



Excavations of prehistoric, Roman and Saxon remains by the Medway estuary at Kingsnorth

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Excavations of prehistoric, Roman and Saxon remains by the Medway estuary at Kingsnorth

by Isca Howell, Michael Henderson and Graham Spurr

with Ian Betts, Lyn Blackmore, Jonathan Cotton, Anne Davis, Michael Marshall, Alan Pipe, Rob Scaife, Amy Thorp and John Whittaker

Introduction

This article reports on the results of excavations carried out by MOLA to the north-east of Kingsnorth Power Station, on the Hoo Peninsula in north Kent, prior to its development. The site was on the east side of the peninsula, bounded to the north by the north Kent extension railway, to the east by tidal flats of the Damhead Creek (a tributary to the River Medway), to the south by the Kingsnorth Power Station and to the west by arable land (Fig 1). The approximate centre of the site is at Ordnance Survey National Grid Reference (NGR) 581340 174310.

A previous archaeological desk-based assessment had subdivided the site into four zones (MOLA 2007), which are shown on Fig 1. Zones II and IV – the eastern two thirds of the site – were overlain by dumps of pulverised fuel ash (PFA) waste from the power station which were up to 10m thick. A geoarchaeological investigation took place in these zones (MOLA 2010).

In the western part of the site, evaluation work led to the definition of areas of archaeological interest in subdivisions of Zones I and III termed Plot 5, Plot 6–7 and Plot 8–11 (Fig 1). The results of the evaluation (MOLA 2010) informed the archaeological specifications for strip, map and sample excavation in these areas (KCC 2010). The excavations were undertaken between 1 November 2010 and 21 January 2011, though an additional trench to the east of the main area of Plot 8–11 was subsequently investigated between 15 and 30 August 2011. The site code was KT-IGM10.

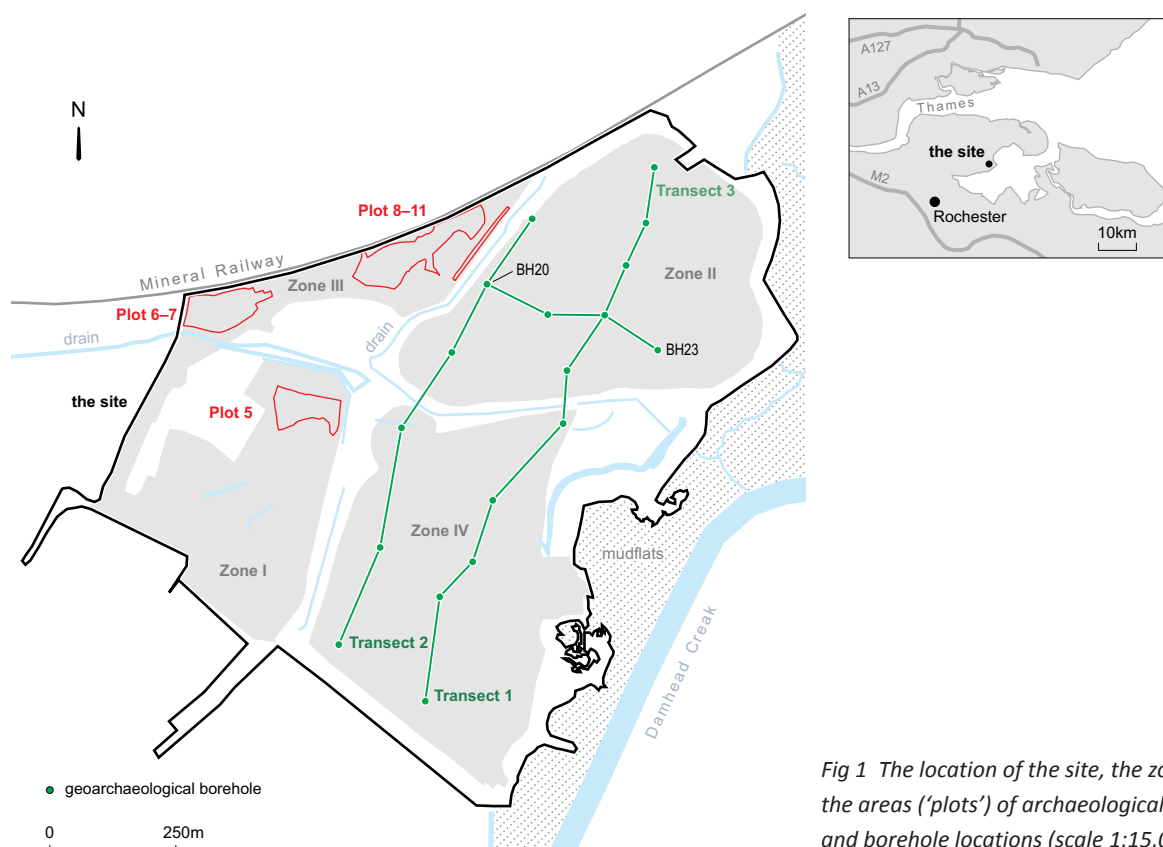


Fig 1 The location of the site, the zones within it, the areas ('plots') of archaeological excavation and borehole locations (scale 1:15,000)

The site produced evidence for Middle–Late Bronze Age, Roman and Saxon activity. The location of specific features within each excavation area is shown on a series of multi-period plans (Figs 2–4). Two large-scale plans show the interrelationship of features in the broader Roman and Saxon landscapes (Fig 14).

The archaeological and historical background

The site covers two distinct natural geological and topographic areas. The higher and drier land (Zones I and III) would have been suitable for settlement. The low-lying parts of the site (Zones II and IV) would have been prone to flooding and, although not attractive for settlement, would have provided direct access to the river and a broad range of valuable intertidal resources.

The higher ground, within both the site and the surrounding area, has produced a range of archaeological evidence. Investigations by Archaeology South-East (ASE) immediately to the south of the present site (Griffin 2004) found intensive land use in the Middle Bronze Age through to the Early Iron Age and Roman periods, especially during the mid second to third centuries AD. Although the majority of recorded features were agricultural, a possible roundhouse and several possibly industrial features were identified on the south-west side of Damhead Creek. A Bronze Age hoard, containing at least 161 items, was found to the north-west of the site by railway workmen in 1973 (Kent HER reference TQ 87 SW 11). It included socketed axeheads, spearheads and gouges, and is believed to be a metal founder's hoard, as some of the objects were newly cast while others were in the process of being broken up ready for smelting. A Roman silver denarius from the reign of Augustus was found c 850m to the north of the site (Kent HER reference TQ 87 SW 18).

Both these natural topographic and geological areas were crossed by an ancient watercourse between Zones I and III, which survives as a drainage channel (the route is plotted on Fig 14). It is an important natural feature as it would have provided ready access from the higher ground across the marshland to the River Medway.

In general, exploitation of the intertidal flood plain and along the north Kent coast appears to have intensified during the Roman period (Dawkes 2012; Dawkes in prep) and it is likely that this was also the case on this site. However, evidence of Roman settlement within the Hoo Peninsula is limited. The nearest major Roman settlement to the site was Rochester, c 10km to the south-west, which, along with Canterbury, was connected to Roman London via Watling Street. But, as no Roman roads have yet been identified on the peninsula, it is likely that its produce was mostly transported by river either to Rochester or London for redistribution.

Throughout the Roman period the climate became warmer and drier (Allen and Sturdy 1980, 4). Some attempt may have been made to drain the lower-lying areas, possibly by constructing banks along the edge of the mudflats. Most coastal marshes contained salt-making industries. Earthwork remnants of salt making in the marshes are known as 'red hills' in Essex (caused by the by-product of salt evaporation). Similar mounds have been noted in the Kent marshes. Salt production was organised on an industrial scale, and salt would have had an important impact on the regional economy and diet, allowing large-scale processing of surplus meat and fish. The north Kent marshes and Hoo Peninsula became a pottery production centre, producing ceramic vessels from the first century AD through to the end of the third, and possibly into the fourth, century AD (Monaghan 1987).

Several possible kiln or production-related sites have been previously identified on the site (Griffin 2004). A large pit on its western boundary contained large amounts of pottery. Another large pit, probably for clay extraction, lay just outside its southern boundary. Finds of Roman pottery have also been made along the waterfront of the Medway (Kent HER reference TQ 87 SW 10 and TQ 87 SW 1094). Briquetage (salt-evaporation vessels) was also present at these findspots. A Roman cremation was found in 1890 c 1.5km to the east of the site within the mudflats of the Stoke Saltings (Kent HER reference TQ 87 SW 1). Other Roman activities within the coastal marshes are likely to have included fish processing and oyster beds, and causeways, waterfront installations, mills and boats could survive within the archaeological record.

The Roman administration withdrew from Britain in the early fifth century AD and what became Kent was transformed during the remainder of that century by Anglo-Saxon settlement. By the end of the sixth century AD, Anglo-Saxon Kent had become an important political unit within England (Welch 2007, 189). Until the

ninth to tenth centuries AD, the territorial organisation of the Church in Kent was centred around minsters or mother churches, each with a number of subordinate or daughter churches. In the two centuries before the Norman Conquest, this structure was increasingly replaced by a more formal parochial system. Hoo St Werburgh was an early minster church, founded before AD 700 and dedicated to the Saxon princess Werburg, daughter of Wulfhere, king of Mercia (Farmer 1997, 503). Although the nunnery associated with the church was destroyed in c AD 800, Hoo continued to serve as a minster (Clarke 2006) and subsequently became the church of a smaller parish. The marshes within which the site lies fell within the manor (estate) of Hoo, which covered the same area as the parish. The place names 'Hoo' and 'Kingsnorth' are of Saxon derivation: the Old English *hoh* meaning '(place at) the spur of land' (Mills 1991, 177), and *cyning snad* denoting a 'detached piece of land or wood belonging to the king' (ibid, 197).

The higher ground overlooking the marshes in the north and north-west parts of the site would have remained the first choice for settlement, but it is likely that the marshland in the south and south-east parts of the site began to be drained and reclaimed in the medieval period (although limited reclamation may already have taken place in the Roman period). Techniques included the construction of sea walls and flood defences and the excavation of drainage ditches. The earliest evidence of sea walls along the Hoo Peninsula survives in reports dating from c 1158, 1236 and 1309 concerning the state of repair of these 'boundaries' (MacDougall 1980). Flooding was common in Kent during the fourteenth century, causing a 40–50% drop in revenue from marsh land rental, and the years 1369/70 appear to have particularly severe. In 1375, as a result of flooding, a new system of drains for the Hoo Peninsula was commissioned (Skelton and Harvey 1986, 100–5).

The reclaimed land provided good-quality grazing and fertile land for crops. It is clear that the coastal marshes were important for sheep pasture and that inland parishes often owned a detached portion of the coastal marshes (Darby 1971, fig 64; Rippon 2000). Those areas that were not reclaimed would have continued to be exploited for a variety of purposes, and the importance of coastal trading, fish and shellfish in the later medieval and post-medieval periods is well known. The fields within the eastern two thirds of the site are noted in the 1845 tithe apportionment as pasture and/or marsh; their irregular shape suggests earlier, medieval, reclamation.

Geoarchaeological investigations

Graham Spurr

The investigation consisted of 18 boreholes (Fig 1) using a cable percussion rig (U4/100 core sampling).

Samples from the upper deposits in two boreholes (BH20 and BH23) were chosen for analysis. These boreholes lay at either end of Transect 3. Borehole 23 at its eastern end was the sample location closest to Damhead Creek. Borehole 20 lay at the western end of the transect. The analysis took the form of pollen and ostracod assessment, and radiocarbon dating (Table 1; Table 2). The upper deposits represented the Holocene period and so covered the post-glacial history of the site over the last c 10,000 years.

Depth (m OD)	Depth (below ground level)	Subsample (P = pollen; O = ostracod; C14 = radiocarbon)
+2.10m	3.58m	P/O and C14
+1.93m	3.75m	P/O
+1.48m	4.20m	P/O
+1.33m	4.35m	P/O

Table 1 Summary of samples taken from BH20

Depth (m OD)	Depth (below ground level)	Subsample (P = pollen; O = ostracod; C14 = radiocarbon)
+1.19m	4.75m	P/O
+0.59m	5.35m	P/O and C14
-0.01m	5.95m	P/O
-0.61m	6.55m	P/O
-1.11m	7.05m	P/O
-1.21m	7.15m	P/O and C14
-1.66m	7.60m	P/O
-1.76m	7.70m	P/O

Table 2 Summary of samples taken from BH23

Samples from BH23, closest to the estuary, provided the longest sedimentary sequence for examination. These sediments related to tidal mudflats dominated by halophyte (salt-tolerant) taxa. From at least the early Neolithic (4000–3000 BC; Table 8, UBA-20541) at -1.22m OD, there was a brackish water, tidal marsh environment that continued to the modern day, although the deposition of the naturally occurring sediments ceased by the medieval period at c 0.60m OD. The upper levels would have remained an exposed land surface, prone to occasional flooding until smothered by the made ground dumped by the power station in the later twentieth century. This sequence of deposition matches Devoy's (1979) Thames III and later transgression phase in this part of the Thames/Medway estuary. Therefore a salt marsh would have existed along the Medway during the periods of occupation represented in this report.

Samples from BH20, some 375m to the west and closer to the present higher ground, were far less productive because of the poor survival of any organic material. The ostracod analysis indicated that this area had probably been high and dry for some time, allowing soil profiles and iron panning to develop. Given that the top of BH23 was dated to the medieval period (Table 8, UBA-20543) and was some 1.5m lower than the top of the samples in BH20 (Table 8, UBA-20542), it can be assumed that the area of BH20 was probably dry at least by the medieval period and possibly earlier. The pollen indicated anthropogenic activity in the area up to and including the post-medieval period.

Overview of excavations on the site

Approximately 200 archaeological features were identified within the three excavation areas (Plot 5, Plot 6–7 and Plot 8–11; Fig 1). The majority were discrete features, such as pits, postholes and ditches or gullies. Many of the features contained no dating evidence. Of these, some could be allocated to a period because of a spatial or stratigraphic relationship with a dated feature.

In all trenches, these features were cut into or overlay a substrate of banded clayey silts and gravels, formed as a result of erosional slope processes. These naturally-formed deposits are defined as period 1. The archaeological sequence described below therefore begins at period 2.

Plot 5

Plot 5 was located to the south of the other plots. It measured c 87m x 127m. The natural ground level was flat, at c 3.80m OD. Features dated to the Middle–Late Bronze Age, Roman and Saxon periods were recorded (Fig 2).

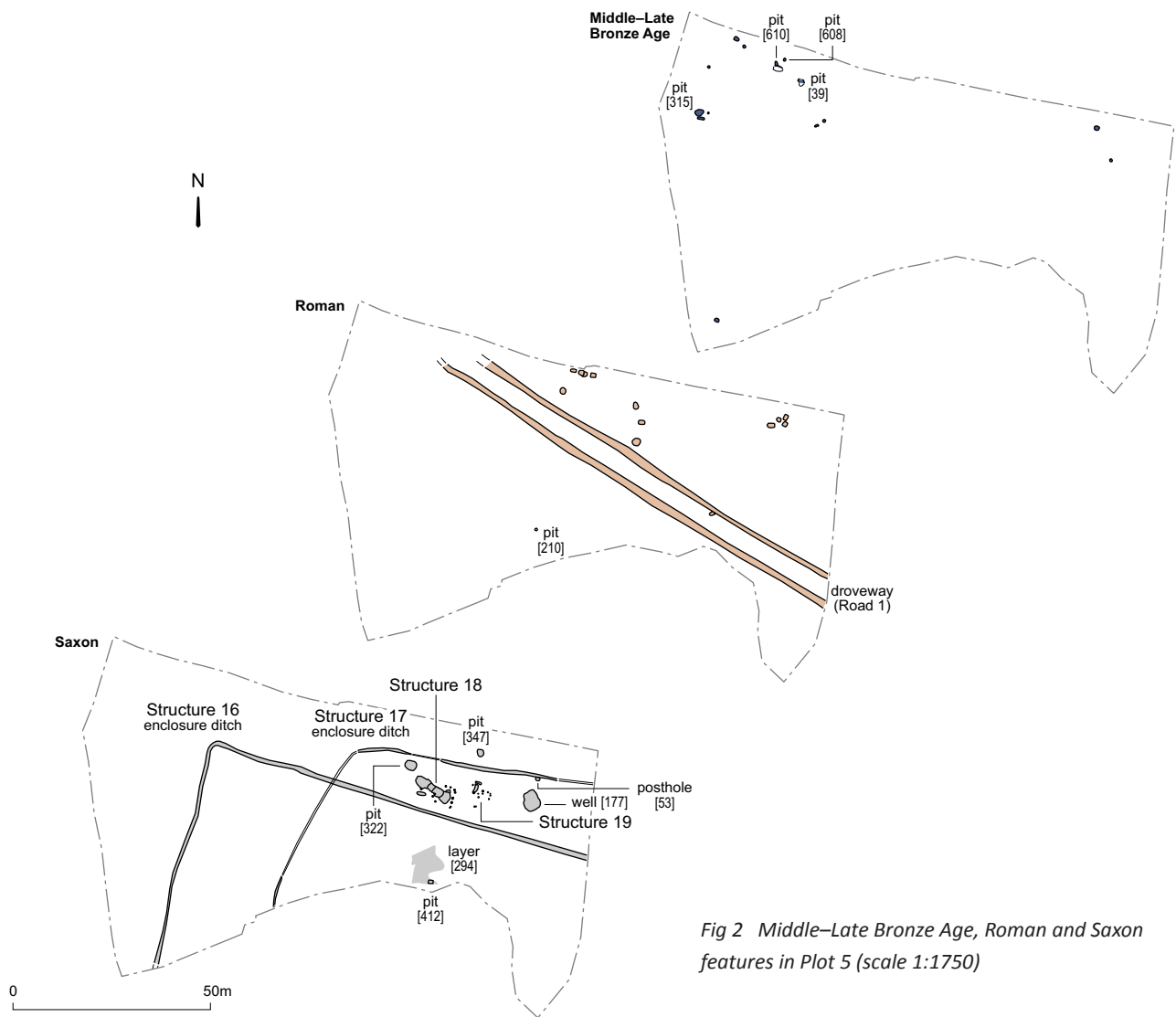


Fig 2 Middle-Late Bronze Age, Roman and Saxon features in Plot 5 (scale 1:1750)

Plot 6-7

Plot 6-7, to the north-west of the site, measured c 100m x 177m. The natural ground level was at 4.80m OD sloping down to 3.50m OD towards a stream channel to the south, where there was a series of marsh deposits (Open Area 7). Middle-Late Bronze Age, Roman and early-middle Saxon pottery was recovered from these deposits, together with worked flint (Fig 3).

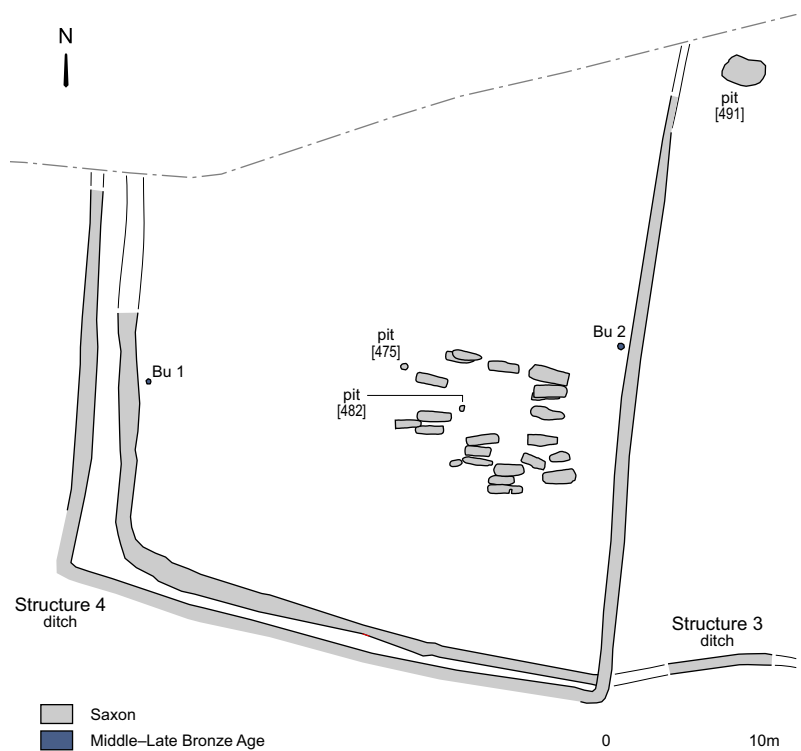


Fig 3 Middle-Late Bronze Age and Saxon features in Plot 6-7 (scale 1:500)

Plot 8–11

Plot 8–11 was located to the north and measured c 56m x 288m. The natural ground level was at 3.70m OD in the north to 3.10m OD in the south. An additional area of excavation consisted of a c 177m x 7m strip to the east of the main area on the low-lying ground (c 3.00m OD) (Fig 4).

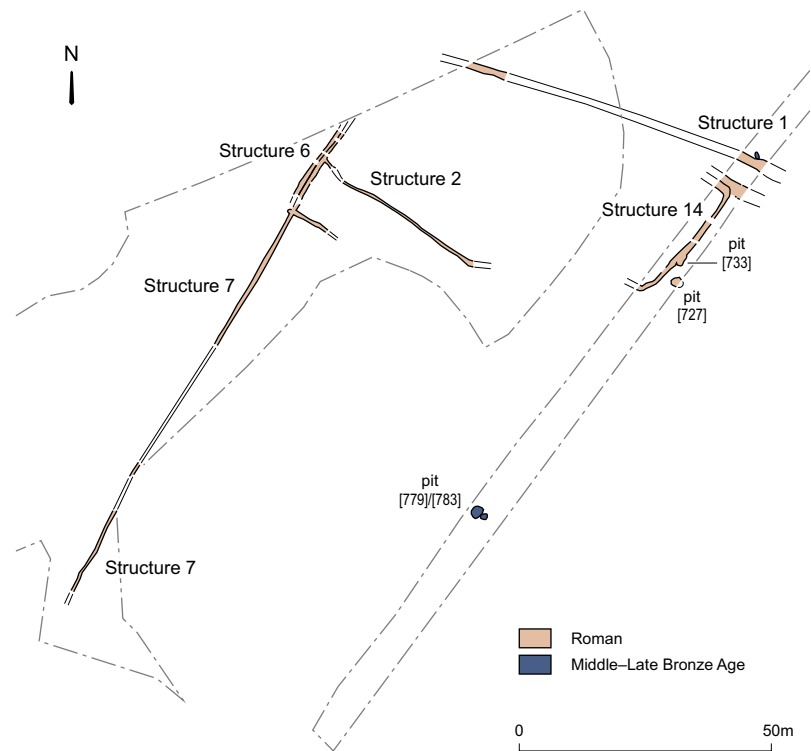


Fig 4 Middle–Late Bronze Age and Roman features in Plot 8–11 (scale 1: 1500)

Evidence of occupation in the Middle–Late Bronze Age (period 2, c 1600–800 BC)

Evidence for Middle–Late Bronze Age activity was present in all three excavated plots but was particularly conspicuous in Plot 5, which generated nearly 60% of the prehistoric ceramic assemblage by sherd count (over 73% by weight). Sixteen pits and postholes, mostly lying towards the north-west of the plot (Fig 2), were dated by the exclusive presence of sherds of Deverel-Rimbury pottery.

Pit [610] in Plot 5 (Fig 2) contained a cache of relatively large primary and secondary flint flakes that had been detached from a single fresh flint nodule. This appears to represent the residue of a single knapping episode, though no re-fits could be readily identified.

Four features are of particular interest: the two cremation burials (Bu 1 and Bu 2) and a pit ([475]) in Plot 6–7 (Fig 3) and pit 779/[783] in Plot 8–11 (Fig 4). These are discussed in more detail below. Three other features in Plot 8–11 were also dated by the exclusive presence of sherds of Middle–Late Bronze Age pottery.

It should be noted that much of the Middle–Late Bronze Age pottery from Plot 6–7 and Plot 8–11 was found in demonstrably later features: <P11> and <P12>, for example, came from Roman ditch fills (Fig 14) and <P13> from deposits which also contained pottery dated to c AD 450–700 (OA7; Fig 15). It remains possible, therefore, that some of the Bronze Age pottery encountered in otherwise undated features is similarly residual.

The cremation burials and pit [475] in Plot 6–7

There was no pottery associated with either of the two cremation burials, Bu 1 and Bu 2 (Fig 3), but a radiocarbon date corresponding to the Middle–Late Bronze Age (1380–1120 cal BC) was obtained from Bu 2 (Table 8, UBA-20700).

Both cremation burials had been subject to heavy truncation resulting in a high degree of fragmentation (Table 3). All surviving bone displayed moderate levels of preservation, mostly comprising the outer cortical bone with only minimal survival of the internal trabecular structures. The burnt bone from both appeared

highly oxidised and fully calcined, indicating that efficient cremation had taken place at a temperature of over 600°C (Holden et al 1995a; 1995b). Spiral, transverse and longitudinal cracking and warping was consistent with the burning of fleshed bodies placed upon the pyre (Buikstra and Ubelaker 1994, 97).

The absence of repeated skeletal elements suggested a single, largely incomplete individual present in each cremation burial. While it was not possible to determine the age or sex of the individuals, the size and morphology of several identifiable fragments suggested that both cremations were of adults.

Pit [475] contained prehistoric pottery and struck flint. It was positioned about midway between Bu 1 and Bu 2 and may have been another feature within this burial site.

Burial no.	Context	Total weight (g)	>10mm (g)	>4mm (g)	>2mm (g)	Colour	Fragmentation
Bu 1	[114]	105.3	5.3	89.3	10.7	90% off-white, 10% dark blue-grey	Transverse and spiral cracking, warping
Bu 2	[356]	73.3	5.6	56.9	10.8	90% off-white, 10% dark blue-grey	Transverse, longitudinal and spiral (crescent shapes) cracking, warping

Table 3 Summary of burnt bone weights, colour and fragmentation patterns

Pit [779]/[783] in Plot 8–11

In the trench to the east of Plot 8–11 (Fig 4), pit [779]/[783] contained particularly noteworthy quantities of finds, including a complete, internally-smearred base and lower wall of a thin-walled jar <P1> and two conjoining sherds of a plain, thin-walled fine ware bowl <P2> with burnished surfaces (Fig 5). There were 72 other sherds of pottery in this feature; where identifiable these were of post-Deverel-Rimbury plain ware.

This pit also contained nearly all the fragments of perforated clay slab recovered from the site. Similarly, a number of large pieces of unworked burnt flint within it represented over 70% by weight of the site assemblage. Also recovered was a possible fired clay weight in a flint-tempered fabric with at least one possible rounded corner. The function of pit [779]/[783] was unclear as there were no structural remains associated with it, nor evidence from it of direct firing, other than small charcoal fragments. Several surrounding features also contained Late Bronze Age material, but this would appear to be residual, and may have originally derived from this feature.

The Middle–Late Bronze Age finds

POTTERY

The assemblage (Fig 5; Table 4) was evenly divided between coarse crushed burnt flint-tempered fabrics assignable to the Middle Bronze Age (eg <P3>–<P9>, <P11> and <P13>), and rather more finely crushed burnt flint-tempered fabrics assignable to the Late Bronze Age (eg <P1>, <P2>, <P10> and <P12>).

Furthermore, the assemblage broadly accords with the characterisation for Kent by Champion (2011, 156–62), where the Middle–Late Bronze Age pottery (Deverel-Rimbury phase) assemblages were dominated by jar forms, especially bucket-shaped, in flint-gritted fabrics, with a small percentage of finer wares in other forms, such as globular urns, and Late Bronze Age pottery where jars and bowls in a variety of forms and fabrics were significantly finer. Decoration was rare and limited to simple fingertip ornamentation of the rim.

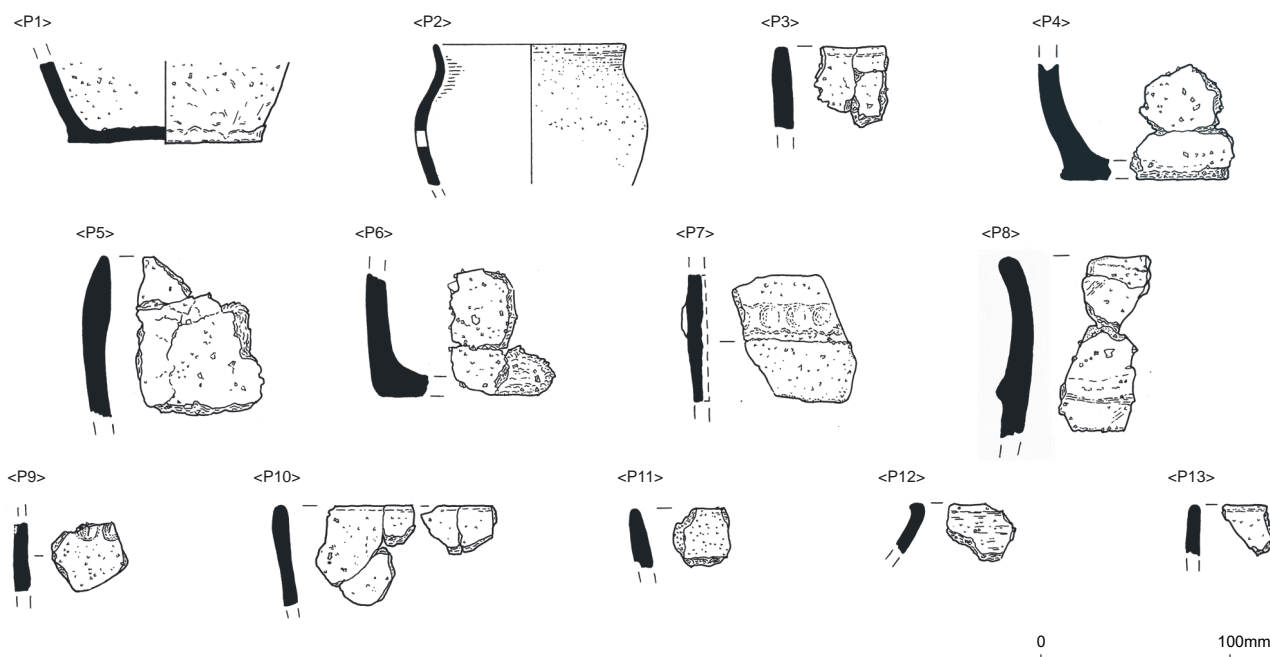


Fig 5 Selected Middle and Late Bronze Age pottery <P1>–<P13> (scale 1:4)

Fabric code	Description	Assessment equivalent	Possible date range
FLIN 1	Abundant, ill-sorted angular crushed burnt flint (individual clasts >7mm) with occasional grog and/or organic inclusions. Thick-walled (>12mm)	-	?MBA
FLIN 2	Moderate, ill-sorted angular crushed burnt flint (individual clasts >4mm) with sand and occasional grog (some large). Medium- to thick-walled (7–11mm); surfaces often eroded	LFL1-3; LFLGR2	MBA
FLIN 3	Abundant, ill-sorted sub-angular crushed burnt flint (individual clasts 1–3mm). Medium- to thick-walled (7–18mm), possibly slab-built; surfaces often eroded	GFL3-4	MBA
FLIN 4	Abundant, evenly-sorted sub-angular to sub-rounded crushed burnt flint (individual clasts <2mm). Thin-walled (<8mm)	GFL2	M/?LBA
FLIN 5	Moderate to common, evenly-sorted sub-angular crushed burnt flint (<3mm) in dense sandy matrix with occasional grog. Medium-walled (10mm)	GFL1	LBA
FLIN 6	Sparse to moderate ill-sorted sub-angular to sub-rounded crushed burnt flint (<4mm) in brittle, laminated sandy matrix with occasional grog. Medium-walled (>10mm)	LFLGR; LFLGR3	LBA
FLIN 7	Abundant, very fine crushed burnt flint (individual clasts <1mm) in fine sandy matrix. Brittle and thin-walled (<5mm) with burnished surfaces	GFL5	LBA
FLIN 8	Sparse, sub-angular crushed burnt flint (individual clasts <2mm) in dense fine sandy matrix with occasional grog and organics. Medium- to thin-walled (<10mm)	LFLGR1	LBA/?EIA

Table 4 Fabric descriptions for Middle and Late Bronze Age pottery

WORKED FLINT

The lithic assemblage (Fig 6) was dominated by debitage in the form of small broad flakes, tested nodules and irregular nodular shatter, with a number of small cores and formally retouched tools. The cores are small and irregular, and appear to have been worked in an unsystematic fashion (<F1>–<F3>, <F6> and <F15>) and there are few retouched pieces (<F4>, <F5>, <F7>–<F14> and <F16>).

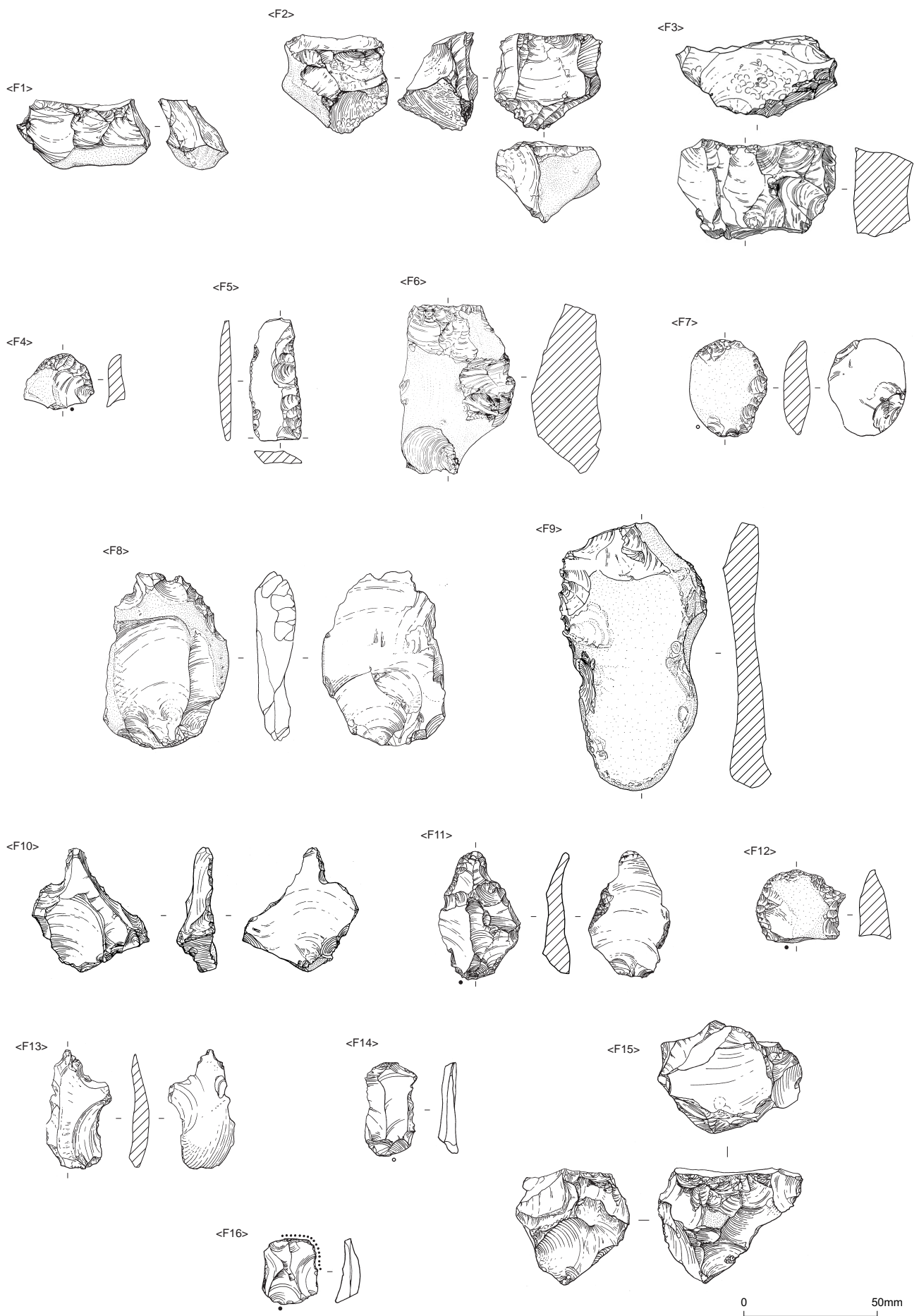


Fig 6 The prehistoric worked flint <F1>—<F16> (scale 1:2)

Most of the worked flint involved the opportunistic use of readily available resources to fulfil a range of specific tasks. It was characterised by ‘high levels of debitage, hard hammer mode, irregular flakes, and limited retouch’ (Champion 2011, 215) and therefore broadly contemporary with the Middle/Late Bronze Age pottery, though very few contexts contained both lithics and ceramics.

Comparable later prehistoric lithic assemblages have been reported from Damhead Creek Power Station (Butler 2004), and from localities all along the north Kent littoral between Dartford/Gravesend and Thanet (eg Bradley 1994; Bishop 2005; Healey 1994). Similar assemblages have also been recovered from a string of sites along the High Speed 1 route further inland (Champion 2011).

PERFORATED CLAY SLABS

Thick perforated clay slabs in abundantly flint-tempered fabrics were recovered (Fig 7). Together, these probably represent no more than four or five individual slabs.

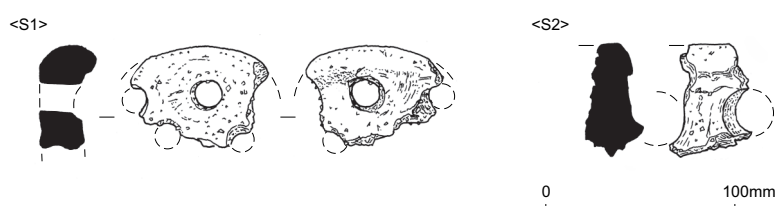


Fig 7 Perforated clay slabs <S1> and <S2> (scale 1:4)

These objects are common finds from a range of Late Bronze Age sites flanking the greater Thames estuary (Champion 1980; 2011, 220) but their function remains obscure. Near Kingsnorth, perforated clay slabs have been found at Hoo St Werburgh (Moore 2002) and Kingsmead Park, Allhallows (Greatorex 2005, 77). However, their association here with sherds of post-Deverel-Rimbury plain ware pottery and, more particularly, with a number of large pieces of unworked burnt flint in pit [779]/[783] is noteworthy, and links them with other Kentish finds at Tollgate and Cobham Golf Course (Champion 2011, 220).

The Middle–Late Bronze Age: discussion

In the near vicinity of the site, previous archaeological investigations identified an intensification of human activity in the Middle Bronze Age with a continuation into the Early Iron Age, but suggested that permanent occupation in this period would have been focused on the higher ground further west/north-west, with the area around the site being given over to pastoral use (Griffin 2004). At the site itself, however, activity does not extend into the Early Iron Age. An absence of later decorated post-Derevel-Rimbury pottery suggests a hiatus from c 800 BC until the Late Iron Age (Cotton 2012).

The prevailing view of the Late Bronze Age in southern England is that it was a period of large-scale landscape reorganisation, as demonstrated on numerous archaeological excavations, particularly in the Thames valley (Yates 2007). On the Hoo Peninsula, Late Bronze Age settlements are known north of Cliffe Woods (Kinnes et al 1998) and Kingsmead Park, Allhallows (Greatorex 2005), c 8km to the west and c 6km to the north-east respectively. Some evidence for Late Bronze Age field systems has also been found close to the site: at Malmaynes Hall Farm (James 1999) 1.4 km to the north, and at Middle Stoke (James 2006, 84) 1.8km to the north-east. However, these results were from small-scale excavations and the more extensive archaeological investigations on the Isle of Grain to Shorne pipeline route only found small areas of possible field systems (six ditches in 21 kilometres) (Dawkes 2012, 121–2; Dawkes in prep). As a result, it has been argued that the Hoo Peninsula in this period was a landscape characterised by relatively small pockets of agricultural fields fringing settlement sites from which large-scale field systems were absent (Dawkes 2012, 121) and that the most visible evidence of Middle–Late Bronze Age activity, even in areas set back from the estuary, was salt working. Nor is this pattern necessarily unique to the Hoo Peninsula. Archaeological work in north-west Kent on the Eynsford to Horton Kirby pipeline (Powell and Sykes 2011, 241) and the High Speed 1 railway (Booth

et al 2011) has also noted the absence of large-scale field systems from this period.

Therefore, the Kingsnorth site complements the existing evidence for both the immediate vicinity and north-west Kent. It demonstrates activity in the immediate area in the Middle and Late Bronze Age but no direct evidence for a settlement site or extensive field systems. It is surprising, however, that no definite evidence for salt working was found, though the function of pit [779]/[783] remains uncertain.

A Roman agricultural landscape (periods 3 and 4, c AD 40–400)

The droveway (R1) and other features (OA4) in Plot 5

The most prominent feature in Plot 5 consisted of two parallel gullies, each c 1m wide and 0.40m deep and aligned north-west to south-east (Fig 2; Fig 14). The gullies would have flanked a 4–5m wide droveway that extended for at least 140m. The finds from this feature included two sherds from the base of a sand-tempered jar (unsourced Roman) and ceramic building material, which suggests that the droveway was contemporary with the similarly aligned Roman field boundaries in Plot 8–11 (Fig 4; Fig 14) described below. Otherwise, however, the pottery from the droveway comprised predominantly residual prehistoric sherds.

Seven pits in Plot 5 contained exclusively Roman artefacts. A single sherd from a Verulamium region white ware hook-flanged mortarium (c AD 50–140) was found in pit [210] and small quantities of Roman roofing tile and brick were recovered from the other pits. One brick was partly burnt to a grey colour, suggesting that it may have come from a hearth, oven or drying kiln. Fragments of daub, some of which also showed evidence of burning, could have come from the same or a similar structure.

A field system and associated pits in Plots 8–11

In the east of Plot 8–11, a co-axial arrangement of gullies defined a complex sequence of field boundaries (Fig 4; Fig 14). All were on, or perpendicular to, a north-west to south-east alignment, similar to the modern field layout. Fig 4 shows only a representative selection of the gullies (Structures 1, 2, 6, 7 and 14) and of the adjacent discrete features, mostly pits, many of which clustered on the east side of the site.

Dating evidence from the boundaries included three sherds from a north Kent grey ware beaker, dated c AD 70–275, from Structure 2, and the use of the fields through to the end of the Roman period was suggested by three sherds of an Oxfordshire red/brown colour-coated ware form 52 bowl (Young 1977, 160–1), dated to c AD 350–400, from Structure 7. The majority of the pottery from both the gullies and the adjacent pits was dated to the late second to early third centuries AD, and a large quantity of Roman roofing tiles and bricks dated to the first to second centuries AD was also present. There was further evidence for a hearth, oven or drying kiln in the vicinity – an imbrex has a partly burnt top surface and some burnt daub was also recovered. An iron knife (<S3>, Fig 8) was found in pit [733] (Fig 4).

Pit [727] contained pottery dated to c AD 120–250 (fill [724]) and a radiocarbon date from its primary fill ([726]) is cal AD 80–240 (Table 8, UBA-20701). This pit also produced two vertebrae from a fish of the cod family, possibly cod (*Gadus morhua*). Game species were represented by a charred fragment of humerus (upper wing) of adult grey partridge (*Perdix perdix*). This bird is an indigenous British species of open farmland and meadowland, breeding in or beside cultivated fields, particularly those with hedges or other shelter (Svensson 2001, 56). Both the fish vertebrae and a sheep-sized long bone had been charred brownish-black, indicating a combustion temperature of 350–500°C, while the partridge humerus had been charred brown, indicating a slightly lower combustion temperature of 300–400°C (Lyman 1994, 386).

A moderately large assemblage of waterlogged plant macrofossils was also recovered from pit [727]. It consisted principally of seeds from persistent nitrophilous ruderals such as stinging nettle (*Urtica dioica*) and hemlock (*Conium maculatum*), along with other plants of disturbed places, potentially including cultivated and/or waste land. Another group, including crowfoots (*Ranunculus* subgen *Batrachium*), celery-leaved crowfoot (*Ranunculus sceleratus*), blinks (*Montia fontana* ssp *chondrosperma*), gipsy-wort (*Lycopus europaeus*)

and sedges (*Carex* spp), indicated marginal waterside and damp environments and reflected the site's location close to estuarine marshes. A few blackberry (*Rubus cf fruticosus* agg) seeds and cereal caryopses may indicate the disposal of food remains or cess in this pit. Most important of all, a single fig seed suggests that the occupants in the vicinity of the site had access to imported foodstuffs.

The Roman finds

POTTERY

A total assemblage of 247 sherds (3628g) of Roman pottery was recovered from the site. The material is in poor condition, with frequent wear or abrasion noticeable on at least half the assemblage. The average size of sherds is small and survival of diagnostic vessel features was infrequent.

ACCESSIONED FINDS

Only two finds of Roman date were accessioned (Fig 8), both from Plot 8–11 (Fig 4). Iron knife <S3> was found in pit [733], which was dated c AD 175–300 by native grog-tempered coarse ware (CAT code R1). Iron tool <S4> is a possible punch or awl but could simply be a fortuitously broken nail shaft. It was found in field boundary Structure 7, which included an Oxfordshire red/brown colour-coated ware form 52 bowl (Young 1977, 160–1) which dates the disuse of the ditch to c AD 350–400.

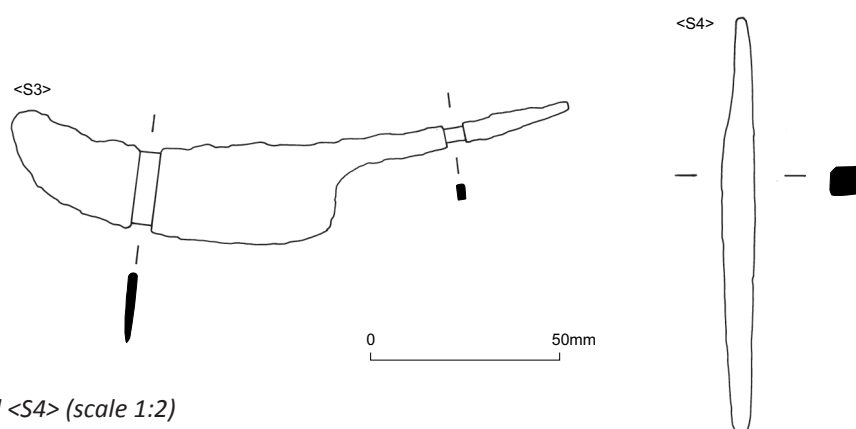


Fig 8 Knife <S3> and tool <S4> (scale 1:2)

ANIMAL BONE

A small and poorly-preserved animal bone assemblage from Roman contexts represents the consumption of beef and mutton and, to a comparatively minor extent, lamb. Wild species were represented by two bones of a very large adult raptor, the radius (lower wing) and tibia (lower leg) probably of a white-tailed eagle (*Haliaeetus albicilla*). This was recovered from the fill of Structure 13, a field boundary that was replaced by Structure 14 (Fig 4). Archaeological evidence indicates that this species was common on many prehistoric and Roman sites in Britain, and may have remained widespread in England until around a thousand years ago (Brown and Grice 2004, 239–40). This eagle was largely coastal in habitat (Serjeantson 2010, 152–3) and adult birds are largely resident rather than migratory (Svensson 2001, 92).

The Roman period: discussion

Although the Hoo Peninsula is known for large-scale pottery and salt production in the Roman period (Andrews 2004, 20), activity on the site appears to have been purely agricultural. The peninsula is unusual in having no known villas, despite north-west Kent – close to the main London to Richborough/Dover road – having a very high density. The ceramic building material recovered from the site included no box-flues, tesserae or other material indicating a high-status building in the vicinity. Agriculture in the locality of the site may, therefore, have been organised as smaller-scale farmsteads. The field boundaries and presence of animal bone suggest pastoral husbandry but the burnt ceramic building material and daub indicate that

hearths, ovens or drying kilns were likely to have been a feature of the Roman landscape and that arable agriculture was also practised. However, the supporting environmental evidence is limited: just five charred grains of wheat (*Triticum* sp), two charred glume bases from a hulled wheat (*Triticum* sp) and oats (*Avena* sp).

Griffin (2004) suggested that it was probable that any permanent settlement and arable fields were on the higher ground to the north-west and that salt working would have been concentrated in the true estuary marsh to the east. The vicinity of the site should therefore be seen as a 'buffer' of land between these two zones, combining elements of both in a mixed use of agriculture with some industry. The east-west aligned driveway (R1) could represent a line of communication between the higher ground and the estuary. The presence of cod, a deep-water fish, in pit [727] could be evidence for interlinked industries such as the preparation and transportation of salted fish and fish sauce.

The majority of Roman pottery from the site dates to the second to early third centuries AD, and this accords, for example, with the chronology of Kent pottery production, which peaked between the second and mid third centuries AD (Detsicas 1983, 156–61). On the other hand, there was also evidence from the site for its continued use until the later 4th century AD. This reflects the late Roman activity recorded at the settlement at Wainscott (Clark et al 2009) and at the cemetery at Rose Court Farm (Philp 2010), which lay c 8km to the south-west and north-east of the site respectively.

A middle Saxon cemetery in Plot 6–7 (period 5, c AD 680–890)

In the middle Saxon period an organised cemetery (Open Area 6) was laid out (Fig 3; Fig 9; Fig 14). The date of the cemetery was established by the radiocarbon dating of three of the inhumations, Bu 4, Bu 5 and Bu 6 (Table 8), which indicates that it was in use within the period cal AD 680–890.

FEATURES ASSOCIATED WITH THE CEMETERY

Enclosure ditches (S3 and S4)

Two phases of ditch, Structure 3 and its replacement Structure 4, apparently defined the cemetery area, and were on the same alignment as post-Roman features in Plot 5 (Fig 14), but neither contained datable finds contemporary with the use of the cemetery. Structure 3 was completely undated. Structure 4 contained three fragments of tegula and a fragment of stone quern, though the latter may be Saxon, by analogy with those in Plot 5 (below). It remains possible that the ditches are elements of a separate enclosure system, particularly Structure 3 which could have extended further east than the defined cemetery area.

Pit [491]

Large, shallow pit [491], c 3m x 2m in plan but only 0.25m deep, was located c 20m to the north-east of the cemetery, outside enclosure ditch Structure 4 (Fig 3). It contained a fill rich in charcoal and charred grain which provided a radiocarbon date of cal AD 680–890 (Table 8, UBA-20699), contemporary with the cemetery. Also present were pieces of daub, some with interlocking wooden withy impressions and some partly burnt to a grey colour. The daub is likely to have come from the superstructure of an oven or corn drier.

The charred plant remains included partially cleaned grains of (mainly) barley (*Hordeum vulgare*) and free-threshing wheat (*Triticum* cf *aestivum/turgidum/durum*), together with wheat chaff and many seeds of wild plants. Smaller amounts of rye (*Secale cereale*) grain and chaff were also present, along with a few grains of oats (*Avena* sp). The weed assemblage was dominated by over 500 seeds of stinking mayweed (*Anthemis cotula*), many of which were still in partial seed heads. The relatively high proportion of chaff, particularly of wheat, and weed seeds suggests that this assemblage may derive from a partially cleaned crop from which these contaminants had still to be removed. Alternatively clean grain may have become mixed, after deposition, with crop cleaning by-products burnt as fuel. Non-cereal foods were represented by several charred cotyledons of horse bean (*Vicia faba*) and a fragment of hazelnut (*Corylus avellana*) shell. Other finds

included single fragments of cattle skull and maxillary (upper jaw) tooth and cattle-sized rib, lamb mandible (lower jaw) and sheep-sized long bone. Dental evidence from the lamb mandible indicates a first-year animal in the second six months of life.

Pit [491] was very similar to several pits in Plot 5 which were probably part of a cereal-processing site.

Pit [482]

A small pit ([482]) within the cemetery (Fig 3; Fig 9) contained numerous very small fragments of lava rotary quern weighing a total of 495g.

The cemetery

Michael Henderson

The cemetery (Open Area 6) consisted of 20 graves (Bu 3–Bu 22) which contained 25 individual skeletons. Two further cuts, [371] and [502], may have been graves but contained no skeletal material. The remaining 20 graves were subject to full osteological analysis and recorded onto an Oracle 9i (v9.2.0) relational database using standard Museum of London Archaeology (MOLA) criteria (Connell and Rauxloh 2007; Powers 2012). A catalogue of the inhumations can be found in Appendix 4.

BURIAL PRACTICES

All burials were orientated east–west with their heads to the west (Fig 9). This orientation can occur in pagan as well as Christian practice (Daniell and Thompson 1999, 67–8). The graves were regularly laid out and there were only two instances of intercutting – Bu 5 cut Bu 6 and Bu 8 cut Bu 7. In general, therefore, the graves respected their neighbours. Many also appeared to be aligned in both north–south and east–west orientated rows. This strongly suggests that the layout of the cemetery was managed and it is possible that grave markers were used. Evidence for the use of externally visible features such as barrow mounds, ditches or wooden post-built structures added to graves has been found associated with graves across Kent and predominantly attested during the seventh century AD or later (Richardson 2005, 124). The graves, however, appeared to respect an open space, measuring c 5.3m east–west by 4.2m north–south, at the centre of the cemetery, which may indicate that the cemetery was laid out around an earlier structure or feature now invisible. As two Middle–Late Bronze Age cremation burials (Bu 1 and Bu 2) lay to its west and east, the cemetery may have respected a third burial, perhaps marked by a mound, all trace of which was since lost.

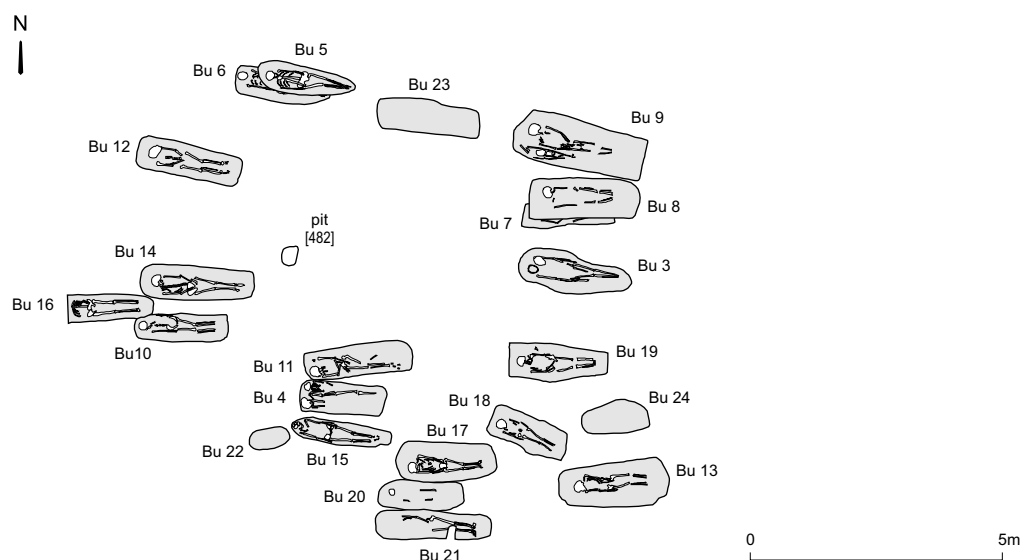


Fig 9 Detailed plan of the middle Saxon cemetery (Open Area 6) (scale 1:150)

The reuse of existing burial places and an association with earlier structures has been recorded frequently in Kent, and this practice becomes more common during the seventh century AD or later (ibid, 74–6). At Buckland cemetery, Dover, some of the late sixth- to seventh-century AD graves were found focused around a Bronze Age round barrow (Parfitt and Anderson 2012, 371). Such an area may also have served as a space, or for a temporary building within a cemetery, where funerary rites or memorial services could be performed (Lee 2007, 93–5). At the middle Saxon settlement at Yarnton, Oxfordshire, a small timber building in proximity to a cemetery is assumed to have been a chapel (ibid, 95). Cemeteries may also be defined by the presence of focal graves, marked out by a square or rectangular ditch or fenced enclosure (Petts 2013, 115). At Raunds Furnells, Northamptonshire, a defined plot contained a single male burial at the centre of a space almost empty of graves except for one infant (Boddington 1996, 51). Against this, at Kingsnorth there was no evidence for a mound or ring ditch associated with either of the two extant Bronze Age cremations. Nor is there any direct evidence for a middle Saxon building, a mortuary chapel or the like, having occupied this space.

The majority of graves contained an individual burial, the body laid in a supine, extended position as was the dominant rite in both Christian and pagan burials of the period (Lucy 2000, 80). There was no evidence for interment within a coffin or wrapped in a shroud.

Two graves contained multiple burials laid side by side in an extended position: grave Bu 3 contained two adults of undetermined sex, skeleton [129] and skeleton [139], and grave Bu 4 contained adult male [135] and subadult [137], aged 12–17 years. Multiple burials were a fairly common feature in the Anglo-Saxon period, and contemporary multiple burials suggest the death of two individuals within a short space of time (Lucy 2000, 82). While these have previously been interpreted as representing family plots, studies of contemporary multiple burials have revealed certain sex- and age-specific patterns which suggest that other relationships between individuals could allow joint burial (Stoodley 2002, 105). Paired subadults are rarely found together, while children are often buried with adults, young children with females and older juveniles with males (ibid, 112–13). This may indicate a difference in gender roles between children of differing ages, and the responsibilities and protection of adults – and possibly unrelated members of the community – extending beyond death (ibid, 120–1).

Three graves had evidence of additional interments, representing a third type of burial rite. Grave Bu 5 was located over grave Bu 6, with each containing a single female skeleton: [148], aged 36–45 years, and [351], aged 26–35 years, respectively. It was noted during excavation that the lower left arm of skeleton [351] had been moved, possibly to accommodate the later burial. Grave Bu 7 was cut by grave Bu 8, with each containing a single skeleton: adult [132] of unknown sex, aged 36–45 years, and female [364], aged 18 years or older. Grave Bu 9 contained the disarticulated remains of female [358], aged 26–35 years. The bones had been neatly stacked along the south edge of the grave to make room for the later burial of male [359], aged 36–45; finally, the skeleton [142] of a baby, possibly pre-term, was deposited.

These graves may have originally been intended for one burial and a substantial period of time may have passed before they were reopened. As lack of burial space does not appear to have been an issue at Kingsnorth, the reuse of particular graves could suggest that their location was known (remembered or marked) and had significance for members of the community. A family link between the individuals in each grave cannot be ruled out, but the fact that the primary burials were disturbed by the reuse indicates that preserving the integrity of the remains of the primary individual was not considered essential (Stoodley 2002, 114).

The cemetery population

The majority of burials had been subject to truncation and disturbance resulting in a high degree of post-mortem damage and the survival of only partial remains. The overall completeness of the assemblage ranged from 2.5% to 76.9%, with just under a quarter of all remains (6/25: 24.0%) displaying less than 50% of skeletal elements present. Nevertheless, moderate overall levels of bone preservation (14/25: 56.0%) allowed for estimations of age and biological sex and observations of pathological bone changes.

Analysis of the assemblage identified six subadults (6/25: 24.0%): two perinates who died close to their time

of birth, one child aged 1–5 years and two juveniles aged 12–17 years. There were 19 adults, with more males (11/19: 57.9%) than females (5/19: 26.3%) present. The commonest age at death for adults was 36–45 years (8/19: 42.1%); six were aged 26–35 years (6/19: 31.6%) and two survived to be aged ≥46 years (2/19: 10.5%) (Table 5).

The stature of three adult males was calculated to be in the range 1.68–1.74m. These results are comparable to those recorded for the early medieval period (c AD 410–1050) (Roberts and Cox 2003, 195). These rates reveal a slight increase from the Roman period and may reflect an adequate diet or efficient adaption to stress such as disease or dietary imbalances (ibid, 185, 195). Two individuals displayed hypoplastic defects to the enamel tooth surfaces, suggesting survival of a period of malnutrition, stress or illness during early life that may have affected normal development (Roberts and Manchester 2005, 75).

	Subadult	Male male	Probable female	Probable	Female	Not sexed	Total
Perinatal	2	-	-	-	-	-	2
1–6 months	-	-	-	-	-	-	-
7–11 months	-	-	-	-	-	-	-
1–5 years	1	-	-	-	-	-	1
6–11 years	-	-	-	-	-	-	-
12–17 years	2	-	-	-	-	-	2
Subadult	1	-	-	-	-	-	1
18–25 years	-	-	-	-	-	-	-
26–35 years	-	3	-	-	2	1	6
36–45 years	-	3	3	1	-	1	8
≥46 years	-	1	-	1	-	-	2
Adult	-	1	-	1	-	1	3
Total	6	8	3	3	2	3	25

Table 5 Inhumation burial demographic profile

Dental disease was prevalent in the assemblage and suggested a lack of dental hygiene but also a diet rich in starchy, carbohydrate-based foods (Roberts and Cox 2003, 303–4). Cane and beet sugar had not yet entered the diet but cariogenic substances such as honey and fructose from fruit would have been consumed (ibid, 190). While foodstuffs such as meat, eggs, vegetables, fish and dairy products may have been commonplace for some, not all would have had access to such a well-balanced diet (ibid, 184). Over half of the adult individuals showed deposits of mineralised plaque adhering to the surfaces of teeth and there was evidence of cavities, gum disease, dental abscesses and the loss of teeth during life (Table 6; Table 7). Female [461] (Bu 10), aged ≥46 years, had lost all the teeth of the lower jaw during life, with the sockets displaying fully reabsorbed bone. Male [471] (Bu 11), aged 36–45 years, had an edentulous upper jaw.

Severe dental wear affected six adults (6/19: 31.5%). The biting surfaces of the teeth of male [359] (Bu 9), aged 36–45 years, were worn to the dentine, and the tooth crowns of the upper canines and incisors of male [361] (Bu 12), also aged 36–45 years, had worn down to the roots. Particles of grit entering the food from stone querns used to grind cereal may have contributed to this dental wear (Roberts and Cox 2003, 68). However, such wear would also have removed fissures that could trap food from the tooth surfaces and may have helped to reduce decay (Roberts and Manchester 2005, 78).

	Subadults (n = 6)		Adults (n = 19)		Total (n = 25)	
	Affected	%	Affected	%	Affected	%
Caries	0	-	5	26.3	5	20.0
Calculus	0	-	11	57.9	11	44.0
Enamel hypoplasia	1	16.7	1	5.3	2	8.0
Periodontal disease	0	-	4	21.1	4	16.0
Periapical abscess	0	-	2	10.5	2	8.0
Ante-mortem tooth loss	1	16.7	9	47.4	10	40.0

Table 6 Crude prevalence of adult and subadult dental pathology

	Subadult			Adult		
	n	Affected	%	n	Affected	%
Caries	71	0	-	182	8	4.4
Calculus	71	0	-	182	62	34.1
Enamel hypoplasia	71	2	2.8	182	2	1.1
Periodontal disease	47	0	-	290	14	4.8
Periapical abscess	47	0	-	290	5	1.7
Ante-mortem tooth loss	47	1	2.1	290	61	21.0

Table 7 True prevalence of adult and subadult dental pathology

Adult male [145] (Bu 13), aged 26–35 years, had widespread dental disorders. Gross caries was present in the back teeth of the lower left jaw and had resulted in the formation of large, externally draining abscesses. This advanced decay may have prompted the use of the front teeth for chewing, as these showed an advanced degree of wear compared to the molars.

Overall, the rates of disease among the buried population were low and there was no evidence of infectious bone changes. However, not all disease will leave its mark on the skeleton, and the fragmented and partial nature of many of the remains may have obscured any bone changes.

Degenerative joint disease of the spine was one of the more common conditions observed and suggests that some individuals were subjected to physical stresses during life. New bone growth at vertebral joints (osteophytes) (3/19: 15.8% of adults; 4/179: 2.2% of adult vertebrae) and disc herniations into the vertebral bodies (Schmorl's nodes) were more prevalent among the males, with a distribution in the lower weight-bearing regions of the spine. These stresses on the spine were probably the result of manual labour (such as agricultural work) from a young age (Rogers and Waldron 1995; Roberts and Cox 2003, 195; Roberts and Manchester 2005, 140). Two adults had osteoarthritis at vertebral facet joints (2/19: 10.5% of adults; 3/179: 1.7% of adult vertebrae). Course pitting, diagnostic of intervertebral joint disease, affected the upper cervical vertebrae of one adult male (1/19: 5.3% of adults; 3/179: 1.7% of adult vertebrae).

The joint surface of the first right thumb bone (metacarpal) of male [135] (Bu 4), aged 36–45 years, appeared flattened and polished (eburnated), with new bone formation indicating osteoarthritis, possibly secondary to a traumatic injury such as a partial dislocation of the knuckle joint (McRae 1999, 340). Male [471] (Bu 11), aged 36–45 years, had osteoarthritis to the head of the left great toe (metatarsal). This can occur as a result

of the major stresses placed on the toes through normal walking, including barefoot (Ortner 2003, 548). There was also severe degeneration evident in a fragment of femoral head that appeared flattened, with extensive pitting of the joint surface. Osteoarthritis of the hip may be caused by age-related degeneration, trauma or as part of a disease process (ibid, 548).

Further evidence of possible trauma occurring from a young age was evident in the left knee of female [461] (Bu 10), aged ≥ 46 years. Sub-circular healed lesions were present in the distal joint surface of the left femur and corresponding patella surface (osteochondritis dissecans). This commonly occurs in young individuals, often secondary to trauma where a fragment of bone separates and may either remain loose in the joint or be reabsorbed back into the lesion (Roberts and Manchester 2005, 121). This may cause pain and clicking in the joint and lead to further joint disease in later life (Roberts and Cox 2003, 71).

There was a large bony outgrowth on the posterior left femur of female [148] (Bu 5) aged 36–45 years. This may represent an osteoid osteoma, a benign neoplasm in the cortex of the bone that may appear as a swelling on the bone surface, causing considerable and constant pain in the leg (Roberts and Manchester 2005, 256). Alternatively it may represent an osteochondroma, a commonly occurring benign tumour that forms during childhood growth (ibid, 254).

The most dramatic case of bone pathology observed was in male [479] (Bu 14), aged 25–35 years, who displayed multiple trauma as a result of interpersonal violence (Fig 10). An extensive linear cut mark ran across the left aspect of the cranium at an oblique angle into the left eye socket, where a flaked piece of cortical bone had been removed. This indicated a single blow downwards onto the left side of the head, a pattern common in hand-to-hand combat where a right-handed person strikes the left side of the person they are facing (Wenham 1989, 137). The force of the impact had caused bone to fracture and detach from the underlying surfaces. Terminal fissures extended down the right frontal bone bisecting the forehead. Indirect forces transmitted into the jaw had resulted in chipping to the enamel of the right maxillary third molar and second mandibular molar, revealing the underlying dentine. An additional cut mark to the upper body of the sternum indicated a blow to the chest.

The nature of these extensive injuries, with well-defined, linear and polished edges, suggests the use of a bladed weapon, possibly a sword (Wenham 1989, 127). There was no evidence of healing, and the blade had passed through all tables of the left parietal bone and may have made contact with the brain. This would have produced bleeding and possibly loss of consciousness, leading to death occurring immediately or a short time after through shock or blood loss (ibid, 128).

It is not possible to determine whether this individual was a warrior who died in battle or a civilian who had been attacked. In a study of nine sites dated to the early medieval period, 21 individuals presented weapon injuries, the majority involving the skull (Roberts and Cox 2003, 168). Violence between individuals, communities or different groups of people appears common at this time, particularly in the southern and eastern regions and possibly related to new contacts between incoming groups and the already established population (ibid, 168).

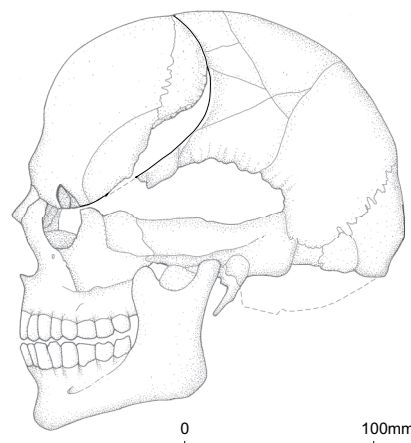


Fig 10 Sharp force trauma to the cranium of male [479] aged 25–35 years

A Saxon cereal-processing site in Plot 5

A concentration of activity that is likely to be broadly contemporary with the use of the cemetery was found in Plot 5 (Open Area 8). No evidence for Saxon activity was found in the area of the former Roman field systems in Plot 8–11.

Plot 5 (Fig 2) contained a cluster of features associated with cereal processing, defined principally on the basis of charred remains including cereal grain, and two linear features, Structures 16 and 17, each defining the north-western corner of respective enclosures. The common alignment of the enclosure ditches suggests that they belong to the same broad period of landscape use but the sequential relationship between the two was not ascertained. All the features associated with cereal processing – Structures 18 and 19, pit [322] and pit [412] – lay within the enclosure defined by Structure 17.

Charred barley grains from a basal fill [247] in Structure 18 and the fill of pit [412] have been radiocarbon dated as cal AD 770–990 (UBA-20698) and cal AD 690–890 (UBA-20697), respectively (Table 8). Although Roman finds and medieval pottery (dated c 1050–1225) were recorded in some of the fills of the cereal-processing features and associated layers, the radiocarbon dates suggest an AD 8th/9th century period of use.

The orientation of the cemetery enclosure and the Open Area 8 ditches (Fig 15) is very similar, suggesting that they are parts of the same landscape and that the radiocarbon dates are correct.

ENCLOSURE DITCHES STRUCTURES 16 AND 17

Structure 16 (Fig 2; Fig 15) was the most prominent feature in this excavation area other than the Roman droveway (R1), through which it cut. It contained one fragment of lava quernstone, similar to those found in other Saxon features. Three short stretches of Structure 17 (Fig 2; Fig 15) were recorded in detail. Its charcoal-rich fills were very similar to those of the cereal processing features to its south, suggesting that it was contemporary with them, despite a range of residual prehistoric and Roman and intrusive post-medieval finds.

FEATURES (STRUCTURES 18 AND 19 AND PITS [322] AND [412]) ASSOCIATED WITH CEREAL PROCESSING LYING TO THE SOUTH OF STRUCTURE 17

An elongated arrangement of up to seven intercutting pits, Structure 18, with charcoal-rich fills and stakeholes around its eastern end, lay c 4m south of Structure 17 (Fig 2; Fig 15). The Structure 18 pits were between 0.55m and 0.90m deep and extended over an area c 10m long by c 3m wide. However, the stakehole arrangement around the eastern end of Structure 18 extended its width to c 4.5m. These stakeholes, along with the fragments of daub (some burnt and some with withy impressions) found within it, imply that Structure 18 had some form of wattle-and-daub superstructure. Loom weights and lava querns from the many fills indicate industrial use of the near vicinity. The latest pottery present (from a sealed context) was a single shell-tempered sherd dated c 1050–1225 but, as noted above, this is probably intrusive. The cereal grain recovered from Structure 18 suggested that it was used for corn drying. The sequence of intercutting elements indicated a series of small structures in use over a period of time. To the west of Structure 18, pit [322] also contained significant amounts of charred plant remains as well as local Roman pottery and two fragments of quernstone.

To the east of Structure 18, Structure 19 (Fig 2; Fig 15) consisted of two shallow elongated pits; the northern of the pair was filled with charcoal and its longer and shallower southern counterpart surrounded by a dense cluster of stakeholes. Like Structure 18 it is dated to c 1050–1225 by a single shell-tempered sherd. The northern, charcoal-filled component of Structure 19 produced a charred plant assemblage, the largest part of which comprised weed seeds (sample {15}). The c 60 cereal grains present came mostly from rye (*Secale cereale*) and barley (*Hordeum vulgare*), but very little cereal chaff was found. This contrasts with the assemblages from the other cereal-processing features (below). It is likely that the remains represent burnt fuel residues from the final use of the feature.

Pit [412] contained Roman, Saxon and medieval pottery and daub. However, the radiocarbon date from [412] of cal AD 690–890 matches those from the cemetery (Table 8, UBA-20697). Once again, pit [412] contained charred plant remains.

THE CHARRED PLANT REMAINS FROM STRUCTURES 18 AND 19 AND PITS [322] AND [412]

Samples ({18}, {17} and {16}) from three fills of Structure 18 each contained large assemblages of charred remains. Grains in sample {18}, from a basal fill, had been cleaned of the majority of chaff and weed seeds. The proportions of the cereals were rather different from those found in the other pits, with 50% of the grain identified as rye (*Secale cereale*), 35% as barley (*Hordeum vulgare*) and with little wheat (*Triticum* sp) or oats (*Avena* sp).

Sample {19} from pit [322] produced over 300 charred items identified per litre of sediment. These were predominantly cereal grains (c 70% of the assemblage), with a relatively small proportion of chaff and very few weed seeds. Almost half of the identified grains were from barley (*Hordeum vulgare*), with a substantial proportion of free-threshing wheat (*Triticum aestivum/turgidum/durum*), some rye (*Secale cereale*) and just three grains of oat (*Avena* sp). Chaff came from the same three main cereals and some wheat rachis nodes were identifiable to probable bread wheat (*T. cf. aestivum*), suggesting that the wheat grains probably belonged to this species. Preservation of both grains and chaff was poor, however, and many grains and rachis fragments could not be identified. Very similar proportions of each cereal grain were seen in a smaller charred assemblage from sample {23}, although weed seeds were considerably more numerous in this sample. In both {19} and {23} the most abundant seeds came from stinking mayweed (*Anthemis cotula*), vetch/wild pea (*Vicia/Lathyrus* sp), docks (*Rumex* spp), brome (*Bromus* sp) and other wild grasses (Poaceae), all common weeds of arable fields.

However, it should be noted that samples {19} and {23} were from the upper fills of the pit, and as such do not describe the pit but the dumping of material from the surrounding area.

Pit [412] contained a large assemblage of cereal grains and weed seeds. The majority of grains were from barley (*Hordeum vulgare*) and free-threshing wheat (*Triticum aestivum/turgidum/durum*), but with rye (*Secale cereale*) almost as frequent in this case. A number of charred flax (*Linum usitatissimum*) seeds, together with several horse beans (*Vicia faba*), a blackberry (*Rubus cf. fruticosus* agg) pip and fragments of hazelnut (*Corylus avellana*) shell, indicate the disposal of domestic waste, probably including the cereal grains, in the final use of this hearth. No cereal chaff was found in this sample, and the relatively abundant weed seeds are most likely to have come from burnt fuel residues. Included in the assemblage was a seed from gold-of-pleasure (*Camelina sativa*), a plant cultivated as an oilseed crop in the past but which is also a common weed of flax. As both species occurred only in this sample, it is likely that they were associated, and perhaps the weeds used as fuel were a by-product from the cleaning of a flax crop rather than from cereals.

DISCUSSION OF THE PLANT REMAINS

The concentration of charred cereal remains in Plot 5 suggests that cereal processing was taking place here. All the studied assemblages contained cereal grains, with some chaff in most, and significant numbers of weed seeds. The proportions of these components varied, from relatively clean grain with very few weed seeds recorded in pit [322] to that from pit [412] in which weed seeds made up almost 60% of the assemblage. Barley (*Hordeum vulgare*) was the most abundant grain in the pits, closely followed by free-threshing wheat (*Triticum aestivum/turgidum*), but in the assemblages from Structures 18 and 19 rye (*Secale cereale*) grains were more numerous than barley, with wheat accounting for less than 10% of the identified grains. It is evident that all three cereals were in use on the site, and may have been used as bread grains.

Chaff fragments, in the form of rachis nodes and internodes, were generally less abundant than grains. These remains survive charring less well than grains, and the higher numbers of wheat rachises in most samples may be because barley and rye chaff is more delicate than wheat and so less likely to have survived. The charred weed seeds were dominated by stinking mayweed (*Anthemis cotula*), a plant of nutrient-rich loams and clay soils, whose seeds greatly outnumbered all other taxa. Vetch/wild pea (*Vicia/Lathyrus* sp) seeds

were quite numerous and those of cleavers (*Galium aparine*), orache (*Atriplex* sp), docks (*Rumex* spp), brome (*Bromus* sp) and other wild grasses (Poaceae) were also recovered from all samples of this date.

Free-threshing cereals, such as those described here, are unlikely to have been deliberately exposed to fire except during drying, either before storage to prevent spoilage, or to harden the grain prior to milling. In either of these activities a proportion of the grain may have become accidentally charred, and thus discarded. If the function of Structure 19 was as a bread oven, the grain may well have been being prepared for milling, and the finds of quernstones in the same area adds weight to this interpretation. Alternatively, perhaps, Structure 19 was used for drying grain. By this stage grain would have been cleaned of all but occasional chaff and weed seeds, so the presence of these components in the samples would indicate mixing with burnt fuel debris after deposition.

Bread is likely to have been an essential part of any meal during the Anglo-Saxon period (Hagen 1992, 18), with wheat being the preferred grain for baking as it produces a lighter loaf than other cereals. Barley and rye bread are both heavier, and have a stronger flavour than wheaten loaves. The use of all three cereals for flour is attested in the Leechdoms, which refer to barley, wheat and rye 'meal' (ibid, 14).

Little evidence was found for non-cereal foods in these samples, although a number of flax (*Linum usitatissimum*) seeds, beans (*Vicia faba*) and hazelnut (*Corylus avellana*) shell fragments in the sample from hearth [412] give some idea of plant foods eaten on the site.

OTHER EVIDENCE OF SAXON OR LATER ACTIVITY

In the north-east of Plot 5 was a c 5.5m x 4m sub-oval feature [177] (Fig 2). It was c 2m deep and waterlogged at its base. This feature is interpreted as a well. A small quantity of ironworking slag was found in the basal fill. Several sherds of prehistoric and Roman pottery, ceramic building material and some fragments of copper were also recovered.

The Saxon finds

POTTERY

Saxon pottery was recovered from a range of features, including Structure 18 in Plot 5 and the marsh deposits of Open Area 7 in Plot 6–7. It amounted to 26 sherds (10 ENV; 196g). The sherds are of average size (up to 55mm across). Almost all the Saxon pottery has a fine silty matrix with organic/chaff temper, and was probably made quite locally. Decorated body sherd <P14>, from pit [53] in Plot 5, in a fine sandy fabric made of London Clay with sparse organic matter (fabric LS1), has small, closely-spaced round bosses (diameter c 16mm) at intervals across the surface of the body (Fig 11). This form of decoration has been found on several sites in Canterbury, where it is dated to c AD 850–75 (Macpherson-Grant 1995, 870, fig 374, no. 287A).

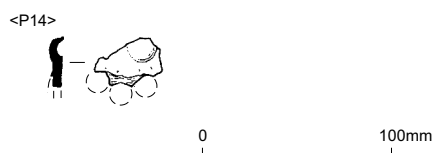


Fig 11 Bossed middle Saxon pottery sherd <P14> (scale 1:4)

DAUB

'Saxon' daub was characterised by frequent dark red iron oxide inclusions, particularly the daub from enclosure ditch Structure 16 which has a vitrified surface. A few pieces have a fairly flat surface and there are a small number with circular withy impressions between c 12mm and c 25mm in diameter.

LOOM WEIGHTS

Nine fragments (604g) of Saxon ceramic loom weight were recovered from four different contexts within Plot 5. These represent at least four different weights, none complete; two tiny fragments (4g) were too small to be definitively identified. The fabrics are somewhat variable but all are coarse, consisting of poorly-mixed iron-rich sandy clay with poorly-sorted flint inclusions.

Circular ceramic loom weights are common finds on Saxon sites. They were used to tension threads on a warp-weighted loom, and reflect an important aspect of the domestic economy of the period (Walton Rogers 2007, 28–32). Because many were required to weight each loom, they are sometimes found in large groups which can indicate a storage area or a loom decayed *in situ*. The few scattered examples from Kingsnorth indicate Saxon occupation somewhere in the vicinity but not within the excavated areas.

Three basic forms of weight annular, intermediate or bun-shaped (Hurst 1959, 23–5 and fig 6) tend to be equated with the early, middle and late Saxon periods respectively. However, it is now clear that there is considerable chronological overlap and the types can appear together (eg Goffin 2003, 218, table 34). Weights <294> and <S5> are of intermediate form and another example, <215>, is probably from a weight of this form as well, albeit with a slightly larger or off-centre perforation. A biconical/bun-shaped weight <S6> was associated with Structure 18. Of these, <S5> has a circular stamp while <S6> has a sub-rectangular stamp (Fig 12).

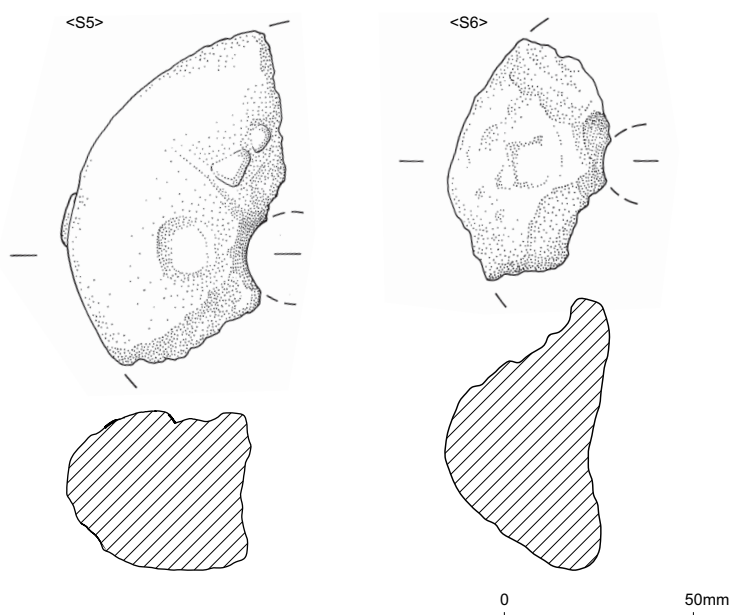


Fig 12 Loom weights <S5> and <S6> (scale 1:2)

In Kent the annular type appears from as early as the fifth to sixth centuries at Darenth (Philp 1973, 154–5, nos 462–3), while a date as late as the early twelfth century has been claimed for bun-shaped examples at Rochester (Harrison 1972, 144, 156). Riddler, however, has argued that this is too late and that the warp-weighted loom had gone out of use in the region during the eleventh century (Andrews and Riddler 2006, 9), perhaps as a result of the switch to beam-tensioned or horizontal looms (Wilson 1976, 271).

QUERNS

The assemblage of 141 fragments of imported lava rotary quern weighs a mere 3.25kg, less than some individual querns. Most are highly abraded, retaining little indication of their original form, but nonetheless provide evidence for the processing of grain on the site. Mayen Lava querns, from Germany, were widely traded and are common finds after the Roman invasion of Britain in AD 43 (Crawford and Röder 1955; Peacock 1980). Largely absent from early Saxon contexts, they are again found in middle Saxon and later

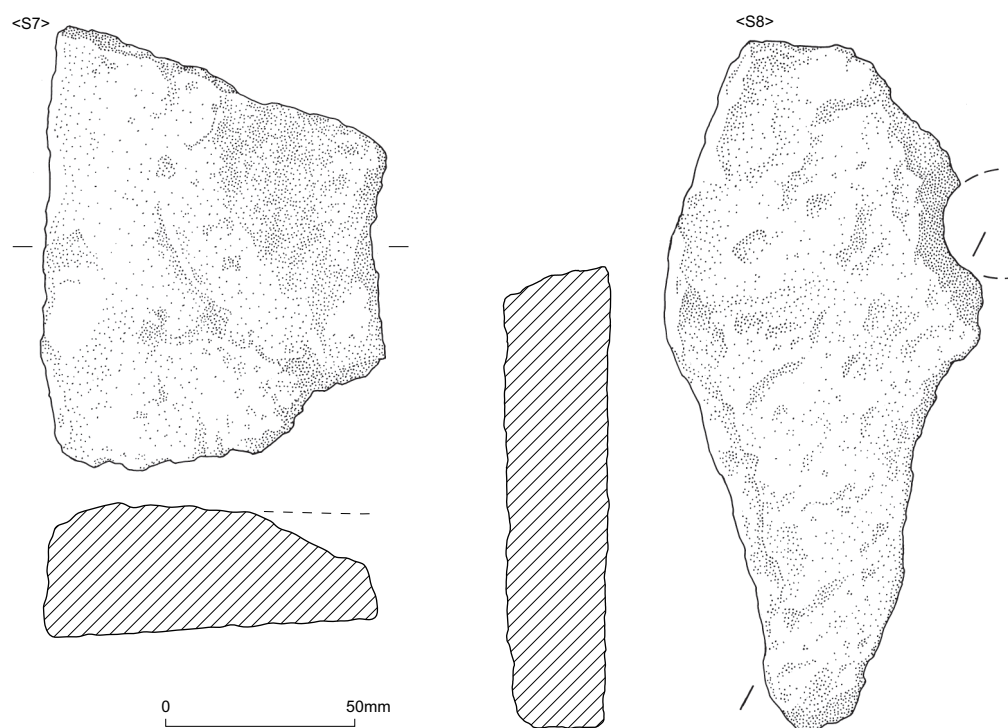


Fig 13 Lava querns <S7> and <S8> (scale 1:2)

contexts (Pritchard 1991; Blackmore 2008, 194–5). The two most complete querns, <S7> and <S8>, seem to derive from flat, relatively thin discoid forms (Fig 13) more typical of the Saxon period and came from areas in Plot 5 that also produced Saxon loom weights. It is possible that the whole assemblage is of this date, but less well-preserved fragments cannot be dated and none are from firmly dated contexts.

Beyond a general concentration in Plot 5, there is no obvious spatial focus to the quern assemblage and, given their poor condition and wide distribution, many may have been disturbed and moved about the site. Structure 18 in Plot 5 produced both charred grain and lava quern fragments but these relatively small pieces do not reflect *in situ* milling.

IRONWORKING SLAG

A very small assemblage of ironworking slag (17 fragments weighing a total of 0.43kg) was recovered from two contexts in Plot 5. The first was [176], the basal fill of well [177], a context which also contained copper fragments. The second was [346], a fill of pit [347], which also contained a single sherd of probably residual prehistoric pottery. No microslags or hammerscale were recovered. The iron slag from both contexts was magnetic, dark grey and vesicular with charcoal fragments within the matrix. The largest fragment recovered is only 75mm across and partly comprises ceramic presumably from furnace or hearth lining. The assemblage is essentially both undated and undiagnostic and far too small to represent any kind of sustained ironworking.

The middle Saxon period: discussion

The middle Saxon cemetery, set on a slightly raised bluff, contrasts with the scant evidence from this period found at Damhead Creek to the south of the site (Griffin 2004). While it is likely that the main settlement focus was near modern Hoo St Werburgh, c 3 km to the south-west, the cemetery indicates that a small community was active on the site for at least several generations at some point in the seventh to ninth

centuries AD. There is no indication that the cemetery was of high status – there is for example a complete absence of grave goods – and it is likely to represent the inhumation of an essentially agricultural community. More generally it should be noted that the cemetery is one of the few examples in Kent from this period.

Conclusions: the archaeological landscapes

A variety of uses of parts of the site are demonstrated in the Middle–Late Bronze Age: cremation burials in Plot 6–7, possible industrial activity in Plot 8–11 and the discarded worked flint and pottery in Plot 5 hint at a nearby occupation site. The burials are situated on higher, drier ground, while activity in the other zones probably reflects exploitation of resources closer to the tidal zone.

Evidence for a possible Late Bronze Age field system was found immediately south of the site at Damhead Power Station. The absence of similar boundary features of this period from the site itself suggests that it lay just beyond, or outside, the structured Late Bronze Age landscape.

The associated marsh deposits (Open Area 7) seen in Plot 6–7, with their Middle–Late Bronze Age pottery and worked flint finds, would have created a natural boundary. If a cremation cemetery also existed on a dry promontory above the intertidal marshes, it would have added to the sense of liminal or marginal land.

On the site the earliest established features were the field system in Plot 8–11 and the droveway (R1) in Plot 5. These features, dating from possibly as early as the first century AD, had a shared alignment, despite being over 200m apart and probably either side of the watercourse that crossed the site (Fig 14). To the south of the site, at Damhead Power Station, the Roman ditches also shared this alignment, but unlike the present site there were also a number of Bronze Age and Iron Age ditches that ran either approximately north-west to south-east or at a right angle. It is interesting to note that all these alignments are reflected in the modern field patterns to the north and west of the site.

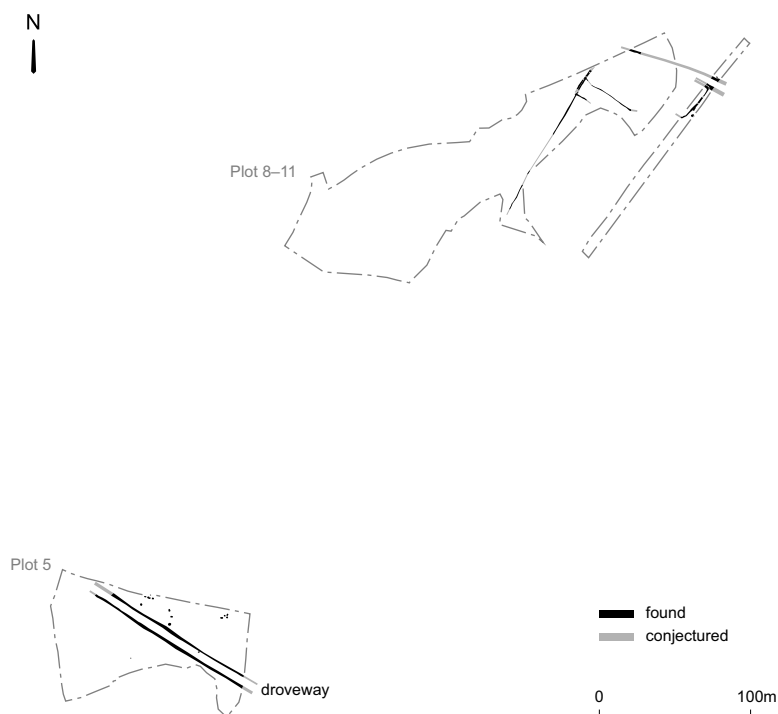


Fig 14 The Roman landscape (scale 1:5000)

While demonstrating shared alignment it is curious, however, that the Saxon ditches in both Plot 5 and Plot 6–7 would appear to have rotated anti-clockwise, closer to an east–west alignment (Fig 15) compared with

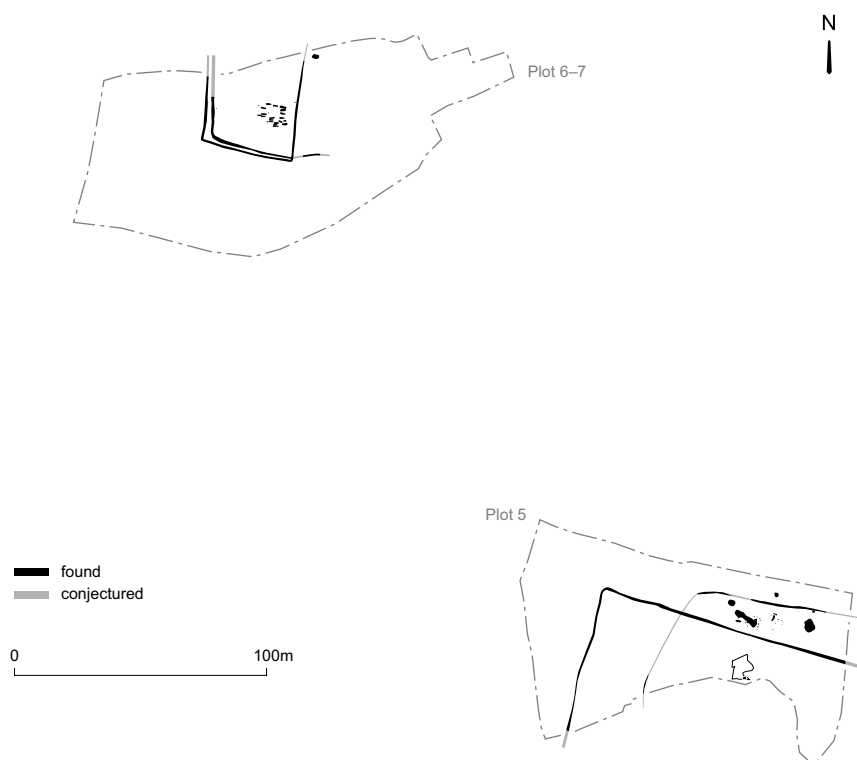


Fig 15 The Saxon landscape (scale 1:3000)

the Roman features. The reason for this is unclear but reinforces the notion of an independent period within the landscape. The cemetery and cereal processing were probably separated by the watercourse on the site, although in this case limited evidence in the vicinity suggests that the watercourse was more of a focus than a boundary.

How this community ceased is unclear, but 27 sherds of medieval pottery, dated to before c 1225 and possibly the result of field manuring associated with enclosure ditch Structure 16, suggest that some form of land use continued.

Acknowledgements

Museum of London Archaeology (MOLA) would like to thank Goodmans International Ltd who generously funded the archaeological work, in particular Martin Scambler and Dave Rothwell. Our thanks also go to Ben Found, the County Archaeological Officer from Kent County Council Heritage, who monitored the site.

The fieldwork was supervised by Steven Turner, with the subsequent assessment and analysis by Isca Howell, who also wrote this article with Mike Henderson (human osteology) and Graham Spurr (geoarchaeology). Specialist input came from Jonathan Cotton (worked flint, perforated clay slabs, fired clay and Bronze Age pottery), Michael Marshall (accessioned finds and ironworking slag), Amy Thorp (Roman pottery), Lyn Blackmore (Saxon and medieval pottery), Ann Davies (plant remains), Ian Betts (building material), Alan Pipe (animal bone), Rob Scaife (pollen analysis) and John Whittaker (ostracods).

The illustrations were prepared by Judit Peresztegi, including the use of original drawings of the pottery and flint tools by Hannah Faux, and digital site graphics supplied by MOLA's geomatics team, in particular Raoul Bull.

The following field staff were involved in the project: Charlotte Baron, Tony Baxter, Will Carke, Tom Eley, Matthew Ginnever, Greg Laban, Will Mills, Steve Price, Paul Owens, Ruth Rolfe and Nigel Ward. Survey support was by Mark Burch, Neville Constantine, Catherine Drew and Gideon Simons. Stewart Hoad managed the field project, with post-excavation management by Nicola Powell and Julian Hill.

Appendices

Appendix 1: Catalogue of illustrated pottery

<P1> Late Bronze Age base sherd (Fig 5)

[782]; OA3, period 2

Finger-smeared base of brittle fabric with wall 7mm thick (fabric code: FLIN 6).

<P2> Late Bronze Age fine ware bowl (Fig 5)

[782]; OA3, period 2

Round-shouldered fine ware bowl with plain upright rim, burnished surfaces and wall 5mm thick (fabric code: FLIN 7).

<P3> Middle Bronze Age rim sherd (Fig 5)

[38]; OA2, period 2

Upright plain flattened rim 10mm thick in brittle laminated fabric (fabric code: FLIN 2).

<P4> Middle Bronze Age base sherd (Fig 5)

[38]; OA2, period 2

Externally expanded base with wall 12mm thick (fabric code: FLIN 3).

<P5> Middle Bronze Age jar (Fig 5)

[275]; OA2, period 2

Heavy jar with pointed, externally thickened and closed plain rim 10mm thick with contraction cracks on the exterior (fabric code: FLIN 2).

<P6> Middle Bronze Age base sherd (Fig 5)

[275]; OA2, period 2

Heavy upright base with wall 10mm thick (fabric code: FLIN 1).

<P7> Middle Bronze Age decorated body sherd (Fig 5)

[312]; OA2, period 2

Abraded and shattered body sherd with low finger-impressed applied cordon at the girth (fabric code: FLIN 3).

<P8> Middle Bronze Age urn (Fig 5)

[323]; OA2, period 2

Upright urn with plain rounded rim and plain applied cordon below, and wall 10mm thick (fabric code: FLIN 2).

<P9> Middle Bronze Age decorated body sherd (Fig 5)

[30]; R1, period 3

Body sherd with low finger-pinched decoration and wall 8mm thick (fabric code: FLIN 4).

<P10> Late Bronze Age jar (Fig 5)

[30]; R1, period 3

Plain open jar with external thickening towards the rim, brittle fabric with wall 8mm thick (fabric code: FLIN 5).

<P11> Middle Bronze Age rim sherd (Fig 5)

[513]; S7, period 4

Plain, slightly everted rim with wall 7mm thick (fabric code: FLIN 4).

<P12> Late Bronze Age bowl (Fig 5)

[554]; S9, period 4

Beaded rim of round-shouldered bowl with smoothed surfaces and wall 5mm thick (fabric code: FLIN 6/7).

<P13> Middle Bronze Age rim sherd (Fig 5)

[106]; OA7, period 5

Plain upright rim with wall 6mm thick (fabric code: FLIN 4).

<P14> middle Saxon decorated body sherd (Fig 11)

[52]; OA8, period 5

Body sherd decorated with small, closely-spaced round bosses (diameter c 16mm) at intervals across the surface of the body, made by pushing a circular object (diameter 10–11mm) into the inner surface of the pot; dated to c AD 850–75 (Macpherson-Grant 1995, 870, fig 374, no. 287A). Fine sandy fabric made of London Clay with sparse organic matter (fabric code: LS1).

Appendix 2: Radiocarbon dating

The results of radiocarbon dating of eleven samples from Kingsnorth are presented in Table 8. Samples were taken from teeth, bone and terrestrial plant material and dates obtained by the 14CHRONO Centre for Climate, the Environment, and Chronology at Queen's University Belfast by accelerator mass spectrometry (AMS). The results are conventional radiocarbon ages (Stuiver and Polach 1977) and are quoted in accordance with the international standard known as the Trondheim convention (Stuiver and Kra 1986).

Calibrations relate the radiocarbon measurements directly to the calendrical time scale and are calculated using the datasets published by Reimer et al (2013) and the computer program OxCal v4.2 (Bronk Ramsey 1995; 1998; 2001; 2009). The ranges have been calculated according to the maximum intercept method (Stuiver and Reimer 1986) and quoted in the form recommended by Mook (1986) with the end points rounded outwards.

Lab no.	MOLA ref	Sample type & context	Radiocarbon determination (yrs BP)	$\delta^{13}\text{C}$	$\delta^{15}\text{N}$	C:N	Calendar age (2 σ calibration)
UBA-20542	KT-IGM10 BH20_2.10	seeds from borehole	174 \pm 28	-27.4	-	-	cal AD 1650–?present
UBA-20543	KT-IGM10 BH23_0.59	seeds from borehole	833 \pm 30	-25.3	-	-	cal AD 1150–1270
UBA-20541	KT-IGM10 BH23_-1.22	sediment from borehole	4811 \pm 36	-25.4	-	-	3660–3520 cal BC
UBA-20698	KT-IGM10 C247	charred barley grain [247] (S18)	1142 \pm 28	-30.0	-	-	cal AD 770–990
UBA-20700	KT-IGM10 C356	charred tuber [356] (Bu 2)	2998 \pm 29	-24.6	-	-	1380–1120 cal BC
UBA-20701	KT-IGM10 C726	charred chaff [726] (OA5)	1844 \pm 29	-22.9	-	-	cal AD 80–240
UBA-20277	KT-IGM10 _351	human bone – left rib shaft [351] (Bu 6)	1216 \pm 33	-19.33	13.02	3.30	cal AD 680–890
UBA-20278	KT-IGM10 _148	human bone – left rib head [148] (Bu 5)	1226 \pm 32	-19.79	12.67	3.35	cal AD 680–890
UBA-20279	KT-IGM10 _137	human tooth [137] (Bu 4)	1271 \pm 33	-19.72	13.90	3.24	cal AD 660–870
UBA-20697	KT-IGM10 C411	charred barley grain [411] (OA8)	1224 \pm 27	-21.8	-	-	cal AD 690–890
UBA-20699	KT-IGM10 C490	charred barley grain [490] (OA6)	1230 \pm 37	-18.1	-	-	cal AD 680–890

Table 8 Radiocarbon determinations calibrated using the datasets published by Reimer et al (2013) and the computer program OxCal v4.2 (Bronk Ramsey 1995; 1998; 2001; 2009)

Appendix 3: Burial catalogue of cremation burials (OA3, period 2)

Bu 1 cremation burial
[115]; OA3, period 2

A total weight of 105.3g of burnt bone was recovered from the fill of circular pit [115]. The largest fragment measured 20.7mm in diameter and the mean fragment size was 10mm. Approximately 15% of fragments were identifiable to body area, including elements of cranium, upper limb and the majority (44.6%) identified as from the lower limb, likely as a result of a higher survival rate of the more robust cortical bone. The high level of fragmentation was reflected in the small proportion of bone that fell within the >10mm fraction (5.0%) compared to the majority in the >4mm fraction (89.3%).

Bu 2 cremation burial
[357]; OA3, period 2

A total weight of 73.3g of burnt bone was found within sub-circular pit [357]. The largest fragment measured 25mm with a mean fragment size of 10mm. Approximately 14% of bone was identifiable, comprising elements of upper and lower limb with the majority identified as cranial fragments. The greatest proportion of bone fell within the >4mm fraction (77.6%) with only 7.6% in the >10mm sieve.

Appendix 4: Burial catalogue of inhumations in cemetery (OA6, period 5)

Bu 3 multiple inhumation

[140]; OA6, period 5

East–west aligned grave containing the skeletal remains of two individuals. Skeleton [129] was poorly preserved (16.5% complete) and aged 26–35 years with dental calculus. Skeleton [139] was also poorly preserved (5.8% complete) and aged greater than 18 years.

Bu 4 multiple inhumation

[459]; OA6, period 5

East–west aligned grave containing the skeletal remains of two individuals. Skeleton [135] comprised the moderately well-preserved remains (14.9% complete) of a male aged 36–45 years, with trauma to the right first metacarpal and secondary osteoarthritis. Skeleton [137] was the moderately well-preserved remains (52.9% complete) of an individual aged 12–17 years. Skeleton [137] was radiocarbon dated to cal AD 680–860 (Table 8, UBA-20279).

Bu 5 inhumation

[149]; OA6, period 5

East–west aligned grave containing the moderately well-preserved remains (62.8% complete) of female skeleton [148]; aged 36–45 years, with dental calculus and possible osteoid osteoma on the left femur. Radiocarbon dated to cal AD 680–890 (Table 8, UBA-20278). This inhumation was located over an earlier inhumation (Bu 6), possibly representing an additional interment in a known plot.

Bu 6 inhumation

[352]; OA6, period 5

East–west aligned grave containing the moderately well-preserved remains (64.5% complete) of female skeleton [351]; aged 26–35 years, with dental calculus and left calcaneal double facet. Radiocarbon dated to cal AD 690–890 (Table 8, UBA-20277). The lower left arm appeared to have been moved to accommodate the insertion of another inhumation (Bu 5) at a later date.

Bu 7 inhumation

[133]; OA6, period 5

East–west aligned grave containing the poorly-preserved remains (12.4% complete) of skeleton [132] aged 36–45 years. This inhumation was cut by a later inhumation (Bu 8).

Bu 8 inhumation

[365]; OA6, period 5

East–west aligned grave containing the poorly-preserved remains (18.2% complete) of female skeleton [364] aged greater than 18 years. This inhumation had cut through an earlier inhumation (Bu 7).

Bu 9 multiple inhumation

[143]; OA6, period 5

East–west aligned grave containing the skeletal remains of three individuals. Skeleton [359] was the moderately well-preserved remains (28.1% complete) of a male aged 36–45 years with severe dental wear. The interment of skeleton [359] appeared to have disturbed an earlier burial, as the disarticulated remains of a female skeleton [358] had been neatly stacked along the south edge of the grave to make room for the second burial. The remains of the earlier skeleton [358] were moderately well preserved (31.4% complete) and aged 26–35 years. The third skeleton [142] comprised the poorly-preserved remains (34.7% complete) of a perinate aged between 36 weeks pre-term and 4 weeks post-term.

Bu 10 inhumation

[462]; OA6, period 5

East–west aligned grave containing the moderately well-preserved remains (43.0% complete) of female skeleton [461]; aged greater than 46 years, with an edentulous maxilla and osteochondritis dissecans of the left femur.

Bu 11 inhumation

[472]; OA6, period 5

East–west aligned grave containing the moderately well-preserved remains (57.9% complete) of possible male skeleton [471]; aged 36–45 years, with dental calculus, caries, periodontal disease, an edentulous maxilla, osteoarthritis on the left first metatarsal head and severe degeneration of a femoral head. Curiously, the poorly-preserved remains (6.6%) of a perinate [785] aged between 36 weeks pre-term and 4 weeks post-term were recovered from this sample.

Bu 12 inhumation

[362]; OA6, period 5

East–west aligned grave containing the well-preserved remains (76.9% complete) of male skeleton [361]; aged 36–45 years, with dental calculus, caries, periodontal disease and severe dental wear, as well as bilateral tibial squatting facets. This individual would have stood 1.68m high.

Bu 13 inhumation

[146]; OA6, period 5

East–west aligned grave containing the well-preserved remains (31.4% complete) of male skeleton [145]; aged 26–35 years, with dental calculus, caries, periapical lesion and severe dental wear.

Bu 14 inhumation

[480]; OA6, period 5

East–west aligned grave containing the well-preserved remains (76.0% complete) of male skeleton [479]; aged 26–35 years, with dental calculus, dental trauma and sharp force trauma to the cranium (Fig 10) and sternum; also bilateral double atlas facets, os acromiale, double calcaneal facets, bilateral tibial squatting facets, and septal aperture of the left humerus. This individual would have stood 1.74m high.

Bu 15 inhumation

[355]; OA6, period 5

East–west aligned grave containing the moderately well-preserved remains (22.3% complete) of male skeleton [354]; aged 36–45 years, with dental calculus, caries, periodontal disease, periapical lesion and severe dental wear.

Bu 16 inhumation

[465]; OA6, period 5

East–west aligned grave containing the well-preserved remains (37.2% complete) of male skeleton [464]; aged 26–35 years, with bilateral double calcaneal facets, third trochanter on the right femur and a lateral squatting facet on the left tibia. This individual would have stood 1.74m high.

Bu 17 inhumation

[487]; OA6, period 5

East–west aligned grave containing the moderately well-preserved remains (48.8% complete) of male skeleton [486]; aged 36–45 years, with dental calculus, enamel hypoplasia and severe dental wear.

Bu 18 inhumation

[494]; OA6, period 5

East–west aligned grave containing the moderately well-preserved remains (31.4% complete) of subadult skeleton [493]; aged 12–17 years, with enamel hypoplasia.

Bu 19 inhumation

[497]; OA6, period 5

East–west aligned grave containing the moderately well-preserved remains (38.0%) of male skeleton [496]; aged greater than 46 years, with dental calculus, caries and severe dental wear. The remains of a human skull were found adjacent to the left humerus.

Bu 20 inhumation

[500]; OA6, period 5

East–west aligned grave containing the poorly-preserved remains (4.1% complete) of subadult skeleton [499] aged less than 18 years.

Bu 21 inhumation

[525]; OA6, period 5

East–west aligned grave containing the moderately well-preserved remains (21.5% complete) of male skeleton [524]; aged greater than 18 years, with bilateral double calcaneal facets.

Bu 22 inhumation

[367]; OA6, period 5

From a sub-oval feature, moderately well-preserved remains (2.5%) of subadult [784] aged 1–5 years.

Possible inhumation

[371]; OA6, period 5

East–west aligned grave-shaped feature but no human remains. Interpreted as a grave, but the reason for the absence of skeletal remains is unknown.

Possible inhumation

[502]; OA6, period 5

Sub-oval feature found adjacent to several burials. Despite the absence of any skeletal remains, this was interpreted as a grave because of evidence from Bu 22 and [371] (above).

Appendix 5: Catalogue of later prehistoric, probably Middle/Late Bronze Age, worked flint

<F1> Platform flake core (Fig 6)

[106]; OA7, period 5

Small irregular single platform flake core on a small cobble of grey-brown flint with thin, heavily abraded cortex. L 28mm, W 50mm, Th 23mm, Wt 40g.

<F2> Platform flake core (Fig 6)
 [106]; OA7, period 5
 Small irregular two-platform flake core of dark brown flint with thin heavily abraded cortex. Herzian cones on both striking platforms. L 38mm, W 38mm, Th 30mm, Wt 32g.

<F3> Platform flake core (Fig 6)
 [106]; OA7, period 5
 Irregular two-platform flake core of grey-orange/brown flint with multiple Herzian cones along one platform edge. L 36mm, W 60mm, Th 28mm, Wt 74g.

<F4> Thumbnail scraper (Fig 6)
 [107]; OA7, period 5
 Small 'thumbnail' scraper on distal end of a small squat secondary flake of semi-translucent orange-brown flint. L 20mm, W 25mm, Th 8mm, Wt 4g.

<F5> Knife (Fig 6)
 [107]; OA7, period 5
 Knife with fresh invasive ventral retouch along one margin of an already worked narrow flake/blade of banded grey-orange/brown flint. L 45mm, W 19mm, Th 5mm, Wt 8g.

<F6> Core (Fig 6)
 [38]; OA2, period 2
 Pebble worked as core on thermally shattered nodule of lustrous grey-black flint with smooth, thin cortex. Two striking platforms have been attempted on the same face; the subsidiary platform has a series of Herzian cones which have failed to detach any flakes. L 65mm, W 40mm, Th 25mm, Wt 89g.

<F7> Thumbnail scraper (Fig 6)
 [314]; OA2, period 2
 Small discoidal 'thumbnail' scraper on a secondary flake of semi-translucent grey-brown flint with thin, fresh buff cortex. L 32mm, W 35mm, Th 10mm, Wt 15g.

<F8> Secondary flake (Fig 6)
 [607]; OA2, period 2
 Large secondary flake of grey-brown flint with thick rough cortex with distal/side scraper-like retouch. L 65mm, W 45mm, Th 12mm, Wt 46g.

<F9> Primary flake (Fig 6)
 [609]; OA2, period 2
 Large primary flake from a previously worked nodule of semi-translucent grey-brown flint with steep marginal retouch at its proximal end. L 100mm, W 55mm, Th 20mm, Wt 127g.

<F10> Borer (Fig 6)
 [507]; S6, period 4
 Robust borer on the distal end of a tertiary flake (with a cortical striking platform) of semi-translucent grey-brown flint. L 43mm, W 42mm, Th 6mm, Wt 16g.

<F11> Borer/awl (Fig 6)
 [526]; S9, period 4
 Borer/awl on the distal end of a tertiary flake of banded grey-brown flint. L 47mm, W 30mm, Th 7mm, Wt 12g.

<F12> Thumbnail scraper (Fig 6)
 [128]; OA6, period 5
 'Thumbnail' scraper on a squat secondary flake of semi-translucent grey-brown flint. L 27mm, W 32mm, Th 13mm, Wt 13g.

<F13> Borer/notched piece (Fig 6)
 [110]; S4, period 5
 Combination borer/notched piece on the distal edge of a squat tertiary flake of opaque orange-brown flint. L 24mm, W 32mm, Th 13mm, Wt 8g.

<F14> End scraper (Fig 6)
 [73]; modern, Plot 8–11
 Small end scraper on tertiary narrow flake/blade of lustrous semi-translucent orange flint. L 35mm, W 18mm, Th 5mm, Wt 5g.

<F15> Platform flake core (Fig 6)
 [534]; modern, Plot 8–11
 Irregular two-platform flake core of grey-orange/brown flint with Herzian cones at one platform edge. L 40mm, W 50mm, Th 43mm, Wt 75g.

<F16> End scraper (Fig 6)
 [75]; topsoil stripping
 Small end scraper on a short tertiary flake of semi-translucent grey-brown flint. L 23mm, W 21mm, Th 7mm, Wt 5g.

Appendix 6: Catalogue of prehistoric accessioned finds

<S1> Perforated clay slab

<30>, [778]; OA3, period 2

Curving edge of perforated clay slab, with one perforation and traces of three others; abundant flint temper. Th 30mm at edge, 20mm at interior; 1 fragment; Wt 100g.

<S2> Perforated clay slab

<31>, [778]; OA3, period 2

Perforated clay slab fragments including one edge piece with two perforations; abundant flint temper. 25 fragments; Wt 147g.

Appendix 7: Catalogue of Roman accessioned finds

<S3> Iron knife (Fig 8)

<34>, [732]; OA5, period 3

Iron knife with straight back which curves up at the tip. The curved cutting edge is stepped down from the tang. Manning type 23 (Manning 1985, 118), a form originating in the Iron Age which survives into the Roman period. Complete; L 147mm, L of blade 87.5mm, max W of blade 25mm.

<S4> Iron tool (Fig 8)

<21>, [513]; S7, period 4

Iron tool, very corroded and cracked. Square-sectioned bar tapering gradually to a broken point at one end. The other end tapers to a narrower point, probably a tang. Probably a tanged punch or awl with a broken tip, but the irregular 'tang' alignment raises the possibility that this is a fortuitously broken fragment of a larger object. Complete; L 111.5mm, max W 11mm, max Th 10.5mm.

Appendix 8: Catalogue of post-Roman accessioned finds

CATALOGUE OF ILLUSTRATED LOOM WEIGHTS

<S5> Ceramic loom weight (Fig 12)

<11>, [301]; OA8, period 5

Incomplete; estimated Diam c 105mm, H 47mm, extant Wt 211g. Fragment from a ceramic loom weight of 'intermediate' form with a central perforation and a D-shaped section, probable representing about a third of the original weight. There is a radial groove projecting from the centre in the same position on either face, possibly caused by suspension, and a sub-circular stamp on one face. Coarse oxidised sandy fabric with quartz sand and occasional infrequent very poorly-sorted flint and other stone inclusions up to 16mm in size.

<S6> Ceramic loom weight (Fig 12)

<12>, [340]; S18, period 5

Incomplete; estimated Diam c 90mm, H 71mm, extant Wt 116.5g. Fragment from a ceramic loom weight of bun-shaped or biconical form, probably representing about a quarter of the original weight. It has an extremely uneven surface with a sub-oval impression approximately the size of a thumbprint on one side, with a rectangular stamp in the centre. Coarse sandy fabric with oxidised surface and reduced centre with occasional poorly-sorted stone inclusions.

CATALOGUE OF ILLUSTRATED QUERNS

<S7> Stone quern (Fig 13)

<19>, [316]; OA8, period 5

Incomplete; Diam c 450–500mm, Th at edge 27mm. Discoid Mayen lava rotary quern, upper stone edge fragment. Roughly finished exterior, worn grinding face.

<S8> Stone quern (Fig 13)

<20>, [406]; OA8, period 5

Incomplete; max Diam of spindle hole 40mm, min Diam of spindle hole 30mm, H at spindle hole 26.5mm. Discoid Mayen lava rotary quern, possible lower stone fragment with central spindle hole and approximately parallel faces, c 25mm apart, thickening to 27mm at the spindle hole.

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