

Archaeological Investigations at Broom Quarry, Bedfordshire: Phases 11-13

Post Excavation Assessment Volume I



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Volume I

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Summary

A series of archaeological excavations were undertaken by Cambridge Archaeological Unit (CAU) ahead of gravel extraction at Broom Quarry, Broom, Bedfordshire on behalf of Lafarge Tarmac Ltd (formerly Tarmac Ltd). The work was carried out in four phases over the period 2007-2012, with excavations undertaken across an area totalling 11.7ha.

Spanning the period between the Early Neolithic and the 6-7th century AD, seven main phases of activity have been identified, however, the main focus of the excavations comprised a substantial multi-phase Middle Iron Age settlement. A total of 24 roundhouses and 20 settlement enclosures were recorded belonging to at least three phases of Middle Iron Age settlement and representing a gradual shift from open settlement (roundhouses situated within an 'open' field system) to enclosed settlement. In addition some 870 pits were associated with the Middle Iron Age settlement. The pits particularly produced important finds assemblages including comparatively high numbers of 'special' deposits, amongst which a series of Associated Bone Groups are of particular significance.

This report outlines the results of the excavations before considering the significance of the site and its finds assemblages, as well as its potential to further our understanding of the Iron Age in the region and beyond.

1.0 INTRODUCTION

This report details a series of archaeological excavations undertaken by Cambridge Archaeological Unit (CAU) ahead of Phases 11-13 of gravel extraction at Broom Quarry, Broom, Bedfordshire on behalf of Lafarge Tarmac Ltd (formerly Tarmac Ltd). The work was carried out in four phases over the period 2007-2012, with excavations undertaken across an area totalling 11.7ha to the east of Gypsy Lane (centred on TL179 437).

The work followed an archaeological evaluation of the area undertaken in 2003 (Cooper and Knight 2004). The evaluation, which comprised aerial photographic survey, geophysical survey and trial trenching, identified seven concentrations of archaeology dating from the Neolithic through to the Saxon period including significant Iron Age and Roman settlement remains.

The project was commissioned by Andrew Josephs Associates on behalf of Lafarge Tarmac Ltd. Each phase of work was undertaken in accordance with an Archaeological Management Plan prepared by Andy Josephs (2003) and a project design specification (Gibson 2006) produced by the CAU in response to a brief by Martin Oake of the Archaeology Team of Development Management at Central Bedfordshire Council.

The site codes for the various phases of excavation were BEDFM2007.655, BEDFM2011.68 and BEDFM2012.51.

1.1 Location, geology and topography

The site is located immediately to the east of Gypsy Lane, less than 1km to the north-east of Broom and approximately 1.5km to the west of Biggleswade town centre (Figure 1). It is situated at a height of *c.*35m OD on a terrace occupying the western flank of the valley of the River Ivel. The river valley is gently undulating and bisected north to south by a canalised section of the Ivel. The underlying geology comprises glacial sands and gravel overlying Oxford Clay (www.bgs.ac.uk/geoindex). Prior to gravel extraction the site comprised arable fields.

1.2 Archaeological background

Situated in the valley of the River Ivel, a tributary of the River Great Ouse, Broom Quarry lies within a landscape rich in archaeological remains dating from prehistory (the earliest evidence dating to the Palaeolithic) through to the post-medieval period. The Bedfordshire Historic Environment Record lists numerous find spots in the vicinity including Palaeolithic hand axes recovered from the glacial gravels, flint arrowheads and Iron Age coins. However, the major source of evidence for archaeological activity in the area comprises aerial photographs, which show significant cropmark complexes along this stretch of the River Ivel (see Figures 1 and 2). Previous phases of quarrying at Broom, to the north-west of the current site have allowed a number of these cropmark complexes to be investigated and the resulting

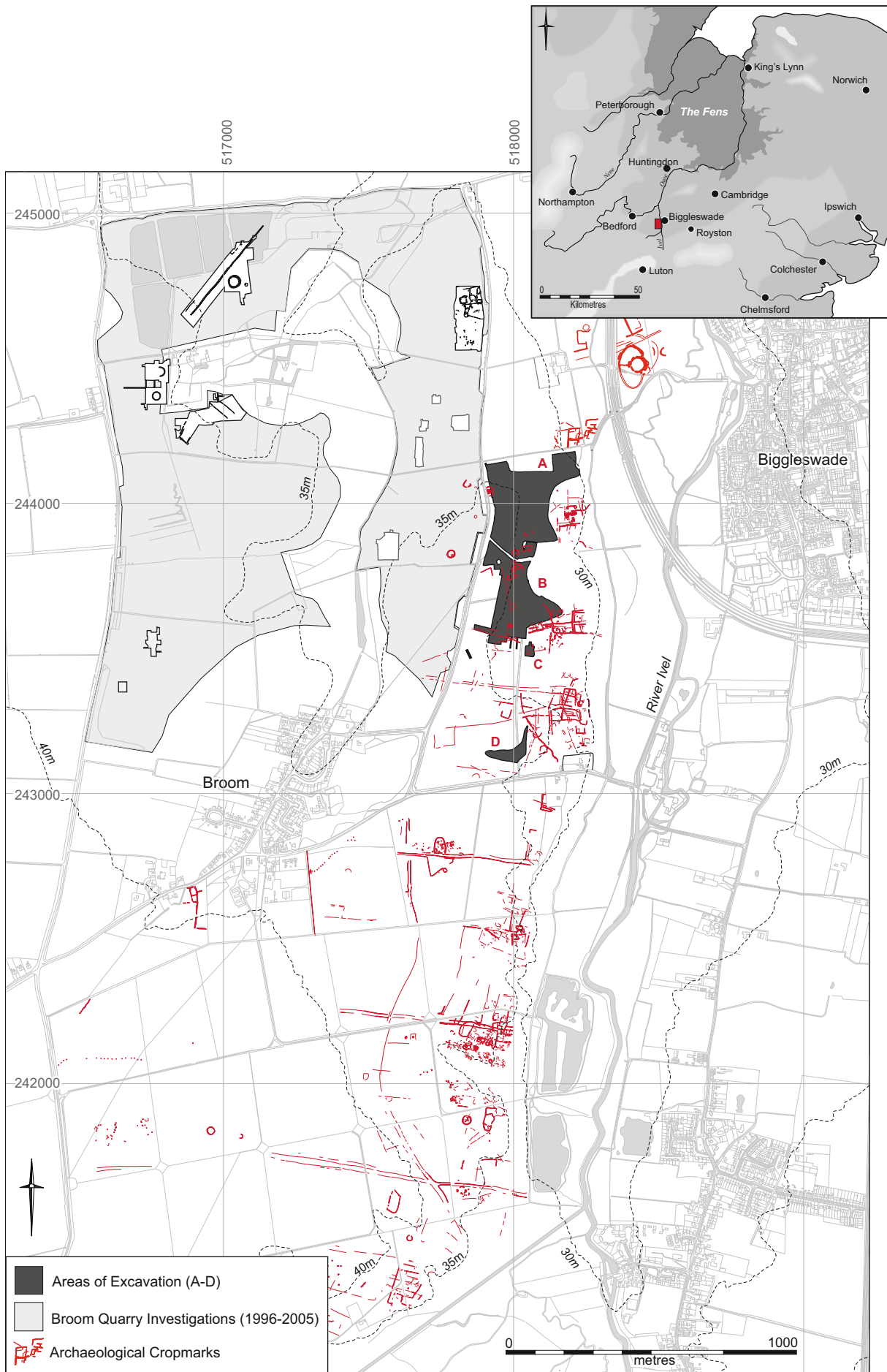


Figure 1. Site location

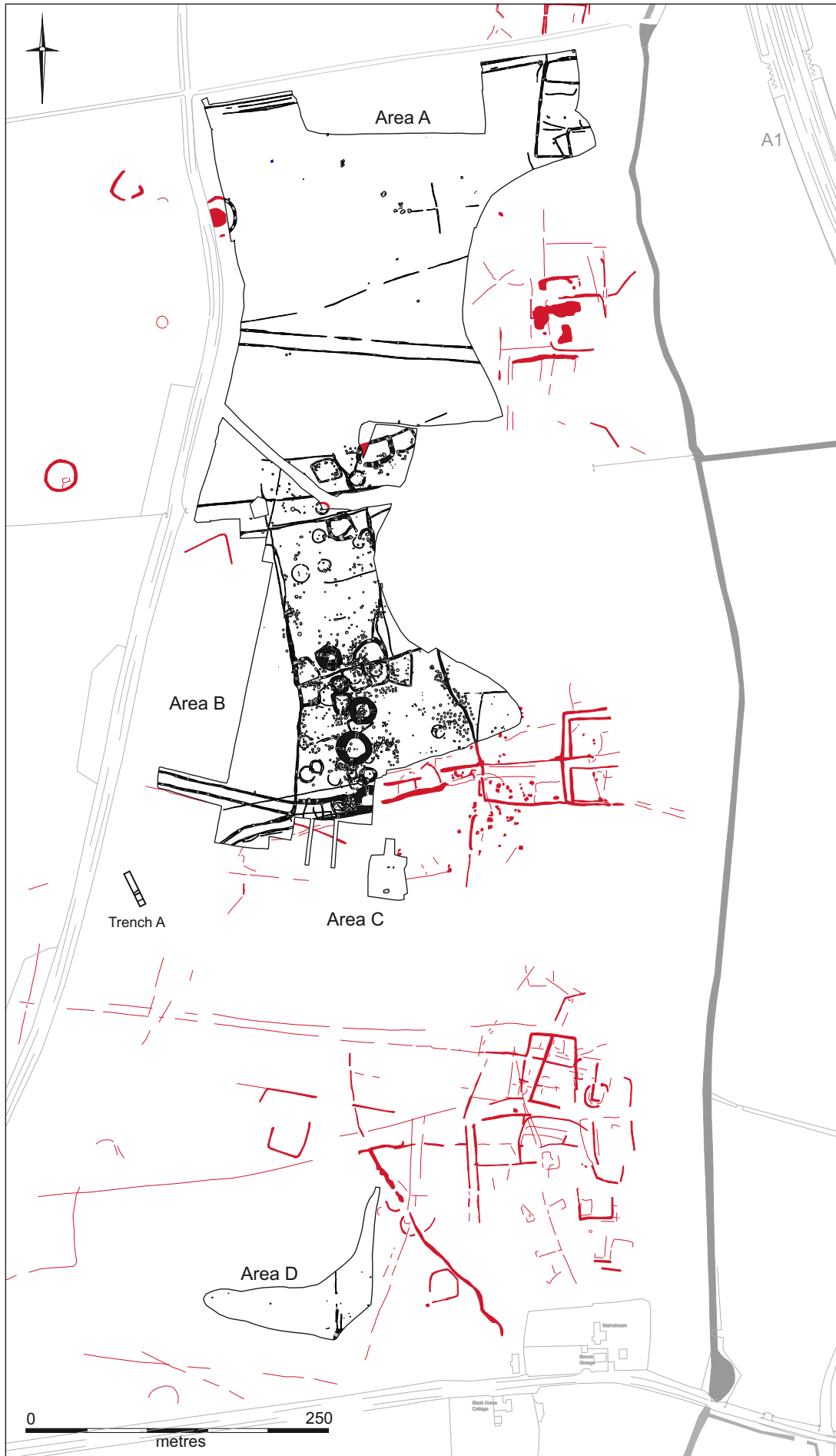


Figure 2. Excavated areas, with all archaeological features

ten year programme of archaeological recording has provided a detailed landscape history of the area (Cooper and Edmonds 2007), summarised below, to which the results of the Phase 11-13 fieldwork are an important addition.

With the exception of gravel-derived Palaeolithic hand axes the earliest significant archaeological remains recorded at Broom Quarry date to the earlier Neolithic. Flintwork dating to this period was recovered (alongside small quantities of possible Late Mesolithic material) during fieldwalking, whilst a number of pits and tree throws yielded assemblages of worked flint and pottery. A particular concentration of features was recorded at King's Hill in the vicinity of two Bronze Age monuments, and is clearly indicative of an occupation/settlement site. Evidence of later Neolithic activity has proven more difficult to identify although a number of pits containing Peterborough Ware pottery and chronologically diagnostic flints within fieldwalking assemblages suggest that occupation in the wider area continued throughout the Neolithic into the Bronze Age.

The Great Ouse valley is well known for its Early Bronze Age monument complexes (Field 1973) and as a tributary of the Great Ouse the River Ivel also appears to have been a focus for monument building. Within Broom Quarry, two ring ditches/barrows and a C-shaped ditch have been excavated at Hill Lane/King's Hill and one further ring ditch has been preserved *in situ*. Associated funerary remains were limited but included cremations and pits containing pottery (one with a complete miniature Collared Urn). As with the later Neolithic, evidence of settlement in the area is more scarce, however, an area of preserved buried soil associated with a group of pits and watering holes at Brookland Farm, produced a relatively substantial finds assemblage including Collared Urn pottery, worked flint and large quantities of burnt stone as well as a significant deposit of five aurochs skulls.

The Middle Bronze Age saw the development of a field system comprising multiple ditches and including a striking double ditched boundary clearly referencing the earlier Bronze Age barrows at Hill Lane/King's Hill; the area also became the site of a cremation cemetery comprising 42 cremations, 13 of which were held within Deverel Rimbury urns. Evidence of occupation/settlement becomes more archaeologically visible during this period with a post-built roundhouse and associated pits and postholes recorded at Ash Covert. Indeed from the middle to later Bronze Age the landscape was clearly widely settled. Late Bronze Age occupation sites within Broom Quarry number at least five with four post-built roundhouses recorded as well as significant numbers of pits and postholes.

Iron Age occupation of the landscape also appears to have been extensive, with two significant settlement sites recorded at Gypsy Lane and Hill Lane respectively. At Gypsy Lane a sequence of settlement enclosures represent a long-lived settlement site established in the Early Iron Age and continuing well into the Middle Iron Age. At Hill Lane an impressive group of 121 Early and Middle Iron Age pits associated with a single roundhouse were recorded. Both sites produced substantial finds assemblages with the latter particularly notable for its significant, often articulated, animal bone deposits, which clearly represent some kind of structured deposition.

Turning to the Romano-British period, the investigations within Broom Quarry encountered comparatively few Romano-British features (although field system

ditches and droveways were recorded). Instead the evidence for Romano-British occupation comes largely from the extensive cropmarks occurring along the River Ivel. Here, a regular pattern of enclosed settlement sites, connected by a network of trackways and ditches, stretches for at least 4km along the eastern banks of the river. The sites have seen only minimal investigation (see 2003 evaluation, below) but clearly represent significant settlement sites.

Evidence of activity during the Anglo Saxon period comprises both settlement and mortuary sites. The riverside zone occupied by the Romano-British enclosures continued to be settled with one Saxon *Grubenhause* excavated during the 2003 Evaluation (see below) and further potential *Grubenhause* visible as cropmarks on aerial photographs. Within Broom Quarry, a small cemetery developed around one of the Bronze Age ring ditches and comprised five individual graves, nearby a small rectangular building was also recorded. As for the ensuing medieval and post-medieval periods, relatively few sites in the area have been investigated in detail however a moated site is located at Hill House and a ringwork and bailey survive as earthworks to the east of Brookland Farm, less than 500m to the north-east of the Phase 11-13 quarry area (both Scheduled Ancient Monuments). In addition, evidence of ridge and furrow cultivation and field system ditches/enclosures is widespread.

1.3 The 2003 Evaluation

Evaluation of the proposed Phase 11-13 quarry site was undertaken in 2003 and initially comprised aerial photographic survey and geophysical survey. Based on the results of these investigations a programme of trial trenching was undertaken (Cooper and Knight 2004). Designed to both provide coverage of the entire investigation area and to target individual 'sites' identified by aerial photography and geophysics, the trial trenching identified seven concentrations of archaeology. Sites identified often comprised multiple phases of activity and settlement features dating from the Neolithic through to the Anglo Saxon period were recorded. The most significant sites comprised a probable Bronze Age ring ditch (Site 3), at least two Iron Age settlement sites (including an extensive Middle Iron Age enclosed settlement (Site 2)) and three Romano-British settlement sites dating from the early Roman period to the 1st to 2nd centuries AD (Sites 5,6 and 7). In addition a single Saxon *Grubenhause* was recorded (Site 6).

Following the 2003 evaluation the proposed Phase 11-13 quarry area was modified in order to avoid major concentrations of archaeology where possible and to preserve many of the sites *in situ*. As a result all of the major sites along the eastern edge of the investigation area, including all of the major concentrations of Romano-British settlement, were excluded from the quarry area. The main focus of the archaeological investigations consequently became the extensive Middle Iron Age enclosed settlement (Site 2).

2.0 METHODOLOGY

Archaeological work was undertaken in four main phases ahead of quarry expansion during the period 2007-2012. Each area was stripped of topsoil using a 360° tracked

excavator fitted with a toothless bucket operating under the supervision of an experienced archaeologist.

Sites were located using an advanced Global Positioning System (GPS) with Ordnance Datum (OD) heights obtained. Potential archaeological features were planned at a scale of 1:50 and subsequently sample excavated. Features were excavated by hand and archaeological finds retained. Where significant finds assemblages or unusual deposits were encountered features were 100% excavated. Environmental bulk soil samples were taken from selected features.

A written record of archaeological features was created using the CAU recording system (a modification of the MoLAS system) and sections were drawn at an appropriate scale. A photographic record of the site was also maintained.

3.0 RESEARCH AIMS

The principal objective of the excavations was to excavate archaeological sites identified during the evaluation and that lay within the working quarry area. These consisted of Site 2, which was located entirely within the quarry and to a lesser extent Sites 3 and 4, which fell partly within the quarry. Site 2 comprised a Middle Iron Age enclosed settlement, while Sites 3 and 4 comprised a probably Bronze Age barrow and an Early/Middle Iron Age settlement respectively.

The following general aims were also defined:

- to determine the extent, character and date of the archaeological deposits and features present throughout the site.
- to determine, as far as possible, the origins, development, function, character and status of the site.
- to establish the stratigraphic sequence of the site, the date of the features and the 'occupation' horizons, and the nature of the activities carried out at the site during the phases of its occupation.
- to place the findings of the aims above in both regional and national research contexts.
- to present the archaeological data in a manner appropriate to that information, probably in the form of a formal report in a journal or web based publication.

4.0 RESULTS

For the purposes of this report the site has been divided into four areas; Areas A, B, C and D (see Figure 2). In the north of the Phase 11-13 quarry area, archaeological features in Area A were relatively sparse and it was in Area B – where dense Middle

Iron Age settlement remains were exposed – that the vast majority of archaeological features were recorded. Areas C and D, to the south of Area B, represent much smaller, targeted excavations in areas of less dense archaeology.

In total some 1658 archaeological features were recorded within the Phase 11-13 quarry area, including 958 pits, 189 boundary ditches/gullies, 21 enclosures and 27 structures (see Figure 3). Due to the high numbers individual feature numbers for features in Area B are not shown on the report figures, however, a searchable PDF plan showing all recorded feature numbers is included on CD.

4.1 Areas A, B and C

Spanning the period between the Early Neolithic and the 6-7th century AD, seven main phases of activity have been identified within Areas A, B and C. In addition a series of features associated with relatively recent agricultural practices and land division comprise an eighth phase dating to the post-medieval/modern period. Also of interest, although significantly pre-dating the recorded occupation of the site, a Palaeolithic hand axe was recovered from the stripped surface of the natural gravels (see Beadsmoore and Billington, below).

Earlier Neolithic

Evidence of Neolithic activity was limited to residual worked flint recovered from later features (see Beadsmoore and Billington, below) and a single tree throw in the far north of the excavation area (Figure 4). The tree throw (**F.2019**) contained a charcoal rich fill probably derived from a nearby ‘midden’ deposit, which contained pottery sherds from at least three separate Early Neolithic vessels of the Carinated Plain Bowl type and 28 worked flints - including waste flakes, blades and exhausted cores - along with very small quantities of burnt stone and flint (see Knight, below; Billington and Beadsmoore, below).

Late Neolithic/Early Bronze Age

Evidence of Late Neolithic/Early Bronze Age activity at the site was also relatively scarce. Features dating to this broad period were confined to the north of Area A and comprised an isolated Beaker pit (**F.1832**) and a ring ditch (**F.2025**), which fell partially within the excavation area (Figure 4). Pit F.1832 contained 23 sherds of Beaker pottery alongside a small assemblage of burnt and unburnt animal bone and is typical of the Beaker period activity recorded sporadically in the Broom landscape (see eg. Cooper 2004).

Ring ditch F.2025, which is visible as a cropmark on aerial photographs lay largely beyond the excavation to the west, however, a c.17m long section of the ditch was

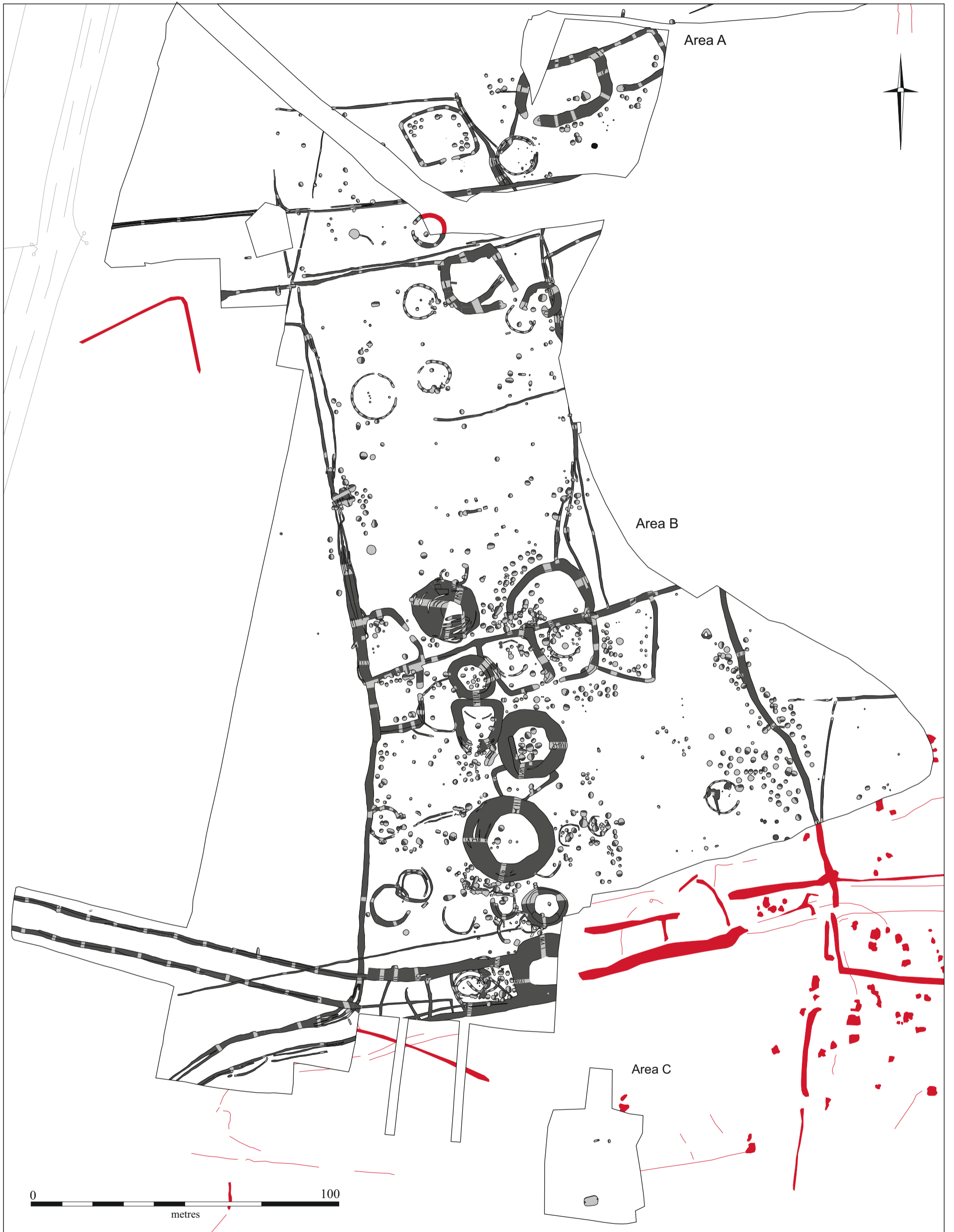


Figure 3. Areas A south, B and C; all archaeological features and excavated slots

NB. This plan is available on CD as a searchable pdf document as an accompaniment to printed copies

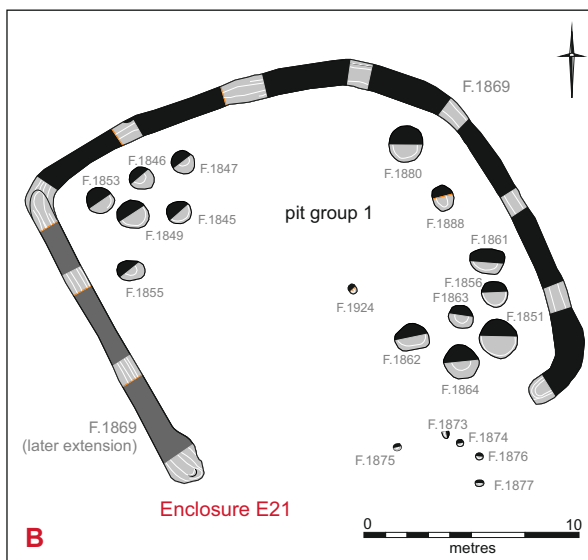
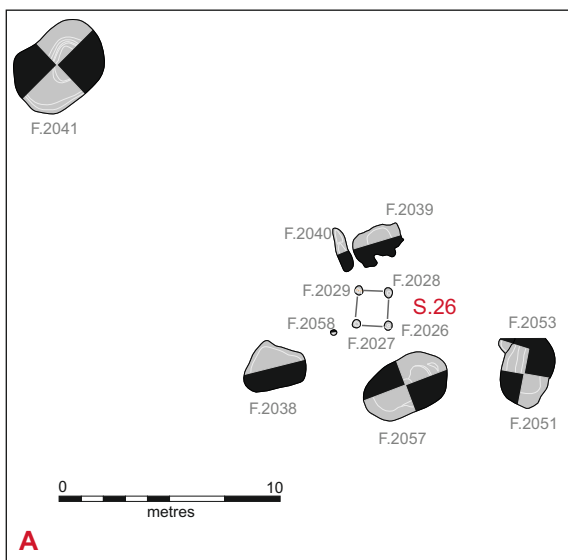
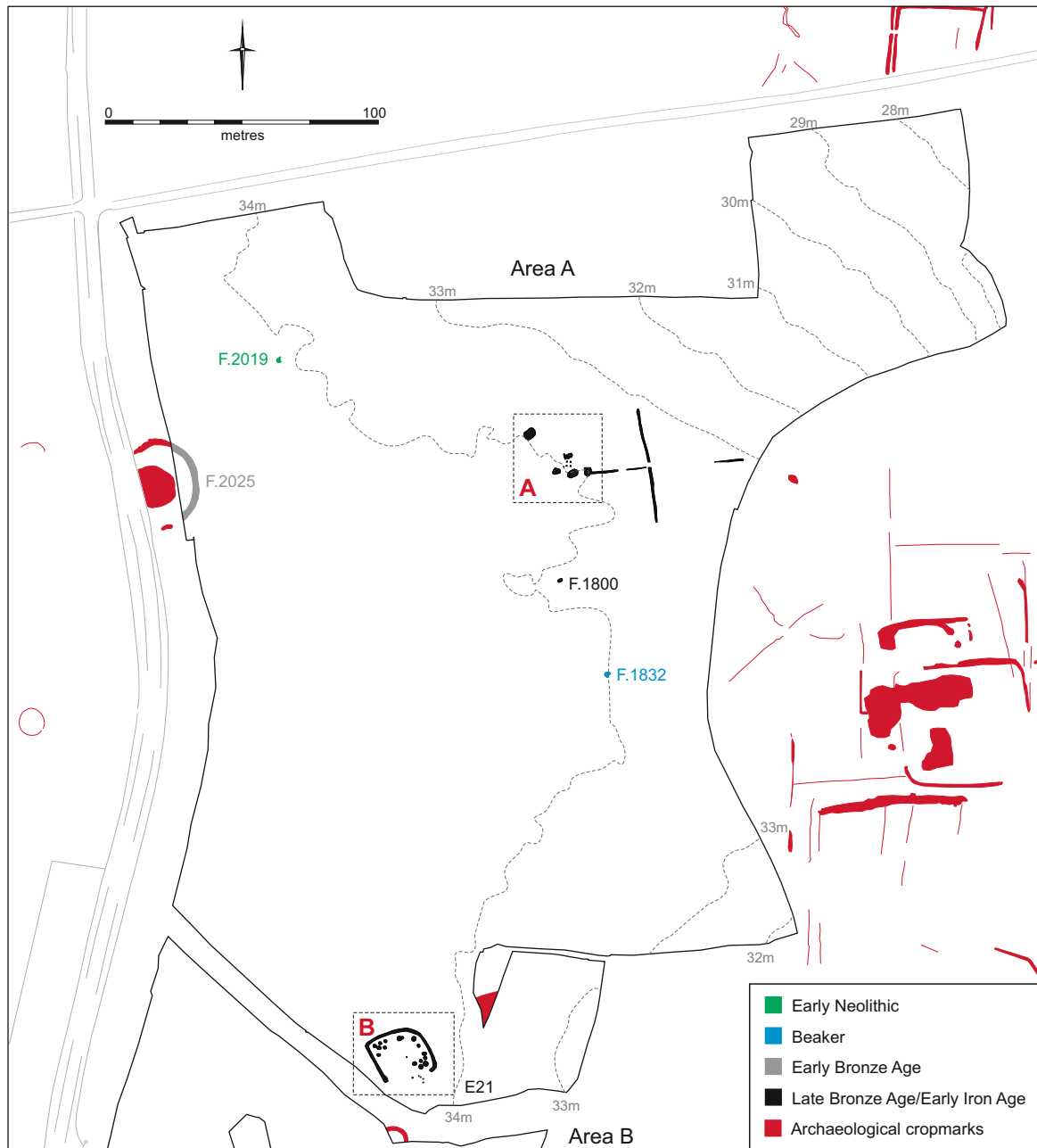


Figure 4. Neolithic, Bronze Age and Early Iron Age features

exposed. Based on the projected course of the ditch the external diameter of the ring ditch can be estimated to be c. 36m, while the ditch itself measured 1.19-2.3m wide by 0.78-0.96m deep. Four two metre slots excavated through the ditch yielded only a small finds assemblage comprising nine worked flints, two sherds of pottery, eight fragments of burnt stone and a small fragment of animal bone. Although not closely chronologically diagnostic the finds are typical of Late Neolithic or Early Bronze Age assemblages (see Knight, below; Beadmoore and Billington, below). No associated features, cremations or burials were encountered.

Late Bronze Age/Early Iron Age

A number of features including a ditched enclosure (E21), a four post structure (S26) and an isolated pit (F.1800) yielded pottery dating to the Late Bronze Age/Early Iron Age (see Wells, below). Based on the continued use of enclosure E21 into the Middle Iron Age and the Late Bronze Age characteristics of the pottery assemblage from pit F.1800 it has been possible to refine this broad phasing slightly and identify Late Bronze Age and Early Iron Age phases with relative confidence.

Late Bronze Age (Figure 4)

Features attributed to the Late Bronze Age are confined to the north of Area A where an isolated pit (**F.1800**) measuring 0.7m across by 0.1m deep, yielded a substantial assemblage of Post Deverel-Rimbury pottery including almost half of a large storage jar (see Knight, below). Other finds were limited to burnt stone/flint within a soil matrix, which included comparatively large amounts of charcoal and scorched material. Some 30m to the south-west of Pit F.1800 a smaller pit (**F.1802**) contained a small assemblage of Late Bronze Age/Early Iron Age pottery and seems likely to be contemporary.

Located c. 40m to the north of pit F.1800 the posthole remains of a four post structure (S26) measuring 1.1m by 1.08m also yielded a small assemblage of Late Bronze Age/Early Iron Age pottery. Although the pottery is more abraded and less chronologically diagnostic than that from pit F.1800 its relatively close proximity (and general scarcity of features in this area of site) suggests the structure and pit are probably broadly contemporary.

In the immediate vicinity of structure S26, sherds of pottery recovered from three hollows (**F.2038**, **F.2039** and **F.2040**) and a posthole (**F.2058**) suggest further Late Bronze Age activity while two possible watering holes (**F.2051** and **F.2057**) located immediately to the south/south-east of structure S26 and a 'pit well' (**F.2041**) located to the north-west may also be contemporary. Despite containing only small and chronologically mixed finds assemblages (including two probably intrusive sherds of Roman pottery in the uppermost fill of F.2041) it seems likely that the pit well and watering holes form part of this discrete zone of Late Bronze Age activity.

Finally, two ditches (**F.2052/2059** and **F.2056**), aligned east to west and north to south respectively, may also date to the Late Bronze Age, although in reality they are hard to phase with any confidence. With F.2052 apparently being truncated by

watering hole (F.2051) and containing a single sherd of Late Bronze Age/Early Iron Age pottery it is possible that the ditches represent elements of an early field system. However, with the exception of an 'early' ditch in Area B to the west of enclosure E21, this potential field system was not recorded elsewhere in the Phase 11-13 quarry area.

Early Iron Age (Figure 4)

Situated at the northern extent of the Middle Iron Age settlement zone enclosure E21 produced Late Bronze Age/Early Iron Age pottery. However, based on the apparent continued use of the enclosure into the Middle Iron Age it is possible to state with relative confidence that enclosure E21 dates to the later Early Iron Age. Seventeen pits on the interior of enclosure E21 (Pit Group 1) have also been dated to this period.

Enclosure E21

Measuring 21m by 18m, enclosure E21 was sub-rectangular in shape with a south facing entrance (Figure 5). Two, possibly three, phases of enclosure were recorded. The form of the enclosure ditch in both plan and profile suggest that the enclosure in its earliest form may have comprised a simple curving ditch (which would later form the north-west and north-east arms of the enclosure). The enclosure was then modified with the addition of a south-west arm comprising a slightly deeper ditch. The resultant Early Iron Age enclosure (**F.1869**) was open-sided to the south with two clearly defined ditch termini on either side (see Figure 4). The final phase of ditch (**F.1850/1868**) effectively 'completed' the enclosure by defining this formerly open southern side, leaving only a narrow entrance *c.*2m wide.

Although provisionally dated solely to the Early Iron Age, closer analysis of pottery distributions shows that the upper fills of the enclosure ditch (F.1869) yielded exclusively Middle Iron Age pottery while the lower fills produced only Late Bronze Age/Early Iron Age material. Consequently it is clear that, although not initially recorded as such, the final phase of enclosure (ditch F.1850/1868) comprised a 're-cut' that occurred around the entirety of the enclosure ditch and that this re-definition actually occurred in the Middle Iron Age following the almost-complete silting up of the Early Iron Age enclosure (see below, phase MIA I). A finds assemblage comprising 25 sherds (110g) of pottery (11 Late Bronze Age/Early Iron Age sherds and 14 Middle Iron Age sherds), nine worked flints and small amounts of burnt clay and animal bone was recovered from the enclosure.

A total of 17 pits (Pit Group 1) were located on the interior of enclosure E21, the majority of which appeared to be typically storage pit type features. Five of the pits contained very small assemblages of Late Bronze Age/Early Iron Age pottery (**Fs. 1845, 1847, 1851, 1853** and **F.1880**) and two contained Middle Iron Age pottery (**F.1857** and **F.1889**), however, for the most part it is difficult to confidently attribute the pits to either the Early or Middle Iron Age. The pits were clearly arranged around a void in the centre of the enclosure, which evidently represents the site of a structure although only a single posthole was recorded within the enclosure. Finally, an arc of five postholes (**Fs. 1874-1877**) was located on the southern side of enclosure E21;



Figure 5. Enclosure E21 looking north (top) and Enclosures E6-E10 looking north-east (bottom)

although undated one of these postholes was truncated by the MIA I enclosure ditch re-cut (F.1868) and they potentially also date to the Early Iron Age.

Middle Iron Age

The vast majority of archaeological features recorded in the Phase 11-13 quarry area were associated with the substantial Middle Iron Age settlement at the site (Figure 6). The main feature types recorded were boundary ditches, ditched enclosures, roundhouse gullies and pits. Whilst multiple phases of settlement are clearly present, producing a definitive phasing structure is problematic; only limited stratigraphic relationships between features were present and the pottery assemblage is dominated by generic Middle Iron Age wares, which have few or no chronologically diagnostic attributes (see Wells, below). Consequently the phasing of the site is unavoidably interpretative and relies on a *development model* for the settlement as a whole, which utilises known stratigraphic relationships, spatial relationships/distribution and feature types. Phases are unavoidably chronologically broad and while sub-phases clearly occur in defined areas of sites (multiple cuts of enclosure ditches and roundhouse gullies for example) on the whole it has not been possible to translate these into phases that occur across the site.

Enclosures, structures and boundary ditches are detailed according to phase, however, the site's Middle Iron Age pits are largely discussed separately given that at present it is difficult to confidently attribute individual pits and pit groups to identified phases.

MIA I: Field system and open settlement

The earliest Middle Iron Age activity at the site appears to have comprised largely open settlement (although the re-cutting of enclosure E21 does indicate the continued use of this feature) within a coaxial field system defined by ditched boundaries of multiple phases.

Enclosure E21

Having been detailed in the Early Iron Age results it remains only to reiterate that the second and final phase of this enclosure – in which the enclosure was re-cut and its formerly open southern side 'closed' – dates to the Middle Iron Age. As a feature that originated in the Early Iron Age, it is clear that enclosure E21 is significant and is one of the earliest elements (if not the earliest) of the Iron Age settlement.

Field system

The coaxial field system was aligned north by north-west to east by north-east and extended across the entirety of Areas A and B and beyond the limits of excavation to the west, south and east (see Figure 6). In Area A the field system appears to have been heavily truncated and only east by north-east aligned ditch **F.1801** (probably the main axial ditch in this area) survived (see Figure 7). In Area B the field system was



Figure 6. Middle Iron Age enclosures, structures and field system

much better preserved and three fields (Fields I-III) fell within the excavation area. Measuring 0.4ha, 1.1ha and 1.7ha in area respectively, Fields I-III were all defined by ditched boundaries. Over 100 separate Middle Iron Age boundary ditch 'cuts' were recorded in Area A; often boundaries were marked by sequences of ditches indicating that they were probably re-cut/redefined over a relatively lengthy period.

In some areas, sections of boundaries were apparently re-defined when other parts of the system were not, suggesting some complexity to the system's use. One example of this occurs along the western side of Field I where an entrance was clearly redefined on a number of occasions before being blocked and becoming a focus for pit digging (Pit Group 3, see below). A second example was recorded at the far north of settlement zone where a funnel-like gap/entrance in the field system, potentially associated with stock control, appears to have been altered on a number of occasions following the construction of structure S1 (see below).

Probably the main entrance to the field system and associated settlement was located in the south-west of Field III where a ditch-defined trackway extended in a south-westerly direction from the field corner. A trench excavated along its projected course (Trench A, Figure 2) confirmed that it extended for a distance of at least 150m. Again a sequence of at least three ditches indicates the continued redefinition and use of the trackway over a lengthy period, potentially extending into the Late Iron Age (see below).

Structures

All of the site's roundhouse gullies have thus far been attributed to MIA I (given that this structural form appears to be largely replaced by 'household compounds' in MIA II, see below). On the whole the site's stratigraphy supports this interpretation; where relationships are present, roundhouse gullies are invariably truncated by Middle Iron Age enclosure ditches and pits, which occur at the same location, suggesting that the structures that they represent are early in the sequence. Recorded roundhouse forms (detailed in Table 1) were variable but can be divided into two broad types; firstly a typical penannular form usually with a clearly defined entrance (Type A; see Figure 8) and secondly a more irregular open-sided or 'horseshoe' form (Type B). In terms of size, roundhouses ranged from 6.8m to 15.3m in diameter; generally the more irregular Type B roundhouses were smaller suggesting they may represent ancillary structures while Type A structures represent more formal roundhouses. Where entrances were present they were usually east or north-east facing although variation was recorded. Few structural postholes survived in association with the roundhouses – although postholes representing potential door posts were recorded in structure S3. Evidently, on the whole structural postholes were placed on post pads or in very shallow postholes no trace of which remained. Based on size and gully profiles it seems likely that the gullies themselves represent eaves-drip gullies, although for some of the smaller structures particularly, that they were foundation trenches for walls is also possible.



Figure 8. Roundhouse S1 looking west (top) and S20 looking east (bottom)

Structure No.	Diameter (m)	Form	No. of cuts	Notes
S1	13.8	A	3	4 potentially associated postholes. East facing entrance
S2	11.4	A	1	West facing entrance
S3	11.75	A	1	5 potentially associated postholes including 2 door postholes. East facing entrance
S4	9.8	A	1	-
S5	15.3	A	1	5 potentially associated postholes including one possible door posthole. East facing entrance
S6	12	A	2	-
S7	9.2	B	1	-
S8	11.9	A	1	-
S9	11.9	A	1	5 potentially associated postholes
S10	12	?Truncated	1	-
S11	11.4	A	2	East facing entrance
S12	14	A	1	1 potentially associated posthole. East facing entrance
S13	11.8	B	2	-
S14	11	B	1	-
S15	10.2	B	1	-
S16	6.8	A	1	West facing entrance
S17	9.8	B	1	-
S18	7.5	B	1	3 potentially associated postholes
S19	7.2	B	1	-
S20	11.1	A	1	4 potentially associated postholes. East facing entrance.
S21	12.5	A	1	East facing entrance?
S22	11.6	A	1	East facing entrance?
S23	10.5	A	1	East facing entrance?
S24	12	A	1	Up to 16 potentially associated postholes. East facing entrance.

Table 1: MIA I roundhouse forms

The roundhouse gullies largely comprised a single cut, with only structures S1 and S6 having re-cut gullies (three and two cuts respectively). This suggests that on the whole, roundhouses were not renovated over a long period and they were potentially regularly rebuilt and their location moved slightly. The most obvious example of this is structures S21-S24 where four roundhouse gullies clearly represent a sequence of buildings at approximately the same location. Only structure S1 with its three phase roundhouse gully appears to have persisted for any length of time.

The finds assemblages recovered from the MIA I roundhouse gullies are detailed in Table 2. The assemblages are dominated by Middle Iron Age pottery sherds and animal bone with very little burnt clay/daub encountered. Due to the fact that the percentage of each feature excavated varied considerably the average finds per *c.* 1m segment excavated is the most telling statistic. Average finds per metre segment vary a great deal (ranging from 2 to 53 finds), however, there appears to be little patterning in terms of number of finds and form/size of roundhouses, indeed the highest finds per metre segment came from the smallest roundhouse, structure S16. Furthermore,

comparatively large ‘formal’ (Type A) roundhouses such as structure S5 and structures S21-S24 produced very low number of finds despite intensive sampling. As such it would appear that deposition within roundhouse gullies varied according to location on site rather than potential use of the structure (as discussed further below). Generally speaking, the finds assemblages were small suggesting that deposition in areas around structures was low and largely occurred away from their immediate environs. As Fryer notes, below, the lack of preserved plant remains from the roundhouse gullies also suggests they were kept ‘scrupulously clean’.

Structure No.	Pottery	Animal Bone	Burnt clay	Others	Total	Average per c.1m seg.
S1	260 (1600g)	221 (267g)	1 (5g)	7 (238g)	488 (2105g)	31 (132g)
S2	54 (617g)	10 (7g)	8 (12g)	1 (1g)	73 (637g)	12 (106g)
S3	23 (250g)	7 (404g)	4 (4g)	3 (181g)	37 (839g)	3 (65g)
S4	41 (201g)	4 (3g)	12 (9g)		57 (213g)	6 (24g)
S5	38 (358g)	81 (150g)	1 (8g)	7 (443g)	127 (959g)	6 (48g)
S6	108 (1560g)	72 (176g)	-	2 (1951g)	183 (9187g)	15 (766g)
S7	49 (482g)	27 (316g)	1 (51g)	-	77 (849g)	19 (212g)
S8	29 (528g)	28 (297g)	-	-	57 (825g)	8 (118g)
S9	40 (343g)	147 (748g)	8 (32g)	2 (3g)	197 (1126g)	20 (113g)
S10	4 (13g)	14 (7g)	-	-	18 (20g)	5 (5g)
S11	52 (1187g)	158 (270g)	-	-	210 (1457g)	35 (243g)
S12	30 (574g)	101 (183g)	3 (4g)	10 (1797g)	144 (2558g)	48 (853g)
S13	77 (475g)	56 (70g)	-	-	133 (545g)	27 (109g)
S14	6 (447g)	3 (38g)	-	-	9 (485g)	2 (121g)
S15	8 (31g)	19 (114g)	-	1 (166g)	28 (311g)	28 (311g)
S16	14 (52g)	91 (254g)	-	-	105 (306g)	53 (153g)
S17	17 (181g)	8 (35g)	1 (1g)	1 (24g)	27 (241g)	9 (80g)
S18	9 (52g)	-	2 (35g)	-	11 (87g)	2 (17g)
S19	1 (13g)	11 (7g)	-	-	12 (20g)	4 (7g)
S20	22 (301g)	63 (127g)	-	11 (14g)	96 (442g)	7 (34g)
S21	24 (85g)	22 (105g)	2 (145g)	-	48 (335g)	16 (112g)
S22	4 (110g)	-	10 (21g)	-	14 (131g)	2 (22g)
S23	46 (368g)	15 (39g)	-	1 (4g)	62 (411g)	10 (69g)
S24	6 (27g)	-	-	1 (21g)	7 (48g)	1 (10g)

Table 2: MIA I roundhouses assemblage breakdown.

The open settlement with associated roundhouses, clearly persisted for some time and sub-phases of activity can clearly be identified in defined areas; as discussed structures S21-S24, for example, clearly represent a sequence of four structures at the same approximate location. Indeed the nature of the site’s structures and their finds assemblages suggest most roundhouses may have been rebuilt and moved on a fairly regular basis. While it is generally difficult to relate these roundhouses to each other (due to a lack of stratigraphic relationships and chronologically diagnostic artefact types) and create a definitive sequence of sub-phases, it is possible to identify a number of structures that appear to have come early or late in the sequence.

Structure S11 seems likely to have come early in MIA I given the fact that it is clearly truncated by a field boundary ditch whilst the way in which a series of field boundary ditches curve in respect of structure S1 also suggests that this roundhouse was probably early (and probably relatively long lived). Structures S8 and S9 on the other

hand almost certainly fall late within the MIA I sequence given that they are clearly direct precursors to the MIA II 'household compounds' represented by enclosures E8 and E7 respectively (see below). Indeed the relationship between structures S8 and S9 and enclosures E8 and E7 appears to characterise the shift in settlement form from open to enclosed settlement. It is worth noting at this juncture that while it is tempting to see the roundhouses as being situated within their respective enclosures, the way in which enclosure E7 truncates structure S9, strongly suggests that they represent distinct phases, with the roundhouses falling out of use and being replaced by the enclosures/'domestic compounds'. Furthermore, the degree to which, the respective roundhouse gullies are truncated by pits, which in enclosure E8 particularly, appear to cluster so as to leave a void for a contemporary house would appear to support this.

A single Middle Iron Age four post structure (S25), located just to the north-west of MIA I structure S20, has also provisionally been assigned to MIA I although in reality there is little evidence to suggest where exactly it falls within the Middle Iron Age sequence. The structure measured 2.36m across with two of the postholes producing a total of 11 sherds of Middle Iron Age pottery and seven fragments of burnt clay.

MIA II: Enclosed settlement

The MIA II phase is characterised by the development of a series of enclosures or 'household compounds' (as defined by Evans and Hodder 2006), which replaced the open settlement layout. None of the enclosures had any structural remains directly associated with them and it is presumed that contemporary structures were post-built and utilised post pads or very shallow postholes, no trace of which survives. With the exception of enclosure E19, all of the MIA II enclosures were 'attached' to boundary ditches, and were thus aligned closely on the existing field system. Indeed the arrangements of the enclosures suggests that although there was clearly a movement away from the open settlement of MI I, its basic field system remained largely unchanged. Having said this, a number of MIA II modifications are identifiable within the field system layout. Firstly, to the north of enclosure E6, two boundary ditches, representing subsequent phases of the same boundary, clearly diverge from the original field system alignment in order to connect with enclosure E6. Secondly, the east and west boundaries of Field II became noticeably more sinuous and turned to the east and west respectively, extending beyond the edge of excavation in both cases, rather than continuing on their original north-south alignment (see Figure 6). Both modifications suggest a gradual divergence from the formality of the original MIA I co-axial system.

In total, nine enclosures have been assigned to MIA II, details of the dimensions and form each enclosure, as well as potentially associated pit groups, are provided in Table 3.

Enclosure No.	Dimensions (m)	Maximum ditch dimensions (width x depth(m))	Form	No. of re-cuts	Associated pit group
E1	32.4 x 20.8	4.2 x 1.32	Sub-rectangular	2	2
E2	24 x 16.5	1.7 x 0.9	Sub-rectangular	1	2
E6	28.5 x 22	2.84 x 1.4	D-shaped	1-2	7
E7	23.2 x 20.7	3 x 1.6	Trapezoidal	1-2	9
E8	21 x 17.5	3 x 1.45	Trapezoidal	1-2	8
E10	30 x 21.5	1.4 x 0.63	Trapezoidal	1	10
E19	19.7 x 13.5	1.4 x 0.75	Trapezoidal	-	-
E25	22.8 x 22.2	2.4 x 1.15	Trapezoidal	1-2	4
E26	21.2 x 17.3	2.05 x 1.28	Trapezoidal	1-2	5

Table 3: Phase 4.2 enclosures

The majority of the enclosures were trapezoidal in form with rounded corners (although sub-rectangular and D-shaped forms were also present) and in all cases, bar enclosure E19, one or two sides of the enclosure were determined by existing field system boundary ditches. Although re-cuts were recorded, none of the MIA II enclosures appear to have been re-cut or redefined on more than one or two occasions.

All of the enclosures had pits on their interior, often arranged so as to leave a convincing house-void. However, whilst many of the pit groups can be broadly associated with enclosures given the palimpsest effect present in particularly dense areas of occupation (where pits almost certainly represent multiple phases of activity) no definitive link can be established and the site's pits are discussed separately below.

Enclosures E1 and E2

Located in the far north of the Middle Iron Age settlement, enclosures E1 and E2 were attached to the main east by north-east field system boundary, which effectively marks the settlement's northern extent. Although clearly contemporary, the final re-cut of E1 truncated the in-filled ditch of E2, suggesting the former persisted for longer. Few features were recorded on the interior of the enclosures (three pits in E1 and two in E2) and no evidence of structures was encountered.

Enclosures E6, E7, E8, E10

At the centre of the Middle Iron Age settlement, enclosures E7, E8 and E10 comprised a series of enclosures 'strung out' along a MIA I field boundary ditch and clearly represent contemporary settlement enclosures/household compounds. To the north, enclosure E6, a D-shaped enclosure, adjoined the same field boundary ditch and was also almost certainly contemporary. Episodes of clear re-cutting were not generally recorded in the sequence of enclosures, although the ditches seem highly likely to have been 'cleaned out' on a number of occasions. The enclosures' spatial relationships are the most convincing evidence for their broad contemporaneity, however, stratigraphic relationships between the ditches were also recorded suggesting that the enclosures fell out of use in a particular order. Enclosure E10, the most easterly fell out of use first, followed by E7, whilst E8 appears to have persisted for longest. Comparatively high numbers of features were recorded within enclosures E6, E7, E8 and E10, each being associated with an individual pit group (PGs 7, 9, 8 and 10 respectively; see below). No clear structural remains were associated with any of the enclosures (the roundhouses in Enclosures E7 and E8 belonging to the earlier MIA I phase) although voids within the arrangement of pits provide relatively good evidence of contemporary structures in each.

Enclosures E25 and E26

Also apparently contemporary with enclosures E6, E7, E8 and E10, enclosures E25 and E26 were located in the south-west corner of Field II and the north-west corner of Field III respectively. Once again, each enclosure can be associated with an individual pit group (PGs 4 and 5 respectively) and convincing house voids were present within the arrangement of pits.

Enclosure 19

Distinct from the other MIA II enclosures in not being attached to a field boundary ditch, E19 was situated to the south of enclosure E8. Clearly truncated by MIA III enclosures E12 and E13, the feature seems most likely to belong to MIA II while its trapezoidal form is also comparable to other MIA II enclosures. Four pits were recorded on the interior of the enclosure.

Enclosure No.	Pottery	Bone	Burnt clay	Others	Total
E1	249 (2074g)	460 (4372g)	19 (64g)	19 (447g)	747 (6961g)
E2	7 (40g)	118 (1247g)	-	5 (24g)	130 (1311g)
E6	136 (1988g)	478 (4262g)	19 (190g)	5 (58g)	638 (6498g)
E7	314 (3143g)	697 (9783g)	102 (526g)	52 (598g)	1165 (14050g)
E8	221 (3526g)	517 (7373g)	13 (105g)	25 (1583g)	776 (12587g)
E10	62 (974g)	215 (1456g)	-	2 (85g)	279 (2515g)
E19	24 (427g)	72 (1050g)	6 (56g)	-	102 (1533g)
E25	95 (1250g)	409 (3477g)	-	4 (593g)	508 (5320g)
E26	146 (3357g)	673 (6756g)	6 (45g)	7 (899g)	832 (11057g)

Table 4: MIA II enclosures assemblage breakdown

The finds assemblages recovered from the enclosures are detailed in Table 4. Dominated by pottery and animal bone, subtle variations in the assemblages potentially reflect differences in function and/or longevity of the enclosures. Large finds assemblages were recovered from E1, E7, E8, E26 and to a lesser E6 and E25, suggesting these were probably relatively long lived household compounds. At the other end of the scale, the small finds assemblage from E2, E10 and E19 indicates these were either much shorter lived or potentially had a slightly different function. On the whole, the finds assemblages are small compared to the pit assemblages (see below) and as with the MIA I roundhouses – although to a lesser extent – they appear not to have been the sites of major deposition and may have been ‘cleaned out’ on a regular basis.

MIA Phase III: Enclosed settlement

The final phase of Middle Iron Age settlement comprised eleven enclosures. Enclosures have been attributed to this phase based on stratigraphy and enclosure form; details are provided in Table 5. Generally speaking - although variation is present - the MIA III enclosures were sub-circular (or 'horseshoe-shaped'), rather than trapezoidal, and had been re-cut on multiple occasions. Of the enclosures, nine were located within the settlement 'core' and appear to be a continuation of the settlement activity represented by MIA II enclosures E5, E7, E8, E10, E25 and E26. Slightly detached from this, two enclosures (E3 and E4) were located c. 90m to north.

Enclosure No.	Dimensions (m)	Maximum ditch dimensions (width x depth (m))	Form	No. of re-cuts	Associated pit group
E3	22 x 21	2.15 x 1.1	Sub-rectangular	5-6	-
E4	12.5 (diam.)	2.5 x 1.23	Horseshoe	1	-
E5	24 (diam.)	1.95 x 1	Sub-circular	6-7	-
E9	16.7 (diam.)	1.4 x 0.54	Sub-circular	3-4	6
E11	17.3 x 18.8	0.9 x 0.45	Trapezoidal	4	-
E12	23.5 (diam.)	1.6 x 1.35	Sub-circular	9	14
E13	30 (diam.)	1.4 x 1.2	Sub-circular	7	-
E14	22.8 (diam.)	3 x 1.65	Sub-circular	8	-
E18	>21 (diam.)	0.45 x 0.19	D-shaped	-	-
E22	15 (diam.)	3 x 0.9	Sub-circular	1	-
E23	9 x 9	1.1 x 0.38	Horseshoe	1	-

Table 5: MIA III enclosures

The core of the MIA III settlement was represented by a series of sub-circular enclosures and one trapezoidal enclosure arranged in a north-south linear pattern. Although appearing in plan as wide enclosure ditches, the enclosures actually comprised multiple gullies/ditches, indeed the presence of multiple, re-cut gullies/ditches appears to be a distinctive characteristic of the MIA III enclosures. The re-cutting of each gully/ditch, probably as a result of the silting-up of its preceding cut, appears to have resulted in a very slight shift in the location of each enclosure, creating the effect of a wide ditch in plan. On the whole, it appears that for each enclosure, each gully or ditch cut is equivalent to a single phase although in some cases that individual ditch and gully cuts may have been contemporary is possible (eg. E12, see Figure 9).

The six sub-circular enclosures can be split into four relatively large features over 20m in diameter (E5, E12, E13 and E14), which are interpreted as potential household compounds or structures, and two smaller enclosures less than 17m in diameter (E9 and E22), which potentially represent ancillary features.

Enclosures E5, E12, E13 and E14

The northern most of the linear arrangement of enclosures, E5 comprised at least 7-8 separate phases, each potentially marking a slight north-westward shift in the enclosure's location. Re-cutting took place

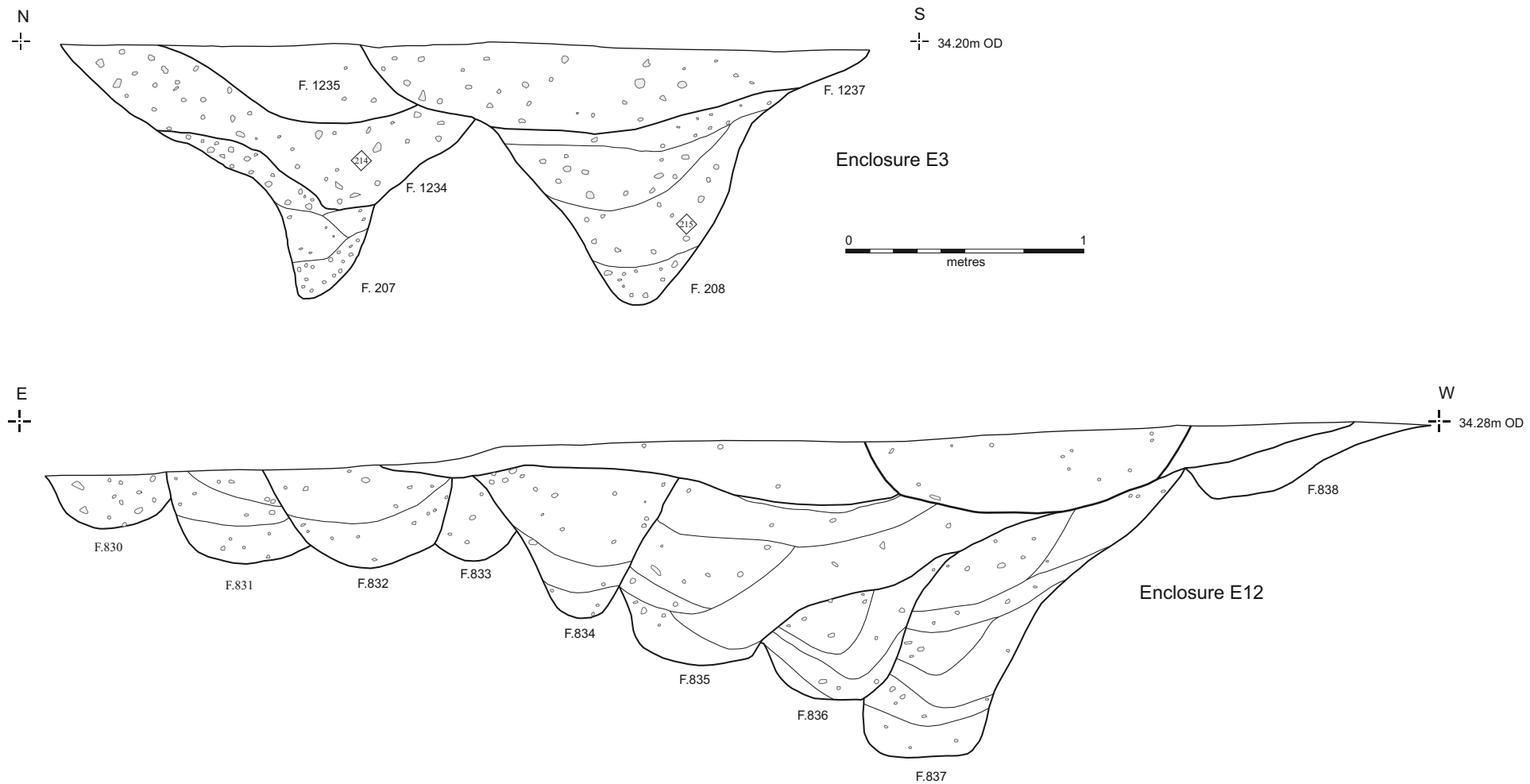


Figure 9. Examples of Middle Iron Age enclosure ditch sections

to such an extent that only a small area (6.8m in diameter) of undisturbed natural gravel occurred in the centre of the enclosure. No entrance was recorded, although two potential termini were recorded in two of the sections across the inter-cutting ditches/gullies.

Enclosures E12, E13 and E14 were of a comparable size to E5 and exhibited similar multiple re-cutting sequences of ditches/gullies. Once again, no entrances were recorded. No features were recorded on the interior of Enclosure E14 however five pits, two of which were clay-lined, and two postholes were recorded within E13, and 15 pits (PG14; including two Associated Bone Groups (see below)) were recorded on the interior of E12.

Enclosures E9 and E22

On a smaller scale but similar in form to enclosures E5, E12, E13 and E14 were enclosures E9 and E22. E22 was potentially associated with only one internal feature, a pit, while Enclosure E9 had a significant number of pits on its interior (PG 6) including two with Associated Bone Groups (see below).

Three further MIA III enclosures (E11, E18 and E22) took a slightly different form to the sub-circular enclosures described above.

Enclosure E11

Enclosure E11 was trapezoidal in shape and was located immediately to the south of, and abutting, enclosure E9. As such the two were almost certainly directly contemporary. To the east, E11 slightly truncated enclosure E12 although there is every chance they were also at least partly contemporary. Once again comprising multiple re-cuts (at least four) E11 had a south facing entrance and four pits were recorded on its interior.

Enclosure E18

Attached to E11 and E9, a D-shaped gully, with a west facing entrance, effectively linked the two enclosures creating a further enclosed area (enclosure E18) to the west. Clearly different in form to the other MIA III enclosures and comprising only a single relatively narrow gully, E18 almost certainly served a different function to the contemporary settlement enclosures.

Enclosure E22

A small horseshoe-shaped enclosure (E22) was located to the south of Enclosure E12. Again this appears likely to have served a different function to the probably contemporary settlement enclosures probably as some kind of ancillary structure/enclosure.

Finally, two enclosures (E3 and E4) have been included in the MIA III phase although in reality the place of E3 particularly, within the Middle Iron Age settlements' phasing structure remains uncertain. Two factors suggest they belong to MIA III. Firstly, Enclosure E4 truncated multiple field boundary ditches, including ditches attributed to MIA II, while E3 truncated an MIA I boundary. Secondly, the multiple re-cut form of Enclosure E3 appears characteristic of the sites' MIA III enclosures. However, if other characteristics of enclosure E3 particularly are taken into account - such as the fact that it appears to 'mirror' enclosure E21 or that it is aligned on a MIA I boundary - it can equally be argued that the enclosures could belong to MIA II or even, in the case of E3, MIA I.

Enclosure E2 and E3

Enclosure E3 comprised a sub-rectangular enclosure ditch, which had been extensively re-cut (on five or six occasions). The early phases of the enclosure appear to have been open-sided (or at least unditched) to the south before the open-side was later ‘closed’ leaving a narrow entrance to the south-east. This modified form was then re-cut and enlarged on at least three further occasions. To the south-east a much smaller horseshoe-shaped enclosure (E4), with a south-west facing entrance, appears likely to be related to Enclosure E3 and potentially represents some kind of ancillary enclosure.

Enclosure No.	Pottery	Bone	Burnt clay	Others	Total
E3	251 (2091g)	847 (5619g)	21 (48g)	18 (797g)	1137 (8555g)
E4	230 (2419g)	182 (1220g)	24 (77g)	12 (189g)	448 (3905g)
E5	190 (2470g)	672 (6421g)	64 (195g)	33 (160g)	959 (9246g)
E9	165 (2827g)	232 (2938g)	-	3 (454g)	400 (6219g)
E11	65 (789g)	189 (1269g)	4 (7g)	-	258 (2065g)
E12	50 (992g)	188 (2852g)	2 (33g)	3 (28g)	243 (3905g)
E13	61 (1821g)	158 (2574g)	2 (115g)	4 (3335g)	225 (7845g)
E14	78 (1502g)	129 (2165g)	5 (148g)	4 (13g)	216 (3828g)
E18	82 (1615g)	58 (726g)	-	-	140 (2341g)
E22	34 (728g)	127 (1444g)	2 (66g)	1 (1g)	164 (2239g)
E23	15 (256g)	16 (234g)	-	-	31 (490g)

Table 6: Phase 4.3 enclosures assemblage breakdown

The finds assemblages recovered from the MIA III enclosures are detailed in Table 6, above. Unfortunately the finds totals cannot be taken completely at face value given the variation in the percentage of each enclosure that was excavated; the low finds totals from settlement enclosures E12, E13 and E14, for example, probably simply reflect the relatively low percentage sampled. However, taking this into account it is still clear that generally, as expected, the settlement enclosures have higher finds totals than ancillary enclosures. One exception to this appears to be enclosure E4, interpreted as ancillary to enclosure E3, which yielded a comparatively large assemblage of pottery from only three excavated slots.

Pits

A total of 870 pits have been attributed to the Middle Iron Age settlement phase. Of these, 524 yielded Middle Iron Age pottery while the remaining 346 pits have been dated by association and their location within the Middle Iron Age settlement. Whilst many of the pits, particularly those located within settlement enclosures, could potentially be attributed to one of the sub-phases of Middle Iron Age settlement, in

reality this would be speculative. It is clear that, particularly in the core of settlement, where structures/enclosures belonging to phases MIA I, II and III are present, pits are the result of a long cumulative process. Furthermore, the difficulty in assigning the majority of the pits to sub-phase is only exacerbated by the lack of closely diagnostic pottery within the finds assemblage. Consequently it is better to discuss the pits in terms of spatial groupings. Eighteen pit groups have been identified, with pits being grouped together according to whether a) they exhibit clear spatial clustering, or b) they occur within a settlement enclosure and are more likely than not to be associated with it (Figure 10). A breakdown of the pit groups and their finds assemblages is provided in Table 7.

Pit Groups

The majority of the pits within the pit groups took the form of typical ‘storage pits’ commonly found on Middle Iron Age sites (see Cunliffe 2007, 411-12), and the lack of four-post structures (representing potential granaries) in any number at the site appears to support this interpretation for most. Although variable, storage pit dimensions were generally between 1m and 2m in diameter by between 0.3m and 1.2m deep. All were sub-circular or sub-oval in plan, with steep sides – often undercutting towards to the base – and relatively flat bases (Figure 11).

In terms of the Middle Iron Age pit groupings, seven pit groups (Pit Groups 4, 5, 6, 8, 9, 10 and 14) have been identified due to their location within, and probable association with, enclosures. A further three pit groups (Pit Groups 3, 12 and 15), were quite different in form and appear to have been established along existing boundaries in a broadly linear pattern. Within the latter category, PG 15 was by far the largest pit group with 100 pits spreading either side of the ditch marking the eastern boundary of the settlement for a distance of some 65m north to south. One pit group (PG 7) appears to be a combination of the aforementioned pit group types with pits located on the inside of enclosure E6 as well as spreading along the outside of the enclosure in a linear pattern closely following the exterior of the enclosure. Finally, the remaining six pit groups (PGs 2, 11, 13, 16, 17 and 18) were clear clusters of pits, largely within the heart of the Middle Iron Age settlement, which clearly represent areas of intense activity.

The Middle Iron Age pits produced a large and varied finds assemblage, indeed as a whole, over 75% of the sites’ finds came from pits. Dominated by pottery and animal bone, the assemblage also includes 26 complete or fragmentary quern stones, fragments of burnt clay/daub as well as significant finds of metalworking debris and metalwork, which are discussed further below. In addition a large number of placed or ‘special’ deposits including articulated animal skeletons/Associated Bone Groups (ABGs), complete pottery vessels and human remains were also found within pits (see below). In terms of finds distribution, at a very basic level, it is clear that for the most part the highest finds densities occurred in pit groups associated with settlement enclosures or located within clearly domestic areas, close to structures and enclosures (as demonstrated by the distribution of features containing over 50 sherds of pottery, Figure 12). Pit Group 15 had by far the largest average finds per pit, however, its finds assemblage is dominated by animal bone (with a high number of ABGs present) whilst its pottery assemblage is comparatively small given the size of the pit group.



Figure 10. Middle Iron Age pit groups

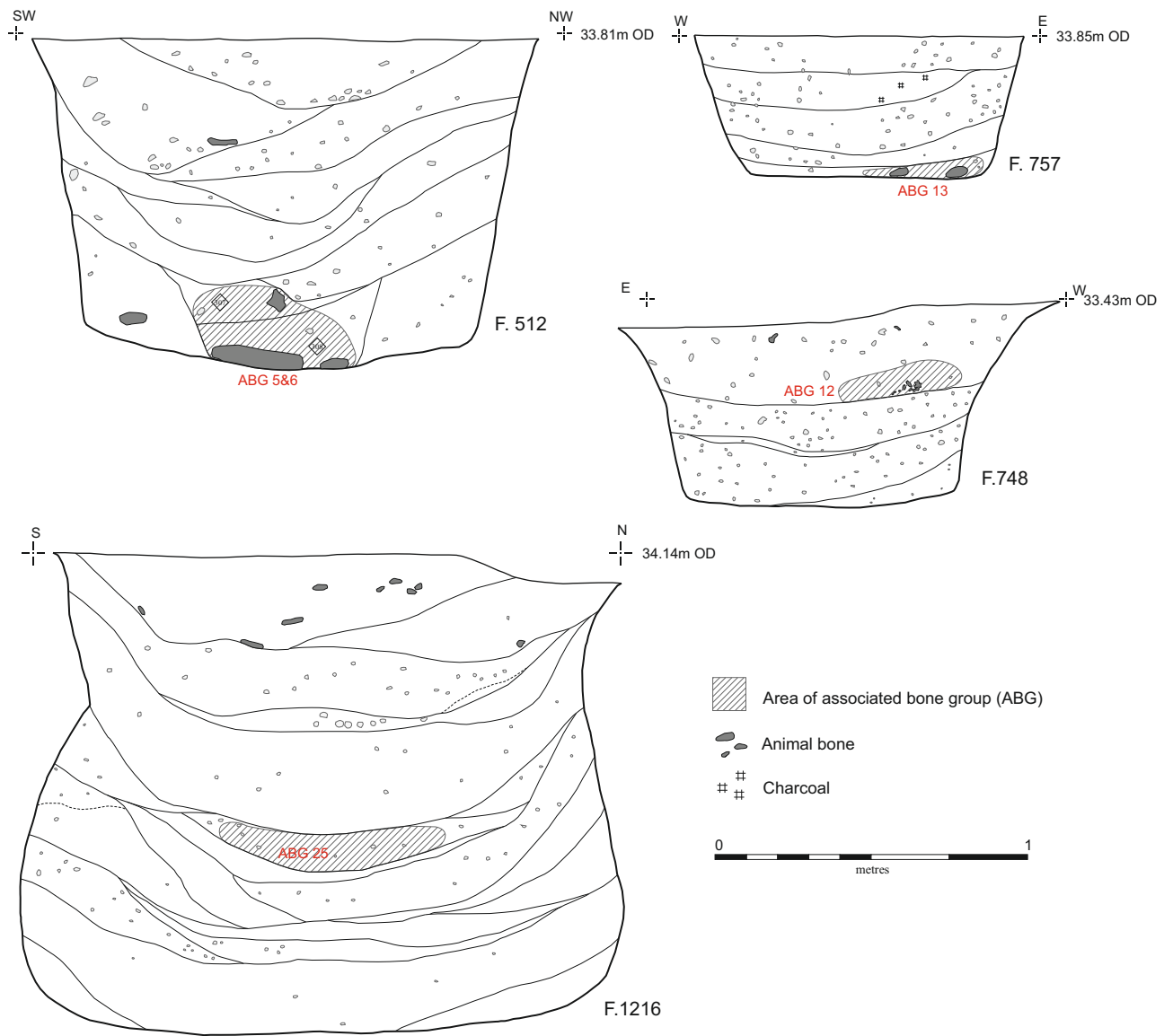


Figure 11. Examples of Middle Iron Age pit sections



Figure 12. Distribution of features with significant pottery deposition

Pit Group	No. of pits	Finds				Placed deposits/significant finds	Total finds	Average no. of finds per pit
		Pottery	Bone	Burnt Clay	Others			
2	20	55 (813g)	4090 (20287g)	92 (2945g)	4 (183g)		4241 (24228g)	212 (1211g)
3	46	160 (2361g)	961 (4659g)	1 (2g)	9 (183g)	ABG x 2	1131 (7205g)	25 (157g)
4	10	17 (197g)	288 (2142g)	-	-		305 (2339g)	31 (234g)
5	23	63 (756g)	249 (1168g)	-	5 (1178g)		317 (3102g)	14 (135g)
6	12	81 (731g)	348 (2399g)	12 (61g)	1 (69g)	ABG x2	442 (3260g)	37 (272g)
7	56	459 (6379g)	1276 (15552g)	63 (464g)	43 (1316g)	ABG x 2	1874 (23918g)	33 (427g)
8	14	410 (6408g)	616 (4047g)	123 (2790g)	13 (1841g)		1162 (15086g)	83 (1077g)
9	22	316 (2692g)	771 (5010g)	48 (529g)	56 (1236g)		1191 (9467g)	54 (430g)
10	31	600 (7974g)	1274 (9641g)	16 (698g)	19 (9304g)	ABG x 1	1909 (27617g)	62 (891g)
11	26	544 (6905g)	941 (8487g)	66 (379g)	18 (1838g)		1569 (17609g)	60 (677g)
12	41	181 (4004g)	649 (1701g)	83 (335g)	37 (28 28g)		950 (8868g)	23 (216g)
13	25	227 (4282g)	840 (5335g)	12 (79g)	50 (8209g)		1129 (17905g)	45 (716g)
14	15	271 (3408g)	508 (5266g)	9 (49g)	18 (194g)	ABG x 1	806 (8917g)	54 (594g)
15	100	485 (5116g)	10405 (43884g)	6 (12g)	213 (2689g)	ABG x 13	11109 (51701g)	111 (517g)
16	56	1076 (15788g)	2191 (19162g)	51 (812g)	62 (21610g)	ABG x 3	3380 (57372g)	60 (1025g)
17	49	398 (5057g)	2631 (10828g)	177 (971g)	77 (192g)	ABG x 3	3283 (17048g)	67 (348g)
18	20	209 (2694g)	531 (1102g)	56 (778g)	3 (588g)		799 (5162g)	40 (258g)

Table 7: Middle Iron Age Pit Groups

Peripheral pits

Nine storage-type pits were located away from the settlement, in Area A (Figure 7). Of these a cluster of six comprising a linear arrangement of paired pits (**Fs. 2030-2035**) yielded no dating evidence but took a very similar form to the Middle Iron Age storage pits recorded in the settlement while a single pit (**F.2017**) located some 24m to the north yielded a small quantity of abraded Middle Iron Age pottery sherds. A further two pits (**F.1866** and **F.1867**) occurred as a pair just to the south of Romano-British Trackway C (see below). The pits yielded few finds although an abraded Middle Iron Age pottery sherd and a fragment of human bone were recovered from pit F.1866.

One further shallow pit/hollow (**F.2020**) in the far north-east of the excavation area in an area otherwise occupied by Romano-British enclosures yielded 38 sherds of Middle Iron Age pottery.

Clay-lined pits

While storage pits were most prevalent, other pit-types were also recorded and most notable amongst these were 18 clay-lined pits. Smaller in size than the storage pits the clay-lined pits were between 0.4m and 0.87m in diameter by 0.08m and 0.36m deep. Although yielding few finds generally, many contained quantities of burnt stone or 'pot boilers' and the pits have been interpreted as potential cooking pits in which hot rocks or 'pot boilers' were used to heat water (see Timberlake, below). In this sense a domestic function seems most likely, however, whilst a number of the clay-lined pits are located 'within' roundhouses or enclosures, others are relatively isolated and there is no real pattern to their distribution (see Figure 10). Despite this it seems reasonable to assume that each was associated with an individual roundhouse or household.

Pit-wells/watering holes

Interestingly only one potential pit-well/watering hole was recorded amongst the Middle Iron Age settlement remains (see Figure 10). **F. 1834** was 3.35m in diameter by 2.4m deep and contained a fill sequence resulting from a combination of natural silting and side collapse/slumping. The pit-well produced only a small finds assemblage comprising 11 sherds of Middle Iron Age pottery and 21 worked flints. The fact that only one well was recorded is perhaps indicative of such features being located away from the immediate settlement, perhaps for reasons of cleanliness. The results of recent excavations at the newly established Broom South Quarry, c.1km to the south of the Phase 11-13 quarry area, would indeed suggest that this was the case. Here, a high number of well-type features were recorded situated well away from a settlement context (see Tabor forthcoming).

Special deposits

The placed or 'special' deposits within Middle Iron Age pits included 26 Associated Bone Groups, four human burials and two pottery vessels (Figure 13).



Figure 13. Middle Iron Age special deposits

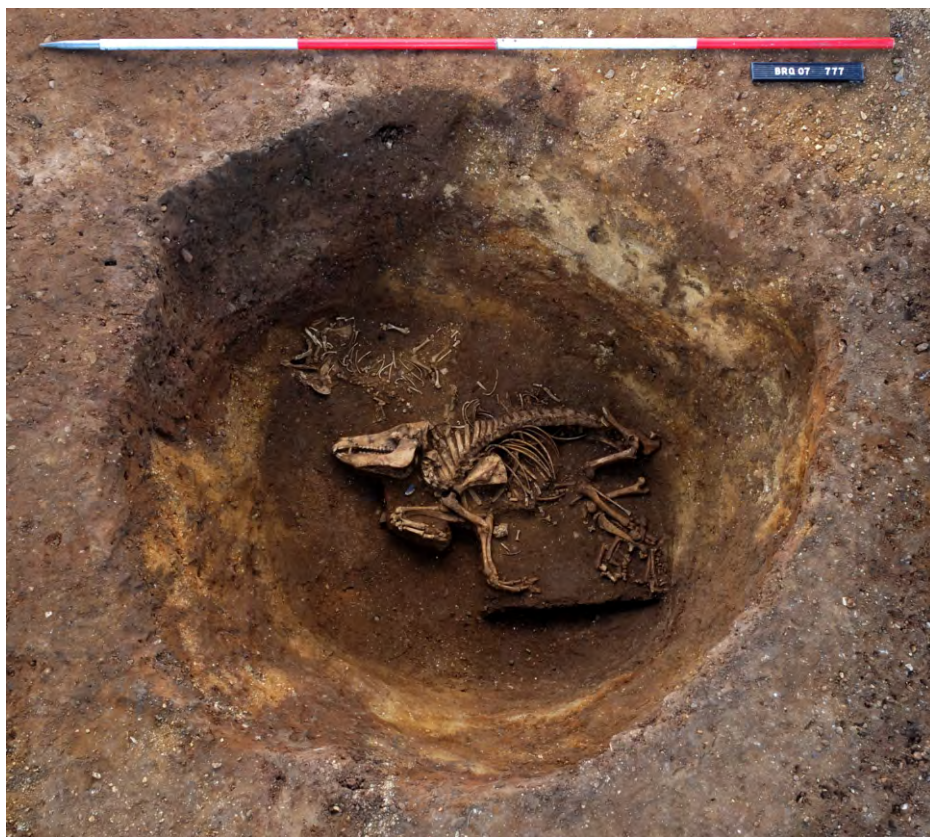


Figure 14. Middle Iron Age associated bone groups: ABG 12 (top), ABG 14 (bottom)

Associated Bone Groups (Figure 14)

Associated Bone Groups (ABGs) were encountered within 22 pits, four of which contained two separate ABGs. The ABGs (discussed in detail by Rajkovača, below) largely comprised complete or partial articulated animal skeletons, however, four non-articulated bone deposits/skulls, which were considered at the time of excavation to have been 'placed' are also included. In terms of the species which make up the ABGs, cattle are present in the highest number followed by dog, sheep and pig. Other species such as horse, mustelid (weasel family) and red deer are present in small numbers as well as one deposit of bird bone.

Given the significance attached to ABGs it is important to consider their distribution (see Figure 13). While they are fairly well distributed around the mostly densely settled areas of site the clear concentration of 12 ABGs in PG 15 is clearly significant and elevates the importance of this pit group.

Human remains

Three articulated adult human skeletons were found within Middle Iron Age pits all in a crouched position. Of the burials, two were located in PG 15 (**F.855** and **F.897**) whilst the third (**F.311/384**) was located in relative isolation to the north of enclosure E6. The skeletons were all of younger to middle adult males (see Dodwell, below). Some variation in the nature of their deposition is evident; both pits F.855 and F.897 contained no other finds (other than a single residual animal bone fragment and worked flint respectively) whereas pit F.311/384 contained quantities of pottery, animal bone and a fragment of slag ie. a typical storage pit assemblage. In addition, the burial of a neonate (**F.1884**) was placed within pit **F.1889** on the interior of Enclosure E21. The skeleton appeared to have been placed on a shelf in the side of the pit, which otherwise produced finds limited to seven fragments of animal bone and a single sherd of pottery.

One further articulated adult human burial contained within a shallow elongated lozenge-shaped grave (**F.1588**) was recorded just to the south of the Middle Iron Age settlement. The skeleton was extremely poorly preserved but was clearly placed in a slightly crouched position. As such, and given its location the grave seems most likely to be Middle Iron Age although that it is earlier, or indeed later (it is located just to the south of Romano-British Trackway C) cannot be ruled out.

In addition to the articulated remains a further six fragments of disarticulated bones were found within Middle Iron Age features including pits and enclosure ditches (see Figure 13). Three of the bones showed evidence of post-mortem modification prior to their final deposition, as detailed by Dodwell, below.

Pottery vessels

A complete pottery vessel, broken *in situ* was recovered from pit **F.652** in the centre of enclosure E8, while an almost complete vessel was recovered from **F.519** located at the entrance to enclosure E11. The former particularly appears to have been to some

degree 'placed', however, the significance of these deposits (especially the almost complete vessel from F.519) should perhaps be treated with some caution; whilst the location of pit F.652 in the centre of Enclosure E8 appears significant, that complete pots could have found their way into what were essentially rubbish deposits is possible.

Metalwork and metalworking debris

Evidence of metalworking was recovered from across the site in the form of smithing and smelting slag and crucible fragments, albeit largely in low quantities (see Timberlake, below). The most significant deposit of smelting slag (over 3.5kg) derived from a single pit (**F.254**) located immediately adjacent to the eastern edge of excavation (Figure 10) and truncated by the eastern boundary of Field II (**F.197**, which also contained a significant quantity of slag). The pit seems almost certainly to have been a slag dump pit, which would have been associated with a furnace. Seemingly a furnace was located in the immediate vicinity, either within the excavation area and subsequently truncated/destroyed, or just beyond the edge of excavation. The remaining slag recovered from the site was largely found in small quantities and unremarkable, however, a small assemblage of slag with attached furnace lining recovered from the roundhouse gully of structure S5 also suggests the existence of a nearby furnace. Whether this could be the same furnace as that associated with pit F.254 located some 56m to the east is unclear.

Seven fragments of crucible were recovered from Middle Iron Age features (two pits, a field system ditch and the ditch of enclosure E3). While crucible remains were present in only very small quantities they nevertheless provide evidence of copper alloy casting at the site (see Timberlake, below).

A small quantity of metalwork was recovered from Iron Age contexts (see Hall and Appleby, below), the majority derived from pits although it was also present in roundhouse gullies and enclosure ditches. Ironwork was by far the most common and comprised largely nail fragments and unidentifiable objects although two blade fragments and part of a La Tene I brooch were also recovered. One copper alloy pin was also recovered from an Iron Age pit.

Late Iron Age

Evidence of activity during the Late Iron Age is hard to pinpoint although a small quantity of pottery within the site's finds assemblage (28 sherds dated to the Late Iron Age and 177 sherds dated more broadly to the Middle-Late Iron Age) suggest that there was a presence during this period.

Only two features can tentatively be assigned to the Late Iron Age. Firstly, the corner of an enclosure formed by ditches **F.2048** and **F.2049** in the north-east corner of Area A appears to have been an Iron Age precursor to the Romano-British enclosures in this area (Figure 7). Ditch F.2048 produced two sherds of Late Iron Age pottery, while a number of residual Late Iron Age sherds were also present in nearby features. The alignment of the enclosure with the Middle Iron Age field system, particularly

ditch F.1801 does, however, suggest the feature may have earlier origins, potentially with continued use into the Late Iron Age. Secondly, two of the ditches forming subsequent phases of the southern side of the Middle Iron Age trackway extending south-westerly from the southern edge of the settlement, also yielded seven sherds of Late Iron Age pottery suggesting the trackway may have continued in use into this period.

Unphased Iron Age features

All of the sites enclosures and structures have been fitted into the development/phasing model detailed above, while the site's Middle Iron Age pits (along with those in Area B, which remain undated but seem highly likely to associated with the main Middle Iron Age settlement) have been discussed more broadly. There remains only a small number of gullies/ditches, which are difficult to place within the site's phasing. These include two gullies (**F.1017/18** and **F.1019**), which appear to be the truncated remains of a former east-west aligned boundary, which seems most likely to relate to the Middle Iron Age settlement but could potentially pre-date it. Also, a network of gullies/ditches, which remained unexcavated but were seen to be truncated by Romano-British Trackway C (see below), but also appear to effectively 'block' the main Middle Iron Age trackway from the south-west of the settlement; as such they also remain undated. The remaining unphased features all comprise truncated short lengths of gully/ditches the function and date of which remains unknown although that they are broadly contemporary with the main Middle Iron Age settlement seems most likely.

Romano-British

Romano-British features recorded in Areas A, B and C were limited, especially considering the proximity of the Roman-British cropmark complexes along the River Ivel to the east.

Trackways

Three trackways (A, B and C) aligned broadly east to west were recorded transecting Areas A and B (see Figure 15). All apparently leading from Romano-British cropmark complexes (settlements) in a westerly direction, each was defined by parallel ditches with no evidence of any kind of surface surviving.

Trackway A

The most northerly trackway was 5.9m wide and appeared to comprise at least two phases with its alignment shifting slightly on at least one occasion. The trackway ditches yielded only four sherds of pottery; two abraded Roman sherds and two residual Middle Iron Age sherds.

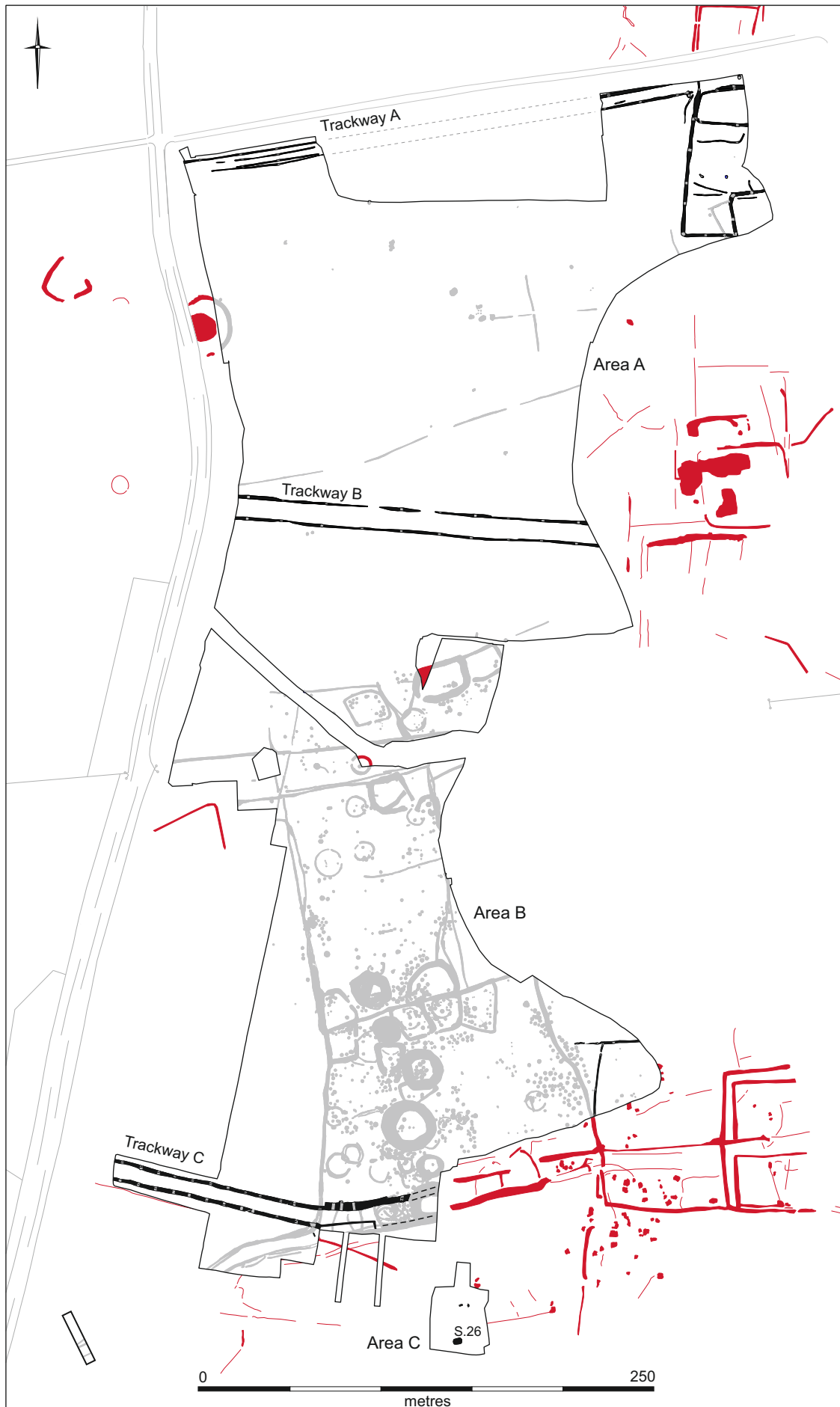


Figure 15. Romano-British and Anglo-Saxon features. (Earlier archaeology in grey)

Trackway B

Approximately 175m to the south of Trackway A, Trackway B appeared to be single phase and was represented by two single linear ditches 11.4m apart (**F.1837** and **F.1839**). Although containing only two residual sherds of pottery dating to the Middle and Late Iron Age respectively, the trackway can be dated with relative accuracy to *c.* 148 AD due to the presence of a coin, an *As* of Antoninus Pius, within the fill of ditch F.1839 (see Hall and Appleby, below).

Trackway C

The third trackway was 6.7m wide and its ditches had been re-cut on at least two occasions suggesting it was a relatively long-lived route way. Pottery recovered from the trackway ditches largely comprises residual sherds of Middle Iron Age pottery – unsurprising given the proximity of the main Middle Iron Age settlement – but also includes a single abraded Roman sherd as well as a small number of Late Iron Age sherds. Based on the latter, and given the general lack of Late Iron Age sherds recovered generally, it can be speculated that Trackway C may have Late Iron Age origins. In addition a crucible fragment was also recovered from ditch F.1540 (see Timberlake, below).

Enclosures

In the north-east of Area A, a series of Romano-British ditches represented a small part of an extensive series of cropmark enclosures visible on aerial photographs, which fell within the excavation area. The ditches, which produced residual Middle and Late Iron age pottery as well as Romano-British pottery are difficult to interpret in detail given their limited exposure, however, at least two main enclosures appear to be present along with a series of potential internal sub-divisions. The features align well with the cropmark enclosures to the north and south. Five pits recorded within the vicinity of the enclosures yielded no finds and remain undated although they are perhaps most likely related to the Romano-British activity. The lack of finds generally suggest the enclosures are not directly settlement related and lie some distance from any settlement core.

Anglo-Saxon

A single Anglo Saxon Sunken Featured Building/*Grubenhäuser* (structure S27; **F.156**) was recorded in Area C some 60m to the south-west of a *Grubenhäuser* identified in the 2003 evaluation, which in turn appears to be part of a relatively extensive cluster of similar features visible on aerial photographs and geophysics plots (Cooper and Knight 2004). Structure S27 was sub-rectangular (3.4m x 2.8m, surviving to a maximum depth of 0.34m) and was aligned north-east to south-west (see Figure 16). A single post hole was located at each end of the structure (**F. 158** and **F.159**).

The finds assemblage recovered from the *Grubenhäuser* (detailed in Table 8, below) is dominated by 6th-7th century AD pottery and animal bone (largely ovicapra and sheep-sized elements, see Rajkovaca, below). Other notable artefacts within the assemblage include a fragment of a copper alloy bow brooch, a copper alloy pin, an iron knife blade (see Hall and Appleby, below and Figure 17) and a worked bone needle (see Rajkovaca below). The copper alloy finds are particularly notable in that they are almost certainly Romano-British in origin and could well be ‘curated’ objects or potentially have been collected for recycling/re-use. Two further Roman finds, a

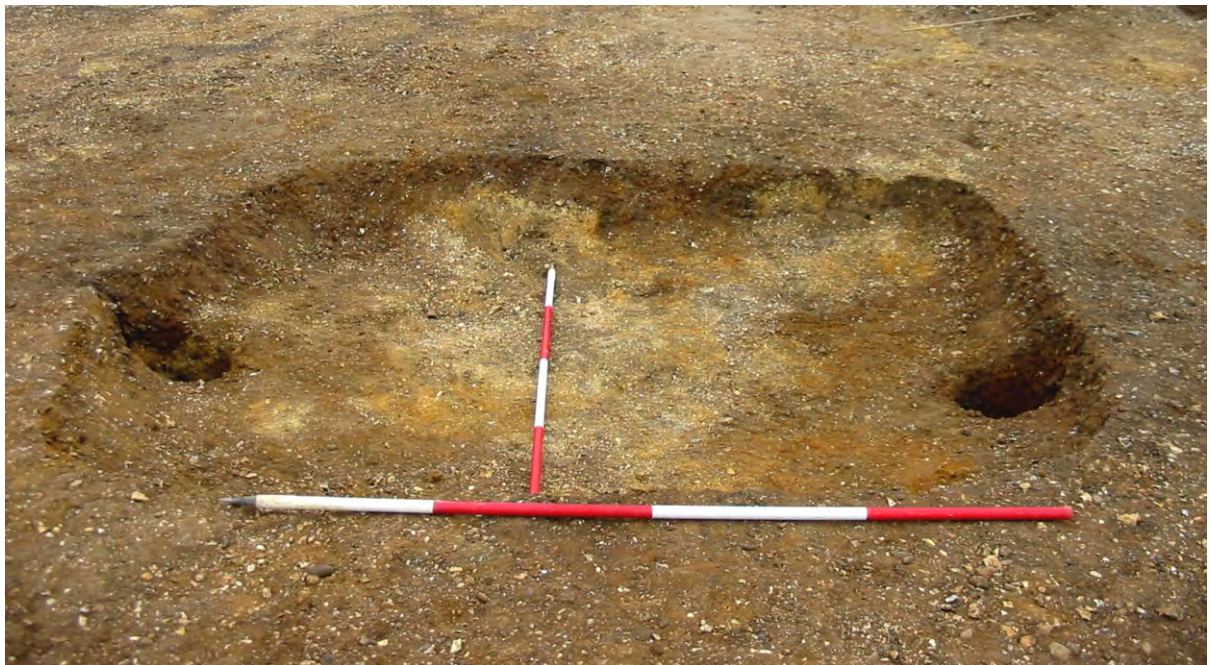
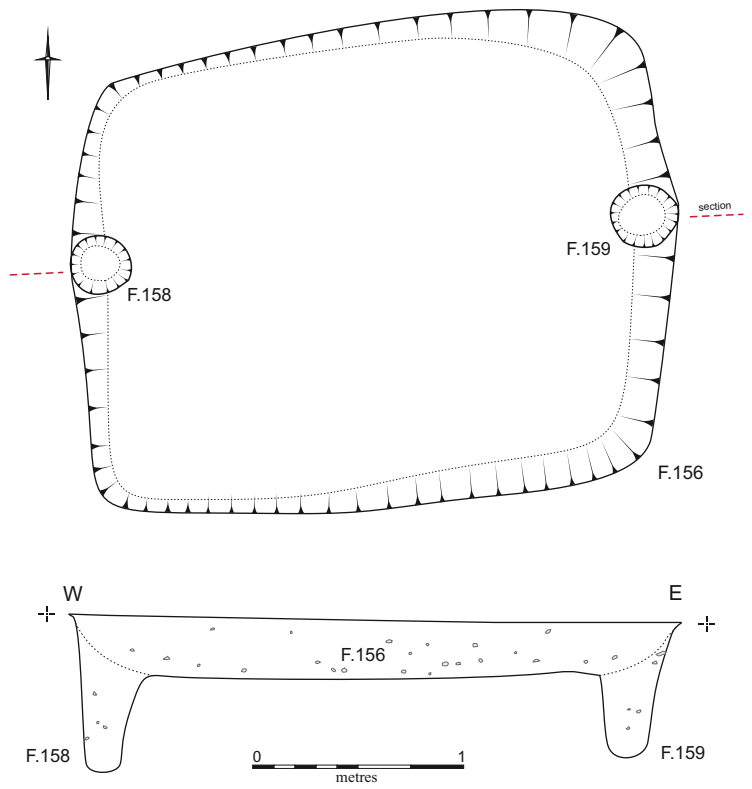
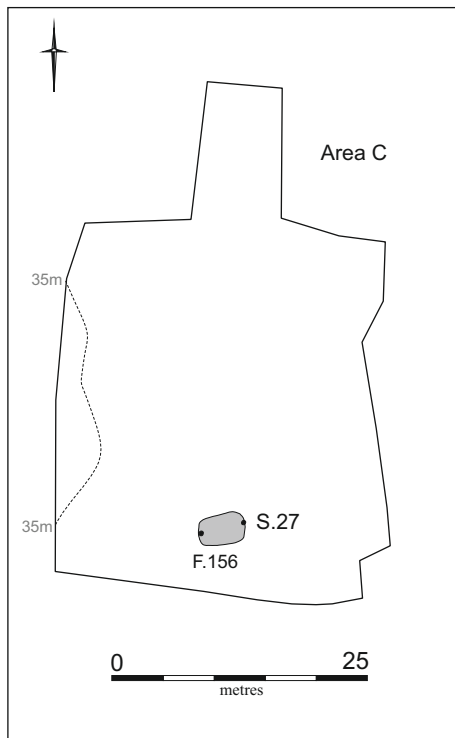


Figure 16. Anglo-Saxon Sunken Featured Building S27



Figure 17. Roman and Saxon metalwork from Sunken Featured Building S27

fragment of *tegula* and one pottery sherd, almost certainly represent residual material originating from the nearby Roman settlement site.

	Quantity	Weight (g)
Pottery	175	2560
Bone	92	1446
Metalwork	7	29
Burnt clay	5	63
Burnt stone	1	2
Tile	2	537
Worked bone	1	2

Table 8: Structure S27 assemblage breakdown

Post-medieval/modern

A total of 13 post-medieval or modern features were recorded within Areas A, B and C. Features were limited to small pits of unknown function and two ditches occupying the same north-east to south-west alignment and located some 250m apart. The location of both ditches coincides with field boundaries, which appear to have still been in existence immediately prior to the start of quarrying in this area.

4.2 Area D

At the southern extent of the Phase 11-13 quarry area, Area D incorporated the edge of an Early-Middle Iron Age site identified during the 2003 evaluation (Site 4, Cooper and Knight 2004). Measuring 0.56ha in area, the excavation exposed features dating to the Late Bronze Age/Early Iron Age, Middle Iron Age and post-medieval period (Figure 18).

Late Bronze Age/Early Iron Age

A cluster of features within Area D, three of which yielded Late Bronze Age/Early Iron Age pottery, can be dated to this period. Firstly, two pits amongst a cluster of three (**F.1250**, **F.1261** and **F.1262**), two of which were inter-cutting, yielded three sherds of Late Bronze Age/Early Iron Age pottery. Secondly, *c.*13m to the east, a cremation held within a small pit (**F.1251**), produced two sherds of Late Bronze Age/Early Iron Age pottery. The cremation comprised the partial remains of an adult (see Dodwell, below).

A second cremation (**F.1255**), located *c.* 20m to the south-west of F.1251, was also contained within a small pit and once again comprised the partial remains of an adult. Although yielding no datable finds the cremation seems likely to be contemporary with F.1251 and therefore Late Bronze Age/Early Iron Age in date.

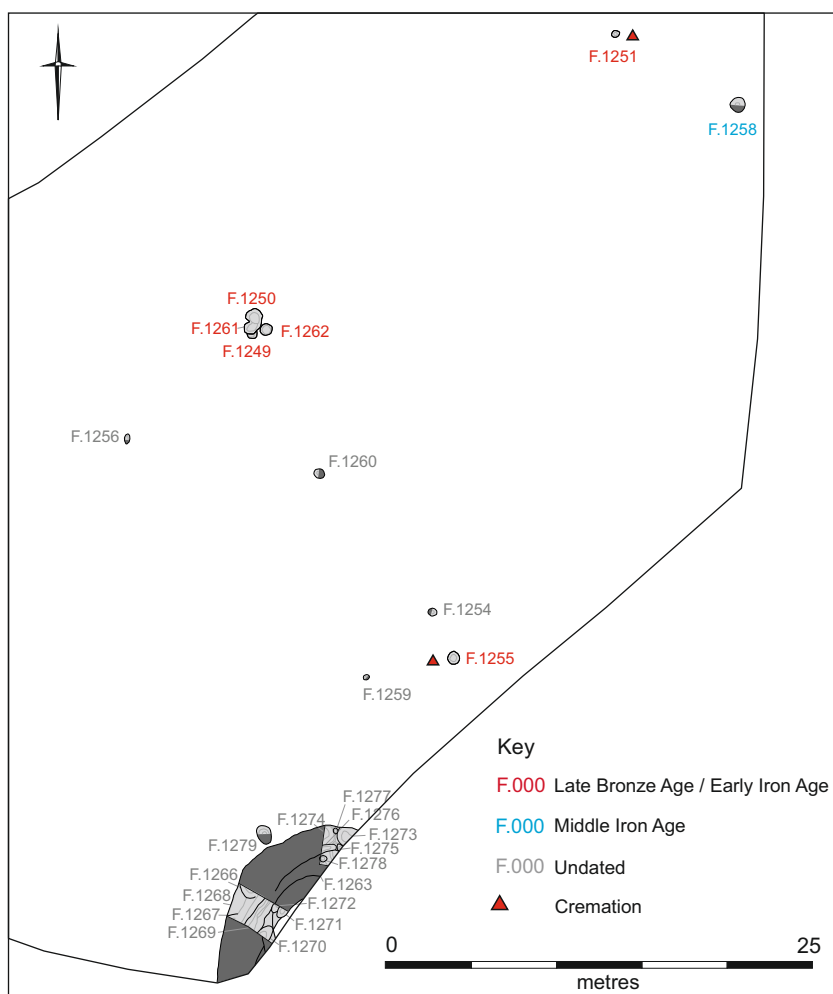


Figure 18. Archaeological features in Area D

Middle Iron Age

A single, apparently isolated pit (F.1258) close to the eastern limit of excavation yielded a single sherd of Middle Iron Age pottery.

Unphased (later prehistoric)

The corner of an enclosure (E27), which extended beyond the edge of excavation to the south and east was also recorded in Area D. The enclosure appears to have had at least five phases, with four re-cuts recorded, and almost certainly relates to either the Late Bronze Age/Early Iron Age or Middle Iron Age activity in the vicinity. While an association with the latter is perhaps more likely, the ditches yielded no finds and there is little to definitively date the feature.

Four further pits in the area are unphased but potentially relate to the later prehistoric activity in the area.

Post-medieval/modern

A further 13 features in Area D (not shown on Figure 17) dated to the post-medieval/modern period. These comprised a series of five boundary ditches relating to a trackway marked on modern maps and seven pits/postholes of relatively recent origin.

4.3 Discussion

Earlier prehistory

The site's Neolithic and Early Bronze Age evidence can in many ways be considered typical of that previously encountered in the Broom landscape. The Carinated Plain Bowl type pottery and flint assemblage from tree throw F.2019, and the manner of its deposition, is typical of the dispersed Early Neolithic activity, represented by features found in isolation or in loose clusters, across the landscape. Indeed, a cluster of broadly contemporary pits and tree throws has been recorded less than 200m to the north-west at Brooklands Farm. Other evidence of Early Neolithic activity was restricted to residual worked flint within later features and although limited, the scant evidence is nevertheless useful in apparently conforming to the patterns of Neolithic occupation recorded during previous excavations at Broom (as discussed in Cooper and Edmonds 2007). Much the same can be said for the Beaker period evidence although the assemblage of 23 sherds recovered from pit F.1832 is relatively large compared to the very small, often residual assemblages, previously recorded in the immediate landscape (*ibid.*).

Ring Ditch F.2025 is also closely comparable to features previously excavated at Broom, most notably Monuments III and IV (Cooper and Edmonds 2007). Both in terms of overall dimensions (c.30m in external diameter) and ditch size (c.2m wide by

1m deep) it is particularly reminiscent of ring ditch Monument III, which was fully exposed during the excavations at King's Hill (*ibid.*). The finds assemblages from the ditch are also remarkably similar in comprising limited quantities of worked flint and generic Late Neolithic/Early Bronze Age pottery. Despite the fact that Ring Ditch F.2025 almost certainly represents a funerary monument, it is no surprise that no associated interments were found given that the majority of its interior fell outside of the excavation area. In addition, the small numbers of features associated with Monument III – a pit containing 10 sherds of Collared Urn and a truncated cremation pit – suggest that associated surviving funerary remains may well be extremely limited in any case. Indeed a similar ring ditch recently excavated at Broom South quarry some 2.5km to the south was found to have no surviving interments or evidence of funerary activity (Tabor, forthcoming). It seems likely that, as demonstrated by well-preserved sites such as the Low Grounds barrow cemetery at Over, Cambridgeshire (Evans *et al* forthcoming) any associated cremations were probably placed on the ground surface or inserted into an existing mound, and consequently no longer survive at 'plough truncated' sites such as Broom. In terms of its wider context, the ring ditch forms part of an extensive concentration of monuments along the River Ivel – and beyond along the Great Ouse valley – identified through both archaeological excavations and cropmarks and which are discussed at greater length by Cooper and Edmonds (2007).

Late Bronze Age

The difficulties in identifying distinct Late Bronze Age and Early Iron Age phases amongst pottery assemblages that can be only be broadly defined as Late Bronze Age/Early Iron Age have been previously discussed with regard to Broom (see Brudenell in Cooper and Edmonds 2007). However, despite this, as discussed above it has been possible to 'split' many of the features yielding such pottery assemblages within the Phase 11-13 quarry area; the continued use of enclosure E21 into the Middle Iron Age, strongly suggests its pottery assemblage is later Early Iron Age, whilst the exceptional pottery assemblage from pit F.1800, clearly dates it, and to a lesser extent features in the vicinity, to the Late Bronze Age.

The recorded Late Bronze Age features form a loose cluster in the northern half of Area A and include pit F.1800, four-post structure S26 and a number of wells/watering holes. The Post-Deverel Rimbury pottery assemblage from F.1800 was substantial and yet while occasional burnt stone/flint was also recovered, the feature was not indicative of settlement or occupation on any scale. The same can be said for structure S26 and the apparently associated pits/watering holes to the north, which although producing a small assemblage of pottery were also notably lacking in clear indicators of occupation such as animal bone and burnt stone. Furthermore, whilst four-post structure S26 would be typically interpreted as a granary there is no reason such a feature could not have served a different function and on the whole there is scant evidence for the feature cluster representing settlement *per se*.

Late Bronze Age activity in the Broom landscape is widespread, with six settlement sites recorded during previous excavations (Cooper and Edmonds 2007). Settlement has been characterised as relatively low density and with some fluidity in character, duration and setting (*ibid.*). In many ways, the features in Area A conform to this

model, however, that they do not appear to be settlement-related adds another dimension to our understanding of the Late Bronze Age landscape; potentially, they represent relatively significant activity away from a settlement context. Indeed, it is possible that the pits/watering holes were the main reason for activity at this location. Pits/watering holes are conspicuous by their absence in Late Bronze Age settlement contexts at Broom and that they were located away from occupation sites seems likely.

Iron Age

Settlement chronology and development

The earliest Iron Age settlement activity is represented by enclosure E21 and associated Pit Group 1. Although the pottery recovered from both enclosure ditch and pits has only been broadly dated to the Late Bronze Age /Early Iron Age, the continued use of the enclosure into the Middle Iron Age indicates that – barring a considerable and unlikely lapse in use – the enclosure dates to the later Early Iron Age. Having said that, a slight break in the sequence of occupation seems likely given the clear separation between Early and Middle Iron Age pottery types in the respective ditch cuts and the almost complete silting up of the enclosure ditch before it was re-cut in the Middle Iron Age. The enclosure and associated pits produced little in the way of evidence for environment and economy however and their significance lies in being the earliest features of what was to become a substantial settlement at the site in the Middle Iron Age, and effectively marking its foundation. Indeed enclosure E21 finds a close parallel in Early Iron Age Enclosure 1 at the Gypsy Lane Iron Age settlement less than 1km to the north-west (Cooper and Edmonds 2007). Here, an Early Iron Age palisade enclosure was re-defined during the Middle Iron Age (again after an apparent short lapse in use) and became the focus for a Middle Iron Age settlement (*ibid.*). Both the Gypsy Lane enclosure and enclosure E21 mark a significant departure in terms of settlement form from the preceding open and relatively dispersed Late Bronze Age settlement and appear to have very much been the impetus for the respective Middle Iron Age settlements.

That this change in settlement form was not wholesale is, however, made very clear by the open settlement of phase MIA I, and while enclosure E21 was re-defined during this phase and apparently continued in use, it is seemingly out of place in a settlement otherwise characterised by roundhouses situated within an ‘open’ field system. In this sense the continued use of enclosure E21 serves to highlight the fluidity of settlement form during later prehistory. As stated by Cooper and Edmonds with regard to the strikingly similar sequence at Gypsy Lane ‘sequences erode some of the distinctions between open and enclosed as categories of occupation, revealing patterns in the reworking of settlement spaces which suggest subtle shifts in the logic of architectural and depositional practice’ (2007, 181).

Nevertheless, the MIA I settlement was largely open and comprised roundhouses within ‘fields’ defined by relatively diminutive ditched boundaries. As discussed above, there seems likely to have been considerable time depth to this open settlement, with sequences of up to four structures recorded (structures S21-S24). It is,

however, impossible to translate localised stratigraphic sequences to the site as a whole and presently any site-wide sub-phases are difficult to identify. In this sense the spatial organisation of the settlement is key. Three loose clusters of roundhouses are evident suggesting settlement *foci* existed within the wider settlement, with the separation between the southern and northern roundhouse groups particularly notable. While it is clear that many of the roundhouses cannot be contemporary (the obvious examples being structures S21-S24) it seems almost certain that many were, indeed inter-relationships between roundhouses, and therefore their contemporaneity, has been well demonstrated at other sites in the region. At Bancroft, Milton Keynes, for example, three roundhouses connected by gullies were clearly inter-related (Williams 1994), while there is a convincing case for pairs of roundhouses being contemporary at sites such as Wardy Hill, Cambridgeshire (Evans 2003). A number of clear 'pairings' occur within the Broom open settlement, most notably structures S5 and S6 and structures S8 and S7 (which were superseded by contemporary household compounds represented by Enclosures E8 and E7 respectively); it can even be argued that Enclosure 21 and Structure S1 also represent such a pairing. In addition, many of the smaller (and less formal) structures surely represent ancillary structures to larger 'houses'. As such that we are seeing a grouping of households (a number of which are contemporary) over a shorter period as opposed to one or two over a much longer period, for example, seems most likely. Despite this it remains difficult to comment on the duration of the open settlement phase, although certainly it persisted long enough to see numerous phases of rebuilding as demonstrated by structures S21-S24.

At this juncture it is important to recognise the limitations of the site phasing that we have imposed on the settlement and the probable overlap between phases that occurred; these phases would not have had strict boundaries and that elements of open settlement coincided with enclosed settlement is almost certain. In effect we are looking at broad settlement trends rather than strict episodes of occupation and the development of the MIA II settlement phase was almost certainly gradual.

The MIA II settlement apparently saw a move away from open settlement and the replacement of roundhouses by a series of small enclosures or household compounds. The characteristic 'washing line' arrangement has parallels with many sites recorded from aerial photography in the region – a local example having been sample excavated at Shillington (Dawson 2000) – and this 'attachment' to existing field system boundaries highlights their continued use and significance.

Concerning the chronology of the enclosures, although stratigraphic relationships were recorded, these effectively tell us more about their sequence of decline, rather than their establishment; enclosure E8 for example appears to be the last of the three conjoining enclosures (E7, E8 and E10) to have been abandoned but is also potentially one of the earliest to have been established. As such, that enclosures E7 and E8 appear to represent direct continuation of the occupation represented by MIA I structures S7 and S8 at the same site suggests that they are the earliest household compounds. It can, therefore, be argued that the remaining four enclosures (E6, E10, E25 and E26) grew up around the central pairing of enclosures E8 and E7. Potentially this was a gradual process representing a protracted shift from open to enclosed settlement. Given that the pit arrangements in all of the MIA II enclosures (with the exception of E1 and E2) form convincing house voids, it is reasonable to assume that they all represent household compounds, however, the finds assemblages recovered

from the enclosure ditches and associated pits suggest some variation in use. For example, enclosure E10 produced far fewer finds than its contemporaries and also had only one clear phase, suggesting that this household compound may have been relatively short-lived (this despite the fact that Enclosure E10 had more pits on its interior than the other enclosures).

MIA II enclosures E1 and E2 are perhaps harder to characterise. Whilst potentially a direct continuation of the occupation represented by enclosure E21 and structure S1, the number of pits associated with the enclosures is comparatively few and they are less clearly domestic in nature. Neither are there convincing house voids or structural remains in either enclosure. Enclosure E2, particularly with its low finds densities seems unlikely to have been a household compound in the way that others at the site clearly were.

The final MIA III settlement comprised a third shift in settlement architecture and layout. It is clear that during this phase the field system was no longer the determining factor in settlement layout and it seems likely that the MIA I/II field system fell out of use during this period. Instead, the MIA III settlement took the form of a north-south linear arrangement of largely sub-circular enclosures comprising multiple phases of re-cutting, which appear to pay no respect to previous settlement layout. The exact form and function of the MIA III enclosures is hard to characterise, furthermore given the multiple re-cutting of their circuits it is difficult to identify sequences. At enclosure E12, for example, some phases appear to be represented by gullies, others by ditches, indeed it is possible that at one point ditch was contemporary with gully (see Figure 9). What is clear, is that they are different from the household compounds represented by MIA II enclosures. In some ways it is easier to envisage the MIA III enclosures as multiple phases of roundhouse gully or else enclosures, which closely follow the circuit of any internal structure, and in the absence of any contemporary structural remains it seems most likely that the enclosures themselves represent the 'houses' of the MIA III settlement. Parallels can be found in single enclosures recorded at Rhee Lakeside, Earith (*Compound M*, Evans *et al* 2013) and Haddenham (*HAD IV*, Evans and Hodder 2006) where again, despite their initial identification as enclosures, the features were also interpreted as structures.

Of the sub-circular enclosures, four (E5, E12, E13 and E14) are of sufficient size to consider being 'houses', while three (E4, E22 and E23) appear likely to be ancillary features, enclosure E9 appears to sit somewhere in between. Two further enclosures (E3 and E11) identified as belonging to phase MIA III took a slightly different form. Enclosure E11, was similar to the sub-circular forms in terms of its multiple re-cuts, however, its trapezoidal shape marks it out as different. In terms of spatial relationships, it was, however, clearly contemporary with the other MIA III enclosures. The phasing of enclosure E3 on the other hand remains ambiguous; despite its inclusion in Phase MIA III it could in reality belong to any of the Middle Iron Age phases. Assigned to the MIA III phase because, along with 'ancillary' enclosure E3, it was seen to truncate the MIA I field system, whilst seemingly having no regard for layout of the MIA II field system, it is nevertheless aligned on the field system. For this reason, together with the difference in form between it and the other MIA III enclosures it does not sit easily within the MIA III phase and the enclosure remains an enigmatic feature.

In terms of the development of the MIA III settlement, the spatial integrity of each enclosure is notable and strongly suggests that all are broadly contemporary. At the same time, however, there is a case to be made that enclosures E9 and E12 fell out of use before E5, E11, E13 and E14, for the simple reason that the interior of each were 'in-filled' with storage pits. Assuming that they do indeed represent structures, this must have happened following their abandonment, and it follows that the pits most likely result from activity associated with longer-lived enclosures. As such it is possible to suggest that a MIA III.i and MIA III.ii phase potentially existed.

In summary, it seems that the Middle Iron Age settlement, comprised multiple households, and evolved over a period of time measured in at least generations from open settlement within a field system to enclosed settlement, the final phase of which was potentially situated in an open landscape. The settlement remains appear to represent an unbroken sequence from the later Early Iron Age through to the settlement's abandonment at some point in the Middle Iron Age. Although Late Iron Age activity was recorded at the site, with certain landscape features continuing in use, the settlement focus clearly shifted (probably closer to the River Ivel where the significant Romano-British settlements were located) during this period. In terms of settlement size, the enclosed phases are perhaps more telling than the multiple roundhouses of open settlement and a population of between four and six households at any one time can be envisaged for phases MIA II and MIA III. That this number could easily be accommodated by the number of roundhouses in phase MIA I suggests that the population could have been remarkably consistent over the life of the settlement.

Pits and special deposits

As the main focus of deposition (containing over 75% of the finds assemblage) and the most numerous feature type the site's pits are perhaps the most significant aspect of the Middle Iron Age settlement. The majority of pits appear to take the form of typical storage pits of this period and the fact that few inter-cut (with the exception of PG 3) suggest that pits cut into 'clean' natural gravels were required for this purpose. As discussed above, the site's pits represent the result of a cumulative process and it is difficult to associate individual pits with settlement phases, it is however clear that three types of pit group are present i) pits within enclosures/household compounds, ii) defined pit clusters within the settlement core and iii) linear pit clusters along boundaries. The first two categories contained finds assemblages that appear to conform to their association with the settlement core, and can largely be interpreted relatively straightforwardly as storage pits, which have subsequently been in-filled with a combination of soil and the detritus of contemporary settlement (none contained deposits that can be clearly associated with their original use). The linear pit clusters along settlement boundaries (PGs 3, 12 and 15), however, appear more complex, particularly PG 15. Despite being located away from the settlement core PG 15, was the largest numerically and in area and although some of the pits were probably directly associated with nearby structure S20, the majority of the pits seem to be focussed on the eastern settlement boundary. In addition to its status as the largest pit group it also contained by far the most special deposits; clearly PG15 was important. Potentially it represents a communal storage area situated away from the settlement core and shared by the site's occupants, while its location at the edge of the

settlement may reflect a range of issues including ownership and interaction with other communities (as discussed by Cooper and Edmonds with regard to the broadly contemporary pit group at Hill Lane (2007)). The importance of pits as boundaries is something that clearly requires further consideration, particularly the apparent alignments of pits, which occur within Pit Groups 3, 12 and 15 and the extent to which they can be compared to pit alignments of this period. Pit Group 3's role in 'blocking' a former entrance to the site is also surely significant.

Focussing on pit deposition, whether the pits' finds assemblages derive from midden deposits or are the result of relatively direct deposition is certainly an avenue for further analysis. It is tempting to interpret some of the relatively 'blank' areas, such as that between PG15 and the settlement core, as midden areas from which the pits finds derived, however, more work is required on this aspect of the assemblages. The presence of clearly placed or 'special' deposits meanwhile clearly identifies certain pits as different and their location significant. Although articulated human skeletons, and complete pottery vessels were recorded and the former at least clearly had significance attached, the most common special deposits comprised ABGs. The site's ABGs and interpretations of ABGs within the current literature are discussed in more detail by Rajkovaca below and need not be repeated here. Suffice to say that they represent one of the most important aspects of the archaeology recorded at Broom and clearly had attached significance in the Middle Iron Age.

Site economy

The faunal assemblage recovered from the Middle Iron Age settlement is dominated by cattle, suggesting that they were a major component of the site's economy and conforming to a pattern recorded across much of Britain (see Rajkovaca, below). Furthermore, the evidence of this apparent reliance on cattle as livestock is present in features belonging to all three identified phases (MIA I-III) suggesting that the site's economy changed little over time. That rearing cattle was the settlement's primary concern appears to be supported by the relatively scant evidence of cereals within the site's environmental record. While, the large amounts of storage pits within the settlement suggest that these were important, there is little evidence for cereal processing on a large scale and cereal production appears likely to have been on a subsistence scale only (see Fryer, below). Metalworking also appears to have been undertaken on a small scale, with relatively good evidence for the presence of on-site smelting in the form of slag pit F.254 and more scattered evidence of tool production in the form of smithing slag.

On the whole, the site's economy seems to be characterised by operations undertaken at a subsistence scale, although within this economy animal husbandry and particularly the rearing of cattle for meat and other products was clearly the primary concern. Features clearly associated with animal husbandry within the settlement context are scarce, and most if not all of the enclosures (with the possible exception of E2) appear to have been household compounds. Consequently, it would appear that livestock was tended largely within the wider area/'outfields', although the funnel-like entrance to Field II during Phase MIA I suggests they were at times brought into settlement area.

Landscape setting and regional context

The large scale archaeological investigations undertaken at Broom over the last 20 years, which have included both targeted excavation and evaluation of the wider landscape (eg. Cooper and Knight 2004; Cooper 2005), afford a rare opportunity to understand a Middle Iron Age settlement within the context of a well documented prehistoric landscape. For the sake of clarity the Middle Iron Age settlement will from this point onward be referred to as *Broom North Grange*. As mentioned above, the closest and most striking parallel to the Middle Iron Age settlement at Broom North Grange is the broadly contemporary site at Gypsy Lane, less than 1km to the north. Like Broom North Grange, the Iron Age settlement sequence at Gypsy Lane was initiated in the Early Iron Age with an enclosure, which was redefined and remodelled in the Middle Iron Age. The site then saw apparently continued in use until its abandonment at some point in the Middle Iron Age. A general shift from open to enclosed settlement characterises both sites although settlement layout and development is in many ways different; at Gypsy Lane enclosures and structures were apparently the determining factor for settlement layout and broader land divisions whereas at Broom North Grange the existing field system was clearly key. Direct parallels between Broom North Grange and the site at Hill Lane, Broom can also be drawn, most notably between Pit Group 15 and structure S20, and the large pit group and roundhouse at the latter. Both appear to have developed along existing boundaries and contained a high number of special deposits/ABGs. Both Hill Lane and Gypsy Lane appear to have relied on a similar subsistence style economy heavily reliant on livestock and were almost certainly directly contemporary with one or more phases of the settlement at Broom North Grange. Together the excavations form an impressive and important record of Middle Iron Age activity on a landscape scale.

Looking beyond the confines of Broom Quarry, aerial photographs and evaluation and excavation of future quarry sites at Broom South, Southhill (Cooper 2005; Tabor forthcoming) allow the site to be considered on an even broader scale. Cropmarks together with excavated/evaluated sites suggest the presence of a series of major Middle Iron Age settlements along the River Ivel, of which Broom North Grange and Gypsy Lane are two. This linear arrangement of sites, dispersed at c.1km intervals, is reminiscent of the series of Romano-British settlements recorded as cropmarks along the Ivel valley and suggests that the organised and divided Romano-British landscape was the culmination of a process that began long before. Indeed, the Early Iron Age pit alignments recorded during the evaluation of Broom South (Cooper 2005) and the field system at Broom North Grange clearly represent phases of this pre-Roman land division and were important landscape features. Interspersed amongst these major settlements were a number of smaller, or perhaps shorter-lived settlements, such as Hill Lane and a site recently excavated at Broom South - comprising two roundhouses alongside two small pit groups (Tabor forthcoming) - which appear not to have developed into agglomerated settlement sites in the same way.

In terms of its regional context Broom North Grange should be considered alongside a series of Middle Iron Age settlement sites, both open and enclosed, across Bedfordshire and the surrounding counties. As discussed by Cooper and Edmonds (2007), broadly contemporary sites in the region include open settlements at Bancroft (Williams and Zeepfat 1994) and Salford (Dawson 2000) and enclosed settlements at Pennyland and Hartigans (Williams 1993), Hinksey Road, Flitwick (Luke 1999) and

Norse Road, Bedford (Edgeworth 2001). As at the Broom settlements, the various settlements appear to represent a general shift from open to enclosed settlement over the course of the Middle Iron Age often resulting in a characteristic site plan of interconnected enclosures (see Cooper and Edmonds 2007, 184). That no two site plans are directly comparable no doubt reflects a difference in scale and settlement history. Perhaps the closest parallel to the Broom North Grange MIA I and II settlements, however, comes from Northamptonshire where the Middle Iron Age settlement at Twywell is strikingly similar not only in terms of site plan but also the characteristic features recorded; trapezoidal enclosures, roundhouse gullies, storage pits (a number of which contained ABGs) and clay-lined pits (Jackson 1974). Whilst not recognised as such by the author at the time, it is also possible that Twywell's site sequence (in terms of a progression from open to enclosed settlement) is also comparable to Broom. Interestingly, however, there appear to be few local parallels for the sub-circular enclosures of the Broom North Grange MIA III settlement, which with its apparent disregard for previous land division and settlement layout appears quite different. As discussed above, two enclosures in the lower Ouse environs at Earith and Haddenham, respectively are perhaps their closest parallel.

Finally, it is also important to consider Broom alongside another major landscape scale investigation in the region, the Biddenham Loop (Luke 2008). Here, a series of Early-Middle Iron Age farmsteads situated in riverside locations within a loop in the River Great Ouse form an interesting comparison to Broom. Whilst the roundhouses, enclosures and pit groups of the four recorded farmsteads are clearly reminiscent of the settlements at Broom, they appear never to have developed into the kind of agglomerated settlements represented by Gypsy Lane and Broom North Grange.

Romano-British

Taking the form of three trackways transecting Areas A and B, together with a series of enclosures/fields in the north-west of Area A, the Romano-British features are typical of the wider landscape of droveways and field systems recorded during previous excavations and evaluations across the Broom landscape. With no evidence of Romano-British occupation within the Phase 11-13 quarry area, it is clear that the settlements to the east – part of a string of settlement sites along the River Ivel – did not extend this far to the west and that the excavation area comprised agricultural land during this period.

The system of fields and trackways/droveways of the Romano-British landscape are one of the defining characteristics of the exceptional cropmarks, which occur within the Broom landscape. Within this network, the series of east-west aligned trackways connecting settlements along the River Ivel to an apparently more significant north-south routeway to the west, are important landscape features. As such, confirming the presence of Trackway C, which was visible as a cropmark, as well as identifying Trackways A and B, which are not clearly identifiable as cropmarks, provides further evidence as to the layout of the Romano-British landscape. The pottery assemblage of mainly 2nd-3rd century AD coarse wares also provides a broad date range for the Romano-British activity, with the date of use for Trackway B, further refined by the presence of the *As* of Antoninus Pius (c. 148 AD) within its ditch fill.

Anglo-Saxon

The Anglo-Saxon *Grubenhuis* (structure S27) although isolated in terms of the archaeology recorded within the excavation area is a significant feature given that a second *Grubenhuis* (F.103) was excavated during the 2003 evaluation some 60m to the north-east where cropmarks also suggest the existence of a number of further *Grubenhuis* amongst earlier Romano-British settlement features (*Site 6*, Knight and Cooper 2004). Having produced 6th-7th century AD pottery structure S27 was broadly contemporary with *Grubenhuis* F.103, which yielded a 5th-7th century AD pottery assemblage, and together with the cropmarks they provide evidence of a potentially extensive settlement. Early Saxon settlements are not common in the region - although an increasing number are being identified through developer funded archaeology (Oake *et al.* 2007) - and the settlement remains at Broom are an important addition to the archaeological record. Taken together with the small Early Saxon cemetery at King's Hill (Cooper and Edmonds 2007) located just over 1.5km to the north-west and three *Grubenhuis* recently excavated at Broom South Quarry c.1.5km to the south, (Tabor, forthcoming) the site has the potential to add considerably to our understanding of Anglo-Saxon activity both at a landscape and regional level.

4.4 Statement of potential

Neolithic and Early Bronze Age

The Early Neolithic tree throw, Beaker pit and the Early Bronze Age ring ditch are an important addition to the archaeological record. However, whilst the features and their finds assemblages to a large extent confirm our existing understanding of the landscape during these periods, in isolation they add little to our overall understanding of it. Having said that, they should certainly be considered in any future landscape scale analysis of the prehistory of the area.

Late Bronze Age/Early Iron Age

The features that yielded Late Bronze Age/Early Iron Age pottery represent something of a period of transition when the dispersed settlement, widely recorded during previous phases of investigation at Broom quarry, was replaced by more 'formal' settlement sites. While features dating to this period are few compared to sites such as Gypsy Lane and Ash Covert to the west, and their potential for furthering our understanding of this period is correspondingly lower, some further work would be beneficial. This would apply particularly to the pottery assemblage, which with further analysis, can potentially be divided into a Late Bronze Age component (deriving from the 'site' around structure 26/pit F.1800) and an Early Iron Age component (from enclosure E21). This would clarify both the phasing of the site and our understanding of the origins of the subsequent Middle Iron Age settlement.

Middle Iron Age

The multi-phase Middle Iron Age settlement at Broom North Grange is of regional, if not national significance and has the potential to contribute to a number of key areas of research as identified by both the Bedfordshire Research Framework (Oake *et al.* 2007) and national research agendas (eg. Haselgrove *et al.* 2001). The need to approach Iron Age studies at a landscape scale features highly in both, and as part of a long established landscape project, the Broom North Grange site is well placed to do this. Indeed, in this sense it is important that further analysis builds on the results and conclusions of previous excavations at Broom detailed in the *Past and Present* publication (Cooper and Edmonds 2007). As such the site can significantly contribute to our understanding of how the Iron Age landscape was organised and developed over the time, and potentially how it was understood and perceived by its inhabitants. Settlement is a second area that features strongly in research agendas. As probably the largest and most extensively excavated Iron Age settlement site in the region Broom North Grange has great potential in terms of understanding settlement character and development as well as chronology. In addition, the clear relationship between the settlement and the surrounding field system is rare elsewhere in the region and certainly of significance. Placed in its regional context the site can also contribute to broader discourses concerning variation in settlement patterns and form.

In terms of the site's finds, a number of assemblages have a high potential to contribute to Iron Age studies (see specialist studies, below). Firstly, the pottery assemblage, while having little potential in terms of refining existing chronological frameworks, is an important and sizeable assemblage, especially given the lack of published Iron Age assemblages that has been noted in research frameworks (eg. Bryant 2000). Further analysis of distribution and depositional history could also contribute to our understanding of the character of settlement activity and use of the site. Of perhaps greatest potential is the faunal assemblage and particularly the Associated Bone Groups. The high number of ABGs, their location within the settlement and the manner of their deposition has great potential to contribute to the ongoing debate regarding these enigmatic deposits (see eg. Morris 2011). Finally, the evidence of on-site iron smelting and smithing is of interest and requires further consideration alongside the metalworking evidence from Gypsy Lane (Doonan in Cooper and Edmonds 2007).

Late Iron Age/Roman

While the excavations have recorded further elements of the Late Iron Age and Romano-British landscape the main sites of interest for these periods clearly lie beyond the excavation area and further towards to the River Ivel to the east. As such the features recorded are clearly peripheral and whilst the recording of them is important, in isolation, they have little additional potential in terms of furthering our understanding of the Romano-British landscape.

Anglo Saxon

The Anglo Saxon Grubenhuis is a significant feature and its pottery assemblage in particular is worthy of further analysis. However, whilst clearly related to further, largely unexcavated, Anglo-Saxon settlement to the east, the feature stands in isolation in terms of the excavated archaeology of Broom North Grange. As such, it is proposed that the feature be considered alongside the three Grubenhuis and a small Anglo-Saxon cemetery, recently excavated at Broom South Quarry (Tabor forthcoming) and be included in any future publication of these features.

5.0 REVISED RESEARCH AIMS

As a result of the post-excavation assessment the following revised research aims have been identified:

- to refine the chronology of the Iron Age occupation of the site and to determine its duration. A series of radiocarbon dates from selected phased features will be required.
- to further define the character and development of the Middle Iron Age settlement and place the site in its regional context. Comparison with the other recorded Middle Iron Age settlement sites could potentially contribute to our understanding of settlement patterns in the region.
- to undertake full analysis of the pottery, animal bone, human bone and metalworking assemblages and further consider the manner of their deposition and what this tells us about settlement activity at the site.
- to carry out further distributional analysis of the finds assemblages in order to establish any significant differences between deposition within enclosure ditches, structures and pit groups, as well to identify any potential zones of specialised or increased activity within the settlement. That pits were clearly the most important places of deposition indicates that these features and their finds assemblages should be prominent within this analysis.
- to fully analyse the site's ABGs and establish the extent to which they can contribute to ongoing debates regarding these deposits.
- to publish the results of the excavation of the Iron Age settlement, probably as an article within a national journal.

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6.0 SPECIALIST STUDIES

Worked Flint – *Emma Beadsmoore and Lawrence Billington*

Introduction

A total of 434 (4154g) worked flints, 12 (74) of which were also burnt, were recovered from the excavations at Broom in 2007, 2011 and 2012. Of the 434, 263 (2880g) were from the 2007 excavations (BEDFM2007.655), 65 (\leq 524g) from 2011 (BEDFM2011.68) and 94 (\leq 676g) from 2012 (BEDFM2012.51). In addition, 746 fragments (\leq 1241g) of unworked burnt flint were also recovered from the excavations, 217 (260g) from 2007, 527 (928g) from 2011 and 2 (53g) from 2012. With the exception of seven flints collected from the surface of the site, the entire assemblage is derived from the fills of cut features.

The flintwork contains limited diagnostic retouched pieces and was thinly distributed, with the majority of features containing between 1 and 10 flints, and only three features containing over ten. Much of the assemblage comprises residual earlier material inadvertently caught up in the fills of later features; a view reinforced by the technological traits of the material, which indicates that the bulk of the chronologically diagnostic flintwork dates from the late Mesolithic to the Early Bronze Age. However, some flint was also utilised during the later prehistoric period and deposited in broadly contemporary features. In addition, two lower Palaeolithic hand axes were recovered from the site, presumably having originated from the underlying gravels. As a whole, the assemblage provides evidence for earlier prehistoric activity in the landscape, predating the dominant Iron Age activity, whilst also contributing, albeit in a limited respect, to our understanding of the activities carried out within the landscape during the Iron Age.

The flints are listed by type in Table 9 and are discussed by broad periods, defined by lithic technologies in this assessment. A full list of the flint from individual features is retained in the archive. Flints that were broadly contemporary with the features that yielded them will be highlighted in the text.

Raw materials and condition

The entire assemblage is made up of flint. The vast majority is translucent and fine grained but varies considerably in terms of colour and frequency of inclusions. Cortex varies from thick, relatively unabraded to thin and waterworn. Flaws, in the form of incipient thermal fractures are common and where present would have adversely affected knapping. The quality of the raw material is notably better among the technologically 'early' pieces (Mesolithic/earlier Neolithic blade based pieces). All of the flint is consistent with a source within secondary deposits, probably the local terrace gravels.

chip	11
irregular waste	21
primary flake	14
secondary flake	162
tertiary flake	86
secondary blade	22
tertiary blade	30
thinning flakes	7
rejuvenation flake	9
irregular core	8
single platform flake core	6
two platform core	2
multiple platform flake core	1
single platform blade/narrow flake core	1
multiple platform blade/narrow flake core	4
opposed platform core	3
keeled core	2
discoidal core	4
core fragment	7
core and retouched tool	1
tested nodule	2
barbed and tanged arrowhead	1
oblique arrowhead	1
fabricator	1
end scraper	3
side scraper	1
sub circular scraper	1
other scraper	4
scraper and other	1
piercer	2
serated flake	1
serated blade	2
retouched flake	7
retouched and worn flake	1
retouched and worn blade	1
edge used flake	1
handaxe	2
Total	434

Table 9: The flint assemblage

Recortication is very rare and where it does occur takes the form of a light blue clouding. Such recortication is restricted to regular prismatic blade products, probably of Mesolithic date. The assemblage is generally in fairly good condition, some of it comparatively fresh, whilst other elements exhibit the edge rounding and macroscopically visible edge damage typical of residual assemblages.

Palaeolithic

Two Palaeolithic handaxes were recovered from the site. Some key attributes are presented in Table 10. A large ovate bifacially flaked handaxe was recovered from the gravel underlying the site and exposed during machining. This piece was stained a

uniform opaque orange and did not retain any cortex. According to Wymer’s scheme it is ‘slightly rolled’ (“the ridges are dulled sufficiently to show as a faintly visible facet, but nowhere more than 1mm wide” 1995: 46) The flint appears to be fine grained but with some large cherty inclusions. It appears to have been worked from a sizeable nodule as opposed to a flake. The second handaxe was recovered from pit F.177, and may have been deliberately deposited during the Iron Age. Its origin is therefore less secure than the first handaxe, although it seems likely that it was derived from the local gravels. This piece is much smaller and of pointed form, with an opaque green staining. It is in similar, slightly rolled, condition to the first piece. It is possible that this handaxe was made on a large flake and it retains a large area of relatively thick cortex on its lower dorsal(?) side. The tip and upper half has been carefully bifacially flaked.

Context	condition (after Wymer 1995)	length	width	thickness	weight	class (after Roe 1964)
surface	slightly rolled	147mm	93mm	44mm	562.7g	ovate
pit F.177	slightly rolled	92mm	48mm	26mm	107.8	pointed

Table 10: Palaeolithic flint hand axes.

It is now widely acknowledged that existing typologies of hand axes are largely untenable and that individual pieces such as these can only be dated in relation to the geological context in which they occur (Ashton and MacNabb 1994). Suffice to say that such handaxes were produced and used throughout the Lower Palaeolithic. The dating of the gravels at the site would give a *terminus ante quem* for the handaxe recovered from the gravels.

Mesolithic and earlier Neolithic

The flint assemblage includes significant evidence for systematic flake production/core reduction frequently focused on the production of narrow flakes and blades, which are key characteristics of Mesolithic and earlier Neolithic flint working strategies. The assemblage included 52 blades, and several blade cores, many of which were thoroughly and systematically worked down, effectively exhausted, whilst neat core rejuvenation flakes also indicate systematic and efficient core reduction. Although limited, some earlier tools were also recovered from later features, including serrated flakes and blades and a fabricator. The majority of the Mesolithic and earlier Neolithic material was residual in later features, with one notable exception, 28 flints were recovered from tree throw F. 2019. Alongside a standard range of earlier Neolithic flint working waste and by-products, including systematically manufactured waste flakes and blades, core rejuvenation flakes and exhausted cores, the tree throw also yielded an unusual group of axe/biface thinning flakes. Seven thinning flakes were recovered in total, all probably from the same biface/axe, some with the edge of the tool on the dorsal surface of the flake.

Later Neolithic, Beaker and Early Bronze Age

A smaller, but still distinct assemblage of later Neolithic/earlier Bronze Age material was also recovered from the site. Evidence for later Neolithic flake production/core reduction was indicated by the recovery of discoidal cores and their products, and confirmed by an oblique arrowhead (F. 2016). Equally, the odd core would not look out of place in Early Bronze Age assemblages, and a Beaker/Early Bronze Age barbed and tanged arrowhead was also recovered from a later 'pit well' (F. 2041). A Beaker pit (F. 1832) yielded a small assemblage of seven chips and flakes, the majority of which was chronologically non-diagnostic due to the small size of the material. However one flake is broadly compatible with Beaker flint assemblages, suggesting that the material may be contemporary with the feature. Finally, an Early Bronze Age ring ditch (F. 2025) yielded nine flints, and although one of the flints was clearly a residual Mesolithic/Neolithic core, some of the remaining material could potentially be broadly contemporary with the ring ditch.

Undated and later prehistoric

The remaining material is chronologically non-diagnostic; either the unidentifiable remains of systematic earlier flint working strategies, or the result of expedient later prehistoric flake production/core reduction strategies. As there are no chronologically diagnostic tool types in later prehistoric flint assemblages, the use of flint during these periods can only be inferred from the repeated association of expediently manufactured flint and later prehistoric features. At Broom, the bulk of the crudely manufactured material was recovered from the excavations within the Iron Age settlement, suggesting that flint was utilised during that period. For example, one large Middle Iron Age feature (F. 1834) yielded 28 flints, which comprised predominantly an assemblage of residual Neolithic flakes, blades, core rejuvenation flakes and cores, but amongst this systematically manufactured material was a small assemblage of crudely produced, potentially Iron Age, flakes and cores. Likewise, later Bronze Age 'pit well' F. 2041 also yielded a predominantly multiperiod assemblage, however, in amongst the earlier material were potentially some expediently manufactured flakes that could be broadly contemporary with the feature.

Discussion

The flint assemblage recovered from the excavations at Broom provides evidence for activity dating from the Mesolithic through to the later prehistoric period within the landscape (as the Palaeolithic handaxes most likely derived from the underlying gravels). The majority of the chronologically diagnostic material dates to the Mesolithic/earlier Neolithic, although evidence for later Neolithic, Beaker, Early Bronze Age and potentially Bronze Age and Iron Age flintworking is also present. Whilst the majority of the material was residual in later features, several assemblages date broadly to the features they were recovered from; most notably an Early Neolithic tree throw and a Beaker pit, whilst components of assemblages within an Early Bronze Age ring ditch and Iron Age features were also potentially broadly contemporary with the features that yielded the material. Whilst the flint assemblage

further contributes to our understanding of the Broom landscape during prehistory, it does not warrant further analysis.

Neolithic and Bronze Age pottery – *Mark Knight*

The BEDFM2011.68 assemblage comprised 210 sherds weighing 3414g (MSW 16.2g). The majority of the material came from pit F.1800 (3287g or 96.3% by weight) and together constituted the incomplete remains of at least three separate Post Deverel-Rimbury type vessels. A second feature, pit F.1832, generated a diminutive collection of Beaker sherds (Table 11).

Feature	Context	Number	Weight	MSW	Type	Fabrics	Large >8cm	Medium >4cm	Small <4cm
1800	7004A	111	2343g	21.1g	PDR	1, 2	17	30	64
1800	7004B	76	944g	12.4g	PDR	1, 2	4	29	43
1832	7115	23	127	5.5g	BK	3	0	5	18
<i>Totals:</i>	-	<i>210</i>	<i>3414g</i>	-	-	<i>3</i>	<i>21</i>	<i>64</i>	<i>125</i>

Table 11: BEDFM 2011.68 assemblage composition by Feature/Context

The material from BEDFM2012.51 consisted of 79 sherds weighing 348g (MSW 4.4g). An Early Neolithic tree-throw F.2019 produced the largest quantity (344g or 98.8%) but also included six small intrusive sherds of Roman pottery ([2019]). The remaining 4g was made of an Early Bronze Age fabric type (Fabric 6) and came from a single feature, ring ditch F.2025 (Table 12).

Feature	Context	Number	Weight	MSW	Type	Fabrics	Large >8cm	Medium >4cm	Small <4cm
2019	7765	68	325	4.8g	EN	4, 5	0	9	59
2019	7767	9	19	2.1g	EN	5	0	0	9
2025	7980	2	4	2.0g	EBA	6	0	0	2
<i>Totals:</i>	-	<i>79</i>	<i>348g</i>	-	-	<i>3</i>	<i>0</i>	<i>9</i>	<i>64</i>

Table 12: BEDFM 2012.51 assemblage composition by Feature/Context

Early Neolithic

The pottery from tree-throw F.2019 represented the fragmented remains of three separate Early Neolithic bowls which included features characteristic of the Classic Carinated Plain Bowl type (Cleal 2004; Herne 1988). The presence of rolled and everted/tapered rims as well as curved necks above low inflections or carinations represent attributes indicative of the early form. Equally, an absence of heavy rims, obvious shoulders and upright profiles would suggest the fragments did not belong to the slightly later Mildenhall tradition. Some of the pieces had burnished surfaces and applied slips (internal and external) whilst others displayed the effects of severe weathering and/or post-breakage burning.

Parallel assemblages have been excavated elsewhere within the Broom Quarry environs including the published pit-based group from King’s Hill (Knight in Cooper & Edmonds 2007, 234).

Beaker

The 23 sherds of fine comb-impressed Beaker pottery from F.1832 represented the partial remnants of at least three separate vessels. Simple flattened rim fragments from two different forms were identified together with sherds decorated with round and squared-toothed combs. Fingernail impressions adorned two pieces and involved delicate crowsfoot motifs. Most of the sherds were small (78.3%) and many had abraded or rounded edges. All except one were decorated and a single base fragment was present.

Early Bronze Age

The Early Bronze Age component consisted of two small lumps of thick-walled grog-tempered pottery with pale buff coloured oxidised exteriors and dark black un-oxidised interiors (F.2025). Although not specifically diagnostic, Broom landscape sherds sharing these attributes have commonly been associated with the Collared Urn tradition.

Post Deverel-Rimbury

The Post Deverel-Rimbury (PDR) assemblage (F.1800) incorporated parts of a large diameter (36cm) storage jar with a flattened everted rim above a high angular ledge-like shoulder, a large diameter bowl (34cm) with similar rim profile above a slightly less angular inflection and a small everted rim of a small bowl or cup. Pieces belonging to the large storage jar made up a large portion of the total assemblage, although at least half of its profile was missing. The collection included a high number of large and medium-sized pieces (43.8%). All of the forms were made of a hard flint-rich fabric and several pieces retained surface details such as impressions of the potter's fingernails.

Angular jars also of PDR provenance were found at the Gypsy Lane site and attributed to the post-800 BC chronology of the ceramic tradition (Brudenell in Cooper & Edmonds 2007, 248).

Fabric Series:

Fabric 1 Very hard with abundant flint and common sand and possible rare grog

Fabric 2 Very hard with frequent quartz common quartz sand

Fabric 3 Medium with common grog and rare sand

Fabric 4 Hard with frequent to abundant small flint/quartz and sand

Fabric 5 Medium with common burnt flint

Fabric 6 Medium with common medium grog (soapy)

Later prehistoric and Roman pottery – Jackie Wells

Methodology

For each context, pottery was recorded by fabric type and quantified by minimum vessel and sherd count, and weight. Pottery was spot dated by individual fabric and/or form type.

Quantification

The assemblage comprises 5062 vessels, represented by 10448 sherds (155kg) the majority (96% by sherd count) deriving from features assigned to the Middle Iron Age (Phases MIA I-III: Table 13).

Phase	Sherd No.	% Sherd	Wt (g)	% Wt
-	61	0.6	926	0.6
LBA/EIA	74	0.7	387	0.2
EIA	22	0.2	97	0.1
LBA/EIA?	2	0.1	5	0.1
MIA	7074	67.6	106496	68.4
MIA I	823	7.8	10876	7.0
MIA II	1173	11.2	17672	11.3
MIA III	985	9.4	15662	10.0
MIA?	5	0.1	64	0.1
LIA	8	0.1	101	0.1
LIA?	6	0.1	18	0.1
RB	87	0.8	686	0.4
Saxon	2	0.1	15	0.1
PM	28	0.3	487	0.3
Unphased	98	0.9	1848	1.2
Total	10,448	100	155,340	100

Table 13: Pottery Quantification by Phase

Provenance, phasing and date range

The later prehistoric pottery assemblage spans the Late Bronze Age to the Middle Iron Age and can be divided into ceramic phases, broadly corresponding with those identified by Brudenell (2007, 241). A small quantity of Late Iron Age, Roman and post-medieval/modern pottery also occurred within the assemblage.

Pottery was collected from 828 features: 66% of the assemblage (by sherd count) from pits, 32% from boundary and enclosure ditches/gulleys, and the remainder from post holes, layers and surface deposits.

A total of 519 features (63% of contexts producing pottery) contained less than 100g, and 29 features (4%) yielded in excess of 1kg, the largest single deposit weighing 4.2kg. Single sherds were collected from 148 features (18% of contexts yielding pottery). The range of mean sherd weights recorded for each feature type indicates variance in deposition patterns. Higher weights (17–15g) observed in post holes, pits

and enclosure ditches represent episodes of deliberate disposal/dumping from adjacent occupation activity, while lower values (8–7g) from trackway ditches, tree throws *etc.* are consistent with processes of natural accumulation.

Tables B1-B4 in Appendix B quantify the pottery (by sherd count and ware) within the major elements of the contextual hierarchy: pit groups, enclosures and structures.

Late Bronze Age/Early Iron Age and Middle Iron Age

Pit groups (Table B1)

Pits are the main focus of deposition, with sizeable pottery deposits deriving from several Middle Iron Age pit groups, in particular PG16, which contained 15.7kg. Assemblages weighing in excess of 5kg derived from PG7, PG10, and PG11.

Enclosures (Table B2)

Phase MIA II enclosures E1 and E7 yielded the highest sherd count; while E7 and E26 produced the heaviest assemblages, each weighing approximately 3.9kg. The range of fabric types is fairly consistent across all enclosures. Those associated with the MIA II enclosed settlement contained the highest proportion of residual LBA/EIA material.

Structures (Table B3)

The largest assemblages by both sherd count and weight derived from MIA I structures S1 and S6, each containing approximately 1.5kg.

Late Iron Age and Roman (Table B4)

A small Late Iron Age assemblage (224g) was collected from boundary ditches F.531 and F.534. Roman pottery (431g) derived mainly from enclosure ditches F.2000, F.2002, F.2008 and F.2045.

Pottery Type Series

Fabrics are listed below in chronological order (Table 14), using common names and type codes in accordance with the Bedfordshire Ceramic Type Series. No new fabric types were identified. Later prehistoric fabrics have been correlated, as far as possible, with ware groups recorded in the Broom publication (Brudenell 2007, 242–243). Most Iron Age and Roman wares are judged to be of local manufacture and distribution — the site is well placed for exploitation of raw materials from the Lower Greensand, Oxford clays, Jurassic outcrops and river gravel deposits.

Fabric Type	Common name	Sherd No.	Wt (g)
<i>Late Bronze Age/early Iron Age transition</i>			
F01A (F1 Broom fabric group)	Coarse flint	24	168
F01B (F3)	Fine flint	95	360
F01C (F2)	Flint and quartz	96	525
F02 (G1)	Flint and grog	6	58
		221	1,111
<i>Iron Age</i>			
F (-)	Non-specific Iron Age	33	14
<i>Middle Iron Age</i>			
F16 (S1, S2)	Coarse shell	742	17879
F16B (S4)	Fine shell	131	1508
F18 (S4)	Fine sand and shell	406	6269
F21 (S5)	Shell and organic	1	11
F27 (S)	Shell and grog	29	211
F17 (G)	Grog	130	985
F22 (G)	Grog and organic	351	2992
F29 (Q1)	Coarse sand	1206	19785
F28 (Q2)	Fine sand	3144	40463
F19 (Q3)	Sand and organic	1435	19885
F35 (Q4)	Micaceous	21	419
F38 (Q)	Glauconitic	504	8805
F03 (Q/G)	Grog and sand	645	8104
F14 (Q/S/CH)	Fine mixed	623	10079
F15 (Q/S/CH)	Coarse mixed	299	7607
F20 (CH)	Calcareous	76	1040
F30 (CH)	Sand and calcareous	191	2896
F37 (CH)	Calcareous mixed	77	3081
F04 (VE1)	Organic	18	254
F32 (F4)	Sand and flint	89	931
		10,118	153,204
<i>Late Iron Age</i>			
F05	Grog and shell	1	3
F07	Shell	4	23
F08	Shell and grog	8	20
F09	Sand and grog	15	168
F39	Grog and mica	2	10
		30	224
<i>Roman</i>			
R03	White ware	2	49
R05B	Fine oxidised sandy	1	2
R06B	Coarse grey ware	5	40
R06C	Fine grey ware	11	92
R08	Micaceous black ware	2	4
R13	Shell	7	82
R13B	Shell with limestone and sand	11	156
R14	Sand (red brown harsh)	2	6
		41	431

Table 14: Pottery Type Series

Assemblage composition

Late Bronze Age/Early Iron Age (c. 1100–500 BC)

Pottery datable to the Late Bronze Age/Early Iron Age totals 221 hand-made sherds (1.1kg) in a range of flint-tempered fabrics. Sherds are generally small (mean weight 5g), abraded and undiagnostic, with 40% of the assemblage (by sherd count) occurring residually in Middle Iron Age features.

The fragmented nature of the assemblage has hampered identification of vessel forms, although some general observations can be made. Vessels in the coarser fabric types have thick walls and are more crudely fashioned than those in finer fabrics, which are well made with carefully burnished and/or tooled surfaces. Feature sherds are rims of simple rounded or flattened form, some of the latter with a slight external ledge. Only three rims were large enough for diameter to be measured; the values ranged from 180–300mm, the latter probably representing a bowl.

Middle Iron Age (c. 500–100 BC)

A total of 10118 sherds weighing 153kg are datable to the Middle Iron Age, spanning the c. 4th to 2nd centuries BC (cf. Brudenell 2007, 255). The assemblage has a mean sherd weight of 15g, and contains a high proportion of vessels which are represented by more than single sherds. A number of cross-context re-fits were recorded, mainly between different fills of individual features, suggesting that the pottery was discarded relatively soon after breakage, rather than accumulating in surface middens.

Fabrics

A range of sandy wares dominate the assemblage, totalling 72% (by sherd count). These include coarse and fine variants, and wares containing glauconite, a mineral largely peculiar to the Lower Greensand, and occurring in local soils. Shelly fabrics total 13%, and 'mixed' wares, containing a suite of sand/grog/calcareous inclusions, the remainder.

Forms

Diagnostic forms are variants of the slack- or round-shouldered, fairly open jars and bowls with either ovoid, globular or near-cylindrical profiles, which dominate middle Iron Age assemblages in the region. Vessel wall thickness varies from 4–21mm, indicating a variable range of vessel sizes. Thirty-two handle fragments also occur. Rim forms are predominantly upright, rounded or flat-topped, with a small number of bevelled and flanged examples. Rim diameters typically range from 100–380mm, with an outlier at 480mm. Bases are mainly flat, although single footring and pedestal examples occur.

Surface treatment

Burnishing occurs on a number of vessels, across a range of fabrics. The surfaces of coarser wares are often wiped or randomly twig-brushed prior to firing. Scoring, which may have served both functional and cultural purposes occurs on 512 sherds. Scored vessels are usually represented in Bedfordshire Middle Iron Age assemblages, although always constitute only a small proportion. Decoration is rare, and mainly comprises fingernail and/or fingertip impressions along rim tops, and occasionally on vessel shoulders. Incised linear and geometric decoration reminiscent of the latest Early Iron Age period occurs on two vessels.

Late Iron Age (c. 100 BC–AD 50)

The Late Iron Age assemblage totals 30, predominantly grog-tempered, sherds (224g), characteristic of the period. A bead rim jar, and lid-seated vessels, the latter datable to the early 1st century AD, are the sole diagnostic forms. No rims were sufficiently complete for diameters to be measured. All pottery datable to this period is highly abraded.

Roman

Forty-one sherds (431g) are datable to the Roman period. The assemblage mainly comprises 2nd–3rd-century AD coarse wares, represented by locally manufactured sand-tempered and shelly wares. Diagnostic vessel forms are jars with everted and triangular rims, ranging in diameter from 120–210mm; and a straight-sided bowl (rim diameter 190mm) with burnished lattice decoration. Two rim sherds from a white ware mortarium (RA3) are a regional import from Oxfordshire.

Assessment of Potential

A chronological framework has been established extending from the Late Bronze Age to the Roman period, with the majority of the pottery dating to the Middle Iron Age. Roman pottery comprises a small component of the assemblage and negligible quantities of post-medieval / modern date, the remainder.

The pottery assemblage has variable potential to address the project's broad research objectives relating to settlement character and development, chronology, and regional artefact studies.

- Beyond the establishment of chronology, the small Late Bronze Age/Early Iron Age assemblage has limited potential for analysis, although it provides a useful addition to the sizeable, published Broom CPI assemblage (Brudenell 2007 in Cooper and Edmonds 2007).
- The focus of ceramic analysis will rest on the Middle Iron Age assemblage, which has good potential for analysis, particularly when considered in conjunction with the published Broom CPIII material (Brudenell 2007). The pottery appears to reflect the typical composition of assemblages from Middle Iron Age sites in the Ivel and Great Ouse valleys. The material may be usefully compared with other contemporary sites in the region, which will permit the assemblage to be placed in a local and regional context.
- The Middle Iron Age assemblage affords an opportunity to examine a sizeable and largely undisturbed collection of pottery, deriving from primary deposits. Pits are the main focus of deposition, and to a lesser degree, enclosure ditches. Study of the assemblages from these deposits may help to elucidate the nature of settlement activity undertaken. Any spatial variation noted may indicate

chronological, functional, or depositional differences between various pit groups and enclosures.

- The Middle Iron Age pottery has low potential to assist in the clarification and/or refinement of the dating for Iron Age types. Attention has been drawn (Bryant 2000) to the lack of published examples of Iron Age pottery assemblages within the region which have been subject to full quantification and analysis, noting that the absence of quantified assemblages severely limits the degree to which intra- and inter-site comparisons can be made. The issue of dating will be examined. However, given the apparent conservatism of Middle Iron Age potting traditions, the largely undiagnostic nature of much of the assemblage, and a general lack of material suitable for independent/scientific dating, it seems unlikely that chronology will be further refined beyond the parameters established during study of the earlier assemblage (Brudenell 2007).
- The presence of small assemblages of Late Iron Age and Roman pottery possible suggests an element of continuity from the Middle Iron Age. This was lacking from the previous Broom excavations, where LIA/RB pottery was largely absent from the assemblages. However, the quantity of material is relatively small and it does not merit further analysis.

Anglo-Saxon pottery – *David Hall and Richard Newman*

A small but significant assemblage of Early Saxon pottery was recovered from a single feature at the site, Sunken Featured Building **F.156**. This group totalled 175 sherds, weighing 2560g (Table 15). In addition, a single residual off-white Roman sherd was also present within the assemblage.

Ware	Count	Weight (g)	MSW (g)
Black burnished	169 (96.6%)	2532 (96.8%)	15
Vegetable-tempered	2 (1.1%)	30 (1.2%)	15
Maxey-type	4 (2.3%)	52 (2.0%)	13
Total	175	2560	14.6

Table 15: Anglo-Saxon ceramics by fabric

As Table 15 makes clear, the fabric-type which constituted the majority of the assemblage comprised a hard-fired black ware with occasional fine surface burnishing. This accounted for 96.6% of the total by count and 96.8% by weight. Compositionally, this hand-made fabric contained numerous igneous grits including mica and feldspar. The material had been formed into a variety of vessel types. Perhaps most significantly, around half a shallow lamp – with a complete profile – was recovered. Much more common, however, were jars and bowls with predominately rounded bases and vertical rims, although some everted examples were

noted. Six sherds bearing stamped decoration, pertaining to a minimum of three separate vessels, were also identified. Along with the lamp these sherds merit further analysis and publication. Also present within the group was a small quantity of handmade vegetable-tempered sherds, containing occasional quartzite inclusions but very little mica, along with four sherds of shell-tempered Maxey-type ware. The presence of these latter fabrics – which are primarily Middle Saxon in date (Hamerow *et al.* 1994) – indicates that the assemblage as a whole was most probably deposited during the mid to late 6th or, less probably, early 7th century.

Recommendations

Overall, although isolated to a single feature this assemblage is nevertheless significant and warrants full analysis and publication.

Burnt clay and daub – *Simon Timberlake*

Some 12.056 kg of burnt clay was recovered from 189 different features sampled during the excavations. The largest quantities within individual features came from F.684 (2.7kg), F.174 (1.982kg) and F.442 (1.45kg). Eleven different types of burnt clay fabric were identified, some of these being quite similar, and almost all most likely representing daub manufactured locally using local clay-rich and silt-rich alluvium, sandy-silty soil and chalky alluvium sources. The most widely distributed fabric types (in terms of occurrence per feature) would appear to be: *Fabric 4* (within 69 features), followed by *Fabric 2* (49 features), *Fabric 5* (32 features) and *Fabric 6* (27 features). However, in terms of the total weight of burnt clay recovered the most abundant was *Fabric 6* (c. 7 kg) followed by *Fabric 7* (2.029 kg).

Fabric types

<i>Fabric 1</i>	hard pink, red or sometimes grey/yellow fired silty clay with v small voids (e.g. burnt-out small grass or chaff <1mm) and usually few, but occasionally sometimes moderate chalk and flint inclusions (<3mm)
<i>Fabric 2</i>	soft sandy brown or pink to reddish fabric with occasional small (<2mm) lighter coloured silty (grog particle) inclusions, broken flint and voids representing burnt-out organic
<i>Fabric 3</i>	lightweight pale to dark grey silty clayey fabric with small voids from burnt-out organic, but no other inclusions
<i>Fabric 4</i>	pink to brick red slightly micaceous clay fabric with variegated yellow to red flow lines, some slightly reduced patches (buff to light grey) and occasional small (light pink to off- white coloured) grog inclusions (<5mm)
<i>Fabric 5</i>	light brown-grey to pink silty clay fabric with lamellar voidy structure and large number of burnt-out plant inclusions but with little or no sand
<i>Fabric 6</i>	gritty and slightly conglomeratic reddish-light brown coloured silty clay with crushed chalk and crushed flint temper (typically <7mm and 70:30 chalk:flint) with some laminae of now burnt-out organic (straw?)

<i>Fabric 7</i>	lightweight and moderately soft buff-brown to red poorly mixed silty clay with generally a more pinkish-reddish exterior, small voids and moderate amount of both chalk (<5mm) + burnt flint (<10mm) inclusions
<i>Fabric 8</i>	very dense and hard grey-reddish pink silty clay without any inclusion
<i>Fabric 9</i>	hard dense fired clay with slightly porous uneven yellow-pink- buff coloured fired exterior and void-rich but inclusion-free grey (reduced) coloured interior
<i>Fabric 10</i>	white to off-white coloured chalky clay with occasionally with mortar-like appearance
<i>Fabric 11</i>	off-white to buff coloured flaky and voidy clay fabric with occasional grog and chalk inclusions

A full catalogue of burnt and worked clay is included in Appendix B (Tables B7 and B8)

The possible number of worked clay objects represented by the mass of fragments not deemed to be part of structural features or non-descript daub clay walling may be 13 or 14, of which at least seven are probably small fragments of clay loomweights (c. 0.65 kg). Just one or two of the latter had sufficient of the loomweight remaining to be classed as probable rectangular-pyramidal loomweight forms (i.e. <2439> from F.1094) – in other words those types typical of the Early-Middle Iron Age period in the region (see also Evans 2003; Timberlake 2010). The assemblage also provides evidence for the potential existence of numerous moderate to well-made circular, thick-rimmed clay-lined basins or hearth pits, some of these calculated on the basis of the rim curvature as having been between 230 – 300mm in diameter (e.g. F.442 and F.438). These might have been part of oven structures given the sooting and intense fire-reddening present, but equally they might have been water-filled basins into which hot stones were placed for the purposes of boiling (cooking).

Much of the fired and moulded clay could have been derived from the destruction of these broken-up hearth and basinal structures. There is evidence also for the presence here of some square or slab-type clay hearths (e.g. F.172, F.454, F.749 and F.992).

Some of these may have had wattle supports or reinforcement with evidence of stick perforations noted on some pieces (e.g. F.380). There is also one example of a ‘hearth’ rim with square slots in the top of it (F.1093). These perhaps were moulded for the purposes of resting wooden sticks or iron bars upon, perhaps for cooking and roasting, or perhaps for the use of this structure as a griddle.

It is difficult to know how representative this burnt clay assemblage is of the clay-lined structures encountered during the excavation of this site, given that no burnt clay at all was recovered from 17 out of the 18 ‘clay-lined pits’ recorded. As a result, it may not be possible to say for sure whether the fired clay mouldings identified within this assemblage represent such ‘hearth pits’, or may instead come from quite different domestic-type structures.

Worked stone – *Simon Timberlake*

A total of 35.117 kg of quern stone (consisting of 36 complete or fragmentary saddlequerns, three rubbing stones and a possible hone stone) was recovered from the excavations. A full catalogue of the worked stone is included in Appendix B (Tables B5 and B6). The majority of the querns were recovered from Middle Iron Age pits, into which they seem to have been deposited as rubbish after breakage - most of them having been burnt - perhaps after having first been used as burnt stone for cooking, a common secondary use of worn worked stone objects (particularly of quern) on Early-Middle Iron Age sites (see Timberlake in Patten 2012 and Tabor & Evans 2013). Few of the (complete) querns were much longer than 200 mm and more than 170mm wide (and 150mm deep).

Some 21 of these quern stones were of the ‘slab’ form or type, four were ‘dish’ types, whilst there were single examples of the ‘keel’ type, ‘block’ and ‘rocking’ forms. To some extent these quern forms simply reflect the choice of available stone, in turn dictating the way they were used, and the wear patterns generated. Slab type querns were used upon the ground or else upon other stones supported by wedges, whilst ‘keel’ forms were dug or pushed (embedded) into the earth; ‘dish’ forms perhaps reflect the partial use of querns as mortars.

The degree of smoothing and polish on these querns attests to the amount of wear and duration of use, the greatest amount of attrition occurring on the slightly softer (i.e. non-quartz cemented) sandstones. A preference can be seen therefore for choosing orthoquartzitic sandstones or quartzites, and to a lesser extent exotic (erratic) crystalline igneous rocks, amongst these granodiorite, picrite (or peridotite) and dolerite (x4).

The presence of discarded worn quern within pits, and sometimes ditches, implies nearby dwellings, a domestic economy to the settlement, and perhaps also small scale cultivation of wheat.

Burnt stone – *Simon Timberlake*

Burnt stone recovered from the excavations was largely examined and characterised on site and immediately discarded. Much of the assemblage appeared to be from material redeposited within the infill and backfill of features, whilst relatively large quantities were also directly associated with small clay-lined cooking pits.

Because the burnt stone has not been sampled *in total*, no statistical sample or assessment could be made. However, a ‘rule of thumb’ percentage reckoning of cobble size and lithology is provided along with an interpretation of the possible process(es) involved. Burnt stone fragments that were found to have been previously worked are included in the worked stone assessment (see Timberlake, above).

Method

Small separated piles of stone associated with individual excavated features were examined and assessed in hand specimen after being broken open with a hammer to expose the fresh (though in many cases still highly burnt) rock surfaces. Very few samples were brought back for further examination, thus the degree of identification and geological provenancing undertaken was quite basic. Part of the problem of identification lay with the degree of heat alteration, many of the rocks having become intensely blackened and 'rotten' on account of the original firing and quenching under a mix of oxidising and reducing conditions.

All piles of rock (>1 broken and burnt cobble) were examined, amounting to 52 separate sample points across the whole of the site. However, apart from one or two significant features, these have not been related to feature numbers.

Results

The make-up of the stones gathered for burning suggests a selection typically of sub-rounded to sub-angular 'hand size' erratic (non-local) cobbles averaging 0.12-0.14m in diameter (the largest being approximately 0.25m the smallest about 0.09m), most of which were composed of hard and moderately well cemented fine grained sandstone. A fair proportion of these were of quartzitic sandstone or even quartzite, but in addition to this there were a number of dense fine grained igneous rocks (such as basalts). The latter erratics are usually of much rarer occurrence within the gravels – thus their collection may suggest some sort of positive selection (although this remains speculative given the limited scope of this study). Non-local sandstones made up about 75% of the total assemblage, whilst there was another 10-15% composed of local carstone (Lower Greensand) and occasional flint, with <10% of basalt (igneous exotics).

Taking into account the difficulties of identification of heavily burnt and sometimes quite reduced (altered) mineralogy and fabrics within these rocks, it has still been possible to suggest geological horizons and provenance (original sources of glacially transported material) for at least some of this assemblage. Perhaps 40-50% of the hard, moderately well cemented sandstones may have been of sarsens (a well cemented quartzitic sandstone) associated with former outcrops of the basal Tertiary capping stripped by glaciation, probably from Southern Britain. Most of the remainder came from the various beds of the Millstone Grit or Coal Measures gannister (seat earth) sandstones of the East Midlands and Northern Pennines. Cobbles of Old Red Sandstone (Midlands, Welsh Borders and North of England) were also identified, whilst the characteristically very well-rounded pebbles of Palaeozoic/Cambrian/Precambrian quartzite pebbles derived from the Bunter (Trias) conglomerates (typically a Midlands source). Whilst there may have been examples of poorly recognisable limestone amongst this (in particular Carboniferous Limestone), these were rare, suggesting an avoidance of these lithologies which appear to calcine and readily crumble on firing. The more useful igneous rocks appear to have been dominated by basalts, and to a lesser extent dolerites, many of the former probably transported as erratics from the Carboniferous outcrops of the Peak District, though some may have a more distant origin – the North of England and Scotland. The rare

syenite and granodiorites may also have derived from the Lake District, Scotland or even Scandinavia.

The most likely source for the local carstone (Lower Greensand) erratics are the outcrops immediately to the west of Biggleswade (the Chicksands Hills and Old Warden) and the greensand ridge to the north-east which lies between Sandy, Potton and Gamlingay.

Discussion

The Broom burnt stone assemblage and its link to small circular clay-lined ‘boiling’ pits forms an interesting development within this cooking pit ‘technology’. This may be compared with the earliest ‘burnt stone/flint mounds’, in the Cambridgeshire and Norfolk Fens (for instance at Fairstead (see Beadmoore 2005), most of these strung out alongside, the fen margin. These are fairly amorphous mounds of burnt material dating from the Beaker/Early Bronze Age and often associated with a central clay and/or wood-lined pit and a possible hearth or clay-lined ‘fire box’ but with little pottery. Perhaps these were communal cooking mounds and part of seasonal or temporary campsite associated with hunting in the Fens. We find rather similar Early Bronze Age burnt flint mounds along the banks of the braided channels of the River Granta at Babraham (Timberlake and Armour 2006), whilst rather more clearly defined groups of ‘cooking’ and ‘boiling’ pits can be found associated with simple waterhole/well features (again without associated settlement or material culture) on the valley floodplains, as has recently been discovered at Clay Farm, Cambridge (Timberlake 2008 forthcoming). At the latter site we begin to see evidence for selection of sandstone cobbles from the gravels, and perhaps even the avoidance of flint. By the Middle Bronze Age these cooking features have evolved still further; at Clay Farm (*ibid.*) we see both size and rock type selection amongst the cobbles used, whilst more carefully dug elongated cooking pits become associated with this cooking activity. Rather than discreet burnt stone dumps, the material becomes scattered over a wider area, with evidence for further use of heat-cracked stone within other cooking pits, which then become dumps for smaller-sized stone.

At Broom we can perhaps see the most economical development of this by the Middle Iron Age in the form of small boiling pits potentially associated with individual households, perhaps family groups, or ‘hearths’ (located outside of the dwellings). Here we see smaller numbers of (slightly larger) cobbles, perhaps just one or two, used during each cooking event. Perhaps then by the Late Iron Age we are looking at smaller pebbles being used individually within pots for cooking – literally ‘pot boilers’.

The types of cobbles being used are fairly specific, or relatively so given the ease (or difficulty) of collecting these from amongst the tons of flint concentrated on the gravel bars or in lag-channel deposits. The very competent sandstones, and in particular the fine grained igneous rocks such as basalts, form ideal heat sources. On immersion in liquid these tend not to fragment or easily granulate, and instead give out a steady heat flow over a longer period (they don’t chill quickly) – clearly superior to the flint as well as to the local carstone pebbles.

Metalwork – *Andrew Hall and Grahame Appleby*

A total of 35 pieces of metalwork were recovered from the excavations. These included seven items of copper alloy, 24 iron objects and two lead pieces; two coins were also recovered, both dating to the Roman-British period. Most of the material was recovered during metal detecting of upper fills of exposed features and spoil, with the remainder retrieved during hand excavation of features. Post-medieval material is generally excluded from this assessment, except where considered intrusive.

Coins (Area A)

<223> F.1839 [7359]. Copper alloy coin of 24.5mm diameter and 3.5mm thickness, weight 12g. This is an *As* of Antoninus Pius, 138-161 AD. On the obverse within a wreath '*Primi Decannales Cos III SC*'. This coin is in exceptional condition with little wear and is a commemorative edition celebrating the Decannales games in the 10th year of the emperor's reign, c. 148 AD.

<224> F.1839. SF 2. Copper alloy coin of 25mm diameter and 2.5mm thickness, weight 8g. This a heavily worn *As* of Domitian, 81-96 AD. Due to the heavily worn nature of this coin, it is likely it would have been in circulation for a considerable period of time before loss.

Lead (Area A)

<3360> F.163 [397]. Irregular shaped lump of lead, weighing 77g, Probably post-medieval.

Copper Alloy (Area B)

<3328> F.418 [1562], pit: heavily corroded 26mm long copper alloy rod decorated with repeated cast concentric grooves. Possibly a pin shaft fragment; weight 1g, diameter 2.9mm.

<3329. F.535 [2074], enclosure ditch/Roman Trackway C: Two refitting fragments of a folded sheet, forming a hollow tube. These pieces may be fragments of an armlet/bracelet; heavily corroded. Max. diameter 4.3mm, length 56mm, weigh 2g. ?Roman.

<3330> F.895 [3595], pit: A complete, bent copper alloy pin with a flattened disc-shaped head, weight 5g, length 47mm, max. head diameter 4.5mm. This example is very similar to other Nail-headed pins recovered from Flag Fen (Coombs 2001: 275), which have been dated to the Late Bronze Age/Early Iron Age.

<3331> F.1219 [4816], pit adjacent to roundhouse; complete, undecorated copper alloy d-shaped cross-section bracelet/armlet with overlapping terminals. Internal diameter c. 45mm, weight 6g. Probably Roman, possibly intrusive.

The Ironwork (Areas A and B)

<225> SF4. Heavily corroded iron nail with rectangular cross-sectioned tapering shank with circular head; length 59mm, head diameter 19mm, weight 11g.

<226> F.1923 [7604], small ditch; a large, delaminating nail with rectangular cross-sectioned tapering shank. Length 126mm, weight 50g. Probably Roman, structural.

<3333> F.399 [1497], pit; two objects: a) an iron nail with flattened triangular head, initially the x-ray indicated this may have been an iron stylus, but it is too crudely made, length 62mm, weight 12g; b) fragment of iron binding strip. X-ray shows two, possibly three holes towards one end, length 54mm, width 30mm, 3mm, 12g.

<3334> F.441 [1681], enclosure ditch; complete C-shaped open loop with slightly inward facing terminals; weight 23g, length 95mm, width 33mm. Probable suspension loop.

<3335> F.414 [1709], pit; heavily corroded nail fragment, length 26mm, 1g; undated.

<3336> F.442 [1711], pit; complete nail, 66mm long, weight 4g. Undated.

<3337> F.454 [1700], pit; fragment of tapering shank from a pin, length 63mm, weight 3g. Undated.

<3338> F.471 [1853], enclosure ditch; D-shaped iron plate or strip terminal, with rounded end and (from x-ray) an oval-shaped perforation. Function unknown. Weight 25g, max. length 60mm, width 50mm, thickness 4mm. Undated.

<3339> F.431 [1904], roundhouse gully; incomplete heavily corroded simple, one piece D-shaped fibula/brooch of La Tène I date; possibly later. Length 40mm, weight 3g.

<3340> F.535 [2073], enclosure ditch/Roman Trackway C; heavily corroded nail shank of square cross-section; 58mm long. Roman?

<3341> F.741 [2294], pit; well-made strap fitting, with tapering waist, expanding towards the terminals with flattened ends. A single rivet remains in situ towards one end. Possibly attached to a wooden box or leather strap etc. Length 57mm, weight 6g.

<3342> F.873 [3489], pit; fragment of a rectangular iron plate with two in situ rivets. Traces of organic material survive in the corrosion products. The x-ray reveals a finely made object, possibly a handle fragment from a blade implement. Length 37mm, width 22mm, weight 10g.

<3343> F.850 [3403], pit; heavily corroded, delaminating iron blade with an upturned point measuring 220mm in length, with a maximum blade width of 42.7mm. Towards one end is a rectangular plate attached to the blade with two iron rivets. Iron Age?

<3344> F.875 [3496], pit; iron strip formed into a closed loop, head diameter 16mm, length 37mm, weight 4g. Undated.

<3347> F.884 [3542], pit; tapering iron bar, rectangular in cross-section, possibly a tool fragment; length 35mm, max. width 13mm, weight 6g. Undated.

<3346> F.876 [3509], ditch; two fragments from a small blade tool, possibly a tanged knife. Weight 10g. Undated,

<3348> F.885 [3544], pit; small dome-headed nail, length 11mm. Undated.

<3349> F.953 [3826], pit; several, very corroded fragments of an iron rod, possibly the shank of a large nail; total weight 26g. Undated.

<3350> F.972 [3882], pit; small fragment of a heavily corroded unidentified iron object, weight less than 1g. Undated.

<3351> F.980 [3899], pit; bent/clenched nail, length 35mm, weight 4g. Undated, possibly Iron Age.

<3352> F.1043 [4095], roundhouse gully; small, clenched, dome-headed hob-nail, length 12mm, weight 1g. Roman.

<3334> F.1168 [4615], pit; nail with an oval shaped head and rectangular cross-sectioned shank, length 40mm, weight 3g. Undated.

Structure 27 metalwork (Area C)

The following five artefacts were recovered from F.156, Structure 27, identified as a Sunken Featured Building, attributed to the post-Roman period.

<3325> [363]; cast copper alloy dress/hair pin with faceted cuboid head. The shaft is decorated with repeated grooves, arranged in groups, from the base head in 3, 3, 3, 9 configuration. This is a particularly finely made pin, although the tip is missing. It may have been curated or collected during the post-Roman period, thus accounting for its presence in the structure. Similar pins have been recovered from Colchester (Crummy 1983).

<3326> [363]; incomplete cast copper alloy Langton brooch, dating AD 10-60, of reeded variant, possibly deliberately cut. The foot, most of the catch-plate and pin are missing. Commonly encountered brooch type on Late Iron Age and Early Roman sites of southern Britain (for example see Corney 2000: 330, cat. no. 51). Weight 9g, length 35mm.

<3327> [363]; an undecorated T-shaped copper alloy sheet with two perforation on the T-bar, measuring 2.8mm in diameter. Possible from a buckle plate or fitting. Undated. Length 24mm, width 20mm, weight 2g.

<3332> F.156 [363]; small, corroded curved back tanged knife with triangular cross-sectioned blade; blade length 50mm (tang broken, but present), weight 11g.

<3359> [363]; corroded, but substantially complete lead alloy pot repair/plug. Similar pot repairs are recorded from numerous sites, frequently found in association with repairs to larger storage vessels and Samian (Appleby 2013). Weight 10g, max. length 23mm, width 14mm, thickness 11mm.

Summary

This is a small, but important assemblage spanning the Late Bronze Age to Saxon period. Of particular note is the Roman material recovered from Structure 27, a Sunken Feature Building (a small Saxon knife was also found from this building) and may be evidence either of curation of copper alloy items or a collection of material intended for recycling.

Slag and metalworking debris – *Simon Timberlake*

The assemblage comprises a total of 10.73 kg of iron slag, consisting of 8.304 kg of smelting slag (or primary smithing slag) and 2.426 kg of secondary smithing. The largest amount of smelting slag came from pit F.254 (3.556 kg) and nearby ditch F.197 (1.066 kg), whilst the largest amounts of smithing slag (mostly in the form of small smithing hearth bases (SHB)) came from features F.399 (0.39 kg) and F.884 (0.67 kg).

Magnetic residues from three bulk environmental samples (pit F.254, pit F.896 and roundhouse gully F.1345) were also examined.

In addition, eight crucible fragments (62g) representing non-ferrous metalworking were recovered from the excavations.

A full catalogue of the slag, magnetic residues and crucible is included in Appendix B (Tables B9-B11).

Smelting slag

No evidence of *in situ* furnaces was encountered during the excavation, however, the distribution of iron smelting slag from across the site potentially pin-points the loci of furnaces. Pit F.254 contained the highest percentage of smelting slag per any feature on-site with large pieces of loose furnace conglomerate. Evidently this was a dump deposit with one fill containing distinct debris layers including (from the context description) heat-affected clay; most likely the destroyed and dumped remnants of thick-walled clay (refractory) furnace lining. Although this feature was referred to by the excavator as being a possible ‘smelting furnace’, the description simply doesn’t support this, given that in a furnace some traces of *in situ* lining would have been present, and most likely therefore noticed and recorded. Whilst the rounded 0.34m diameter and 0.28m deep base is not inconsistent with the sub-surface portion of a shaft furnace, the lateral dimension (0.7m) rather suggests a scoop-shaped pit one might expect of a slag dump.

If one was to compare this feature with the broadly similar-dated but much better preserved furnace at Bradley Fen, Cambridgeshire (Timberlake *et al* forthcoming), such a slag pit would probably lie within a metre or so of the front of the furnace. Into this the slag and fused furnace lining debris would be scraped following each smelting event; probably the end result of the cleaning out, re-lining, and in some cases the rebuilding of what would have been a small shaft furnace built over a pit for the accumulation of the slag forming beneath the iron bloom. On reconstructing this potential smelting site a little further, it seems probable that the iron smelting furnace(s) may have lain a few metres to the east of pit F.254, perhaps just beyond the limits of excavation, or else within the area subsequently truncated by field system ditch F.363/F.197. This interpretation is supported by the large amount of iron smelting slag recovered from the fill of this ditch.

Just to the west of F.254, pit F.269 contained a much smaller amount of the same type of slag material, this probably reflecting the dispersion of slag around the primary smelting site. Much smaller amounts of smelting slag recovered from features F.334, F.394, F.412, F.420, F.435 and F.1345 may yet provide clues as to the whereabouts of other furnace sites, but currently no distinctive pattern seems to have emerged from this.

Smithing slag

Various foci for secondary smithing hearths indicating blacksmithing and forging activity are suggested by the more distinctive assemblages of smithing debris; these including fragments of smithing hearth bases (SHBs), the presence of melted iron within slag smithing lumps (SSL), and more typically fragments of thin shallow hearth lining (including vitrified hearth lining (VHL) and fired refractory (FR)). Features with just iron smithing evidence (as opposed to both smelting and smithing debris) include F.385, F.884 and F.885. In addition one of the more minor iron slag

assemblages (<100g from F.876) also contained what might be evidence for copper alloy casting in the form of what could be the pouring lip of a small crucible (see below).

Analysis of magnetic residues

Analysis of the magnetic residues recovered from environmental samples taken from the fills of features containing slag debris has revealed the presence of hammerscale, slag droplets and also goethite (see Table B10); an association which supports the evidence for iron smelting, primary bloom smithing, and possibly also the secondary smithing or forging of iron.

A bulk environmental sample taken from the slag dump pit F.254 (sample 235) provided over 400g of sieved residues, 244g of which were largely non-magnetic, yet recognisably composed of broken-up smelting slag runnel and slag droplets within the >4mm fraction, and 156g of which was composed of magnetic grains, separately collected from the >4mm (26g), 2-4mm (46g) and <2mm (72g) fractions. The bulk of the magnetics recovered from this feature appeared to consist of waterworn and polished grains/ nodules of goethite, the naturally forming iron hydroxide mineral, suggesting that this may have formed part of the charge of the furnace; either as material collected from the nearby oxidised carstone outcrops near Sandy, or from ironstone-rich gravel residues. However, the identification of just one or two grains of soft limonite nodule also raises the question as to whether this 'ore' could have been mixed with locally-formed bog iron as well.

Further evidence for smelting and metalworking within the magnetic residues from pit F.254 comprised just seven grains of iron slag present within the >4mm fraction (5.5%) (including two 2-3mm diameter spheroidal slag droplets); 120 grains of iron slag (7%) within the 2-4mm fraction (which includes six spheroidal hollow slag droplets (hammerscale) and 17 pieces of platy hammerscale); and 486 grains (6%) within the <2mm fraction (consisting of small solid slag droplets (10), fragments of fractured vitrified-slag runnel (20) and slag (50), hollow slag spheres (56), platy hammerscale (300) and 'curled scale' (50)).

Far fewer magnetic grains were recovered from the residue of sample 503 from roundhouse gully F.1345 (Structure S5); 1 slag runnel from the >4mm fraction; 2 fragments of fractured vitrified slag, 2 hollow slag spheres, 6 goethite from the 2-4mm fraction; and 4 fractured slag droplets, 26 platy hammerscale, 5 hollow slag spheres and 20 goethite grains from the <2mm. However, the composition of this still suggests the presence of nearby smelting along with primary/ secondary smithing.

There has been much recent discussion concerning the deposition of different types of hammerscale (i.e. hollow spheres of silicate or iron oxide, solid slag droplets, large platy ('flats') or fine platy hammerscale) during the production sequence of iron from primary (bloom) smithing through to the secondary smithing and welding of bar iron (see Crew in Doonan & Dungwoth 2013 and www.archmetalslist). The results of experimental work suggests that hammerscale (both spheres and plates) is produced in both technological process stages (primary and secondary smithing), but that there is (sometimes) a size difference, with large (up to 10mm diameter) flat scale as well as

solid (slag droplets) and hollow spheres being formed in the 'blooming' process, and small platy hammer scale being produced during secondary smithing. However, it is not quite as simple as this, since the production of 'thin' hammer scale also accompanies bloom smithing, most likely as a result of the fragmentation of vesicular (bubbly) slags, this scale being the residue of broken shells rather than of oxidation and hammering. This subtle difference can sometimes be recognized in its form, where it is known as 'curly scale' (P. Crew info.). Having said this, the hammer scale being produced at the very end of the bloom smithing process is likely to resemble the hammer scale of secondary smithing, and thus it is the proportion of small platy hammer scale present which will help determine the nature of the process. The same goes for the presence of 'spheroidal hammer scale'. A high proportion of these small hollow slag spheres within the magnetic residues is much more likely to indicate secondary smithing (welding) than bloom smithing, whereas the bloom smithing produces more evidence for slag droplets. Indeed Crew suggests that the presence of fractured vitrified slag droplets (including those present within the fine residues) is indicative of 'cold' forging of the primary bloom. If this were so, then the evidence from Broom suggests that we are looking at a scenario where the crude bloom was removed from the furnace following the dismantling of its walls, and then worked-up on an anvil without re-heating.

Non-ferrous metalworking

Some 62g of crucible fragments (8 sherds) were recovered from five different features in total, most of these being found alongside smithing slag. A full catalogue of the crucible fragments is included in Appendix B (Table B11).

One rather good example of a well-preserved pouring lip and rim fragment which came from Roman trackway ditch F.1540 (6278) has allowed us to reconstruct the probable shape and dimensions of this crucible. This seems to have been round-triangular in cross-section, and up to 90mm in diameter at the top, and of similar height. The straight rimmed side(s) are between 7-12mm thick and are composed of a sand/grit tempered and well fired grey reduced fabric, which is vitrified on the top and exterior, with signs of furnace gas corrosion. A dark stain beneath this vitrification may be carbon, whilst a small area of light-grey spill (droplet) overlying it may be of lead or tin oxide.

Crucible recovered from Iron Age contexts included a body sherd fragment (12-14mm thick) of crucible from F.208. This was similarly vitrified, with areas of slight melting and corrosion of the fabric. A brick-red coloured stain beneath this may well be that of copper oxide. Interestingly there are strong similarities between the sherd fabrics and surface patination between crucible from F.1540 and F.208. Further crucible remains comprised three very small rim and body fragments from F.399, and two possible fragments from F.682. In addition a pouring lip from a small crucible was found amongst smithing hearth debris in F.876.

Discussion

The picture that emerges from the iron slag assemblage is an attempt at self-sufficiency in iron (or at least an attempt at supplementing or augmenting an existing supply) through the smelting of what was probably a locally-sourced carstone-derived alluvial ore, perhaps with the addition of a bog iron extracted from beneath peat deposits formed upon the adjacent flood plain. The furnaces appear to have been simple, producing an iron bloom and only partially-separated slag; the latter perhaps forming a slag cake above the bloom, rather than being properly tapped. We have no surviving evidence for the type of furnace used, yet this may well have resembled the half-buried 'shaft furnace' found at Bradley Fen, Cambridgeshire (Timberlake *et al* forthcoming), the interpretation of the latter based partly upon a model suggested by Dungworth for smelting at Trevelgue Head, Newquay (Dungworth 1996; Nowakowski & Quinnell 2011), and also by Halkon (1997) at Whelam Bridge, Lincolnshire.

At Broom the primary smithing of the smelted iron appears to have been carried out in approximately the same location(s) as that of secondary smithing or forging, whilst the actual technique of bloom smithing practised here seems quite rudimentary.

Even after taking into account the incomplete sampling of settlement archaeology, the low incidence of iron smelting slag across site suggests that production here must have been small, perhaps even experimental in scale, the same also being said for iron smithing and the manufacture of iron tools or weapons. Whilst there seems to be some coincidence in the locations of iron smelting and smithing (which is quite normal for the Iron Age), there is evidence also for a degree of spatial separation, the latter suggesting some sort of specialised work areas relating perhaps to the location of roundhouse structures.

A rather similar scenario is suggested by the distribution of the small amount of broken crucible. This suggests that a small amount of non-ferrous metallurgy was taking place within the same workshop areas as the iron smithing. Apart from one large fragment of a pouring lip and rim which was fairly diagnostic to a c.90mm diameter triangular/ round crucible, the initial examination of this assemblage has told us little about the nature of the metallurgical process, although future archaeometallurgical/ chemical analysis should reveal more. In appearance the type of crucible from Broom resembles that recovered from Middle Iron Age metalworking assemblage at Bradley Fen (see Timberlake *et al* forthcoming), perhaps also from the Storey's Bar Road site at Fengate (Craddock in Pryor 1984, 174-175), whilst generically these appear typical of the Iron Age metalworking tradition which is so characteristic of Gussage All Saints in Dorset (Spratling 1979).

Recommendations

- Suitable samples of smelting slag should be analysed non-destructively using PXRF to determine their chemistry – i.e. slags high in manganese and/or phosphorous (>1%) are often good indicators of a bog iron source.

- Some of the iron (goethite) concretions (which may be part of an ore horizon within the carstone) also need to be looked at again in order to determine whether there is any evidence of working. Research into the possible (geological) sources for this 'ore' would be interesting.
- It would be worthwhile to further study both drawn sections and existing photographs of F.254 in order to more fully understand this feature.
- The crucible assemblage should be studied in a little more detail. I would recommend sampling this initially using a PXRF in order to determine whether or not we are looking at copper-alloy metalworking evidence, or else the melting of other metals such as lead or tin. There is a good case to be made here for taking thin-section slices to examine the nature of the vitrification, the spill droplets, temperature indicators and also the fabric of these crucible sherds (ceramic petrography) under the microscope.

Worked Bone - *Vida Rajkovača*

A total of nineteen worked bone or antler artefacts were recovered from the excavations. The worked bone/antler is quantified and described below, however, it is recommended that all of the material should be further examined by a worked bone specialist.

<014> [363] F.156: Fragment of what appears to be a dog fibula with a perforation in the distal end.

<906> [1769] F.454: A near complete sheep metacarpus with circular perforations, one made into the proximal and the other in the distal end of the shaft, without affecting either of the articulate surfaces. Both perforations are *c.*3mm in radius.

<928> [1788] F.460: A highly polished cattle-sized limb bone fragment, split axially. One end of the specimen is wider and almost t-shaped, with a perforation in the centre. This end does not appear to have been the working end of the object, although it looks complete. The other end is broken off.

<2432> [4328] F.1093: Cattle-sized limb shaft fragment, split axially. The tapering end is polished and appears to have been used as a gauge/point. The working end is complete.

<2463> [4385] F.1108: Cow rib segment measuring 50mm in length, sawn off at both ends, and with two perforations in the middle. The perforations are some 20mm apart and *c.*4mm in radius.

<2613> [4615] F.1168: Red deer antler fragment, highly polished, probably fashioned into a handle or something similar. The surviving length is 95mm.

<2777> [4799] F.1218: Sheep-sized limb bone fragment with a surviving length of 50mm. The specimen is almost needle-shaped, with a wider centre and a perforation in the middle. The perforation is 3mm in diameter. One of the ends is broken off.

<3363> [877] F.225: A complete sheep left metatarsus measuring 122mm. Polishing and grooves recorded in two 'zones' on either sides of the specimen, proximal and distal. Probably used as a fastener or some sort of weaving implement, as it appears the grooves are a result of torsion.

<3364> [1308] F.321: Cow distal metacarpus, split axially. Distal condyle show signs of use and it is highly polished. The object appears to have been used as a scraper. The surviving length is 106mm.

<3365> [1365] F.368: Cattle-sized limb bone fragment fashioned into a stylus-like point. Surviving length is 46mm.

<3367> [1711] F.442: A complete sheep metacarpus measuring 110mm. Exhibiting two zones of grooves and polish, similar to that from F.225, <3363>.

<3368> [1774] F.454: Sheep-sized limb bone fragment, splinter, fashioned into a sharp and thin point. This specimen could have been part of a 'composite' tool.

<3370> [2113] F.509: Antler fragment, very thin and polished, broken off at one end, with the other end tapering and almost 'bifurcated'. It could have used as a leather working/pottery decorating tool.

<3371> [2662] F.673: Cattle-sized limb bone fragment. Sawn off and polished at both ends, 55mm in length, but broken in half. Given its cylindrical shape, it could have been used as a handle.

<3375> [4537] F.1151: A complete sheep metatarsus, similar to those from F.225 (<3363>) and from F.442 (<3367>), exhibiting two distinct 'zones' of polish and grooves.

<3376> [4549] F.1162: A fragment of a cow distal metacarpus, distal condyle tapered and slightly polished.

<3377> [4661] F.1191: A near complete sheep/goat left metacarpus, unfused distally. Similar to those from F.225 (<3363>), F.442 (<3367>) and F.1151 (<3375>), with two 'zones' of polish and grooves.

<3379> [4753] F.1213: Distal cow metacarpus, similar to that from F.321 (<3364>), [1308]).

<3381> [6734] F.1528: A fragment of a right cow metacarpus, distal end is broken off. It is heavily weathered, yet highly polished.

Miscellaneous Finds

Tile

Two fragments of tile were recovered from Anglo Saxon S27 in the form of a large fragment of *tegula* (507g) and a small fragment of *imbrex* (30g).

Coprolite

Two coprolites were recovered from Middle Iron Age pit F.748. Both require further analysis by a specialist in order to determine species.

Post-medieval finds

Post-medieval and modern finds (pottery, tile, metalwork, glass and clay tobacco pipe), have been excluded from this assessment.

Human Remains – *Natasha Dodwell*

This report assesses the human remains identified during the excavations. These comprise of two cremation deposits thought to be Late Bronze Age/Early Iron Age in date, four inhumations believed to date to the Middle Iron Age (three in pits and one in a rectangular grave) and disarticulated human bone from six features. For the four inhumations, an inventory of all bones was made and estimates of age and sex were determined where possible from the degree of epiphyseal fusion, dental wear, the appearance of the pubic symphysis and auricular surface and from sexually dimorphic traits on the pelvis and skull; standard methods described and referenced in Brickley and McKinley (2004). Age categories rather than specific ages are used; young adult is 18-24 years, middle adult is 25-44 years and mature adult is 45years+. The degree of accuracy is dependent on the completeness and preservation of the skeleton. The same techniques were used when analysing the disarticulated material. For the cremated remains analysis was based on methods described by McKinley in the BBAO/IFA guidelines (ibid, 9-13). No dentition survived in the neonate burial and so it was aged using a variety of metrical data (Schaefer 2009)

Results

Two small, shallow pits, thought to be Late Bronze Age/Early Iron Age in date and located some way to the south of the Middle Iron Age settlement contained small quantities of cremated human bone mixed with charcoal stained silt and mottles sandy silt. Both pits had been truncated to an unknown degree, and each contained the partial, remains of an adult. All of the bone was a buff white colour indicative of complete oxidation. The bone fragments were relatively small with most in the 5-10mm fraction and whilst there were a few skull fragments in both features, most of the identifiable bones were limb shafts, particularly from the forearm. Details about the features and the cremated bone within them are in Table 16 below;

Feature	Depth (m)	Largest fragment (mm)	Weight (g)			Comment
			10mm	5mm	total	
F.1251	0.19	33.2	20	160	180	Pot sherd
F.1255	0.13	38.5	25	105	130	

Table 16: Cremated bone

Three crouched/flexed adult Iron Age inhumations were identified in pits with a fourth poorly preserved adult found in a rectangular grave. In addition, a neonate skeleton was recovered from a pit in the north eastern corner of enclosure E21. The basic osteological and archaeological information is presented in Table 17.

Disarticulated bone was recovered from six features, with three showing evidence of modification. Canine gnawing was recorded on a skull fragment suggesting it had been lying on the ground surface before being incorporated into the ditch. Another fragment of skull had a charred edge as though it had been laid on something hot (rather than place directly on a fire) and a fragment of femur appears to have been split axially. Details are presented in Table 18 below.

Feature No	Skeleton No.	Age/sex	Pathology	Comments
F.384	1415	Middle adult male	Caries, enamel hypoplasia, calculus, degenerative disease in lower spine, possible blunt force trauma on left frontal	Well preserved, lying tightly flexed on r. side with head in NW facing away from enclosure 6
F.855	[3368]	Young adult male	Congenital defect in r. mandibular condyle & mandibular hypoplasia which would have led to facial asymmetry, known medically as hemi facial microsomia (Barnes 2012, 32-35), enamel hypoplasia & calculus	Lying on back, head in SE of pit resting on r side, legs flexed tightly towards left, hands in lap
F.897	[3541]	Younger middle adult male	Fractured r. little finger (fused & poorly aligned phalanges, cribra orbitalia (both orbits), calculus, caries, metopic suture retained	Lying on back, head in west tight against the cut, arms crossed tightly against the chest. Legs MISSING – presumably removed by later pit F. 883
F.1588	[6562]	adult	None observed	Sub-rectangular grave cut, aligned NW-SE with head in NW grave. Extremely poorly preserved
F.1884	[7436]	neonate	Non observed	Near complete. Positioned on 'shelf' within storage pit.

Table 17: Inhumations/articulated burials

Feature	Feature type	Element	Age & sex	Comments
502	Enclosure ditch	parietal	Adult	Canine gnawing on outer skull
922	pit	r.mid tibia shaft	Adult	
1209	pit	l.prox femur fragment	adult	Unusual shape
1529	Enclosure ditch	occipital	Adult male	Charring along the left lamboidal suture
1918	Enclosure ditch	parietal	Subadult/adult	
1866	pit	Mid femur shaft	adult	? blow/strike resembles axial splitting for marrow extraction observed in faunal material

Table 18: Disarticulated bone

Recommendations for further work

- No further work needs to be done on the cremated material.

- For the inhumations it will be possible to calculate the stature for 2 of the skeletons.
- Detailed recording of the pathological lesions, specifically the congenital defects in the mandible of F. 855 which would have led to facial asymmetry, and F.897's fractured finger. This should include photography.
- Although a basic inventory has been made, scoring for preservation and completeness needs to be undertaken (for inhumations & disarticulated elements).
- It is recommended that C14 dates are obtained for material from all features but particularly for skeleton F.897 whose legs are missing. The position, or rather lack of legs of skeleton F.897 is intriguing. The way in which the body lies tight against the cut and the position of the feet almost abutting the pelvis is reminiscent of the position of the young female found at Fordham, Cambridgeshire, at the base of a funerary monument and dated to the Middle/Late Bronze Age (Gilmour and Mortimer forthcoming). At Broom, the legs (tibias, fibulas and femora) are likely to have been removed by the later cut, F.883 but it is interesting to note that neither feet or the innominates show any displacement (there are post-mortem breaks in both acetabulum and ischial rami but the breaks appear relatively recent). There is a large quantity of horse bone in the overlying pit and it would be profitable to date both this and skeleton F.897 to aid the interpretation of these features.
- For the disarticulated material further microscopic work should be undertaken specifically on the charred skull fragment from F.1529 which may have been deliberately exposed to heat, and on the femur from F.1866; the way in which the bone has broken resembles the axial splitting for marrow extraction observed in larger animal bones (V. Rajkovača pers comm).

Faunal remains - *Vida Rajkovača*

The excavations resulted in the recovery of a substantial faunal assemblage comprising 41568 fragments of bone (raw fragment count) weighing 220766g. Using the methods outlined below, the total quantity of assessable material recovered was 7582 bone specimens (when conjoins are taken into account) recovered from over a thousand different contexts. The large majority of the material was hand-recovered with the bone retrieved from the sieving of environmental bulk samples detailed separately. Following the assessment of site's pottery assemblage, the majority of its faunal record was dated to the Middle Iron Age, with small sub-sets from the Early Bronze Age, Late Bronze Age/Early Iron Age and the Romano-British period. The material is quantified and considered accordingly.

A number of special bone deposits or Associated Bone Groups (ABGs) were identified during the excavations and in post-excavation analysis. These have been subject to numerous studies over the last three decades (Grant 1984, 1991; Hill 1995; Morris 2011). The debate surrounding these unusual deposits and the remarkable number of pits recorded from this site offer a useful opportunity to study pit deposition and associated practices during the Middle Iron Age.

Methods: Identification, quantification and ageing

The zooarchaeological investigation followed the system implemented by Bournemouth University with all identifiable elements recorded (NISP: Number of Identifiable Specimens) and diagnostic zoning (amended from Dobney & Reilly 1988) used to calculate MNE (Minimum Number of Elements) from which MNI (Minimum Number of Individuals) was derived. Identification of the assemblage was undertaken with the aid of Schmid (1972), and reference material from the Cambridge Archaeological Unit. Most, but not all, caprine bones are difficult to identify to species, however, it was possible to identify a selective set of elements as sheep or goat from the assemblage, using the criteria of Boessneck (1969) and Halstead (Halstead et al. 2002).

Ageing of the assemblage employed both mandibular tooth wear (Grant 1982, Payne 1973) and fusion of proximal and distal epiphyses (Silver 1969). Where possible, measurements have been taken (Von den Driesch 1976). Sexing was only undertaken for pig canines, based on the bases of their size, shape and root morphology (Schmid 1972: 80).

Withers height calculations follow the conversion factors published by Von den Driesch and Boessneck (1974). Taphonomic criteria including indications of butchery, pathology, gnawing activity and surface modifications as a result of weathering were also recorded when evident.

Preservation, fragmentation and taphonomy

Overall the assemblage demonstrated a moderate state of preservation. Out of some 1223 contexts, 624 (c.51%) were recorded as moderately preserved, 197 (c.16%) as showing a quite good state of preservation and only seven (c.0.5%) demonstrating good preservation. The remainder of the assemblage, a significant proportion exhibited moderate degrees of weathering and surface exfoliation (391 contexts/c.32%). Four contexts showed a mixed state of preservation. Spatially there is no apparent difference in the preservation state of bone from different areas of the site, nor is there any significant difference in preservation between feature types or with depth. If we look at the actual figures corresponding to these categories, of 7490 assessable specimens, 5861 (c.80%) were moderately to quite well preserved.

The ratio between isolated teeth and mandibles can be used to give a gross indication of the fragmentation state of an assemblage; these have been calculated for the main domestic species (Table 19). Pig mandibles appear to be slightly less fragmented than cattle and sheep/goat mandibles. The reasons for this are uncertain, but the apparent

bias may simply be due to recovery. Loose cattle teeth are more likely to have been recovered by hand than loose caprine and pig teeth due to their size.

Category	Cow	Sheep/ goat	Pig
Mandibles	221	177	77
Loose teeth/ Tooth fragments	398	226	78

Table 19: Mandibles and loose teeth for three main 'food species'

Other taphonomic factors that need to be taken into account are butchery and canid gnawing. Butchery marks were recorded on *c.*3% of all post-cranial bones (202 specimens) from the assemblage and the majority are chop marks recorded on cattle (103 fragments) or cattle-sized (28 fragments) bones. The apparently low incidence of butchery marks may be due to preservation and fragmentation, which would also account for the higher incidence of chop marks relative to fine knife and cut marks. Canid gnaw marks were recorded on only *c.*3% of post-cranial bones (240 specimens) and the majority affect cattle bones; this is a low figure suggesting that the bone refuse was rapidly buried after disposal or that dogs were unable to access the material.

Results

Early Bronze Age

The Early Bronze Age material was sparse, recovered from two features; pit F.1832 which also contained Beaker pottery and ring ditch F.2025. Cow and pig were the only identified species (Table 20).

Taxon	<i>Beaker pit F.1832</i>	<i>Ring ditch F.2025</i>	Total NISP
Cow	.	3	3
Pig	2	.	2
Sub-total to species	2	3	5
Cattle-sized	6	.	6
Sheep-sized	9	.	9
Rodent-sized	1	.	1
Mammal n.f.i.	9	.	9
Total	27	3	30

Table 20: Number of Identified Specimens for all species from two Early Bronze Age features; the abbreviation n.f.i. denotes that the specimen could not be further identified.

Late Bronze Age/Early Iron Age

A few pits and ditches generated animal bone. The total amount recovered was 15 specimens, of which seven were assigned to cow and horse (Table 21).

Taxon	<i>Late Bronze Age/ Early Iron Age</i>
Cow	5
Horse	2
Sub-total to species	7
Cattle-sized	5
Sheep-sized	3
Total	15

Table 21: Number of Identified Specimens for all species from Late Bronze Age contexts.

Middle Iron Age settlement

The vast majority of the remains were dated to the Middle Iron Age. At first glance, the range of species for the Middle Iron Age assemblage as a whole mirrors rather well those from each of the sub-sets given in Table 22. Cattle were overwhelmingly the most prevalent species, followed by sheep/ goat. Perhaps unexpectedly, horse was the third most common species, and then pig. Similar percentages for the most dominant species recorded for each of the phases also suggest there seems to be little change over time, in terms of the food preference.

Occurrence and relative importance of species

In common with most archaeologically recovered animal bone assemblages from Britain, the majority of identified fragments from Broom belong to the three main livestock species. Cattle, sheep and pig together account for *c.* 81% of the total number of specimens identified to species (or NISP) from the assemblage. Horse, dog and cat are the only other domestic species identified from the assemblage and together account for *c.* 18% of NISP. Domestic goose is another indication for the exploitation of domestic sources of food. Wild species such as deer, wild boar, fox, wild birds, small mammals and fish are less common (collectively *c.* 1%). Whilst some of these wild species may have been exploited for food or raw materials (e.g. antler), others may be purely incidental, forming part of the general ‘background noise’ to the site, and some (e.g. water vole) are definitely intrusive and tell us more about the site’s environmental conditions than about the human factors.

Pits

Pits were evidently the main receptacle for bone and other waste generating 73% of the bone material by weight. A relatively varied range of species was identified (Table 22) and all of the ABG deposits came from pits. Grouped in some 18 distinctive clusters, the site’s pits produced a remarkable amount of faunal material. Five clusters produced noticeably more bone than others, both by count and by weight. If we look at the actual numbers, PGs 2, 7, 15, 16 and 17 were made up of 280 pits (48% of the total 582 pits yielding faunal remains). The bone accumulated in these 280 pits generated a total weight of *c.* 110kg (or 68% of the 161kg total bone weight from pits).

In terms of the location of these pit groups, PG 2 is located at the northern limit of the settlement (adjacent to enclosures E1 and E2) while PG7 is located to the north of the enclosure E6. The remaining three pit groups yielding large quantities of animal bone (PGs 15, 16 and 17) were located along the settlement’s southern edge, some distance away from the enclosures apparently marking its centre. PG 15 is also interesting as the pits are scattered along the eastern boundary of the settlement on the periphery of the main settlement swathe. Furthermore an in-depth look into the distribution of ABG deposits across the site showed that almost half (12 deposits) came from PG 15, with additional five being recorded from the southern bounds of the settlement (PGs 16 and 17).

Taxon	Pits (MIA)			Structures 1 - 25 (MIA I)			Enclosures 1, 2, 6, 7, 8, 10, 19, 25 and 26 (MIA II)			Enclosures 3, 4, 5, 9, 11, 12, 13, 14, 18, 22 and 23 (MIA III)			Total NISP
	NISP	%NISP	MNI	NISP	%NISP	MNI	NISP	%NISP	MNI	NISP	%NISP	MNI	
Cow	1197	44.1	81	41	49.4	3	298	50	22	190	48.3	10	1726
Sheep/ goat	733	27	49	26	31.3	2	145	24.4	12	132	33.6	14	1036
Sheep	42	1.5	16	.	.	.	14	2.4	6	7	1.8	3	63
Goat	7	0.2	3	1	1.2	1	4	0.7	1	2	0.5	1	14
Pig	197	7.2	29	2	2.4	1	35	5.8	7	19	4.8	4	253
Horse	400	14.7	13	12	14.5	1	54	9.1	2	37	9.4	3	503
Dog	98	3.6	8	.	.	.	40	6.7	3	3	0.8	1	141
Cat	1	0.03	1	.	.	.	.	.	.	.	.	.	1
Red deer	4	0.15	1	.	.	.	3	0.5	1	2	0.5	1	9
Roe deer	1	0.03	1	.	.	.	1	0.2	1	.	.	.	2
Wild boar	7	0.26	1	.	.	.	1	0.2	1	1	0.3	1	9
Fox	3	0.1	1	.	.	.	.	.	.	.	.	.	3
Mustelid n.f.i.	4	0.15	1	.	.	.	.	.	.	.	.	.	4
Domestic goose	5	0.2	1	.	.	.	.	.	.	.	.	.	5
Swan	4	0.15	1	.	.	.	.	.	.	.	.	.	4
Crane	3	0.1	1	.	.	.	.	.	.	.	.	.	3
Corvid n.f.i.	1	0.03	1	.	.	.	.	.	.	.	.	.	1
Duck <i>sp.</i>	1	0.03	1	.	.	.	.	.	.	.	.	.	1
Water vole	6	0.22	1	.	.	.	.	.	.	.	.	.	6
Rat <i>sp.</i>	2	0.07	1	1	1.2	1	.	.	.	.	.	.	3
Sub-total to species	2716	99.8	.	83	100	.	595	100	.	393	100	.	3787
Cattle-sized	1320	.	.	47	.	.	308	.	.	196	.	.	1871
Sheep-sized	1115	.	.	35	.	.	157	.	.	117	.	.	1424
Rodent-sized	36	.	.	.	.	.	4	.	.	.	.	.	40
Mammal n.f.i.	173	.	.	26	.	.	27	.	.	9	.	.	235
Bird n.f.i.	5	.	.	.	.	.	1	.	.	.	.	.	6
Fish n.f.i.	53	.	.	.	.	.	1	.	.	.	.	.	54
Total	5418	.	.	191	.	.	1093	.	.	715	.	.	7417

Table 22: Number of Identified Specimens for all species from all Middle Iron Age pits, structures and enclosures – breakdown by phase; the abbreviation n.f.i. denotes that the specimen could not be further identified.

Structures

Contexts excavated within structures yielded small amounts of animal bone, with the list of species similar to that recorded for the Middle Iron Age assemblage as a whole (Table 22).

Enclosures

Although not as abundant as the material accumulated in pits, the bone from enclosure ditches showed a range of species almost identical to that from the rest of the settlement. The obvious difference in terms of species representation was the total absence of birds from the enclosure contexts (Table 22).

'Food species' and matters of economy (Middle Iron Age)

Cattle

Amounting to just under half of the identified species' count, cattle were undoubtedly the most important animal, providing the majority of meat and secondary products. Though highly fragmented and with large numbers of loose teeth and mandibles relative to other skeletal elements, it was evident that all parts of the beef carcass were represented in the assemblage, suggesting that this bias may be the result of differential preservation between teeth and bones.

Cattle were the most commonly butchered species, and butchery marks were recorded on *c.*6% of all cattle bones. Chop marks were consistently observed in the mid or distal shaft region of tibiae and metapodials and, to a lesser extent, the acetabulum and scapula glenoid. These are all areas of primary carcass dismemberment (i.e. removal of limb extremities) and the reduction of the carcass into individual cuts or joints (i.e. foreshank and hindshank). One horn core exhibited evidence of having been removed from the skull by sawing, presumably for further working of the outer horny sheath. In addition, a small number of metapodials had been split axially, presumably to extract marrow-fat. Fine cut marks implying meat removal were also commonly observed, particularly on tibiae and skinning marks were also relatively common (*c.* 6% of the butchered specimens).

The preliminary analyses of the epiphyseal fusion data indicated that the majority of the Middle Iron Age cattle at Broom lived to reach skeletal maturity. At first glance, it would seem that, on the basis of the fusion evidence alone, the majority of beasts were slaughtered around their third year. This is the time animals reach maximum body size, representing the most efficient point of killing for meat and for the production of prime quality beef. This being said, neonate and older adult individuals were also recorded, suggestive of more complex cattle husbandry practices. If we look at the tooth wear stage data, the proportion of immature cattle is significantly higher than suggested by the epiphyseal fusion data. Some nine mandibles aged to 0-1 months could represent natural mortalities. It is possible that these were culled as part of a milk-based economy strategy (as suggested by Legge 1981, although challenged by e.g. McCormick 1992).

A single case of irregular wear recorded on a third mandibular molar was recorded, as well as some eburnation on one cow tibiae. This reflects the generally healthy condition of Middle Iron Age cattle at Broom. In addition to these, several non-metrical traits were noted in this assemblage. Absence of the second premolar was recorded on four mandibles; the absence or reduction of the hypoconulid (posterior cusp of the third molar) was noted on three specimens and, finally, seven mandibles showed evidence of variation in the conformation of the mental foramen, which ranged from distinct double foramina to one with an elongated or grooved appearance. The interpretation of these traits is still unclear; however, it has been suggested

that their incidence in ancient populations may be explained by the restricted gene pools of local cattle (O'Connor 1988).

Measurable information obtained from the assemblage showed that cattle shoulder height ranged from 108cm-116cm, generally supporting the idea that Iron Age cattle were of small stature.

Ovicapra

Ovicapra were of secondary importance, accounting for c.30% of the identified species count. Similar to the cattle cohort, mandibular elements were the most commonly recorded body part. By contrast, post-cranial bones, and in particular phalanges were grossly under-represented. The sheep bone was not as affected by butchery as was the cattle, with only 2% of the elements recorded with butchery marks. The low incidence of butchery marks may reflect a lesser degree of reduction required to obtain manageable joints of meat, as well as the fact that a smaller carcass can be disjointed using a sharp knife - a technique which would leave very few marks on bone if carried out by a skilled butcher. Marks suggestive of disarticulation were noted on radii, humeri and femora, as well as skinning marks noted on astragali.

First analyses of the epiphyseal fusion data hints at slaughter before the animals reached skeletal maturity, with just over half of the entire cohort culled between the age of 16 and 28 months. The results from mandibular tooth wear, on the other hand, showed a greater number of adults, with the majority of animals killed between the age of 4 and 8. The marked difference between the results gained via these two methods is not uncommon, since the preservation and fragmentation are likely to have affected post-cranial bones and teeth in different ways. This polymodal distribution pattern may therefore suggest that sheep were managed for a range of commodities, with slightly more emphasis on wool. Shoulder height calculations suggest that the mean size of the Broom sheep was 53.8cm with a range of 51-57cm and therefore at the lower end of the size range for sheep.

Pig

Though often considered as the third most important 'food species', pigs were less common than horse. Body part distribution produced results similar to those for cattle and ovicapra, with mandibles and teeth being well represented, and post-cranial elements found in smaller numbers. Based on the morphology of canine teeth, the majority of pigs were male (c.77% of teeth being possible to assign to a sex), and this was expected given that young males are usually culled first, being considered surplus to breeding requirements. Breeding sows were also represented.

Unsurprisingly, almost all bones in the early fusion category were fused and almost all bones in the late fusion category were unfused, suggesting slaughter between the ages of one and two to three years; this was also mirrored by the tooth wear data. This largely reflects the fecundity of pigs and the fact that they reach their full body weight relatively quickly. The recovery of a small number of isolated bones from neonatal individuals suggests that the breeding of pigs was carried out locally, either on the site or in the immediate vicinity.

Horse

Despite being the third most common species, the majority of horse elements comprised loose teeth. Of 503 assessable specimens, 232 were teeth (46%), although most parts of post-cranial skeleton were represented. The majority of horses were adult individuals, with no indications of younger animals.

Only 11 specimens were affected by butchery, corresponding to c.2% of the horse cohort. Fine cut marks found on mandibles and scapulae are more common than chop marks. Several oblique chops on limb bones' mid-shafts were also encountered. The evidence is limited but

has some similarities with the butchery noted on cattle bones, suggesting that horse carcasses were processed in a similar way, perhaps owing to their large size.

Withers height estimates based upon one metacarpal and three metatarsals suggest that the Broom horses ranged in size from 1237mm-1359mm (or c.12.2hh-13.4hh) and therefore similar in stature to modern ponies.

Dog

Dog was relatively well represented in the Middle Iron Age faunal record with 146 specimens or 4.1% of the identified species. They varied in stature, ranging from 36cm to 52cm. The most important thing to note about the dog cohort is the fact that they were commonly found as partial or complete skeletons, usually deposited in pits and commonly interpreted as ABGs.

Other species

The remainder of the assemblage was made up of one domestic (cat) and a range of wild species including bird and fish. Both red deer (*Cervus elaphus*) and roe deer (*Capreolus capreolus*) have been positively identified from the assemblage, being represented by both antlers and meat bearing elements. One of the antler fragments bears clear signs of being utilised (rather than worked) having been sawn through at the junction of the brow tine. Another woodland species also present in the assemblage is wild boar. Remains of fox and unidentified juvenile mustelids were present but rare. Vole and rat remains were recorded, both of which are probably intrusive, with the brown rat probably being introduced in the early 18th century.

Four wild bird species were recovered from the assemblage; duck, swan, crane and a member of corvid family. Unlike the majority of Iron Age assemblages (Dobney and Ervynck 2006; Hambleton 2008), fish remains were recorded in one enclosure ditch (Enclosure 7) and three pits (F.483, F.742 and F.904). Two of these pits were part of Pit Group 15.

Associated Bone Groups (Middle Iron Age)

A summary of the contents and a description of the ABGs noted in the site's faunal record are given in the table below (Table 23). The majority of ABGs contained cattle remains, often being found in association with other species (ovicapra and pig) or even other types of material culture (eg. quern stone). In addition, dogs were often found as part of ABGs and were the only species deposited as complete skeletons, either separately or as part of a group of two or three animals within the same feature.

Although it is not the intention to contribute to the wider debate concerning ABGs here, a few comments are necessary. Firstly, the archaeological attribution of ABGs is rather artificial and their classification problematic. Are we identifying only those deposits which fall into the categories established by Grant (1984), or are we making sure we look for any patterns of articulation or association between groups of bones? Also, if the first part of the term ABG says that these deposits consist of *associated* bone groups, why is it then that single bone deposits such as skulls are often taken into account (see Wait 1985)? If we accept that a single skull deposited at the bottom of a pit can potentially reflect ritual behaviour, it is perhaps then necessary to coin a new term for these types of deposits. Regardless, the common feature of ABGs, whether they are single bone or associated bone deposits, is the fact that they appear to be *placed* rather than thrown and this is the main criteria that has been used to define ABGs at Broom.

Though these deposits occur in other feature types on sites across the country, all of the ABGs recorded on Broom were noted from pit features. It was apparent that the state of preservation noted in these deposits was noticeably better than those of disarticulated dumps of bone post-consumption, implying their quick deposition.

ABG No.	Feature No.	Species present	Associated finds	Notes	Pit Group
1	F.375	Dog	Pottery	Fragmented skull	7
2	F.413	Cow, ovicapra	Pottery	Cow axial skeleton and disarticulated sheep elements	7
3	F.476	Cow, sheep and dog	Quern fragment	Not noted as ABG in the field; disarticulated cattle, sheep and dog skull in association with the quern stone	9
4	F.505	Cow	N/A	Axial skeleton	15
5	F.512	Pig, dog, bird and mustelid	N/A	Bird and mustelids unidentifiable; however, the three mustelid skeletons (the weasel family) all seem to be complete.	15
6	F.512	Cow	N/A	Cow lower legs showing signs of skinning	15
7	F.555	Cow, pig	Pottery	Cow lower legs showing signs of skinning; pig specimen juvenile	15
8	F.555	Cow	N/A	Cow axial skeleton	15
9	F.556	Dog	N/A	Dog shoulder height c.48cm	6
10	F.557	Cow, pig	N/A	Cow pelvis and vertebra, pig neonate mandible	6
11	F.569	Cow, sheep	Flint	Complete sheep neonate skeleton; cow hind legs	15
12	F.748	Sheep, dog	Pottery and saddle quern	Partial sheep, two dogs and a horse mandible	10
13	F.757	Sheep	Pottery	Aged 6-9 months; not butchered	15
14	F.777	Pig	Flint	Adult male pig showing signs of an injury which could have resulted in the animal's death; two neonate piglets	15
15	F.778	Dog	Pottery	Articulated dog skeleton	15
16	F.778	Cow, dog	N/A	Dog skeleton in association with near complete senile cow skeleton	15
17	F.819	Cow, ovicapra, pig	Pottery	Cow complete skeleton with the skull, pig and sheep/goat mandible	15
18	F.859	Dog	N/A	Noted as damaged in the field; partial dog skeleton	15
19	F.906	Sheep, cattle and pig	Pottery, quern stone	Lamb skeleton (0-2 wks), cattle mandible (0-2 mts), sheep and pig mandible	14
20	F.921	Dog, cow	Pottery	Dog skeleton, disarticulated cow specimens most likely from two individuals	15
21	F.1122	Dog	N/A	Two dog skeletons; one probably decapitated; smaller complete with the shoulder height of c.36cm; appeared thrown rather than placed	17

ABG No.	Feature No.	Species present	Associated finds	Notes	Pit Group
22	F.1122	Dog	N/A	Shoulder height c.51cm; appeared thrown rather than placed	17
23	F.1147	Horse	Pottery	Skull placed at the base of the pit	17
24	F.1167	Cow	Pottery	Noted as ABG in the field; disarticulated therefore ambiguous	16
25	F.1216	Horse, cow, ovicapra	Burnt clay	Noted as ABG in the field; disarticulated therefore ambiguous	16
26	F.1219	Red deer	Pottery	Red deer skull with antler tines sawn off	16
27	F.1387	Horse, vole	N/A	Complete articulated horse front leg and a complete vole skeleton (most likely intrusive and not anthropogenic)	3
28	F.1387	Dog	N/A	Partial skeleton just above the base of the pit; tibia butchered; shoulder height c.53cm	3
29	F.1844	Cow	N/A	Cow leg	?

Table 23: Summary of Associated Bone Groups recorded within the Broom faunal record.

Almost all categories of ABGs or ‘special bone deposits’ listed by Grant (1984) were also noted at Broom, fully matching her list: fully or partially articulated skeletons, skulls and horse mandibles, and articulated limbs (both complete limbs and portions of limbs) were considered. Further arguments to support their interpretations as ABGs offered by Grant, such as the occurrence of two different species and the association of these articulates with quern stones were all noted in the Broom assemblage. One further aspect Grant promoted as prominent, which only partially stands for the Broom assemblage, is the fact that the *incidence of burials* of each of the species does not reflect their *relative importance* within faunal record as a whole.

Grant’s argument about animals with greater economic significance being less common from ABGs than ‘non-food species’ stands for the Broom assemblage up to a certain extent. However, cattle, the main providers of meat as was proved from the faunal analysis, were clearly as commonly interred as ABGs as dogs, which even if they were skinned or eaten were certainly not raised for food. Shoulder height estimates based on measurements of the complete elements showed that some animals were relatively short in stature (c.36cm) (similar to today’s lap dogs) and some were the stature of hunting dogs (c.52cm), both would likely have lived in close contact with humans. Whatever the reasoning behind placing the articulated remains of both ‘food’ species and what are considered to be a ‘pet’ species, it seems that these two categories of species sometimes received similar treatment in death. Although butchery marks on dog bones at Broom were rare, they are certainly present, as they are on dog elements on other Iron Age sites across the country. This could suggest that dogs could have been utilised for skin. It is also possible they were eaten, as they are eaten in certain parts of the world even today.

This also stands for livestock raised for food; people almost certainly had a close relationship with the animals they kept for consumption. In other words, the way in which the Broom community treated their animals was clearly very different to the way we perceive animals today, as it is likely that the community as a whole took part

in breeding and management of animals and had a much closer relationship with them to start with.

Romano-British

A small number of contexts dated to the Roman period generated a small amount of bone (Table 24). Like in the Iron Age, cattle were the prevalent species. Remains of rabbit are most likely to be intrusive.

Taxon	Romano-British contexts		
	NISP	%NISP	MNI
Cow	9	60	1
Sheep/ goat	2	13.3	1
Rabbit	4	26.7	1
Sub-total to species	15	100	.
Cattle-sized	5	.	.
Sheep-sized	7	.	.
Total	27	.	.

Table 24: Number of Identified Specimens for all species from all Romano-British contexts.

Anglo Saxon

The Anglo Saxon Sunken Featured Building (F.156; structure S27) produced a small quantity of bone, amounting to some 92 assessable specimens, of which only 23 were identifiable to species (Table 25). Material showed good preservation. The prevalence of ovicapra and sheep-sized elements is in keeping with expected period patterns.

Taxon	NISP	%NISP	MNI
Cow	6	26	1
Sheep/ goat	13	56.5	1
Pig	2	8.7	1
Horse	1	4.4	1
Chicken	1	4.4	1
Sub-total to species	23	100	.
Cattle-sized	19	.	.
Sheep-sized	50	.	.
Total	92	.	.

Table 25: Number of Identified Specimens for all species from all Romano-British contexts.

Fauna from heavy residues

Animal bone recovered from the environmental bulk soil samples was sparse and is detailed in Tables 26 and 27. The lack of fish and bird bones seems to confirm that the generally low quantities from the hand-recovered material are a true reflection of the consumption of these species.

Taxon	<i>Early Bronze Age</i>	<i>Late Bronze Age</i>
	F.1832	F.1800
Sheep/ goat	.	1
Pig	2	.
Sub-total to species	2	1
Cattle-sized	6	.
Sheep-sized	9	11
Rodent-sized	1	.
Mammal n.f.i.	9	.
Total	27	12

Table 26: Number of Identified Specimens for all species from environmental bulk soil samples/ recovered as heavy residues from Early and Late Bronze Age contexts; the abbreviation n.f.i. denotes that the specimen could not be further identified.

Taxon	<i>MIA I</i>	<i>MIA II</i>	<i>MIA III</i>	Total MIA NISP
	Pits F.213, 607, 1209, 1351, 1398, 1805, 1844 and 1858	Roundhouse gullies F.1345 and F.1566	Enclosure ditch F.1918	
Cow	1	1	.	2
Sheep/ goat	7	1	.	8
Pig	1	.	.	1
Mouse	1	.	.	1
Frog/ toad	3	.	.	3
Sub-total to species	13	2	.	15
Sheep-sized	58	19	.	77
Rodent-sized	5	1	3	9
Mammal n.f.i.	79	14	2	95
Bird n.f.i.	2	.	.	2
Total	157	36	5	198

Table 27: Number of Identified Specimens for all species from environmental bulk soil samples/ recovered as heavy residues from Middle Iron Age contexts; the abbreviation n.f.i. denotes that the specimen could not be further identified.

Summary and recommendations

Most of the faunal evidence from the assemblage is fairly typical of the majority of Middle Iron Age assemblages from Britain. The faunal record is dominated by the remains of livestock species, with very few wild remains. The relative frequency of the three main livestock species (by NISP) have been compared against similarly dated assemblages from the region (see Table 28). Though the species ratios within the wider region are quite varied, especially the ratio between sheep and cattle, the more typical pattern for the east of England is characterised by a high cattle component. In addition to regional and topographical variations, it is possible that site morphology influenced its economy, as it can be argued that different sites may have represented small components of a broader farming system within a landscape and diversity between assemblages from sites within the same localities may be a reflection of different site types. Hambleton's regional review showed a clear

relationship between the site type and the relative abundance of species (2008). The most obvious comparative would be the Middle Iron Age assemblage from previous Broom excavations (Swaysland in Cooper and Edmonds 2007, 297-300), although the exact species ratios are not comparable due to differences in quantifying methods. Middle Iron Age remains were recovered from two Middle Iron Age sites (Hill Lane and Gypsy Lane), with both having a dominant cattle component. Associated Bone Group deposits were recorded from Hill Lane, with horse being especially dominant (ibid, 298). The ratio between cattle and sheep/goat at Broom is rather marked and more comparable to the enclosed settlements at Blackhorse Road, Hertfordshire (Legge *et al.* 1989) and Pennyland and Hartigans, Buckinghamshire (Holmes in Williams 1993, 199-206), where the proportion of cattle is especially high. Although smaller in size, the Biddenham Loop assemblages (Maltby in Luke 2008, 189-192) could be included in this comparison, given its proximity. The assemblage showed a similar dominance of cattle at 50%, followed by sheep/ goat at 39% and pig at 11% (the relative abundance of these three species).

Site	County	Cattle %	Ovicapra %	Pigs %	Total	Reference
<i>Cat's Water Fengate</i>	<i>Cambridgeshire</i>	50	42	8	100	Biddick 1984
<i>Bradley Fen</i>	<i>Cambridgeshire</i>	61	31	8	100	Rajkovača in Knight <i>et al.</i> forthcoming
<i>Blackhorse Road, Letchworth</i>	<i>Hertfordshire</i>	67	27	6	100	Legge <i>et al.</i> 1989
<i>Pennyland</i>	<i>Buckinghamshire</i>	62	30	8	100	Holmes 1993
<i>Prickwillow road, Ely</i>	<i>Cambridgeshire</i>	54	36	10	100	Deighton 2002
<i>Broom</i>	<i>Bedfordshire</i>	56	36	8	100	This assemblage

Table 28: Relative importance of the three main domesticates on Middle Iron Age sites used in comparison. Having established the number of identified specimens (NISP) of each species, the percentage of the total NISP found at the site for each species was calculated. The most common domesticates (cow, ovicaprid and pig), was then separated from the list of identified species and analysed as a separate sub-group. The percentage of the total NISP for each of these species within this sub-group was then calculated in order to demonstrate which were the most prevalent.

Given the range of secondary products and uses to which cattle were put as well as the fact that they are more expensive to keep, it has been suggested that cattle may be indicators of wealth (Haselgrove 1999). Whilst some Early Iron Age sites show the inability to maintain their animals for any other products other than meat (e.g. Mulville and Levitan 2004), this is not the case with the Broom faunal record and does not seem to be the case with Middle Iron Age assemblages.

As with the majority of Iron Age settlements, pits were the preferred receptacle for the bone waste generating as much as 73% of the Middle Iron Age fauna by count. Ditches were used to dispose of the bone waste, but not to the same extent. The range

of recorded species also differed: the microfauna and the entire bird cohort came from pits, whilst ditches were used to dispose of common mammals, especially larger bones of cattle and horse. The proportion of bone from pits was especially high from those few clusters situated along the southern edge of the settlement (PGs 15, 16 and 17). As far as the species frequencies are considered, cattle were the dominant species regardless of area or feature type.

The quick deposition of the bone material as indicated by the absence of gnawing marks could paint a picture of a community being in control of their food refuse, i.e. bone waste. Although there is no evidence to argue a presence of professional butchers on site, it is clear that the community had skilled butchers who were able to portion carcasses into left and right side, as well as dress the meat joints to be distributed both across the site and maybe even across the area, between other neighbouring sites. This is based on a number of chop marks observed on cattle elements implying crude dismemberment of beef carcasses. In addition, portions of meat from the right side of the carcass were recovered from certain features and similar joints of meat belonging to the left side of the carcass coming from other features. It was difficult to assess whether these were part of the same carcass, however, it could be argued that some rough disarticulation and division of meat was taking place at a community level.

An especially challenging side to any palaeoeconomic interpretation is that which involves consideration of the apparent symbolic aspects faunal assemblages. These deposits were first noted during the 1970s (Alcock 1972, 33) and became the subject of an ongoing debate during the 1980s and 1990s (Grant 1984, Wait 1985, Hill 1995) following the publication of the Danebury faunal record (Grant 1984). Though Grant was the first to identify these deposits and interpret them as evidence for ritual offerings, by terming them 'special', she indicated their apparent difference to the disarticulated and fragmented remains that constituted the domestic refuse on site. Despite being widely accepted, not all authors shared her view. Maltby in particular (1985) argued that these deposits could have resulted from 'utilitarian' everyday butchery activities. Whilst she identified 'special deposits' based on bones alone, Hill's work (1995) emphasized the importance of having an integrated approach, looking at ABGs in relation to other evidence to see if these potentially special deposits represented structured deposition, linked to ritual or symbolic actions. Regardless of the intentions behind these, it could be argued that repeated interment of articulated animal skeletons at bottoms of pits suggests the presence of routines or practices which could be both secular and spiritual in character, but were regularly followed and certainly deeply embedded in people's daily lives. A more in-depth consideration of the manner of deposition and the composition of pit deposits would go some way to, if not resolving, then adding to the ongoing concerning this phenomenon debate (Cunliffe 1992; Pollard 2001; Wilson 1992, 1999).

In view of these findings, recommendations for further work are summarised below:

- Further specialist analyses: Worked bone must be analysed by a specialist. This will be complemented by a detailed study of butchery patterns with a view to understanding the chaîne opératoire of the bone working in its entirety.

- Reporting: It is necessary to produce a full archive report including measuring and ageing datasheets, as the foundation upon which to build a publication text.
- Spatial analyses and patterns of deposition: it is recommended to invest more analytical time in a detailed study of spatial distribution of species, skeletal elements by feature type, as well as associated bone groups.
- Radiocarbon dating: Faunal material could provide samples for a series of dates in main to establish whether specimens like antler tools or skeletons deposited as ABGs were curated over a longer time or deposited instantly. As a supplementary form of analysis to that concerning temporal difference between certain pit clusters, animal bone also provides ideal opportunity to date certain pit assemblages.
- It is recommended that the pit assemblages are particularly targeted for further analyses.

Assessment of bulk environmental samples – Val Fryer

Samples for the retrieval of the plant macrofossil assemblages were taken from across the excavated areas and 37 were submitted for assessment. Most were of Middle Iron Age date, although a Saxon Sunken Featured Building was also excavated along with two cremation deposits of probable Late Bronze Age to Early Iron Age date.

The samples were bulk floated by the Cambridge Archaeological Unit and the flots were collected in a 300 micron mesh sieve. The dried flots were scanned under a binocular microscope at magnifications up to x 16 and the plant macrofossils and other remains noted are listed in Tables 1 – 4. Nomenclature within the tables follows Stace (1997) for the plant macrofossils and Kerney and Cameron (1979) and Macan (1977) for the mollusc shells. All plant remains were charred. Modern roots, seeds and arthropod remains were also recorded within all thirty seven assemblages.

Results

Although cereal grains, chaff and seeds of common weeds and wetland plants were present within all but eleven of the samples studied, the density of material was generally very low, with most remains occurring as single specimens within an assemblage. Preservation was very variable; most specimens were moderately well preserved, with rare grains and seeds being extremely well preserved. However, other specimens were fragmentary and abraded and some cereals were puffed and distorted, probably as a result of combustion at very high temperatures. Charcoal/charred wood fragments were generally comminuted, although occasional robust fragments >10mm in size were also recorded.

Barley (*Hordeum* sp.) and wheat (*Triticum* sp.) grains were recovered, with wheat occurring most frequently. Chaff was generally scarce, although spelt wheat (*T.*

spelta) glume bases were recorded within eight assemblages. Silica skeletons of cereal awn were noted within the assemblage from pit F1209 (sample 467 context [4736]), probably indicating that this material had been burnt in well-oxygenated conditions, possibly within a bonfire.

Weed seeds were generally scarce, although the assemblages from pits F896 (sample 425 context [3600]) and F341 (sample 242 context [1301]) did contain slightly higher densities of material. Most seeds were of common segetal species or grassland herbs, and taxa noted included brome (*Bromus* sp.), black bindweed (*Fallopia convolvulus*), grasses (Poaceae), poppy (*Papaver* sp.) and dock (*Rumex* sp.). Seeds of common wetland plants, namely sedge (*Carex* sp.), spike-rush (*Eleocharis* sp.) and blinks (*Montia fontana*), were noted within five assemblages and tree/shrub macrofossils, including elderberry (*Sambucus nigra*) seeds and a sloe (*Prunus spinosa*) fruit stone, were also recorded. Charcoal/charred wood fragments were present throughout, although rarely at a high density. Other plant macrofossils were scarce, but did include small pieces of charred root/stem and indeterminate culm nodes.

Other remains also occurred infrequently. The fragments of black porous and tarry material were mostly residues of the combustion of organic remains at very high temperatures, although some pieces were hard and brittle, possibly indicating that they were bi-products of the combustion of coal, small fragments of which were noted within a number of assemblages. Such remains are commonly recorded where night soil was spread on the land in the post-medieval period or where steam implements were used during the early modern era. Other remains included small fragments of bone (some of which were burnt/calined), small pellets of burnt or fired clay, splinters of burnt stone and vitreous globules. The small mammal/amphibian bones were all possibly intrusive within the feature fills.

Although specific sieving for molluscan remains was not undertaken, occasion shells of terrestrial and marsh/freshwater obligate species were recorded, most notably within the assemblage from clay lined pit F456 (sample 271 context [1781]). Within the latter, many specimens were fragmentary and abraded, possibly indicating that they were contemporary with the context from which the sample was taken. However, the assemblage was unusual, containing a mixture of species more commonly found in larger bodies of water, flowing water and stagnant, muddy water. At the time of writing, the reason for this variance was not known.

Discussion

For the purposes of the discussion, the samples have been divided by feature type:

Late Bronze Age/Early Iron Age cremations (Appendix B, Table B12)

Samples 474 (F1251) and 475 (F1255) are both from cremation deposits of probable Late Bronze Age to Early Iron Age date. Not unsurprisingly, the assemblages are predominantly composed of charcoal/charred wood fragments, suggesting that wood was the main fuel used for the cremation processes. However, grains, chaff and seeds of common weeds and wetland plants are also recorded along with a single sloe fruit

stone. It would appear most likely that these remains are derived from either cereal processing waste, dried herbage or hedge brush, which were used as tinder or kindling for the fires, or from plants burnt *in situ* beneath the pyres.

MIA I structures (Appendix B, Table B13)

Nine samples were taken from the gullies of round house structures 2, 4, 5, 6, 9, 11, 20 and 24. With the exception of the assemblages from structures 5 and 11 (samples 503 and 518 from F1345 and sample 537 from F1566), which contain moderate to high densities of charcoal/charred wood possibly derived from hearth waste, plant macrofossils and other remains are exceedingly scarce, probably indicating that the structures were kept scrupulously clean, almost certainly as a means of preventing accidental fires.

MIA II-III enclosure ditches (Appendix B, Table B14)

The seven assemblages from the enclosure ditch fills are all very sparse, with only sample 259 (F442 Enclosure 8) containing a slightly higher density of plant macrofossils and other remains. As the enclosures were probably in use throughout much of the Middle Iron Age period, it would appear that the ditches were systematically cleaned of any accumulated detritus, although it is currently unclear why such stringent measures were undertaken. The few remains which are recorded are probably derived from low densities of scattered or wind dispersed refuse, all of which was accidentally incorporated within the ditch fills.

Middle Iron Age pit fills (Appendix B, Table B15)

Of the eighteen pit assemblages studied, ten contain cereals, chaff and weed seeds, whilst eight contain only low densities of charcoal/charred wood and occasional other remains. It would, therefore, appear that the pits fulfilled various different purposes within the everyday functioning of the site. Pits F213 (sample 212), F286 (sample 236), F341 (sample 242), F453 (sample 265), F464 (sample 279), F607 (sample 317), F644 (sample 322) and F1096 (sample 451) all contain low to moderate densities of grain, chaff and weed seeds, which may be derived from a mixture of cereal processing waste and domestic detritus. As the density of material is so low, it is impossible to state with any certainty whether cereal processing was occurring in the immediate vicinity, or whether the occupants of the site were primarily engaged in a pastoral economy and reliant on batches of imported grain. The latter pattern has been suggested for a number of sites in eastern England, where the soils were either too poor for cereal production (for example Thetford, Norfolk (Murphy 1991), situated on the light sand soils of the Breckland) or too heavy to be readily tilled (for example Stansted Murphy 1990). However, work on the Iron Age and Romano-British assemblages at Loves Farm, St. Neots (Fryer forthcoming) has shown that some sites were also operating a subsistence economy, where the occupants were producing sufficient grain for their own needs with little in the way of surplus. The processing of this grain was undertaken on a daily basis with minimal waste, and much of the chaff was probably used as fuel for domestic and other purposes. The assemblages from

Broom would certainly be consistent with the latter practice, with some or all of the grains being burnt during culinary preparation in fires where chaff was used as tinder or kindling.

The assemblage from pit F896 (sample 425) is somewhat different, as cereal remains are rare, but small grass fruits and seeds of grassland herbs are common. This may indicate that these remains are derived from burnt bedding, flooring or fodder. Other pit assemblages appear to be derived from very specific activities including the interment of animal carcasses (for example pit F778 sample 399) and smithing (F254 sample 235). Three clay lined pits were also recorded (samples 265 F453, 271 F456 and 444 F971), although at the time of writing, their intended function is unknown. Plant remains were scarce within all three, but sample 271 included a large number of shells of marsh and freshwater molluscs, possibly indicating that pit created a unique microhabitat within the site.

The remaining pit assemblages contain very few remains, and it is presumed that those which are recorded are primarily derived from wind-dispersed detritus which accidentally accumulated within the feature fills.

Anglo Saxon structure S27

A single sample was taken from a fill within Sunken Featured Building 27 (sample 200 F156). The assemblage is typical of material from such a context, containing a very low density of remains which are almost certainly derived from domestic detritus which fell through the floor of the building into the underlying cavity.

Conclusions and recommendations for further work

In summary, although small and somewhat limited in composition, these assemblages clearly illustrate various aspects of the day to day life of the site, particularly during the Middle Iron Age period. The occupied area was systematically divided into enclosed plots, the ditches of which appear to have been kept clear of all refuse, possibly to protect against animal incursion/escape or as a means of facilitating the drainage of ground water. The domestic dwellings appear to have been kept scrupulously clean, with much of the refuse being deposited within the many pits which abound across the site. The assemblages recovered from these pits suggest that animal husbandry was an essential aspect of the local economy, and although cereals were almost certainly also being grown, they appear to have been part of a subsistence economy rather than a large-scale agricultural concern. Bi-products from the processing of the grain were almost certainly used as fuel, meaning that waste was kept to a minimum within the habitable area of the site.

Of the current assemblages, only two (from samples 242 and 425) contain a sufficient density of material for quantification (i.e. 100+ specimens). Unless further corroborative evidence is recorded from future phases of the post-excavation assessment, analysis of two assemblages in isolation is not recommended, as it would add little to the data already contained within this assessment.

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Project details

Project name	Broom Quarry Phases 11-13
Short description of the project	A series of archaeological excavations were undertaken by Cambridge Archaeological Unit (CAU) ahead of gravel extraction at Broom Quarry, Broom, Bedfordshire on behalf of Lafarge Tarmac Ltd (formerly Tarmac Ltd). The work was carried out in four phases over the period 2007-2012, with excavations undertaken across an area totalling 11.7ha. Spanning the period between the Early Neolithic and the 6-7th century AD, seven main phases of activity have been identified, however, the main focus of the excavations comprised a substantial multi-phase Middle Iron Age settlement. A total of 24 roundhouses and 20 settlement enclosures were recorded belonging to at least three phases of Middle Iron Age settlement and representing a gradual shift from open settlement (roundhouses situated within an 'open' field system) to enclosed settlement. In addition some 870 pits were associated with the Middle Iron Age settlement. The pits particularly produced important finds assemblages including comparatively high numbers of 'special' deposits, amongst which a series of Associated Bone Groups are of particular significance.
Project dates	Start: 22-05-2007 End: 18-09-2012
Previous/future work	Yes / No
Any associated project reference codes	BEDFM2007.655 - Sitecode
Any associated project reference codes	BEDFM2011.68 - Sitecode
Any associated project reference codes	BEDFM2012.51 - Sitecode
Type of project	Recording project
Site status	None
Current Land use	Cultivated Land 3 - Operations to a depth more than 0.25m
Monument type	DITCHED ENCLOSURE Iron Age
Monument type	PIT Iron Age
Monument type	DITCH Iron Age

Monument type	GRUBENHAUS Early Medieval
Monument type	CLOTHES LINE ENCLOSURE Iron Age
Monument type	FIELD SYSTEM Iron Age
Monument type	TRACKWAY Roman
Monument type	INHUMATION Iron Age
Monument type	ANIMAL BURIAL Iron Age
Monument type	PIT Early Bronze Age
Monument type	RING DITCH Early Bronze Age
Monument type	TREE THROW Early Neolithic
Monument type	PIT Late Bronze Age
Monument type	ROUND HOUSE Iron Age
Significant Finds	POTTERY Early Neolithic
Significant Finds	POTTERY Early Bronze Age
Significant Finds	POTTERY Late Bronze Age
Significant Finds	POTTERY Iron Age
Significant Finds	POTTERY Roman
Significant Finds	FLINT Neolithic
Significant Finds	FLINT Early Bronze Age
Significant Finds	ANIMAL REMAINS Iron Age
Significant Finds	HUMAN REMAINS Iron Age
Significant Finds	DAUB Iron Age
Significant Finds	SLAG Iron Age
Significant Finds	CRUCIBLE Iron Age
Significant Finds	QUERN Iron Age
Significant Finds	BROOCH Iron Age
Significant Finds	BROOCH Roman
Significant Finds	PIN Iron Age
Significant Finds	PIN Roman
Significant Finds	NAIL Iron Age
Significant Finds	POT Early Medieval
Significant Finds	ANIMAL REMAINS Early Medieval
Investigation type	""Open-area excavation""
Prompt	Direction from Local Planning Authority - PPG16

Project location

Country	England
Site location	BEDFORDSHIRE MID BEDFORDSHIRE OLD WARDEN Broom Quarry
Postcode	SG18 9LA
Study area	11.70 Hectares
Site coordinates	TL 179 437 52.0786626781 -0.27936012886 52 04 43 N 000 16 45 W Point

Height OD / Depth Min: 30.00m Max: 35.00m

Project creators

Name of Organisation	Cambridge Archaeological Unit
Project brief originator	Local Planning Authority (with/without advice from County/District Archaeologist)
Project design originator	David Gibson
Project director/manager	David Gibson
Project supervisor	Jonathan Tabor
Project supervisor	Adam Slater
Type of sponsor/funding body	Developer
Name of sponsor/funding body	Lafarge Tarmac Ltd

Project archives

Physical Archive recipient	Bedford Borough Council
Physical Archive ID	BEDFM2007.655/ BEDFM2011.68/ BEDFM2012.51
Physical Contents	"Animal Bones","Ceramics","Environmental","Glass","Human Bones","Industrial","Metal","Worked bone","Worked stone/lithics"
Digital Archive recipient	Bedford Borough Council
Digital Archive ID	BEDFM2007.655/ BEDFM2011.68/ BEDFM2012.51
Digital Contents	"Animal Bones","Ceramics","Environmental","Human Bones","Industrial","Metal","Survey","Worked bone","Worked stone/lithics"
Digital Media available	"Database","Images raster / digital photography","Spreadsheets","Survey","Text"
Paper Archive recipient	Bedford Borough Council
Paper Archive ID	BEDFM2007.655/ BEDFM2011.68/ BEDFM2012.51
Paper Contents	"Animal Bones","Ceramics","Environmental","Human Bones","Industrial","Metal","Survey","Textiles","Worked bone","Worked stone/lithics"
Paper Media available	"Context sheet","Drawing","Notebook - Excavation',' Research',' General Notes","Plan","Report","Section","Survey ","Unpublished Text"

Project bibliography 1

Publication type Grey literature (unpublished document/manuscript)

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