NAA

EXCAVATION REPORT

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MITCHELL LAITHES FARM, OSSETT WEST YORKSHIRE

2007

prepared for

Arup

on behalf of

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SUMMARY

An archaeological excavation was undertaken in 2007 within a field immediately to the east of Mitchell Laithes Sewage Treatment Works, Osset, West Yorkshire. The work was carried out by Northern Archaeological Associates Ltd for Arup on behalf of Yorkshire Water Services Ltd.

Archaeological remains recorded ranged from earlier Neolithic through to post-Medieval in date. The earliest evidence consisted of groups of pits and postholes suggesting several short episodes of occupation associated with Grimston Ware pottery and radiocarbon dated to the second quarter of the fourth millennium BC. Other pits scattered across the area produced sherds of possible Peterborough Ware pottery and an assemblage of later Neolithic Grooved Ware pottery.

An undated circle of postholes may have represented a later Neolithic or Early Bronze Age timber circle, or alternatively a roundhouse associated with later settlement on the site.

In the Early Bronze Age, a round barrow was constructed in the centre of the excavated area, covering small pits containing cremated remains of three individuals. One burial was accompanied by a small pottery accessory vessel, and another by the cremated remains of a bone bead or toggle. A fourth burial consisting of a cremation within the remains of an inverted Collared Urn was recovered from a small pit nearby. All of these burials produced calibrated radiocarbon dates within the range 1920-1680BC.

Iron Age activity included pits containing pottery, and perhaps also the undated ring of postholes. In the later Iron Age or Romano-British period the area was subdivided by small ditches into fields. Geophysical survey of the site showed that one of the boundaries had smaller D-shaped and rectangular enclosures appended to it, although these lay just beyond the excavated area. Several dispersed features produced Roman finds, and one pit produced a large assemblage of Roman material dated to the later 4th or early 5th century AD. Quantities of metalworking debris found within features across the area indicated that extensive ironsmithing had taken place within or immediately adjacent to the site during the Roman period.

No subsequent activity was recorded until the medieval period when two small quarry pits were excavated. The remains of ridge and furrow cultivation recorded across the area were considered likely to be of early post-medieval date.

INTRODUCTION

A programme of geophysical survey, monitoring and excavation was undertaken in 2007 at Mitchell Laithes Sewage Treatment Works, Osset, West Yorkshire, centred at SE 2650 1990 (Fig. 1). Yorkshire Water had obtained a waste licence to use a field in their ownership immediately outside the sewage works to temporarily stockpile soils comprising a mixture of greenwaste and conditioned sludge as part of a process of recycling to produce a soil mulch. An archaeological appraisal of the site (NAA 2006) determined that the area contained cropmark evidence for a ring ditch and a linear feature likely to be adversely affected by compaction and rutting associated with vehicle movements on the field. The work was undertaken by Northern Archaeological Associates Ltd for Arup on behalf of Yorkshire Water Services Ltd.

The site occupies a pronounced level terrace on the south-facing hillslope overlooking the River Calder, at a height of some 50-52m AOD. The Pildacre Beck (now partially culverted) flows along the western boundary of the field towards the Calder. The solid geology of the area consists of sandstones of the Carboniferous Coal Measures (Institute of Geological Sciences 1979), overlain by coarse loamy soils of the Rivington 1 association (Soil Survey of England and Wales 1983; Jarvis *et al* 1984). There were no Quaternary drift deposits within the excavated area except for a small area of clay at the extreme north-eastern corner.

BACKGROUND

Archaeological and historical background

No early prehistoric sites or findspots are known nearby, although Mesolithic flints have been recovered from Thornhill Edge some 2km to the south-west, as well as sites elsewhere in the Calder valley. Evidence from the Wharfe and Aire valleys suggests seasonal exploitation of the landscape during the Mesolithic period, with activity along the river terraces and adjacent areas of upland. It is likely that similar exploitation occurred along the Calder Valley. Continuing use of the terraces during the Bronze Age is indicated by finds of bronze axes (Faull and Moorhouse 1981, 107-108), although none have been found in the immediate vicinity of Mitchell Laithes.

No later prehistoric or Roman remains had previously been found within the vicinity of the site. A coin hoard, with a date range of AD69 to AD180, is recorded as having been found at an unknown location in Overthorpe some 1.5km to the south-west of the site. The medieval road along the Calder valley from Wakefield to Sowerby Bridge, known as 'Wakefield Gate' may be of Roman origin, and is thought to follow the course of the A638 some 1.5km to the north of the site (Faull and Moorhouse *op. cit.*, 156).

The earliest surviving field-name for the site, Rye Roydes ('rye growing clearing'), is first recorded in 1587 (*Ryroyd*), although the green lane along the northern boundary of the area was already called *Rieroyde Laine* by 1538 (Glover 2008, 19). The name 'Mitchell'

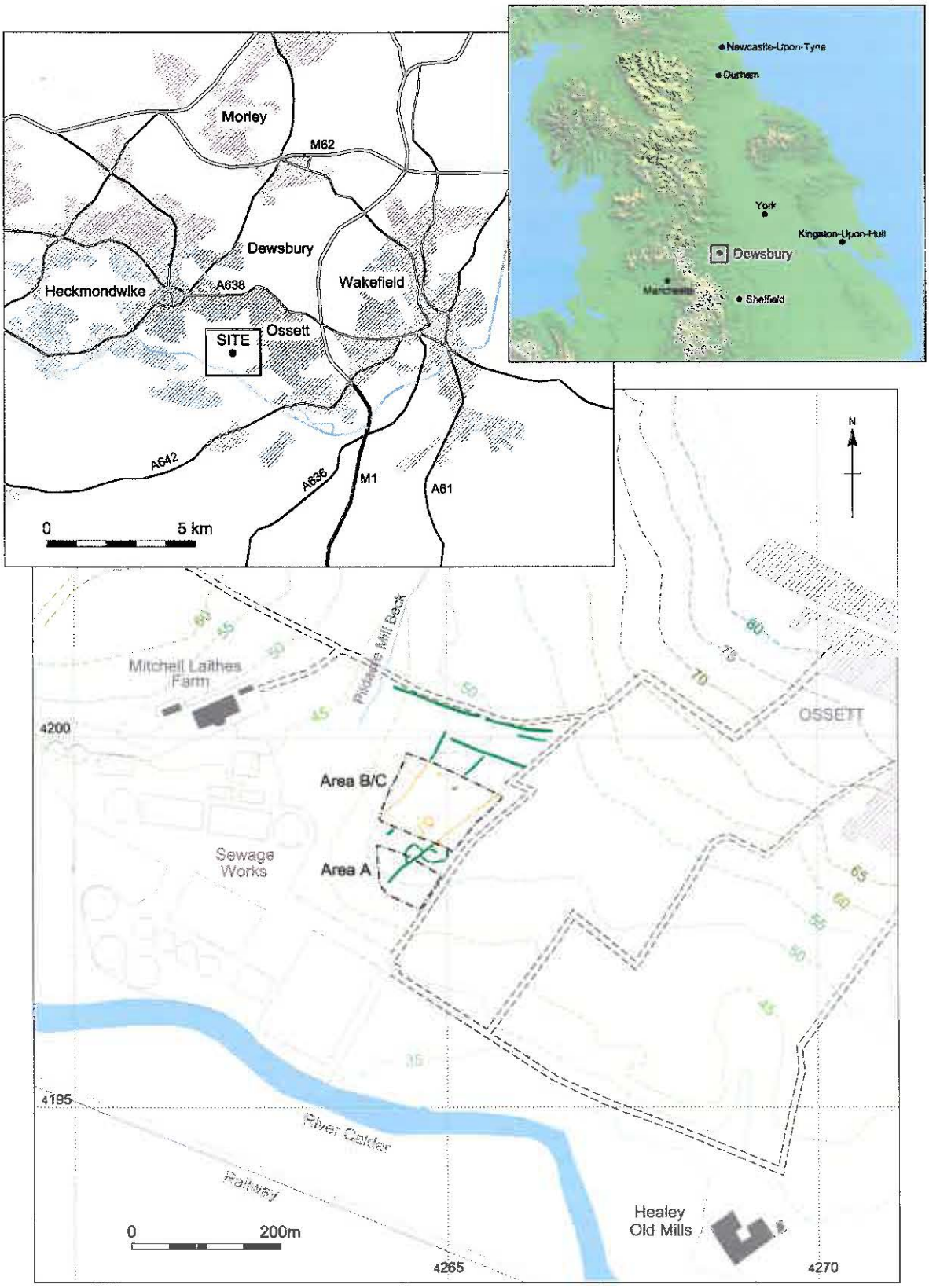


Figure 1: site location

Laithes is derived from a family name common in the area from the early 17th century (Smith 1961, 190). 'Laithes' derives from an Old Norse word for barn (www.domesdaybook.co.uk/places) and is common in the area (e.g. Glover *op cit* 17). The Ordnance Survey (OS) map of 1854 shows the same basic field layout in the area as remains today. Coal mining is recorded across the river at Thornhill by the 14th century. The 1854 OS map shows widespread mining, principally in the Low Laithes and Roundwood areas of Osset. Several 'coal pits', possibly bell-pits, were recorded at Runtlings some 300m upslope to the north of Mitchell Laithes.

Mitchell Laithes Farm was acquired for construction of a sewage farm in 1879. The original sewage system to the site was completed in 1883. Originally, sewage

was merely spread onto a number of plots of open land. With developments in treatment technology the site was reconstructed and re-opened in 1928 and again in 1957. A design drawing of 1925, with amendments to 1926, contains annotations and design details for a network of sewage disposal trenches to be created across the field forming the southern half of the 2007 investigation area (County Borough of Dewsbury 1925).

Geophysical survey

The geophysical survey identified the plotted ring ditch which measured approximately 14m in diameter (Fig. 2). It also identified the ditch to the east, which was found to have D-shaped and sub-square enclosures attached to its eastern and western sides. The D-shaped enclosure measured some 33m by 30m and the smaller enclosure some 18m by 20m. Another linear ditch was identified to the west of the ring ditch together with other discrete anomalies which uncertainly had a geological or archaeological origin.

Excavation aims and objectives

Towards the southern end of the field, where it is bisected by overhead power lines, the enclosures recorded by the geophysical survey were preserved in situ. Outside of this area, the principal aim was to investigate and record (i.e. preserve by record) those remains present that would be damaged or destroyed by the proposed operations.

Excavation methodology

Soil stripping was undertaken in stages across the development area. These were designated Areas A-C (Fig. 1). The zone stripped to the south of the powerlines was designated Area A, comprising a sub-rectangular area extending to some 0.46ha. To the north of the powerlines, a 50m wide strip (Area B) was initially examined. On the basis of the results from Area B, an additional 50m wide strip (Area C) was subsequently

Figure 2: geophysical survey results

investigated. Areas B and C together comprised an area of 1.22ha.

The areas were mechanically stripped under archaeological supervision. Soils were generally removed down to bedrock across Areas B and C. Due to the considerable skill of the machine driver, it was possible to achieve a high quality of stripping despite the broken and disturbed nature of the sandstone surface.

Note on radiocarbon dates

Radiocarbon samples from the site were processed at the Scottish Universities Environmental Research Centre (SUERC) AMS facility. The resulting dates were calibrated using the University of Oxford Radiocarbon Accelerator Unit calibration programme OxCal3. Within the text below, unless otherwise noted, calibrated radiocarbon dates have been quoted at a probability range of 95.4% (2σ).

EXCAVATION RESULTS

Area A

Area A did not produce significant archaeological remains. The main features identified within this area consisted of a network of trenches excavated in the 1920s as part of a sewage-sludge disposal system and corresponding closely to the 1925 proposal drawing. No significant artefacts were recovered.

Area B/C

The topsoil across Areas B and C (numbered respectively 20 and 210), a dark brown silty fine sand, was generally 0.30m thick although over the highest part of the site it thinned to 0.20m. Finds from context 20 included eight struck flints and forty eight potsherds, including a single Iron Age or Romano-British sherd and several medieval sherds. Finds from the stripped bedrock surface (context 66) included three flints, a Romano-British greyware sherd and four sherds of medieval Gritty Wares. Topsoil context 210 produced twelve flints, a fragment of slag and thirty potsherds primarily of post-medieval date but including five sherds of medieval Gritty Wares.

Along the eastern edge of the area there was an accumulation of colluvium which rapidly tailed-off upslope to the west. Elsewhere the topsoil directly overlay bedded or disturbed laminar sandstone bedrock (context 22). At the north-eastern corner of the area this was overlain by a deposit of clean yellowish brown silty clay.

Except where otherwise noted, archaeological features were rock-cut and filled with mid-brown or dark brown silty sand containing varying quantities of small angular sandstone fragments.

Earlier Neolithic activity

Mesolithic or early Neolithic activity on the site was indicated by topsoil finds (context 210) of flint scrapers from the northern part of the site (Area C). A scraper fragment of probable early Neolithic date was recovered from pit 105 located near the centre of Area B/C (Figs. 3 and 4). This was 0.66-0.70m in diameter and 0.33m deep. The mid brown fill 106 included some burnt sandstone fragments and charcoal flecks. A similar nearby pit 148 did not produce finds.

Two discrete groups of features, located at the north-eastern and north-western corners of Area C, produced assemblages of earlier Neolithic pottery and radiocarbon dates within the 4th millenium BC.

Features at the north-east corner of area C (Fig. 5)

Two clusters of pits and postholes produced similar pottery and may have represented a single phase of activity. They lay within a slight hollow, the base of which was lined with a layer of natural clay into which the features were cut.

The north-western cluster comprised three short linear arrangements, each of either two or three closely spaced postholes or small pits, and an additional small pit or posthole. Posthole 268 was oval, 0.87m long, 0.56m wide and 0.22m deep, and filled with mid brown clayey silty sand 269. It contained a group of sandstone fragments within the south-western end, presumably post-packing, and produced two sherds of early Neolithic pottery. Adjacent posthole 270 also contained packing stones within its south-western end. The fill 271 included a lens of heat-reddened clay within its north-eastern end. A small circular pit or posthole 219 lying 0.7m to the east of these features produced sherds of Iron Age pottery and is described below in the section on Iron Age features.

A second short row of three very closely spaced postholes lay 1m to the north of 270, running along a similar axis. The south-western feature 292 was 0.55m in diameter and 0.16m deep, and was filled with mid brown sandy silt 293. Posthole 294 immediately to the north-east was oval and measured 0.90m by 0.69m by 0.10m deep. Its fill 295 included a series of flat sandstone fragments arranged vertically along the centreline of the feature. The third posthole 296 was 0.48-0.52m in diameter and 0.17m deep. The fill 297 again had a line of vertical sandstone fragments running through it from south-west to north-east, and produced a flint and a sherd of early Neolithic pottery.

The third row of features lay 3m to the east, running on a slightly different alignment from south to north. At the surface, feature 260 appeared as a single oval pit; however excavation indicated the presence of two inter-cutting small pits. The northern part of the cut was 0.40m in diameter, 0.07m deep and filled with mid brown clayey silty sand 261. This had been cut to the south by a larger oval pit measuring 0.72m by 0.68m by 0.16m deep and filled with burnt sandstone fragments in a dark brown silty sand matrix 262. The third feature in this group, 263, was 0.35-0.50m in

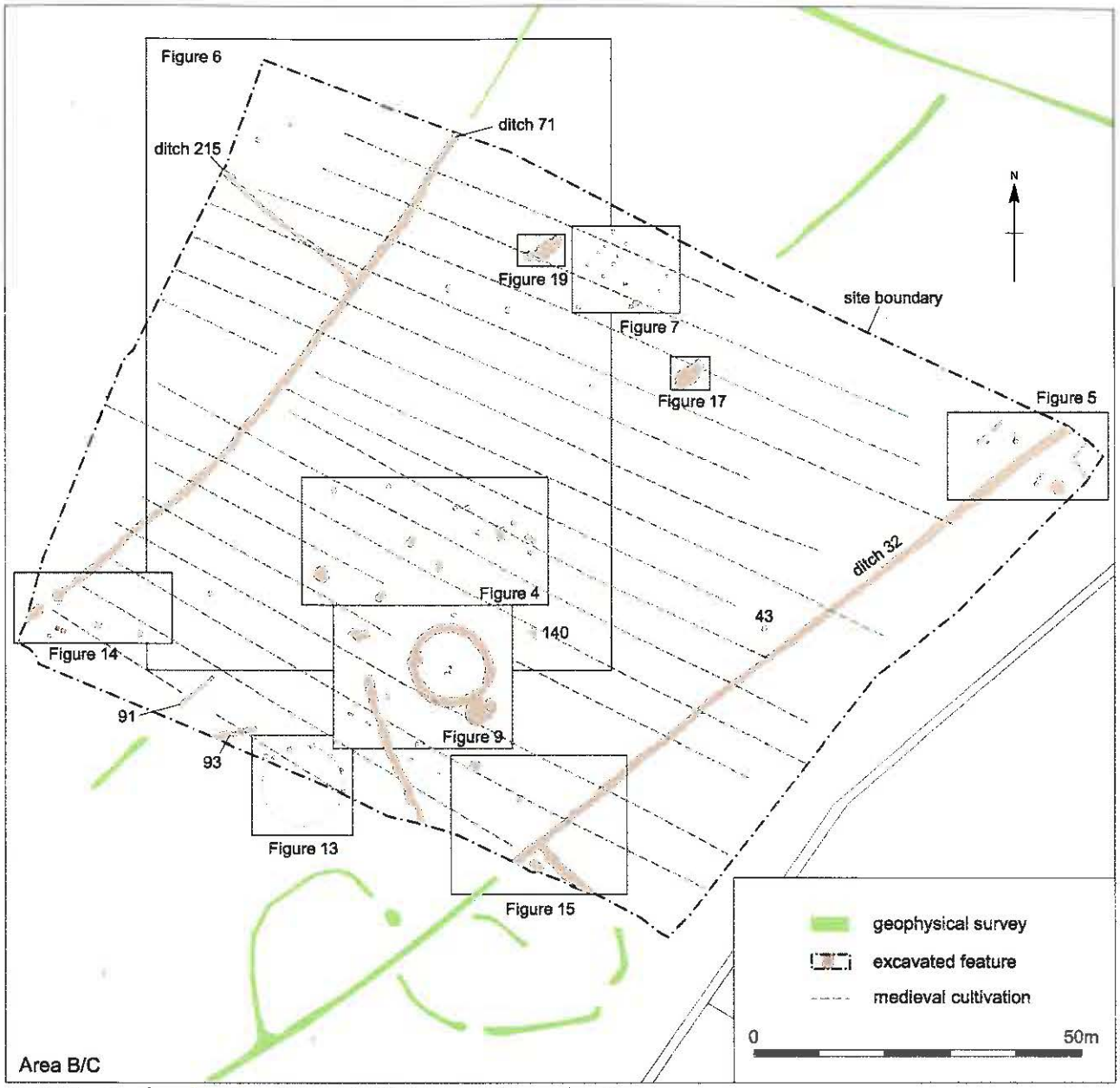


Figure 3: site plan showing all recorded features and figure locations

diameter and 0.10m deep, and again filled with burnt sandstone fragments 264.

The south-eastern cluster of features included another line of three small pits aligned from north-northeast to south-southwest. The northern feature 282 was 0.60m in diameter, 0.23m deep and filled with mid brown clayey sandy silt 283 and small sandstone fragments. Pit 280 immediately to the south was 0.70m in diameter and 0.12m deep and had a similar fill 281 containing a few stones, charcoal flecks and two sherds of early Neolithic pottery. The southern edge of the feature was cut by the third pit 278. This was rectangular, 1.05m long, 0.55m wide and 0.09m deep, and had a similar fill 279 containing a lens of soot or powdered charcoal.

Pit 288, located just to the east, was sub-circular, 2.1m in diameter and 0.41m deep with gently-sloping sides and a fairly level base. There was considerable evidence for slumping of the sides, indicating that the pit had been left open for some time. A primary fill of mid grey silty clay 291 was flecked with charcoal and produced two flints, twelve sherds of Grimston-style pottery and a fragment of fired clay. A soil sample produced a fragment of possible oak charcoal and carbonised grains of emmer and spelt wheat. The latter provided a radiocarbon date of 3780-3650 cal. BC (SUERC-21259, GU-17794). A secondary fill of light brown silty clay 290 contained charcoal and burnt stone. The top of the pit had been in-filled with re-deposited natural mid yellowish brown silty clay 289. This produced another 20 sherds of Grimston-style pottery and three flints.

Pits at the north-west corner of area C (Fig. 6)

Two pits lay in this part of the site. Pit 265 was 0.70-0.75m in diameter and up to 0.30m deep. Its mid brown fill produced eight flints, sixteen sherds of Grimston-style pottery, an intrusive small sherd of modern pottery, unidentifiable wood charcoal and fragments of carbonised hazelnut shell; the latter gave a radiocarbon date of 3710-3635 cal. BC (SUERC-21257). A similar nearby pit 244 did not produce artefacts.

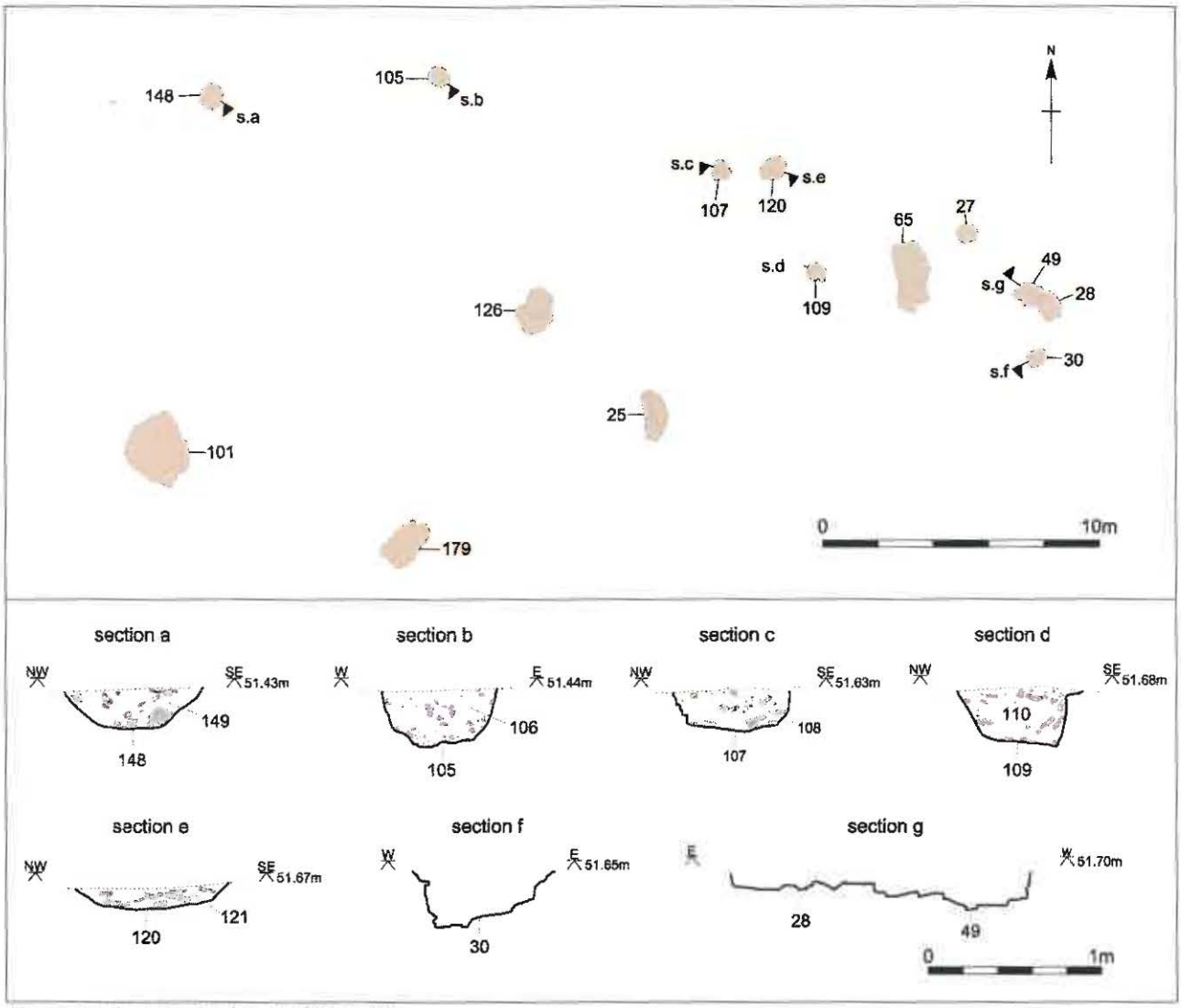


Figure 4: pits in central part of Area B/C

A third radiocarbon date in the middle half of the 4th millennium BC was provided by carbonised hazelnut shell recovered from posthole 67 of structure 190 (described below) at the southern edge of the area; however the nutshell (a relatively robust material) is presumed to have been residual. The sample provided two date ranges spanning 3630-3370 cal. BC (SUERC-21250), suggesting that early Neolithic activity may have been more widespread across than the site than the excavated features and unstratified finds suggested.

Later Neolithic activity

Continuing occupation activity within the site into the later Neolithic period was indicated by scattered pits containing pottery, worked flints and other cultural debris. A small rectangular post-built structure could also have dated from this phase of activity.

Pit 30 was located near the centre of the area (Fig. 4). It measured 0.76m long, 0.60m wide and 0.34m deep, and had a mid brown silty sandy clay fill 31. A quantity of yellow sand within the base of the feature indicated that it had been created by prying-out the bedrock without any effort to remove the interleaving sand lenses. The fill contained six worked flints including a scraper fragment of later Neolithic date, and a considerable quantity of Durrington Walls style Grooved Ware pottery sherds (see Manby, below). A soil sample, comprising almost all of the soil fill, produced a single poorly preserved cereal grain, possibly wheat. Two radiocarbon determinations obtained from carbonised residues on pottery sherds from this feature each gave multiple date ranges spanning 2570-2300 cal. BC and 2570-2340 cal. BC (SUERC-21247 and -21249).

A group of features, comprising a possible rectangular structure and a small number of pits, was located near the central northern edge of the excavation area. The features did not, with one exception, produce finds or other direct dating evidence. The spatial isolation of these (admittedly dispersed) features suggested that they formed an associated group and were of Neolithic date.

Structure 223 consisted of eight small, neatly cut circular postholes, arranged in two roughly parallel rows of four with each posthole paired to one in the opposing row (Figs. 7 and 8). Overall, the structure measured 6.85m from north-east to south-west and up to 3.50m wide. The central pair of postholes in each row were relatively closer together (1.2m and 1.4m, centre to centre) than from these to the four corner posts (2.2m, except 2.7m to the north-western corner).

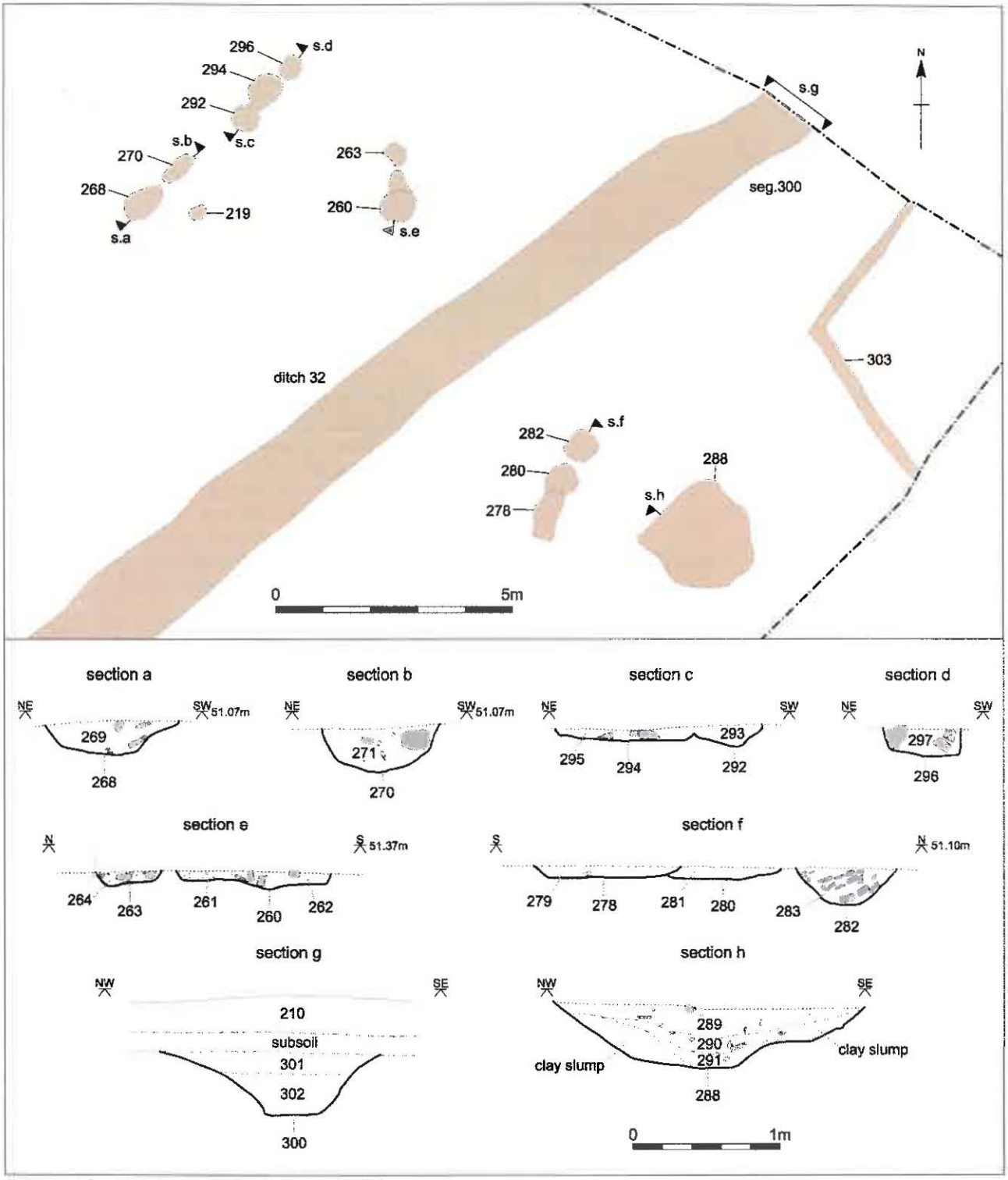
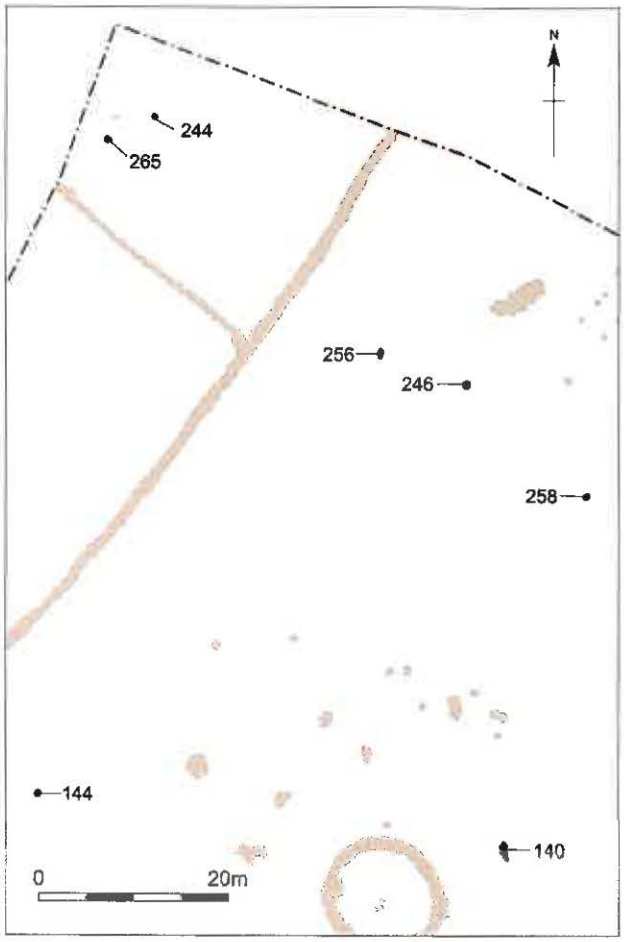


Figure 5: features in north-east corner of Area C

The individual postholes were numbered 224, 226, 228 and 230 in the north-western row and 232, 234, 236 and 238 in the south-eastern row. All of the features had vertical sides and flat bases. None produced dateable finds. Soil samples were taken from four postholes and small quantities of carbonised material were recovered; however a sample submitted for radiocarbon assay proved too small to date.

The largest posthole, 224, at the north-western corner, was 0.60m in diameter and 0.41m deep. The fill 225 included several larger sandstone fragments concentrated against the northern side suggesting that it had held a post some 0.30m in diameter. The next posthole in this row, 226, was the smallest, only 0.38m in diameter and 0.33m deep. Small fragments of burnt bone possibly from a medium-sized mammal were present in the top of the fill 227, together with oak charcoal and an unidentifiable cereal grain. The other postholes were generally 0.47-0.51m in diameter and 0.28-0.33m deep. In posthole 228, the fill 229 included a heat-shattered cobble, fragments of burnt sandstone, wood charcoal and a charred bulb of onion couch grass. Larger stone fragments were concentrated against the south-western edge, suggesting that the post had stood against the north-eastern side of the cut. No post-pipe could be suggested within posthole 230. Within posthole 232, the packing stones suggested



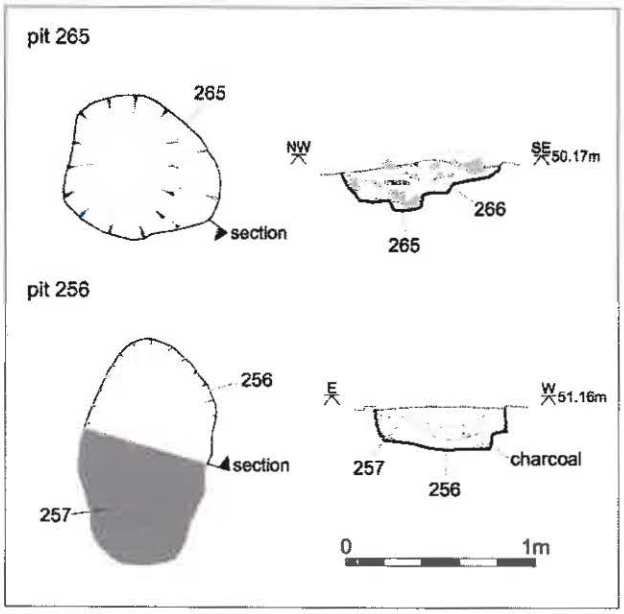


Figure 6: pits in north-west part of Area B/C

that the post had been set centrally. In posthole 234, packing stones were concentrated around the north-eastern edge, defining a post-pipe 0.30m in diameter. Packing around the edges of posthole 236 suggested a central post-pipe 0.25m in diameter. Its fill 237 included unidentifiable wood charcoal, a possible oat grain, a charred bulb of onion couch grass, a heat-shattered cobble and burnt sandstone fragments. Packing within posthole 238 defined a post-pipe 0.30m in diameter against the north-western side.

A pair of similar neatly cut circular postholes were located 8m to the east of structure 223 (Fig. 8). Posthole 240 was 0.41m in diameter and 0.40m deep. The fill 241 included some burnt sandstone fragments and a single heat-shattered cobble, but no post-pipe could be identified. Posthole 242 located 2.5m to the south was slightly smaller, measuring 0.38m in diameter and 0.39m deep. Sandstone fragments set vertically around the edges defined a post-pipe some 0.20m in diameter. Neither feature produced finds.

Pit 248 was located between these two groups of features. It was 0.63m long, 0.40m wide and 0.12m deep. A lens of charcoal flecks within the top of the fill 249 produced fragments of hazelnut shell. To the south of this was another oval pit 272, originally more than 1.04m long, 0.90m wide and 0.12m deep. The south-western end of the feature had been cut away by a circular posthole 274, 0.51m in diameter and 0.17m deep. It was filled with yellowish brown silty sand 275, almost stone-free except for a series of packing stones consisting of cobbles, mostly burnt, and a single burnt sandstone fragment, which had been set around the north-eastern edge of the cut defining a post-pipe 0.30m in diameter against the south-western edge. None of these three features produced finds.

To the west of these features, and to the south of structure 223, was another pit 254 (Fig. 7). This was 0.71-0.77m in diameter and 0.54m deep with neatly cut vertical sides and a flat base. The fill 255 contained a number of large, mostly heat-reddened or blackened sandstone fragments, possibly post-packing, together with charcoal flecks and fragments of heat-cracked

Figure 7: Structure 223 facing south-west, scales 2m

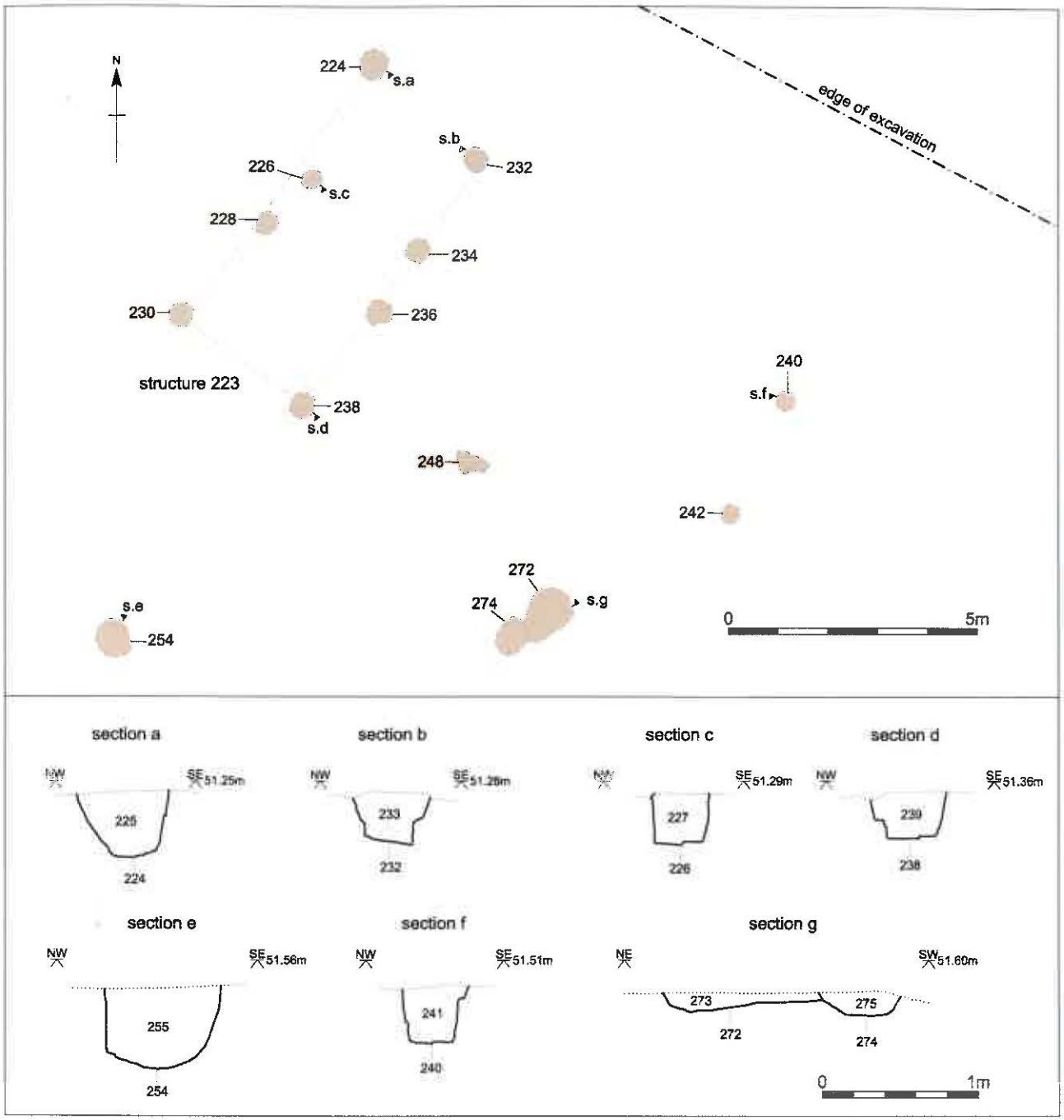


Figure 8: features in north central part of Area B/C

cobbles. Pit 258 lay 17m south of structure 223 (Fig. 6). It was 0.75-0.80m in diameter and 0.20m deep. Neither feature produced finds.

Pits 246 and 256 lay respectively 14m and 21m south-west of structure 223 (Fig. 6). Pit 246 was 0.80-1.00m in diameter and 0.22m deep. Pit 256 was oval, aligned from north to south, and measured 1.20m by 0.68m by 0.24m deep. It was neatly cut, with near-vertical sides and a flat base, and had an almost stone-free fill 257. A thin concave lens of charcoal flecks half-way up the fill contained fragments of charred hazelnut shell which provided radiocarbon date ranges spanning 2570-2340 cal. BC (SUERC-21256). The pit produced two sherds of possible Peterborough Ware pottery and a utilised sandstone pebble.

An undated ring of postholes (structure 190) was excavated at the southern edge of the area. This is described below with the Iron Age features, but could equally have been of Later Neolithis or Early Bronze Age date.

Early Bronze Age

Ring ditch 23 and associated features (Figs. 9 and 10)

The ring ditch recorded from cropmarks and geophysical survey lay within the southern part of Area B. It described a slightly irregular circle with surviving external and internal diameters of 12.6-13.0m and 9.6-10.7m. The continuous rock-cut ditch was 0.85-1.60m wide at the top of bedrock and 0.32-0.50m deep. Initially, four segments of the ring ditch, equating to approximately half of its circuit, were excavated at the northern, eastern, southern and western sides

(respectively segments 70, 111, 63 and 130). The intermediate segments were subsequently excavated as 199, 201, 185 and 191 (clockwise from the north-east) (Fig. 10).

The ditch generally had very steep sides and a broad flat base. Around its northern side where there was solid bedrock it was very neatly cut. Elsewhere, the feature was less regular, although this must to some extent have been the result of erosion of the original sides.

The primary fill of segment 70 at the northern edge of the ring ditch (context 159) consisted of large angular fragments of sandstone in a matrix of clean yellow sand similar to that interleaved with the sandstone bedrock, suggesting that the ditch had been dug in this area by levering out the laminar bedrock without also removing the resulting loose sand. The deposit was present in a thin layer across the base of the cut but mainly concentrated against the base of the sides. The main fill of the ditch above this, and generally throughout its circuit, (numbered sequentially from segment 70 clockwise to 191 as contexts 69, 200, 118/119, 202, 62, 184, 131 and 192) was a deposit of mid to dark brown silty fine sand containing 10-25% small sandstone fragments, occasional rounded cobbles and with occasional fragments of burnt stone near the top of the feature. Lenses of carbonised material were noted amongst this material within segment 70 (deposit 69) and two soil samples produced wood charcoal from oak and ash, and carbonised bulbs of onion couch grass.

Within some ditch segments there were indications of possible re-cutting. In segment 111 at the eastern side of the feature, the primary fill 118/119 only survived against the outer and inner edges of the ditch. Along the centre of this segment was a possible re-cut 117 c.0.75m wide and 0.38m deep with near-vertical sides, and filled with sandstone fragments 116; most of the sandstone fragments lay flat with no indication of any post-settings. It was overlain by a thin dark brown lens 113 containing frequent small fragments of oak and ash charcoal. This was overlain in turn by a mid brown deposit 112 up to 0.16m thick. In segments 63 and 185, at the southern and south-western sides of the ring ditch, there was a less stoney, more soily upper fill within the ditch (deposits 158 and 183) representing either a change in the ditch-silting regime or perhaps the presence of a re-cut 157.

The only finds from the ditch were three flints, from primary segment fills 184, 192, and from the machined surface of fill 69.

The whole of the circular platform surrounded by ring ditch 23 was hand-cleaned. The bedrock surface had suffered considerably less plough-damage compared to the surrounding area. A rock-cut furrow approaching from the east and west was not present within the circuit of the ring ditch. Most features cutting the bedrock of the platform proved to consist either of faulting in the bedrock or possible ancient tree-disturbances. A group of three small pits, 81, 83 and 85, was located near the centre of the platform. Each had a distinctive dark brown silty sand fill within which cremated bone was visible after cleaning.

Figure 9: Ring ditch 23 facing east, scales 2m

The southern pit 81 was 0.44-0.47m in diameter and 0.26m deep with near-vertical sides and a concave base. The fill 82 contained some small rounded pebbles and sandstone fragments. Quantities of cremated human bone were present throughout the deposit although mainly towards the base. The deposit contained an inverted Accessory Cup 87 (Fig. 11) filled with cremated bone (separately designated context 88), much of which had spilled out during deposition to form a continuous deposit with pit fill 82. The cremated remains included two fragments of animal bone, one identifiable as from a pig radius. The pit fill produced an several burnt flint fragments, an assemblage of unidentifiable wood charcoal and charred bulbs of onion couch grass. A fragment of bone from the cremation gave a radiocarbon date of 1920-1750 cal. BC (SUERC-21258).

Pit 83, located 0.6m (centre to centre) to the north-east of pit [81], was 0.30-0.33m in diameter and 0.23m deep, and had vertical sides and a flat base. It contained a similar cremation deposit 84. In this case, no pottery vessel was present, but the majority of the bone was concentrated within a 0.15m diameter area near the north-eastern side of the pit base, and it is possible that it was originally contained within an organic container. Amongst the remains were twenty small fragments of cremated animal bone, some from pig and caprovid. Some oak charcoal and carbonised bulbs of onion couch grass were also recovered. The cremated remains included a bone bead or toggle. Bone from the cremation provided a radiocarbon date of 1920-1740 cal. BC (SUERC-21251).

Pit 85 lay a further 0.8m to the north of pit 83. It was 0.30-0.34m in diameter and 0.12m deep with steep irregular sides and a fairly flat base. Cremated bone fragments were randomly distributed throughout the fill 86, which also produced some unidentifiable wood charcoal and carbonised bulbs of onion couch

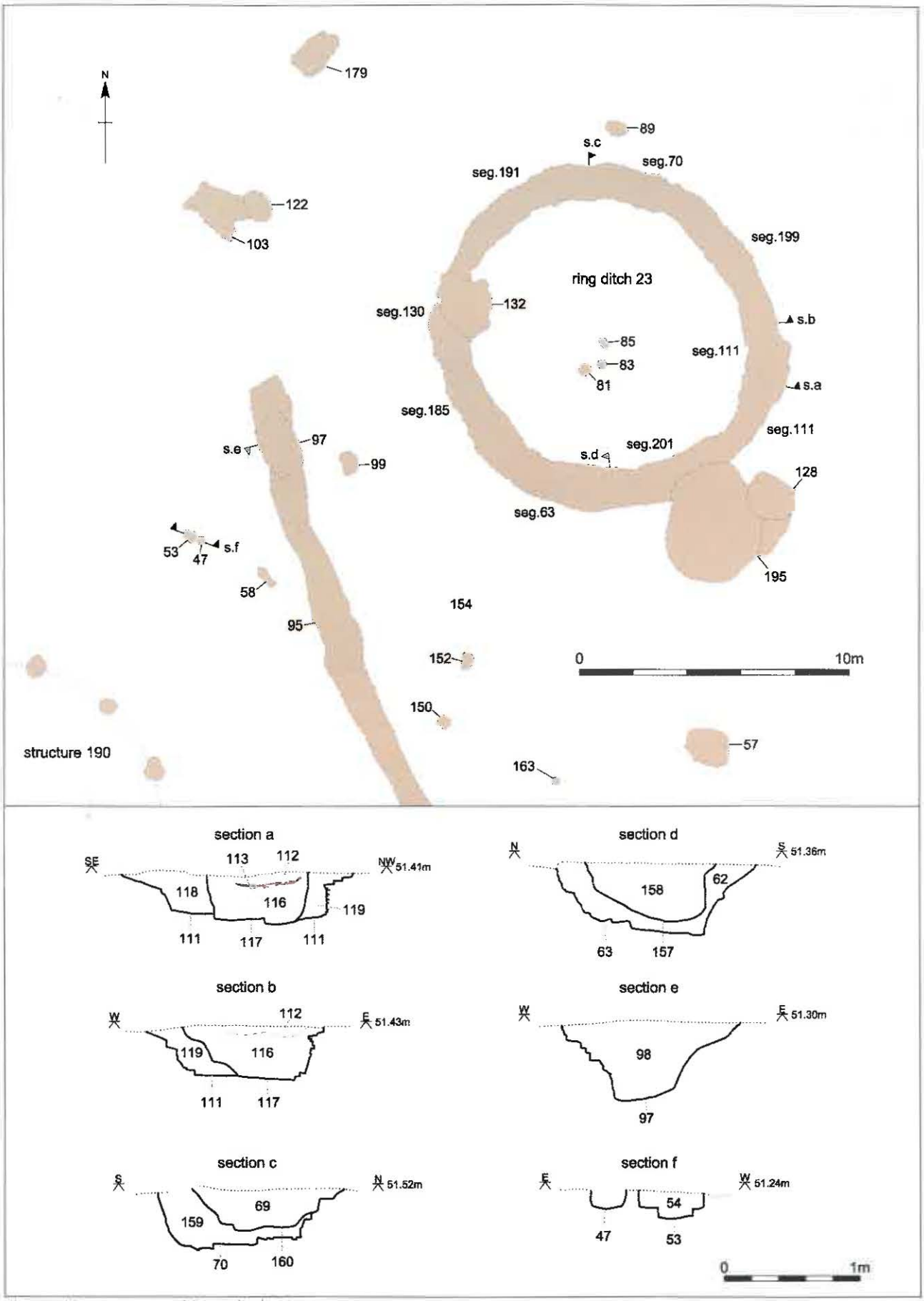


Figure 10: area around Ring ditch 23

grass. A small glass bead recovered from this deposit is considered likely to be Romano-British in date and therefore intrusive. Cremated bone provided a radiocarbon date of 1880-1680 cal. BC (SUERC-21255).

A fourth cremation burial was identified within a small rock-cut pit 47 some 10.5m south-west of the ring ditch (Fig. 10). The neatly-cut pit was 0.28m in diameter and had a surviving depth of 0.12m. Lining the edges of

Figure 11: cremation pit 81 showing accessory cup 87 'in situ'

the cut was the complete but fragmented circuit of the inverted rim of a Collared Urn 45, the rest of the vessel having presumably been removed by plough-truncation (Fig. 12). Around, and within and below the vessel (respectively contexts 48 and 46) was a deposit of cremated bone and dark brown silty sand. The vessel had wedged above the base of the pit allowing much of its contents to spill out; hence a disproportionately large quantity of the cremation had survived. The cremation included four unidentifiable animal bone fragments. A moderate amount of oak charcoal was recovered from within the Urn; by contrast almost none was recovered from the pit fill external to the vessel. Human bone provided a radiocarbon date of 1890-1690 cal. BC (SUERC-21248).

Another small pit 53 was located immediately west of pit 47. It was 0.50m in diameter and 0.20m deep. The dark brown fill 54 contained occasional charcoal flecks, and a soil sample produced four small potsherds possibly derived from Collared Urn 45, and some oak charcoal. The two pits were so close together that they are likely to have inter-cut above the level of the bedrock.

An undated rock-cut oval posthole 89 lay 1m north of ring ditch 23, and might have been associated with it. It measured 0.83m long, 0.55m wide and 0.41m deep, with a vertical northern side (following a fault in the bedrock) and near-vertical sides elsewhere to a roughly circular central base. A post perhaps 0.25-0.30m in diameter had been positioned within the eastern end of the posthole, packed to the north, east and south by thin vertical fragments of sandstone. The western half of the cut contained a more substantial deposit of sandstone fragments including four large pieces of broken sandstone cobbles dissimilar to the local bedrock; these did not re-fit and were not fragments of an object such as a saddle quern. The circular post-pipe was filled with mid brown silty sand 90 containing flecks of charcoal and burnt clay.

After it had become in-filled, ring ditch 23 was cut by two tree-disturbances. The tree within disturbance 132 had probably stood at the inner edge of the ditch at its western side. It had fallen westwards (away from the barrow-mound), prising a wedge of bedrock away from the ditch edge and leaving an irregular oval hole measuring 2.5m by 2.0m by 0.65m deep. The only dating evidence for this event was a fragment of iron-slag recovered from the soil fill 133. Tree-hole 195 cut the south-eastern side of the ring ditch. It was up to 4.3m in diameter and more than 0.4m deep. Its northern edge was cut by an undated oval pit 128, 2.10m long, 1.60m wide and 0.40m. The fill 129 did not produce finds although a soil sample produced a small quantity of oak charcoal and two fragments of charred hazelnut shell.

Possible graves

Five oval pits were excavated to the north and east of the Bronze Age barrow. Each of these features was 'grave-like' in both size and form, although none produced evidence for burial. No similar features were identified elsewhere within the excavated area. Pit 179

Figure 12: Collared Urn 45 after excavation of contents

was aligned from north-east to south-west, the others from north to south.

Pit 179 was located 8m to the north-west of the ring ditch (Fig. 4). Pit 25, located a further 9m to the north-east, had near-vertical rock-cut sides and a flat base. Pits 65 and 126 were located respectively located 10m to the north-east, and 5m to the north-west of pit 25, while pit 140 was located some 3.5m to the north-east of the ring ditch (Fig. 3). The pits were 1.70-2.30m long, 0.90-1.20m wide and 0.18-0.31m deep and filled with mid brown clayey or silty sand. Fill 26 of pit 25 produced a flake of fired clay and an undated pottery sherd. Fill 64 of pit 65 contained flecks of charcoal and produced two flints and a sherd of Gritty Ware pottery of probable 12th century date; the latter was very small and possibly intrusive. Fill 141 of pit 140 produced a worked flint. The presence of flints and absence of the slag, clinker and burnt sandstone common across the site perhaps argues for a Roman or earlier date for these features.

Iron Age features

Features of Iron Age or probable Iron Age date were located in several parts of Area B/C. These included a single probable posthole near the north-eastern corner of the area, a group of pits near the centre of the area, and a possible roundhouse and nearby pits at the southern edge of the area.

The small circular pit or posthole 219 located near the north-eastern corner of the excavated area (Fig. 5) was 0.35m in diameter but only 0.04m deep with a flat base. The fill 220 was a slightly darker brown than those of nearby Early Neolithic features, and included a burnt sandstone fragment in its western side, possibly post-packing. The feature produced five fragments of Iron Age pottery.

Pits near the centre of the area

Pits 28 and 49, located adjacent to Neolithic pit 30 (Fig. 4), were initially thought to represent a single oval feature. Accordingly, the eastern half was excavated and designated pit 28. Subsequent excavation of the western half of the 'feature' showed it to be a separate intercutting pit designated context 49. Hence both pits were fully excavated but the relationship between the two features was not established.

Pit 28 measured 1.05m long, 0.80m wide and 0.14m deep. The dark brown fill 29 contained small flecks of charcoal and a burnt cobble. It produced eight worked flints and seventeen sherds of Iron Age pottery. Pit 49 measured 0.95m long, 0.85m wide and up to 0.20m deep. The fill 50 included heat-reddened sandstone fragments, flecks of charcoal and a burnt cobble. It produced two worked flints, one a scraper of probable later Neolithic date, nine pottery sherds of probably Iron Age date, and a possible rubbing stone, all concentrated towards the base of the feature within its north-western end. Just to the north-west of pit 49, a small patch of mid brown soil 27 conceivably represented an extremely truncated pit. Although only some 0.75m in diameter and up to 0.05m thick,

it yielded five worked flints, seven Iron Age pottery sherds and a possibly utilised pebble.

Three additional pits, 109, 120 and 107, lay just to the west of these features. They were sub-circular or sub-oval in plan and measured 0.69-0.95m in diameter and 0.15-0.36m deep. The fills (110, 121 and 108) included burnt sandstone fragments and charcoal flecks. Pit 109 produced a worked flint, and pit 107 contained three flints and three Later Iron Age potsherds. A soil sample taken from pit 107 produced oak charcoal and charred hazelnut shell.

Structure 190 and nearby pits (Fig. 13)

An arc of six postholes excavated at the south-western edge of the Area B/C formed the northern half of a possible roundhouse extending into the unexcavated zone beneath the powerlines. The structure was 11.5m in diameter, with the postholes spaced approximately 3.0m apart, centre to centre. The postholes varied in form and filling, and were only grouped as a result of their spatial layout. No internal features were identified.

At the eastern side of Structure 190, posthole 193 was 0.59m in diameter and cut 0.22m into rock. It had near-vertical sides and a flat base, and had a homogeneous fill 194. The next posthole to the north, 181, was rather more irregular in plan, 0.90m long, 0.75m wide and 0.25m deep. Posthole 60 was 0.51m in diameter, 0.41m deep and lined with vertical thin sandstone fragments, presumably post-packing, suggesting that the post had been some 0.40m in diameter. Posthole 67 at the northern edge of the structure was 0.56m in diameter, 0.21m deep. A fragment of hazelnut shell from the fill 68 gave an apparently anomalous early Neolithic radiocarbon date, highlighting the need for caution when using single fragments of such material as dating samples.

Posthole 188 was neatly cut with vertical sides and a flat base, 0.54-0.64m in diameter and 0.30m deep. It had been recut, with a shallower replacement 167 located slightly further to the south. This was 0.58m in diameter and 0.10m deep. Posthole 186 was 0.46-0.58m in diameter and 0.16m deep. Immediately to the west of posthole 186 was a circular pit 197. This was 0.75m in diameter, 0.26m deep and had regular steep-sloping sides and a flat base. It was filled with almost stone-free, black, sooty sandy silt 198 containing quantities of oak charcoal but no finds.

Several pits lay in the area to the north-east of Structure 190 (Fig. 9). Pit 150 was square and neatly cut into the bedrock, measuring 0.41m by 0.38m by 0.07m deep. Another neatly-cut pit 163 lay a further 4.5m to the east. It was circular, 0.30m in diameter and 0.13m deep with vertical sides and a flat base. No finds were recovered from either feature. Pit 152 located to the north of pit 150 was oval, measuring 0.60m by 0.46m by 0.16m deep, although it had been partially truncated by a later furrow. Its dark brown fill 153 produced flecks of oak charcoal, burnt animal bone fragments and pottery sherds including part of a cooking pot were either of Iron Age, Romano-British

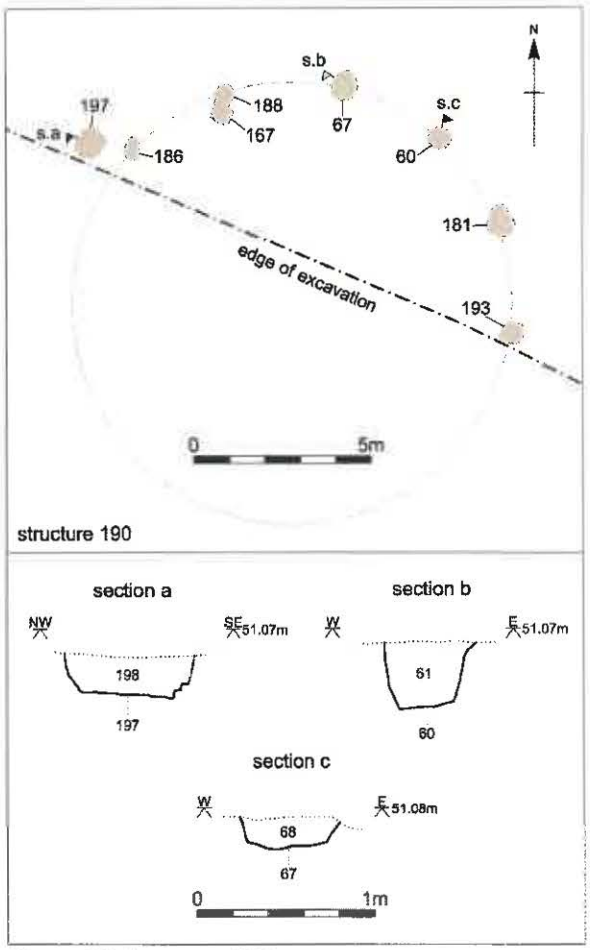


Figure 13: Structure 190

or medieval date. Two similar potsherds (designated context 154) were recovered from the fill of the furrow some 2m to the north-west, and may have derived from this feature.

A natural fault 95 in the bedrock passed between Structure 190 and the barrow, running from south-east to north-west (Fig. 9). The soil in-filling the top of this (context 96) contained quantities of fired clay lumps, burnt sandstone and pieces of slag, but no dateable finds. A large pit 97 had been excavated into, and probably exploiting, the fault. It was sub-rectangular, aligned from north-west to south-east along the line of the fault, and measured 2.30m long, 1.40m wide and 0.60m deep. Within the northern edge of the feature was a large dump of burnt sandstone fragments, heat-cracked cobbles and fired clay fragments. The remainder of the pit was in-filled with mid brown silty sand 98 containing large quantities of sandstone fragments, unidentifiable wood charcoal and fragments of burnt animal bone. Despite total excavation, no other finds were recovered. Just to the east lay a smaller, parallel, oval pit 99, 0.88m long, 0.62m wide and 0.22m deep. The fill 100 included charcoal flecks, burnt sandstone fragments and lenses of heat-affected orange or reddened soil, although no *in situ* burning was apparent. Pit 58 was located just to the west of the fault and measured 0.99m long, 0.29m wide and 0.10m deep. This did not produce finds.

Later Iron Age and Roman features

Ditches 71/75, 215 and associated features (Figs. 3 and 14)

Ditch 71 crossed the western end of the excavation area, running from south-west to north-east, but curving slightly northwards (Fig. 3). Near the south-western corner of the area there was a narrow break in the ditch, the section to the south-west of the break being numbered ditch 75 (Fig. 14). A smaller ditch 215 ran to the north-west from ditch 71 (Fig. 3). Several pits located at the eastern side of the break in ditch 71/75 were possibly associated with this boundary.

Ditch 71 (overall fill 72) was observed for a length of some 96m within the excavated area, but the geophysical survey showed that it continued to the modern northern field boundary with a total length of 180m (Fig. 2). The northern part of the feature ran straight and almost parallel to a former post-medieval field boundary. The ditch was investigated in seven segments, 77 at its south-western terminal, 169, 73, 221, 298 at its intersection with ditch 215, 213 and 211 at the north-eastern edge of the stripped area. At its south-western terminal 77 it was 1.12m wide and 0.44m deep with steep sides and a fairly flat base.

Within segments 169, 73 and 221 to the north-east, the ditch was 1.00-1.35m wide. From its intersection with ditch 215 in segment 298 the ditch was slightly wider at up to 1.5m in segment 213, but narrowing to only 1.0m at the north-eastern edge of the area in segment 211. It was 0.30-0.37m deep (only 0.20m at 211), and generally had a flat-based 'U'-shaped profile. The segment fills (78, 170, 74, 222, 299, 214, 212) were generally mid brown with varying amounts of sandstone fragments, occasional burnt sandstone, small charcoal and coal fragments and, in 74 and 214, burnt cobble fragments. The only finds were from segment fill 299, which produced a flint flake, a fragment of slag and a small group of iron objects (see Bishop, below). A soil sample recovered from the same segment produced unidentifiable wood charcoal, two poorly preserved cereal grains, possibly oats, and a bulb of onion couch grass.

The opposing ditch terminal to the south-west, 75, was separated by a narrow gap of only 1.8m at the bedrock surface, presumably rather less at the original ground surface (Fig. 14). The feature was observed over a length of 3.8m, continuing to the south-west. Its rounded terminal was 1.54m wide and 0.66m deep with a steep-sided 'U'-shaped profile. It had a similar fill 76 to ditch 71, which produced a sherd of Black Burnished Ware 1 pottery of probable later 2nd or earlier 3rd century date.

Ditch 215 was observed over a length of 26.6m running north-west from its junction with ditch 71 (Fig. 3). It was 0.60-0.70m wide but only 0.15m deep. No finds were recovered from the feature.

Quantities of burnt stone, coal fragments and ironworking slag were observed across the whole excavation area within the topsoil, furrows, tree-holes and within many of the archaeological features of Roman or later date. The highest concentrations were noted to occur at the south-eastern corner of the area, adjacent to the 'D'-shaped enclosure, and along the western edge of the area where the ground began to slope down and where furnaces would best have been sited to take advantage of the prevailing wind blowing along the valley. The geophysical survey noted areas of magnetic enhancement in this area, mainly just beyond the excavated area, but no strong responses indicative of the remains of furnaces. Centuries of plough-truncation meant that any associated structures such as hearths are likely to have been lost.

Several areas of heat-reddening on the surviving bedrock surface were observed within the south-western corner of the stripped area. Cleaning over the bedrock around one of these produced quantities of coal, ironworking slag and a Roman greyware sherd of probable later 2nd to earlier 3rd century date (Context 143). It also revealed an irregular shallow hollow or tree-disturbance 155, 1.05m in diameter and up to 0.18m deep (Fig. 14). The dark brown fill 156 included fragments of burnt sandstone fragments, charcoal,

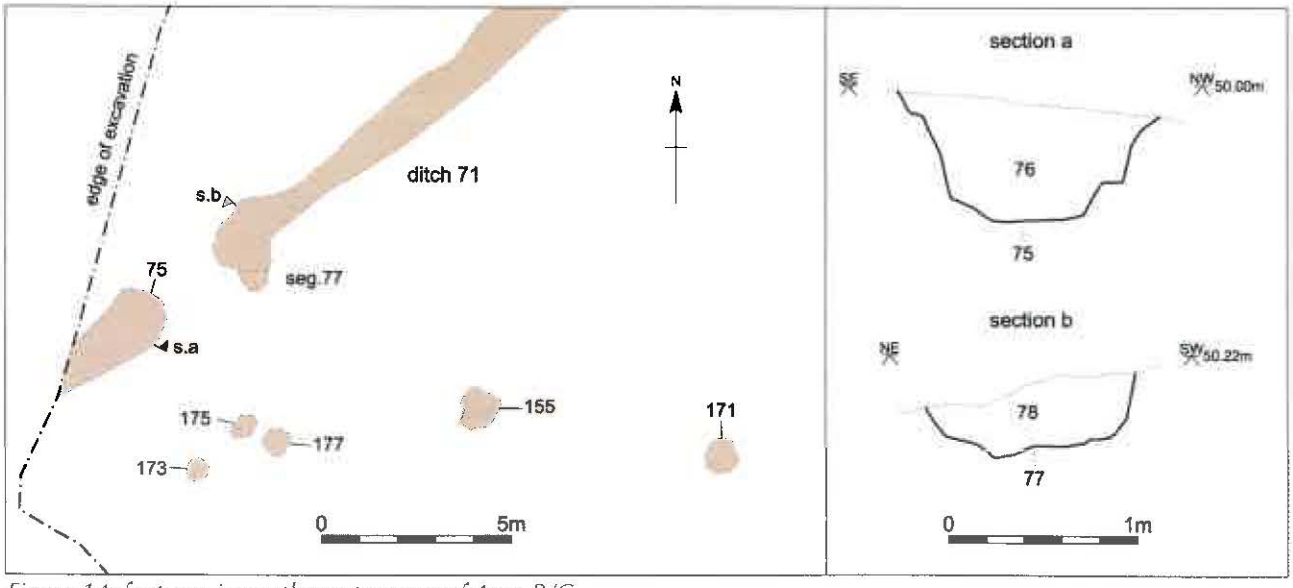


Figure 14: features in south-west corner of Area B/C

coal and fired clay, iron-slag and two sherds of Roman greyware of probable 4th century date. Pit 171 located some 5.5m to the east was some 0.90m in diameter and 0.17m deep, and had a similar fill containing coal and burnt stone fragments, but no finds. Another small pit 144 located a further 12m to the north-east (Fig. 6) also contained charcoal flecks and burnt stone fragments, and was perhaps associated with this activity.

Three small pits or postholes, 173, 175 and 177, located adjacent to the break in boundary 71/75 (Fig. 14) did not produce finds, but did contain fragments of coal and burnt stone. Each was 0.58-0.68m in diameter and 0.20-0.23m deep, and was filled with mid reddish brown silty sand (respectively 174, 176 and 178).

Ditch 32, 'D'-shaped enclosure 40 and associated features (Figs. 3, 5 and 15)

Ditch 32 crossed the eastern side of Area B/C from south-west to north-east, corresponding to the feature previously identified from cropmarks. It was recorded by the geophysical survey over a length of 200m, continuing beyond the survey to the south-west (Fig. 2). To the north-east, the survey suggests that it terminated some 10m beyond the excavated area; however, after a gap of some 20m its line was continued by an extant hedged field boundary (Fig. 16). This suggests that fragments of ancient landscape divisions survive within the modern field pattern in this area.

Six sections were hand-excavated across the ditch. Segment 300 was located at the north-eastern limit of excavation (Fig. 5). Here the ditch was cut into clay rather than sandstone, and was sealed by a layer of colluvium protecting it from modern plough-truncation. It was 1.65m wide and 0.41m deep, with a steep-sloping south-eastern side, gentler north-western side, and a narrow flat base. The asymmetric profile suggested a former hedge at its south-eastern side. The base of the feature was filled with 0.28m of stone-free mid greyish brown clayey silty sand 302,

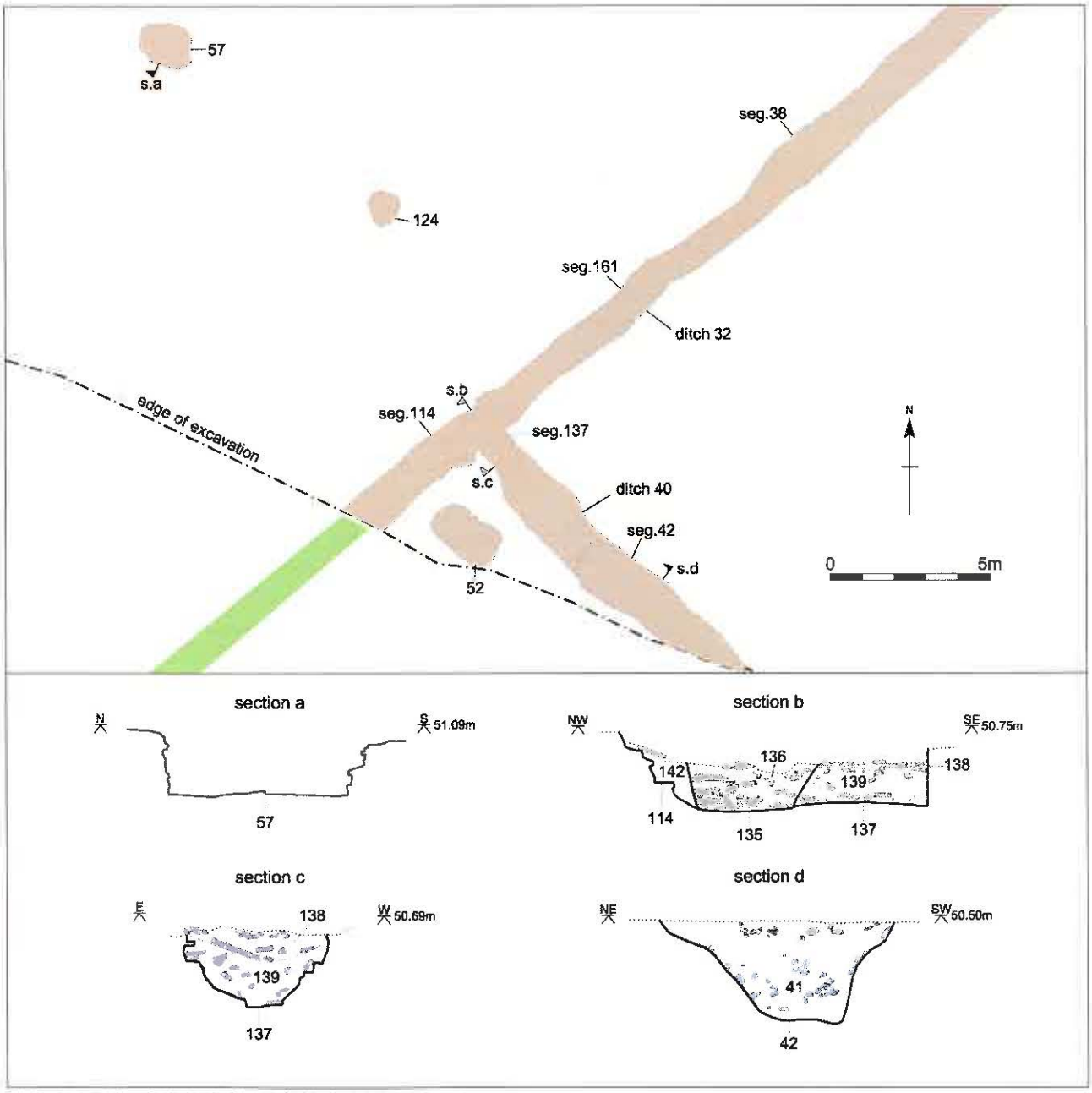


Figure 15: Ditch 32 'D-shaped' enclosure and pits

Figure 16: Ditch 32 facing north-east, showing continuation of modern field boundary, scales 1m

below a browner deposit 301 containing pebbles and small sandstone fragments.

Within segments 34, 36, 38, 161 and 114 to the south-west, the ditch was 1.08-1.45m wide and 0.40-0.52m deep with a steep-sided flat-based 'V'-shaped profile (Fig. 15). It had a mid brown fill containing moderate sandstone fragments, although some stone-free primary silting was noted running down the edges of the ditch. Running south-west from just north of segment 38, the upper part of the ditch contained significant numbers of whole and fragmented burnt cobbles ('potboilers') and some coal and clinker fragments. From amongst this material in fill 39 of segment 38 fragments of a *mortarium* of possibly early 2nd century date were recovered. An undated small pit 43 was located at the north-western side of ditch 32 (Fig. 3), and in the absence of any other nearby features was considered likely to be associated with it.

The extreme northern edge of the 'D'-shaped enclosure recorded by the geophysical survey lay within the stripped area. The enclosure ditch 40 was observed over a length of 11.2m running south-east from its junction with ditch 32 (Fig. 15). It was up to 1.50m wide. An excavated segment 42 showed it to be 0.63m deep with a steep-sloping south-western (internal) side, a more gently sloping north-eastern side and a rounded base. The ditch narrowed as it approached ditch 32, in segment 137 being only 1.05m wide but still 0.50m deep. The ditch was filled with mid brown clayey silty sand 41/139 containing large quantities of sandstone fragments, suggesting deliberate in-filling. The deposit produced a single hand-made sherd of Iron Age or native Romano-British pottery (context 41).

Within segment 137, the fill was overlain by a layer 138 of sandstone fragments, perhaps a surface laid over the in-filled ditch.

The direct relationship between the fills of ditches 32 and 40 had been lost due to re-cutting of ditch 32 after both had become in-filled. Re-cut 135 ran northwards for an uncertain distance from a point approximately in line with the south-western edge of ditch 40. Where excavated it was 0.75m wide and 0.50m deep, with very steep sides and a flat base. It was filled with large quantities of sandstone fragments 136 and occasional burnt cobble fragments. Larger sandstone slabs (up to 0.47m long) had been dumped into the south-western end of the feature. Filling the top of the overall hollow of ditch 32 at this point, and sealing the re-cut, was a less stony deposit 115 up to 1.0m wide and 0.05m thick, containing quantities of burnt stone and a distinct dump of ironsmithing debris and fired clay. It also produced a flint and another hand-made sherd of either Iron Age or native Romano-British pottery. Deposit 115 extended southwards just beyond the underlying recut. It was probably the same material containing heat-shattered cobble fragments observed extending to the north-east along the ditch beyond segment 38.

Pit 52 was located within the angle between the enclosure ditch 40 and linear ditch 32. It was oval, aligned from north-west to south-east parallel to adjacent ditch 40. It was 2.20m long, 1.35m wide and 0.42m deep, and filled with mid orange-brown clayey sand 51 containing very frequent small sandstone fragments, some burnt stone fragments and heat-cracked cobbles. It did not produce any finds. The size, form and position of this feature suggested that it could conceivably have been a grave.

Other Roman features

Several other features located towards the southern edge of the area produced sherds of Roman pottery. Pit 124 was sub-circular and measured 1.07m by 0.98m by 0.38m deep (Fig. 15). The fill 125 contained some burnt sandstone, heat-shattered cobbles, charcoal flecks and a large sherd of greyware of likely 4th century date.

Two short, shallow gullies were recorded near the middle of the southern edge of the area (Fig. 3). Gully 91 ran for 7.0m from south-west to north-east. It cut into an area of silty sand subsoil, and was truncated at each end where it ran up onto exposed bedrock. It was typically 0.45m wide but only 0.08m deep, and the fill 92 contained burnt stone fragments and charcoal flecks. It produced a greyware sherd of probable mid-2nd to early 4th century date. Gully 93 ran westwards from a rounded terminal for some 4.5m before passing beyond the stripped area. It was 0.65-1.05m wide, and up to 0.15m deep. It had a similar fill 94 and produced a mortarium sherd of probable 3rd or 4th century date.

Based on the pottery assemblage recovered from it, pit 57 was the latest Romano-British feature within the site. It lay mid-way between the 'D'-shaped enclosure and the Bronze Age barrow (Fig. 15). The pit was oval in plan, measuring 1.62m from east

to west, 1.32m wide and 0.44m deep. It was neatly rock-cut, with near-vertical sides except to the west where the side sloped slightly, and had a flat base. It had a dark brown fill 55 containing frequent sandstone fragments, some burnt, over 200 heat-cracked cobbles and moderate quantities of charcoal flecks and small fragments. Halfway down the fill was a dump of heat-reddened (but not fired) clay lumps and fragments of a heavily burnt millstone, apparently deposited into the pit from the eastern side. A soil sample produced fragments of oak charcoal, hazelnut shell, carbonised grain and other plant remains, coal, cinder, and slag. Burnt and unburnt animal bone included material from cattle, sheep/goat and pig. By far the largest individual assemblage of finds from the site was recovered from this pit. This included 199 sherds of pottery, a fragment of vessel glass, a fragment of a glass bangle, a possible polishing stone, a whetstone, an unidentified iron object and an unidentifiable fragment of copper alloy. The pottery indicated a mid-4th to early-5th century date for the feature.

Undated features

A large number of disturbances of various sizes and shapes scattered particularly across the western half of the excavation area could be attributed to tree-holes. In no instance was a tree-hole observed to cut the pattern of ridge and furrow crossing the area, implying that the tree holes were of medieval or earlier date. Many contained quantities of burnt stone and, in particular, ironworking debris, further implying that these were of Iron Age or later date. Few stratigraphic relationships were recorded between tree-holes and dateable archaeological features, although as described above tree-holes 132 and 195 cut the Bronze Age barrow ditch, 132 producing a fragment of iron slag. Taken as a whole, the evidence suggests a period of afforestation of this area in the post-Roman period through to the later medieval or perhaps early post-medieval period. No tree-hole cut either ditch 32 or ditch 71, although one possibly cut ditch 215. This strongly suggested that the boundaries represented by ditches 32 and 71 continued in existence through the medieval period and were perhaps only removed when the area was cleared for ridge and furrow cultivation.

Several of the tree-holes were investigated. Tree-hole 101 located some 17m north-west of the ring ditch (Fig. 4) was 2.35-2.40m in diameter and 0.47m deep with a bowl-shaped profile, and was filled in the base with clean yellowish brown sand, overlain by a browner soil 102 suggesting gradual silting of the feature. Feature 103 closer to the barrow (Fig. 9) was sub-rectangular, 2.15m long and 1.35m wide and 0.40m deep. It was filled with mid brown soil 104 and sandstone rubble. Neither feature contained any burnt materials or finds. A smaller oval pit 122, inter-cutting with feature 103, measured 1.20m long, 1.0m wide and 0.45m deep. It had a similar 'clean' fill 123, although the relatively neat form of the cut perhaps suggested that it was man-made.

Medieval or later features

Two large sub-rectangular features were located towards the northern edge of Area C. The eastern feature 267 measured 5.0m from north-east to south-west and up to 2.8m wide (Figs. 17 and 18). It had vertical sides, with a significant overhang at the north-eastern side over a voided cavity. The main fill of the pit consisted of loose and heavily voided sandstone rubble 277 in a mid brown soil matrix. Due to uncertainty as to the depth of the feature, excavation was halted at a depth of 1.1m. Within the rubble fill was a vertical post-pipe 286, 0.30m in diameter, located at the south-western end of the pit. This was filled with mid brown soil 287 similar to that which filled a subsidence hollow over the pit (numbered 276). The pit was interpreted either as a small sandstone quarry or conceivably the top of an unfinished shaft or bell-pit for small-scale coal extraction, well evidenced from documentary sources in the area during the medieval period (Glover 2008, 4).

The second feature 250, located some 25m to the north-west, was of similar appearance in plan, aligned from north-east to south-west, and measuring 6.2m long and 2.3m wide (Fig. 19). Upon investigation, it proved to be of more complex form. At the north-eastern end was a shallow 'shelf' 1.2m wide but only cutting some 0.18m into the bedrock. On top of this was a deposit of small trampled sandstone fragments 252, suggesting its use as a step. The main pit then cut down vertically into the bedrock to a depth of more than 0.85m. A ridge of unexcavated bedrock had been left running across the pit, suggesting that more than one person had been involved in the work and that it had not been completed. The pit had been back-filled with a dump of sandstone fragments 253, and the remaining hollow had become filled with mid brown soil 251. At the extreme base of this soil, immediately overlying the rock fill, contained a group of six sherds of Gritty Ware of probable 12th century date. Higher up was a later, possibly post-medieval, sherd, suggesting a late medieval or early post-medieval date for the site subsequently being brought into cultivation and the hollow levelled.

As noted above, a small pit 152 towards the southern edge of Area B produced a small assemblage of pottery sherds which could have been of medieval date.

Furrows from former ridge and furrow cultivation crossed the whole of Area B/C, running from east-southeast to west-northwest at a slight angle to the Roman field layout (Fig. 3). The furrows, typically 1-2m wide where they survived, were spaced 6-7m apart and ran straight. Where there was a direct relationship the furrows cut all other features including tree-holes. The latest dateable feature that they cut was quarry pit 250, and as noted above, this suggests that they were of later- or post-medieval date. Only small quantities of medieval pottery were recovered from the site, and none from the furrows, again suggesting that the ridge and furrow was of post-medieval origin.

Perhaps the latest feature investigated was a narrow slot 303 which turned an angle across the north-eastern corner of the area (Fig. 5). It was 0.40m wide, 0.25m deep, and packed with pitched sandstone fragments 304. Although no dating evidence was recovered, it cut through a colluvial layer which sealed nearby Iron Age and Roman features. In view of the lower-lying and wetter position of this location, the feature is likely to have had a drainage function.

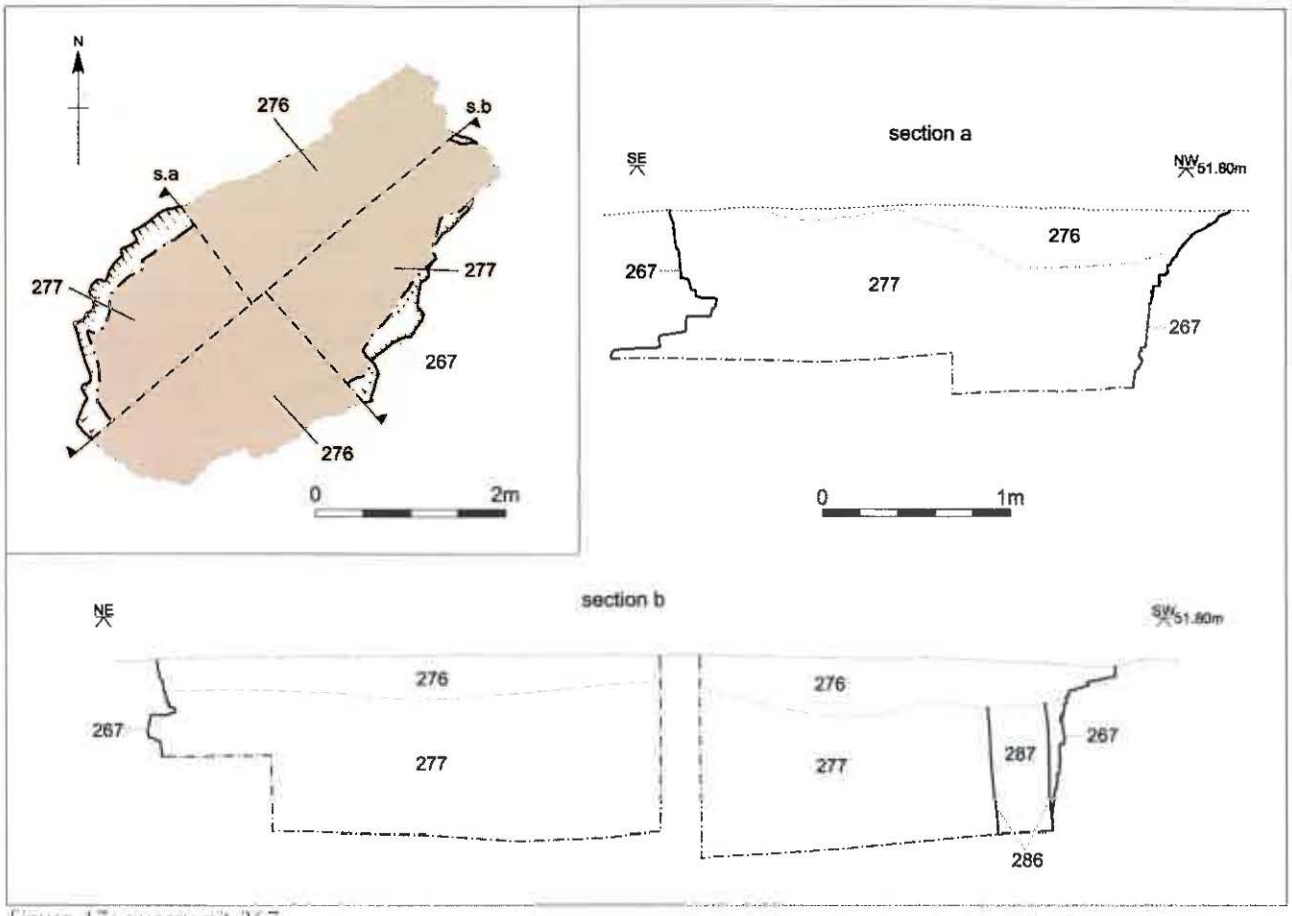


Figure 17: quarry pit 267

Figure 18: quarry pit 267 facing north-east, scales 2m and 1m

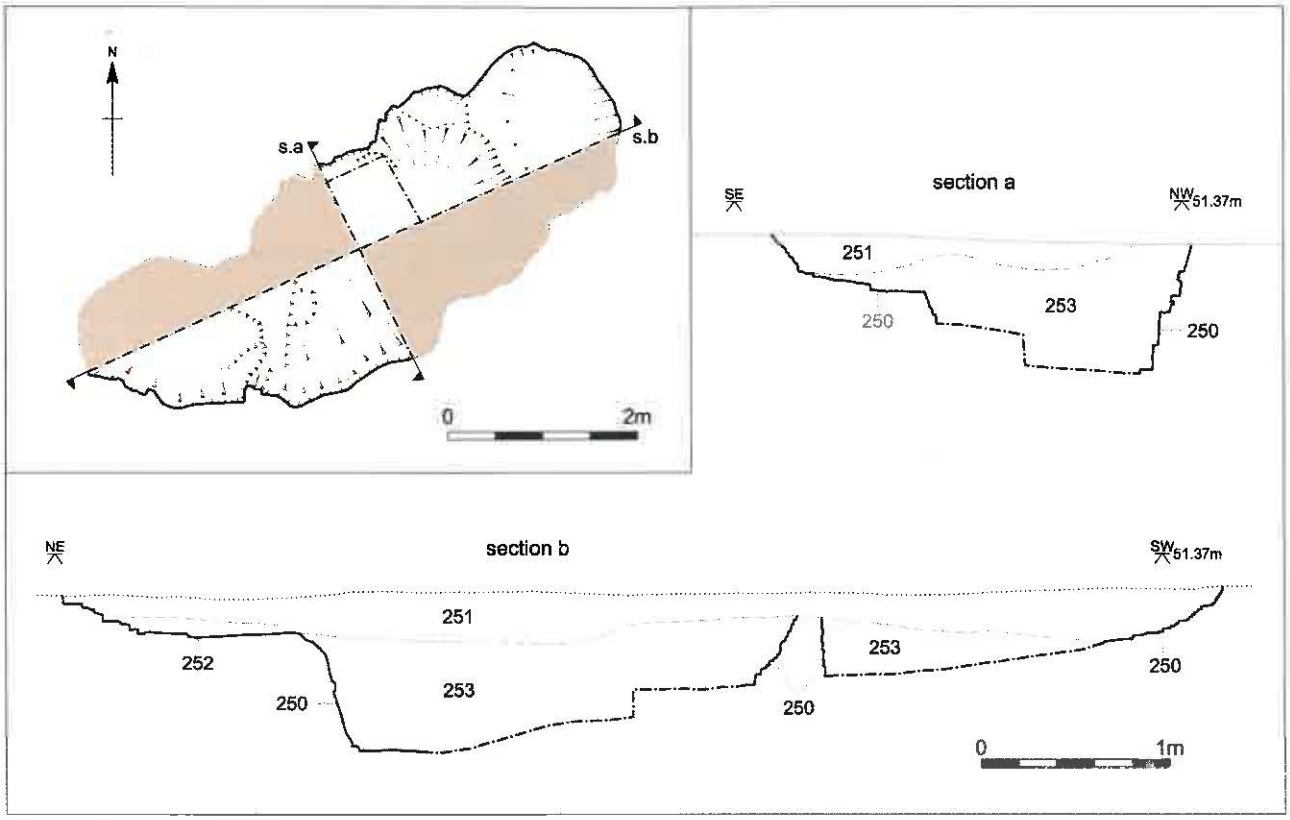


Figure 19: quarry pit 250

The early prehistoric pottery

T G Manby

Introduction

Analysis

The study and recording of the sherd assemblages was based on the recommendations of the Prehistoric Ceramic Research Group's, *The Study of Later Prehistoric Pottery: Guidelines for Analysis and Publication.* (1992).

The Early Neolithic Period (Fig. 20) Dating Range c.4000-3600 BC.

Grimston Style

Both fine and coarse ware varieties are represented by fragmentary pottery from two pits at the opposite ends of Area B/C, Pit 265 and Pit 288; some small features around the latter pit have a small number of pieces of similar fabric in their infills. There are no complete profiles; few pieces re-join and condition varies from unweathered and sharply fractured to surface eroded and rounded worn broken edges. A partial profile of one bowl can be reconstructed.

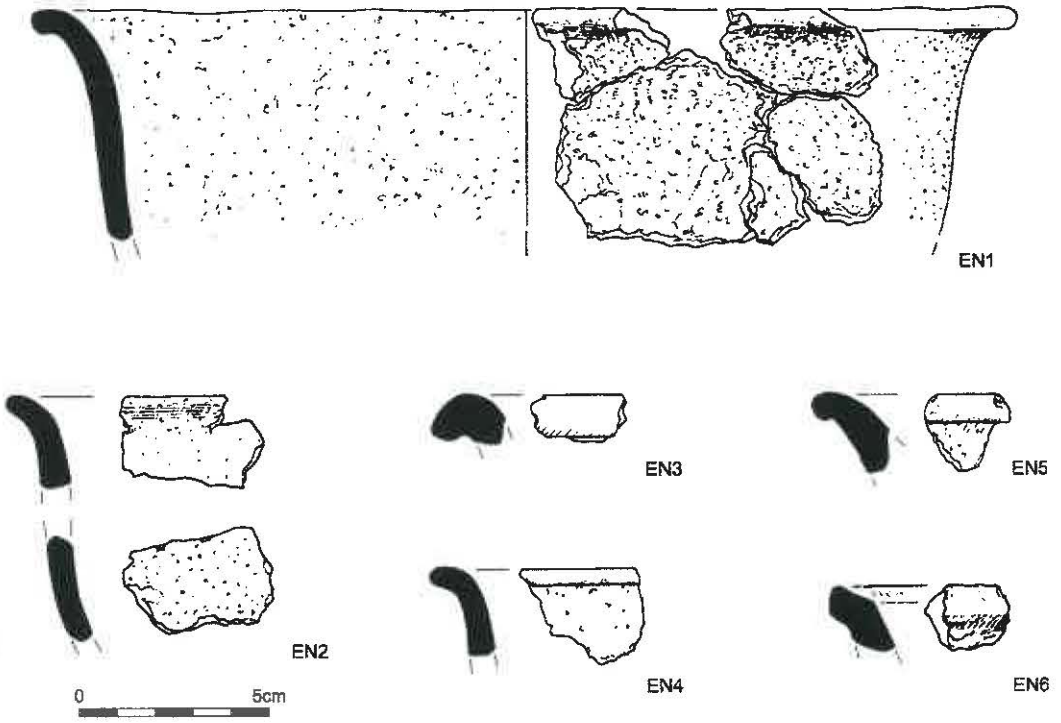


Figure 20: Early Neolithic pottery

With the exception of the Accessory Cup all the pottery was fragmentary. All the pieces were examined by context groups: they have been compared for joins; all surfaces and fractures were searched for evidence of organic material as carbonised residues or as voids in the fabric wall; tempering agents were identified with the aid of x10 hand lens, and in necessary instances using a binocular microscope. Individual pottery vessels have been identified by fabric and decoration.

In describing the fragmentary pottery the following designations describe the size of pieces:-

Sherd: Any pieces in excess of 2.5 cm. square.
Small Sherd: A piece between 1 cm. to 2.5 cm. square.

Flake: An angular piece split off vertically from the sherd wall.

Crumb: A featureless piece less than 1 cm. square.

Pit 265. Context 266. 5 Sherds; 3 Small sherds; 2 Flakes; 2 Crumbs. Weight 55g. Three fabrics:-

Fabric A: Hard laminated, brown exterior, grey interior, dark grey core; rough surfaces with erupting temper. Temper: 20%. Angular and sub-rounded quartz, some angular ironstone, common sharp sand. Wall thickness 8-8.8 mm.

EN 1 Two rim sherds of an open bowl 25 cm. diameter, out-turned rolled over lip.

Fabric B: Hard coarse laminated; orange-brown exterior, light grey interior, dark grey core; temper erupting through the surfaces. Temper: 10%. Angular sandstone, rounded and sub-rounded quartz, some angular ironstone <6 mm. Wall thickness 6.4-8 mm. Two wall sherds, 3 small sherds, 1 flake, non-joining.

Fabric C: Coarse laminated, pale buff exterior, grey interior. Temper: 10%. Angular grey sandstone, sub-angular black mineral, <5 mm. A wall sherd. and a large flake.

Pit 288. Context 289. Upper Fill. 8 Sherds; 4 Small Sherds; 2 Flakes; 4 Crumbs. Weight 135g. Largest fragment 7 x 6.5 cm. Three fabrics recognisable:-

Fabric X: Fine Ware. Hard laminated,. Dark grey fabric. Temper: common (10%) angular white quartzite <4 mm. At least two vessels represented:-

EN2 Rim and wall sherds. Out-curving profile, rounded lip, smoothed exterior surface. Wall thickness 6 mm.

EN3 Rim sherd, out-turnded lip. Weathered. Coarser surfaces. Wall thickness 9mm

Two wall sherds similar to above, 8-9 mm wall thickness. A third fragment 7 x 6.5 cm. is from the convex body profile of a large bowl; hard compact grey fabric, the exterior brown toned to dark grey. Wall thickness 9-10 mm. Probably the same vessel as wall sherd in Post Hole **268**.

Fabric Y: Coarse Ware. Coarse, soft and brittle, laminated, dark brown slightly oxidised exterior. Temper: Angular white quartzite <6 mm. Wall sherd 3.3 x 3.5 cm., 2 small sherds and 2 flakes.

Fabric Z: Coarse Ware. Exterior surface fissured, oxidised orange to a depth of 3 mm. Dark grey interior and core. Temper: 3%. Sub-angular quartz – some as cemented crystal clusters, and a sandstone pebble <7 mm. Wall thickness 12 mm. Wall sherds 3.5 x 3.5 cm. and 2 small sherds.

Pit 288. Context 291. Primary Fill. 5 Sherds; 3 Small Sherds; 3 Flakes; 1 Crumb. 1 Piece of Fired Clay. Weight 75g. Largest fragment 4.4 x 3.3 cm. Two fabrics like those of Context **289**, and a distinctive coarse third:-

Fabric X: At least two vessels represented (2 rims). Hard dark grey, Temper: Common angular white quartzite, some sub-rounded quartz, <1mm.

EN 4 Rim sherd, out-turned profile. horizontal tooling on the exterior; interior eroded leaving projecting temper. Wall thickness 5-7 mm

EN 5 Rim sherd,. Steeply splayed neck and rolled over lip. Wall thickness 10.7 mm. Also a wall sherd, a small sherd and two flakes. Wall thickness 11 mm.

Fabric Z: Coarse, orange exterior layer 4 mm. in depth, dark grey interior and core. Temper: 5 % Sub-angular quartz, some as cemented clusters; sub-rounded quartz sand. Two wall sherds, Wall thickness 11 mm; a flake and a crumb. Traces of a carbonised layer over the interior of the largest sherd.

Fabric W: Coarse, orange exterior layer 4.6 mm., dark grey interior, thin pale orange core. Temper: well rounded quartz < 4 mm., and sub-rounded voids. Two small sherds. Wall thickness 8.5 mm. Also Piece of fired clay 2.5 x 2.8 cm. 9.6 mm. in thickness. Rough granular buff surfaces, orange core. Temper: 5% angular quartzite grains and fine sand.

Posthole 268. Context 269. 2 Pieces. Weight 25g.

EN 6 Rim sherd,. Out-splayed profile, rounded lip. Laminated, orange-buff exterior, orange-greyish interior. Temper: 5%. Rolled sub-angular quartzite, fine sand, scarce ironstone. Wall thickness 8 mm. ***Fabric Y.***

Wall sherd, 5.5 x 4.6 cm. Hard compact, brown-orange exterior with grey tones; dark grey interior. Temper: 5%. angular white quartzite, rolled sub-angular quartz. Probably the same vessel as large wall sherd 'd' in Pit 288, Context 289. ***Fabric X.***

Pit 280. Context 281. 2 Pieces. Weight 5g. Small wall sherds. Laminated: harsh dark brown, temper erupting through both surfaces – erosion?. Temper: 10%, Common sand, angular white quartzite, rolled sub-angular quartz <3 mm. ***Fabric X.***

Posthole 296. Context 297. 1 piece. Weight 15g. Wall sherd. Eroded. Coarse, layered; orange-red exterior layer to 2 mm. depth, dark grey-brown interior. Temper: 7%. Angular white quartzite, rolled sub-angular quartz <4 mm. ***Fabric Z.***

Discussion

The early Neolithic sherd material is notable for its sharp fractures edges and, apart from some pieces in Fabric Z, its mostly un-weathered condition. Unfortunately the quantity is limited, but sufficient is present in terms of hard laminated fabric and bowl rim profiles for an attribution to the early Neolithic Grimston Style, designated after the East Yorkshire Hanging Grimston long barrow association (Newbigin 1937, 209, fig. 1: Piggott 1954, 114; Manby 1988, 46-48). In terms of its fine quality Fabric X in particular is the equal of the best Grimston Style ware, its crushed stone temper has been reduced down to 1 mm. size, and the exterior surfaces smoothly finished. Crushed white quartzite is an alternative in the Pennines to the calcite favoured in east Yorkshire, or at Peak District sites like Green Low (Manby 1965, 11). Of the coarse fabrics without surface finish that leaves temper grains erupting through the surfaces, Fabric Z is the most notable for the clusters of cemented quartz crystals. Such crystals are characteristic of the Millstone Grit that forms the Pennine watershed (Edwards and Trotter 1954, 32-35) that outcrops some 10-15 km to the west and south, but are locally obtainable as an erosion product, re-deposited as the sands and gravels flooring Calderdale. These same local fluvio-glacial derived deposits of the Devensian 'Lake Calderdale' are also the potential source of other the temper materials, including ironstone, used in Fabrics A, B, C, W and Y.

At least seven to ten bowls are represented; of these rims EN 2, 4 and 5 have with concave neck profiles that are appropriate to carinated bowl forms, although no actual carinated profiles are present amongst the sherds. The most extensive profile EN 1 is an open form of medium size, a slight hollowing in wall profile under the rims is comparable with bowls at Hedon and Kemp Howes, Heslerton Barrow 6 and Huggate Barrow 254 (Newbigin 1937, 209-210). There are

the body sherds of a larger-sized bowl in the Pit 288, Context 289 and Post Hole 269 assemblages.

The concentration of Grimston Style associations in eastern Yorkshire derives from both Early Neolithic long and round barrows, and pit features (Newbigin 1937; Manby *et al* 2003, 42-49); recent finds have extended the distribution westwards into the central lowlands of the Vale of Mowbray, and into in the Central Pennine Range where an extensive assemblage of carinated and simple bowl forms comes from a recently excavated pit site at Bell Hill, Stourton, near Leeds (NAA 2001b). Like the Mitchell Laithes Farm site, Stourton lies within a river valley traversing the West Yorkshire Coal Measures. A comparable location on the western side of the Pennine watershed is at Portfield, overlooking lower Ribblesdale, where sherd material from three pits, unfortunately truncated, includes one reconstructable S-profiled bowl with flared rim (Beswick and Coombs 1986, 147 and 156-7, fig. 6.1). Some Grimston Style pottery sites are known from the southern Pennines; on the magnesian limestone belt in north-east Derbyshire at the Whitwell chambered long cairn (Beswick 2011); and to the west on the carboniferous limestone of the Peak District, notably the Green Low chambered tomb (Manby 1965, 11), and the settlement complex with rectangular post-set buildings and pits at Lismore Fields, Buxton (Garton 1991, 11-14, and in prep.)

The advent of pottery, and associated cereals, are key indicators of the introduction of the earliest agriculture economy in the British Isles during the early 4th Millennium BC, and of particularly significance for inland and upland regions like the Pennine Range. Regionally across the Coal Measure and Millstone Grit uplands surface derived finds of stone and flint axes, and some smaller implement types notably leaf-shaped arrowhead, have long been the only indicators of Neolithic settlement activity, monuments and sites with recognisable pottery in closed context features with cereal remains and dating materials have been absent (Manby *et al* 2003, 98-100).

For this earliest pottery tradition an alternative to the Grimston Style type site designation of 'Carinated Bowl', was proposed by Andrew Herne (1988, 9) who sought to promote the finely finished carinated bowl or 'Grimston Bowl' to a non-utilitarian iconic status in the earliest Neolithic culture horizon, relegating all other bowls types to chronologically later 'Plain Bowl' assemblages (Herne 1988, 23-26; Thomas 1991, 98-99). However, in their wide distributions across Great Britain and Ireland in closed early 4th millennium BC dated associations carinated bowls are in recurring assemblages with other vessels forms (Manby 1988, 47-48; Cleal 2004, 170-180; Sheridan 2007). The finely burnished finish is common to bowl types in a functional suite that can consist of various sizes of carinated profiled bowls, simple bowls and cups types, and S-profiled jars and bowls, but these do also occur in some coarser fabrics.

The "Carinated Bowl" ceramic tradition has become qualified by the addition of "Traditional" and "Classical" for the early 4th millennium BC dated assemblages, such early plain ware vessel assemblage sites are widespread across the British Isles, particularly in Yorkshire and eastern England (Manby 1988, 46-48), in Wessex and south-western England (Cleal 2004), Scotland (Sheridan 2002, 85-6) and eastern Ireland (Sheridan 1995, 6) where use of the term Grimston-Lyles Hill Ware was a chronologically misleading amalgamation. The monument types and chronologically associations of the "Carinated Bowl Neolithic" in the light of recent excavations in Scotland has recently been synthesised by Alison Sheridan who also reviewed those aspects of material culture relationships to north-eastern France and the Low Countries (Sheridan 2007b).

Dating

There are two precision determinations on short life material obtained from Mitchell Laithes Pit 288 SUERC-21259 (GU-17794) 4930±30 BP, and Pit 265 SUERC-21257 (GU-17791) 4880±30 BP; overlapping at their respective 2σ ranges of 3780-3650 and 3710-3635 cal. BC. However, these features are sufficiently distant from each other, and have ceramic variables, that may indicate successive site occupation events rather than being contemporary.

Falling within the middle centuries of the first half of the 4th Millennium cal. BC, these dates may be compared with others for Grimston Style pottery associated pit sites in central and eastern Yorkshire: from charred hazelnut shells, at Marton-le-Moor of OxA-5581 4920±75 BP, at 2σ 3820-3610 cal. BC (78%); and Levens of OxA-4411 5000±70 BP, 3950-3659 cal. BC, and OxA-4413 4855±70 BP 3788-3502 cal. BC (Manby *et al* 2003, 44; Steedman in prep.). Similarly the Peak District Lismore Fields site provides early datings for Building 1 on charred emmer and flax of 4930±70 and 4970±70, at 2σ. 3990-3375 cal. BC; and dates on charcoal of 4840±70 and 4920±80 BP (Garton 1991, 19). These 4th Millennium determinations do not have the wide standard deviation of the very early dates obtained on the inhumation burials, accompanied by a fine quality carinated bowl in the Whitegrounds burial chamber, Burythorpe, of HAR-5580 5040±100 BP 4040-3640 cal. BC, and HAR-5506 5260±200 BP 4510-3640 cal. BP (Manby *et al* 2003, 43). There is a more precise determination for a carinated bowl context of KIA20157 5252±28 BP, at 2σ 4220-3970 cal. BC, obtained from an oak plank along side an inhumation burial in a grave at Blackwall on the River Thames foreshore (Coles *et al* 2008). However, the similar turn of the 5-4th Millennium determinations previously available for the burial sequence of the Whitwell chambered cairn, have on being re-run provided a series of dates within a 3800-3700 cal. BC range (Marshall *et al.* 2011).

A precise chronology of the Grimston Style ceramic associations has been developed for Scotland from a major radiocarbon dating programme that has been based on the recent excavations of a range of Neolithic sites and monuments (Sheridan 2007b). Creating this refined chronology for the early development of the Neolithic economy and culture across Scotland has the advantage of multi-sampled context determinations, anomalous dates have been eliminated, and pre-4000 cal. BC associations discounted (Ashmore 2004). Alison Sheridan's recent review of these site associations

recognises a rapid Neolithic colonisation of Scotland with the earliest site dates within a 3950/3900- 3800 cal. BC range characteristed by undecorated Grimston Style Carinated Bowl assemblages that continues down to *c.*3700 cal. BC; subsequently there is a development of regional styles of 'Modified Carinated Bowl' (Sheridan 2007b). There is parallel series of early 4th Millennium radiocarbon determinations emerging for pit complexes associated with Grimston Style pottery in northern Northumberland derived from excavations in the Milfield Basin (Miket and Edwards 2009; Johnson and Waddington 2009).

The Late Neolithic Period. Dating Range *c.*3200 - 2500 BC

Grooved Ware: Pit 30. Context 31 A fragmentary assemblage, total weight 1365g, of 53 sherds, 1 flake and 99 crumbs, ranging in condition from fresh to heavily eroded. Sorted by fabric, decoration and condition into ten groups, at least 9 vessels are represented but there are no complete vessel profiles. There are sufficient characteristics to place the assemblage securely within the Durrington Walls Style or Sub-style (Wainwright and Longworth 1971, 240-243).

Illustrated Catalogue (Figs. 21 and 22)

GW1 The lower body of a large splay-sided vessel consisting of 35 sherds, 1 flake and 7 crumbs, weight 672g; all are in unweathered condition with sharply broken edges. The majority of sherds join into four groups of lower wall fragments- 10 x 13, 11.5 x 9, 9 x 7.5 and 10 x 9.5 cm. in size, the latter has a base angle but there are no linking joins between each of these assembled fragment or another five base angle sherds. Evidence of ring construction is shown by the breakages within the base angle and at 9-10 cm. up the wall profile. Four sherds from the lower body profile retain on the interior a carbonised encrustion layer. Decoration: Applied vertical strips, roughly half-round in section, extending down to the base angle; the space between the strips increases intervals between the strips have columns of randomly scattered impressions made with the tip of a D-sectioned tool. Fabric: Oxidised orange exterior surface extending 5-7 mm. into the wall thickness; interior surface brown passing downwards to dark grey, dark grey core. Temper: common fine sand; scattered sub-rounded and well rounded quartz, sandstone, shale or mudstone and angular limestone <5 mm. Wall thickness 12-15 mm.

GW2 Fragmentary lower body represented by 10 sherds, largest 5.5 x 6 cm. across; 9 small sherds and 2 flakes. Weight 245g. Featured elements are four fragments of base angle allowing its diameter to be calculated at some 20 cm. Decoration: five wall sherds that have thin applied vertical strips with shallow incised diagonal lines infilling the intervening spaces. In contrast to the fresh condition of these lower body pieces wall sherds representative of the upper wall have eroded surfaces. Fabric: Oxidised orange exterior surfaces, rough brown interior surface, pale grey core. Temper: Common fine sand and grog; scattered sub-rounded quartz, ironstone and dark grey shale or mudstone <3 mm. Wall thickness 10-12 mm.

GW3 Two joining pieces of a wall fragment 7 x 8 cm., cylindrical profile. Weight 40g. Decoration: Exterior retains a faint grooved decoration of alternating diagonal lines each side of a vertical line. Fabric: Eroded and pitted exterior surface. Oxidised orange-buff exterior surface, compact dark grey interior, grey core. Temper: Fine sand and grog, some sub-angular quartz and scattered surface voids <5 mm. Wall thickness 8-9 mm.

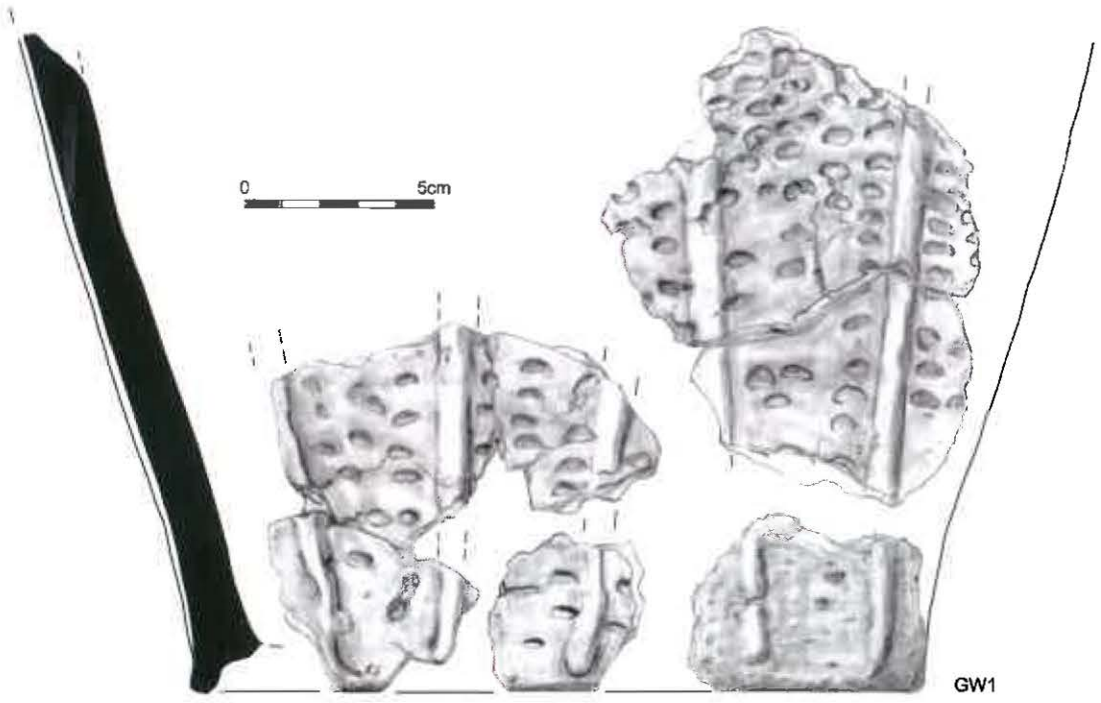


Figure 21: Late Neolithic pottery

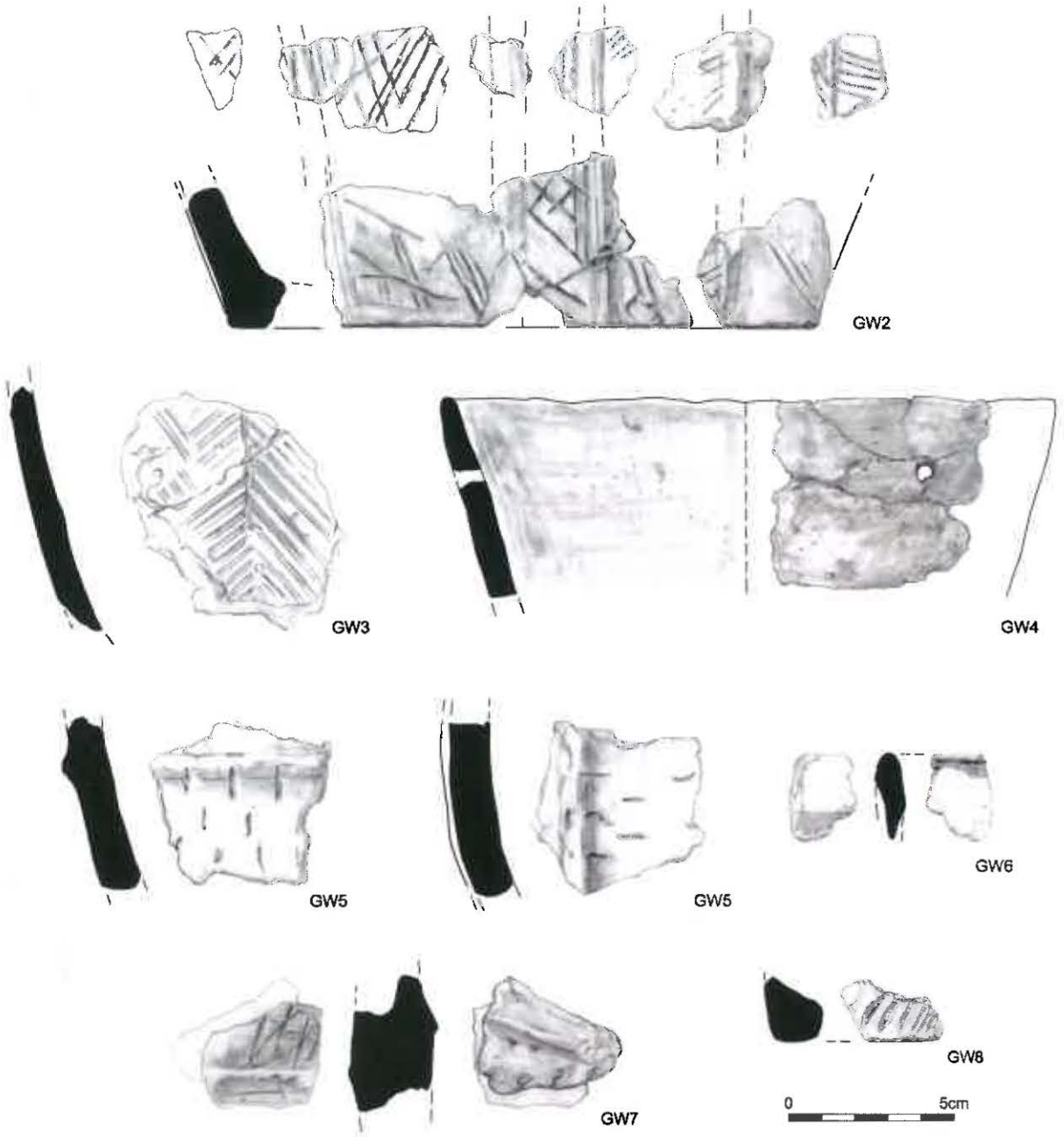


Figure 22: Late Neolithic pottery

GW4 Rim sherd 6.5 x 6 cm. made up of joining fragments, an open bowl profile with rounded lip 17.5cm diameter; a funnel-shaped post-firing perforation from the exterior below the rim. Weight 40g. A thin carbonised encrustation over the interior surface also extends onto the fractured bottom edge of the sherd where it has broken off along a ring build junction. Fabric: Most of the exterior surface eroded, dense dark grey fabric. Temper: common fine sand, scattered sub-angular quartz and sub-rounded voids, rare angular ironstone <3 mm. Wall thickness 8 mm.

GW5 Wall sherd 5 x 5 cm. Has a moulded cordon, or vertical strip?. Weight 40g. Decoration: Three rows of spaced finger nail impressions. The interior surface has the remains of a thin carbonised encrustation layer. Fabric: Compact brown-buff exterior, dark grey interior and core. Temper: Common fine sand, some shale or mudstone and rounded quartz <2 mm. Wall thickness 12 mm.

GW6 Rim sherd 2 x 2.5, simple rounded lip, much of the exterior scaled off. Also a small sherd, a flake and 2 crumbs. Weight 15g. Decoration: a comb impressed line under the lip. Fabric: Dark grey. Temper: Sub-angular and rounded quartz, scattered well rounded black shale or inferior coal <2mm.

GW7 Sherd 4.4 x 4.1 cm. A problem piece, the partial profile and oxidised surface suggest this may represent the thickened rim profile of a large vessel, with the lip missing. Weight 25g. Decoration: An applied strip or cordon and indistinct incised diagonal lines above on ?exterior surface; moulded ridge on the interior with possible circular impressions. Fabric: Oxidised orange surfaces, dark grey core. Temper: Sub-rounded quartz, grog and dark grey shale or mudstone <7 mm. Wall thickness 26 mm.

GW8 Base angle fragment, 2.8 x 2cm. Weight 10g. The exterior has deeply incised diagonal strokes, compact brown exterior, dark grey core; the interior

scaled off. Temper: Sub-rounded quartz and dark grey shale or mudstone, rare angular ironstone.

GW9 Wall sherd 3 x 3.5cm and 3 small wall sherds. Weight 40g. Featureless slightly eroded buff exterior, dark grey interior and core. Temper: Much fine sand, sub-angular quartz and grog <1 mm. Wall thickness 4 mm. [Not illustrated]

GW10 There is a group of heavily eroded and weathered pieces not attributable to any particular vessel: comprising 6 sherds, the largest 7 x 3.5 and 5.5 x 4.5cm from flat bases, 11 small sherds, 3 flakes and 4 crumbs. Weight 135g. All outer surfaces have been eroded leaving only the dark grey core with protruding grits. Temper: Fine sand, sub-rounded quartz and rounded shale or mudstone. [Not illustrated]

Discussion

The character of this small fragmented pottery assemblage is comparable with the many Grooved Ware ceramic associations deposited within apparently isolated single or paired pits that are a feature of this Late Neolithic tradition both in Northern England (Manby 1999, 58-59) and across the tradition's wider distribution (Wainwright and Longworth 1971, 250-251).

Although there are no complete reconstructable vessels at Mitchell Laithes there are evident bucket and barrel-shaped profiles; GW1 and GW2 have exterior applied vertical strips and on GW5 a cordon also, the intervening spaces infilled with diagonal incised lines or finger nail or jab impressions, features that are characteristic of the Durrington Walls Style or sub-style of Grooved Ware (Wainwright and Longworth 1971, 240-243). Within this style are GW3's incised or grooved herring bone pattern that is also on the base angle GW8; an undecorated vessel element is represented by GW4, a plain bowl compared with one at North Deighton (Manby 1999, 73, illus. 6.4.5) and the more numerous examples at Roecliffe (Speed (ed.) in prep.) and at the East Yorkshire North Carnaby Temple sites (Manby 1974, fig.17.2,3,5.; fig.18.2; fig. 19, 27-28). The post-firing perforation of GW8 is likely to have been matched by a second on the other side of a crack they were intended to secure. A vessel of very large size with a thickened rim appears to be represented by GW7, its size and profile cannot be established from such a fragment other than it came from an incised decorated vessel.

There is a notable distinction to be made between the large rejoined fragments of vessel GW1 that makes up half the total number and weight total from this context and the limited sherd numbers of the other eight vessels that are small in size and often eroded. The GW1 fragments have the appearance of being selected when freshly broken for deposition in contrast to the random character of the other vessel fragments many of which had suffered erosion or weathering effects.

The Durrington Walls style, or sub-style of Grooved Ware in its wider geographically distribution (Wainwright and Longworth 1971,268-306) has an eastern coastland bias from Inverness, in Scotland (Connolly and MacSween 2005, 39-42), southwards down to the south coast of England and westwards into Wales and Cornwall (Cleal and MacSween 1999, 177-206). The immediate regional distribution consists of the site concentration centred on the Yorkshire Wolds (Manby 1974, 5 - 9) that have been extended westwards into the Vales of York and Mowbray lowlands by recent Durrington Walls style pottery finds from Monks Cross, York (York Archaeological Trust), Roecliffe and Marton-le-Moor (Tavener 1996; Speed (ed.) in prep.), Thornborough (Vyner 2011), and on the eastern Pennine margin at Green Howe, North Deighton (Manby 1999, 73, Illus. 6.4:6). There is a still very limited and scattered Grooved Ware finds distribution in the Central Pennine uplands of fragmentary Durrington Walls style assemblages: on the Coal Measures like Mitchell Laithes from Swillington Common (Vyner 2001, 149, fig. 113,1; in the Millstone Grit country at the Backstone Beck Ghyll enclosure, Ilkley (Edwards and Bradley 1999; Manby *et al* 2003, 100, fig. 22) and the small pit at Lindley Moor west of Huddersfield (NAA 2001a). This distribution is continued westwards by the scattered finds from the Craven limestone area at Bastow Wood, Grassington (Cherry 1998, 8 &18, fig. 4.5), Rathmell (Manby 2007a, 91, fig.4.7:5) and Thaw Head Cave, Ingleton (Gilks 1995 & 2001).

Date

For Yorkshire and Northern England there is at the present time only a limited number of radiocarbon determinations for the respective Grooved Ware styles; these provide dating range early in the third millennium cal. BC down towards its final centuries (Manby 1999, 68). As in Scotland where the earliest dates fall at the turn of the 4th to 3rd millennia BC where they are effected by the 3100-2900 cal. BC. radiocarbon dating plateau (Ashmore 2004, 131), from Yorkshire and Northern England sites the dating tendency for the Woodlands and Durrington Walls Grooved Ware styles extends from the beginning of the 3rd Millennium BC continuing down towards its later centuries. In contrast, from southern England sites, for these two styles a later temporal range has been recognised that extends from the mid- 3rd millennium down to c.2100 cal. BC, (Garwood 1999, 152, Illus.15.5-6).

The Mitchell Laithes Farm assemblage's two radiocarbon determinations, derived on a short-life organic material, of (SUERC-21247) 3935±30 BP and (SUERC-21249) 3955±30 BP, overlap at their 1σ standard deviation and provide a 2500-2300 cal. BC range at 2σ, that would place the assemblage within the later development of this style. There are comparable single sample dates for other Durrington Walls Style sites in Yorkshire; (OxA-9780) 3865±40 BP), calibrated 2470-2200 cal. BC at 2σ probability for the Lindley Moor pit; (RCD-2099), and 3950±70 BP for Caythorpe Gas Pipeline Pit 1004 (Abramson 1996, 39 and 83). Such a date range is appropriate to a final Neolithic phase, regionally as the Late Neolithic-Early Bronze Age Transition (Manby *et al* 2003, 58-59) or Period 1 c.2500-2300 BC in Stuart Needham's Bronze Age periodisation (Needham 2005, 125-127). The Mitchell Laithes Farm Durrington Walls Style pottery radiocarbon date range is contemporary with that of the earliest Beaker accompanied single

grave burials, and in rare instances small copper and gold artefacts associations. At present such early dates on skeletal remains associated with Beakers are limited in number but widely distributed geographically, from Oxfordshire, Radley, Barrow Hills, (OxA-1875) 3990±80 BP and (OxA- 4356)3880±90 BP, to Sorisdale, Inner Hebrides (BM-1413) 3890±45 BP, and to Dornoch Nursery, Sutherland, of (GrA-26515) 3850±40 BP; the Beaker types are of Clarke's European and All-Over-Cord styles or Case's Groups C and D, that are brought within the Needham's Low-Carinated Beaker classification (Needham 2005, 183-188).

Beakers of these early types do occur in eastern Yorkshire in burial associations, and in some occupational and cave site contexts, but none have quality radiocarbon datings (Manby *et al* 2003, 59).

Early Bronze Age Date Range c.2000-1700 BC.

EBA1 Context 45. Collared Urn. (Fig. 23) Tripartite Form – Longworth Primary Series Form Ia. - 2 Formal and 2 Decorative Traits (Longworth 1984, 19-28); and Burgess's Early Group (Burgess 1986, 345). Total weight of fragments 1005g. Complete circuit of collar, truncated through the neck except for one piece that continues the profile down to the shoulder. Many pieces have freshly fractured edges. Rim diameter 22.5 cm., simple rounded lip; concave collar 5 cm. deep (Longworth Form C/D) with a strongly moulded overhanging lower edge; a shallow concave profiled neck about 6 cm. deep; the shoulder ridge has its surface completely eroded away on the single fragment where it survives. Decoration: Twisted cord 'maggot' imprints of four to five turns, vertical imprints spaced out in horizontal rows – three rows on the collar and five on the neck, a single 'maggot' imprints shows on a small surviving patch of original surface below the eroded shoulder. Fabric: Dense showing evidence of ring construction; smooth exterior surface, brown with grey toned on the collar and orange tones in places on the neck; interior dark to grey black with some horizontal wiping and finger pressed hollows; dark grey core, heckly fracture. Temper: fine sand, scattered angular coarse sandstone <4.5 mm.

EBA2 Context 87. Accessory Cup. (Figs. 24 and 25) Bipartite form – Longworth Class 10.b. (Longworth 1984, 54) 6-6.4 cm. High; 6.6 cm. Diameter Rim; 10.1-10.8 cm. Shoulder Diameter: 4.9 cm. Diameter base. Weight 200g. Complete apart for a recent small impact perforation through the lower body causing some interior flaking. Some surface erosion and minor cracking. Convex upper and lower body divided by a pronounced shoulder; slightly hollow internal rim bevel; two round perforations through the shoulder 2.14 mm. apart and each 5 mm. diameter. There is a circular ring ridge, triangular in section and 3.9 cm in diameter, on the interior floor. Decoration: Impressed fine twisted cord decoration on the exterior, paired horizontal lines below rim, under the shoulder, around the base and around the flat base, and triple above the shoulder; the lines overlap in places; z-twist, 6-7 turns to 1 cm. There are a series of pin holes into the inner rim bevel. Fabric: Smooth buff exterior with some pale orange tones; buff interior with grey toning; dark grey core. Temper: Pale yellow and reddish grog, fine sand, sub-angular grey shale or mudstone <5 mm.

Discussion

The Mitchell Laithes Collared Urn and Accessory Cup were both associated with individual cremation burial deposits; they join a relatively small number of Early Bronze Age burial associations excavated in modern times in the West Yorkshire Pennine uplands (Manby 1986, 67-69 & 95-106, fig. 2). The majority of finds are known from the Millstone Grit moorlands and Magnesian Limestone belt where stone cairns, ring cairns, and barrows survived to attract 19th Century antiquaries, but across the intervening Coal Measures there is an absence of Bronze Age sites as field monuments caused by the historic intensity of industrial and urban activity (Manby *et al.* 2003, 98-101). Of the 19th century recorded discoveries (Keighley 1981, 102-114; Barnes 1982, 110-123), there is from lower hillslope locations comparable with Mitchell Laithes the collared urn burial with a stone axe-hammer from Briggate, Leeds and a collared urn and accessory cup at Oulton, both finds no longer available for study. There are the recently excavated

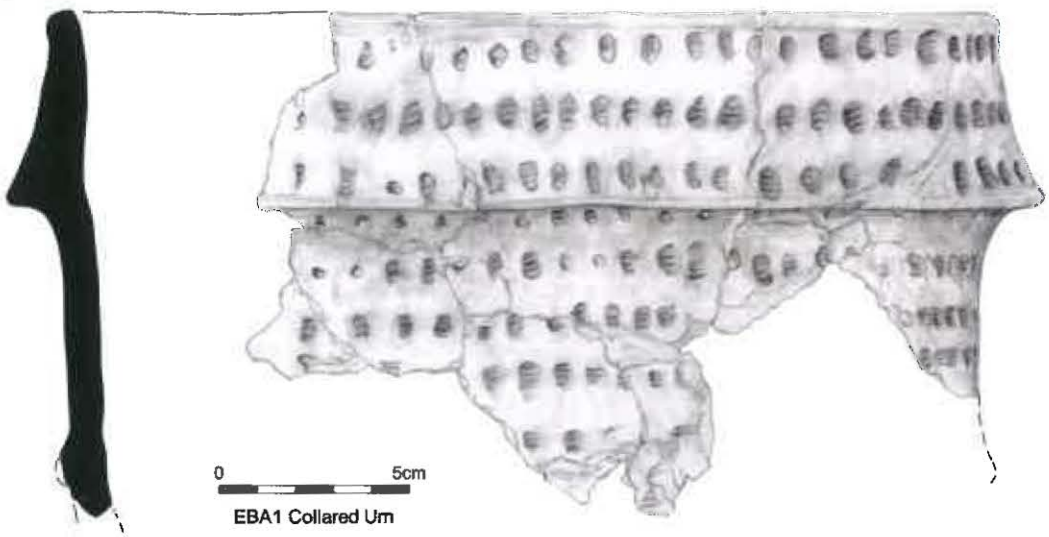


Figure 23: Early Bronze Age pottery

collared urns from Bell Hill, Stourton, (Robinson 2008) and Manor Farm, Garforth (Vyner 2001, 151, fig. 113, 16), and Colton (info. York Archaeological Trust). The setting of the Mitchell Laithes barrow as an Early Bronze Age burial monument can also be compared to the ring cairn cemetery of Blackheath Cross, Todmorden, within the steeper Millstone Grit slopes of upper Calderdale, that had an extensive series of cremations the majority within collared urns and some accompanying accessory cups (Longworth 1984, 280-281, No.1607-1619).

In his seminal Collared Urn corpus Ian Longworth (1984, 19-46) defined an earlier Primary Series and a

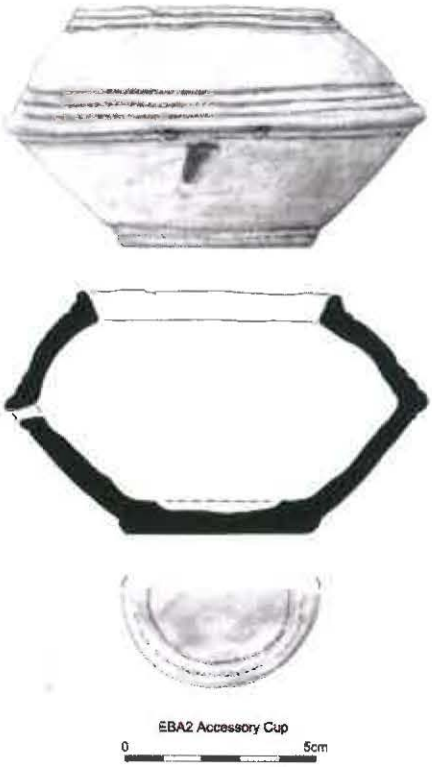


Figure 24: Early Bronze Age pottery

later Secondary Series, both designated on the basis of a series of formal and decorative traits. However, Colin Burgess by a re-allocation of Longworth's early and late traits to produce a three-fold developing collared urn sequence of Early, Middle and Late Groups (Burgess 1986, 344-348, fig.1-2). Within these current typo-chronological schemes the Mitchell Laithes collared urn has just enough formal and decorative traits to be placed within both Longworth's Primary Urn Series, and Burgess's Early Group. Its decoration of solely of spaced rows of short cord 'maggot' imprints is not a common one and can be compared with a collared urn from 'Near Pickering' (Longworth 1984, No.1216, Pl. 29e) on the southern range of the North York Moors; also more distantly at Kirk Ireton, Derbys. (Longworth 1984, No. 218, Pl. 65c); West Overton, Wilts. (Longworth 1984, No.1714, Pl. 27e), and Llandysillo on Anglesey (Longworth 1984, No.2120, Pl. 3h).

The Early and Middle Group Collared Urns by their associations and context were seen as characteristic of Burgess's Bush Barrow Phase - c.1600-1450 bc, that in Stuart Needham's periodisation scheme lie within a Bronze Age Period 3 - 2050- 1700 cal. BC (Needham 1996, 130-132). At the time of Longworth and Burgess typological classifications the early collared urn characteristics were perceived to have a derivation from the later Neolithic Fengate style of Peterborough Ware (Longworth 1984 19-20), an ancestry no longer chronologically viable (Brindley 2007, 214). Currently for the earliest developments,

Figure 25: Accessory cup 87

c.2100/2000 BC, of the collared urn tradition and its associated in-urned cremation practises (Needham 1996, 130-131) are considered to have a geographical 'heartland' south of a Mersey-Humber line with an initial distribution across southern and central England (Burgess 1986, 348), and into north Wales where the application of carbonate determinations supports a chronological early usage (Brindley 2007, 319 & 361-367). Across Northern England, Scotland and Ireland where contemporary Food Vessel associated inhumation practices predominated, the characteristic 'Early' collared urns are perceived as scarce, and some available pre-2000 cal BC determinations based on charcoal are suspect of 'old wood effect' or they have large standard deviations.

The systematic dating programmes based on cremated bone associations in Scotland (Sheridan 2007a, 162-

166) and Ireland (Brindley 2007, 282-286), provide respective date ranges of *c.*1950 and 1850/30 BC onwards for collared urns; these 'Early' characteristics do not correlate well with dating sequences obtained. Lying between the proposed initial southern 'heartland' and the later extended distribution northern and westwards, refining the regional chronological relationship of collared urn cremation usage with established Food Vessel accompanied inhumation and cremation traditions is a priority for Yorkshire and Northern England.

Accessory Cups: these small vessels of various shapes are associated with cremation burial deposits either alone, as at Mitchell Laithes and Pule Hill, Marsden (Manby, 1969, 273-275), or placed within a collared urn, like the recent Stanbury find, near Keighley (Richardson and Vyner 2011); also in a few cases with inhumation burials in eastern Yorkshire. Designated in 19th century literature as 'incense cups' (Bateman 1861, 282-283) and as 'pygmy cups' in Lord Abercromby's corpus (1912, II. 24), there is a variety of shapes that have in common two or more perforations through the wall. Recent practise describes this small vessels series as accessory cups that in Ian Longworth's detailed classification (1984, 51-56) consists of eleven types with some division into sub-types, but the miniature Food Vessel and Collared Urn types were not included in his scheme. Alex Gibson used the simple designation as 'Cups' both in his study of Scottish finds recognising only seven classes, including miniature Food Vessels (Gibson 2004), and again in his research project investigating their use by the application of absorbed residue analysis (Gibson and Stern 2006). The comparable accessory cup series in Ireland including small Food Vessels has been grouped together by Anna Brindley as 'Miniature Vessels' (Brindley 2007, 230-235).

The Mitchell Laithes cup falls within Longworth's Class 10b –bipartite shape (Longworth 1984, 53-54) as a class more numerously deposited as the sole ceramic with a cremation rather than as an accompaniment with Collared Urns; they have a generally Northern England, Scotland, Wales and Ireland distribution. A most unusual feature of the Mitchell Laithes Farm cup is the internal ring-ridge, this is a rare feature and provides a link to the more regionally distributed Contracted Mouth Cups, Longworth Class 5 (1984, 51-52); locally this is a feature of the large contracted-mouth cup from Pule Hill, Marsden, (Manby 1969, 275, fig. 1.4) on the Millstone Grit Pennine watershed 15 kilometres southwest of Dewsbury. There is also the contracted mouthed cup with this feature from Slingsby Barrow 148 (Kinnes and Longworth 1985, 93) on the Howardian Hills 70km northeast of Dewsbury, and like the Mitchell Laithes cup it had been deposited with a cremation in a small pit that had a second cup of the Bipartite Class.

Dating

The above discussion provides links both for the collared urn and the accessory cup to local central Pennine parallels and wider connections in eastern Yorkshire, also the chronological spread of these ceramic types in the geographical constituent of the British Isles.

For England the radiocarbon database has been biased by the extensive utilisation of oak charcoal with a potential for an 'old wood effect', or a wide standard deviation; both aspects represented by the few Yorkshire dates (Manby *et al.* 2003, 64) available prior to 2000. For the Mitchell Laithes Farm collared urn and accessory cup the present carbonate based determinations are a significant contribution to a refined typo-chronology based on high quality radiocarbon associations for these ceramic types and Northern England. The respective dating for the Mitchell Laithes Collared Urn of 3485±30 BP, 1890-1730 cal. BC at a 93.8% probability range, that support an attribution to the Needham Period 3: 2050-1700 cal BC, is closely comparable to (Wk-14321) 3493±41 BP for Scorton, Vale of Mowbray, burial group (Speed forthcoming) at 1σ 1880-1740 cal. BC (68%), 2σ 1920-1730 cal. BC (89.2%) ranges. The accompanying two collared urns, of Burgess's Middle Group, and a distinctive large contracted-mouth accessory cup; have a high value radiocarbon date obtained from the short life carbonised remains amongst the cremation deposit of - *A. elatius ssp. Bulbossum = Arrhenatherium elatius var. bulbosum,* known commonly as Onion couch grass.

The Mitchell Laithes accessory cup associated date of 3515±30 BP, at 1880-1680 cal. BC at 95% probability, is comparable with the associated high precision datings with other Bipartite Cups of Longworth's Class 10b; that from Breach Farm cup, Letterston, Wales, of (GrA-19964) 3520±60 BP and (GrA-20601) 3520±60 BP, or 3525±40 BP as the mean of two dates, in a 1960-1740 cal. BC range (Brindley 2007, 367); at Mains of Carnousie, Aberdeenshire, of (GrA-19049) 3520±45 BP. (Sheridan 2007a, 182, fig.14.9:4); and at Stanbury, West Yorkshire of (OxA-18361) 3554±31 BP and (SUERC-16360) 3555±35 BP, or 3554±23 BP as the weighted mean of the two dates giving a 1960-1780 cal. BC range (Richardson and Vyner 2011, 50). For Ireland for there are comparable Bipartite Cups from cremation association with dates that overlap in their 2σ range – Drung, Co. Donegal, (GrN-11896) 3545±30 BP at 2σ 1920-1740 cal. BC; and Clonshann, Co. Wicklow (GrA-14679) 3590±50 BP at 2σ 2020/2000-1800 cal. BC Drumnakilly, Co.; and later from Tyrone of (GrA-14792) 3340±40 BP at 2σ 1750-1500 cal BC; (Brindley 2007, 156, fig. 130; 157, Table 25). Further confirmation of the burial usage of the Mitchell Laithes ring ditch/barrow site during c.1800-1700 cal. BC is provided by the datings of 3510±30 and 3450±30 BP obtained from the two cremation deposits without any ceramic associations.

Other Prehistoric Pottery [Not illustrated]

A number of other contexts produced relative small fragments and crumbs of hand-made pottery of prehistoric character, insufficient for a conclusive Early Neolithic or Iron Age attribution. Their eroded and weathered conditions suggest they could be residual in origin and their chronological implications are tenuous in relation to the deposits they were contained in:-

Context 27. Seven sherds, 3 crumbs. Weight 26g. Iron Age. Dark grey fabric. Wall thickness 9 mm. Temper: Angular sand and rare ironstone <3 mm.and angular sand and grog.

Context 29. Sixteen sherds, 14 crumbs. Weight 47g. All eroded. Dark grey fabric. Temper: Angular sand, scarce ironstone and rounded quartz.

Context 48. A Wall sherd 35 crumbs. Weight 11g. Bronze Age fabric. Laminated dark grey, oxidised orange exterior, smoothed interior. Wall thickness 8.2mm. Temper: angular sand, scattered angular sandstone <3mm.

Context 50. Nine small sherds – 2 are angle sherds, 1 crumb. Weight 42g. Iron Age? Hard dark grey, brown toned exterior. Wall thickness 8 mm. Temper: Angular sand; scattered angular voids, rare angular ironstone and sandstone <3 mm.

Context 54. Three sherds, 1 crumb. Weight 10g. Same fabric as Context 48.

Context 108. Three sherds, 2 crumbs. Weight 9g. Late Iron Age. Gritty dark grey. Temper: Angular sand, some ironstone, sandstone and shale fragments. <3 mm.

Context 220. Small sherd, four crumbs. Weight 4g. Same fabric as Context 108.

Context 257. A worn sherd 3.2 x 2 cm., and a flake. Weight 10g. Possibly a shoulder and springing of the neck profile. Horizontal grooves. Fabric: laminated grey, pale grey soapy exterior. Temper: Scattered angular cream quartzite and angular brown and grey sandstone

With the exception of Context 257 there are no satisfactory comparisons to be made for the sherd material from other contexts rising from the local rarity of later Prehistoric pottery. However, for the Context 257 fragment although it is small in terms of fabric texture and the crushed quartzite temper are suggestive of the Grimston Style coarse ware Fabric Z, or a Peterborough Ware fabric; again there is a dearth of local comparatives, the closest would be the small sherds from Ferrybridge (Vyner 2005, 128).

Other Pottery

[The following material is of uncertain date, possibly Medieval although Peter Didsbury considers that it could equally be of Iron Age/Romano-British date]

Pit 152. Context 153. Seven pieces. Weight 40g. Wall sherds: 7.3 x 5.3 cm. (three pieces joining) and 4.5 x 2.8 cm. Hard, harsh reddish exterior, brown interior, dark grey core. Temper: rounded white quartz, angular sand, some angular ironstone and sub-angular voids. Wall thickness 7-8.8 and 5.6 mm. Cooking Pot. Also three small sherds, weathered and eroded.

Pit 152. Context 154. Two pieces. Weight 5g. Wall sherds 2.8 x 2.1 cm. and 2.5 x 1.5 cm Weathered and eroded. Grey fabric. Temper: fine sand and sub-rounded voids. Wall thickness 8.1 and 6.4 mm.

Osteological Analysis

Malin Holst (York Osteoarchaeology Ltd)

Introduction

The barrow contained three small pits (81, 83 and 85) at its centre, which had been protected from later truncation by ridge and furrow ploughing by the barrow mound material. One of these pits included a small accessory cup, which contained a small quantity of the bone from the burial (Table 1). Ten metres to the southwest of the barrow was a further pit that had been so severely truncated that only the rim of the inverted collared urn survived intact. However, much bone had spilled out of the urn into the pit, which meant that a considerable quantity of bone survived. All four burials dated to the Early Bronze Age.

The bone fill of the accessory cup in Feature 81 was given context number 88, as compared to the remainder of the fill, which was given context number 82. As the bone in the cup did not represent a different individual to that in the remainder of the pit, the burial will be called Burial 82 for the purpose of this report.

The skeletal assessment aimed to determine age and sex, as well as any manifestations of disease from which the individuals may have suffered. Additionally, information was sought regarding the cremation techniques. The cremated bone was sieved through a stack of sieves, with 10mm, 5mm and 2mm mesh sizes. The bone recovered from each sieve was weighed and sorted into identifiable and non-identifiable bone. The

Burial No	Feature No	Feature Type	Period	Artefacts and Inclusions	Bone Colour	Preservation	Weight (g)	Percentage of Expected Quantity of Bone
46	47	Pit	Early Bronze Age	Urned in inverted collared urn, animal bone, charcoal,	White	Excellent	1244.9g	77.5%
82	81	Pit	Early Bronze Age	Accessory cup, flint, animal bone, charcoal	White	Excellent	1496.6g	93.5%
84	83	Pit	Early Bronze Age	Carved bone beads, animal bone, charcoal	White	Excellent	1104.3g	69%
86	85	Pit	Early Bronze Age	Charcoal	White	Moderate	593.9g	37%

Table 1: Summary of cremated bone assemblages

identifiable bone was divided into five categories: skull, axial (excluding the skull), upper limb, lower limb and long bone (unidentifiable as to the limb). All identifiable groups of bone were weighed and described in detail.

Osteological analysis

Osteological analysis is concerned with the determination of the demographic profile of the assemblage based on the assessment of sex, age and non-metric traits. This information is essential in order to determine the prevalence of disease types and age-related changes. It is also crucial for identifying gender dimorphism in occupation, lifestyle and diet, as well as the role of different age groups in society.

The quantity of cremated bone recovered per burial varied from 593.9g to 1496.6g (see Table 2), with an overall mean weight of 1109.9g. The amount of bone retrieved from some of the burials weighed only slightly less than the average bone weight produced by modern crematoria, which tends to range from 1000.5g to 2422.5g with a mean of 1625.9g (McKinley 1993). Wahl (1982, 25) found that archaeologically recovered remains of cremated adults tend to weigh less (between 250g and 2500g) as a result of the commonly practised custom of selecting only some of the cremated bone from the pyre for inclusion in the burial, thereby representing a symbolic, or token, interment. Only Burial 82 contained nearly the full quantity of bone expected to survive after the cremation process (see Table 2). However, when the skeletal remains from this burial were identified, it was found that not the full skeleton was represented by the bone elements.

Burial No	10mm (g)	10mm (%)	5mm (g)	5mm (%)	2mm (g)	2mm (%)	Residue	Weight (g)
46	520.5	42	392.5	32	327.0	26	-	1244.9
82	741.8	50	457.6	31	270.9	18	26.3	1496.6
84	597.0	54	326.3	29.5	159.0	14.5	21.4	1104.3
86	140.3	24	243.2	41	201.2	34	9.2	593.9

Table 2: Summary of cremated bone fragment size

Preservation

Skeletal preservation depends upon a number of factors, including the age and sex of the individual as well as the size, shape and robusticity of the bone. Burial environment, post-depositional disturbance and treatment following excavation can also have a considerable impact on bone condition. Preservation of human remains is assessed subjectively, depending on the severity of bone surface erosion and post-mortem breaks, but disregarding completeness.

The majority of the bone (75%) was in an excellent condition. Surprisingly, this included the severely truncated assemblage, whereas one of the bone assemblages from the centre of the barrow (Burial 86) contained moderately well-preserved bone that was partly eroded (see Table 1). This suggests that truncation did not contribute to preservation at this site. Instead, it is likely that post-burning processes, such as raking of the pyre while the bone was still hot, contributed to the erosion of the bone from Burial 86.

Moderate warping and bone cracking, which occurs commonly during the cremation process, was evident. The fragment size of cremated bone is frequently attributed to post-cremation processes. This is because skeletal elements retrieved from modern crematoria tend to be comparatively large before being ground down for scattering or deposition in the urn. Bone is also prone to fragmentation if it is moved while still hot (McKinley 1994, 340).

The majority of burials (75%) contained bone fragments that were 10mm in size or larger (Table 2). However, in Burial 86, the greatest proportion of the bone was derived from the 5mm sieve. This supports the view that the bone from this burial was subject to disturbance while it was still hot.

The cremated bone was very well burnt, causing the complete loss of the organic portion of the bone and producing a white colour in all four assemblages (see Table 1). According to McKinley (1989), the body requires a minimum temperature of 500° Celsius over seven to eight hours to achieve complete calcination of the bone.

Because of the limited fragmentation of the bone elements, it was possible to identify skeletal elements in all of the burials. Between 53% and 64% of bone from each burial could be identified. The majority of identifiable bones were either from long bone shaft fragments or from the skull, including recognisable cranial bones, parts of the mandible and tooth roots, as well as generic vault fragments. Since the cranial vault is very distinctive and easily recognisable, even when severely fragmented, it often forms a large proportion of identified bone fragments in cremated remains (McKinley 1994). Bones representing all parts of the body were found, including small hand phalanges (bones in the fingers), parts of vertebrae and ribs and identifiable bones from the arms and legs. However, unspecified long bone fragments also formed a significant proportion of identifiable remains.

Minimum number of individuals

It is not possible to calculate the minimum number of individuals for cremation burials, because only a token selection of bone from the pyre tends to be buried. Double burials can be identified only if skeletal elements are duplicated, or if skeletons of different ages are represented in one burial. In this instance, no double burials were identified.

Assessment of age

Age was determined using standard ageing techniques, as specified in Scheuer and Black (2000a; 2000b) and Cox (2000). Age estimation relies on the presence of the pelvis and uses different stages of bone development and degeneration in order to calculate the age of an individual. Age is split into a number of categories, from foetus (up to 40 weeks in *utero*), neonate (around the time of birth), infant (newborn to one year), juvenile (1-12 years), adolescent (13-17 years), young adult (ya; 18-25 years), young middle adult (yma; 26-35 years), old middle adult (oma; 36-45 years), mature adult (ma; 46+) to adult (an individual whose age could not be determined more accurately as over the age of seventeen).

Because none of the criteria normally used for age determination were represented in any of the burials, age determination was based on less reliable criteria. The bone robusticity and dental development suggested that the individuals from Burials 46 and 86 were at least sixteen years old (Table 3), but may have been considerably older.

Assemblages 82 and 84 contained the remains of old middle or mature adults aged between 36 years or older (see Table 3). The age determination of these individuals was based on the presence of degenerative joint disease, which rarely occurs in individuals younger than 35 years.

Burial No	Preservation	Age	Sex	Weight (g)
46	Excellent	Adult	-	1244.9g
82	Excellent	Old middle adult or mature adult	Female	1496.6g
84	Excellent	Old middle adult or mature adult	Male	1194.3g
86	Moderate	Adult	-	593.9g

Table 3: Summary of osteological results

Sex determination

Sex determination is usually carried out using standard osteological techniques, such as those described by Mays and Cox (2000). Assessment of sex relies on the preservation of the skull and the pelvis and can only be carried out once sexual characteristics have developed, during late puberty and early adulthood. Eye orbits were found with Burials 82 and 84. The orbital rim from Burial 82 was sharp, suggesting that this was a female, while it was rounded in the case of Burial 84, indicating that this was a male.

Metric analysis

Cremated bone shrinks at an inconsistent rate (up to 15%) during the cremation process and it was therefore not possible to measure any of the bones from these burials.

Non-metric traits

Non-metric traits are additional sutures, facets, bony processes, canals and foramina, which occur in a minority of skeletons and are believed to suggest hereditary affiliation between skeletons (Saunders 1989). The origins of non-metric traits have been extensively discussed in the osteological literature and it is now thought that while most non-metric traits have genetic origins, some can be produced by factors such as mechanical stress (Kennedy 1989) or environment (Trinkhaus 1978).

Both non-metric traits identified were noted in Burial 84. This individual had an ossicle in the skull (an additional little bone in one of the cranial sutures) and a third trochanter on the femur. This is a trait that results from strain on *gluteus maximus*, the large muscle of the bottom.

Pathological and dental analysis

The analysis of skeletal and dental manifestations of disease can provide a vital insight into the health and diet of past populations, as well as their living conditions and occupations.

The most common type of joint disease observed tends to be degenerative joint disease (DJD). DJD is characterised by both bone formation (osteophytes) and bone resorption (porosity) at and around the articular surfaces of the joints, which can cause great discomfort and disability (Rogers 2000). Two skeletons suffered from DJD: one vertebral facet from Burial 84 showed evidence for porosity, indicative of degenerative joint disease. In Burial 82, eighteen vertebral facets showed evidence of severe porosity, indicative of widespread spinal degenerative joint disease. Furthermore, the hand phalanges also exhibited porosity and osteophyte formation, especially in the distal joints, suggesting that this individual also suffered from degeneration of the hand joints. Further lesions could be seen on unidentifiable long bone joints, implying that DJD was widespread in this individual's skeleton.

A total of 41 tooth crown and 93 root fragments were recovered from the four burials. However, because the crowns of the teeth shatter into tiny fragments during the cremation process, no dental pathology could be observed.

Funerary ritual

Three of the cremation burials were interred in the centre of a Bronze Age round barrow, which held a prominent position in the landscape. The burials were interred in simple pits, all of which contained small quantities of charcoal. Animal bone was found in two of the graves (Burials 82 and 84) and Burial 82 also contained fragments of burnt flint. Part of the bone from this burial (about 2%) was contained in an accessory cup, a small pottery vessel with an incurved rim. These can be found in Bronze Age funerary contexts throughout Britain and Ireland (see Manby this paper). There are often perforations in the

side of the cup and they often display signs of burning, indicative of burning aromatic substances (Woodward 2000, 114).

Carved bone bead fragments were recovered from Burial 84. Beads are often already worn or damaged when placed in the grave or on the pyre and it is possible that these were either heirlooms or had been used in social transactions (Woodward *op. cit.*, 118).

Burial 46, which was located 10m to the southwest of the barrow, was probably a satellite burial to the barrow. Such burials are common and examples occur in Yorkshire, such as the four satellite burials located immediately to the north of a Bronze Age barrow at Melton, East Yorkshire (Caffell and Holst 2008) or a single satellite burial, located 20m to the south of a Bronze Age barrow at Bell Hill, Stourton, Leeds (Holst 2007). The satellite burial had been placed in an inverted collared urn, which also dates to the Early Bronze Age. A very similar burial was found at Melton Water Treatment Works, East Yorkshire, where the cremated bone and charcoal had also been placed in an inverted collared urn (Holst 2004). Similar to Burial 46, the charcoal and bone had spilled out of the urn onto the base of the burial pit.

Unusually large quantities of human bone were recovered from three of the graves, particularly Burial 82. According to McKinley (1997, 137) widely varying quantities of human bone have been recovered from cremation burials dating to the Bronze Age; in the 4000 cremation burials of undisturbed adults analysed by McKinley, the amount of bone has varied between 57 and 2200g. No associations as to the quantity of bone and the age and sex of the individual buried have been ascertained (*ibid*). 'To date, however, only one apparent pattern in the weight of bone in a burial has been evident and that is with relation to "primary" Bronze Age barrow burials. Of the 18 such burials so far examined by the writer [McKinley], all *consistently* produced weights of bone of between 902.3g and 2747g with an average of 1525.7g.' (*ibid*, 142). The large quantity of bone recovered from Burials 82 and 84 might suggest that these were primary Bronze Age barrow burials.

The burial at Cross Farm, Stanbury, contained a large quantity of cremated human bone. The burial was found in a collared urn that had been also placed upside-down in a pit, similar to that from Burial 46 at Mitchell Laithes (Richardson and Vyner 2011). In the base of the inverted urn was a stone battle axe, probably placed in the urn before the bone. Two copper alloy objects, perhaps ear rings, a bone pin and bone belt-hook, as well as an accessory cup were also recovered from the urn, together with 2689.1g of human bone and two fragments of animal bone. Two supplementary vessels were found in the pit beside the collared urn. At Stanbury, it was clear that the whole individual had been recovered from the pyre for burial and in fact, it was possible to reconstruct the whole skeleton (*ibid*).

The possibility of Burials 82 and 84 being primary barrow burials is further supported by the grave goods found with the two burials: beads and the burnt flint and an accessory cup, almost identical to the one found at Stanbury.

Discussion and summary

The Early Bronze Age barrow contained three undisturbed central burials. One of these burials (Burial 82) contains such a large proportion of bone (1500g) that the majority of the individual is represented in the burial. The bone was in an excellent condition. This individual was a female mature adult, who had suffered from widespread degenerative joint disease. She was buried with burnt flint, charcoal and animal bone. A small quantity of the bone (2%) from this individual was interred in an intact accessory cup, while the remainder was interred in a simple pit.

A second pit central to the barrow contained over 1100g of human bone, as well as charcoal, animal bone and a carved bone bead. The skeletal remains were very well-preserved. This burial contained an old middle adult or mature adult male, who had suffered from mild degenerative joint disease of the spine. It is likely that the burial contained about two thirds of the bone from the cremated individual.

The third of the three barrow burials was only moderately well preserved and had suffered from erosion, despite the lack of any disturbance of the burial. It is likely that the bone was subject to disturbance on the pyre, while it was still hot, leading to erosion and fragmentation. This burial also contained a much smaller quantity of bone (600g) and neither animal bone nor any artefacts. This burial contained the remains of an adult of undetermined sex.

A fourth burial was discovered 10m to the southwest of the barrow. This burial contained an inverted collared urn, which was heavily truncated. The human bone, animal bone and charcoal had spilled from the urn onto the base of the burial pit. As a result, as large quantity of bone (1250g) remained; perhaps all of it had survived intact and it was very well preserved. This burial contained the remains of an adult of undetermined sex.

The Flint

Peter Rowe

This report summaries an assemblage of 88 lithics collected during the fieldwork. All of the lithics are the result of prehistoric knapping, there are no natural pieces present in the collection. The majority of the flints are from stratified contexts.

A catalogue of the entire assemblage using Microsoft Excel is available with the site archive.

The composition of the assemblage is set out in Table 4.

The assemblage is composed entirely of flint, with the exception of one small flake of carboniferous chert. There are no examples of quartz, jasper or other fine-grained stone types such as tuff. The flint has a fairly homogenous character, mainly consisting of high

quality light brown or chocolate brown items. The incidence of cortex is rare, occurring on only 13 items. There is a single primary flake with a cortical ventral surface (Context 299). Other than this, cortex is generally more limited, usually covering less than 10% of the surface area. When cortex is present it is worn from glacial action and is extremely thin in section.

Flint Type	Contexts	Quantity
Arrowhead	20	1
Blades	31	1
Core	20, 29, 289	4
Core trimming flake	108, 289	2
Debitage	20, 27, 31, 108, 192, 198, 210, 266	15
Flakes (worked/unworked)	20, 27, 29, 31, 50, 54, 64, 66, 69, 74, 82, 108, 110, 115, 141, 184, 210, 266, 291, 297, 299	7/44
Irregular burnt fragment	27, 64, 66, 210, 266	7
Scraper	31, 50,106, 210	6
Total		**87**

Table 4: Flint assemblage composition

The absence of natural pebbles, low incidence of cortex and homogeneity of the material suggest that the flints were imported to the site as prepared cores or flakes. Those pieces retaining cortex are likely to derive from small pebbles collected from glacial deposits, river gravels or beach pebbles from the coast. The general quality of the flint is high and this along with its homogeneity may suggest that pre-dressed imported nodules from a mined source were also used at the site.

There is little evidence of post depositional damage. Post-depositional edge chipping and polishing are absent although there has been some thermal damage from freeze/thaw. Patination is restricted to burnt items. Twenty-five pieces have evidence of thermal damage caused by burning. This ranges from light damage consisting of slight discoloration to the flint surface to more serious damage including complete patination (grey or white), with significant crazing and shattering. Contexts 27 and 108 produced three or more burnt flints whilst 266 produced 2 burnt pieces. All of these contexts are fills of small pits. Three burnt items (two flakes and a pot lid that refits one of the flakes) were retrieved from cremation 82.

Core technology is represented by two small cores (Contexts 20 and 289), two core fragments (Contexts 20 and 29) and two core trimming flakes (Contexts 108 and 289). The cores are all small in size and heavily reduced. A blade core from context 20 has four platforms, two opposed to each other with a further opposed pair at right angles. The remainder of the cores are flake cores with multiple platforms to maximise the raw material. This can also be seen with the presence of core trimming flakes where steep angled platforms have been refreshed by removing a long flake along the platform edge.

The dominant technology of the assemblage is the production of flakes. Flakes represent over 50% of the collection. These range in size from thick squat examples to small chippings recovered from environmental samples. Seven of the flakes demonstrate edge modification from use. Other flake tools include 6 scrapers of varying form. Contexts 106 and 210 produced fragments of elongated end and edge scrapers based on long blade-like flakes. The example from context 106 (Fig. 26.1) is the distal end only, whilst that from context 210 is formed of four refitting fragments (broken during machine-stripping). This class of scraper is likely to date to the Mesolithic or early Neolithic.

An additional two scrapers were noted in context 210. These are both squat flakes of similar dimension (32mm x 30mm x 10mm & 31mm x 33mm x 11mm). Each has retouch along the majority of its end with limited penetration along the edge (see Fig. 26.2). One of the examples is burnt with some damage to the distal end. Both of these scrapers would suit an early Neolithic date.

Context 50 produced a high quality robust circular end and edge scraper (45mm x 40mm x 20mm; Fig. 26.3). This is based on a flake of high quality chocolate brown flint, probably from a mined nodule. It is worked along both edges and its end. The degree of symmetry and consistent retouch about its perimeter suggest a later Neolithic date (Edmonds, 1995, p. 96).

Context 31 included a small scraper fragment (Fig. 26.4) with fairly invasive retouch. This piece retains a degree of cortex on its ventral surface. The invasiveness of the retouch is consistent with a later Neolithic or early Bronze Age date.

The distal end from a bifacial arrowhead (Fig. 26.5) was recovered from context 20. Although the tip is missing the hollow base form is typical of the British oblique arrowhead class of the second millennium b.c. (Green, 1980, p. 115).

Conclusion

This is an interesting assemblage of lithic material. The chronologically distinctive pieces from the collection demonstrate activity at times from at least the early Neolithic through to the early Bronze Age. It is unfortunate that many of the diagnostic pieces are from topsoil contexts including the late Neolithic arrowhead from context 20 and the three early Neolithic scrapers from context 210. However several pieces may be useful in informing site chronology.

The scraper fragment from context 31 (fill of pit 30) is consistent with the later Neolithic Grooved Ware pottery recovered from its fill, although the remaining seven flints from the context are not diagnostic. The

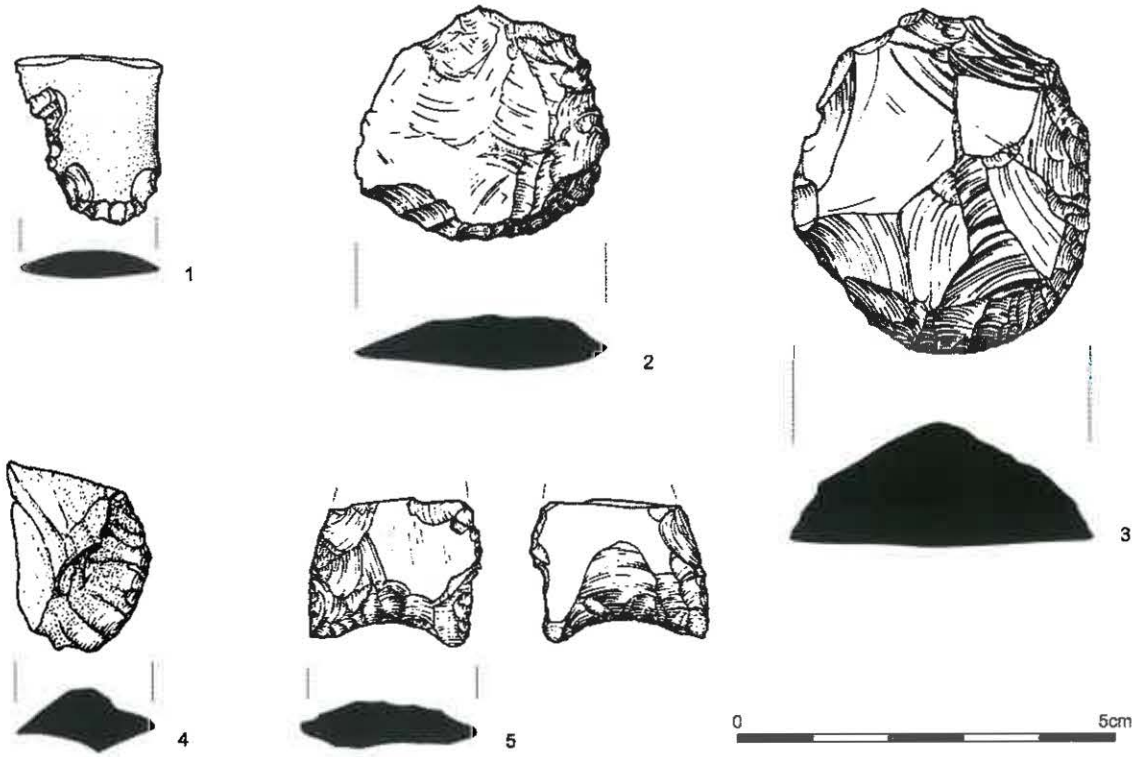


Figure 26: illustrated flint

robust scraper from context 50 (fill of pit 49) is also later Neolithic in date and helps to pin down the relationship between this scatter of features to the north of the ring ditch. This scraper has a remarkably fresh appearance and appears to have been re-sharpened and immediately buried.

Further lithics were recovered from this pit group (pits 25, 65, 107 and 109 produced five, two, thirteen and one flint respectively). Nearby, soil lens 27, produced five flints which were not diagnostic but appear to form part of the same traditional of deliberate disposal of lithics in this area. The fill of pit 105 (Context 106), lying a little to the west of these features, contained a fragment of an end scraper based on a blade or elongated flake. This is likely to be earlier Neolithic in date.

In the north-west corner of the site a further pit (Context 265) produced a dozen knapped flints, all undiagnostic. It is clear that deliberate deposition of lithics in small pits was a significant activity at the site. The presence of burnt flint in these deposits is also worthy of note.

Two heavily vitrified flakes were recovered from cremation 82. These may have formed a deliberate part of the cremation, perhaps part of a small tool kit held on the person of the deceased.

The lithics from the site (both stratified and unstratified) seem to have a clear focus on the Neolithic period. There seems to be a clear relationship between the lithics and the pit cluster to the north of the ring ditch, whilst the ring ditch itself and later boundary features are largely devoid of significant concentrations of lithics.

The bone and glass beads

Gail Drinkall

Introduction

Two beads were recovered from Early Bronze Age cremation deposits: one of bone (84 AB), the other of glass (86 AA). Both were submitted for conservation analysis and, in the case of the bone bead, species identification (see below S O'Connor).

The bone bead (Fig. 27)

A single burnt bone bead (84 AB) accompanied the cremated remains of an old middle or mature adult male (see Holst above, cremation 84). The bead itself is tubular with three circumferential grooves, giving a segmented appearance, and a longitudinal perforation. A single transverse central perforation has been made on one face.

Bone beads such as this have been interpreted as copies of segmented faience beads (Piggott 1958), for example the six bone beads from Cop Heap Hill, Warminster G10 (Coalt-Hoare 1810, 68; Grinsell 1957, 194). These are near identical to the bead from Mitchell Laithes except that they do not have a transverse perforation. The presence of this possibly places the bead within the category of 'toggle'. The Collared Urn grave group from Milngavie, Dunbartonshire (Longworth 1984, no. 1973) has examples of segmented beads and toggles; however the toggles are smoothly cylindrical and have a larger diameter than the beads (Clarke *et al* 1985, plate 5.62). The bead from Mitchell Laithes is a cross between the two: a segmented bead with a 'toggle' perforation. The closest published parallel

was found at Ewanrigg, Maryport, Cumbria (Bewley *et al* 1992, 335, fig. 8). Here, a segmented bone bead with two small transverse perforations on one face was found with a 'bone tube' and Collared Urn (Bewley, *op cit*). Most of the published examples were found in association with early Bronze Age Collared Urns. Cremation 84 has provided a radiocarbon date (2σ) of 1920-1740 cal BC (SUERC-21251), placing it within the early Bronze Age.

Finds of beads have traditionally been interpreted as necklace components, however, very few complete or near complete necklaces are found (Woodward 2000, 116). In the case of cremation this may be partly due to the fact that the burnt remains were not collected in their entirety with some of the pyre goods left behind

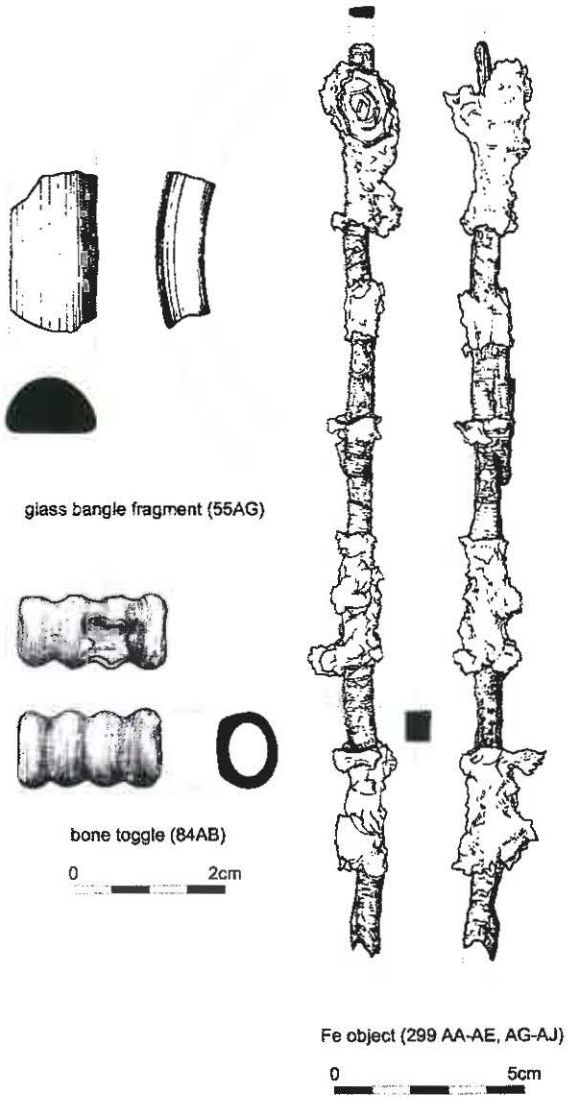


Figure 27: small finds

(Piggott 1997, 130, 137). The bead from Mitchell Laithes was presumably burnt as a result of being a pyre good and therefore other beads could originally have been present. Also, small items may have been placed with the body in a bag or pouch, which would not usually be visible in the archaeological record. This was a practice observed in Anglo-Saxon burial ritual (Drinkall 1998, 286) but one that would not be unlikely in earlier periods.

Technical report for bead 84 AB

Dr Sonia O'Connor FIIC ACR (Archaeological Sciences, University of Bradford)

The bead is made from a section of mammal longbone shaft. The bone has a white porcelain-like appearance; indicating that it has been calcined (burnt at 800 degrees +). Calcined bone can be very distorted and show shrinkage of up to 20%, making identification of the species difficult. However, taking such changes into account it is likely that the bead was cut from a sheep or goat tibia or metatarsal. It has been stuck together from five fragments and a portion of one side is missing. Although eroded, most of the edges of this area of loss have fractured surfaces except for one curved corner. This arc appears to be part of a drilled hole (c.3mm diameter) centred on the middle groove of the decoration. This hole tapers towards the interior of the bead and scoring from the cutting edge of the drill bit can be seen in this surface.

The glass bead (Not illustrated)

A tiny opaque globular bead was found in the environmental sample from the fill of cremation pit 81. Its shape is consistent with that of Guido Group 7 beads 'undecorated globular beads ... whose height is more than half their diameter' (Guido 1978, 69). In natural daylight and under x16 examination it appears black, the latter also revealing a finely pitted surface. EDXRF analysis identified the colourants as iron and manganese.

The date of this item is problematic given that it derives from a Bronze Age context. Beads of faience, though not common, accompany Bronze Age burials. True glass beads, however, are rare: a single example was found in association with a Collared Urn and accessory cups at Gilchorn, Angus and a more unusual plum-coloured bead was found with a dagger grave group in Grave 42 at Wilsford in Witshire (Guido *et al* 1984). No comparable examples for 86 AA have so far been identified from Bronze Age contexts. Its tiny size, however, could point to it being intrusive in this early Bronze Age feature. Glass beads become increasingly common from the Iron Age through to the Roman and Anglo-Saxon periods with centres of production dating to the Iron Age having been identified in this country, for example Meare Lake Village (Hendersen 1980, 60-1). That this bead dates to the Roman period is likely. Examples of miniature dark beads can be found in the late Roman necklace from Fordington, Dorchester (Guido 1978, pl IV) and are listed by Guido in her schedule for Group 7 (Guido 1978, 175). Miniature wound and coiled beads that appear black or dark are occasionally found in early Anglo-Saxon graves, for example at Mill Hill grave 71 and Petersfinger grave 50, the former in large numbers (Brugmann 2004, 30, figs 71, 73): these have been taken as evidence for continuity between the late Roman and Anglo-Saxon periods. In terms of its chemical composition the presence of manganese indicates a date sometime after the 1st century AD. This substance was not used until then but continued in constant use until the 6th century AD (Guido *et al* 1984, 10). Cobalt and copper were also present (0.17% and 0.22% respectively) and

although in small quantities their inclusion represents more than background noise (J. Jones pers comm.). The inclusion of cobalt to produce opaque blue glass – which can appear black – was rare until the Roman period, although imported translucent blue cobalt beads were favoured during early prehistory and are known from sites dating to the 5th-4th century BC. Beads which appear black; however these were never common in Britain before the beginning of the 5th century AD (Guido 1978, 15).

Conclusion

Both these beads represent important finds from the site. The bone bead joins the small number of similar examples from this country, usually from 'rich' burials. That it accompanied the cremation burial of a mature male placed within a visible monument indicates that he had some status within the community: burial within a barrow usually being restricted to a small proportion of the population.

The glass bead was a rare and intrusive find given its diminutive size, with most occurring in inhumation graves. Although it is likely to date to the, possibly late, Roman period it does not affect the date of the cremation from which it came.

Catalogue

84 AB Near complete columnar bead (18mm long) with an oval cross-section (c. 10mm by 8mm external maxima; c. 5mm by 4mm internal minima) and decorated with three circumferential grooves producing a smoothly undulating profile. Context 84

86 AA Complete opaque globular glass bead; appears black. Wound method of manufacture. D 3.5mm; H 2mm; D of perforation 1.5mm. Context 86

The Romano-British and Medieval pottery

Edited by Greg Speed from an assessment report by Peter Didsbury MPhil FSA (2008)

Introduction

A total of 576 sherds of pottery was submitted for examination. All material was quantified by the two measures of count and weight, according to fabric or material category, within archaeological context. Resulting data was entered onto an Access database, which is included within the site archive. Most of the material submitted was of Roman and post-medieval to modern date. A small amount of c.twelfth-century pottery was present, but apart from this there was a distinct lack of ceramic evidence for medieval activity.

Roman material is mainly categorized below in generic terms, though individual fabrics/wares such as BB1, Crambeck greyware and Dalesware are individually noted.

The term 'Gritty Ware' has been adopted for the small amount of material belonging to a c.twelfth-century tempering tradition which is widespread in northern England. Similar material comes from a number of different sources and appears in the literature under a variety of names, e.g. Pimply Ware, York Gritty Ware etc. The types of these wares occurring in West Yorkshire are discussed in detail by Cumberpatch (2007).

Discussion

Two excavated segments of linear ditch 32 produced pottery: 38 and 114 (fills 39 and 115). The first of these produced 10 sherds (127g) from a mortarium which may date from the first half of the second century and a rather worn sherd from a Dalesware jar rim. The Dalesware jar, emanating from Lincolnshire, first appears in the very late second century and continues in production until the mid fourth. The single sherd from segment 114 is an undatable fragment of handmade, stone-tempered pottery or coarse Roman greyware.

Pit 124 (fill 125) produced a single sherd (33 grams) of Crambeck greyware. The fabric was produced from c. AD 270/280, but was probably not widely distributed outside its own production area until some way into the fourth century (Evans 1989, 80).

Pit 57 (fill 55) produced the majority of the Romano-British pottery from the site, amounting to 200 sherds, weighing 1122g. Fabrics present comprised greyware, Crambeck greyware, calcite-gritted wares, colour-coated wares and vesicular scrap. The earliest possible material is probably a late second- or third-century beaker sherd decorated *en barbotine*, but the majority belongs to the mid to late fourth or early fifth century. The bulk of this late component consists of calcite-gritted Huntcliff jars, with nineteen rims representing at least five separate vessels. These are accompanied, in the same contemporary fabric, by a dish cf. Signal Stations Type 31 (Hull 1933). Also present, and contemporary, was a double lid-seated jar of a type common at The Park, Lincoln (Darling 1977). The presence of this second product from Lincolnshire may be noted.

Fill 92 of gully 91 contained the joining freshly fractured rim and body of a curved everted rim jar. The greyware fabric resembles some South Yorkshire products (e.g. Cantley). It bears a broad resemblance to Cantley Type 7 (Annable 1960). The Cantley kilns are dated broadly to c. AD 150-325 (Samuels 1983), but the sherd is scarcely chronologically diagnostic. Fill 94 of gully 93 contained a mortarium sherd, possibly a third- or fourth-century local product.

Ditch 75 (fill 76) produced a sherd from the rim of a Black-Burnished Ware (BB1) jar. The rim has characteristics of both Gillam Types 122 and 138, dated AD 120-160 and 150-250, respectively. It perhaps more nearly resembles the latter.

Cleaning 143 over bedrock produced a Roman greyware jar rim. The fabric is within the South Yorkshire spectrum. The form resembles Buckland and Dolby

1980, Type F large jars, from Blaxton. The Blaxton kilns were dated c.160-250 by Samuels (1983). Nearby tree-hole 155 (fill 156) produced two sherds of Roman greyware. Once again, these may be South Yorkshire products, resembling Branton bowl forms Hb, and Hc-Hd (Buckland 1976). The kilns at Branton were dated c. AD 300-375.

Fill 251 of quarry pit 250 produced 7 sherds, weighing 35 grams. The majority (6 sherds, 34 grams) were Gritty Wares of c.twelfth-century date. The remaining fragment (1 gram) was a post-medieval Glazed Red Earthenware. The sherd's small size would be consistent with it being intrusive.

Fill 26 of pit 25 produced a flake of possible fired clay and a fragment of undated vesicular ware. Fill 64 of pit 65 produced a small sherd (4 grams) of c.twelfth-century Gritty Ware.

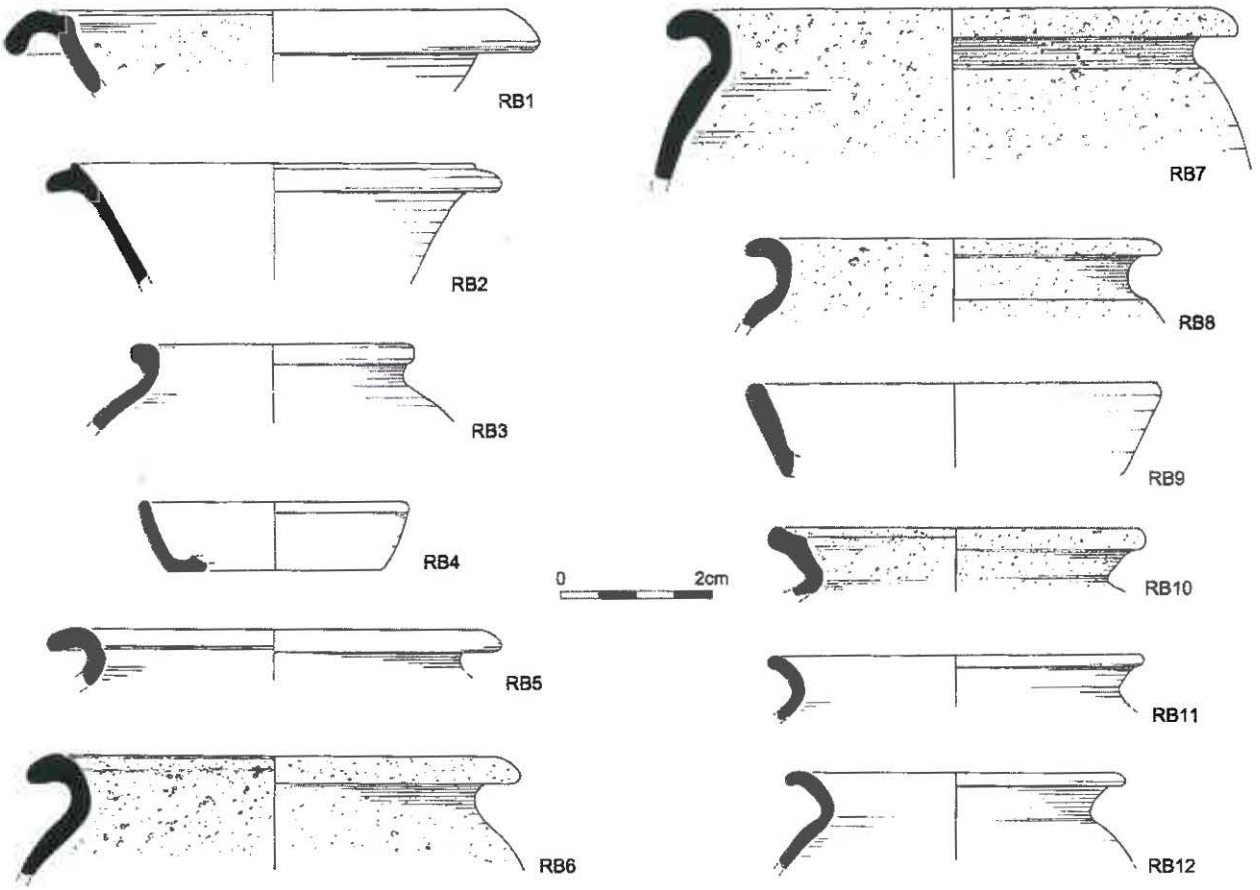


Figure 28: Romano-British pottery

The evidence of the Roman pottery probably shows deposition taking place between at least the earlier second and the mid to late fourth century. The presence of undoubted regional 'imports' from Lincolnshire in the third and fourth century may be noted (Dalesware, Park-type double lid-seated jars).

Catalogue of illustrated pottery (Fig. 28)

RB1 Context 39. Mortarium. Ten joining rim and body sherds, freshly fractured. Bead and flange type, yellowish cream fabric. Fine dark grits. Flange rises above bead. First half of second century (cf. Gillam 1957, No. 243)

RB2 Context 55. Greyware, straight-sided flanged bowl. Fabric of 3rd/4th century appearance.

RB3 Context 55. Greyware, necked jar with a squarish 'bead' rim. Not closely matched in South Yorkshire or Holme upon Spalding Moor industries.

RB4 Context 55. Whiteware. Simple rim dish, grooved on exterior like Crambeck form 2a and equipped with a ridged base, presumably as a cheese press.

RB5 Context 55. Huntcliffe jar. Lid-seated

RB6 Context 55. Huntcliffe jar. Two lid-seating grooves.

RB7 Context 55. Huntcliffe jar. No lid-seating groove but full cavetto and marked shoulder.

RB8 Context 55. Huntcliffe jar. No lid-seating groove but full cavetto and marked shoulder.

RB9 Context 55. Full profile of Signal Stations Type 31 dish (Hull 1933)

RB10 Context 55. Rim of double lid-seated jar – Lincoln, Park type (Darling 1977).

RB11 Context 92. Greyware. Curved everted jar rim, joining freshly fractured rim and body. South Yorkshire

(e.g. Cantley) type fabric. Perhaps cf. Annable 1960 Type 7. Not closely dateable. Cantley kilns dated broadly AD150-325 (Samuels 1983).

RB12 Context 76. Rim of BB1 jar. Has characteristics of both Gillam (1957) Nos. 122 and 138, respectively AD120-160 and AD150-250. Nearer latter.

The Roman small finds

M.C. Bishop

Introduction

Four finds, comprising one copper-alloy item, two glass objects, and one ferrous object, were submitted for examination. All had been assessed for conservation and the metallic items examined using X-radiography by the conservation laboratory at the University of Durham (Jones 2008).

Catalogue

Copper alloy

1. Fragment of copper-alloy sheet bent into a U-section and laterally distorted with irregular edges. Energy dispersive X-ray fluorescence shows this to be a leaded bronze (Jones 2008). Scrap. L: 15mm W: 5mm; Th: 1mm. Context 55 Find AB [Not illustrated]

Ferrous

2. A near-square-sectioned rod, tapering at one end and apparently broadening into spatulate at the other, although this could just be a result of corrosion or damage. This may be a flesh hook (cf. Manning 1985, Pl.51, P36), but there is another alternative. Not all of the parts fit together, but if they do derive from the same object, then this may well be a pilum shank (cf. Bishop and Coulston 2006, figs. 36–7), lacking its pyramidal head and tang or socket (unless the spatulate effect is the remains of such a socket). Ultimately, the remains are too fragmentary for certainty. Total L > 486mm (242mm (AB to AD, AG, AI), 87mm (AF and AH), 56mm (AA), 37mm (AE), 64mm (AJ)); Max W: 8mm; Max th: 7mm. Context 299 Finds AA to AE, AG to AJ. [Fig. 27]

Glass

3. Fragment of characteristically D-sectioned white glass bangle of Kilbride-Jones' (1938) type IIIa. Cf. examples from the cremation cemetery north of Corbridge (Price and Cottam 1995, 27 with further examples from Vindolanda and East Yorkshire cited). L: 20mm; W: 11mm; Th: 7mm. 1st to 2nd century AD. Context 55 Find AG. [Fig. 27]

4. Fragment of blue-green glass, thicker at one edge than the other and slightly turned up on the thicker edge. The inside face is matt, but that on the outside retains sand grain impressions and is glossier. This may be a piece of window glass (although there are no tool marks or elongated bubbles), but it is perhaps more likely that it is a piece of the wall of a square bottle. 1st to 3rd century AD. L: 42mm; W: 27mm; Max Th: 7mm. Context 55. [Not illustrated]

Discussion

The assemblage is very small and it would be unwise to draw firm conclusions from its components. Most of the finds come from context 55 and would fit comfortably into the 1st or 2nd centuries AD. The bangle is an interesting, but not unusual, find and both it and the bottle fragment might be found in domestic or funerary contexts in the Roman period. The fragment of copper-alloy sheet is undiagnostic beyond being, as with most metallic finds in Roman Britain, scrap, albeit in this case rather unprepossessing. The ferrous rod from Context 299 may be a pilum shank, but this is far from certain and it would be pointless to speculate as to why it should come from the site without a more convincing identification.

Worked stone

Millstone 55 AF (Fig. 29)

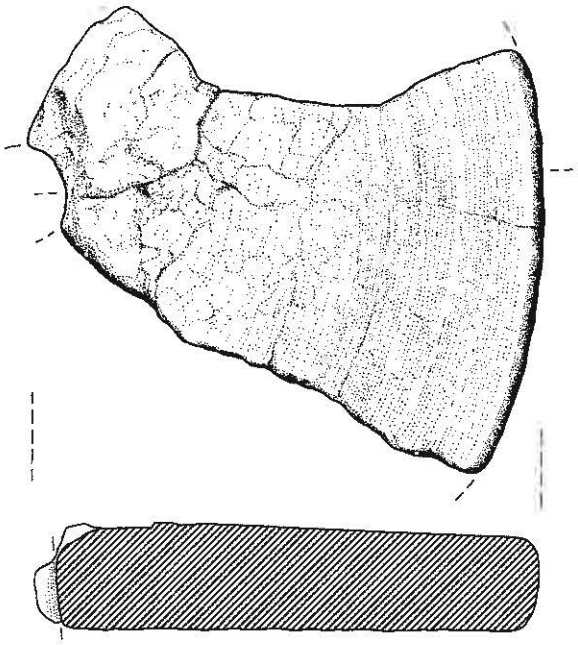
R J Cruse (with Lithology by G D Gaunt)

Probable lower stone of a disc-shaped millstone: c.12% in two fragments, broken radially. The grinding surface is worn smooth. Its inner 150mm diameter is cracked and flaking, with a white colouration which penetrates 15-20mm into the stone, indicating localised heating prior to fragmentation. The red colouration of the stone is also interpreted as being the result of an earlier sustained heating episode. The assumed base surface is roughly dressed flat (with impacts 10-20mm diam. and 3-6mm deep) and lacks any evidence of a hopper. The rim has a slight upper bevel and the central perforation has an upper diam of c.60mm, but widens at the base to c.70mm diam. Lithology: Sandstone: medium to dark, brownish-red, fine to (less commonly) medium grained, with subangular to subrounded grains, moderately sorted, fairly well compacted, with sparse muscovite and sparse feldspar: Either a less course-grained than normal Millstone Grit, or more likely, a Lower Coal Measures Sandstone. Est diam 600-610mm; thickness, 45mm (edge), 55mm (centre); Weight 5kg (est. intact c.40-45kg); YQS No 2328; from fill of R-B pit 57.

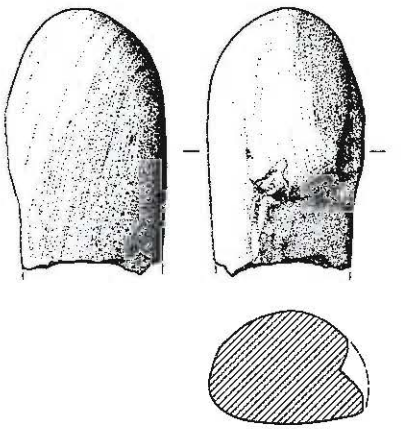
Comment:

Once stones exceed a diameter of between 500mm (Shaffrey, 2003, 163) to 600mm (Cool, 2006, 73), they are generally considered to be too ungainly for hand operation. This probable millstone is therefore likely to have been set in a wooden framework, with the upper stone driven mechanically (either by a slave or by an animal) via a geared linkage through the central perforation in the lower stone. As the site is so near the River Calder, the stone could possibly have been water driven. If so, this could have interesting implications about the status of the site, as water-mills are more usually found at military sites, on villa estates or in towns (Wright 2002, 280).

Mill-stone technology was a Roman introduction, but little is known about their chronological development. The thickness indicates that the stone was well worn before it was heated and broken, as fresh mill-stones are normally c.80-120mm thick. If the sandstone was derived from the Lower Coal Measures, it could be from a relatively local source.



Millstone (55AF)



Possible 'rubber' (50AG)

stone object (55AE)

0 10cm

Figure 29: Stone objects

Possible 'Rubber' 50AG (Fig. 29)

R J Cruse (with Lithology by G D Gaunt)

Perhaps a 60-80% fragment of a water-worn (?), 'rubber-shaped' cobble, fractured at one end and on its side. There is a modern scar along its assumed 'top'. The potential 'grinding surface' is smooth but undressed, with a varying convexity along its length. Lithology: Sandstone: pale brown to slightly reddish-brown, medium to coarse-grained, with angular to sub-rounded grains, poorly sorted, moderately to fairly well compacted, with appreciable interstitial feldspar; either Lower Palaeozoic (probably Silurian) or Millstone Grit (probably from the northern Pennines). Erratic boulder. Length, more than 120mm, width 90-100mm, height 65mm: Weight 2kg: YQS No 2356: Context 50, fill of small pit 49, containing possible IA sherds.

Comment

As it lacks unambiguous evidence of a worn grinding surface, it is classified as a possible rubber, either little used for grain or restricted in use to soft materials, such as nuts. In its unbroken state, it could potentially have been used two-handed on a saddle quern, with a back and forth motion,

The use of a reddish-coloured stone may have some cultural significance, as Hayes *et al* (1980) and Heslop (2008) have both noted a tendency for red or maroon Millstone Grits to be favoured by the IA/ early Roman makers of beehive querns. Although the identified rock sources are not local, this object could utilise a locally found erratic.

Other stone objects

Martin Foreman

Method

All objects were visually examined in natural daylight, and under a daylight lamp with low-power magnifier (1.75X [3 diopter]). Given the nature of the material, they were measured to an accuracy of 0.5mm; the recorded range of certain dimensions is presented where deemed appropriate.

Catalogue

No.1. 257 AB. Possibly utilised pebble (not illustrated). Material: Fine-grained Carboniferous Sandstone. Specialist notes a darkened area could associate this stone with Coal Measures Sandstones. Form: Naturally-formed flat tapering pebble, of sub-rectangular section at its widest point. Slight dishing c.1mm deep occurs on a limited zone (L.c.30mm) of one flat surface; smoothed overall, and blackened on the other flat face. Fractured along bedding plane at

one end of the latter face. Dimensions: L. 115mm, Max. W. 45mm, Max. Th. 10mm.

No. 2. 27 AA. Possibly utilised pebble (not illustrated). Material: Fine-grained Carboniferous Sandstone. Form: Naturally-formed tapering pebble of sub-triangular section at mid-point. Slight dishing c.1mm deep occurs on a limited zone (L. c.40mm) of one surface. Smoothed overall, and slightly darkened towards narrow end. Dimensions: L. 133mm, Max. W. 46mm, Max. Th. 24mm.

No. 3. 55 AE. Possible polishing stone or smoother (Fig. 29). Material: Fine-grained Carboniferous Sandstone. Form: Naturally-formed bar-shaped pebble of sub-triangular section at mid-point, tapering in thickness towards both ends. Smoothed overall, with a limited zone (L. c.45mm) of light polish at the mid-point aris where two narrower faces meet. Dimensions: L. 126mm, Max. W. 34mm, Max. Th. 15mm.

Discussion

These objects are naturally-formed sandstone pebbles. They were found in association with a small quantity of possible Peterborough ware (No. 1), Iron Age potsherds (No. 2); and a concentration of Romano-British finds in a pit dated by later 4th- century pottery (No. 3).

'Finger sponge stones' from south-western Late Neolithic/Early Bronze Age contexts have sometimes been described as hones though lacking signs of wear; unlike the Mitchell Laithes stones – No. 3 in particular - these are made from fine-grained dark rocks with length-to-width proportions of 5:1 (Woodward *et al.* 2005; Smith and Simpson 1966, 139-41). The Mitchell Laithes objects lack the rectangular section or wear patterns distinguishing whetstones of the Romano-British period in the region (e.g. Casey and Hoffman 1998, 145, fig. 16 no. 62; Wright 2004, 58, fig. 28 no. 1343 AB) and beyond (Peacock 1971); and the high polish found on textile 'smoothers' made from fine-grained igneous rock (e.g. Clark and Gaunt 2000, 109) or Sandstone (Foreman 1991, 107, fig. 91 no. 69).

The context and association of Nos 1 and 2 may argue these to be fortuitously distinctive pebbles. No. 3 accompanied a marked concentration of later Romano-British material. This could argue its selection for casual one-handed craft use (cf. Woodward *et al* 2005, 38) in a domestic setting, though what this was must remain uncertain.

The slag

Jane Cowgill

Recording methodology

A total of 4167g (801 pieces) of fired clay, coal, slag and associated finds were submitted for recording, of these 3291g (378 pieces) were iron-smithing debris. A full catalogue of the material is incorporated within the site archive. The three basic categories of find, fuel, fired clay and miscellaneous finds and metal-working debris are discussed separately below.

The magnetic matter was weighed and a subsample (usually 1g) was scanned on a petri dish using the microscope and any hammerscale or items of note were recorded. The quantity was then multiplied up so that the numbers given in Table 6 represent the amount of hammerscale and prill present in the whole magnetic element of the sample residue.

Discussion of the coal and shale

Many of the pieces are very small and may easily have moved down through the soil, although where the count was high, this is perhaps less likely. Many fields were ploughed in the late 19th and early 20th century with coal-powered steam-driven machinery and these account for a large amount of the coal and clinker in our fields today.

The larger pieces all appear to be extremely good quality coal (dense and shiney) and are mainly from Romano-British contexts that also contained iron-smithing debris (undated pit or post hole 254 is the only exception). Coal was also an inclusion in some of the slag indicating it had been used as the fuel. The coal may have been brought to the site for use by the smith, although its use as a domestic fuel is always a possibility. The coal would therefore have to be sulphur free to be suitable for use in a forge hearth. Coal and charcoal as fuels in a smithing hearth behave very differently and require a totally different type of management (pers. comm. H Cole) and it is unlikely that a smith would readily or happily (if competent to) alternate between the two. This suggests that the smith at the site preferred using coal and it may have been brought in specifically for their use. It appears that coal was probably being exploited and used as a fuel in the area by the 1st century AD at the *vicus* at Castleford (Dearne and Branigan 1995, 89) and Smith suggests that 'there is an accumulation of evidence to suggest that the [coal] seams outcropping to the south-east of Leeds and near Castleford were an important source meeting the demand for coal over a wide geographical area' in the Roman period (1997, 318).

The presence of 4g of clinker (partially burnt coal) in an undated pit or posthole 254, may suggest that this feature is Roman in date.

There are just two pieces of shale (contexts 55 and 108), these may be pieces of poor quality coal brought to the site for fuel, although it is just possible that the piece from 55 is part of an object.

Discussion of the fired clay

A very small assemblage of fired clay was recovered from the site, only six pieces may actually have been worked (wedged and possibly tempered) before being used, perhaps to build a structure, such as an oven or hearth (contexts 55, 143 and 257). Clay built structures seldom survive in the archaeological record unless they have been heated to a high enough temperature, which will not generally happen in ordinary domestic circumstances (for example baking bread). The remaining pieces, catalogued as silty clay,

were probably pieces of the natural ground that had become very lightly fired - if they were fired at all.

Discussion of the iron-smithing debris

The slag and tuyeres catalogued below are all by-products of iron smithing - the fabrication or repair of iron objects using traded new bar or old iron. The only exception is the small piece of probable fuel ash slag from context 198. The smithing slags are generally a consistent, if a small group, and they could be the waste products of a single smithy, although there are minor differences between those found on the western side of the site in ditch 32 and those from cleaning 143 and tree-hole 155. Most of the pieces are in a fresh condition suggesting they have not weathered on a ground surface before burial and have suffered little redeposition over time, although some of the pieces from ditch 32 (context 115) are encrusted with soil and corrosion products that masks some of the surface detail. This makes direct comparison between the characteristics of the two main groups difficult and lowers the level of confidence in their similarities. The hearth bottoms are small, quite light and not particularly dense, many also have flowed surfaces, which suggests that the flowed piece from context 55 is also part of this group. There is an unusually high percentage of fragmentary tuyeres in both groups, generally quite fragile objects, but no rims or air holes were measurable. Coal appears to be the fuel used by the smiths (see the discussion on the coal recovered).

A piece of iron was found amongst the slag from context 143, this may be an offcut rather than an actual object, because of the presence of the slag.

The slag and tuyeres were found in small quantities in features scattered across the site (Fig. 30), including a hearth bottom weighing 17g from pit 152 that also contained possibly prehistoric-character pottery. Many of the pieces are very small and those weighing 4g or less may well have moved down through the soil and cannot be used to date the features in which they were found, or be dated by the feature. The largest group weighing over 2.7kg is a primary dump of debris that, judging by the sheer quantity of large fresh pieces of hammerscale, had been swept up from a smithy floor and deposited directly in the ditch. It was found in a recut of ditch 32, where it joined the D-shaped enclosure ditch 40, with a small group of Roman pottery. A large quantity of tuyeres are present in this group and also amongst the second large assemblage found in a shallow pit/ tree-hole 155 beside an area of bedrock that had been heat-affected (slag also from cleaning 143 around the area). This latter group also appears to be Roman in date and a significant quantity of good quality coal was also found amongst the slag. This area is 75m from the deposit in ditch 32.

A smith cannot avoid loosing iron in the form of hammerscale when hot forging. The surface of the hot iron oxidises when it is taken from the hearth and this forms thin shiney flakes known as plate hammerscale (Starley 1995). Spheroidal scale (slag spheres that may be hollow or solid) usually forms a much less significant part of any hammerscale assemblage as it is generally only produced when hot iron is fire welded (Dungworth and Wilkes 2005). Spheroidal scale can,

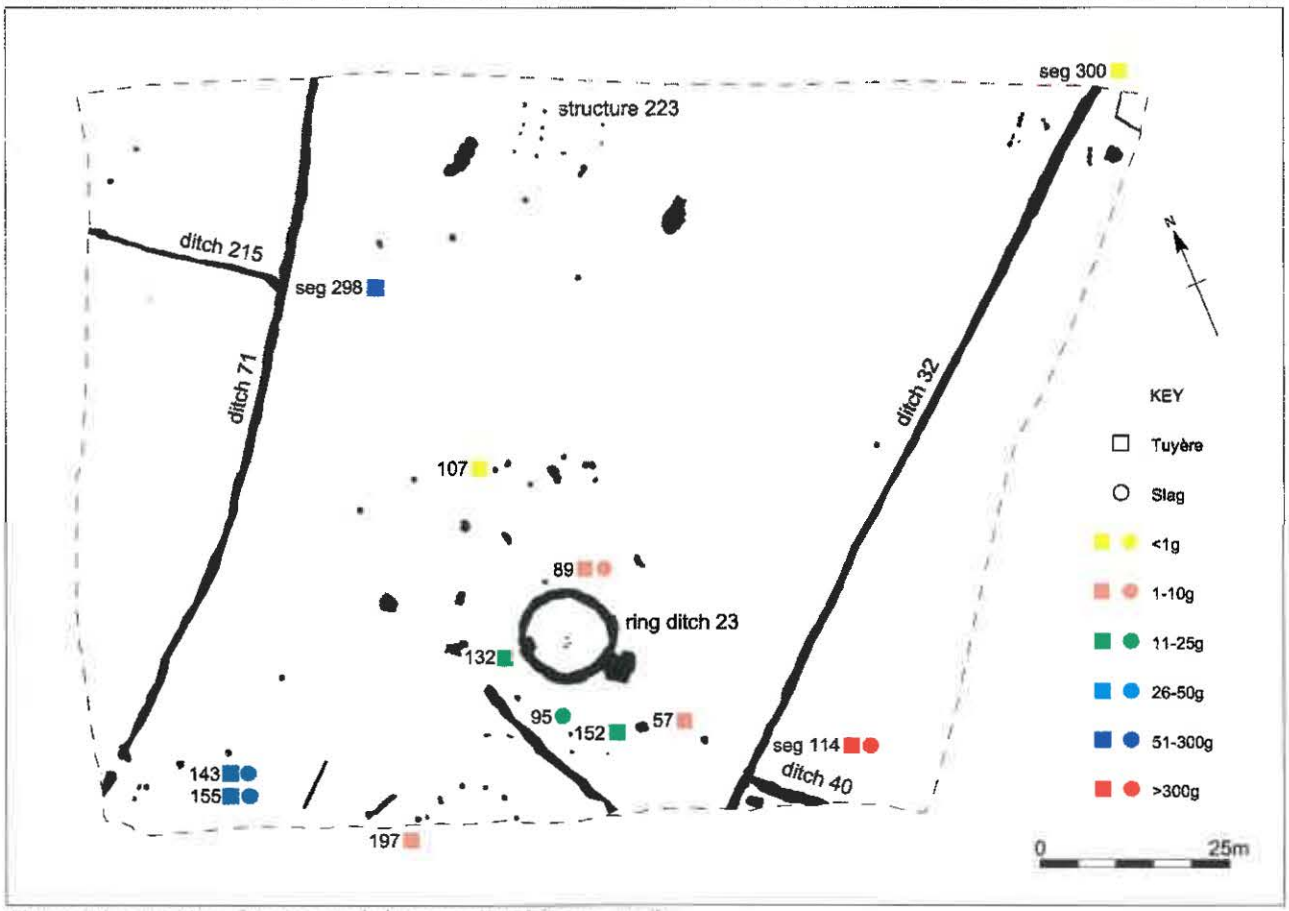


Figure 30: quantity of tuyère and slag recovered from samples

Cont.	Sample code	Type	Count	Weight	Comments
20		tuyere	1	7g	17mm thick; oxidised orange/ pink.
55		slag	1	4g	Small flow; charcoal fuel; smelting or smithing slag.
90	AA	tuyere	5	3g	All possible tuyere fragments; 1 with slag attached (12x12x11mm).
90	AA	slag	4	4g	Smithing-slag lump.
96		tuyere?	4	15g	Slagged surface on oxidised clay - orange/pink.
108	AA	slag	1	<1g	Iron-smithing debris.
115		slag	1	8g	Coal and stone inclusions.
115		tuyere?	4	12g	2 pieces slagged; oxidised buff orange/ pink.
115		tuyere	8	50g	Deeply slagged reduced fired clay.
115		tuyere	14	86g	Not all pieces slagged; flowed slag on some; 1 x rim; maximum depth 25mm; most oxidised orange/pink.
115		protohb	4	71g	1 x magnetic; coal fuel; 3 x encrusted; 1 x flowed and fresh.
115		slag	15	54g	Iron-smithing debris; coal fuel in a few?
115	AA	tuyere	90	80g	All probably tuyere fragments; most oxidised few reduced buff/ grey.
115	AA	fired clay	10	8g	Reduced fired; black -partially slagged; tuyere?
115	AA	slag	11	49g	Encrusted; smithing-slag lump.
115	AA	slag	9	13g	Magnetic fragments; iron-smithing debris; encrusted.
115	AA	fecinder	14	47g	Encrusted.
115	AA	hb	23	358g	HB and protohb encrusted fragments.
115	AA	tuyere	8	85g	1 x rim fragment.
115	AA	slag	90	43g	Encrusted crumbs; iron-smithing debris.
115	AA	hb	5	884g	Encrusted; 80x80x40mm; 60x80x40mm; 60x85x35mm; 50x70x35mm; 55x70x30mm.
115	AA	protohb	12	893g	Encrusted; 30x55x20mm; 40x60x20mm; 35x55x25mm; 30x60x25mm; 20x35x20mm; 35x45x25mm; 30x35x15mm; 35x40x40mm; 30x25x20mm; 25x45x20mm; 35x50x30mm; 30x45x25mm.
133		hb	1	12g	Fresh condition; flowed; protohb?
143		protohb	1	21g	Coal fuel; hammerscale; fresh condition; 25x55x25mm.
143		fecinder	3	21g	Light grey reduced fired hearth lining; fresh condition.
143		fecinder	2	24g	1 large stone inclusion; fresh condition.
143		Hb	1	43g	Fresh condition; rounded; 45x45x45mm.
143		protohb	3	46g	Fresh condition; coal fuel x 2; 35x30x30mm; 30x50x10mm; 25x40x25mm.
143		Iron	1	14g	Object or offcut.
143		tuyere	3	16g	Fragments of 2 or 3; oxidised clays.
153		Hb	1	17g	Flowed; fresh condition; protohb?
156		tuyere	11	54g	Slagged surface; oxidised - buff cream orange/pink; 1 near rim edge.
156		tuyere?	12	42g	Dense laminated clay - fracturing; oxidised cream orange; some slagged but no surfaces.
156		protohb	1	16g	Coal fuel; fresh condition; rounded.
156		stone	1	9g	Slagged.
156		tuyere	10	89g	1 x air hole (distorted); 1 x rim; 2+ tuyeres.
156		tuyere	1	63g	Coal fuel; fresh condition; complete wide hb attached 35x85x30mm.
198	AA	Slag	1	1g	Black fuel-ash slag?
210		Slag	1	4g	Stone inclusion; iron-smithing debris.
299		Hb	1	54g	Abraded; very dense plate with hearth lining on base.
302	AA	Slag	1	<1	

Codes used in the catalogue: fecinder - iron-rich cinder (a by-product of iron smithing); hb - plano-convex slag accumulation (commonly known as a hearth bottom)

Table 5: Catalogue of the iron-smithing debris

Table 6: The hammerscale and prill content in the magnetic matter extracted from sample residues

Feature	context	Sample code	sample vol (l)	fraction	weight	Hammerscale			hamm's per litre of soil	hamm's + prill per litre of soil	Ratio plate to spher'd hamm's	comment
						plate	Spher'd	prill				
Fill Neolithic pit 30	31	AA	40	<4mm	12g	166	50	34+	5.4	6.25	3:1	
EBA cremation pit 47 fill	48	AA	4	<4mm	2g	21	9	11+	7.5	10.25	2:1	
Undated pit/ posthole 53 fill	54	AA	28	>4mm	4g	-	-	-				
Fill of pit next to cremation 47	54	AA	28	<4mm	22g	160	52	24+	7.5	8.4	3:1	
RB pit 57 fill	55	AA	31	>4mm	25g	-	-	-				1xfired clay crumb.
RB pit 57 fill	55	AA	31	<4mm	26g	536	112	12+	20.9	21.3	5:1	
Fill of posthole 60, roundhouse 190	61	AA	17	<4mm	4g	8	4	17+	0.4	1.7	2:1	
Fill of posthole 67, roundhouse 190	68	AA	14	>4mm	5g	-	-	-				
Fill of posthole 67, roundhouse 190	68	AA	14	<4mm	10g	56	18	14+	5.3	6.3	3:1	
EBA segment 70, ring ditch 23 upper/ recut	69	AA	34	>4mm	<1g	-	-	-				
EBA segment 70, ring ditch 23 upper/ recut	69	AA	34	<4mm	9g	582	86	374	19.6	30.6	7:1	Min. no. all small.
EBA segment 70, ring ditch 23 upper/ recut	69	AB	14	>4mm	<1g	-	-	-				
EBA segment 70, ring ditch 23 upper/ recut	69	AB	14	<4mm	3g	39	9	20+	3.4	4.9	4:1	
RB segment 73 fill, ditch 71	74	AA	32	>4mm	4g	-	-	-				
RB segment 73 fill, ditch 71	74	AA	32	<4mm	27g	265	40	50	9.5	11.1	7:1	
Undated posthole 89 fill	90	AA	16	>4mm	4g		-	-				Slag x 2 (3g).
Undated posthole 89 fill	90	AA	16	<4mm	15g	1400	84	56	92.75	96.25	17:1	Large/ fresh.
Pit 97 fill	98	AA	30	>4mm	2g	1	-	-				1 large plate.
Pit 97 fill	98	AA	30	<4mm	19g	684	76	172	25.4	31.1	9:1	Some large.
Pit 107 fill	108	AA	31	>4mm	2g	-	-	-				Slag x 1.
Pit 107 fill	108	AA	31	<4mm	8g	304	44	132	11.2	15.5	7:1	
EBA charcoal lens seg. 111, ring ditch 23	113	AA	6	>4mm	<1g	-	-	-				
EBA charcoal lens seg. 111, ring ditch 23	113	AA	6	<4mm	3g	110	14	66	20.7	31.7	8:1	
RB fill recut segment 114, ditch 32	115	AA	34	>4mm	2g	-	-	-				2 x slag.
RB fill recut segment 114, ditch 32	115	AA	34	<4mm	20g	7940	560	1940	250	307	14:1	Large/fresh, lots tiny hamm's not counted.
Undated pit 128 fill	129	AA	9	<4mm	4g	184	36	84	24.4	33.8	5:1	

Feature	context	Sample code	sample vol (l)	fraction	weight	Hammerscale			hamm's per litre of soil	hamm's + prill per litre of soil	Ratio plate to spher'd hamm's	comment
						plate	Spher'd	prill				
Undated pit/posthole 150 fill	151	AA	9	<4mm	4g	17	8	4	2.8	3.2	2:1	
Prehistoric pit 152 fill	153	AA	17	>4mm	4g	-	-	-				
Prehistoric pit 152 fill	153	AA	17	<4mm	14g	2310	490	420	164.7	189.4	5:1	
Undated pit 197 fill	198	AA	35	>4mm	2g	-	-	-				1 x slag.
Undated pit 197 fill	198	AA	35	<4mm	5g	370	65	35	12.4	13.4	6:1	
Undated posthole 224 fill, structure 223	225	AA	16	>4mm	1g	-	-	-				
Undated posthole 224 fill, structure 223	225	AA	16	<4mm	5g	15	5	30	1.25	3.1	3:1	
Undated posthole 226 fill, structure 223	227	AA	18	>4mm	1g	-	-	-				
Undated posthole 226 fill, structure 223	227	AA	18	<4mm	7g	49	7	14	3.1	3.9	7:1	
Undated posthole 228 fill, structure 223	229	AA	14	<4mm	4g	32	24	32	4	6.3	1:1	All small.
Undated posthole 236 fill, structure 223	237	AA	13	>4mm	1g	-	-	-				
Undated posthole 236 fill, structure 223	237	AA	13	<4mm	2g	-	2	18	0.15	1.5	0:2	All small.
Undated pit 248 fill	249	AA	7	<4mm	1g	9	11	8	2.9	4	1:1	All small.
Pit 256 fill	257	AA	32	>4mm	2g	-	-	-				
Pit 256 fill	257	AA	32	<4mm	8g	88	48	24	4.25	5	2:1	All small.
Pit 265 fill - intrusive Post-Medieval sherd	266	AA	32	>4mm	2g	-	-	-				
Pit 265 fill - intrusive Post-Medieval sherd	266	AA	32	<4mm	6g	60	30	48	2.8	4.3	2:1	
Undated pit 278 fill	279	AA	11	>4mm	1g	-	-	-				
Undated pit 278 fill	279	AA	11	<4mm	2g	1	3	8	0.4	1	1:3	
Primary fill pit 288	291	AA	28	>4mm	1g	-	-	-				
Primary fill pit 288	291	AA	28	<4mm	2g	8	3	6	0.4	0.6	2:1	
RB primary fill segment 300, ditch 32	302	AA	28	>4mm	1g	-	-	-				
RB primary fill segment 300, ditch 32	302	AA	28	<4mm	1g	4	1	3	0.2	0.3	4:1	

however, move down through the soil more easily than plate.

Every sample from the site produced some hammerscale in the magnetic matter extracted from the residue, this ranges from an astonishing 307 pieces per litre of soil from context 115 (ditch 32) to 0.3 pieces in the primary fill of segment 300, also ditch 32. As a very rough guide to the significance of the quantities given in Table 6, over 10 pieces of scale per litre is usually deemed to indicate that there is a smithy in the vicinity, over 26 that it is in proximity and in excess of 50 the deposit constitutes a primary dump of smithy by-products, or is within the smithy. This site has therefore produced an exceptional quantity of scale spread over a very wide area (Fig. 31), but this distribution is partly determined by which features were sampled rather than the actual presence or absence of scale, as the

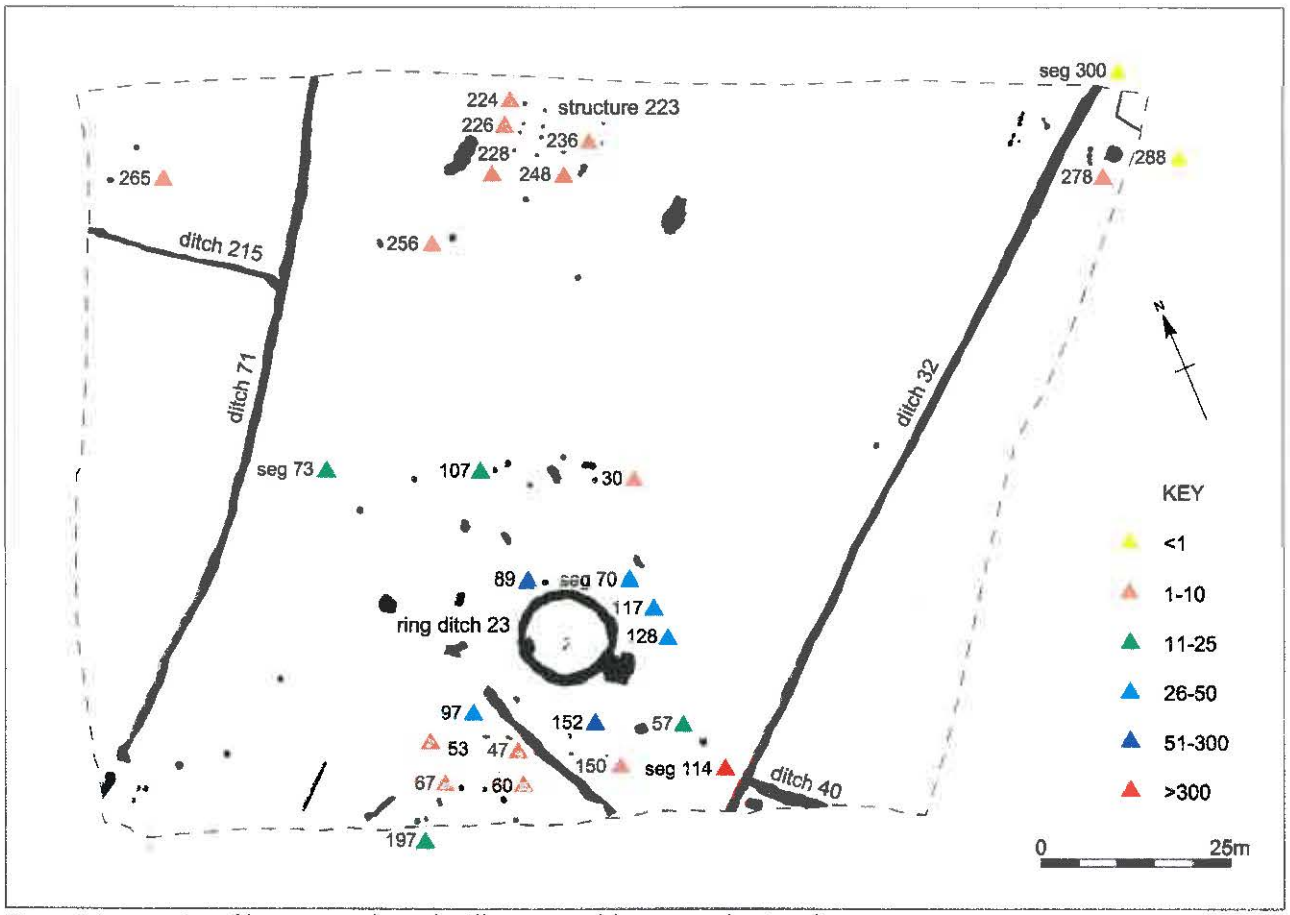


Figure 31: quantity of hammerscale and prill recovered from samples (per litre)

Feature	Context	Slag count	Slag weight	Tuyere count	Tuyere weight	Comment
Modern plough soil Area B	20			1	7g	
RB pit 57 fill	55	1	4g			
Undated posthole 89 fill	90	4	4g	5	3g	
Soil in natural fault 95	96			4	15g	
Pit 107 fill	108	1	<1g			
RB fill recut segment 114, ditch 32	115	294*	2420g	124*	321g	*many crumbs
Fill of tree-hole 132	133	1	12g			
Cleaning bedrock near pos. metalworking	143	10	181g	3	16g	
Fill or prehistoric pit 152	153	1	17g			
Fill of pit or tree-hole 155 (assoc. 143)	156	1	79g	34	194g	
Undated pit 197 fill	198	1	1g			Fuel ash slag
Topsoil and unstratified finds, Area C	210	1	4g			
RB fill of segment 298, ditch 71	299	1	54g			
RB primary fill segment 300, ditch 32	302	1	<1g			

Table 7: Summary of the iron-smithing slags and tuyeres by context

retrieval of scale was not a primary consideration in the sampling strategy. As an example it is noticeable that there is no hammerscale from context 155 when comparing Figures 30 and 31, although the pit/tree-hole produced the third largest assemblage of slag, for the simple reason that it was not sampled.

The smallest groups are from the northern part of the site, around undated structure 223 and to the east where there is a cluster of mainly earlier Neolithic pits and postholes. Some of these features also contained earlier prehistoric pottery (including 265, 256 and 288) suggesting the scale is intrusive. All the large assemblages are from around the ring ditch 23, with six features producing more than 26 pieces per litre (Fig. 31). Large fresh pieces of hammerscale similar to those from the primary smithy dump from fill 115, ditch 32 (segment 114 on Fig.30/31), were recovered from undated posthole 89 and pit 97, which suggests they are contemporary with the smithy/ies. A number of these features, however, are prehistoric in date including an upper fill/ recut 69 in segment 70 (35.5 pieces per litre - minimum number as all were very small) and a charcoal lens 113 in segment 111 (31.7 pieces) both part of the ring ditch 23. Nearby the sample from pit 152 containing possibly prehistoric pottery had 189 pieces per litre (context 153). Early Bronze Age cremation pit 47 contained 10.25 per litre with 8.4 being recovered from neighbouring ?contemporary pit 53. These are all very high counts, particularly when the deposits must pre-date any smithing being undertaken at the site.

Another factor to examine is the ratio of plate scale to spheroidal which would normally be expected to be roughly 50:1, although that is very dependant on the type of forging undertaken in the smithy. From this site only two groups are higher than 10:1, both features containing large and fresh scale (undated posthole 89 17:1 and ditch 32 fill 115 14:1). Unless the scale assemblage was biased towards spheroidal scale when produced, which is unlikely, this would suggest that some other factors may have come into play. They may blow more easily in the wind and perhaps travel further, although distribution by this means would probably occur mainly in a period roughly contemporary with the functioning of the smithy/ies when heaps of debris from them were exposed. This may account for the presence of the scale in the northern features, well away from the concentrations around ditch 23 (ratios range from 0:2 to 7:1). The small, smooth round balls of spheroidal scale will also move much more easily through the soil than the plates, and on this site which had only a thin layer of topsoil, fills of archaeological features will have been subject to greater bioturbation by worms, beetles and small mammals than deeper soils. It is therefore likely that much of the hammerscale (and small pieces of slag) moved down from the topsoil into the features over time and this has introduced, or at least aided, the bias in favour of the spheroidal scale. It would also suggest that there must have been an exceedingly large amount of scale present in the soil overlying the site.

Only cut features survived on the site and most of the slag and hammerscale probably existed in the topsoil, as the debris from a smithy is usually discarded in heaps outside and is seldom reused, except occasionally for surfacing paths and trackways. These heaps would than have been flattened, incorporated in to the soil and moved around the site during centuries of ploughing. Indeed, as noted above 'very large quantities of burnt stone, coal fragments and ironworking slag were observed across the whole excavation area within the topsoil and within furrows...'. Only a very small assemblage of slag was, however, collected from the site and is available for study, compared to the amount of hammerscale recovered which hints at the actual quantity that must originally have been there. It is uncertain whether this material is representative of the total or if originally there may have been a much more diverse assemblage. The recorded slag suggests the presence of perhaps one smith and smithy, but with such a small subsample this conclusion cannot be relied upon.

The iron-smithing was probably occurring on the site during the Roman period, and the quantity of smithing debris suggests that a smithy/ies existed at the site, rather than occasional visits by an itinerant smith. The distribution of the scale suggests that the smithy may have been located near to the ring ditch 23 or at least its by-products discarded in the vicinity of the barrow or even 'added' to it. It would seem an unlikely location (depending on the occupants attitude towards a barrow) but it is difficult to otherwise account for the very high levels of hammerscale in features surrounding it, unless it was used as a discard zone. There is no chronology or time frame for the smithing debris so it is possible that the smithy moved within the settlement, the hammerscale content in some of the prehistoric pits is so high that a smithy could even have been built over them. It is not inconceivable that a smith operated in the unexcavated D-shaped enclosure (perhaps the source of the dump in ditch 32 fill 115?) or even just to the south of the barrow where power-lines prevented the need for excavation.

A smithy at this date may have been quite a simple structure, with a dark interior (to allow control of the fire and the colour/ heat of the iron to be observed) containing a raised hearth, anvil and the other tools required. Smithing requires high temperatures in the hearth and therefore bellows are always a requirement to reach the white or snowball heat that is needed for most fire welding (c. 1300°C). A smith will always try to avoid having loose stone in or near to their hearth because it will explode at high temperatures and cause a hazard, not the least of which could be blindness for the smith. It is unlikely therefore that any of the burnt stone found all over the site, intermixed with the slag and coal, has any direct relationship with the smith.

Summary

The large primary dump of slag in ditch 32 recut 115, could have come from a postulated smithy/ies near the ring ditch 23. The second largest assemblage of slag and tuyeres comes from the cleaning 143 around heat-affected areas of bedrock and neighbouring pit/ tree-hole 155. Possibly this was the location for another smithy, but there is no reason for a smithy floor to become burnt and this may just again have been an area where smithy debris was being discarded. The scale was probably distributed to the northern part of

the site by wind from large dumps of smithy debris that included scale in the southern part of the site, assuming no major barriers such as structures or trees. Very large amounts of slag were noted in the topsoil and it is assumed that large quantities of hammerscale was also present there, this is presumably the source through bioturbation of all the scale in the Prehistoric features.

The biological remains

Alexandra Schmidl and Deborah Jaques (Palaeoecology Research Services)

Introduction

The 'flots' (hereafter termed washovers) and remains recovered from the residues from 32 sediment samples ('GBA'/'BS' *sensu* Dobney *et al.* 1992) processed by NAA, and a small quantity of hand-collected bone, were submitted to Palaeoecology Research Services Limited (PRS), County Durham, for analysis.

Methods

Sediment samples

Plant remains were fully recorded using a low-power binocular microscope (x7 to x45) and identified by comparison with modern reference material at PRS and the use of published works (Cappers *et al.* 2006 and Jacomet 2006). Identifiable taxa and other components were listed on paper and the data later transcribed into *Microsoft Word* tables for presentation. Nomenclature for plant taxa follows Stace (1997).

Larger pieces of well preserved charcoal were randomly selected from different contexts for closer examination and specific identification in order to identify the taxa present. Identification of charcoal was undertaken with reference to the photographs and descriptions in 'Wood anatomy of central European Species' (Schoch *et al.* 2004).

Vertebrate remains

For the vertebrate remains (both from the samples and hand-collected), subjective records were made of the state of preservation, colour of the fragments, and the appearance of broken surfaces ('angularity'). Brief notes were made concerning fragment size, dog gnawing, burning, butchery and fresh breaks where applicable. Where possible, fragments were identified to species or species group. Fragments not identifiable to species were described as the 'unidentified' fraction. Within this fraction fragments were grouped into a number of categories: large mammal (assumed to be cattle, horse or large cervid), medium-sized mammal (assumed to be caprovid, pig or small cervid) and totally unidentifiable.

Results

Sediment samples

In general, the samples gave rather small quantities of biological remains; almost exclusively plant material. Ancient plant remains recovered were preserved by charring and largely consisted of fragments of poorly preserved unidentified charcoal, with a very few cereal grains. Most of the samples also contained rootlets and uncharred seeds/fruits which were almost certainly modern contaminants.

Details of the results of the examination of the processed washovers and remains sorted from the corresponding residues are presented in Tables 8 and 9. Details of the modern plant remains are recorded within the site archive and they are not further considered here.

Vertebrate material from the sediment samples was of little value, being, for the most part, unidentifiable to species or even family group. All fragments were small (typically less than 20 mm in maximum dimension), burnt and mainly white in colour. Material from the fills (Contexts 54 and 98) of two features (undated pits 53 and 97) that were located in close proximity to early Bronze Age cremation pit 47, contained bones that represented medium-sized animals. One metatarsal shaft fragment in Context 54 was identified as possibly being from a young sheep/goat, whilst a juvenile pig metacarpal came from Context 98. Details of the bone from the samples can be found in Table 9.

Hand-collected vertebrate remains

During the examination of the burnt bones from three of the Early Bronze Age cremations (Contexts 46, 82 and 84), a few fragments of animal bone were found amongst the human remains. Few of these bones could be identified, but pig radii fragments were recorded from Contexts 82 and 84, with two pig carpals and a caprovid distal humerus also noted from the latter. Both the radii fragments were from the left side of the pig, and epiphysial fusion data suggested that the individuals represented were less than 3 years old at death, whilst the caprovid humerus was from an individual of at least 10 months old.

The small collection of bones recovered by hand from Context 55 (fill of Romano-British pit 57) included cattle, caprovid and pig remains, with most of the identifiable fragments being teeth. Preservation of this material was extremely poor and the bone fragments recovered were soft and somewhat crumbly. A pig mandible was present, and although rather fragmented, there were several incisors (two permanent erupted, two permanent erupting and one deciduous), a canine and two premolars. The tip of an additional canine, probably from the same animal, was also recovered. On the basis of the teeth, this individual was a young male, of approximately 16 months old. Further details of the remains can be found in Table 10.

Discussion

Charred plant remains, predominantly in the form of charcoal fragments, were recovered from all of the processed samples, with some also yielding small assemblages of cereal remains, associated weeds and gathered food plants such as hazelnuts.

The charcoal was present in varying quantities and mostly as 'silted' fragments. Its condition was, in

Table 8: Plant remains recovered from 32 washovers

Key: 'C/S' = Context number/Sample designation; 'kg/l' = amount of sediment processed in kilograms and litres; 'wt' = weightst of washover/residue in grammes; 'IDs' = identifiable charcoal.

C/S	Context description	kg/l	Wt	Identifiable ancient charred plant remains		IDs
				Washover	Residue	
31/AA	fill of small late Neolithic pit 30	55/40	12/3	mostly very silted deformed charcoal (to 12 mm), one very silted cereal grain (?wheat – Triticum) of poor preservation (eroded and distorted)	slightly silted charcoal (to 10 mm), nine slightly silted fragments of hazel (Corylus avellana L.) nutshell	Oak (Quercus)
46/AA	early Bronze Age cremation deposit within urn 45, in cremation pit 47	6/5	22/56	mostly slightly silted charcoal (to 15 mm), two bulbs of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans)	slightly silted charcoal (to 20 mm)	ash/oak (Fraxinus/Quercus)
48/AA	fill of early Bronze Age cremation pit 47, around urn 45	5/4	4/2	silted charcoal (to 10 mm)	silted charcoal (to 5 mm)	No
54/AA	fill of small pit/posthole 53, immediately adjacent to cremation pit 47 but no obvious association	37.5/28	92/31	silted charcoal (to 30 mm), one grain of spelt wheat (Triticum spelta L.), five bulbs of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans), one achene of black-bindweed (Fallopia convolvulus (L.) Á. Löve)	slightly silted charcoal (to 15 mm)	Oak (Quercus)
55/AA	fill of Romano-British pit 57	47.5/31	38/2	silted charcoal (to 15 mm), four grains of barley (Hordeum distichon L./H. vulgare L.), one grain of naked wheat (Triticum aestivum L./T. durum Desf./T. turgidum L.), one grain of oat (Avena), 16 grains of spelt wheat (Triticum spelta L.), one grain of emmer/spelt wheat (Triticum dicoccum Schübl./T. spelta L.), five grains of wheat (Triticum), 46 unidentified cereal grains – all grains very silted, four caryopses of brome (Bromus), one achene of black-bindweed (Fallopia convolvulus (L.) Á. Löve), two nutlets of cleavers (Galium aparine L.), one bulb of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans)	slightly silted charcoal (to 10 mm), one fragment of hazel (Corylus avellana L.) nutshell, six pieces of coal (to 8 mm), two pieces of cinder (to 5 mm)	Oak (Quercus)
61/AA	fill of posthole 60, part of roundhouse 190	23.5/17	32/<1	silted charcoal (to 15 mm), one bulb of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans), one achene of black-bindweed (Fallopia convolvulus (L.) Á. Löve)	slightly silted deformed charcoal (to 10 mm)	Oak (Quercus)

C/S	Context description	kg/l	Wt	Identifiable ancient charred plant remains		IDs
				Washover	Residue	
68/AA	fill of posthole 67, part of roundhouse 190	20/14	105/-	mostly silted charcoal (to 15 mm), one silted grain of barley (Hordeum distichon L./H. vulgare L.), one fragment of hazel (Corylus avellana L.) nutshell		Deciduous wood
69/AA	upper fill or (possibly) recut fill within segment 70 of ring ditch 23. Probable early Bronze Age date	49/34	472/2	mostly slightly silted charcoal (to 20 mm), two bulbs of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans)	slightly silted charcoal (to 10 mm)	Oak (Quercus)
69/AB	upper fill or (possibly) recut fill within segment 70 of ring ditch 23. Probable early Bronze Age date	17.5/14	137/1	slightly silted deformed charcoal (to 20 mm), one bulb of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans),	slightly silted deformed charcoal (to 10 mm)	Ash/oak (Fraxinus/Quercus)
74/AA	fill of segment 73 of ditch 71	47.5/32	9/14	some silted deformed charcoal (to 20 mm), one grain fragment of ?oat (Avena), one poorly preserved unidentified cereal grain, one bulb of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans)	slightly silted charcoal (to 20 mm)	Oak (Quercus)
82/AA	fill of early Bronze age cremation pit 81, external to pot 87	?	51/2	mostly silted deformed charcoal (to 20 mm), seven bulbs and five root/rootlet fragments (to 10 mm) of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans)	mostly silted charcoal (to 20 mm), one bulb of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans), three fragments of roots (to 10 mm; probably from onion couch)	oak (Quercus)
84/AA	fill of early Bronze Age cremation pit 83	?	7/79	mostly silted charcoal (to 20 mm), seven bulbs of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans), one seed of ribwort plantain (Plantago lanceolata L.)	mostly slightly silted charcoal (to 20 mm), ten bulbs of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans), 27 fragments of rhizome/roots, six tuber fragments	Oak (Quercus)
86/AA	fill of early Bronze Age cremation pit 85	?	6/9	mostly silted charcoal (to 13 mm), twelve bulbs of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans)	mostly silted charcoal (to 8 mm), three fragments of hazel (Corylus avellana L.) nutshell, six fragments of rhizome/root (to 10 mm)	No
90/AA	fill of posthole 89	23/16	12/1	silted deformed charcoal (to 15 mm), one grain of spelt wheat (Triticum spelta L.), two bulbs of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans)	slightly silted charcoal (to 8 mm)	alder/birch/hazel (Alnus/ Betula/Corylus) - twig fragment

C/S	Context description	kg/l	Wt	Identifiable ancient charred plant remains		IDs
				Washover	Residue	
98/AA	fill of pit 97, cutting natural feature 95	46.5/30	83/3	silted charcoal (to 20 mm), one bulb of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans)	slightly silted deformed charcoal (to 10 mm)	Oak (Quercus)
108/AA	fill of pit 107	43/31	46/4	very silted deformed charcoal (to 20 mm)	slightly silted charcoal (to 10 mm), 47 fragments of hazel (Corylus avellana L.) nutshell	alder/hazel (Alnus/Corylus), oak (Quercus), ash/oak (Fraxinus/Quercus)
113/AA	charcoal lens near top of probable recut within segment 111 of ring ditch 23	10/6	462/1	mostly silted deformed charcoal (to 20 mm)	Silted deformed charcoal (to 10 mm)	ash/oak (Fraxinus/Quercus)
115/AA	fill of recut within segment 114 of ditch 32	51/34	39/-	a little silted charcoal (to 10 mm)		No
129/AA	fill of pit 128	12.5/9	44/4	mostly silted charcoal (to 35 mm)	Silted charcoal (to 20 mm), two fragments of hazel (Corylus avellana L.) nutshell	oak (Quercus) – stemwood
151/AA	fill of rock-cut small pit or posthole 150	11/9	12/-	some silted charcoal (to 10 mm)		No
153/AA	fill of small prehistoric pit 152	24/17	24/3	very silted charcoal (to 10 mm), one grain of naked/emmer wheat (Triticum aestivum L./T. durum Desf./T. turgidum L./T. dicoccum Schübl.), one emmer/spelt wheat (Triticum dicoccum Schübl./T. spelta L.), one poorly preserved caryopsis of ?oat (Avena), one caryopsis of oat/brome (Avena/Bromus)	Silted charcoal (to 15 mm)	alder/birch/hazel (Alnus/Betula/ Corylus) - twig fragment, oak (Quercus)
198/AA	fill of pit 197, adjacent to roundhouse 190	42/35	292/156	mostly deformed poorly preserved charcoal (to 25 mm), one bulb of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans), two nutlets of cleavers (Galium aparine L.)	charcoal (to 30 mm)	ash/oak (Fraxinus/Quercus), oak (Quercus) – stemwood
225/AA	fill of posthole 224 of structure 223	23/16	24/1	silted charcoal (to 10 mm), one bulb of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans), one achene of black-bindweed (Fallopia convolvulus (L.) Á. Löve), two achenes of knotweed (Persicaria)	Silted charcoal (to 15 mm)	Oak (Quercus)
227/AA	fill of posthole 226 of structure 223	27/18	38/-	silted charcoal (to 20 mm), one small unidentifiable cereal grain fragment, four achenes of black-bindweed (Fallopia convolvulus (L.) Á. Löve)		Oak (Quercus)

C/S	Context description	kg/l	Wt	Identifiable ancient charred plant remains		IDs
				Washover	Residue	
229/ AA	fill of posthole 228 of structure 223	21/14	16/-	silted charcoal (to 10 mm), one bulb of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans)		alder/hazel (Alnus/ Corylus), ash/oak (Fraxinus/ Quercus)
237/ AA	fill of posthole 236 of structure 223	20/13	13/-	silted charcoal (to 10 mm), one grain fragement of ?oat (Avena), one bulb of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans), one achene of black-bindweed (Fallopia convolvulus (L.) Á. Löve)		No
249/ AA	fill of pit 248. No obvious associations	11/7	2/4	some slightly silted charcoal (to 10 mm)	two fragments of hazel (Corylus avellana L.) nutshell (to 5 mm)	No
257/ AA	fill of late Neolithic pit 256	50.5/32	15/10	some silted charcoal (to 10 mm), one nutlet of cleavers (Galium aparine L.), one tiny fragment of hazel (Corylus avellana L.) nutshell, one seed of tare (Vicia hirsuta (L.) Gray/V. tetrasperma (L.) Schreb.), two unidentified buds	Mostly slightly silted charcoal (to 20 mm; some deformed), 12 fragments of hazel (Corylus avellana L.) nutshell (to 10 mm)	alder/birch/hazel (Alnus/ Betula/ Corylus), oak (Quercus)
266/ AA	fill of Neolithic pit 265	54.5/32	23/1	some silted charcoal (to 8 mm), four grains of emmer/spelt wheat (Triticum dicoccum Schübl./T. spelta L.), one unidentifiable cereal grain – all grains silted and poorly preserved, 18 fragments of hazel (Corylus avellana L.) nutshell, two bulbs of onion couch (Arrhenatherum elatius (L.) P. Beauv. ex J. & C. Presl var. bulbosum (Willd.) St-Amans), one seed of tare (Vicia hirsuta (L.) Gray/V. tetrasperma (L.) Schreb.)	charcoal (to 8 mm), 14 fragments of hazel (Corylus avellana L.) nutshell (to 10 mm)	No
279/ AA	fill of pit 278	18/11	12/<1	silted charcoal (to 10 mm), one fragment of hazel (Corylus avellana L.) nutshell, one fragment of rhizome/root	One fragment of charcoal (to 5 mm)	No
291/ AA	primary fill of Neolithic pit 288	41/28	32/<1	mostly slightly silted charcoal (to 10 mm), one grain fragment of emmer/spelt wheat (Triticum dicoccum Schübl./T. spelta L.), one caryopsis of heath-grass (Danthonia decumbens (L.) DC.)	one piece of silted charcoal (to 10 mm)	ash/oak (Fraxinus/Quercus), ?oak (cf. Quercus)
302/ AA	primary fill of segment 300 of ditch 32	41/28	2/-	a little charcoal (to 3 mm)		No

C/S	Context description	Total frags	Wt	Notes
54/AA	fill of small pit/posthole 53, immediately adjacent to cremation pit 47	57	11	The bone recovered from this deposit had been calcined and all the fragments were small (to 25 mm) and white in colour. The edges of some of them were a little rounded. Although the appearance of the bone suggested that these remains were those of animals. None of the bones could be identified to species but several were clearly shaft fragments (one possibly a metatarsal fragment from a medium-sized mammal – ?a juvenile sheep/goat). Other remains included mandible, cranium and possible humerus/tibia shaft fragments.
55/AA	fill of Romano-British pit 57	79	16	Bone recovered from this sample was very fragmented and most fragments were small (to 23 mm). Some of the fragmentation resulted from fresh breakage. All of the bones were burnt were white (some had a slightly bluish tinge) in colour. Although no fragments could be identified to species, some appeared to represent medium-sized mammals and included maxilla/mandible, rib and shaft fragments.
98/AA	fill of pit 97	32	4	All of the 32 bone fragments (to 22 mm) were burnt and were white in colour. Preservation was good, although fresh breakage damage was extensive. One juvenile pig metacarpal was identified, together with several fragments of medium-sized mammal rib and shaft.
153/AA	fill of small prehistoric pit 152 (?Iron Age)	34	5	Thirty-four burnt bone fragments (to 27 mm) were recovered. They were white in colour. None were identifiable but the texture and appearance of the bone did not appear to be consistent with human remains. There were several shaft fragments and a piece of cranium/ mandible. Fresh breakage damage was apparent.
227/AA	fill of post-hole 226 of structure 223	4	3	Four burnt fragments of bone were present. All were white in colour and appeared to represent the same bone (fresh breakage damage) – a ?medium-sized mammal carpal (largest fragment to 15 mm).

Key: 'C/S' = Context number/Sample designation; 'Total frags' = total number of fragments recovered; 'Wt' = weight of fragments in grammes.

Table 9: Vertebrate remains recovered from five residues.

general, quite good and there was little indication that the material had been disturbed or reworked; many of the individual fragments were too small to be readily identifiable. However, some of the larger pieces could be identified as oak (*Quercus*), with a smaller component that was alder/birch/hazel (*Alnus/Betula/ Corylus*), all probably deriving from local woodlands. The largest concentrations of charcoal were recovered from two fills of the ring ditch of the early Bronze Age barrow, Contexts 69 and 113, and fills of two pits, Contexts 54 (fill of pit 53, associated with early Bronze Age cremation pit 47) and 198 (undated fill of pit 197, adjacent to roundhouse 190). The charcoal from the ring ditch and from pit 53, together with oak charcoal from Context 46, probably derives from the cremation pyres. Oak is the most commonly identified fuel wood for cremation pyres in Britain in the Bronze Age, probably because of its abundance and also because it burns at the prolonged high temperatures necessary for cremation (Barnett 2008).

The most frequently recorded plant macrofossils from the early Bronze Age cremation deposits (Contexts 46, 82, 84 and 86) were 'bulbs' of onion couch (*Arrhenatherum elatius* (L.) P. Beauv. ex J. & C. Presl var. *bulbosum* (Willd.) St-Amans). These tubers are particularly characteristic of Bronze Age cremation deposits (Godwin 1975) and their identification at this type of site is widespread, e.g. from Melton, East Riding of Yorkshire (Jaques *et al.* 2007), from a cremation site at Rollright Stones, Oxfordshire (Robinson 1988), from cremation pits at Abingdon, Oxon (Jones 1978) and from an early Bronze Age Cairn at Sketewan (Dickson 1997). This repeated occurrence suggests that the bulbs were not an accidental inclusion in the deposits and Robinson (1988) has discussed the possibility that this plant was specifically used as fuel in cremation pyres – it is easily uprooted and useful as tinder when dried. It has also been proposed that the bulbs were collected for food (Jones 1978) and they may represent a ritual offering that had, perhaps, been placed on the pyre. There is, as yet, little evidence for onion couch remains in non-cremation contexts or for their use in 'domestic' activities.

Twelve other deposits gave bulbs or rootlet fragments of onion couch and, whilst the fragments from Context 54 (the fill of an undated pit immediately adjacent to cremation pit 47) and Context 69 (fill of ring ditch 23) may derive from cremation pyres nearby, remains from the other deposits (Contexts 55, 61, 74, 90, 98, 198, 225, 229, 237 and 266), some of which were undated and some of which were of Neolithic and probable Iron Age/Roman date, may be indicative of the use of this plant in earlier and later periods or perhaps suggest the presence of reworked material. Elsewhere, there are several records of this species from deposits of later date, however. Van der Veen (1987) identified tubers of onion couch from Iron Age deposits at Thorpe Thewles, Cleveland and Roman cremations in France (Priess *et al.* 2005) included onion couch together with remains of crop plants and fruits/nuts. At the latter, it was suggested that they were collected for their edible properties. It must be noted though, that with the exception of Context 55, most of these other deposits gave only one or two bulbs, whereas in comparison, there were twelve from Context 86 and five from Context 54.

Context 291 (primary fill of Neolithic pit 288; calibrated radiocarbon date (2σ) of 3780-3650 cal. BC) gave a

Context	Context description	Total frags	Wt	Notes
46	early Bronze Age cremation deposit within urn 45, in cremation pit 47	4	2	Unidentified: 4 unidentified calcined fragments (to 15 mm)
55	fill of Romano-British pit 57	34	85	Preservation of the remains (fragments to 50 mm) from this deposit was poor, with extensive fresh breakage damage and bone soft. Mainly teeth recovered, some of the larger ones had poor enamel. Cattle: 2 maxillary molars, 1 maxillary premolar, 1 mandibular molar. Caprovid: 1 mandibular molar Pig: 1 mandible fragment with small male canine, deciduous incisor, 2 erupted permanent incisors and 2 just erupting incisors, also second and third premolars. Tip of another canine present – probably the other side of this mandible. Unidentified: 2 calcined large mammal shaft fragments, 13 other unidentified burnt fragments, 4 unburnt fragments.
82	fill of early Bronze age cremation pit 81, external to pot 87	2	2	2 (to 20 mm) burnt fragments Pig: 1 distal radius fragment, left side, could be unfused Unidentified: 1 fragment
84	fill of early Bronze Age cremation pit 83	20	14	20 fragments (to 40 mm), calcined, fresh breakage damage. Pig: 1 fragment of distal radius epiphysis, left, unfused, 1 piece of radius shaft, left, distal unfused, 2 carpals Caprovid: 1 distal humerus fragment, left, fused, 1 ?ulna fragment. Unidentified: 6 medium-sized mammal shaft fragments (2 possibly pieces of the pig radius), 8 unidentified fragments.

Key: 'Total frags' = total number of fragments recovered; 'Wt' = weight of fragments in grammes.

Table 10: Hand-collected vertebrate remains recovered from four deposits

single record of heath-grass (*Danthonia decumbens* (L.) DC.) which may have originated from peat or turf burnt for fuel at this site. Records reflecting the use of peat are quite common from deposits from the Neolithic onwards (see Hall 2003), and it would seem that this resource was widely utilised, as fuel and/or in construction (e.g. for turf roofs), in prehistoric and later times.

Charred hazelnut shell fragments, most likely representing remains of a gathered human food resource, were recovered from ten of the deposits. Contexts 108 (fill of ?prehistoric pit 107) and 266 (fill of pit 265) gave rather more substantial assemblages highlighting the relative importance of this food resource at prehistoric sites – most frequently found on sites of Neolithic date (e.g. Jones 2000; Robinson 2000; Rowley-Conwy 2004). The two larger collections from Mitchell Laithes were both initially from deposits of uncertain date, but a few fragments of hazelnut shell from Context 266 were submitted for radiocarbon dating and returned Neolithic calibrated dates (2σ) ranging from 3710 to 3635 BC. Context 108 may also be of a similar date given that the fill was from a feature possibly associated with a small rock-cut pit which produced an assemblage of later Neolithic pottery.

Context 266 also produced a few grains of emmer/spelt wheat (*Triticum dicoccum* Schübl./*T. spelta* L.), with traces of onion couch and tare (*Vicia hirsuta* (L.) Gray/*V. tetrasperma* (L.) Schreb.), but the assemblage was rather small for reliable interpretation. Similar assemblages have been recorded from Neolithic pit fills from a nearby site at Bell Hill, Stourton, near Leeds (Snelling 2001). Archaeobotanical studies of Neolithic sites in West Yorkshire are rare, however (see Hall and Huntley 2007), so little comparative data exists. According to Brown (2007), the onset of crop cultivation in Britain did not occur before *c*.3950 BC (calibrated) based on radiocarbon dates of charred cereal grains, but this study supports the case for Neolithic agriculture and the conclusion of Rowley-Conwy (2004) that the Neolithic population was neither nomadic nor dependent mainly upon wild foods.

Cereal grains were identified in ten of the other samples but mostly limited to just one or two grains. The exception to this was Context 55 (fill of Romano-British pit 57) which gave a slightly larger (although still small) but poorly preserved grain assemblage (the remains being very silted and distorted). In spite of the poor preservation, at least five cereal taxa were identified: barley – *Hordeum distichon* L./*H. vulgare* L., naked wheat – *Triticum aestivum* L./*T. durum* Desf./*T. turgidum* L., emmer wheat – *Triticum dicoccum* Schübl., spelt wheat – *Triticum spelta* L. and oat – *Avena*. All of the cereal remains most likely derive from crop processing activities undertaken nearby and the composition of the assemblage was consistent with records of others of Romano-British date from the British Isles (Greig 1991; Van der Veen and O'Connor 1998). This deposit also gave a few charred remains of agricultural weeds, presumably collected accidentally together with the crop plants. Identified weed taxa included black-bindweed (*Fallopia convolvulus* (L.) Á. Löve), brome (*Bromus*) and cleavers (*Galium aparine* L.).

The vertebrate material recovered from the samples and by hand-collection was extremely fragmented

and few of the remains were identifiable. With the exception of the material from Context 55, most of the fragments were burnt and were white in colour, providing evidence for burning at high temperatures or for a prolonged period of time.

The calcined animal bone from the cremations (Contexts 46, 82 and 84) and from the fills (Contexts 54 and 98) of pits which were closely associated with cremation pit 47 probably represent remains from the cremation pyre. The presence of animals remains within the remnants of a cremation pyre, or mixed amongst the cremated remains of the [human] body, is a common occurrence in Bronze Age cists, barrows and burials (e.g. Hollow Banks, Scorton – Jaques 2004; Davidstow Moor, Cornwall – Christie 1988). It is not entirely clear what purpose the animals served or where they fitted into the funeral ceremony but various theories have been proposed, including that they represent sacrificial offerings of food for the afterlife placed on the pyre with the body or that these remains were waste from feasting (MacGregor 2003).

The fill (Context 55) of Romano-British pit 57, was the only other deposit to provide any quantity of bone. The sample from this deposit gave a somewhat fragmented assemblage, with all fragments being burnt. The hand-collected material was mostly unburnt and identifiable fragments were largely restricted to teeth of the main domestic mammals. These remains probably represent butchery waste but the poor preservation of the assemblage suggests that taphonomic factors have influenced the remains that have survived, thus providing a biased picture. Vertebrate remains from the other two deposits were extremely fragmented and too few identifiable fragments were available for any interpretation.

Radiocarbon dates

The site produced relatively little material suitable for radiocarbon dating. The acid soil conditions meant that un-cremated bone only survived (poorly) in a single pit fill (context 55), perhaps due to differing chemical conditions resulting from the presence of a large and varied finds assemblage and much burnt material.

Carbonised plant material was also in general poorly preserved and was only present in small quantities within contexts from which soil samples were recovered. During analysis of the carbonised plant remains, potential radiocarbon samples were identified by PRS. The final selection of submitted samples was made following a number of criteria, primarily the availability of suitable material and whether any resulting date would have a value over and above dating a single feature.

Samples were submitted from each of the Early Bronze Age cremations, both to date them individually, to provide a date-range for use of the barrow and indicate whether the satellite burial was broadly contemporary with interment beneath the mound, and also to provide high-quality dates for the associated material culture, particularly the pottery vessels. Cremated human bone was used in each case in order to avoid the possibility of intrusive or residual material being submitted.

Two samples (one each of carbonised grain and hazelnut shell) were submitted from pits containing early Neolithic pottery. One sample was selected from each of the two areas of the site where such features were located, in order to both to date this activity and in order to determine whether the discrete groups of features represented contemporary or successive phases of occupation. A sample of carbonised plant remains was also submitted from one of the postholes of Structure 223, also considered to conceivably date from this period of activity; however the sample provided insufficient carbon to provide a radiocarbon date (GU-17793), and the structure remains undated.

A sample of carbonised hazelnut shell was submitted in order to date a pit which, on the grounds of containing a small assemblage of Peterborough Ware, was considered likely to represent a middle Neolithic phase of activity within the site.

It was considered that the Neolithic Grooved Ware assemblage from Pit 30 warranted multiple dates, it being the first relatively large assemblage of such material from West Yorkshire, and also due to the availability of high quality sample material (carbonised residue on the potsherds) certain to be derived from short-lived food species and deriving directly from use of the vessels.

A sample of hazelnut shell submitted in order to provide a date for the presumed Iron Age roundhouse Structure 190 returned an early Neolithic date, suggesting that the sample material was residual; the date did, however, serve to complement the other early Neolithic dates from the site.

The results of the radiocarbon dating programme are presented in Table 11, and are discussed in the various specialist reports above and the general discussion below.

DISCUSSION

Earlier Neolithic

It was notable that the evidence for the earlier Neolithic activity (both excavated features and topsoil finds) was spread across the northern edge of Area C, in an area of slightly lower ground between the terrace summit occupied by the Bronze Age barrow and the main hill-slope rising to the north (Fig. 32). This location would have afforded some shelter from the prevailing winds which blow otherwise unimpeded down the Calder Valley, whilst still providing full access to the resources of both the nearby valley floor and the higher ground, and with a convenient nearby supply of fresh water in the Pildacre Beck.

That this activity included some form of at least temporary settlement is indicated by the presence of

Table 11: Radiocarbon dating results

Context	Context Type	Cultural Association	Sample Code	Method	Sample Material	Age bp	Calibrated range BC 68.2% (1)	Calibrated range BC 95.4% (2)
31	Pit fill	Grooved Ware	SUERC-21247 (GU-17784)	AMS	Carbonised residue on potsherd	3935±30	2480-2400 (47.6%) 2390-2340 (20.6%)	2570-2530 (5.9%) 2500-2300 (89.5%)
31	Pit fill	Grooved Ware	SUERC-21249 (GU-17786)	AMS	Carbonised residue on potsherd	3955±30	2570-2520 (22.2%) 2500-2450 (39.4%) 2420-2400 (4.3%) 2380-2350 (2.4%)	2570-2510 (27.3%) 2500-2340 (68.1%)
46	Cremation	Collared Urn	SUERC-21248 (GU-17785)	AMS	Cremated bone: long bone, human	3485±30	1880-1840 (26.6%) 1830-1750 (41.6%)	1890-1730 (93.8%) 1710-1690 (1.6%)
68	Posthole fill		SUERC-21250 (GU-17787)	AMS	Charred nutshell: hazel	4690±30	3520-3490 (15.2%) 3460-3370 (53.0%)	3630-3590 (10.6%) 3530-3370 (84.8%)
82	Cremation		SUERC-21258 (GU-17792)	AMS	Cremated bone: long bone, human	3515±30	1890-1860 (15.5%) 1850-1770 (52.7%)	1920-1750 (95.4%)
84	Cremation	Bone bead	SUERC-21251 (GU-17788)	AMS	Cremated bone: long bone, human	3510±30	1890-1860 (13.5%) 1850-1770 (54.7%)	1920-1740 (95.4%)
86	Cremation		SUERC-21255 (GU-17789)	AMS	Cremated bone: long bone, human	3450±30	1880-1840 (16.7%) 1820-1800 (4.4%) 1780-1730 (33.2%) 1720-1690 (14.0%)	1880-1680 (95.4%)
257	Pit fill	Poss. Peterborough Ware	SUERC-21256 (GU-17790)	AMS	Charred nutshell: hazel	3945±30	2550-2530 (5.9%) 2490-2430 (38.9%) 2420-2400 (8.9%) 2380-2340 (14.5%)	2570-2520 (15.0%) 2500-2340 (80.4%)
266	Pit fill	Grimston Ware	SUERC-21257 (GU-17791)	AMS	Charred nutshell: hazel	4880±30	3695-3675 (23.4%) 3670-3640 (44.8%)	3710-3635 (95.4%)
291	Pit fill	Grimston Ware	SUERC-21259 (GU-17794)	AMS	Charred grain: emmer/spelt wheat	4930±30	3750-3740 (1.8%) 3715-3655 (66.4%)	3780-3650 (95.4%)

probable structures. Most of the features within the group at the north-eastern corner of Area C were arranged in lines. Features 268, 270, 292, 294 and 296 clearly formed a line of postholes complete with packing stones, and the two end features also produced early Neolithic potsherds. It seems reasonable to assume that the two shorter strings of features, 260/263 and 278/280/282 were also structural in nature, and the latter also produced potsherds. Darvill (1996, 85-8) has classified earlier Neolithic houses in England and Wales; in his system (Type B) "...ridge-defined buildings, generally rectangular in plan, can be recognised by the presence of a line of postholes supporting major uprights, flanked sometimes by smaller postholes and lengths of beam-slot. These are amongst the most difficult structures to recognize during excavation as evidence for wall-lines is sparse or non-existant unless the building was constructed in a hollow...". The line of features 268-296 is similar in length to the central line of postholes recorded in early Neolithic Type B structures elsewhere, as for example at Kemp Knowe, Cowlam, East Yorkshire and Windmill Hill, Wiltshire (Mortimer 1905, 336-8; Smith 1965, 25-7). By analogy to these structures and assuming a similar form of construction this would have given the Mitchell Laithes buildings a floor area of perhaps as much as 10m by 5m. Equally, these groups of features could represent small wind-breaks.

Although no dating evidence was recovered from Structure 223 at the central northern edge of the area, and it was not possible to obtain a radiocarbon date, in form it is again strongly reminiscent in both form and size to excavated Neolithic structures of Darvill's Type A, "...which are represented archaeologically by rectangular arrangements of postholes..." (*op cit*, 85-6). The presence of fragments of burnt animal bone and carbonised cereal grains within the postholes suggests a domestic use for this structure.

Apart from the possible structures, several pits across the northern part of the excavated area (265, 288 and probably 256) produced Grimston-style pottery, and it is likely that other pits which did not produce finds were contemporary. Apart from several flint scrapers of earlier Neolithic types recovered from topsoil across the northern part of the area, the only other recognisably early Neolithic flint object recovered from within a feature was a scraper fragment from pit 105, located towards the middle of the area. Although this item could have been residual, there is no reason why pit 105, nearby pit 148 and other undated pits within the central part of the excavated area could not date from this phase of activity.

As Manby (above) has noted, although there is an overlap between the calibrated date ranges for the two pottery-associated early Neolithic radiocarbon dates, variation within the pottery assemblage suggests that the differing results reflect true differences in the dates of the groups of features. That the third early Neolithic radiocarbon date from the site (from residual material recovered from Structure 190) is both spatially and temporally distinct from the other results supports this view. The evidence from Mitchell Laithes supports the generally held view of most Neolithic occupation as being episodic in nature (eg. Fenton-Thomas 2009, 92-5). From what little evidence is available, small, lightly constructed 'houses' and small groups of pits are the typical 'settlement' site-type across lowland northern England throughout most of the Neolithic period. An example of this type of settlement was

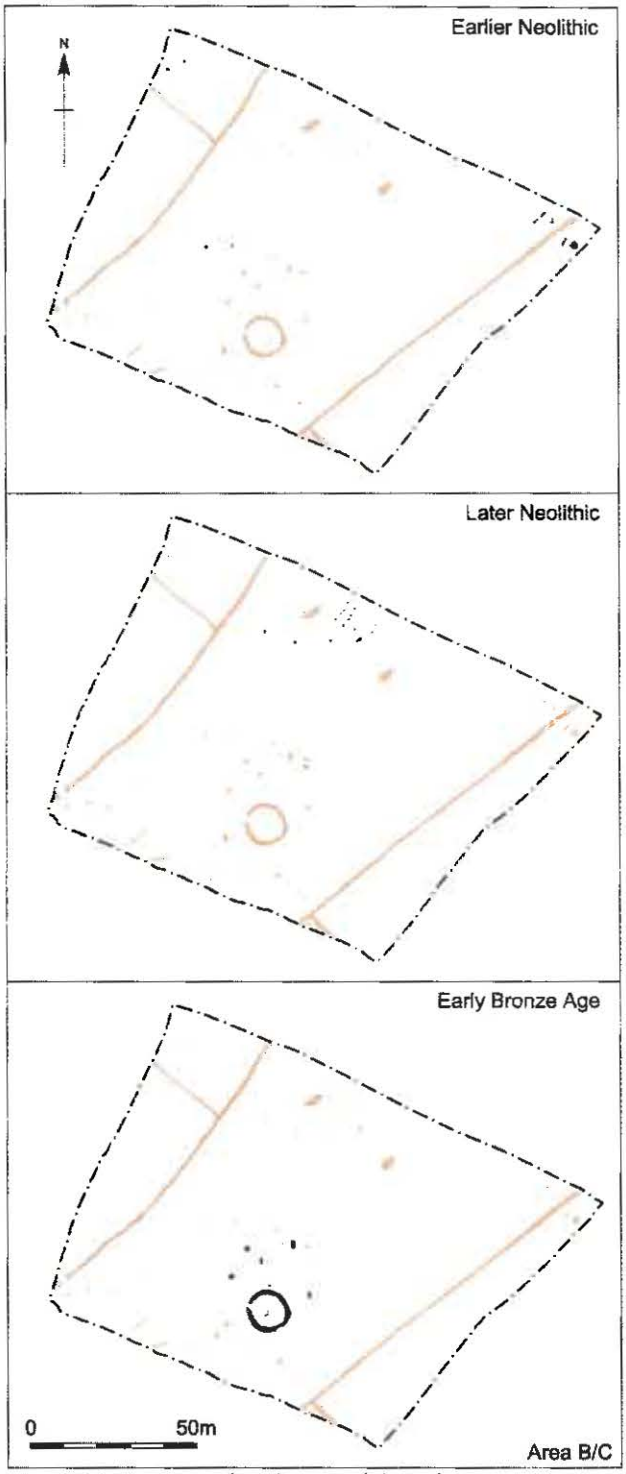


Figure 32: Suggested Earlier Neolithic phasing

excavated at at Hollow Banks Farm, Scorton, North Yorkshire. A small structure consisting of a shallow oval construction slot with central posts and containing sherds of Peterborough Ware pottery was associated with a small dispersed group of pits, which also produced Peterborough Ware, worked flints and a stone loom- or fishing weight (Speed, forthcoming). At Sewerby Cottage Farm, Bridlington, separate phases of Neolithic structures in one area were "...paralleled by

phases of pit groups..." in another part of the site, the radiocarbon dates suggesting that the sequences were related to one another (Fenton-Thomas *op cit* 78-9; tables 3 and 4).

Evidence for earlier Neolithic activity in West Yorkshire, particularly on the Coal Measures, is extremely limited; indeed apart from the complex of ritual monuments at Ferrybridge this also applies to the later Neolithic. Manby, King and Vyner did not cite any evidence for early Neolithic activity in their review of the archaeology of the Coal Measures (2003, 98-9). However, some excavated evidence is gradually emerging within the county. In 2001, an assemblage of Grimston-style pottery representing at least 20 vessels was recovered from an isolated pit at Bell Hill, Stourton (SE 323 293), some 11km north-east of Mitchell Laithes (Manby 2001). Radiometric dating of this material is yet to be carried out. A single pit at Rothwell, Leeds, has produced an assemblage of flint, Grimston Ware sherds and carbonised barley, wheat and hazelnut, and has produced a radiocarbon date of 4200-3800 cal BC (Vyner 2008, 4). Earlier Neolithic evidence was almost absent from sites investigated as part of the M1-A1 motorway development, although some flint and chert tools from two pits at Manor Farm to the north of Garforth (SE 405 336) were considered indicative of early Neolithic domestic occupation. One of these features produced an apparently anomalous Roman radiocarbon date (Brooks 2001, 195). Further to the east on the Magnesian limestone belt, only a single pit containing quantities of charred hazelnut shell and other foodstuffs was identified during widening of the A1 to the north-east of Castleford, and provided a calibrated radiocarbon date (2σ) of 3700-3520BC (SUERC-4360/GU-12379) (Brown *et al* 2007, 391). The small number of Neolithic and Early Bronze Age pits so far known in West Yorkshire contrasts sharply with numerous similar features that have now been excavated on a series of sites within the Vale of Mowbray a short distance to the north (eg. Tavener 1996; Dickson and Hopkinson 2011; Ambrey *et al* in prep.) and also with those recorded in East Yorkshire (e.g. Abramson 1996; Fenton-Thomas 2009); this cannot be explained away by differences in opportunites for modern large area excavations (of which West Yorkshire has seen far more in the last two decades than the Vale) and suggests a real difference between these areas. As Thomas has recently commented (2012, 2), pits of this type "... arguably offer a key measure of regional diversity in the Neolithic".

Later Neolithic

Evidence for continuing activity within the area of the site into the later Neolithic period was provided by the worked flint assemblage and by two pits which produced assemblages of probable Peterborough Ware and Grooved Ware pottery, both supported by radiocarbon dates centred on the third quarter of the 3rd millennium BC, broadly c.2500-2350BC.

Other than unstratified finds of lithics and polished stone axes there is still little excavated evidence for later Neolithic activity on the West Yorkshire Coal Measures. A probable later Neolithic 'floor' at Castle Hill, Almondbury, has produced a radiocarbon date calibrated to a broad range of 2912-2203 BC (Gilks 1992, 22). Excavations during construction of the M1-A1 link motorway identified isolated Neolithic pits, lithics, residual ceramics and polished stone axes at Stillington Common and Manor Farm to the west and north of Garforth (Howell 2001, 49; Burgess 2001, 76). A single small pit with later Neolithic pottery sherds was excavated in advance of a housing development at Lindley Moor, Huddersfield in 2000 (NAA 2001a). There is more extensive evidence for later Neolithic and early Bronze Age activity on the Magnesian Limestone belt slightly further to the east, perhaps as a result of the presence of major henge sites at Newton Kyme and Ferrybridge, and also due to several major archaeological campaigns of open area excavation and watching briefs associated with widening of successive sections of the A1 through the county.

The sherds of possible Peterborough Ware found at Mitchell Laithes add to a very sparse distribution for such material within West Yorkshire as a whole. During construction of the M1-A1 link motorway a small number of sherds were found residually in later features at Manor Farm (Burgess 2001a), but only a single residual sherd was recovered from an Iron Age pit near Ferrybridge henge, on the Darrington to Wetherby section of the A1 improvements (Richardson 2005, 56; Brown *et al* 2007, 25). No middle or later Neolithic pottery was recovered from Bell Hill, Stourton, which produced assemblages of both Early Neolithic and Early Bronze Age material (Robinson 2008). A small pit recorded during excavations at the site of the former castle in Wetherby in 2005 produced part of a Peterborough Ware vessel (Speed, in prep.). However, this find should perhaps be regarded as the southern limit of a widespread distribution of such material that has been recovered through the length of the Vale of Mowbray within North Yorkshire, including large quantities recovered from the mound make-up of an Early Bronze Age barrow just to the north at Green Howe, North Deighton (Wood 1971), within pits scattered across a broad area at Marton-le-Moor (Speed (ed.), in prep.), at Nosterfield (Vyner 2011), Baldersby (Ambrey *et al.* in prep.) and several locations at Catterick/Scorton and Easby Abbey (Speed 2010; forthcoming; Manby 2007b). This widespread Vale of Mowbray distibution contrasts with the scarcity of material across West Yorkshire.

The Durrington Walls style Grooved Ware assemblage recovered from pit 30 was of some significance. As discussed by Manby above, it is one of the largest groups of such material to have been recovered to date within West Yorkshire, its value being enhanced by the high quality radiocarbon dates obtained from carbonised residue derived directly from the pottery sherds. A single sherd of possible Grooved Ware was recovered at Swillington Common in 1996 (Vyner 2001, 149) and four sherds, of Durrington Walls style, were recovered from a small pit excavated at Lindley Moor, Huddersfield in 2000 (NAA 2001a). These sites lie respectively 17.5km north-east and 15km west of Mitchell Laithes. Charcoal accompanying the Lindley Moor sherds produced a calibrated radiocarbon date (95%) of 2470-2200BC (OxA-9790), slightly later than the determinations from Mitchell Laithes. Once again, this sparse distribution of sites contrasts sharply with

the situation to the north within the Vale of Mowbray where Grooved Ware finds are much more widespread.

Aspects of the Grooved Ware assemblage from pit 30 perhaps indicate some form of (admittedly possibly fairly short-lived) later Neolithic occupation of the site rather than a single visit with subsequent burial of rubbish in the pit. Duncan Garrow has conducted a detailed analysis of Neolithic and Beaker pits and their contexts within East Anglia. At Kilverstone on the outskirts of Thetford, Norfolk, it was possible to infer the sequence of excavation of individual pits within tightly grouped pit-clusters from the distribution of sherds from individual pottery vessels and re-fitting flint-knapping sequences (2006, 54-5). In one pit group, where nine pits had been dug apparently sequentially in a curving 'string', numerous (93) sherds from an individual vessel appeared in the second pit, and then rapidly diminished in number in (some but not all) successive pits up to the eighth (2 sherds), with none in the final pit. Sherds from other vessels, together with the refitting groups of flint fragments, showed similar and overlapping distribution patterns. From these results and other evidence relating to the physical condition of the potsherds, he concluded that the artefacts had been stored elsewhere (presumably above-ground) for a period after breakage, with additional material being periodically added and with part of the accumulating deposit then being used to fill individual pits.

It seems quite likely from its nature that the artefact assemblage from pit 30 at Mitchell Laithes was the product of a similar process. Manby (above) has highlighted that the largest group of sherds, vessel GW1, representing just over half of the material by weight and including the largest sherds, was un-weathered with sharp breaks and retaining carbonised encrustations. The remainder of the material consisted of either single or small groups of weathered sherds representing small fractions at least eight other vessels, together with a number of heavily eroded and weathered sherds unattributable to any of the other vessels. The 'fresh' condition of the sherds from vessel GW1 suggests that it had been broken only shortly before burial within the pit. By contrast, the other sherds had clearly spent some time in an environment where they were exposed to weathering prior to inclusion within the pit (the continuing 'fresh' condition of the GW1 sherds demonstrating that the weathering had not occurred after inclusion).

Such Neolithic pits are found singly, commonly in pairs, or in larger groups, but are often not obviously associated with other contemporary features. Work at Marton-le-Moor in North Yorkshire along a 4km construction corridor during widening of the A1 did, however, demonstrate that although widely dispersed, such pits can form part of a very widespread 'occupied' landscape, in that case with similar pits dating from a protracted period from the earlier Neolithic through to the Beaker period (Speed (ed.) in prep.). The presence of early, middle and later Neolithic pits within the same section of that motorway corridor indicated a relatively static pattern of recurrent activity throughout the period. A recent limited programme of radiocarbon dating of isolated 'undated' pits along the route of the A1 improvements northwards from Marton-le-Moor to Leeming has shown that the majority of such features also had a similar date-range (Ambrey *et al.* in prep.). A similar pattern of Neolithic occupation is likely to have been represented at Mitchell Laithes (Fig. 32), the apparently wide temporal spacing of the occupation episodes perhaps more a product of the restricted size of the excavated area, with unidentified pit groups from other parts of the Neolithic possibly being present in the immediate surrounding area. The location of the site would have had a continuing attraction for occupation, overlooking the river valley and its resources, particularly if, as has been speculated above, the river channel once lay closer to the site, easing access to water.

As noted above, there is a possibility that the ring of postholes, Structure 190, could represent an earlier prehistoric post-circle. The only dating evidence recovered from the available postholes, which were all fully excavated, was carbonised hazelnut shell which produced a calibrated radiocarbon date (2) of 3630-3370BC and is considered likely to be residual material. Gibson (2005, 155-73) produced a gazetteer of the then-known Neolithic and Early Bronze Age timber circles in Britain and Ireland. This showed that they generally varied from 7-44m in diameter, with several larger examples, meaning that Structure **190** at Mitchell Laithes, at 11.5m, lay comfortably within the lower end of the size range. The only examples listed by Gibson for West Yorkshire were the Ferrybridge North and South circles excavated in 1989, each 15.5m in diameter and consisting of respectively thirteen and twelve posts and each also with a central posthole (Wheelhouse 2005, 48 and fig. 36). To these can be added three additional examples excavated nearby during construction of the Holmfield Interchange in 2001-2. Hengiform ditched enclosure 155 incorporated a circle of twelve posts with a diameter of 13.5m (*op cit* 28 and fig. 13); timber circle 140 with 12 posts and 35m in diameter (*op cit* 37 and fig. 27); and timber circle 165 with eight posts and 22m in diameter (*op cit* 41 and fig. 30). Structure 190 at Mitchell Laithes, if symmetrical, will have consisted of twelve posts, and hence appears to share a common architecture with some of the Ferrybridge circles. The postholes forming the Ferrybridge North and South monuments were of similar dimensions to those at Mitchell Laithes (*op cit* 48-9). Due to the limit of the available excavation area it was not possible to determine whether a central posthole was present at Mitchell Laithes.

Gibson concluded from the available dating evidence that timber circles were mainly constructed during the period c.2800-1500BC (*ibid*, 201), surporting the surmise that the available date from Mitchell Laithes derives from residual material.

The Early Bronze Age Barrow

The ring ditch was located in a typical position for a Bronze Age barrow, highly visible both across and up and down the valley for a considerable distance, and also from a wide arc of higher ground to the north (Fig. 10), depending on the contemporary tree cover. Whether it was deliberately sited in a similar location to the earlier pits and the possible timber

circle, in a continuing tradition of use of the same location for 'ritual' purposes, cannot be demonstrated. However, there are numerous excavated examples of the juxtaposition of Early Bronze age barrows either adjacent to or over earlier pits, as for example at Upper Ninepence in the Welsh borders, where pits containing Peterborough and Grooved Wares were sealed by the barrow mound (Gibson 1999, 33-47), and at Catterick Racecourse, North Yorkshire where a group of pits containing Rudston Style pottery lay immediately next to a large Early Bronze Age cairn (Moloney *et al* 2003, 6-9). The barrows at Bell Hill, Stourton, lay in an area also containing earlier and later Neolithic or Early Bronze age pits (Robinson 2008). The common presence of large quantities of residual Neolithic pottery in barrow-mound make-up, as at Green Howe, North Deighton (Wood 1971), also implies a similar continuity of focus. At both Sawdon Moor 1 and 2 on the North York Moors, pottery ranging in date from early Neolithic to Beaker was found in pits sealed beneath the barrows, in the buried ground surface and contained within the mound material (Brewster and Finney 1995, 11-24). Pre-barrow activity in the form of a considerable quantity of debris of later Neolithic and early Bronze Age date was found beneath, and incorporated into the body of, the mound of Barrow 1 at Walkington Wold in East Yorkshire (Bartlett and Mackey 1973, 6).

As noted above, breaks in later furrows crossing the area of the ring ditch at Mitchell Laithes suggest that it surrounded a mound which survived as an earthwork probably into the post-medieval period. That this feature was sufficiently substantial to resist a period of ploughing intense and prolonged enough to carve furrows into the bedrock to either side argues against an enclosed cemetery marked by an earthen ring-bank or ring cairn, which are "...a particular feature of the West Yorkshire uplands..." (Vyner 2008, 10) and also across the Pennines in Cumbria (Evans 2008, 177). A covering mound has also been suggested for the broadly contemporary collared urn burial at Stanbury (Vyner *loc cit*).

The diameter of the Mitchell Laithes barrow, at some 13m, falls well within the range for Early Bronze Age barrows excavated within West Yorkshire. Two barrow ring ditches excavated at Bell Hill, Stourton were 15.25m and 16.25m in diameter (Robinson 2008). Examples excavated at Ferrybridge by Pacitto in 1962 (Mounds I and II) and by Archaeological Services WYAS in 2001-2 (Barrows 135 and 154) had ditch diameters respectively of 16.5m (main inner ditch), 7.0m, 11.5m, and 15.0m (Pacitto 1969; Wheelhouse 2005, 37-9 and 42-8). Larger examples included barrows 113 (25m) and 114 (28.5m) (Wheelhouse *op cit* 28-31).

The group of three cremation burials located within the Mitchell Laithes barrow ditch, together with the fourth nearby burial, can be confidently dated to the period 1920-1680 BC based upon the four radiocarbon dates, supported by the presence of the accompanying Collared Urn and Accessory Cup. These classes of vessel are commonly found together, as within a cremation burial found earlier in 2007 at Cross Farm, Stanbury, near Haworth, some 30km to the north-west of Mitchell Laithes (Richardson and Vyner 2011). The Stanbury accessory cup is almost identical to that from Mitchell Laithes.

Holst (above) has suggested that cremations 82 and 84 perhaps represented the primary burials beneath the barrow, based upon the large quantities of cremated bone recovered, although this argument has recently been challenged (Richardson and Vyner 2011, 50-52). However, at Mitchell Laithes these were also the two cremations accompanied by grave-goods, the accessory cup and burnt flint flakes in burial 82 and a bone bead or toggle in burial 84; both cremations also included animal bones. The radiocarbon dates from these two individuals are near-identical and slightly earlier than for the other two cremations, supporting their primary status. That they represent an elderly man and woman who appear to have both had some status and died at a similar time suggests a direct relationship between the two.

Compared to other soil samples from the site, large quantities of carbonised bulbs of onion couch grass were identified in those taken from the three cremations beneath the barrow, despite the small sample volumes relative to those from other contexts. Additional bulbs were present within samples taken from lenses of carbonised material within the barrow ditch, perhaps suggesting that these represented debris from the cremation process; McKinley (1997, 138) has noted that at Twyford Down, Winchester, excess pyre material was dumped into the barrow ditch. Remains of onion couch grass have been identified elsewhere within Early Bronze Age cremation deposits (eg. Speed, forthcoming). Vyner (pers. comm.) has observed that onion couch grass, if not dried, would have generated smoke perhaps adding to the 'drama' of the cremation ritual. Another possible explanation is that the bulbs derived from turves used to 'bank-up' the pyre, which, as every gardener knows, would have encouraged the fire to burn longer and hotter and would have produced a more efficient cremation.

The small quantities of cremated animal bones noted within several of the cremation deposits can equally be paralled elsewhere. Fragments of pig were identified with cremations 82 and 84, and at least one caprovid fragment in 84. Other unidentified animal bone fragments were recovered from cremation 46. All of the identified fragments came from fore-limbs. More cremated animal bone came from pit 53 immediately adjacent to, and possibly associated with, cremation 46, although none of this could be securely identified. The inclusion of animal bones, particularly pig, amongst the cremated remains is not an unusual occurrence, as for example pig cranial fragments associated with a collared urn cremation at Brackmont, Fife (Mears 1937) and the remains of a single caprovid associated with a cremation in an Enlarged Food Urn at Glennan, Argyle and Bute (MacGregor 2003). At Scorton, North Yorkshire, the head and lower limbs of a single pig were represented, together with two caprovid fragments, mixed with the remains of several people within a collared urn (Speed forthcoming). McKinley (1997, 132) records that "From a sample of c.130 British Bronze Age burials examined by [her], an average of about 16% contained fragments of cremated animal bone". It is perhaps of note that the Scorton cremation

deposit lay within a 'double' pit, perhaps paralleling the situation at Mitchell Laithes with cremation pit 46 and the adjacent and probably intercutting pit 53.

As noted above, several oval pits (25, 65, 126 and 140) located to the north and north-east of the barrow were of uncertain origin but 'grave-like' in form. No similar features were identified elsewhere within the excavated area (Fig. 32). Although none produced any surviving evidence for burial (the ground conditions were too acidic for bone survival), it is possible that they represented a small 'flat' inhumation cemetery focussed upon the barrow. The small and apparently residual or intrusive finds assemblage recovered from these features included several worked flints, a flake of fired clay, an undated pottery sherd and a medieval Gritty Ware sherd. The burnt stones and slag common across the site from Roman-period metalworking were absent from these features, perhaps arguing for an earlier, prehistoric, date. At Nosterfield, North Yorkshire, a Middle Bronze Age inhumation burial had been placed adjacent to the ring ditch surrounding an Early Bronze Age cremation burial, and a 'flat' Middle Bronze Age cremation cemetery appeared to be centred on another truncated ring ditch (Dickson and Hopkinson 2011, 137-142).

The Mitchell Laithes Collared Urn cremation was found some 11m from the barrow. At Bell Hill, Stourton, the central cremation in each barrow was unaccompanied by pottery, although a few sherds of Bronze Age pottery were found in a shallow hollow close to one. A cremation burial some 20m south of the barrows was accompanied by much of a Bucket-Barrel Urn of Middle Bronze Age date. A cremation in a Collared Urn was found 120m north of the two barrows, with another unaccompanied cremation nearby. Large sherds of an Early Bronze Age Enlarged Food Vessel Urn perhaps representing another disturbed cremation were recovered during topsoil stripping a short distance away (NAA 2001b; Robinson 2008).

There was no indication for the presence of a barrow over the cremation accompanied by a Collared Urn and Accessory Cup at Cross Farm, Stanbury (Richardson and Vyner 2011). A small group of sherds from a single collared urn were found in an shallow hollow, probably a tree-throw, excavated to the north-east of Castleford during widening works on the A1 (Brown *et al* 2007, 37). During construction of the M1-A1 Link Motorway sherds from Collared Urns were recovered from a pit and a number of postholes at Swillington Common, with clear domestic associations; however another Collared Urn at Manor Farm had been inverted over a cremation burial at the centre of a ring ditch which had presumably provided material for a mound or ring-bank (Howell 2001, 49-52; Burgess 2001a, 76).

Iron Age activity

A number of pits within the excavated area produced pottery assemblages of Iron Age character (Fig. 33), although no other features of certain pre-Roman Iron Age date were identified and hence the nature of Iron Age activity within the site remains uncertain. Structure 190, discussed above as a possible Neolithic timber circle, was also of a size and form consistent with it having been a roundhouse of Iron Age type found elsewhere in West Yorkshire (Roberts *et al* 2010, fig. 74). Significantly, none of these features produced Roman potsherds, and in the case of the pits these primarily lay in areas within the central and southern parts of the site but away from Roman features. In 2001, Burgess was only able to comment upon a relatively limited body of excavated evidence for the Iron Age within West Yorkshire, with few excavated finds. However, a decade later Vyner (2008, 13-36) and Sherlock (2012, 16-7) were able to discuss a considerably wider range of evidence deriving mainly from road construction schemes (primarily construction of the M1-A1 motorway and successive improvements to the A1) and quarry sites. However, these sites have been primarily located on the Magnesian limestone belt in the eastern part of the county, with little additional evidence from the Coal Measures to the west. There is little or no previous evidence for the period from the Dewsbury area, although the Iron Age hillfort at Castle Hills, Almondbury lies only 12km to the south-west. The material from Mitchell Laithes, even though not closely dated and of uncertain character, still therefore provides a useful addition to the available corpus of information for this period on the Coal Measures.

The Romano-British landscape

By the later Iron Age or Romano-British period the main excavation area had been divided into four rectilinear fields by ditches 32, 71/75 and 215. The geophysical survey showed a probable settlement area within this agricultural landscape represented by enclosures appended to boundary 32; however, almost all of this part of the site remains unexcavated, and the exact nature and date of the occupation and when the fields were laid out can only be speculated. Unfortunately Mitchell Laithes lies just to the west of the study area covered by a recent survey of the cropmark evidence for the Magnesian Limestone belt and its margins (Roberts *et al* 2010); however this included an area of the Coal Measures a short distance down the Calder valley where the predominant form of Iron Age/ Romano-British field system recorded was 'mixed' (*op cit* 22 and fig.26); in contrast to 'brickwork' systems of strip fields these contain fields of more variable width and size, within the survey area ranging from 0.2ha to over 5ha.

Dating evidence recovered from the field ditches was sparse and widely scattered, and consisted primarily of an extremely small assemblage of Roman pottery ranging in date from the first half of the 2nd century to the mid-4th century. Only a single sherd of pottery of either Iron Age or native-style Romano-British manufacture was recovered from the small part of the ditch enclosing the 'D'-shaped enclosure available for investigation, and the single pit obviously directly associated with the enclosure produced no finds at all. Enclosures of this type are relatively common in West Yorkshire (Roberts *et al* 2010, fig. 35), and excavated examples have typically been attributable to the later Iron Age or Romano-British periods. A 'D'-shaped enclosure appended to a linear boundary at Thorpe Park, Austhorpe, Leeds (SE 382 340) did not produce pottery, although the presence of a beehive quern suggested a later Iron Age date (NAA 2004).

Limited trenching at Thorntree Hill, Walton (SE 370 168), 10.5km to the east of Mitchell Laithes, in 1991, suggested that a 'D'-shaped enclosure was in use during the 2nd or 3rd century AD (Turner 1991, 15-16). At Thurnscoe, South Yorkshire, a small Romano-British farmstead dating from the mid 2nd to 4th centuries AD had a number of phases, the main one of which comprised 'D'-shaped and rectangular enclosures appended to either side of a linear boundary. The 'D'-shaped enclosure was similar in size to that at Mitchell Laithes. The enclosures at Thurnscoe lay within a wider agricultural landscape comprising ditched field boundaries and a droveway. Coal appeared to have been the main fuel used within the site, although iron-smithing slags were associated exclusively with wood charcoal (Neal and Fraser 2004). The limited distribution of Romano-British pottery at Mitchell Laithes was emphatically concentrated at the southern edge of Area B (Fig. 33), supporting this assumption that any contemporary occupation was in the area of the unexcavated enclosures.

Although only a small part of the D-shaped enclosure ditch was investigated, its asymmetric profile, very steep on the 'inner' edge and more gently sloping on the outer edge, suggests that there was a barrier such as a hedge lining the bank along the inner edge of the ditch. An absence of such a barrier on the external edge would have allowed livestock to have access to the ditch which would have provided seasonal shelter, watering and mud/dust bathing opportunities. Similar asymmetric erosion has been noted within the ditches of similar Iron Age/Romano-British enclosures elsewhere, and the effect can be observed in the field-ditches on any modern livestock farm.

Field systems like that investigated can be very extensive, and it is quite likely that the system at Mitchell Laithes was part of a much wider enclosed landscape extending across the valley side for some distance, interspersed with other settlement enclosures, perhaps similar to that recorded between Colton and Garforth (Deegan 2001, fig. 11). In the modern semi-urban environment of this part of the Calder Valley where Mitchell Laithes is located, with only limited and dispersed areas of undeveloped land, the widely spaced boundaries of such a Roman agricultural landscape would be difficult to identify.

There was extensive evidence across the site, in the form of slag, hearth bases, hammerscale and coal, indicating Roman and possibly Iron Age ironsmithing having been undertaken on possibly a fairly large scale, despite the absence of any surviving *in situ* associated structures such as furnaces and hearths within the excavated area. There was no indication of furnace-type magnetic reponses within the area covered by the geophysical survey. The slag, coal and hearth bases were recovered mainly from features concentrated within the southern half of Area B/C. Lower levels of material were also recovered from features spread across the northern half of the area. Slag and particularly burnt stone was noted to be present in some quantities within both the topsoil and furrow fills right across the area. However, following the comments from Cowgill above, it is likely that the large quantities of burnt stone fragments and scorched areas of bedrock observed across the area were not associated with this metalworking activity.

Very high levels of hammerscale were noted within many of the soil samples taken across the site, with a concentration of high readings in the area of the Early Bronze Age barrow and the D-shaped enclosure;

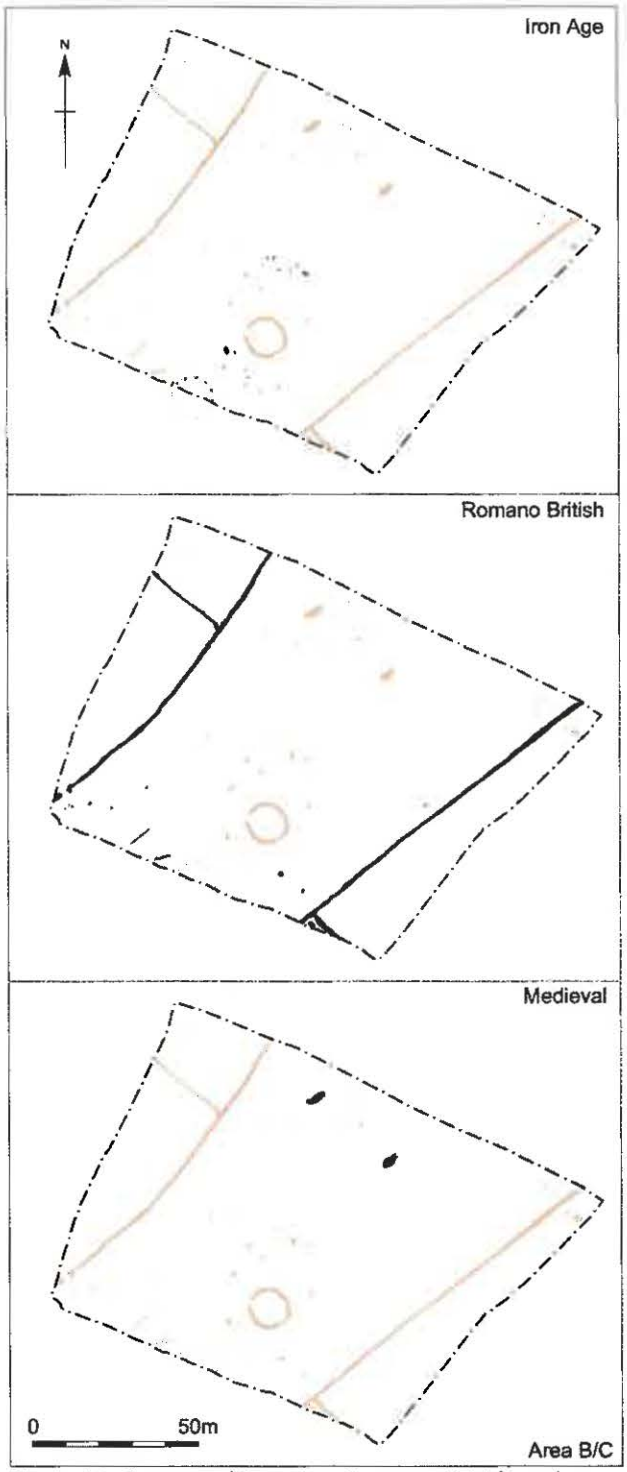


Figure 33: Suggested Iron Age, Romano-British and Medieval phasing

however, as Cowgill has noted, the recorded distribution of this material is to some extent affected by the choice of the samples taken, but the results again suggest that the main area(s) of smithing activity was located towards the southern part of the area. The presence of significant levels of hammerscale within pre-Iron Age features highlighted the potential

for contamination of features by intrusive material on a site like this where only a thin layer of soil directly overlies bedrock, resulting in an enhanced level of faunal disturbance of archaeological features cutting into the bedrock.

Coal and iron ores are not immediately available at the surface within the investigated area, but would certainly have been available nearby, with coal pits (possibly bell-pits) recorded in 1716 only 300m to the north and in sight of the excavated area (Glover 2008, 19). Coal seams are commonly accompanied by ironstone deposits.

Travis has recently (2008) published a comprehensive study of the evidence for the extraction, transportation and usage of coal in Roman Britain, concentrating primarily on a study area comprising the modern counties of Derbyshire, South Yorkshire and Lancashire. Mitchell Laithes lies only 8km beyond the limit of this study area, and above the same band of Carboniferous Westphalian Coal Measures which form the South Yorkshire and Derbyshire Coal Fields; removing the constraint applied to his study area by the existence of modern county boundaries, it seems reasonable to assume that Travis' conclusions can be cautiously applied to the remainder of the archaeological landscape overlying this geological formation within West Yorkshire.

Coal, almost certainly from the Barnsley area, has been identified on Roman sites as far afield as Denver in the Norfolk Fenlands (Gurney 1986, 133-4), and Travis presents a large body of evidence for an extensive trade in coal across Roman Britain and beyond. By plotting the distribution of known Romano-British settlement sites across his study area against the pattern of outcropping coal seams, he presents a strong argument for there being a correlation between the two (Travis 2008, 56-7). The correlation is particularly strong along the valley of the River Dearne in the area to the north-west of Barnsley and closest to Osset (*op cit*, 79). Following from this, he suggests (*op cit*, 134) that "...it is probable that the extraction of coal, stone and ironstone associated with these settlements was seasonal and, along with mixed farming and possibly charcoal burning within managed woodland, was the basis of the local economy." It is notable that at both Bell Hill, Stourton and at Thorpe Park, Austhorpe, post-medieval mining had taken place within the investigated areas (Robinson 2008; NAA 2004); the latter site formed part of a much wider complex of cropmarks of fields, trackways and enclosures and shown to date from the Iron Age and Romano-British periods by excavations at Stile Hill, Colton and at Swillington Common North and South (Roberts, in prep.; Howell 2001).

It is perhaps of interest that the only finds-rich Romano-British feature within the excavated area at Mitchell Laithes, pit 57, also produced much the latest assemblage. Although pottery dateable to the late-2nd or 3rd century was present, the bulk of the material including parts of at least five calcite-gritted Huntcliffe jars and other contemporary vessels dated to the mid-4th to early 5th century. Cruse (pers. comm.) has suggested, from the condition of the burnt quern fragments from the same context, that the assemblage could represent some form of 'structured' deposit, perhaps an abandonment gesture. In addition he has pointed out that the position of the pit half-way between the 'D'-shaped enclosure and the Bronze Age barrow, which would still have been a visible landscape feature at this date, is perhaps of significance in this context. Given the date of the material, at the very end of the Roman period, this is an attractive scenario, although difficult to demonstrate without excavation of the adjacent enclosures from which the material presumably in large part derived, in order to determine whether they were abandoned at this date. However, Welfare (2002, 74) has commented, with reference to similar Iron Age material "...identified as 'special deposits'..." that "...they could also be interpreted more simply as domestic rubbish".

Post-Roman

As noted above, it seems likely that the site was wooded during the post-Roman period and possibly into the medieval period, although the Roman linear boundaries may have been retained in some form since trees do not seem to have been allowed to grow along them. The retention of one of these Roman boundaries within the modern landscape is of some note. Although such survival has been recognised since at least the 1970s (e.g. Taylor and Fowler 1978), dateable excavated examples remain relatively rare. Brennand *et al* (2007, 400) have noted that a number of major boundaries established during the Middle and Late Iron Age on the Magnesian Limestone belt through West Yorkshire remained in use through the Romano-British period and in some cases up to the present day.

It was perhaps within this wooded landscape that small-scale quarrying occurred during the medieval period, probably the 12th century, for recovery of the harder sandstone layers which would have been suitable for manufacture of roofing slates. There was a small sandstone quarry immediately to the south-west of the excavation area in the 19th century, demonstrating the suitability of the local sandstone for exploitation.

The extremely limited quantity of medieval pottery present within the site suggested that it was not the subject of intensive manuring during that period, and may not have been in arable usage. Several sherds of Gritty Ware recovered from topsoil complement the material recovered from the quarry pit and were presumably of similar date. Later pottery recovered from topsoil consists of a small assemblage of late medieval or early post-medieval material, and this seems a likely date for the site having come into arable cultivation. Ridge and furrow cultivation was still practised well into the post-medieval period, and it is likely that the furrows recorded at Mitchell Laithes date from this phase. As noted above, the earliest surviving field name for the site is *Ryroyd*, meaning a clearing used for growing rye, from a will of 1587, although the trackway along the northern edge of the site was already called *Rieroyde Laine* by 1538, indicating that the area was in arable use by that date (Glover 2008). The mound of the barrow seems to have still been present at this stage, with a break in an intersecting

furrow indicating that in this area it had been cut entirely within the depth of the mound material and leaving the underlying bedrock surface undamaged. More modern ploughing has served to level both the mound and the ridges, and there was evidence to suggest that there had also been some plough-truncation of the surface of the underlying bedrock across much of the area.

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