

Comparisons with other sites were possible, but only in terms of the species present. Generally the relative percentages for the major domesticates appear to fit into the parameters show by Robinson and Wilson (1983) for late Saxon and medieval sites in the region.

More specifically, the 11th-century material from Cowper Tannery, Olney (Deighton 2004) was comparable with that from Wolverton. Cattle were the dominant species at the former site then pig and sheep/goat in almost equal numbers, unlike the heavy dominance of ovicaprids at Wolverton. Less species diversity was encountered at 11th-century Olney which has major domesticates and indeterminate birds only. When the 12th-century Olney material was compared with Wolverton a domination of cattle was seen, again followed by sheep then pigs at the former site. Chicken and goose were present at this date at Olney as at Wolverton. Dog and deer are also present at Olney but only dog is seen at Wolverton. This apparent difference in dominant domesticates could possibly reflect a difference in status, as cattle are often more prevalent at higher status sites. Alternatively it could reflect a difference in local environmental conditions with one area more suited to sheep. A similar range of species was seen for the medieval period at West Cotton (Albarella and Davis 2010) although cats were common here and were absent from Wolverton. Pigs at West Cotton are seen to decrease though time and sheep to increase whereas numbers for both species at Wolverton mill remain fairly constant. This again could reflect the differing local environments and the variable balance between woodland and pasture.

9 THE CHARRED AND MINERALISED PLANT REMAINS by Wendy Carruthers

The main phases of activity discussed in this report were associated with two early and early/middle Saxon sunken-featured buildings (SFB), a middle Saxon enclosure and a late Saxon/Saxo-Norman settlement with post-built structures and 13th to 14th-century pits and ditches.

9.1 Methods

A large number of environmental samples were taken during the excavations from a variety of features including pits, ditches, postholes, SFBs fills, gullies and an oven. The samples were processed by Northamptonshire Archaeology staff using standard methods of flotation. A 250 micron mesh sieve was used to recover the flot and a 250 micron mesh was used to retain the residue. Bones and charred plant remains were sorted by eye from the residues and sent to the author with the unsorted dry flots. Three residues from the most 'cessy' samples and samples producing frequent charred remains were sent to the author for microscopic scanning, as a check on recovery (samples 101 (possible cess deposit), 98 and 109).

9.2 Results

The results of the analysis are presented in Appendix 2. Nomenclature and most of the habitat information follow Stace (1997).

The residues that were available to be checked for mineralised plant remains (samples 12, 98, 101, 109, 115) produced no evidence of concentrated faecal material. The sparse mineralised remains scattered around the site probably represent redeposited material from cess pits and middens, as described below. The residues also contained very little charred material indicating that the flotation had been effective.

9.3 Mineralisation

Mineralised (calcium phosphate-replaced, see Green 1979; Carruthers 2000) remains are usually recovered from mineral-rich, moist deposits such as cess pit and middens. Although occasional mineralised seeds and 'nodules' (Carruthers 1989) were recovered from the flots, the residues examined showed no signs of concentrated mineralised faecal material (eg bran fragments, clinker-like concretions, mineralised straw). It is likely that the calcareous nature of the soil together with the presence of rotting organic waste brought about preservation by mineralisation in small pockets around the site. Apart from sample 57, only one or two mineralised remains per sample were recovered, and these were spread around the site in a wide range of feature-types, with no particular focal point. The range of plant taxa preserved by mineralisation (primarily brassica seeds (*Brassica/Sinapis* sp., occasional sedges (*Carex* sp.) and nettles (*Urtica dioica*)) is very typical of calcareous sites that produce scattered mineralised remains, probably because these taxa appear to be very readily preserved by mineralisation. Sample 57 from enclosure ditch 416 is discussed further below.

9.4 Notes on Identification

Chenopodiaceae

As on many sites, modern, intrusive Chenopodiaceae seed (primarily fat hen (*Chenopodium album*) and orache (*Atriplex* sp)) were frequent in the flots. Since it is difficult to differentiate these small, black seeds from charred ancient Chenopodiaceae seeds without breaking every seed open to look for charred

embryos, this taxon was omitted altogether from the analysis. Being a very common weed of a wide range of disturbed and cultivated habitats, its omission does not detract from the interpretation to any notable extent. Several other weeds such as docks (*Rumex* sp) and nettles (*Urtica* spp) are also indicators of this type of habitat.

Cereals

Due to the scarcity of chaff fragments (see Discussion below), the cereal remains could only be identified to the following levels;

Wheat

Only free-threshing wheat was recovered, indicating that no residual charred remains from earlier phases were present. The cultivation of hulled wheats may have continued on a very small scale into the early Saxon phase in a few areas, but this does not appear to be the case at Wolverton Mill. Of the two common free-threshing wheats cultivated during the medieval phase, only bread-type wheat (*Triticum aestivum*-type, includes club-type *T compactum*) was positively identified from a few fairly well-preserved rachis fragments. Most of the rachis fragments were very poorly preserved and could only be identified as free-threshing wheat (includes both rivet-type and bread-type wheat). Unfortunately, grain morphology is too variable to distinguish between the different taxa (Jacomet 1987), but it was notable that most of the grains were of a short, square form, more typical of bread wheat than rivet wheat. Because so little chaff was identifiable it is possible that rivet-type wheat was also being cultivated, but if so this is likely to have been on a small scale, since only a few of the longer, deeper keeled grains were observed. A number of sites in central and southern England have produced evidence of rivet-type wheat cultivation, primarily dating to the 13th/14th centuries (Moffett 1991).

Bread-type wheat grows well on heavy soils but is fairly demanding of nutrients. As the name suggests, it is the best grain for making a well-risen loaf of bread. Rivet-type wheat is better suited for biscuit making, and it has a longer straw that is useful for thatching.

Barley

Although poor preservation and lack of well-preserved rachis fragments limited the level of identification in many cases, it is most likely that hulled six-row barley (*Hordeum vulgare*) was the species being cultivated from the early Saxon to the 14th century. Where preservation was good, the grains were found to be hulled, and both straight and twisted grains were present (a characteristic of six-row barley). It is not possible, however, to rule out the cultivation of some two-rowed barley (straight grains only).

As with any of the cereals, barley can be mixed with other cereals to make bread. It was sometimes grown as a maslin with oats, and there is archaeobotanical evidence for its use (both with and without oats) to produce malt for brewing. The husked grains require extra stages of preparation if they are to be used for human consumption, so they were probably more often used for fodder. Barley prefers lighter soils, but will tolerate a wider range of soil types than any of the other cereals.

Oats

Very few oats retaining their floret bases were recovered, but where they were reasonably well-preserved they were identifiable as cultivated oat (*Avena sativa*). Wild oats may also have been growing as a crop weed, but the large size of most of the grains and frequency of oats in the samples indicates that oats were a useful

crop at Wolverton Mill through all three periods.

Oats are a high energy fodder crop, useful for draft animals. They need to be harvested under-ripe, before the ears shatter. They will grow on poor, acidic soils and are useful in areas with high rainfall, such as Scotland and Wales.

Rye

Rye was not a major crop at this site, but its continued presence through all three periods indicates that it had its uses. It is possible that rye was primarily used for fodder, or was grown as an early bite, ie grazed off the field while still green and so not always left to set seed. Rye straw is also useful for thatching, and rye will grow on acidic, well-drained sandy soils that may be too poor and dry for other crops. It is a free-threshing grain which can be mixed with wheat to make bread.

Documentary sources from the medieval period suggest that barley, oats and rye were lower status cereals that could be consumed in times of famine, used as payment to servants or used as fodder. Bread wheat was the preferred cereal for human consumption.

Legumes

Leguminous crops are usually under-represented in the charred crop record, as they are less likely to come into contact with fire, and when charred, often lose important identifying characters (primarily the seed coat and hilum (detachment scar)). The size and shape of charred legumes can be useful, but these are imprecise characters so identifications are uncertain (eg pea/bean/vetch (*Pisum/Vicia/Lathyrus* sp.)). At Wolverton Mill sufficient large leguminous seed fragments and large vetch (3-4mm diameter) seeds were recovered to indicate that legumes were important to the economy throughout the early Saxon to the medieval periods. In addition, a few seeds retained their hilums, so identifications of all three taxa were confirmed in at least some samples. From the table below it can be seen that peas and beans were not confirmed as being present in the 13th/14th centuries, but this may be because fewer samples were examined from this phase. The presence of large legume fragments suggests that they were still being grown in this period.

(N.B. where cf is indicated no hilums were present to confirm the identifications, but seed dimensions and shapes indicated probable taxa present);

Table 10: Number of legume remains per period

	5th-mid 9th centuries	Mid 9th -11th centuries	13th -14th centuries
Pea (<i>Pisum sativum</i>)	1 + cf 1	cf 5	-
Celtic bean (<i>Vicia faba</i> var. minor)	1	3 + cf.3	-
Large legume fragment (pea/bean/vetch)	-	7	15
Cultivated vetch (<i>Vicia sativa</i> cf var. <i>sativa</i>)	5	4	2
Possible cultivated vetch (3-4mm <i>Vicia/Lathyrus</i> sp)	-	65	30
Total no of samples examined	16	39	10

Legumes were particularly important during the Saxon period, as demonstrated by

the excavation of a large number of cess pits from Saxon Southampton (Carruthers 2005). Not only do they help to restore nitrogen to poor soils when grown in rotation with cereal crops, but they are also a good source of protein that can be dried and stored for long periods.

9.5 Discussion

Possible origins of the charred remains

As is common in most Saxon and medieval assemblages, the principal component of all of the samples was cereal grains, with very few chaff fragments to assist in identifications. During these periods, the cultivation of primarily free-threshing wheat for human consumption meant that cereals were less likely to become charred during processing, than with the hulled wheats of prehistoric times (which required parching). Valuable processing waste was more easily removed and stored for use as fodder etc. closer to the point of cultivation, away from settlements. For this reason most of the cereal remains recovered from Saxon and later sites has probably become charred at a later stage in its use, perhaps accidentally, whilst being prepared for cooking, or deliberately, in the disposal of grain spoilt during storage. This means that the assemblages tend to be grain-rich, with just a trace of contaminants such as chaff and weed seeds that managed to slip through the processing system.

Fodder crops, such as barley and oats, also rarely come into contact with fire, being fed to livestock in the husk, but they may become charred during the disposal of rubbish such as stable waste. It can be difficult to distinguish these two types of charred cereal assemblage (grain for human consumption and fodder crops), as the straw and hay component of fodder is likely to completely burn away, leaving very little charred evidence. Occasionally both types of crops may need to be gently oven dried if harvested under-ripe or during wet weather, giving the potential for accidents to occur, and in these rare cases highly informative assemblages can be preserved.

All of the assemblages from Wolverton Mill are likely to represent either domestic waste from floor sweepings and hearths, or domestic waste mixed with burnt fodder, bedding and stable waste. Pure cereal processing waste was not recovered, although small quantities of contaminants of the processed grain (chaff and weed seeds) picked out by hand during food preparation may be represented. Admittedly, differential preservation can favour the preservation grains in comparison with chaff fragments (Boardman and Jones 1990), and in a few samples (54, 104, 134) white-grey silicified globules were observed indicating that silica-rich plant material such as chaff may have originally been present but had mostly been destroyed. However, since the highest number of chaff fragments in any one sample was only 13 rachis fragments (sample 132, gully 1158), processing waste was obviously not present in any significant concentrations in the Wolverton Mill samples. Processing waste would have been a valuable resource, providing roughage for livestock and being used as temper for building materials. Although it was also often used as fuel or kindling for corn-drying ovens (van der Veen 1989), no evidence for this was recovered from oven 254 (samples 24, 25 and 33). Perhaps the ash had been regularly cleaned out.

The range of cereals cultivated and changes through time

Sufficient samples were taken from the three periods, early/middle Saxon to the 13th/14th centuries, to obtain a measure of relative importance of the different crops grown, taking into account the taphonomic biases mentioned above. Bread-type wheat was clearly the principal crop grown for human consumption, as is found on most Saxon and later sites across the British Isles. Out of the sixty-five samples examined, bread-type wheat was the dominant identifiable cereal in all except one

early/middle Saxon (5th-mid 9th centuries) sample (sample 79) from gully 787 where barley was a little more frequent, and three samples from a late Saxon/Saxo-Norman cess pit 945 and postholes from structure 955 (samples 110, 132 and 134) where oats were much more frequent. Oats were generally fairly frequent in Structure 955, suggesting that it had been used for a particular purpose – perhaps to house livestock or to store oats. There was little other evidence from Structure 955 samples to support the stabling of livestock, such as increased numbers of grassland taxa (from hay), weed seeds or mineralisation (due to the presence of dung), but chaff fragments were slightly more frequent in gully 1157/923 than in most of the other samples from Wolverton Mill. No other corroborating evidence was found in either the faunal or small find assemblages.

The local calcareous clay soils would have been very suitable for the cultivation of bread wheat. The constant presence of stinking chamomile seeds (*Anthemis cotula*) in 44% of the 5th-mid 9th centuries samples, 87% of the 9th to 11th-century samples and 91% of the 13th/14th-century samples provides further evidence that the cereals were being grown nearby, since it is typically a weed of heavy, damp clay soils. The increased occurrence of stinking chamomile through time probably reflects the spread of this weed across cultivated fields. Alternatively, a greater percentage of the land under cultivation could have been clayey during the later periods, or the soil structure deteriorated through constant cultivation, favouring the spread of stinking chamomile. Jones (1993) suggested that the increase in this species in the Saxon samples at Pennylands, Milton Keynes, in comparison with Iron Age samples from the same site, might also relate to deeper cultivation of the soil in the later period. Comparisons with the Pennylands results are discussed further below.

It is interesting to examine the occurrence of other indicator weeds in addition to stinking chamomile (bearing in mind the relatively small numbers of samples examined from some phases):

Table 11: Percentage of samples in which taxon is present

Arable weed	Soil preferences	5th-mid 9th centuries	mid 9th - 11th centuries	13th-14th centuries
Stinking chamomile (<i>Anthemis cotula</i>)	Heavy, damp, clayey	44%	87%	91%
Cornflower (<i>Centaurea cyanus</i>); [<i>Centaurea</i> sp.]	light, sandy soils	0%	5% [13%]	9% [9%]
Corn spurrey (<i>Spergula arvensis</i>)	acidic, sandy soils	0%	3%	18%
Therow-wax (<i>Bupleurum rotundifolium</i>)	calcareous soils	0%	10%	27%
Average concentration of charred fragments per litre of soil processed (fpl)		5.7 fpl	11 fpl	13.9 fpl
Total number of samples analysed		16	39	11

Although the increased concentration of charred remains through time slightly raises the chances of finding a wider range of weed taxa (27 weed taxa in 5th-mid 9th centuries compared with 30 in mid 9th - 11th centuries) this is unlikely to fully account for the changes, as most of the increase in concentration was due to greater numbers of cereals grains being present rather than weeds (grain to weed ratios increase from 6:1 in the 5th to mid 9th-century samples, to 10:1 in the mid 9th to 11th-century samples). The possible significance of the weed changes seen in the

table are discussed further below.

In addition to the weeds in the table above, other weed taxa recovered from the samples included typical medieval arable weeds such as shepherd's needle (*Scandix pecten-veneris*) and corn cockle (*Agrostemma githago*). In the Pennylands samples, Jones (1993) noted the presence of weeds such as cornflower and stinking chamomile in the Anglo-Saxon but not the Iron Age samples and suggested that this may relate to deeper ploughing and the change from cultivating primarily spelt wheat to bread/club wheat. Greig (1991) traced the introduction of cornflower into Britain back to the Roman period, but could find no obvious reason for the fact that it did not become a common arable weed until the later medieval period, around AD 1200. It is particularly common on sites with light, sandy soils, so its spread is sometimes linked to the spread of rye.

Hulled barley (*Hordeum vulgare*) and oats (*Avena* sp.) were present in almost all of the samples across the phases. Rye (*Secale cereale*) was more frequent in the early-mid Saxon to Saxo-Norman periods, but to some extent this was also true of barley and oats. As with the weed seeds, this may, in part, be a consequence of increased preservation of charred material in the later phases. However, there does appear to have been a genuine increase in the quantities of non-wheat cereal crops being grown over time. The leguminous evidence, although slight, suggests that the cultivation of peas (*Pisum sativum*) and beans (*Vicia faba* var. *minor*) may have decreased by the 13th/14th centuries (see table above), but because these remains are only rarely recovered in an identifiable state, the smaller number of samples examined from the 13th/14th centuries could have produced this impression. Cultivated vetch (*Vicia sativa* var. *sativa*) continued to be a useful fodder crop through the three phases, although barley, oats and rye may have replaced vetch to a certain extent in the later phases.

Table 12: Percentage of samples where present

	5th-mid 9th centuries	mid 9th -11th centuries	13th-14th centuries
free-threshing wheat	100%	100%	100%
barley	94%	97%	100%
oats	81%	85%	91%
rye	38%	74%	73%
<i>Vicia sativa</i> (3-4mm vetch seeds)	25%(56%)	8%(41%)	9%(73%)
number of samples	16	39	11

Taking the cereal and weed ecology evidence together, there appears to have been a gradual expansion with the passage of time onto a wider range of soils, making use of the different abilities of all four cereal crops to cope with different soils. Initially the local loamy brown earth soils along the river valley would have provided fertile, moist, fairly easily ploughed land for wheat cultivation. If expansion onto land further afield became necessary, the calcareous clays to the west would have been suitable for the cultivation of wheat and barley, and oats and rye would have tolerated the sandier, acidic soils to the east. Two of the three corn spurrey seeds (acid indicator) were recovered from samples that contained relatively high oat and/or rye levels (samples 93 and 112). Four of the seven samples containing thorow-wax (calcareous soil indicator) produced abundant bread-type wheat with frequent barley, oats and rye. The other three were fairly poor samples with only sparse cereals.

Wet/damp ground weed taxa such as spike-rush (*Eleocharis* subg *Palustres*) and

sedges (*Carex* spp) were present in small quantities in samples from all three periods (31% early/middle Saxon, 36% - late Saxon/Saxo-Norman; 27% - 13th/14th centuries), with no obvious increase or decrease indicating changes in the moisture content of the soils under cultivation.

Because the assemblages contained redeposited burnt material that may have come from several sources, it is impossible to say whether or not the cereals were being grown as maslins (mixed crops). Documentary sources demonstrate that barley and oat dredge and wheat/rye maslin were commonly grown as fail-safe methods of coping with poorer climatic conditions or soils, but this can be difficult to demonstrate archaeobotanically unless primary deposits are examined. Because Wolverton Mill is located in a fairly good climatic and edaphic region, the growing of maslins may have been less important. Cereal/legume maslins, however, such as oats and cultivated vetch (hara) can help to maintain soil fertility, as well as producing a nutritious fodder crop. Unfortunately, vetch seeds from Wolverton Mill were not frequent enough to demonstrate an association with any of the cereals. Peas and beans can be grown either as field crops or as garden plants.

One further crop of economic importance that was recorded from all three phases of occupation was cultivated flax, *Linum usitatissimum*. It is unusual to find charred flax seeds in such a wide range of deposits (11 samples in total, including gullies, pits, ovens, ditches and cess pits), as its oily seeds do not preserve well by charring. This suggests that flax was particularly important at Wolverton Mill. The local damp river valley soils would have suited the cultivation of flax well. The records mostly consisted of occasional seeds, but sample 104 (pit 900, associated with Structure 955) produced 202 seeds. This structure could be linked with flax production, eg burnt waste from removing the seed heads and leaves. However, perhaps a more likely explanation for the presence of a large number of charred seeds is that oil extraction was taking place. The presence of three charred seeds in two different cess pits 465 and 767 (samples 13 and 71) suggests that seeds may also have been consumed. Flax or linseed has a laxative property. Alternately, burnt waste had been used in the cess pit to dampen odours, as is often found in faecal deposits.

Distribution around site

In the early/middle Saxon, the two samples where barley was fairly frequent came from enclosure gullies 280 and 787 (samples 11 and 79), rather than features associated with the SFBs. These may represent dumps of waste fodder. Four samples from SFB 144 produced mainly bread-type wheat with very few weed seeds, suggesting the deposition of food waste. A few mineralised sedge seeds (*Carex* sp.), nodules (Carruthers 1989) and worm cocoons came from enclosure ditches 349/280 and 416/359 and gully 787 (samples 12, 57 and 79), cess pit 465 (sample 13) and posthole 151/SFB 144 (sample 15). Of particular note were 77 mineralised brassica seeds (*Brassica/Sinapis* sp) in enclosure ditch 416/359 (sample 57). Unfortunately it is not possible to distinguish whether these remains came from a weed brassica such as charlock, or a food plant such as mustard, as the seed coats were not preserved. The fact that the seeds were concentrated in this feature in a mineralised state of preservation suggests that, in this case, faecal remains may be represented. These seeds are often present in cess pits amongst human faecal material, and there is evidence to suggest that brassica seeds have been used as a spice since at least the Iron Age.

The late Saxon/Saxo-Norman samples, being more abundant, were widely spread around the site. No obvious pattern of distribution was observed with regards to the occurrence of flax seeds, mineralised remains or larger concentrations of cereal

grains, ie these remains were scattered from one side of the site to the other. The large wheat concentrations, however, were all recovered either from ovens, pits or postholes, rather than ditches or gullies. It is also notable that most of the charred peas and beans from all three phases were recovered from rubbish pits, postholes or SFBs, rather than enclosure ditches, suggesting an association with human food waste rather than fodder. As noted above, the highest concentrations of oats were found in samples from Structure 955, indicating a special use for this building that probably involved livestock.

No significant patterns of distribution were observed for the 13th/14th-century samples either, but perhaps this is not surprising considering that the remains were not preserved due to cereal processing activities, but were the waste from day to day domestic activities around the settlement.

Comparisons with other sites in the Milton Keynes area

As noted above, excavations at Pennyland (Jones 1993) produced Anglo-Saxon charred assemblages that were comparable to those from Wolverton Mill. Jones's samples were richer in bread/club wheat by a ratio of 1.68 to 1. The Wolverton ratios were as follows:

Early/middle Saxon (5th-9th centuries): 2.27 to 1, wheat to barley

Late Saxon/Saxo-Norman (mid 9th -11th centuries): 3.86 to 1, wheat to barley

13th to 14th centuries: 4.52 to 1, wheat to barley

The increased and increasing proportion of wheat to barley could relate to the use of a wider range of soils to cultivate a range of fodder crops, rather than heavily relying on barley (as noted above).

Oats were fairly scarce in the Pennylands samples and rye was not recorded, but the Pennylands soil samples were much smaller and less abundant than those from Wolverton Mill, so the two sets of results are not directly comparable.

Apart from these small differences, some similarities between Pennylands and Wolverton are notable. This includes the occurrence of cultivated flax and possible cultivated vetch at Pennylands, and similarities between the ranges of arable weed seeds recovered, as discussed above.

The Wolverton Mill assemblages were generally typical of Saxon and medieval sites across most parts of southern Britain, producing evidence for the cultivation of all four cereal types in addition to peas, beans, cultivated vetch and flax (eg West Fen Road, Ely; Ballantyne 2005). It is only where soils are the limiting factor, eg at West Stow (Murphy 1985), that settlements had to select a different range of crops to suit the local conditions. The settlers at Wolverton Mill were fortunate enough to have access to a range of fertile soils that enabled them to grow the preferred grain for human consumption, bread wheat. It is notable, however, that like most rural sites of the period, there was no evidence that luxury imported fruits and spices were consumed. Admittedly, this type of evidence is less frequently preserved by charring, but some sites have produced occasional charred remains of orchard crops, such as plum and bullace. Even native hedgerow remains like hazelnut shell fragments (*Corylus avellana*) were notably scarce at Wolverton Mill. A single rose seed (*Rosa* sp) and an elder (*Sambucus nigra*) seed were the only other fruit remains recovered. It is possible that the mallow seeds (*Malva* sp) in pit 899 represented a native plant used as a vegetable, as the large leaves of mallow can be consumed like spinach and the seeds make a tasty snack. Of course, other native plants such as henbane

(Hyoscyamus niger) could have been used medicinally (with caution!), but this is difficult to confirm from the archaeobotanical evidence.

10 DISCUSSION

10.1 Prehistoric and Roman

The presence of prehistoric flint suggests activity in the area at least from the Bronze Age, if not earlier, and perhaps contemporaneous with the Bronze Age round barrow to the south of the present site. There was no evidence of any Iron Age activity.

The small group of residual Roman finds suggest that the site was agricultural land during the Roman period. Enclosures found in earlier evaluations to the south and presumed to be of Roman date as they pre-dated the middle Saxon enclosure, could be of either Roman or early Saxon date.

10.2 The early/middle Saxon settlement and enclosure

The early Saxon settlement

It has been suggested that, unlike many Milton Keynes parish boundaries which follow the furlongs of the medieval open field systems, Wolverton parish is likely to be an early foundation with boundaries formed by Watling Street, the River Great Ouse and Bradwell Brook (Croft and Mynard 1993, 15-16).

On the present site there is a small assemblage of 5th-century pottery in association with a sunken-featured building, and in trial trenching to the east of a site another sunken-featured building has been radiocarbon dated to the 5th-6th centuries (Preston 2007, figs 2 & 5, 112, table 7). However, the pottery from the other SFBs and the post-built structures can only be broadly dated to the early/middle Saxon (450-750 AD), so the main Saxon settlement on the site may date to the late 7th to the 8th centuries, only shortly pre-dating the middle Saxon enclosure.

Nature of the early/middle Saxon settlement

The sunken-featured buildings (SFBs) and associated post-built structures are presumed to be part of a dispersed settlement, which is likely to have occupied the remainder of the hilltop to the immediate south and west of the site, with a 7th-century cemetery known to lie to the east of the middle Saxon enclosure.

A shallow pit contained a range of finds including two spears, a seax, a heckle, two bone combs and most of a lava quern. Special deposits' in Saxon settlements seem to have performed different functions, perhaps relating to 'termination' deposits at the end of a building's life or situated at settlement entrances or boundaries (Hamerow 2006). However, the assemblage from the pit does not appear to conform to such a model, and there was no bone, animal or human, within this deposit.

Possible explanations for its deposition are perhaps indicated by the nature of the items, which are largely those deposited as grave goods in the middle Saxon period. One possibility, therefore, is that they derive from disturbed graves. However, the quern is not a typical grave good, which opens a second possibility, that the assemblage comprises some of the prized possessions of both a man and a woman perhaps as a cenotaph to both, buried near their home and marking their deaths, which perhaps occurred elsewhere.

The middle Saxon enclosure

The large ditched enclosure, apparently devoid of associated internal features at its northern end, may be equated with a large oval at Higham Ferrers, Northamptonshire, which was 160m long by 100m wide (Hardy and Lorimer 2004, 13-15). At Higham Ferrers, the nearby presence of an elaborate stone-built malting

oven of middle Saxon date seems to confirm the high status of the site at this time, although material directly related to the enclosure was sparse. The enclosure has been interpreted as 'a purpose-built tribute centre for a royal estate', with the large enclosure functioning at least in part as a stock corral, with this accounting for the sparse material evidence related to it. There may have been another similar large enclosure at Tempsford, Bedfordshire. In this case middle Saxon occupation lay adjacent to what may have been an oval enclosure up to 130m diameter, but the full plan was not recovered (Maull and Chapman 2005, 16-21 & fig 3.3).

The defining ditches of the enclosure at Wolverton are quite insubstantial and even the deepest, with an external bank, would still have needed additional fencing or hedging to prevent animals from straying. There is little evidence that the enclosure ditches were slighted in the later Saxon period, indeed the settlement appears to have avoided the enclosed area. This may indicate that the boundaries remained intact for many generations subsequent to their creation, and also that the memory of the former importance of the enclosure was retained and respected.

It has been suggested that there was a change from an earlier broad-based subsistence economy to a more specialised one in the middle Saxon period, where the surplus goods were traded, allowing the inhabitants to engage in limited trade (Blinkhorn 1999b). The presence of the stock enclosure and the possible race and drafting gate to the east indicate that the inhabitants were engaged in such an economy, probably dominated by sheep. A slight predominance of young animal bones from the enclosure ditches may suggest that they were farming animals for meat, as well as for secondary products. Finds from the enclosure ditches, such as a key for a barrel padlock, a fragment of rotary quern and a nail all suggest domestic settlement in the vicinity, as also occurred at both Higham Ferrers and Tempsford.

To the north of the middle Saxon enclosure at Wolverton it would appear that there was a smaller rectangular enclosure as well as ditch systems to the east that may have been related to stock management. However, disentangling and dating the complex sequence of ditches in this area, when individual section often produced only small quantities of pottery has left the structure and the chronology of the sequence uncertain.

10.3 Re-ordering of settlement in the late Saxon/Saxo-Norman period

By the 10th century there had been a major reorganisation of the landscape, although the location and the alignment of the middle Saxon enclosure was still respected. It was probably at this time, as part of the wider process of village formation, that a trackway running north-west to south-east, on an alignment parallel to the middle Saxon enclosure, was created. It is possible that the hollow-way formed one of three main routes between the mill, the castle and church and the northern manor in Wolverton village.

The nature of settlement

Running south-westward from the track or hollow-way, there were further parallel boundary ditches that defined separate domestic plots, one adjacent to the trackway and another to the south-west. To the south the earliest of the new boundary ditches all stop short of the middle Saxon enclosure, and there was little encroachment onto this area even in the 11th and 12th centuries.

The area adjacent to the trackway showed a complex of shifting ditch systems. There was a single well-defined building, structure 955. The nearby presence of a cess pit would suggest that this was a domestic building, although a slot or drain and some of

the environmental evidence suggest use for livestock, although this might have been a reuse of the building.

The area to the south-west may have been a single property, a croft within its toft. To the north there was a house, with a nearby well and cess pits. To the south-west a more functional area contained a malting/drying oven and a nearby well.

While the small size of the post-built houses does not suggest a high status for the occupants, they were involved in a level of trade, acquiring quality metal items such as horse fittings and Oxford ware pottery. There is also evidence for flax/linen working and spinning and weaving, but only minimal evidence for smithing.

Thorir's manor?

In the 10th-11th centuries the settlement may have been at the southern end of the village of Wolverton, which was centred around the church. It is possibly that this end was a separate manor, divided from the remainder by the road. The settlement may have been part of one of the tripartite manors of Wolverton known at Domesday. A total village population of 40 in 1086 (excluding the manor owners and their families) suggests that there were around 10 households.

It is assumed that the main Wolverton manor would have been based with the church and imposed upon by the later castle. Godwine, the man of King Harold, may have held it. Of the remaining two pre-Norman Saxon landowners, Thorir the *housecarl* was a man of Edward rather than Harold, so it is uncertain whether he would have fought at Hastings.

The impact of the Norman Conquest

The Domesday Book records the value of Wolverton at £20 prior to the conquest (TRE: *tempora Regis Eduardis* or at the time of King Edward), £15 when received (in 1066), but only 20s by 1086. Raids and reprisals after conquest were not uncommon and many villagers may have deemed it not safe to stay. The archaeological record shows that in this part of the settlement occupation continued through the 12th century with the final pit digging occurring into the 13th century.

Occupation may have contracted to the north and east to what survives as Old Wolverton deserted medieval village (DMV). The site of the Butts (the medieval village archery practice area) close to the southern/centre part of the DMV is another indicator of the continued village centre. Another major change in the locality was the new town of Stony Stratford, which was founded in the 12th-13th centuries.

Later medieval

The major site boundary/hollow-way was maintained and recut. This evidence seems to reiterate local preoccupations where the lord was taken to the local courts for failing to scour out his ditches bounding with common land and allowing his cattle to roam freely at night!

During the 13th century settlement was abandoned within the excavated area, and the site is presumed to have become agricultural land, perhaps taken in to the open fields. This was suggested by ridge and furrow earthworks (recorded by Croft and Mynard 1993) and the presence of very deep subsoil over the centre of the site. Ridge and furrow earthworks have also been noted superimposed over earlier settlement remains within the DMV area north of the site, so the process of contraction seems to have been widespread. This may in part be due to the spread

of the Black Death which is known to have severely affected northern Buckinghamshire, certainly including Bradwell in the mid 14th century. Some inhabitants may also have moved to Stony Stratford.

Post-medieval period

The main boundary ditch between the two site areas was maintained into the post-medieval period but was eventually superseded by hedge-lines set slightly further north.

The two site areas were part of two separate large enclosed fields (Black Hill and Bar Race) belonging to Warren Farm since at least 1654 and up until 1967. The re-introduction of dispersed settlement into Old Wolverton, including Spinney Cottage at the north site boundary between 1742 and 1814 may be associated with the post-medieval limestone quarry pits located within the smaller site area.

The hollow-way was retained as a major back route and boundary throughout the post-medieval period until the imposition of the current Milton Keynes road system which bisected it. The boundary south of Wolverton Road is still operational as a footpath.

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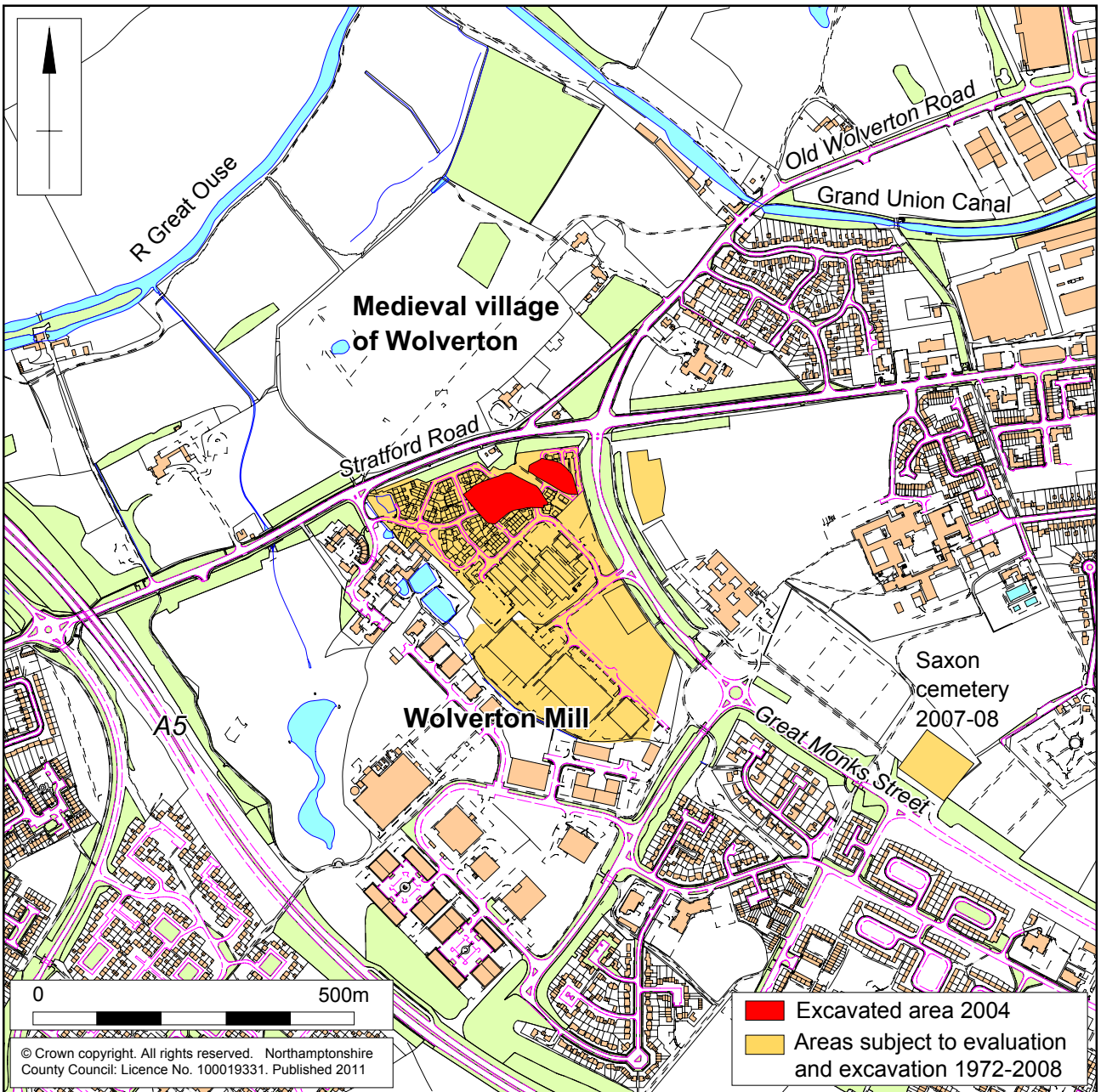
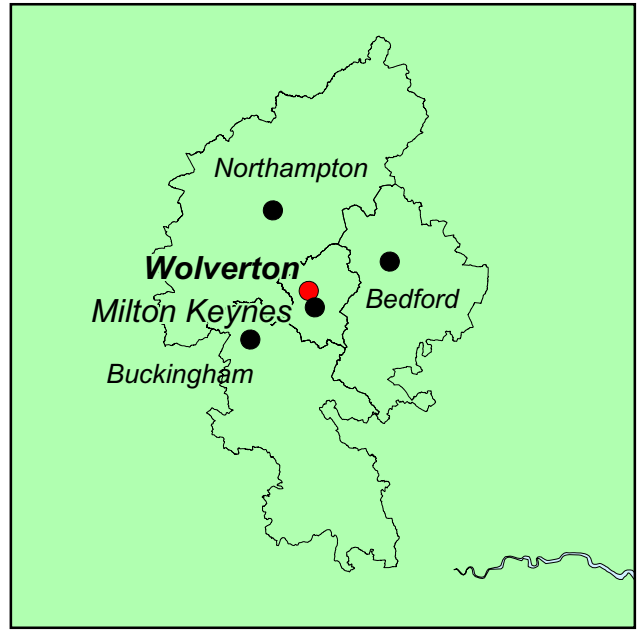
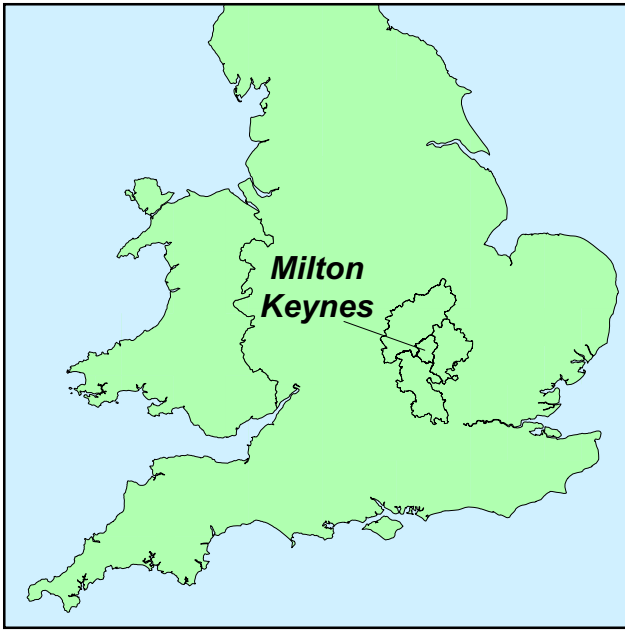
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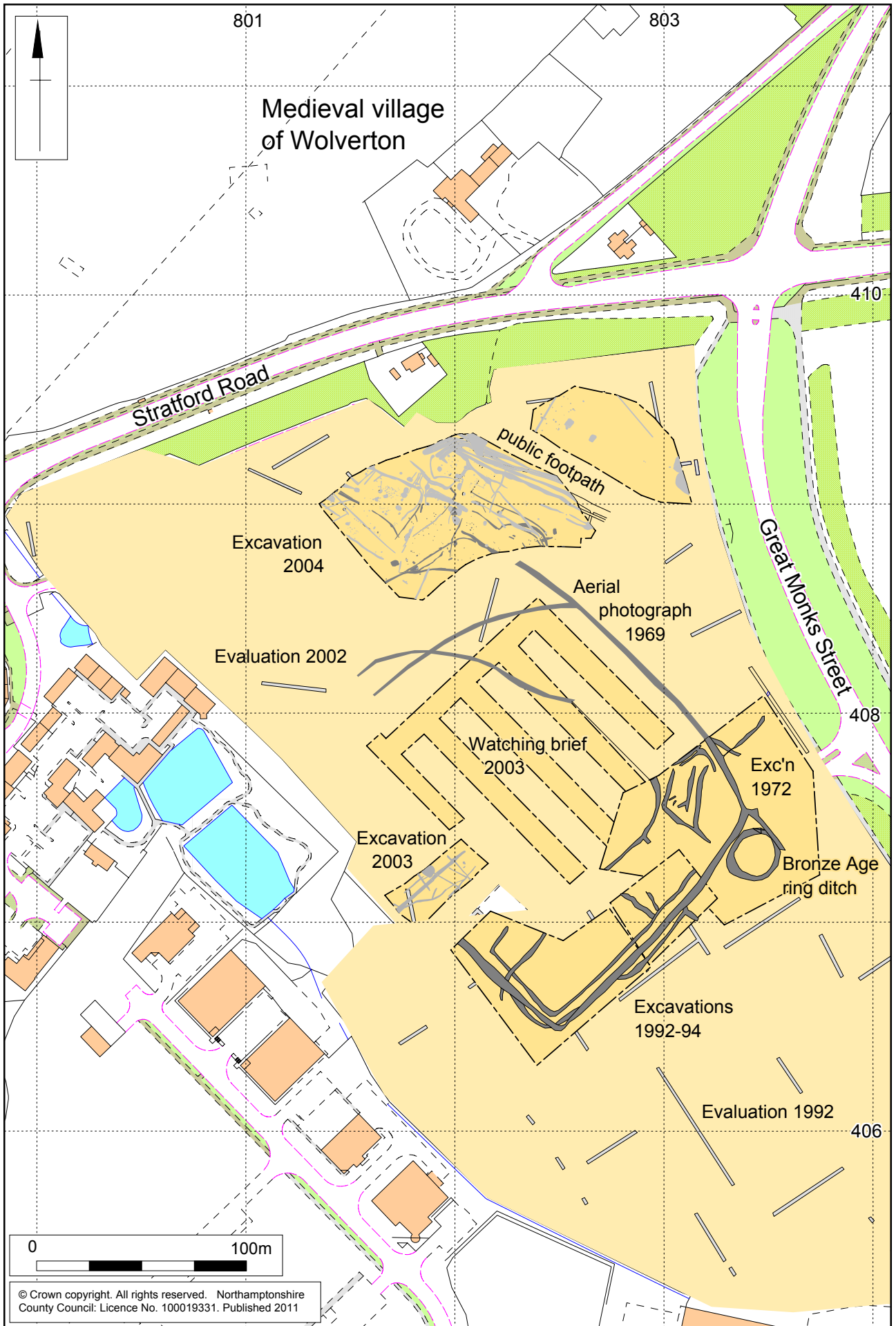
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Scale 1:10,000

Site location Fig 1

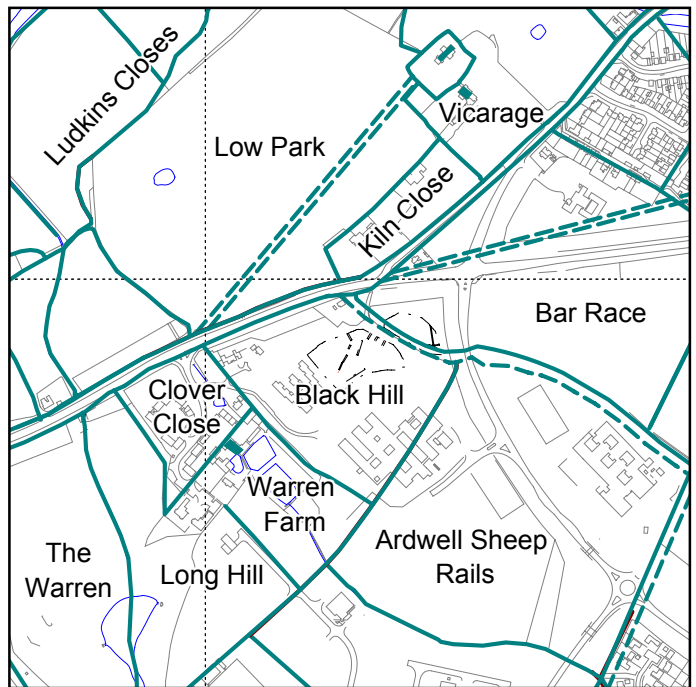


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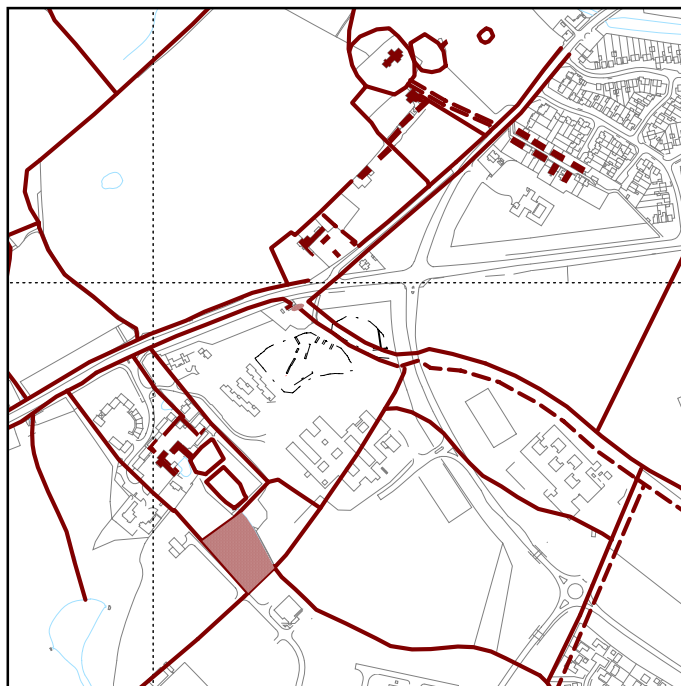
Excavations at Wolverton Mill Fig 2



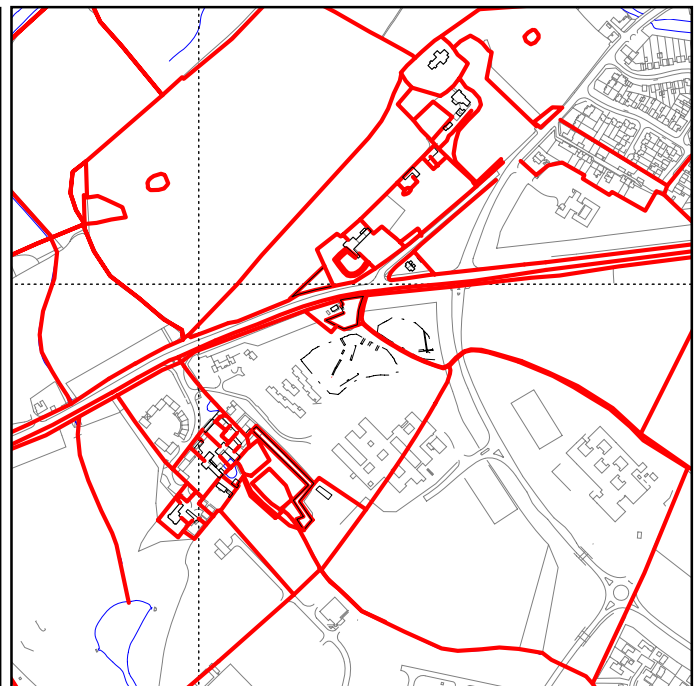
a) Medieval landscape of Wolverton (from Croft and Mynard 1993)



b) Post-medieval landscape of Wolverton (from Croft and Mynard 1993)

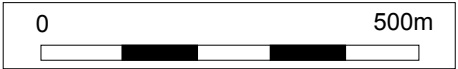


c) Transcription of the Provisional Edition 1814 Ordnance Survey Buckinghamshire Sheet

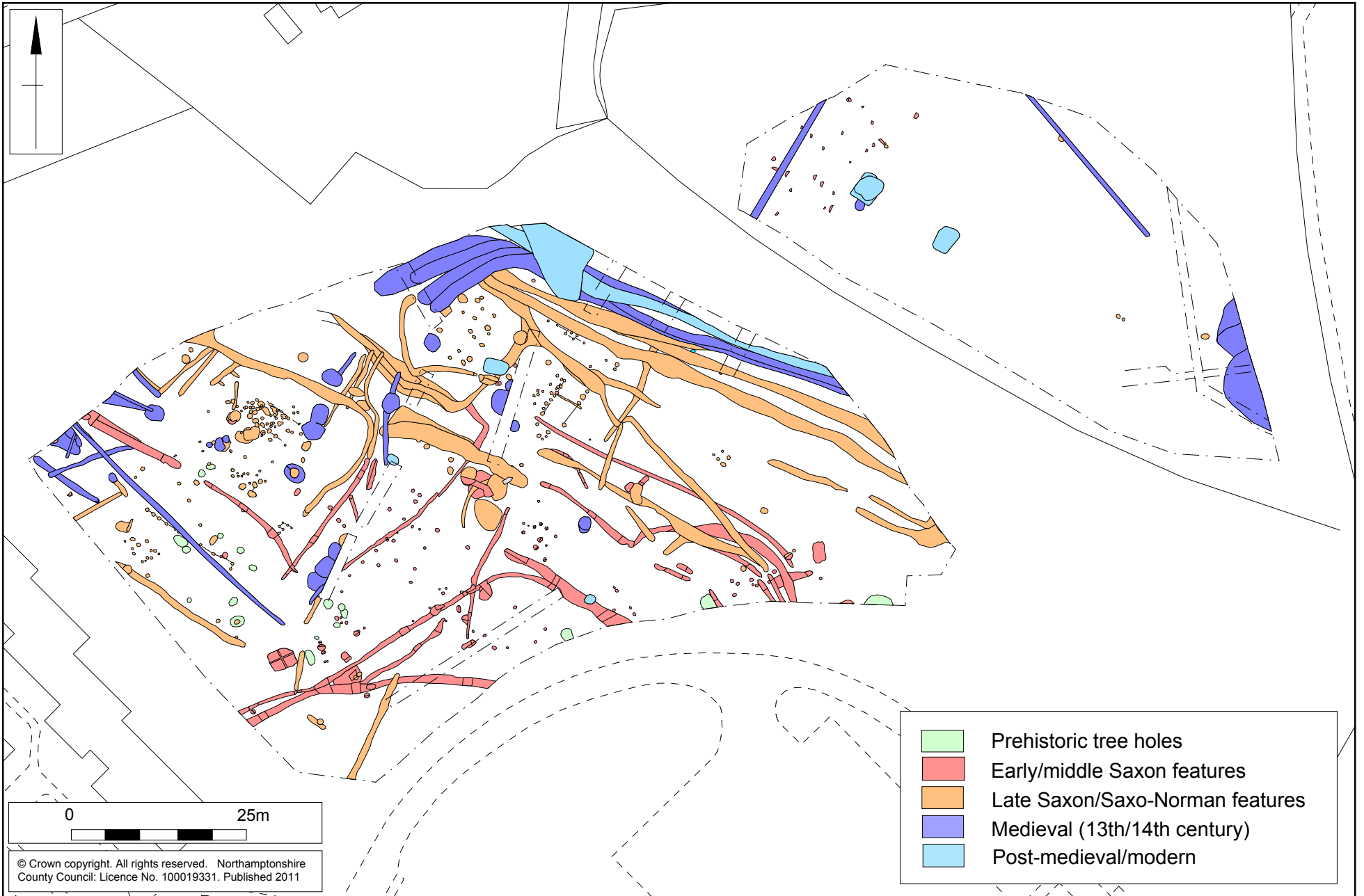


d) Transcription of the 1967 Edition Ordnance Survey map (from Croft and Mynard 1993)

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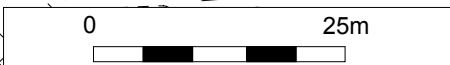
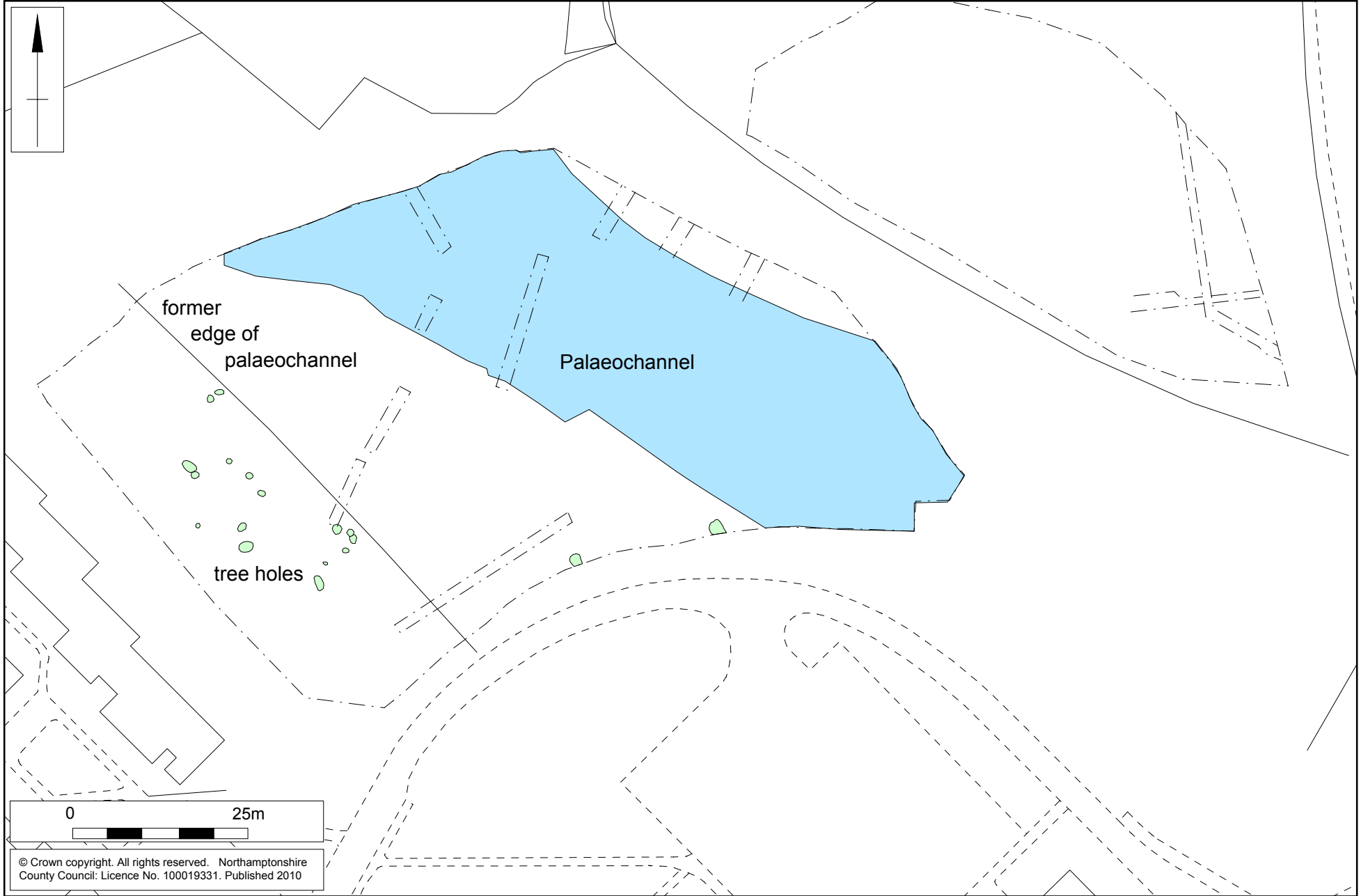
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General site plan Fig 4

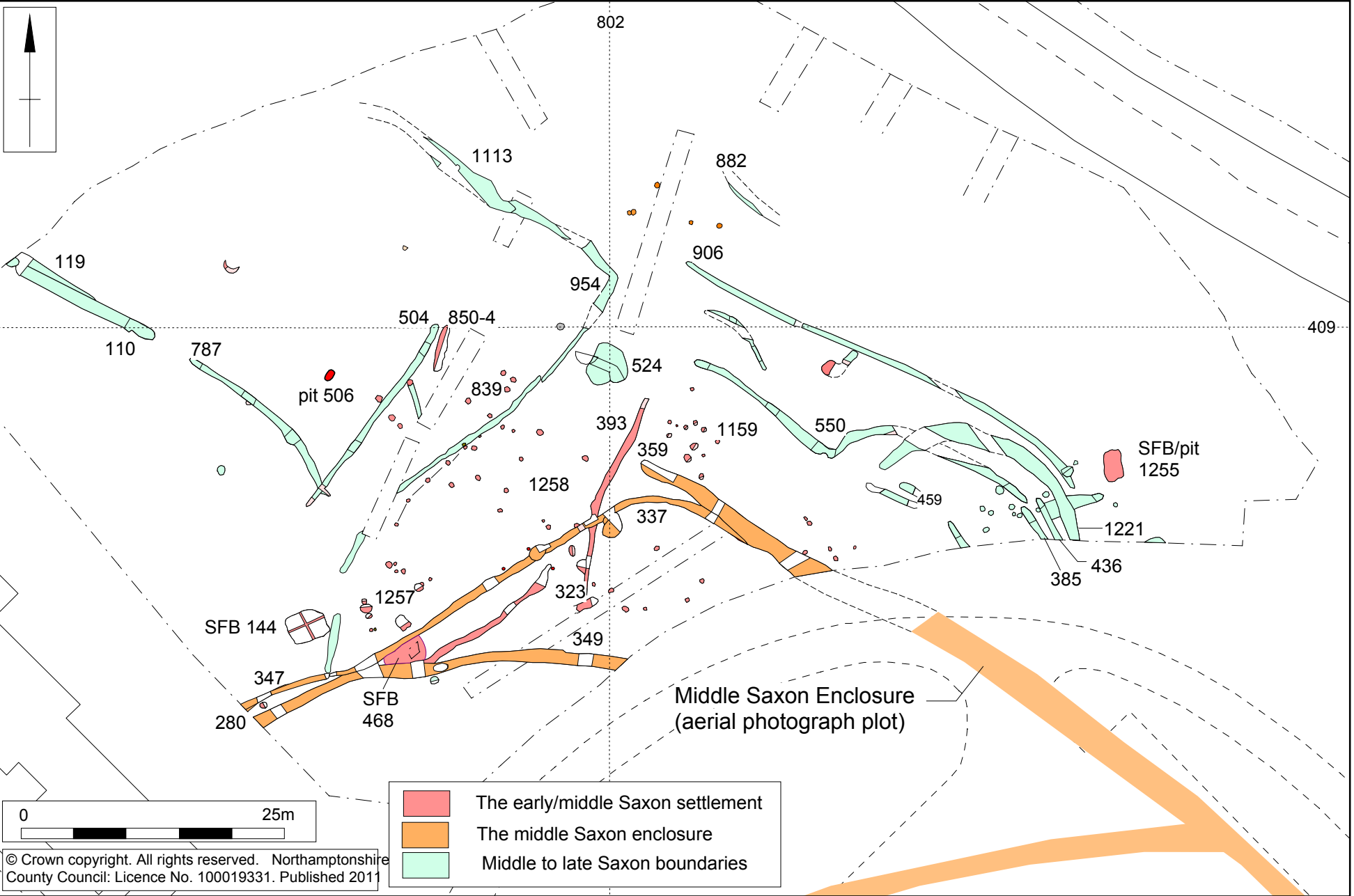
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Prehistoric palaeochannel and tree holes Fig 5



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
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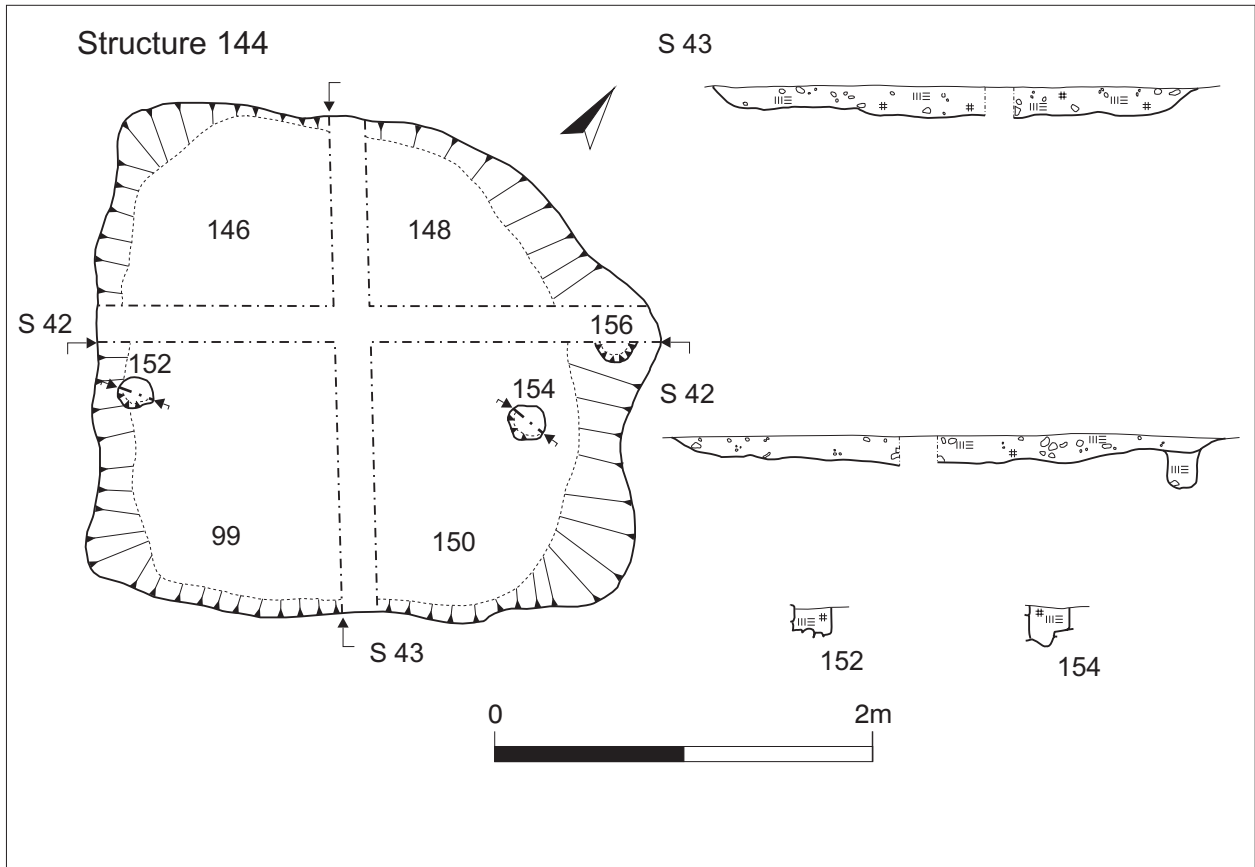


Early and Early/middle Saxon settlement Fig 6



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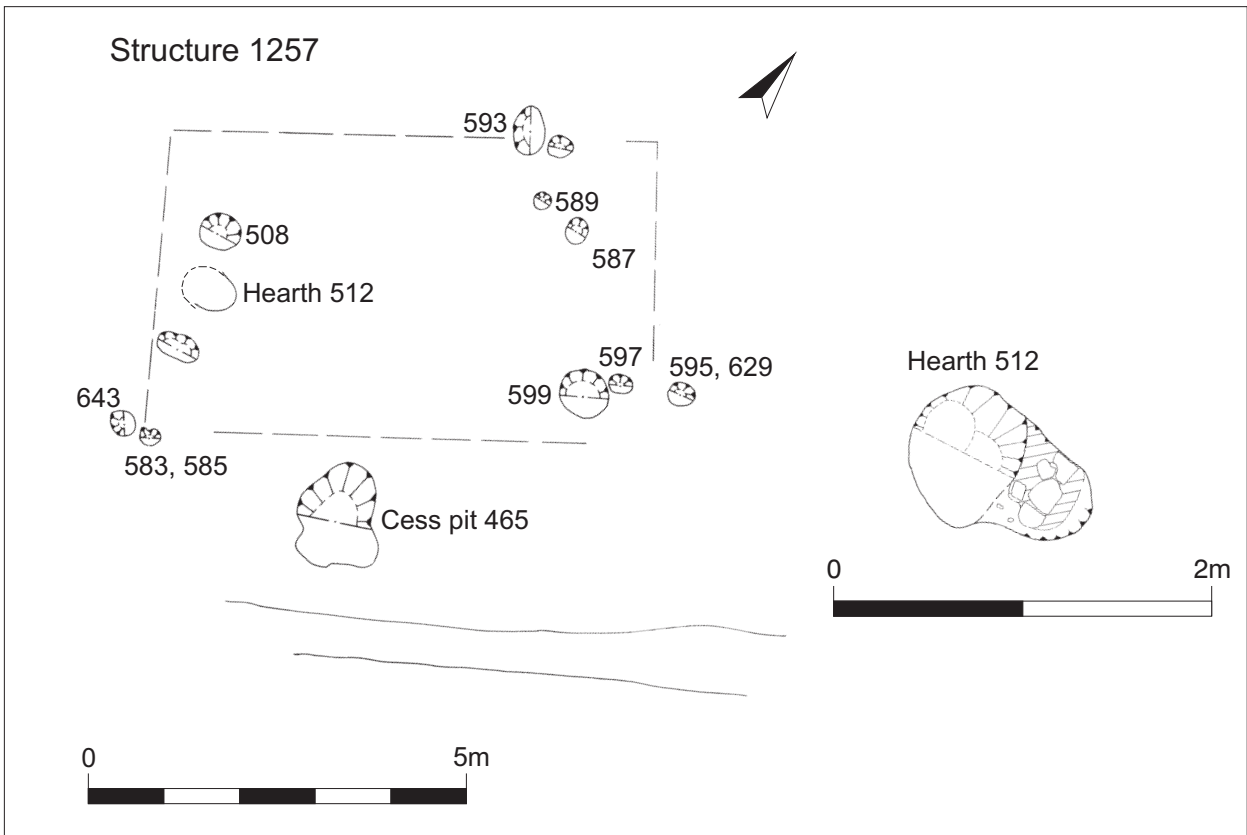
	The early/middle Saxon settlement
	The middle Saxon enclosure
	Middle to late Saxon boundaries



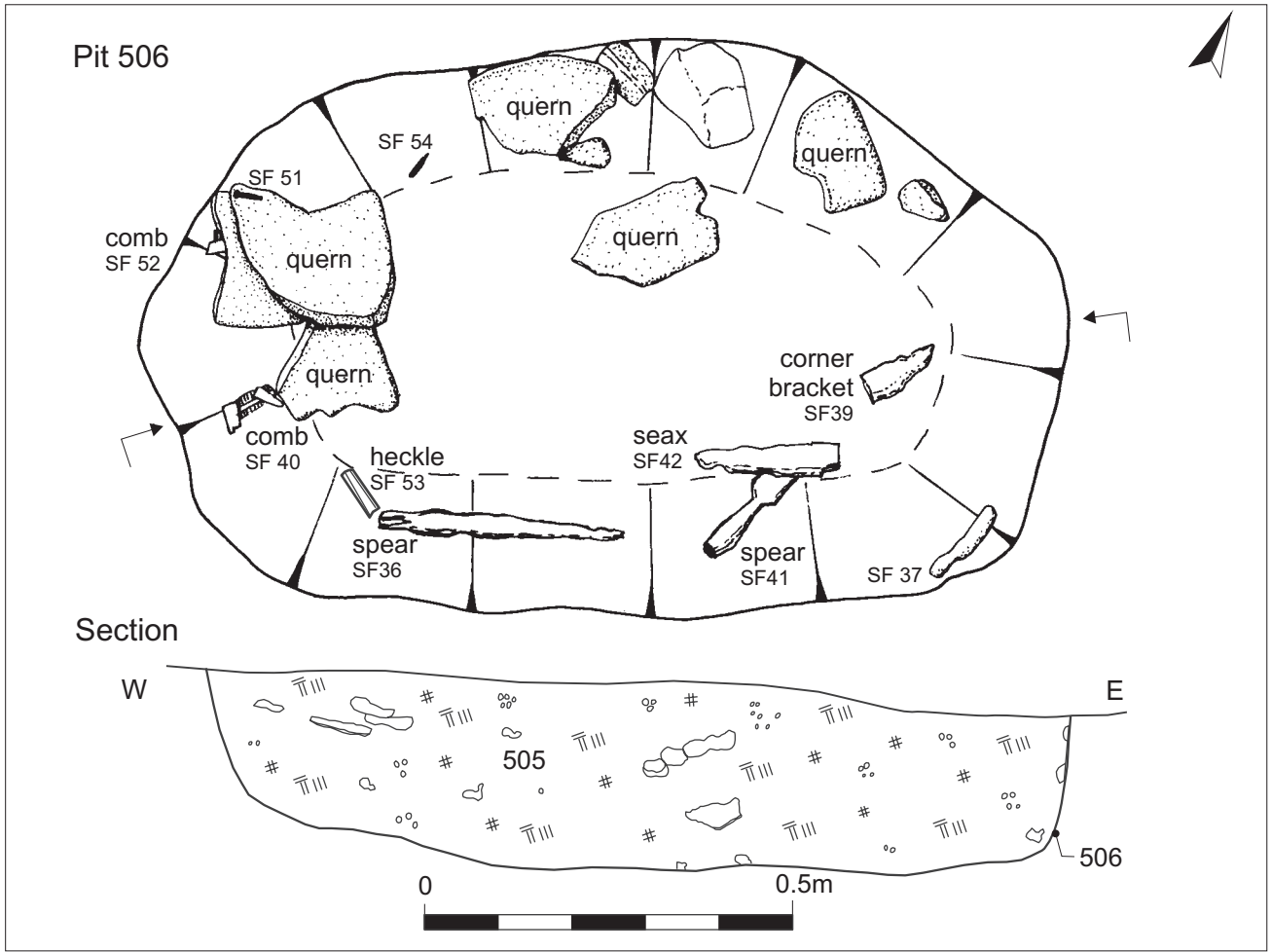
Early Saxon sunken-featured building Fig 7



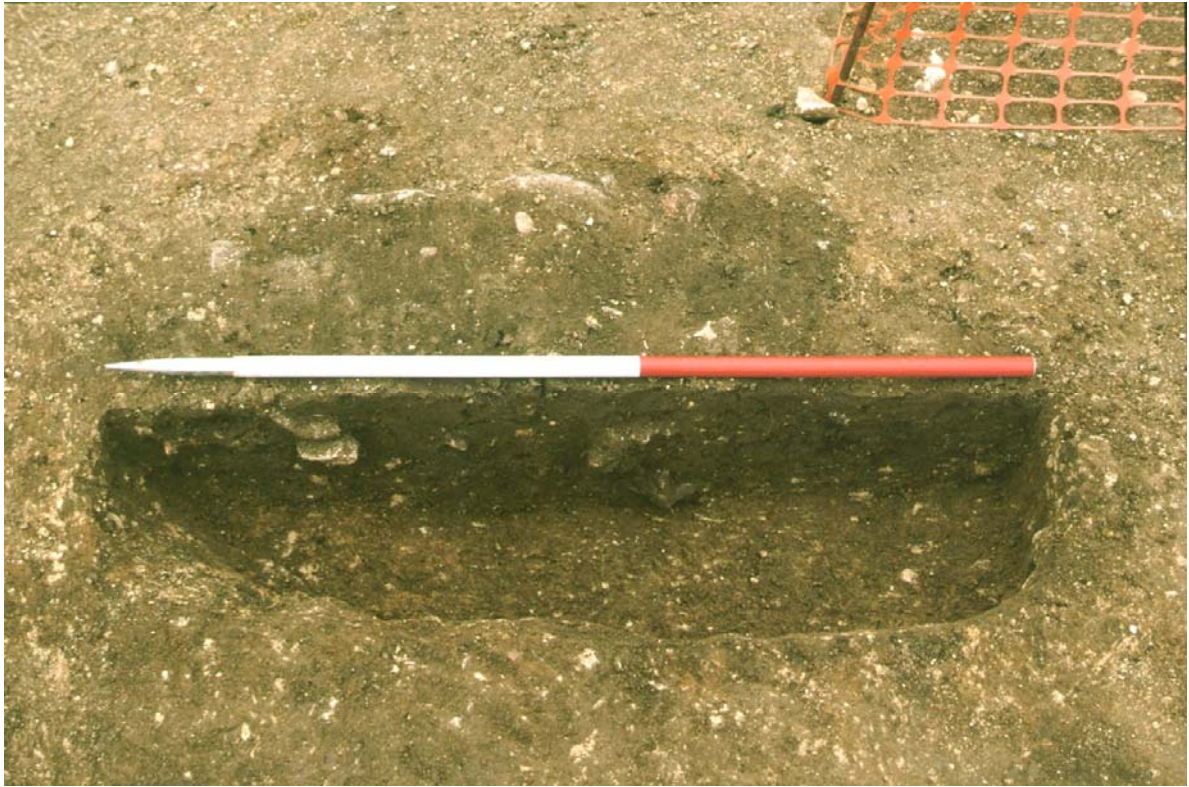
View of sunken-featured building 144, looking south-west Fig 8



Early/middle Saxon structure group 1257 Fig 9



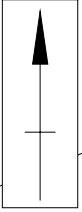
Early/middle Saxon pit 506 Fig 10



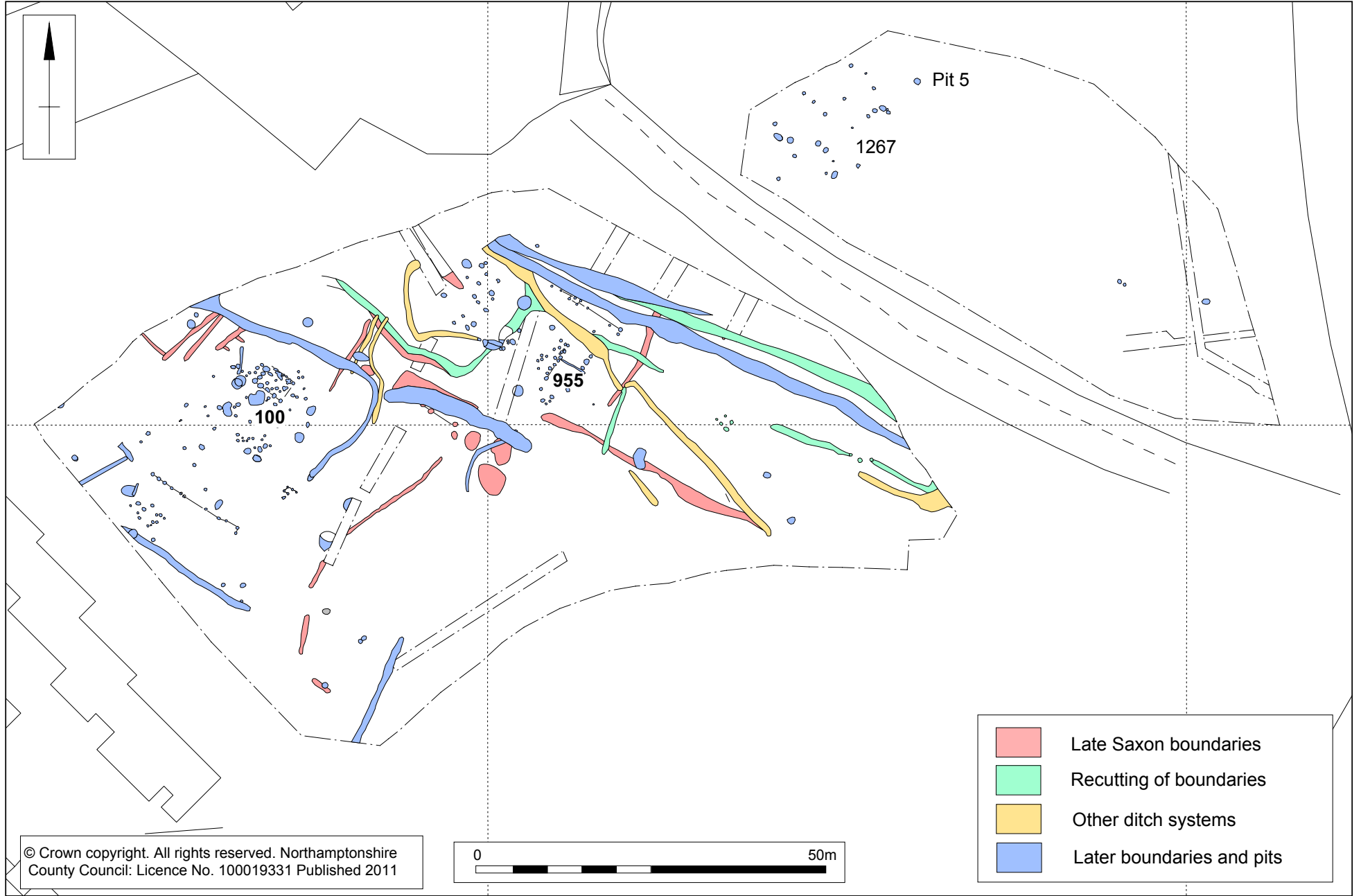
View of section of early-middle Saxon pit, 506, looking north

Fig 11

1:750



Late Saxon / Saxo-Norman settlement Fig 12

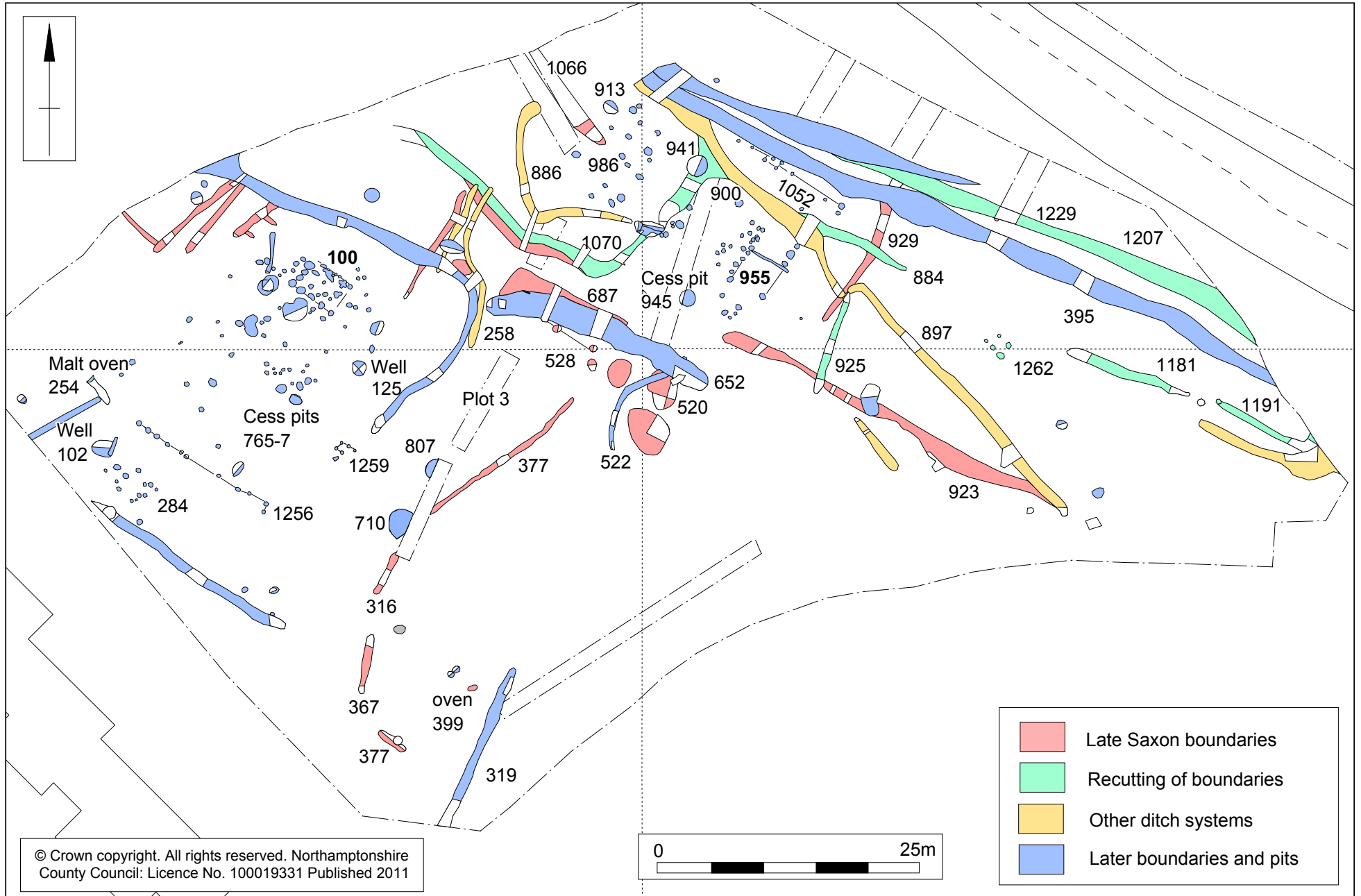


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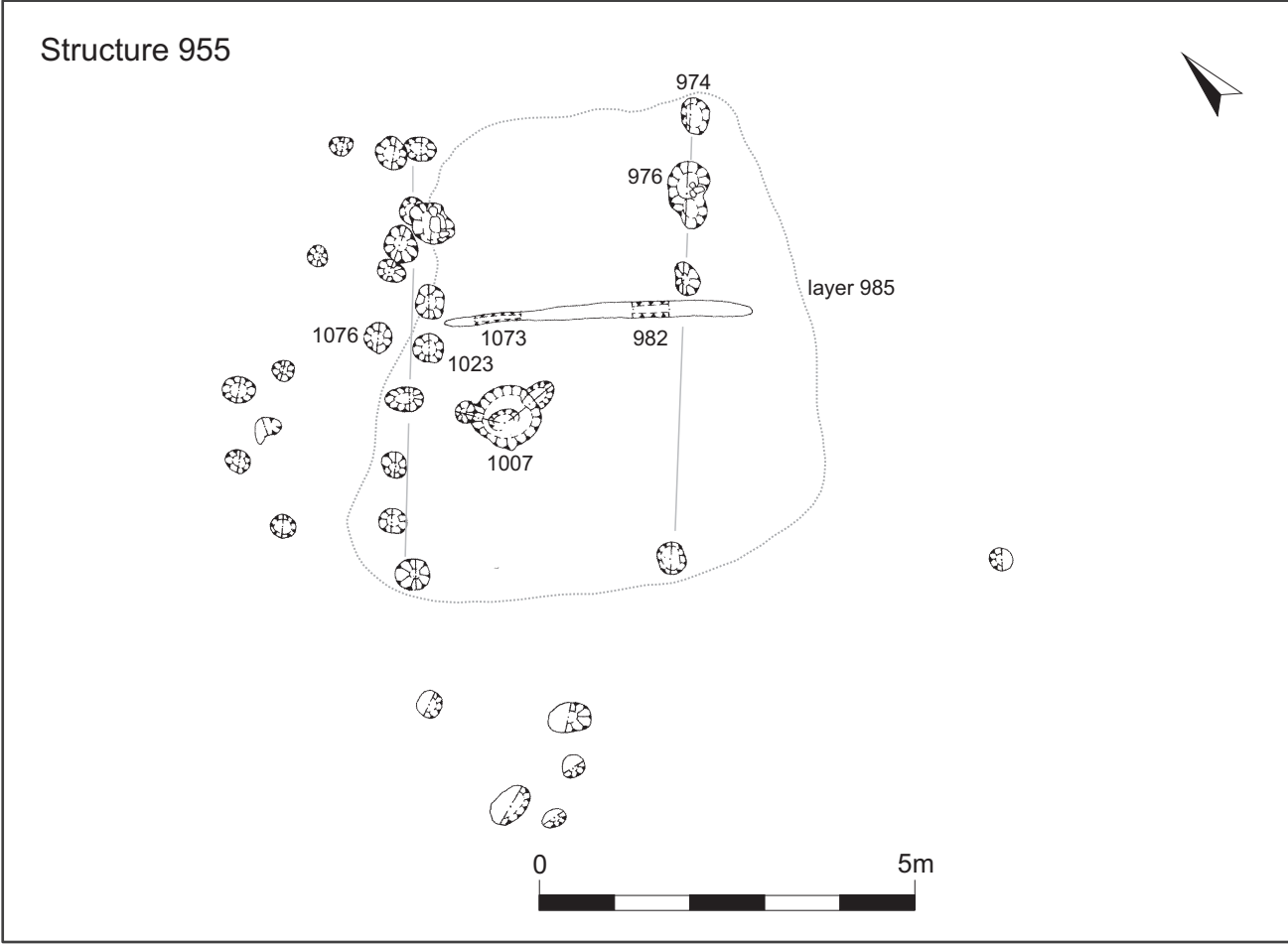
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Late Saxon / Saxo-Norman settlement, structure groups Fig 13



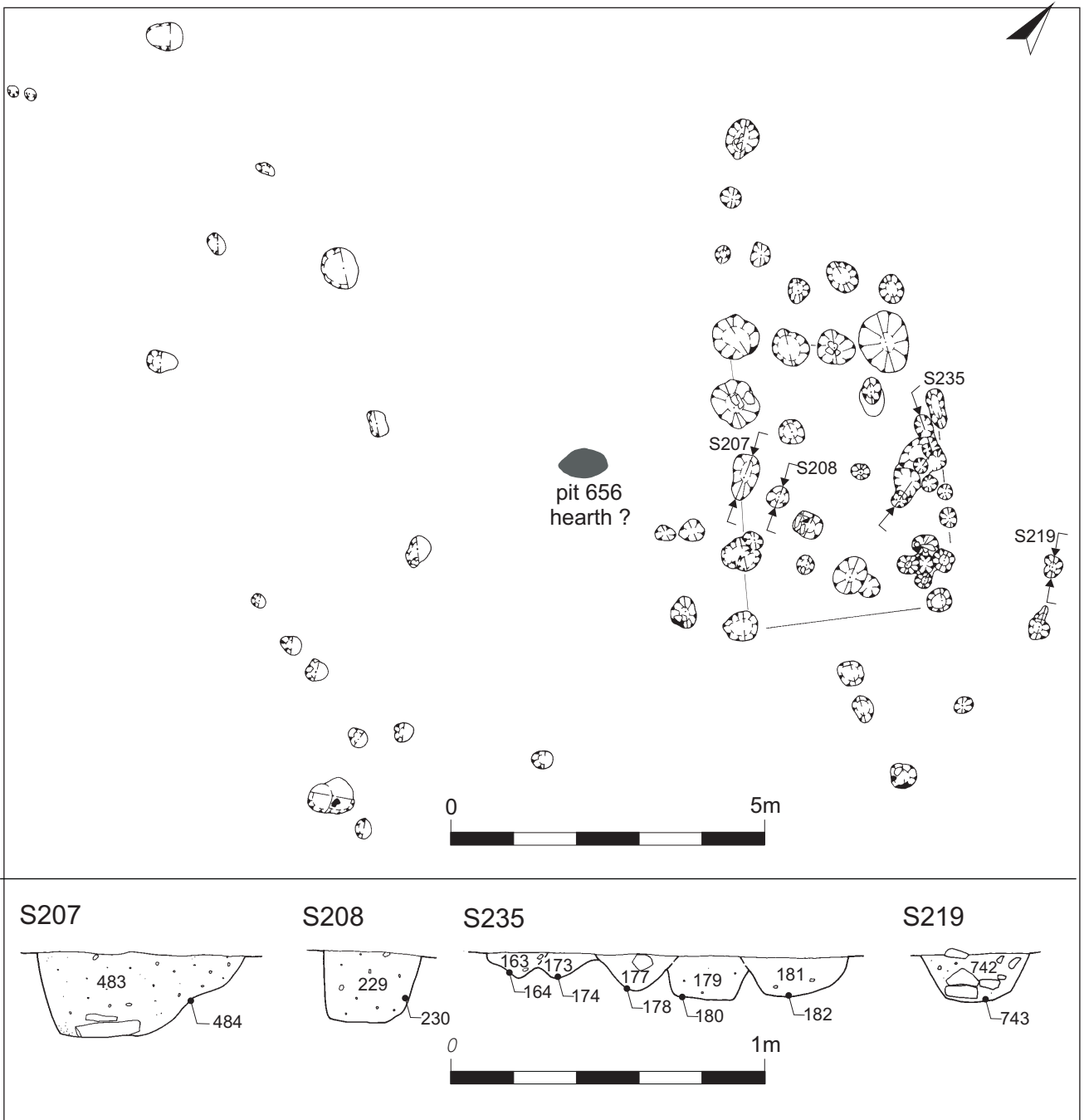
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Late Saxon/Saxo-Norman Structure 955 Fig 14

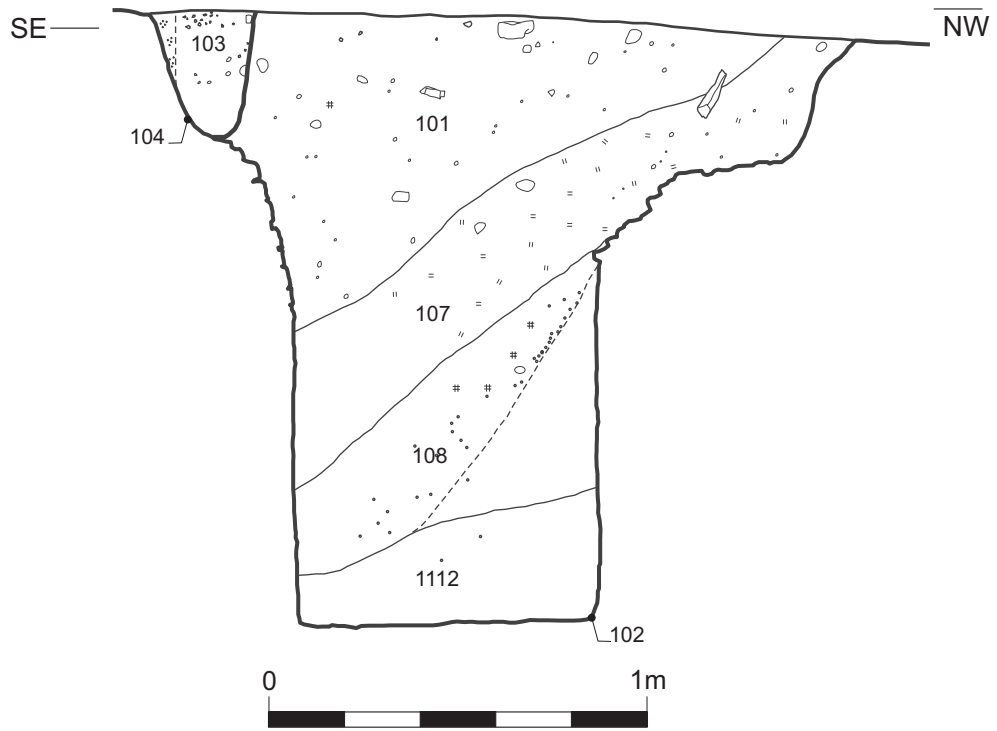


Hearth 913 with late Saxon structure group 986 Fig 15

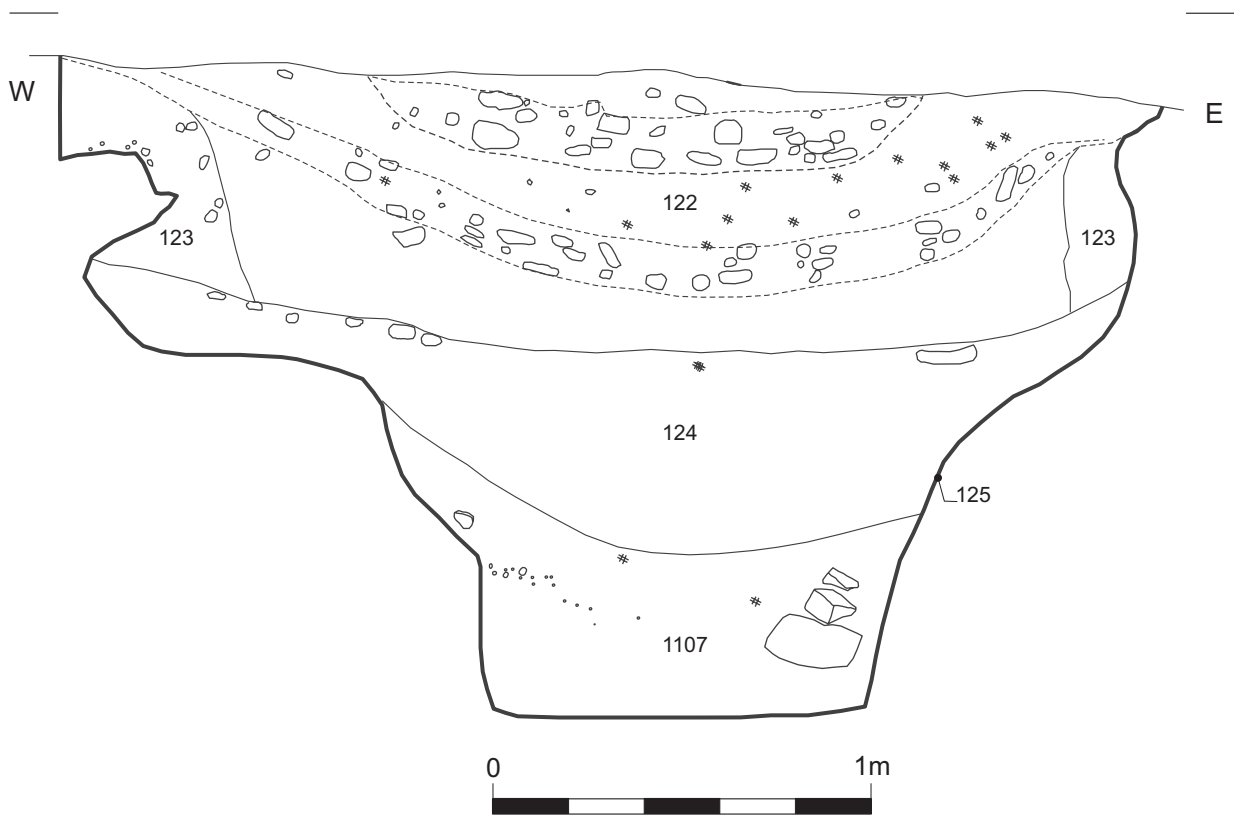


Late Saxon/Saxo-Norman, Structure 100 Fig 16

Well 102



Well 125



Sections of wells 102 and 126 Fig 17



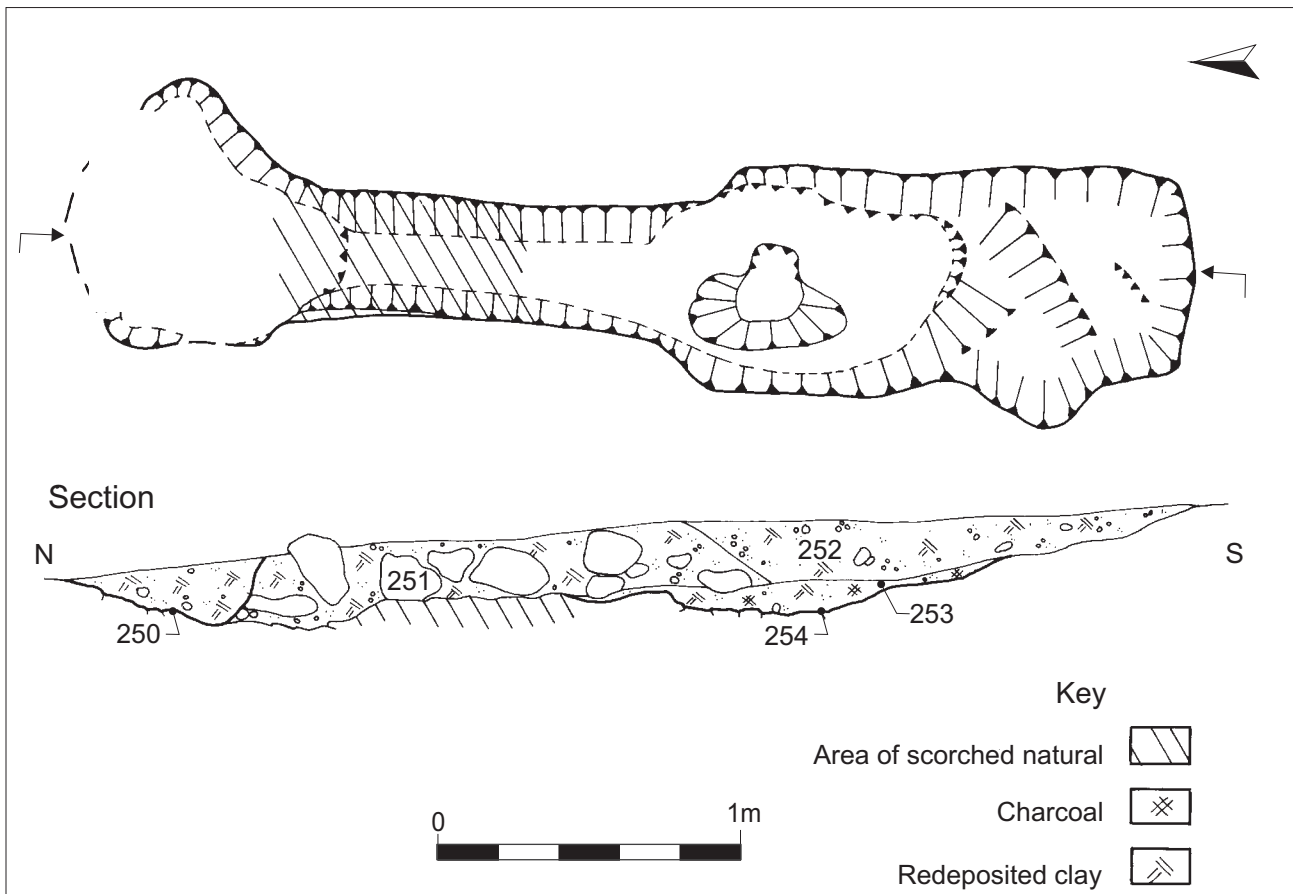
View of the top of well 125 Fig 18



View of well 125, looking north Fig 19



View of well 102 Fig 20



Late Saxon malting/drying oven 250 Fig 21



Malting oven 250, stokehole, looking south
Fig 22

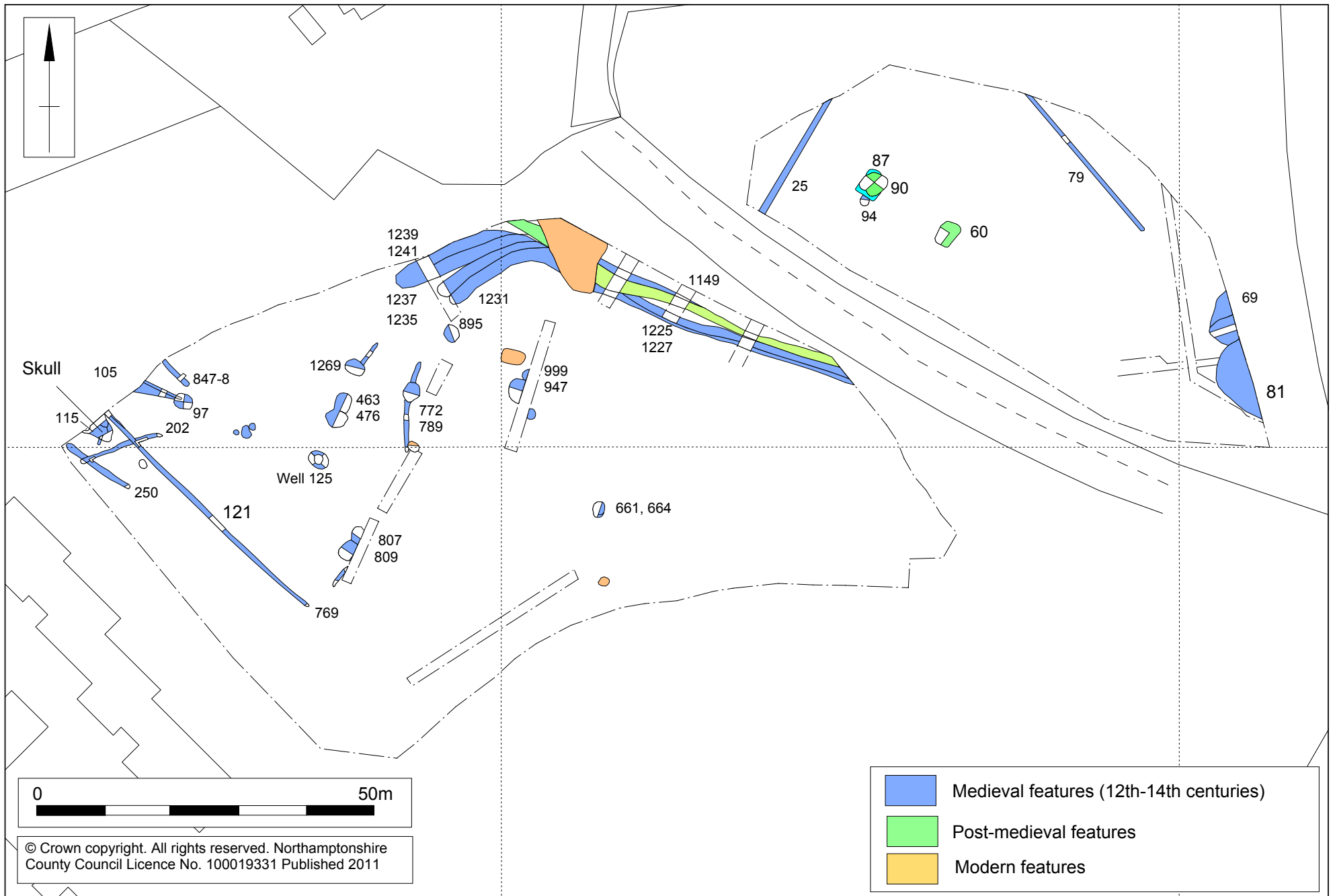


Malting oven 250, oven chamber,
looking north
Fig 23



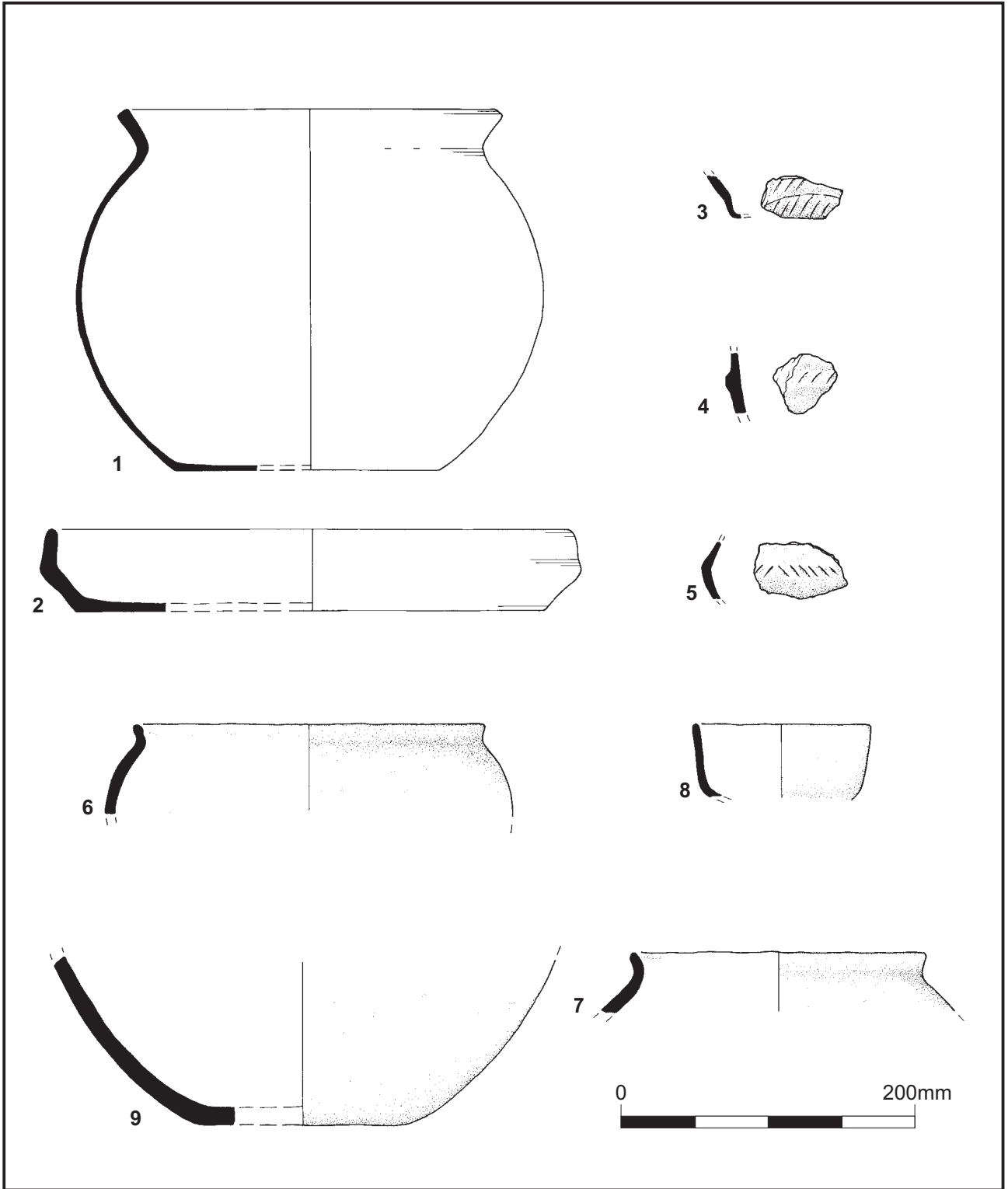
Stokehole of malting oven 250, looking north,
showing archaeomagnetic sampling Fig 24

Medieval and post-medieval fields Fig 25

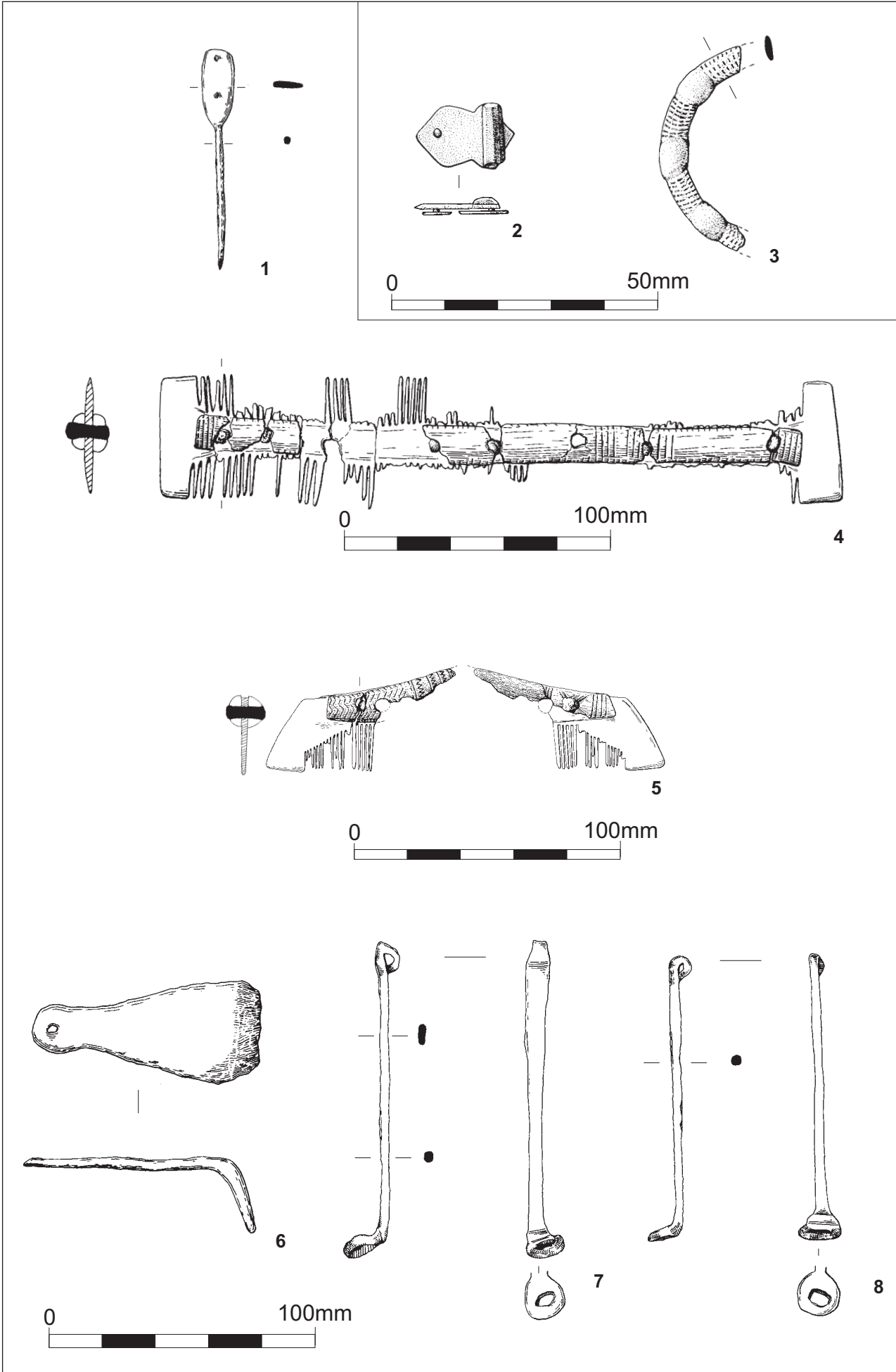




Human skull from medieval ditch115 Fig 26



Early/middle Saxon pottery, 1-9 Fig 27



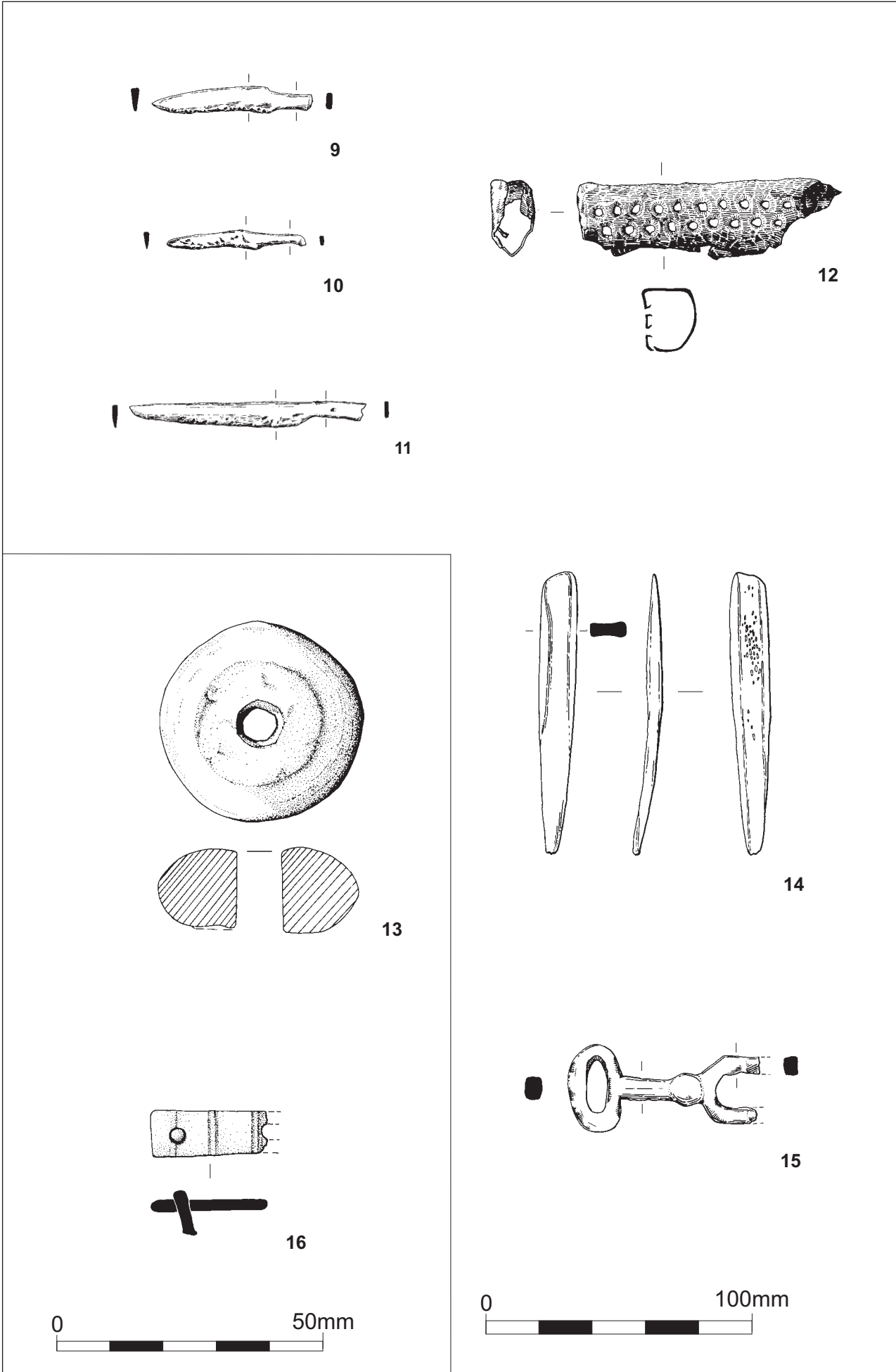
Bone combs, keys and other objects, 1-8 Fig 28



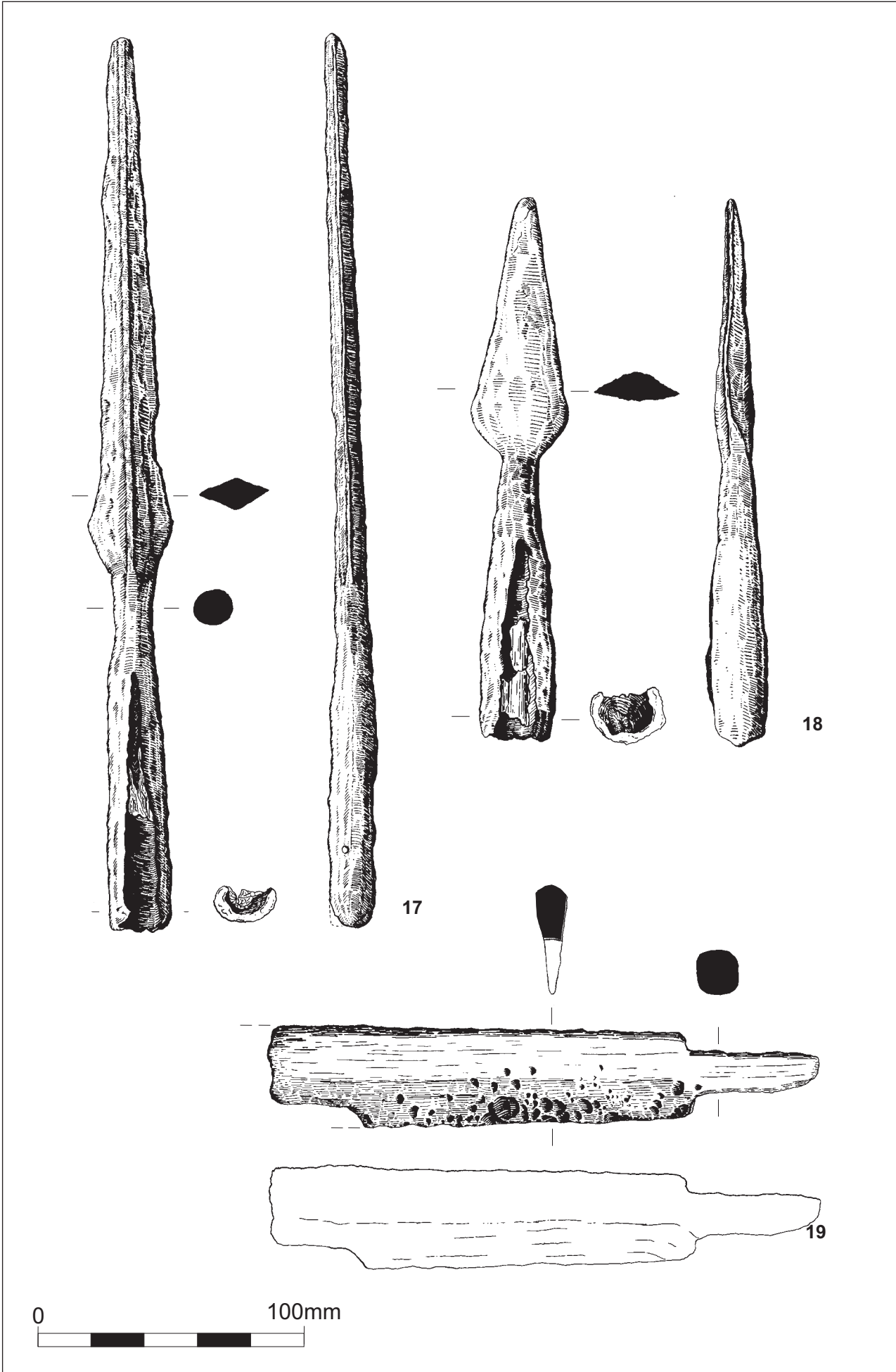
Large double-sided bone comb (Scale 50mm) Fig 29



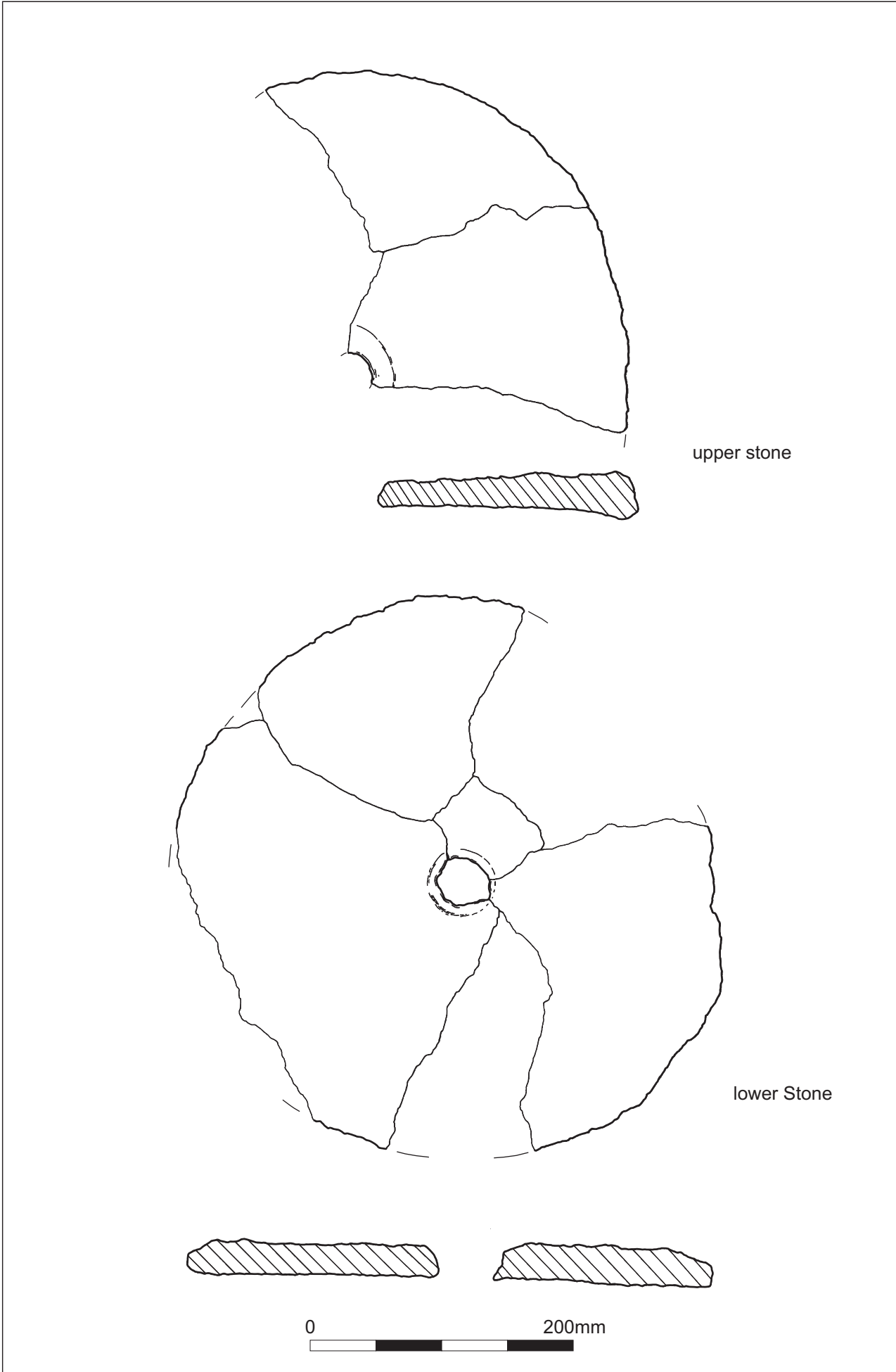
Small single-sided comb (Scale 50mm) Fig 30



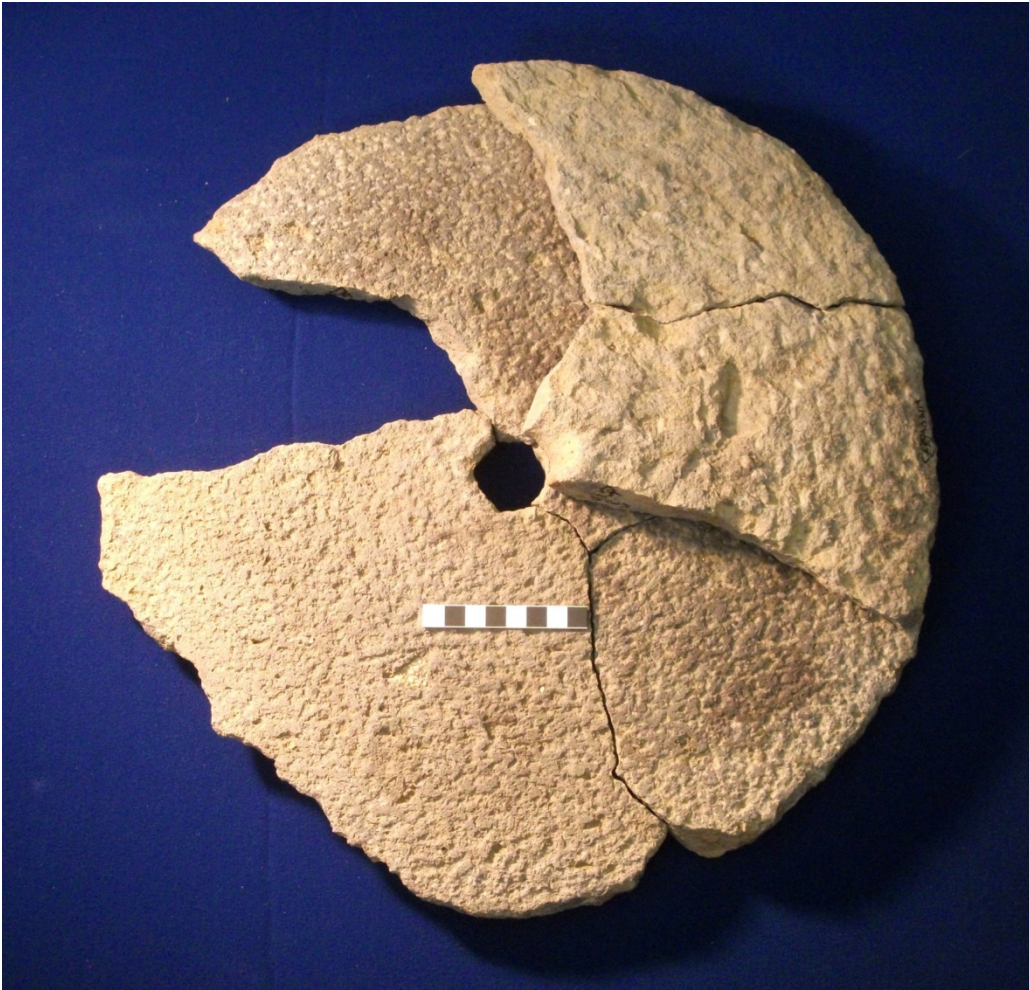
Knives, heckle, weaving tools and other objects, 9-15 Fig 31



Spearheads and seax from pit 506, 17-19 Fig 32



Upper and lower stones of a lava quern from pit 506 Fig 33

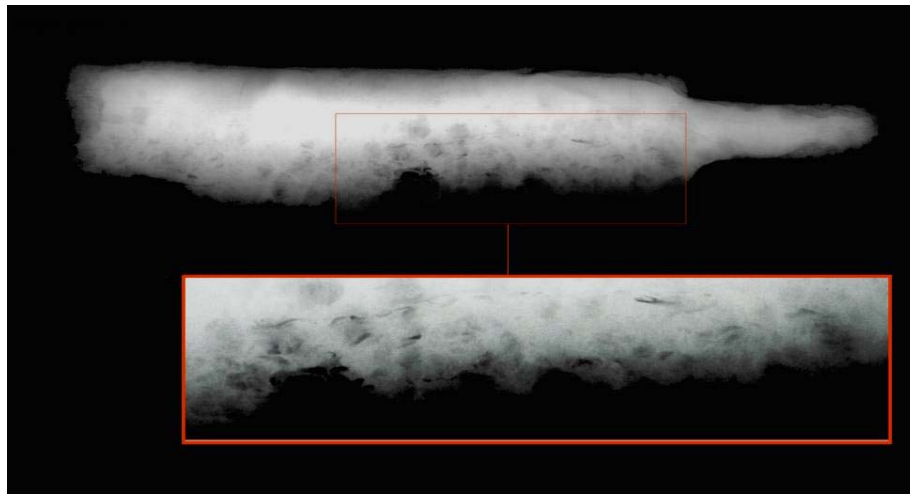


Lava quern, showing dimpled grinding surface of lower stone and Tool marks on upper surface of upper stone (Scale 80mm) Fig 34

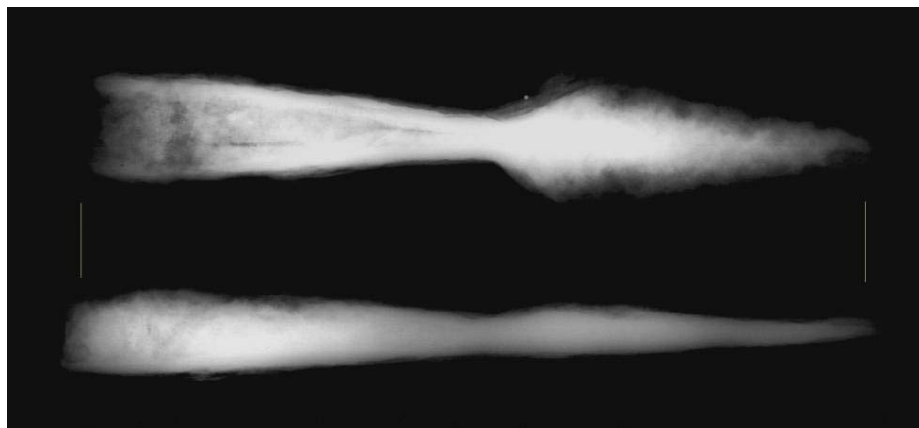
**APPENDIX 1: THE CONSERVATION AND EXAMINATION OF THE SEAX AND
SPEARHEADS FROM PIT 506**

by David Parish, Buckinghamshire County Council, Conservation Service

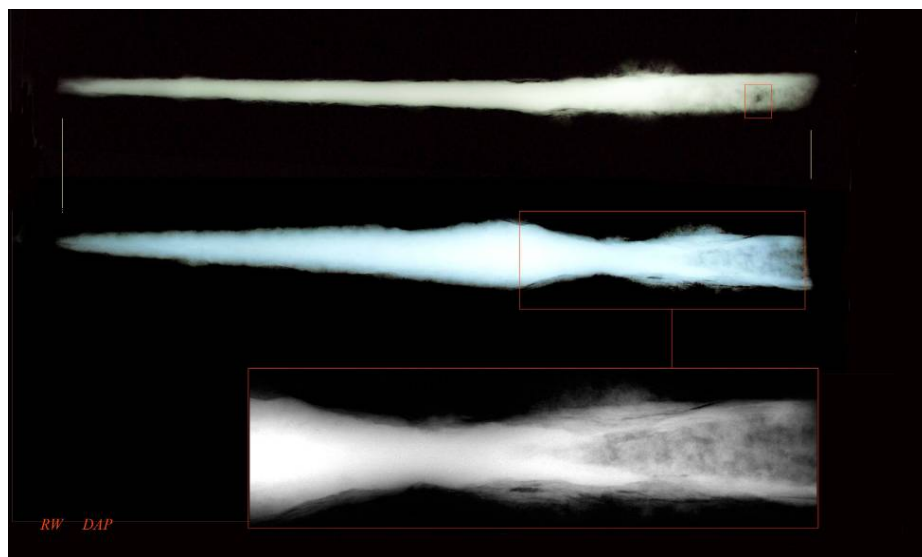
A1.1 X-radiographs of the seax and spears from pit 506



X-ray of seax (WM 32), plan and detail of cutting edge



X-ray of spear (WM41), plan and section

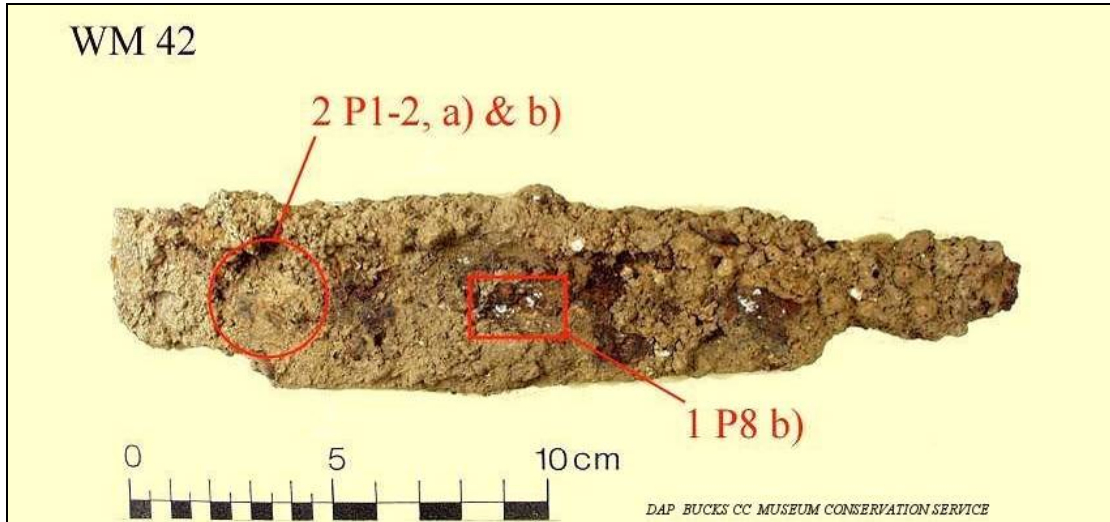


X-ray of spear (WM 36); section, plan and detail of socket

A1.2 Location of mineralised organic remains on the seax and spears from pit 506

The following photographs and the accompanying descriptions show the location of mineralised organic remains on the spears and seax from pit 506. These remains were further exposed using airbrasive cleaning, and were recorded in detailed photomacrographs, as reproduced below.

The seax (WM 42)



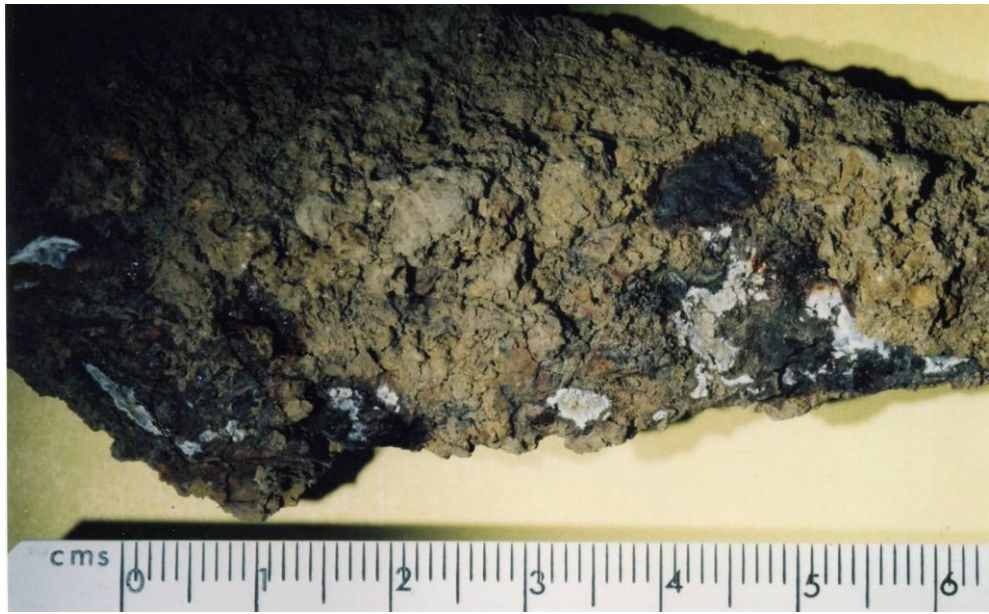
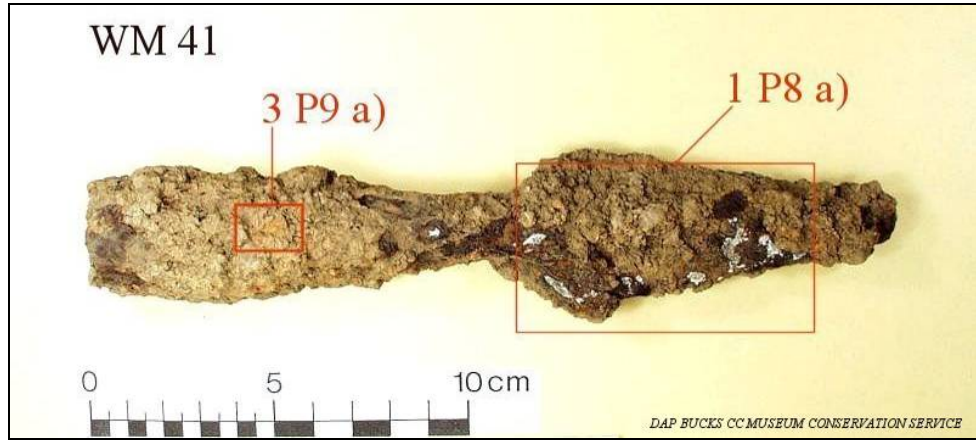
The Seax, WM 42: 2 P1-2 a) Organic remains having appearance of grass or straw before investigative conservation



The Seax, WM 42: 2 P1-2 b) Same as above but at higher magnification



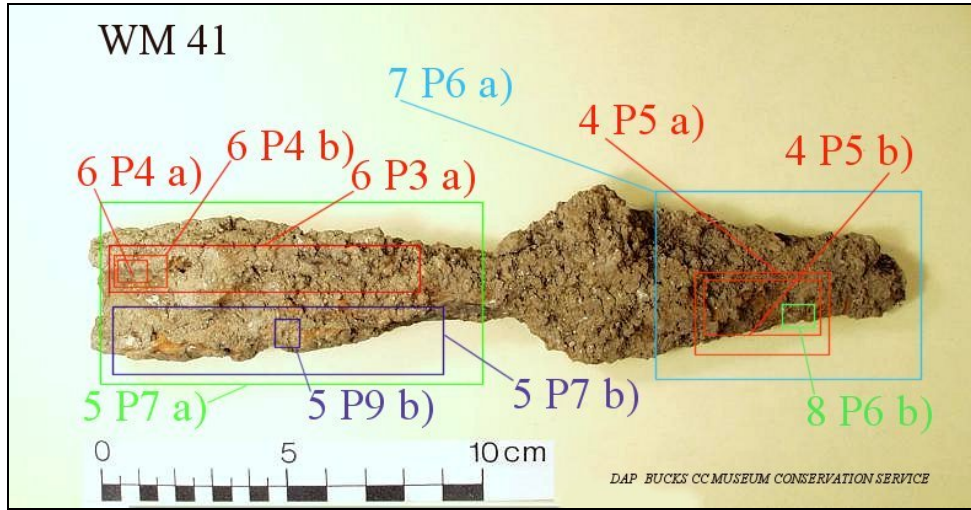
The Seax, WM 42: 1 P8 b) Deposits of a white precipitate, looks calcareous, on blade of the seax



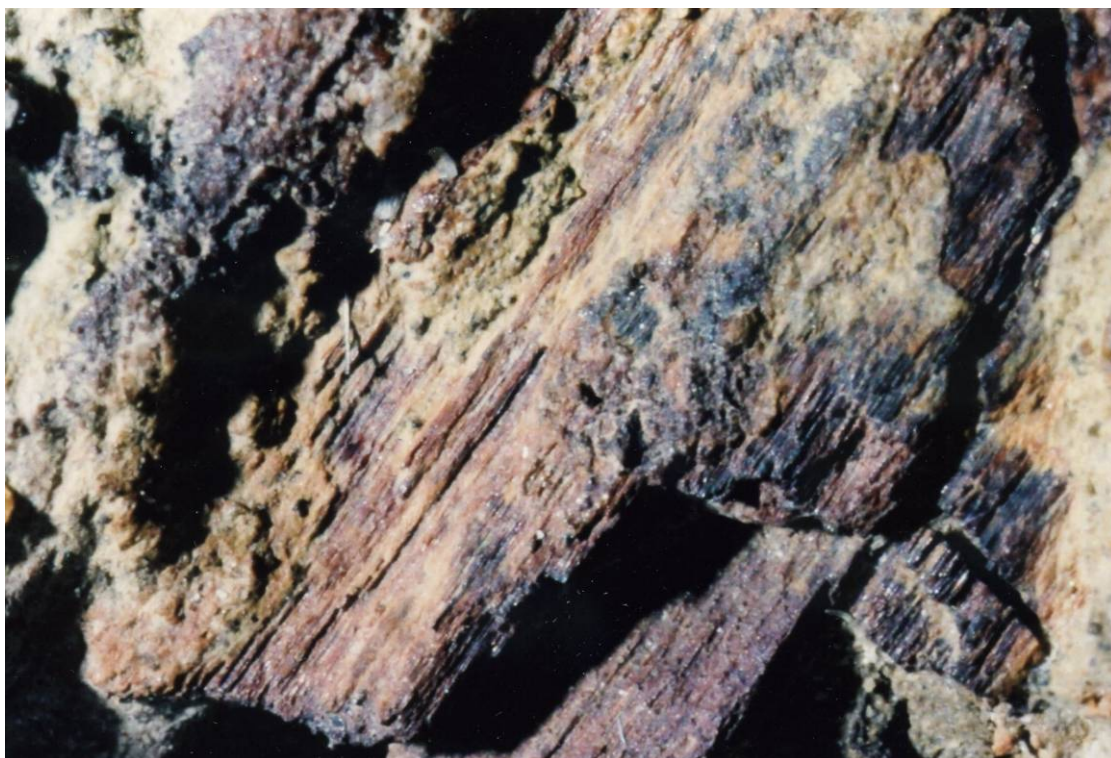
Spear WM 41: 1 P8 a) Several deposits of a white precipitate on blade of the spear; looks calcareous



Spear WM 41: 3 P9 a) Cluster of mineralized wood in soil on the outside of the socket



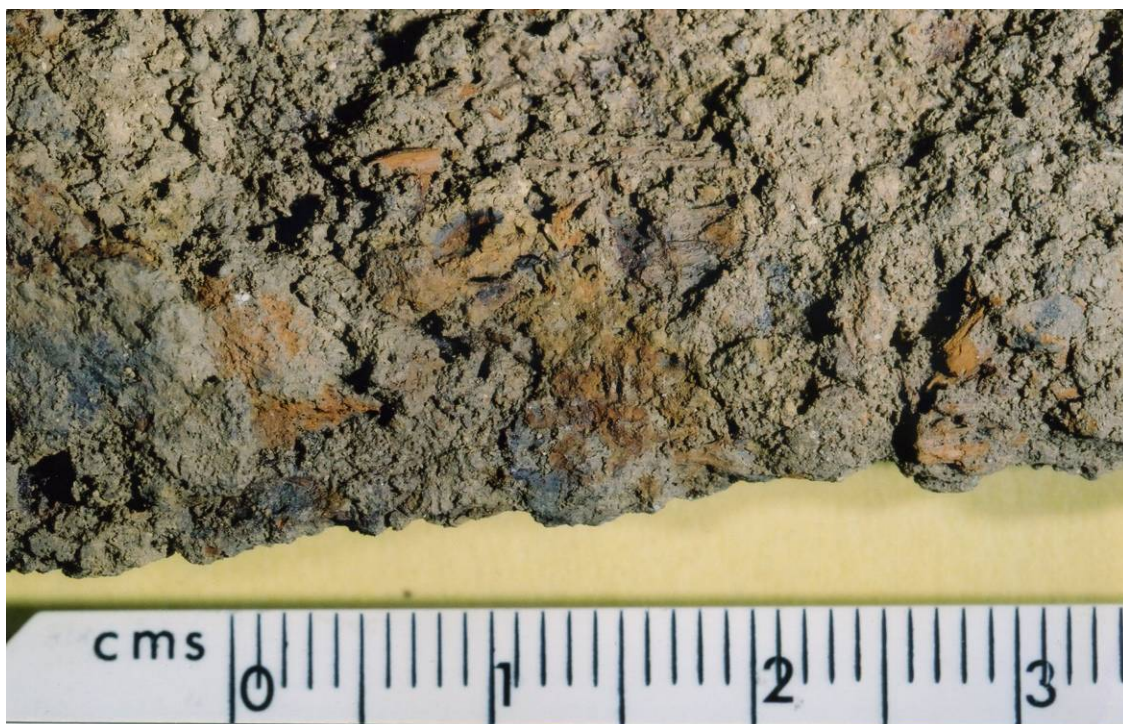
Spear WM 41: 6 P3 a) Location of several pieces of mineralized wood from remains of wooden shaft



Spear WM 41: 6 P4 a) Detail of mineralized wood remains inside socket



Spear WM 41: 6 P4 b) Lower magnification to show more of the wood remains inside the socket



Spear WM 41: 4 P5 a) Traces of organic remains before investigative conservation



Spear WM 41: 4 P5 b) Detail of above after development by airbrasive techniques



Spear WM 41: 7 P6 a) View of blade end of spear showing extent of organic remains after airbrasive cleaning



Spear WM 41: 8 P6 b) Detail of what appears to be straw fully exposed after airbrasive treatment



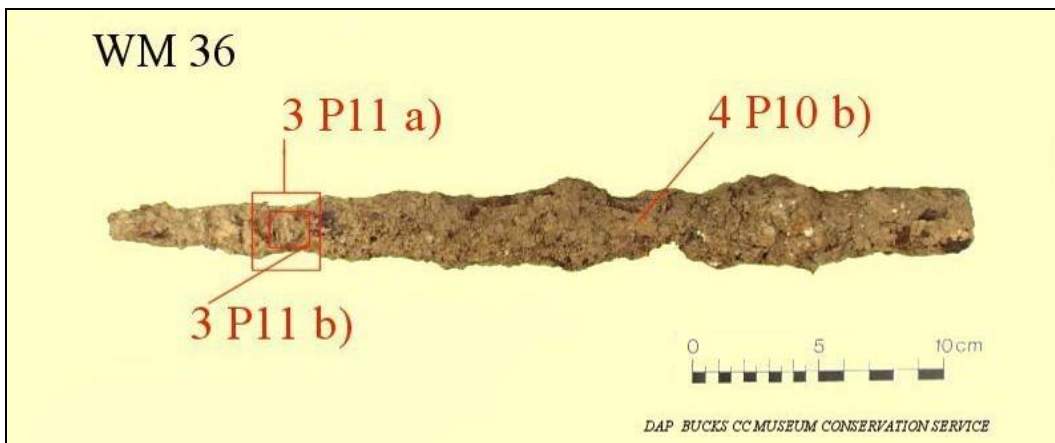
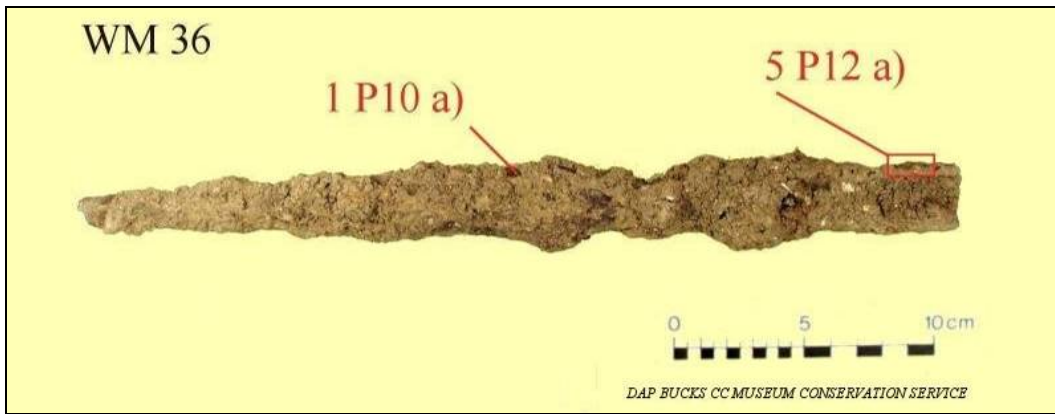
Spear WM 41: 5 P7 a) Organic remains on outside of socket before investigative conservation, with flecks of apparent decayed wood also present



Spear WM 41: 5 P7 b) Development of the above remains by airbrasive techniques



5 P9 b) Detail of organic remains in 5 P7 b) resembling wood/straw after exposure by airbrasive treatment



Spear WM 36: 5 P10 a) Fine grain fibre-like impressions on surface of the iron



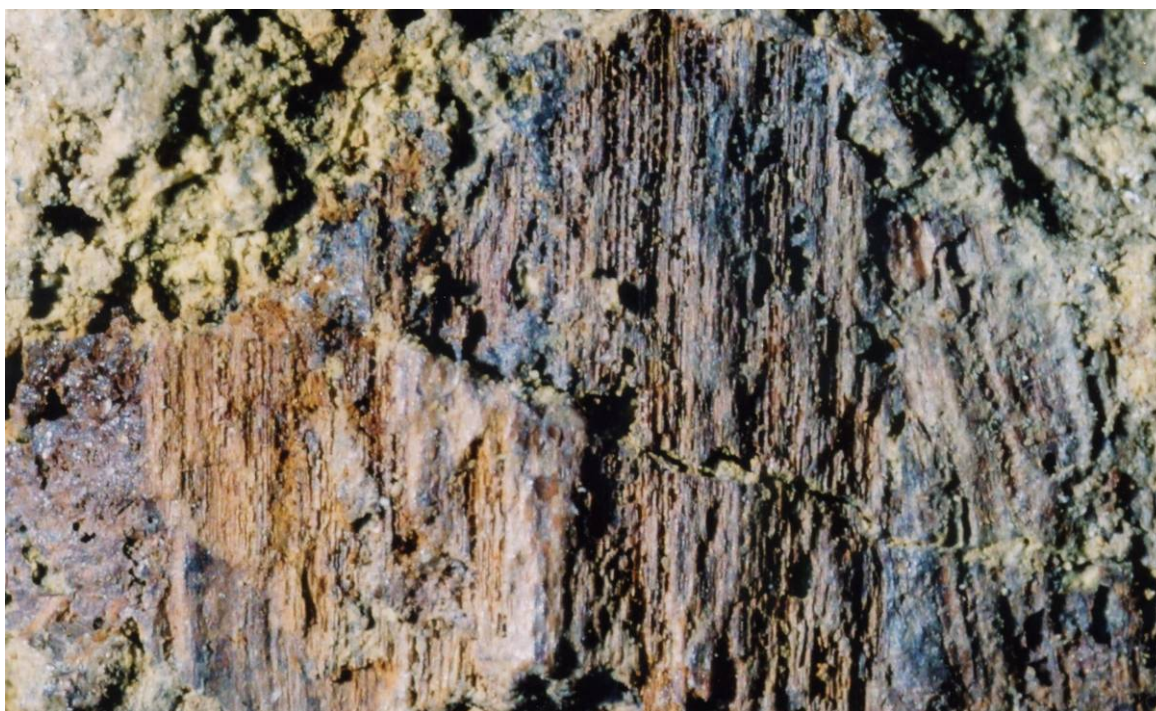
Spear WM 36: 4 P10 b) Faint traces of apparent grass/straw impressions on and close to surface of the iron



Spear WM 36: 3 P11 a) Mineralized wood fragment loose in adhering soil



Spear WM 36: 3 P11 b) Detail of grain structure in above mineralized wood fragment



Spear WM 36: 5 P12 a) Sliver of mineralized wood on outside of the socket

APPENDIX 2: CHARRED AND MINERALISED PLANT REMAINS

Table A2.1: Early/middle Saxon plant remains

KEY: Feature types : CP = cess pit; D =ditch; ED = enclosure ditch; G = gully; GH = grubenhaus; P = pit; PH = posthole; W = well; [] = mineralized; f = fragment; cf. = uncertain ID
Habitat Preferences : A = arable; C = cultivated; D = disturbed/waste; E = heath; G = grassland; H = hedgerow; M = marsh/bog; R = rivers/ditches/ponds; S = scrub; W = woods; Y = waysides/hedgerows; a = acidic soils; c = calcareous soils; d = dry soils; n = nutrient-rich soils; o = open ground; w = wet/damp soils; * = plant of economic value; cf. = uncertain ID

	Sample	2	3	4	5	11	12	13	15	20	22	23	56	57	61	79	95	
	Context	98	147	149	145	279	348	464	151	336	509	101	414	415	417	786	469	
	Feature number	99	148	150	146	280	349	465	152	337	510	102	416	416	418	787	470	
Taxa	Feature type	GH-sw	GH-ne	GH-se	GH-nw	EG	EG	?2,CP	PH	EG	?2,P	W	ED	ED	G	G	GH468	
Cereals :																		
<i>Triticum aestivum/turgidum</i> (bread/rivet-type free threshing wheat grain)		18	13	16	10	24	24	51	16	9	33	11	6	13	6	20	9	
<i>Hordeum vulgare</i> L. emend. (hulled barley grain)		1	1	12	2	13	2	7	-	4	11	3	1	2	-	20	1	
<i>Hordeum</i> sp. (barley grain NFI)		2	1	-	5	10	5	4	3	1	1	-	-	-	-	11	-	
<i>Secale cereale</i> L. (rye grain)		-	-	-	-	1	1	8	-	1	-	-	-	-	Cf.1	1	-	
<i>Avena</i> sp. (wild/cultivated oat grain)		3	4	5	2	5	1	20	1	1	8	1	-	-	-	4	1	
Indeterminate cereals		17	48	44	33	135	97	172	6	19	85	42	9	6	25	51	17	
Chaff :																		
<i>Triticum aestivum</i> -type (bread-type wheat rachis frag.)		-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	
<i>Triticum</i> sp. (free-threshing wheat rachis frag.)		-	-	-	-	1	-	-	-	2	1	-	-	-	1	2	-	
<i>Hordeum</i> sp. (barley rachis frag.)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
<i>Secale cereale</i> L. (rye rachis frag.)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Avena</i> sp (oat awn frag.)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cereal-sized culm node		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cereal-sized culm base		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Weeds :																		
<i>Ranunculus repens/acris/bulbosus</i> (buttercup achene) DG		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Urtica urens</i> L. (small nettle achene) CDn		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Urtica dioica</i> L. (stinging nettle achene) CDn		-	-	-	-	-	-	-	-	-	-	-	-	[2]	-	-	-	
<i>Corylus avellana</i> L. (hazel nut shell frag.) HSW*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Stellaria media</i> (L.)Vill. (common chickweed seed) CoD		-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	
<i>Agrostemma githago</i> L. (corn cockle seed) A		-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	
<i>Agrostemma githago</i> L. (corn cockle capsule frag.) A		-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	
<i>Spergula arvensis</i> L. (corn spurrey seed)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Silene vulgaris</i> Garcke (bladder campion seed) GoD		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Persicaria maculosa/lapathifolia</i> (redshank/pale persicaria) CD		-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	
<i>Polygonum aviculare</i> L. (knotgrass achene) CD		-	-	1	-	1	1	-	-	-	1	-	-	-	-	-	-	
<i>Fallopia convolvulus</i> (L.) A.Love (black-bindweed achene) AD		-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Rumex acetosella</i> (sheep's sorrel achene) GDa		-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	
<i>Rumex</i> sp. (dock achene) CDG		1	1	-	2	-	1	4	1	-	1	-	-	-	-	3	-	

WOLVERTON MILL, MILTON KEYNES

Table A2.1: Early/middle Saxon plant remains (continued)

	Sample	2	3	4	5	11	12	13	15	20	22	23	56	57	61	79	95
	Context	98	147	149	145	279	348	464	151	336	509	101	414	415	417	786	469
	Feature number	99	148	150	146	280	349	465	152	337	510	102	416	416	418	787	470
Taxa	Feature type	GH-sw	GH-ne	GH-se	GH-nw	EG	EG	?,CP	PH	EG	?,P	W	ED	ED	G	G	GH468
<i>Malva</i> sp. (mallow nutlet) DG		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Brassica/Sinapis</i> sp. (mustard, charlock etc. seed) CD*		-	-	-	-	-	1	1	-	-	-	-	-	[77]	-	1	-
Rosaceae thorn, hawthorn/sloe type		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pisum sativum</i> L. (pea seed)*		-	-	-	-	-	Cf.1	-	-	-	-	-	-	-	-	-	1
<i>Vicia faba</i> var. <i>minor</i> (Celtic bean frag.)*		-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
<i>Vicia sativa</i> (cultivated vetch seed)		-	-	-	-	1	-	2	-	-	1	-	-	-	1	-	-
<i>Vicia/Lathyrus</i> sp. (<=2mm seeded vetch/tare) CDG		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Vicia/Lathyrus</i> sp. (2-3mm seeded weed vetch/tare) CDG		-	-	-	-	-	-	2	-	1	1	-	2	-	-	-	2
<i>Vicia/Lathyrus</i> sp. (3-4mm seeded vetch/tare) CDG	1	2	-	-	-	-	1	2	1	-	2	-	-	-	-	2	-
<i>Vicia/Lathyrus/Pisum</i> sp. (vetch/tare/pea frag.)		-	1	1	-	-	-	-	3	1	-	1	-	-	-	-	-
<i>Trifolium/Lotus/Medicago</i> sp. (clover/trefoil/medick) DG		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Linum usitatissimum</i> L. (cultivated flax seed) *		-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-
<i>Prunella vulgaris</i> L. (selfheal seed) GD		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Plantago lanceolata</i> L.(ribwort plantain) Go		-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
<i>Odontites vernalis/Euphrasia</i> sp. (red bartsia/eyebright) CD		-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
<i>Galium aparine</i> L. (cleavers) CDH		-	1	-	-	-	-	2	-	-	-	-	1	-	-	1	-
<i>Galium palustre</i> L. (common marsh-bedstraw nutlet)		-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
GwPMF																	
<i>Galium</i> sp. (cleavers frag.)		-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
<i>Sambucus nigra</i> L. (elder seed) HSW*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Valerianella dentata</i> (L.)Pollich. (narrow-fruited corn-salad fruit)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Knautia arvensis</i> (L.)Coul. (field scabious achene)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Centaurea cyanus</i> L. (cornflower achene) A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Centaurea</i> sp. (cornflower embryo) AG		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Anthemis cotula</i> L. (stinking chamomile achene) ADhw		-	-	-	-	4	4	5	-	1	3	-	-	-	2	2	-
<i>Eleocharis</i> subg. <i>Palustres</i> (spike-rush nutlet) MPw		-	-	-	-	2	2	-	-	-	-	-	-	-	-	1	-
<i>Carex</i> sp. (trigonous sedge nutlet) MPw		-	-	-	-	-	[1]	[2]	-	-	-	-	-	[1]	-	-	-
<i>Carex</i> sp. (lenticular sedge nutlet) MPw		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Bromus</i> sect. <i>Bromus</i> (chess caryopsis) ADG		-	-	-	-	-	1	1	-	-	1	-	1	-	-	1	-
<i>Lolium perenne/rigidum</i> (rye-grass caryopsis) CDG		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poaceae various (small seeded grass caryopsis) CDG	1		1	1	1	-	1	1	-	2	-	-	-	-	-	1	-
Mineralised nodules		-	-	-	-	-	-	-	[2]	-	-	-	-	-	-	-	-
Mineralised worm cocoons		-	-	-	-	-	-	-	-	-	-	-	-	[6]	-	[1]	-
Total charred remains:		44	73	80	55	200	146	285	32	42	151	60	21	101	37	121	33
Sample size:		10	10	10	10	20	20	30	5	20	20	20	20	20	20	20	20
Fragments per litre:		4.4	7.3	8.0	5.5	10.0	7.3	9.5	6.4	2.1	7.6	3.0		5.1	1.9	6.1	1.7

WOLVERTON MILL, MILTON KEYNES

Table A2.2: Late Saxon/Saxo-Norman plant remains

	Sample	10	18	24	25	33	26	34	49	50	51	52	54	55	58	66	69	
	Context	374	366	251	252	253	475	547	648	649	650	651	709	711	658	734	754	
	Feature number	375	367	254	254	254	476	548	652	652	652	652	710	710	659	735	755	
Taxa	Feature type	P	G	O	O	O	P	P	D	D	D	D	P	P	CP	PH	PH	
Cereals :																		
<i>Triticum aestivum/turgidum</i> (bread/rivet-type free threshing wheat grain)		13	81	176	309	16	22	31	60	7	12	18	351	65	67	5	5	
<i>Hordeum vulgare</i> L. emend. (hulled barley grain)		-	8	4	2	-	5	2	3	-	-	1	18	1	-	1	-	
<i>Hordeum</i> sp. (barley grain NFI)		7	16	17	3	2	6	13	30	3	1	8	55	8	28	-	1	
<i>Secale cereale</i> L. (rye grain)		1	-	3	2	-	-	4	1	Cf.1	-	-	36	1	10	2	-	
<i>Avena</i> sp. (wild/cultivated oat grain)		1	7	2	5	-	7	4	8	1	-	5	101	11	10	-	-	
Indeterminate cereals		35	219	230	158	24	8	60	165	10	10	21	380	108	86	14	13	
Chaff :																		
<i>Triticum aestivum</i> -type (bread-type wheat rachis frag.)		-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	
<i>Triticum</i> sp. (free-threshing wheat rachis frag.)		1	2	7	1	-	-	3	6	1	-	2	4	-	6	1	1	
<i>Hordeum</i> sp. (barley rachis frag.)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Secale cereale</i> L. (rye rachis frag.)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Cf.1	
<i>Avena</i> sp (oat awn frag.)		-	+	-	-	-	-	-	-	-	-	-	+	-	-	+	-	
Cereal-sized culm node		-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	
Weeds :																		
<i>Ranunculus repens/acris/bulbosus</i> (buttercup achene) DG		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Corylus avellana</i> L. (hazel nut shell frag.) HSW*		-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	
<i>Urtica urens</i> L. (small nettle achene) CDn		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Urtica dioica</i> L. (stinging nettle achene) CDn		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Stellaria media</i> (L.)Vill. (common chickweed seed) CoD		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Agrostemma githago</i> L. (corn cockle seed) A		-	1	-	-	1	1	-	1	-	-	-	-	-	-	-	-	
<i>Agrostemma githago</i> L. (corn cockle capsule frag.) A		-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Spergula arvensis</i> L. (corn spurrey seed)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Silene vulgaris</i> Garcke (bladder campion seed) GoD		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Persicaria maculosa/lapathifolia</i> (redshank/pale persicaria) CD		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Polygonum aviculare</i> L. (knotgrass achene) CD		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Fallopia convolvulus</i> (L.) A.Love (black-bindweed achene) AD		-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Rumex acetosella</i> (sheep's sorrel achene) GDa		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Rumex</i> sp. (dock achene) CDG		-	-	1	-	-	-	-	3	-	-	2	6	-	5	-	-	
<i>Malva</i> sp. (mallow nutlet) DG		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Brassica/Sinapis</i> sp. (mustard, charlock etc. seed) CD*		[1]	-	-	-	-	[1]	-	[1]1	-	-	-	-	-	1	-	-	
<i>Rosa</i> sp. (rose seed) HSW*		-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	

WOLVERTON MILL, MILTON KEYNES

Table A2.2: Late Saxon/Saxo-Norman plant remains (continued)

	Sample	10	18	24	25	33	26	34	49	50	51	52	54	55	58	66	69
	Context	374	366	251	252	253	475	547	648	649	650	651	709	711	658	734	754
	Feature number	375	367	254	254	254	476	548	652	652	652	652	710	710	659	735	755
Taxa	Feature type	P	G	O	O	O	P	P	D	D	D	D	P	P	CP	PH	PH
<i>Pisum sativum</i> L. (pea seed)*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Vicia faba</i> var. <i>minor</i> (Celtic bean frag.)*		-	-	-	-	-	-	-	-	-	-	-	-	-	Cf.1	-	-
<i>Vicia sativa</i> (cultivated vetch seed)		-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
<i>Vicia/Lathyrus</i> sp. (<=2mm seeded vetch/tare) CDG		-	2	-	-	-	-	-	5	-	-	-	-	-	-	-	-
<i>Vicia/Lathyrus</i> sp. (2-3mm seeded weed vetch/tare) CDG		-	1	-	-	-	-	-	2	-	-	-	8	2	-	1	1
<i>Vicia/Lathyrus</i> sp. (3-4mm seeded vetch/tare) CDG		-	2	1	-	-	1	2	-	-	-	1	11	1	-	-	-
<i>Vicia/Lathyrus/Pisum</i> (vetch/tare/pea frag.)		1	1	-	1	-	-	-	-	-	-	-	1	-	-	-	-
<i>Trifolium/Lotus/Medicago</i> sp. (clover/trefoil/medick) DG		-	-	1	-	-	-	-	1	-	-	2	1	-	1	-	1
<i>Linum usitatissimum</i> L. (cultivated flax seed) *		1	-	1	-	-	-	-	-	Cf.1	-	-	1	-	-	-	-
<i>Scandix pecten-veneris</i> L. (shepherd's needle mericarp) AD		-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
<i>Bupleurum rotundifolium</i> L. (thorow-wax mericarp) Ac		-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-
<i>Lithospermum arvense</i> L. (corn gromwell nutlet) AD		-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	-
<i>Prunella vulgaris</i> L. (selfheal seed) GD		-	-	-	-	-	-	-	1	-	-	-	-	-	Cf.1	-	-
<i>Plantago lanceolata</i> L. (ribwort plantain) Go		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Odontites verna/Euphrasia</i> sp. (red bartsia/eyebright) CD		-	-	-	-	-	-	1	1	-	-	-	4	-	-	1	-
<i>Galium aparine</i> L. (cleavers) CDH		-	-	1	-	-	-	-	2	-	-	-	-	1	-	1	-
<i>Galium palustre</i> L. (common marsh-bedstraw nutlet) GwPMF		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Galium</i> sp. (cleavers frag.)		-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
<i>Sambucus nigra</i> L. (elder seed) HSW*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Valerianella dentata</i> (L.)Pollich. (narrow-fruited corn-salad fruit)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Knautia arvensis</i> (L.)Coul. (field scabious achene)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Centaurea cyanus</i> L. (cornflower achene) A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Centaurea</i> sp. (cornflower embryo) AG		-	-	-	1	-	-	-	-	-	-	-	2	1	-	-	-
<i>Anthemis cotula</i> L. (stinking chamomile achene) ADhw		2	10	9	5	-	2	5	3	-	1	1	9	2	9	5	4
<i>Eleocharis</i> subg. <i>Palustres</i> (spike-rush nutlet) MPw		-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
<i>Carex</i> sp. (trigonous sedge nutlet) MPw		-	-	-	-	-	-	-	2	-	-	-	-	-	1	-	-
<i>Carex</i> sp. (lenticular sedge nutlet) MPw		-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
<i>Bromus</i> sect. <i>Bromus</i> (chess caryopsis) ADG		3	2	2	3	-	2	1	4	-	1	-	23	1	1	1	1
<i>Lolium perenne/rigidum</i> (rye-grass caryopsis) CDG		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poaceae various (small seeded grass caryopsis) CDG		-	3	-	-	-	1	1	2	-	-	-	4	4	5	1	-
Mineralised nodules		-	-	[2]	-	-	-	-	[1]	-	-	-	-	-	-	-	-
Mineralised worm cocoons		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total charred remains:		66	367	458	491	27	72	129	306	24	25	63	1034	209	233	33	28
Sample size:		20	20	60	50	30	20	20	40	20	10	20	20	20	40	30	10
Fragments per litre:		3.3	18.4	7.6	9.8	0.9	3.6	6.5	7.6	1.2	2.5	3.2	51.7	10.5	5.8	1.1	2.8

WOLVERTON MILL, MILTON KEYNES

Table A2.2: Late Saxon/Saxo-Norman plant remains (continued)

	Sample	70	71	75	77	78	84	88	91	93	94	97	100	101	104	109	
	Context	764	766	211	215	225	179	487	14	157	136	806	458	855	899	940	
	Feature number	765	767	212	216	226	180	488	15	158	137	807	459	856	900	941	
Taxa	Feature type	CP	CP	PH	PH	PH	PH	PH	PH	PH	PH	P	G	CP	P	P	
Cereals :																	
<i>Triticum aestivum/turgidum</i> (bread/rivet-type free threshing wheat grain)		25	11	49	16	53	11	30	40	235	49	102	53	12	128	104	
<i>Hordeum vulgare</i> L. emend. (hulled barley grain)		2	-	10	3	10	1	3	4	33	3	-	4	-	17	4	
<i>Hordeum</i> sp. (barley grain NFI)		2	2	5	-	1	-	-	3	13	-	18	27	3	39	48	
<i>Secale cereale</i> L. (rye grain)	Cf.1	1	1	7	-	3	5	3	-	7	-	3	1	2	8	23	
<i>Avena sativa</i> (cultivated oat grain)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Avena</i> sp. (wild/cultivated oat grain)		3	-	35	13	27	2	20	32	150	19	14	4	1	36	33	
<i>Avena/Bromus</i> sp. (oat/chess grain)		-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	
Indeterminate cereals		140	33	80	36	74	9	41	42	303	45	123	138	15	251	313	
Chaff :																	
<i>Triticum aestivum</i> -type (bread-type wheat rachis frag.)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Triticum</i> sp. (free-threshing wheat rachis frag.)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Hordeum</i> sp. (barley rachis frag.)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Secale cereale</i> L. (rye rachis frag.)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Avena</i> sp (oat awn frag.)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cereal-sized culm node		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cereal-sized culm base		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Weeds :																	
<i>Ranunculus repens/acris/bulbosus</i> (buttercup achene) DG		1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	
<i>Corylus avellana</i> L. (hazel nut shell frag.) HSW*		-	-	-	-	-	-	-	-	-	-	-	2	-	1	3	
<i>Urtica urens</i> L. (small nettle achene) CDn		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Urtica dioica</i> L. (stinging nettle achene) CDn		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Stellaria graminea</i> (L.)Vill. (lesser stitchwort seed) CoD		-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Agrostemma githago</i> L. (corn cockle seed) A		1	-	-	-	-	-	2	-	-	-	-	-	-	1	-	
<i>Agrostemma githago</i> L. (corn cockle capsule frag.) A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Spergula arvensis</i> L. (corn spurrey seed)		-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	
<i>Silene vulgaris</i> Garcke (bladder campion seed) GoD		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Persicaria maculosa/lapathifolia</i> (redshank/pale persicaria) CD		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Polygonum aviculare</i> L. (knotgrass achene) CD		1	-	-	1	-	-	-	-	-	-	2	-	1	3	-	
<i>Fallopia convolvulus</i> (L.) A.Love (black-bindweed achene) AD		1	-	-	-	-	-	-	-	-	-	-	1	-	2	-	
<i>Rumex acetosella</i> (sheep's sorrel achene) GDa		-	-	-	1	-	-	-	-	-	-	-	1	-	1	-	
<i>Rumex</i> sp. (dock achene) CDG		-	1	1	1	1	1	2	-	1	-	3	2	1	14	7	
<i>Malva</i> sp. (mallow nutlet) DG		-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	
<i>Brassica/Sinapis</i> sp. (mustard, charlock etc. seed) CD*		-	-	1	-	-	-	-	-	-	-	2	-	-	9	[5]2	

WOLVERTON MILL, MILTON KEYNES

Table A2.2: Late Saxon/Saxo-Norman plant remains (continued)

	Sample	70	71	75	77	78	84	88	91	93	94	97	100	101	104	109
	Context	764	766	211	215	225	179	487	14	157	136	806	458	855	899	940
	Feature number	765	767	212	216	226	180	488	15	158	137	807	459	856	900	941
Taxa	Feature type	CP	CP	PH	PH	PH	PH	PH	PH	PH	PH	P	G	CP	P	P
Rosaceae thorn, hawthorn/sloe type		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pisum sativum</i> L. (pea seed)*		-	-	-	-	-	-	-	-	Cf.1	-	Cf.1	-	-	-	-
<i>Vicia faba</i> var. <i>minor</i> (Celtic bean frag.)*		-	-	-	Cf.1	-	-	-	-	-	-	-	-	-	1	-
<i>Vicia sativa</i> (cultivated vetch seed)*	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
<i>Vicia/Lathyrus</i> sp. (<=2mm seeded vetch/tare) CDG		-	-	1	-	-	2	-	-	5	-	1	-	-	2	-
<i>Vicia/Lathyrus</i> sp. (2-3mm seeded weed vetch/tare) CDG	2	1	1	-	-	-	-	-	-	5	-	1	-	-	-	11
<i>Vicia/Lathyrus</i> sp. (3-4mm seeded vetch/tare) CDG	1	-	2	-	2	-	-	-	-	3	-	4	-	1	7	25
<i>Vicia/Lathyrus/Pisum</i> (vetch/tare/pea frag.)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<i>Trifolium/Lotus/Medicago</i> sp. (clover/trefoil/medick) DG		-	1	-	1	-	-	-	-	-	-	-	-	1	1	1
<i>Linum usitatissimum</i> L. (cultivated flax seed) *		-	2	-	-	Cf.1	-	-	-	-	-	-	-	-	202	-
<i>Bupleurum rotundifolium</i> L. (thorow-wax mericarp) Ac		-	-	-	-	-	1	-	-	-	-	-	-	-	1	-
cf. <i>Pimpinella saxifraga</i> L. (cf. burnet saxifrage mericarp) G		-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
<i>Daucus carota</i> L. (carrot mericarp) Gc		-	-	-	-	-	-	-	-	-	-	-	-	-	Cf.2	-
<i>Hyoscyamus niger</i> L. (henbane seed) Dn		-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
<i>Lithospermum arvense</i> L. (corn gromwell nutlet) AD	1	-	-	-	-	-	-	-	-	-	-	-	-	1	1	7
<i>Prunella vulgaris</i> L. (selfheal seed) GD	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Plantago lanceolata</i> L.(ribwort plantain) Go		-	-	-	-	-	-	-	-	-	-	-	-	-	4	-
<i>Odontites vernalis/Euphrasia</i> sp. (red bartsia/eyebright) CD		-	-	-	-	-	-	1	-	2	-	-	-	1	3	-
<i>Sherardia arvensis</i> L. (field madder nutlet) AD		-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
<i>Galium aparine</i> L. (cleavers) CDH		-	1	-	-	-	-	-	-	-	-	-	-	-	1	-
<i>Galium palustre</i> L. (common marsh-bedstraw nutlet)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-
GwPMF																
<i>Galium</i> sp. (cleavers frag.)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Sambucus nigra</i> L. (elder seed) HSW*		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Valerianella dentata</i> (L.)Pollich. (narrow-fruited corn-salad fruit)		-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
<i>Knautia arvensis</i> (L.)Coul. (field scabious achene)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Centaurea cyanus</i> L. (cornflower achene) A		-	-	-	-	-	-	-	-	-	-	2	-	-	1	-
<i>Centaurea</i> sp. (cornflower embryo) AG		-	-	-	-	1	-	-	-	1	-	-	-	-	-	-
<i>Lapsana communis</i> L. (nipplewort achene) DG		-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
<i>Anthemis cotula</i> L. (stinking chamomile achene) ADhw	3	-	2	2	8	2	3	1	14	1	2	4	2	14	10	
<i>Eleocharis</i> subg. <i>Palustres</i> (spike-rush nutlet) MPw	1	-	-	-	-	-	-	-	-	-	1	-	-	1	-	
<i>Carex</i> sp. (trigonous sedge nutlet) MPw		-	-	2	-	-	-	-	-	-	-	-	2	-	10	1
<i>Carex</i> sp. (lenticular sedge nutlet) MPw		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Bromus</i> sect. <i>Bromus</i> (chess caryopsis) ADG	2	-	11	2	9	3	1	4	28	1	1	2	-	24	15	
<i>Lolium perenne/rigidum</i> (rye-grass caryopsis) CDG		-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Poaceae various (small seeded grass caryopsis) CDG	5	-	2	4	5	-	-	2	12	-	-	-	-	22	3	
Mineralised nodules		-	-	-	-	-	-	-	-	-	-	-	[2]	-	[1]	-
Mineralised worm cocoons		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total charred remains:		199	54	211	82	197	36	106	129	819	118	287	254	41	833	631
Sample size:		20	20	30	10	30	10	?	10	30	10	20	?	20	40	20
Fragments per litre:		9.9	2.7	7.0	8.2	6.6	3.6		12.9	27.3	11.8	14.4		2.1	20.8	31.6

WOLVERTON MILL, MILTON KEYNES

Table A2.2: Late Saxon/Saxo-Norman plant remains (continued)

	Sample	110	114	115	122	123	132	134	136
	Context	944	1004	1016	1081	1022	1157	975	1208
	Feature number	945	1005	1017	1082	1023	1158	976	1209
Taxa	Feature type	CP	D	PH	PH	PH	G	PH	G
Cereals :									
<i>Triticum aestivum/turgidum</i> (bread/rivet-type free threshing wheat grain)		61	45	10	6	1	84	9	42
<i>Hordeum vulgare</i> L. emend. (hulled barley grain)		4	7	-	-	-	8	1	5
<i>Hordeum</i> sp. (barley grain NFI)		5	28	1	2	-	34	2	29
<i>Secale cereale</i> L. (rye grain)		3	3	-	2	2	2	1	1
<i>Avena sativa</i> (cultivated oat grain)		2	-	-	-	-	-	-	-
<i>Avena</i> sp. (wild/cultivated oat grain)		245	26	-	2	1	185	10	6
<i>Avena/Bromus</i> sp. (oat/chess grain)		-	-	-	-	-	-	-	-
Indeterminate cereals		375	133	14	8	13	175	11	135
Chaff :									
<i>Triticum aestivum</i> -type (bread-type wheat rachis frag.)		-	-	-	-	-	1	-	-
<i>Triticum</i> sp. (free-threshing wheat rachis frag.)		1	5	1	-	-	8	1	7
<i>Hordeum</i> sp. (barley rachis frag.)		-	-	-	-	-	2	-	-
<i>Secale cereale</i> L. (rye rachis frag.)		-	-	-	-	-	2	-	-
<i>Avena</i> sp (oat awn frag.)		-	-	-	-	-	-	-	-
Cereal-sized culm node		-	-	-	-	-	-	-	-
Cereal-sized culm base		-	-	-	-	-	-	-	-
Weeds :									
<i>Ranunculus repens/acris/bulbosus</i> (buttercup achene) DG		-	-	-	-	-	-	1	-
<i>Corylus avellana</i> L. (hazel nut shell frag.) HSW*		1	-	-	2	1	-	-	-
<i>Urtica urens</i> L. (small nettle achene) CDn		-	-	1	-	-	-	-	-
<i>Urtica dioica</i> L. (stinging nettle achene) CDn		-	-	-	-	-	-	-	-
<i>Stellaria media</i> (L.)Vill. (common chickweed seed) CoD		-	-	-	-	-	-	-	-
<i>Agrostemma githago</i> L. (corn cockle seed) A		1	-	-	-	-	-	-	-
<i>Agrostemma githago</i> L. (corn cockle capsule frag.) A		-	-	-	-	-	-	-	-
<i>Spergula arvensis</i> L. (corn spurrey seed)		-	-	-	-	-	-	-	-
<i>Silene vulgaris</i> Garcke (bladder campion seed) GoD		-	-	-	-	-	-	-	-
<i>Persicaria maculosa/lapathifolia</i> (redshank/pale persicaria) CD		-	-	-	1	-	-	-	-
<i>Polygonum aviculare</i> L. (knotgrass achene) CD		-	-	-	-	-	-	-	-
<i>Fallopia convolvulus</i> (L.) A.Love (black-bindweed achene) AD		-	-	-	-	-	-	-	-
<i>Rumex acetosella</i> (sheep's sorrel achene) GDa		-	-	1	-	-	-	-	-
<i>Rumex</i> sp. (dock achene) CDG		6	1	1	-	-	7	1	3
<i>Malva</i> sp. (mallow nutlet) DG		-	-	-	-	-	-	-	-
<i>Brassica/Sinapis</i> sp. (mustard, charlock etc. seed) CD*		[2]	-	[1]	-	-	5	-	-

Table A2.2: Late Saxon/Saxo-Norman plant remains (continued)

	Sample	110	114	115	122	123	132	134	136
	Context	944	1004	1016	1081	1022	1157	975	1208
	Feature number	945	1005	1017	1082	1023	1158	976	1209
Taxa	Feature type	CP	D	PH	PH	PH	PH	PH	G
Rosaceae thorn, hawthorn/sloe type		-	-	-	-	-	-	-	-
<i>Trifolium/Lotus/Medicago</i> sp. (clover/trefoil/medick) DG		1	-	-	-	-	1	2	1
<i>Pisum sativum</i> L. (pea seed)*		Cf.1	Cf.2	-	-	-	-	-	-
<i>Vicia faba</i> var. <i>minor</i> (Celtic bean frag.)*		-	Cf.1	1	-	-	1	-	-
<i>Vicia sativa</i> (cultivated vetch seed)		-	-	-	-	-	-	-	-
<i>Vicia/Lathyrus</i> sp. (<=2mm seeded vetch/tare) CDG		-	1	-	-	-	1	-	1
<i>Vicia/Lathyrus</i> sp. (2-3mm seeded weed vetch/tare) CDG		-	-	-	-	-	-	-	-
<i>Vicia/Lathyrus</i> sp. (3-4mm seeded vetch/tare) CDG		1	-	-	-	-	-	-	-
<i>Vicia/Lathyrus/Pisum</i> (vetch/tare/pea frag.)		1	-	-	-	-	-	-	1
<i>Prunella vulgaris</i> L. (selfheal seed) GD		-	-	-	-	-	-	1	-
<i>Linum usitatissimum</i> L. (cultivated flax seed) *		-	-	-	-	-	-	-	-
<i>Bupleurum rotundifolium</i> L. (thorow-wax mericarp) Ac		-	-	-	-	Cf.1	-	-	-
<i>Plantago lanceolata</i> L.(ribwort plantain) Go		-	2	1	-	-	2	-	-
<i>Odontites vernalis/Euphrasia</i> sp. (red bartsia/eyebright) CD		-	-	2	-	-	1	-	-
<i>Galium aparine</i> L. (cleavers) CDH		-	-	-	-	-	-	-	1
<i>Galium palustre</i> L. (common marsh-bedstraw nutlet)		-	-	-	-	-	1	-	-
GwPMF									
<i>Galium</i> sp. (cleavers frag.)		-	-	-	-	-	-	-	-
<i>Sambucus nigra</i> L. (elder seed) HSW*		-	-	-	-	-	-	-	-
<i>Valerianella dentata</i> (L.)Pollich. (narrow-fruited corn-salad fruit)		-	-	-	-	-	-	-	-
<i>Knautia arvensis</i> (L.)Coul. (field scabious achene)		1	-	-	-	-	-	-	-
<i>Centaurea cyanus</i> L. (cornflower achene) A		-	-	-	-	-	-	-	-
<i>Centaurea</i> sp. (cornflower embryo) AG		-	-	-	-	-	-	-	-
<i>Picris</i> cf. <i>hieracioides</i> L. (cf. hawkweed oxtongue achene)		1	-	-	-	-	-	-	-
GocD									
<i>Anthemis cotula</i> L. (stinking chamomile achene) ADhw		3	1	2	-	-	4	2	1
<i>Eleocharis</i> subg. <i>Palustres</i> (spike-rush nutlet) MPw		-	-	-	-	-	-	1	-
<i>Carex</i> sp. (trigonous sedge nutlet) MPw		-	2	-	-	-	2	1	1
<i>Carex</i> sp. (lenticular sedge nutlet) MPw		-	-	-	-	-	-	-	1
<i>Bromus</i> sect. <i>Bromus</i> (chess caryopsis) ADG		1	8	-	-	-	2	-	1
<i>Lolium perenne/rigidum</i> (rye-grass caryopsis) CDG		-	-	-	-	-	-	-	-
Poaceae various (small seeded grass caryopsis) CDG		-	3	1	-	-	1	-	-
Mineralised nodules		-	-	-	-	-	-	-	[1]
Mineralised worm cocoons		-	-	-	-	-	-	-	-
Total charred remains:		719	510	37	23	19	489	44	238
Sample size:		20	10	10	3	3	40	40	20
Fragments per litre:		36.0	51.0	3.7	7.7	6.3	12.2	1.1	11.9

WOLVERTON MILL, MILTON KEYNES

Table A2.3: Medieval plant remains

	Sample	9	17	29	30	32	96	98	107	112	113	31
	Context	249	120	266	96	122	669	808	462	909	946	268
	Feature number	250	121	269	97	125	670	809	463	999	947	269
Taxa	Feature type	P	D	P	P	W	P	P	P	P	P	P
Cereals :												
<i>Triticum aestivum/turgidum</i> (bread/rivet-type free threshing wheat grain)		19	22	24	26	44	30	334	36	70	153	2
<i>Triticum</i> sp./ <i>Secale cereale</i> (wheat/rye grain)		-	-	-	-	-	-	-	-	2	2	-
<i>Hordeum vulgare</i> L. emend. (hulled barley grain)		1	2	1	6	14	-	8	3	5	8	-
<i>Hordeum</i> sp. (barley grain NFI)		3	6	2	5	1	1	53	4	12	23	2
<i>Secale cereale</i> L. (rye grain)		2	1	1	1	3	-	22	-	2	6	-
<i>Avena</i> sp. (wild/cultivated oat grain)		4	5	7	3	20	5	45	11	26	67	-
<i>Avena/Bromus</i> sp. (oat/chess grain)		-	-	-	-	-	-	-	-	-	-	1
Indeterminate cereals		33	47	76	65	100	84	511	48	181	375	2
Chaff :												
<i>Triticum aestivum</i> -type (bread-type wheat rachis frag.)		-	-	-	-	-	-	-	-	-	-	-
<i>Triticum</i> sp. (free-threshing wheat rachis frag.)		-	-	3	-	-	-	5	1	1	-	-
<i>Hordeum</i> sp. (barley rachis frag.)		-	-	-	-	-	-	-	1	-	1	-
<i>Secale cereale</i> L. (rye rachis frag.)		-	-	-	-	-	-	1	-	-	-	-
<i>Avena</i> sp (oat awn frag.)		-	-	+	-	-	-	-	-	-	-	-
Cereal-sized culm node		-	-	-	-	-	-	-	-	-	2	-
Cereal-sized culm base		-	-	-	-	-	-	-	-	-	-	-
Weeds :												
<i>Ranunculus repens/acris/bulbosus</i> (buttercup achene) DG		-	-	-	-	-	-	-	-	-	1	-
<i>Corylus avellana</i> L. (hazel nut shell frag.) HSW*		-	-	-	-	-	1	2	1	1	2	-
<i>Urtica urens</i> L. (small nettle achene) CDn		-	-	-	-	-	-	-	-	-	-	-
<i>Urtica dioica</i> L. (stinging nettle achene) CDn		-	-	-	-	-	-	-	-	-	-	-
<i>Stellaria media</i> (L.)Vill. (common chickweed seed) CoD		-	-	-	-	-	-	-	-	-	-	-
<i>Agrostemma githago</i> L. (corn cockle seed) A		-	-	-	-	-	-	-	-	-	1	-
<i>Agrostemma githago</i> L. (corn cockle capsule frag.) A		-	-	-	-	-	-	-	-	-	-	-
<i>Spergula arvensis</i> L. (corn spurrey seed)		-	-	-	1	-	-	-	-	1	-	-
<i>Silene vulgaris</i> Garcke (bladder campion seed) GoD		-	-	-	-	-	-	1	-	-	-	-
<i>Persicaria maculosa/lapathifolia</i> (redshank/pale persicaria) CD		-	-	-	-	-	-	-	-	-	-	-
<i>Polygonum aviculare</i> L. (knotgrass achene) CD		-	1	-	1	-	-	2	-	-	1	-
<i>Fallopia convolvulus</i> (L.) A.Love (black-bindweed achene) AD		-	-	-	-	-	-	-	1	-	-	-
<i>Rumex acetosella</i> (sheep's sorrel achene) GDa		-	-	-	-	-	-	-	-	-	-	-
<i>Rumex</i> sp. (dock achene) CDG		-	-	4	2	-	-	5	2	4	8	-
<i>Malva</i> sp. (mallow nutlet) DG		-	-	-	-	-	-	-	-	-	-	-
<i>Brassica/Sinapis</i> sp. (mustard, charlock etc. seed) CD*		-	1	-	[1]	-	-	2	1	[1]1	2	-

WOLVERTON MILL, MILTON KEYNES

Table A2.3: Medieval plant remains (continued)

	Sample	9	17	29	30	32	96	98	107	112	113	31
	Context	249	120	266	96	122	669	808	462	909	946	268
	Feature number	250	121	269	97	125	670	809	463	999	947	269
Taxa	Feature type	P	D	P	P	W	P	P	P	P	P	P
Rosaceae thorn, hawthorn/sloe type		1	-	-	-	-	-	-	-	-	-	-
<i>Pisum sativum</i> L. (pea seed)*		-	-	-	-	-	-	-	-	-	-	-
<i>Vicia faba</i> var. <i>minor</i> (Celtic bean frag.)*		-	-	-	-	-	-	-	-	-	-	-
<i>Vicia sativa</i> (cultivated vetch seed)		-	-	-	-	-	-	2	-	-	-	-
<i>Vicia/Lathyrus</i> sp. (<=2mm seeded vetch/tare) CDG		1	-	-	-	1	1	9	5	1	-	-
<i>Vicia/Lathyrus</i> sp. (2-3mm seeded weed vetch/tare) CDG		-	-	4	-	2	-	-	-	3	3	-
<i>Vicia/Lathyrus</i> sp. (3-4mm seeded vetch/tare) CDG		1	1	2	4	3	-	14	1	-	4	-
<i>Vicia/Lathyrus/Pisum</i> (vetch/tare/pea frag.)		1	-	-	2	1	3	4	1	2	1	-
<i>Trifolium/Lotus/Medicago</i> sp. (clover/trefoil/medick) DG		-	-	-	1	1	-	1	-	1	-	-
<i>Linum usitatissimum</i> L. (cultivated flax seed) *		-	-	-	-	-	-	-	-	1	-	-
<i>Bupleurum rotundifolium</i> L. (thorow-wax mericarp) Ac		-	1	-	-	-	-	1	-	1	-	-
<i>Prunella vulgaris</i> L. (selfheal seed) GD		-	-	-	-	-	-	-	-	-	-	-
<i>Plantago lanceolata</i> L. (ribwort plantain) Go		-	-	1	-	-	-	-	-	-	1	-
<i>Odontites vernalis/Euphrasia</i> sp. (red bartsia/eyebright) CD		-	-	-	-	-	-	5	-	-	-	1
<i>Galium aparine</i> L. (cleavers) CDH		-	-	-	-	-	1	-	1	-	-	-
<i>Galium palustre</i> L. (common marsh-bedstraw nutlet)		-	-	-	-	-	-	-	-	-	-	-
GwPMF												
<i>Galium</i> sp. (cleavers frag.)		-	-	-	-	-	-	-	-	-	-	-
<i>Sambucus nigra</i> L. (elder seed) HSW*		-	-	-	-	1	-	-	-	-	-	-
<i>Valerianella dentata</i> (L.)Pollich. (narrow-fruited corn-salad fruit)		-	-	-	-	-	-	-	1	-	-	-
<i>Knautia arvensis</i> (L.)Coul. (field scabious achene)		-	-	-	-	-	-	-	-	-	-	-
<i>Centaurea cyanus</i> L. (cornflower achene) A		-	-	-	-	-	-	4	-	-	-	-
<i>Centaurea</i> sp. (cornflower embryo) AG		-	-	1	-	-	-	-	-	-	-	-
<i>Lapsana communis</i> L. (nipplewort achene) DG		-	-	-	-	-	-	1	-	1	-	-
<i>Anthemis cotula</i> L. (stinking chamomile achene) ADhw		1	2	6	1	13	3	25	2	8	2	-
<i>Eleocharis</i> subg. <i>Palustres</i> (spike-rush nutlet) MPw		-	-	-	-	1	-	1	1	-	-	-
<i>Carex</i> sp. (trigonous sedge nutlet) MPw		-	-	-	-	-	-	-	-	-	-	-
<i>Carex</i> sp. (lenticular sedge nutlet) MPw		-	-	-	-	-	-	-	-	-	-	-
<i>Bromus</i> sect. <i>Bromus</i> (chess caryopsis) ADG		-	1	1	-	1	-	2	1	2	2	-
<i>Lolium perenne/rigidum</i> (rye-grass caryopsis) CDG		-	-	-	-	-	-	-	-	-	-	-
Poaceae various (small seeded grass caryopsis) CDG		-	-	2	2	2	-	5	3	-	7	1
Mineralised nodules		-	-	-	[1]	-	[1]	-	-	[2]	-	-
Mineralised worm cocoons		-	-	-	-	-	-	-	-	-	-	-
Total charred remains:		67	90	135	122	208	130	1065	125	329	672	9
Sample size:		10	20	20	20	20	20	20	20	20	20	5
Fragments per litre:		6.7	4.5	6.8	6.1	10.4	6.5	53.3	6.3	16.4	33.6	1.8

KEY: Feature types : CP = cess pit; D = ditch; ED = enclosure ditch; G = gully; GH = grubenhaus; P = pit; PH = posthole; W = well; [] = mineralized; f = fragment; cf. = uncertain ID
Habitat Preferences : A = arable; C = cultivated; D = disturbed/waste; E = heath; G = grassland; H = hedgerow; M = marsh/bog; R = rivers/ditches/ponds; S = scrub; W = woods; Y = waysides/hedgerows; a = acidic soils; c = calcareous soils; d = dry soils; n = nutrient-rich soils; o = open ground; w = wet/damp soils; * = plant of economic value

APPENDIX 3: ARCHAEOMAGNETIC DATING

Results of the archaeomagnetic dating are abstracted from:

GeoQuest 2004, *Archaeomagnetic Analysis of Context Nos. 254 and 512 from Wolverton Mill, Northants (Site Code WM04)*, GeoQuest Associates, 9 July 2004

**MAGNETIC DATING REPORT**

SITE NAME: Wolverton Mill
SITE CODE: WM04
SAMPLING DATE: 18/6/04
CONTEXT: 254. Limestone

LOCATION: Wolverton, Northants.
COORDINATES: 52.04°N 0.70°W
SITE CONTACT: Northants. Archaeol.
FEATURE TYPE: Malting oven/corn dryer

SITE/CONTEXT DESCRIPTION

Open area excavation by Northamptonshire Archaeology has revealed traces of a multiphase Anglo Saxon settlement, comprising an arrangement of enclosures containing houses, pitting, wells and areas of burning. These remains may reflect a small hamlet on the edge of the Blisworth Limestone, overlooking the Ouse valley. The sampled context comprises burnt fragments of limestone, embedded in clay that has also been fired.

ANALYTICAL METHODS

Sampling via button method with orientation by sun compass. Archaeomagnetic remanence measured using a Molspin fluxgate spinner magnetometer and stability assessed using stepwise, alternating field demagnetisation. Secondary components of magnetisation removed by partial demagnetisation. Mean of selected vectors computed (with unit weights) and corrected to Meriden. Comparison then made to the UK Master Curve to obtain a last-firing date. Further details of technical methods are contained in the Appendix.

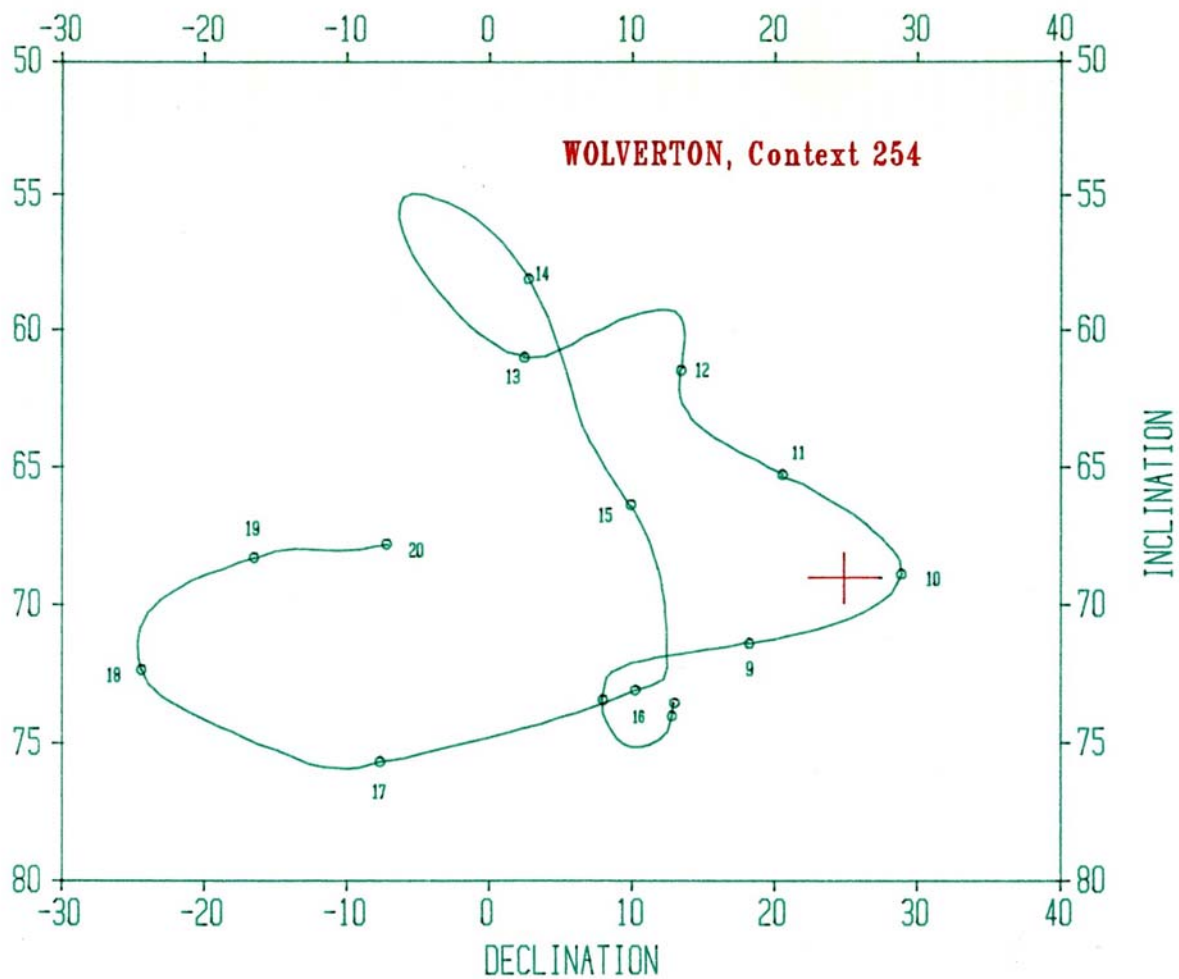
RESULTS

SAMPLE	J	D	I	A.F.	D	I	Comment
WOM1	1.0	16.1	54.1	2.5	33.4	68.3	
WOM2	2.0	19.8	69.6	2.5	17.5	71.0	
WOM3	811.6	31.5	70.4	2.5	31.7	70.3	
WOM4	351.8	18.2	64.3	2.5	18.5	65.4	
WOM5	89.6	17.6	69.5	2.5	20.8	70.3	
WOM6							too small
WOM7	620.9	23.9	68.7	2.5	22.8	69.8	
WOM8	849.0	29.6	67.7	2.5	30.8	68.3	
WOM9	689.6	20.8	68.7	2.5	23.7	68.8	
WOM10	370.0	22.8	66.8	2.5	24.4	67.3	
MEAN	K=877.6 Alpha95=1.7 c.s.e.=0.9				24.8	68.9	
MERIDEN					24.9	69.0	

D=declination, I=inclination, J=intensity in units of $\text{mA}\cdot\text{m}^{-1}\times 10^{-3}$. A.F.=peak alternating demagnetising field in milliTesla. K=precision parameter, c.s.e.=circular standard error, alpha95=semi-angle of the 95% cone of confidence.

Estimated date range for last firing:

970 A.D. – 1020 A.D.



Comparison between the mean archaeomagnetic vector in Context 254 hearth with the UK Master Curve 600 AD to present. Numbers refer to date in centuries. The error bar is based on the circular standard deviation given in the Table.



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