THE EXCAVATION OF TWO ROUND BARROWS ON LONGSTONE EDGE, DERBYSHIRE

By JONATHAN LAST

(English Heritage, Fort Cumberland, Eastney, Portsmouth, PO4 9LD)

With contributions by

PETER ANDREWS, PAULINE BESWICK,

CHRISTOPHER BRONK RAMSEY, GILL CAMPBELL, CHRIS GLEED-OWEN,

RUTH LEARY, PETER MAKEY, PETER MARSHALL, SIMON MAYS,

PETER MURPHY, PETER POPKIN, WENDY SMITH

and JOHANNES VAN DER PLICHT

SUMMARY

This paper reports on the excavation of two adjacent Peak District barrows with very different histories. Barrow 1 exhibited several phases of use in the Neolithic and Early Bronze Age, and was reused in later prehistory and the Romano-British period. The earliest human remains, which date to the 4th millennium cal BC, comprise some crushed bone on the land surface beneath the barrow mound. The form of the site in the Neolithic is unclear but it is possible that a low ring-cairn pre-dates the mound into which it was incorporated and belongs to the initial mortuary phase. Also pre-dating the main barrow mound is a cist grave containing disturbed remains of two individuals and fragments of a Beaker pot. The grave fill contained large quantities of small mammal bones, probably deriving from owl pellets. Subsequently, following the deposition of a Food Vessel cremation burial, the main barrow mound was constructed.

Barrow 2, which had been partly excavated in the 19th century by Thomas Bateman, had a less complex sequence and fewer finds, though there were human remains broadly contemporary with those in the Barrow 1 cist grave. Assemblages of struck flint, prehistoric and Romano-British pottery, human and animal remains, charred plant remains and molluscs were recovered from both monuments and provide information on the nature of human activity in different periods and the formation processes that have operated. The final discussion reflects on the implications of the barrows for our understanding of prehistoric mortuary practice and the human occupation of the White Peak.

INTRODUCTION

> Morning very cold and foggy, quite nice on Longstone Edge as the sky was clear with a bright, warm sun. All around, the valleys were filled with white, rolling mist. One has the feeling of working above the clouds.
> (P. Reeves, Site Diary, 24th September 1996)

Longstone Edge is an east-west aligned escarpment on the edge of the White Peak Carboniferous Limestone plateau in the Peak District National Park, some 5km north of Bakewell (Fig. 1). Behind it, running approximately north-east to south-west, is High Rake, one of the mineral veins within the lead ore-field of the White Peak that was exploited as part of the medieval and later lead-mining industry (Barnatt and Penny 2004). The barrows discussed here lie directly north of the rake on one of the highest points along Longstone Edge, at an altitude of over 390m above sea-level. They came to be situated on the northern lip of opencast mine workings, threatened by slippage and collapse of the quarry edge and subsidence cracks behind this face, exacerbated by vibrations from ongoing fluorspar mining (Figs 2 and 3). Because of the need to stabilise the fissured edge using heavy plant, which would further damage the surviving archaeology, it was decided to excavate the barrows. The fieldwork reported here was therefore undertaken by the Central Archaeology Service of English Heritage in 1995–6, prior to stabilisation work by the quarry company. The objectives of the excavation were to understand the construction and use of the barrows, define burial practice, recover dating, artefactual and environmental evidence, and investigate the use of space around the monuments.

The barrows comprised two adjacent bowl-shaped mounds of stone and earth construction without ditches (Fig. 3). Barrow 1 was located on the highest point of the escarpment (NGR SK 2088 7341) while Barrow 2 lay 25m to the south-west (SK 2086 7339). When recorded by John Barnatt in 1988, as barrows High Rake 4:9 and 4:10 respectively, Barrow 1 had a diameter of 19–21m and stood to a height of 1.1m above the hill crest, its top at 393.9m OD; Barrow 2 was slightly smaller, measuring 13.5–16m in diameter and standing 1m above the crest (Barnatt 1996a, 186). At that time it was thought that Barrow 1 had been excavated in 1848 by the antiquarian Thomas Bateman (Bateman 1861, 41–2; Barnatt 1996a, 186). However, the excavations reported here revealed that Bateman was describing Barrow 2, while Barrow 1 had not previously been excavated (as noted in Barnatt 1999, 61).

At the time of excavation the southern 4m of Barrow 1 had either subsided or fallen into the rake, owing to collapse of the quarry edge, while the remainder of the southern part of the monument was affected by a prominent fissure. Barrow 2 had survived relatively unchanged although a fissure had opened across this monument as well, effectively bisecting it. The space between the two barrows had also become fissured.

The setting of the monuments is significant for their interpretation. Today the landscape is open, with flocks of sheep grazing the thick, spongy upland grass. This may not be very different from conditions during the Bronze Age. As a result of climatic warming during the early Holocene, birch-dominated woodland had spread across the White Peak, but there seem to have been two significant episodes of clearance, in the Early Neolithic (around 4000 cal BC) and the Late Neolithic (around 2700 cal BC), after which – if we can assume evidence from the valley of the River Lathkill, south of Bakewell, is typical – 'very little forest appears to have remained' (Taylor *et al.* 1994, 363). The local prehistoric environment is discussed further by Andrews (below).

The barrows are prominently sited and command views in all directions: most spectacularly to the south over Longstone Edge towards Bakewell and the River Wye, some 4–5km away, but also northwards towards Blakedon Hollow and Eyam Edge, westwards over the expanse of Longstone Moor, and eastwards towards the Derwent Valley (Fig. 1). The barrows fit the trend for the limestone plateau of a ridge or hill top location on the fringe of traditional

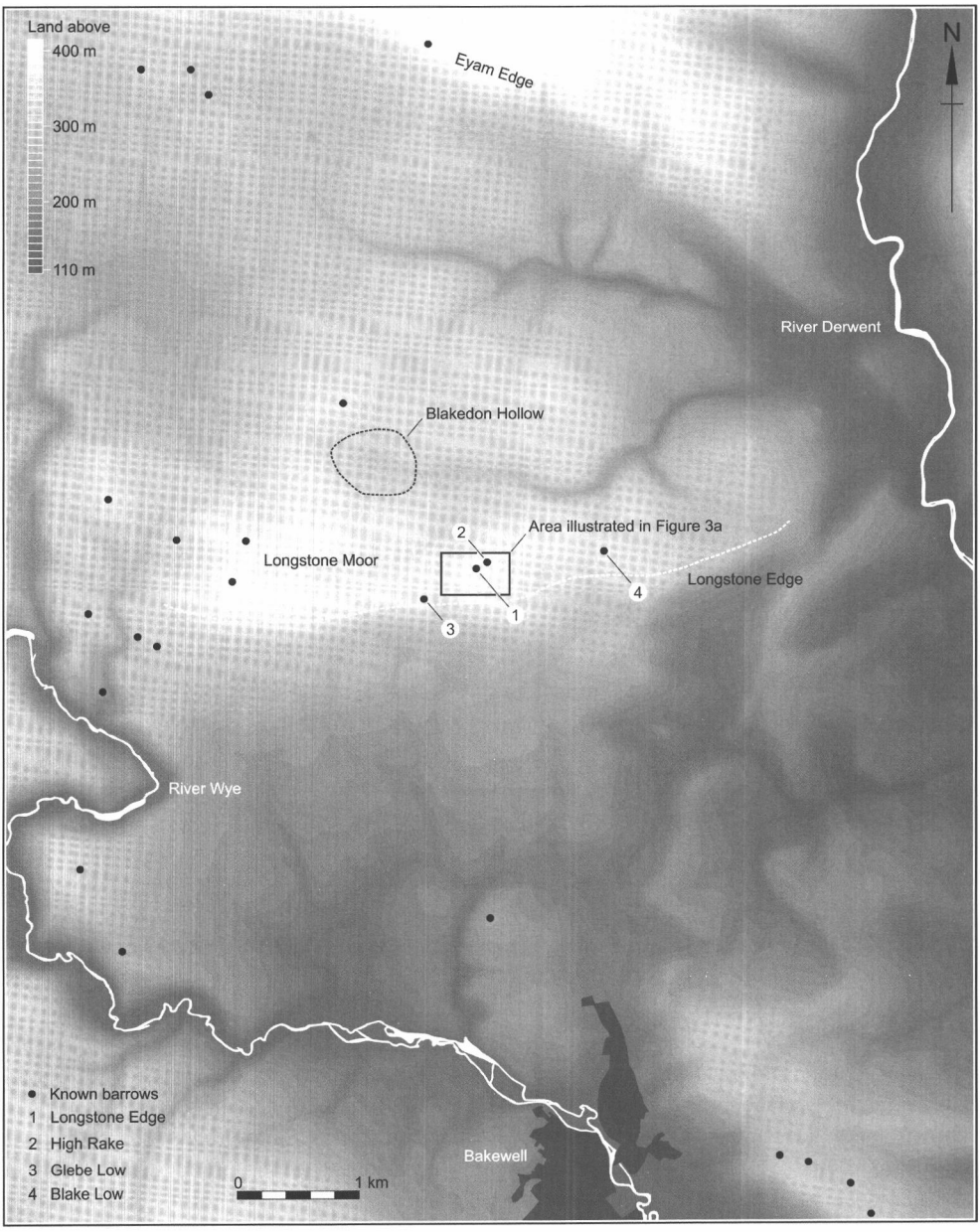

Fig. 1: Location map showing local topography and known barrows (site data from Barnatt 1996a)

Fig. 2: View of fissure in Barrow 2, with Barrow 1 in the background.

cultivation zones (Barnatt 1996b, 67). At least three other barrows are sited along or near High Rake: the closest, also excavated by Bateman, is just 200m to the north-east and was recently reinvestigated following damage to the monument (O'Neill 2008); the now destroyed Glebe Low (Radley 1966) lies 500m to the south-west; and 1km to the east is a site at Blake Low (Varley 1991). Another group of monuments lies further west on Longstone Moor.

METHODOLOGY

> Although the deturfing is hard, spirits remain high, even to the extent of a sweepstake on what we will find, aside from spent .303 cartridges.
> (P. Reeves, Site Diary, 16th August 1996)

Following a topographical survey of the site using a total station theodolite (Fig. 3) the excavation took place between August and October 1996, directed by Peter Reeves. All deposits and features were fully excavated by hand, and contexts containing human remains or significant artefact or palaeoenvironmental assemblages were 100% sampled for flotation (see Smith below), totalling some 3000L of soil. Locations of all finds and samples were recorded three-dimensionally using a total station. In addition, about 5½ hours of video footage was taken during the fieldwork.

Barrow 1 was divided into three areas (Fig. 4): two quadrants (Areas 1 and 2) were placed over the intact northern half while the fissured southern part was investigated as a single area (Area 12). The deposits here, particularly the upper contexts, had been twisted and compressed by movement within the underlying geology, but despite the truncation the sequence of events

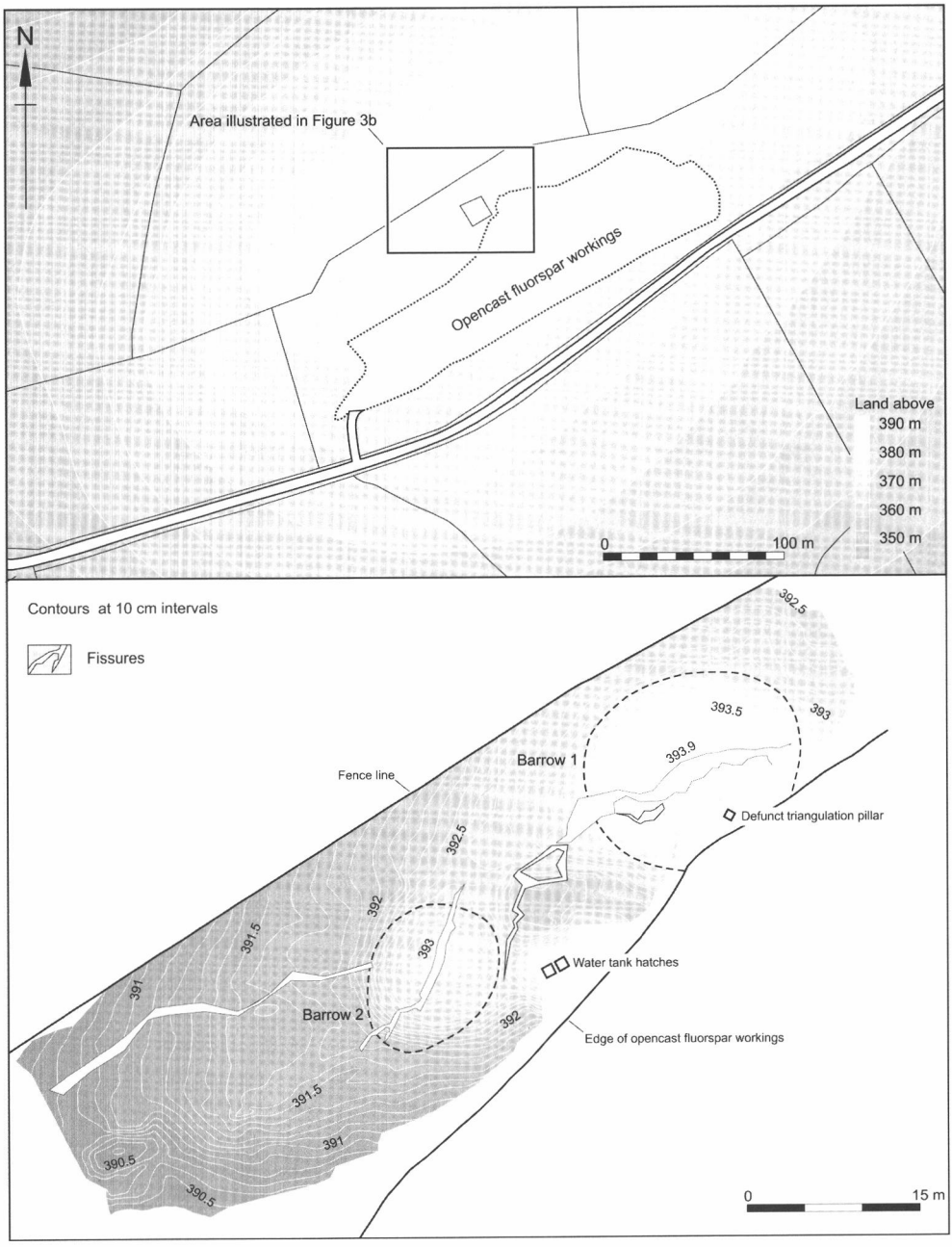

Fig. 3: Detailed location and pre-excavation topographic survey, showing barrow mounds as initially defined, fissures and modern features

could still be elucidated; indeed, the main cist grave and most of the human remains were retrieved from this area. A cremation urn (squashed flat) was lifted in a block to be excavated in the laboratory.

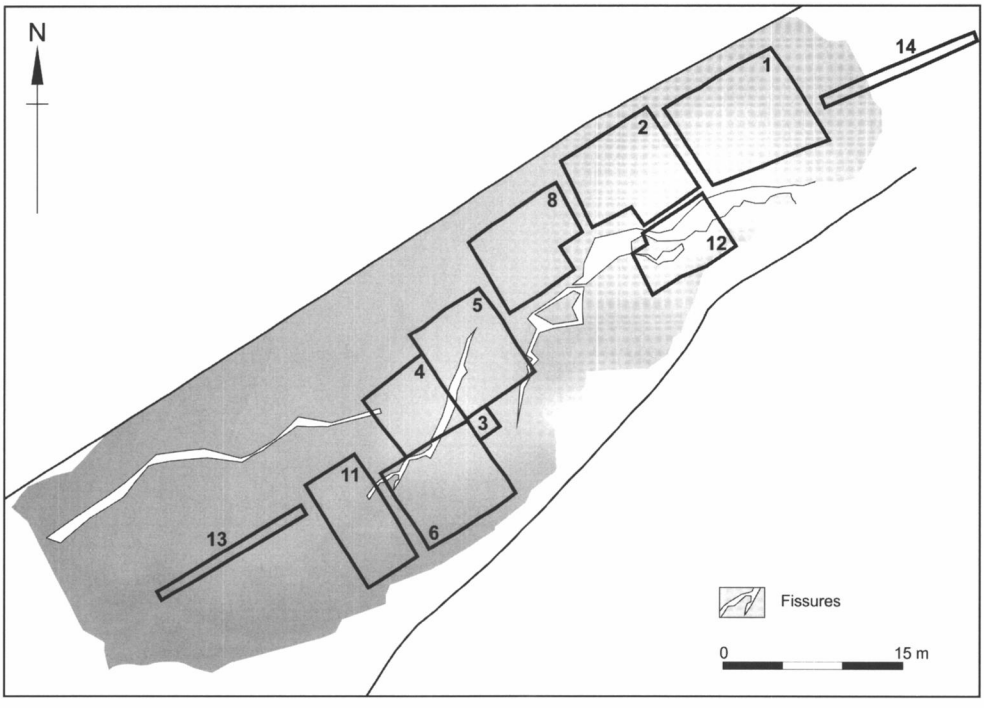

Fig. 4: Excavation areas.

Barrow 2 was divided into four quadrants, Areas 3–6 (Fig. 4). Upon stripping the first (Area 5) it was found that the barrow was slightly smaller than anticipated and made use of the underlying surface of the limestone to enhance its height; in consequence there was little mound material present in Area 3. The central cist grave was revealed beneath Bateman's backfill at the junction between Areas 5 and 6, running into the north-west corner of Area 3. The fissure noted above ran across the barrow from north-east to south-west, just to the west of the grave.

The remaining excavation areas and the sieving transects set up in Areas 8 and 11 were designed to look for related features or activity beyond the barrows, but no archaeological deposits were located; all topographical features turned out to be natural, related to the composition or weathering of the limestone bedrock. This was consistent with earth resistance and magnetometer surveys undertaken by the University of Sheffield, which revealed no archaeological anomalies beyond the barrows.

This report first discusses the stratigraphic sequence for the two mounds, beginning with the barrow previously investigated by Bateman, then presents the specialist data from the site, and finally attempts to draw together the different lines of evidence into an integrated narrative of several millennia of activity on Longstone Edge. It should be noted that the archive inherited by the present author is inadequate in places and some issues can no longer be resolved; where there is uncertainty or missing information this is made clear in the following discussion.

BARROW 2

> On the 29th of August [1848] we opened another barrow, near the last, situated on a part of the hill still more elevated. Externally it has the appearance of a cairn or tumulus solely composed of stone, which in fact it was, so far as artificial means had been employed, but in the middle the rock rose above the natural level, and caused the tumulus to appear of greater extent than it really was.
> (Bateman 1861, 41)

> A very definite difference between the two barrows. Barrow 1 – large blocks of limestone, quite rounded and more natural looking. Barrow 2 – far smaller stone size and a great deal more angular, the whole appearance being inferior to Barrow 1 – why?
> (P. Reeves, Site Diary, 19th August 1996)

Barrow 2 (Fig. 5) was the smaller and less complex of the pair, its construction and use covering Phases 3–4 in the Barrow 1 sequence set out below. Rather than using blocks of stone, as in Barrow 1, the excavators suggested that the builders had chipped at the limestone bedrock to create enough material to raise the mound, mixing these chippings with soil cleared from the site during setting out of the barrow; the structure gave the impression of a hurried construction. As excavated, the mound measured only some 10–12.5m in diameter, rather smaller than the survey suggested, because the natural slope of the limestone topography around the southern part of the mound gave a false height to the structure – as described by Bateman in the quotation above (though his account was not originally thought to refer to this barrow). From the drawn sections (Fig. 6), the maximum surviving height of the mound was *c.* 0.65m.

As well as ongoing disturbance of the monument caused by shifts in the underlying limestone (Fig. 2), the barrow had been modified by Bateman's excavations, quarrying of unknown date on the southern side of the monument, the insertion of a large post on the northern side, and the construction of a reservoir tank to the south-east, for which part of the mound was scooped out to form a platform (Fig. 3).

The Grave

An area of disturbance in the centre of the barrow, described by the excavator as 'not so much a cut feature, more an area where stones have been removed and replaced', is interpreted as the remains of Bateman's excavation. It measured a maximum of 3.4 x 2.5m across and overlay a cist grave (i.e. a rock-cut grave lined with slabs), which was described thus by Bateman (1861, 42):

> In the centre was an irregularly shaped rock grave, about three feet deep, lined with flat stones placed edge-way, and covered with four or five large slabs laid over it without much regularity. It contained a deposit of calcined bones, evidently of an adult, with bits of stags' horn intermixed, laid in a heap near the middle of the grave, which was the chief interment; in one corner was the decayed skeleton of a child of tender age, around which were numerous rats' bones; and in the opposite corner were two vases of different shapes, … which yet stood upright in their original position, and contained nothing but fine mould; casually were found some cows' teeth, two hoofs of deer, and a bit of flint.

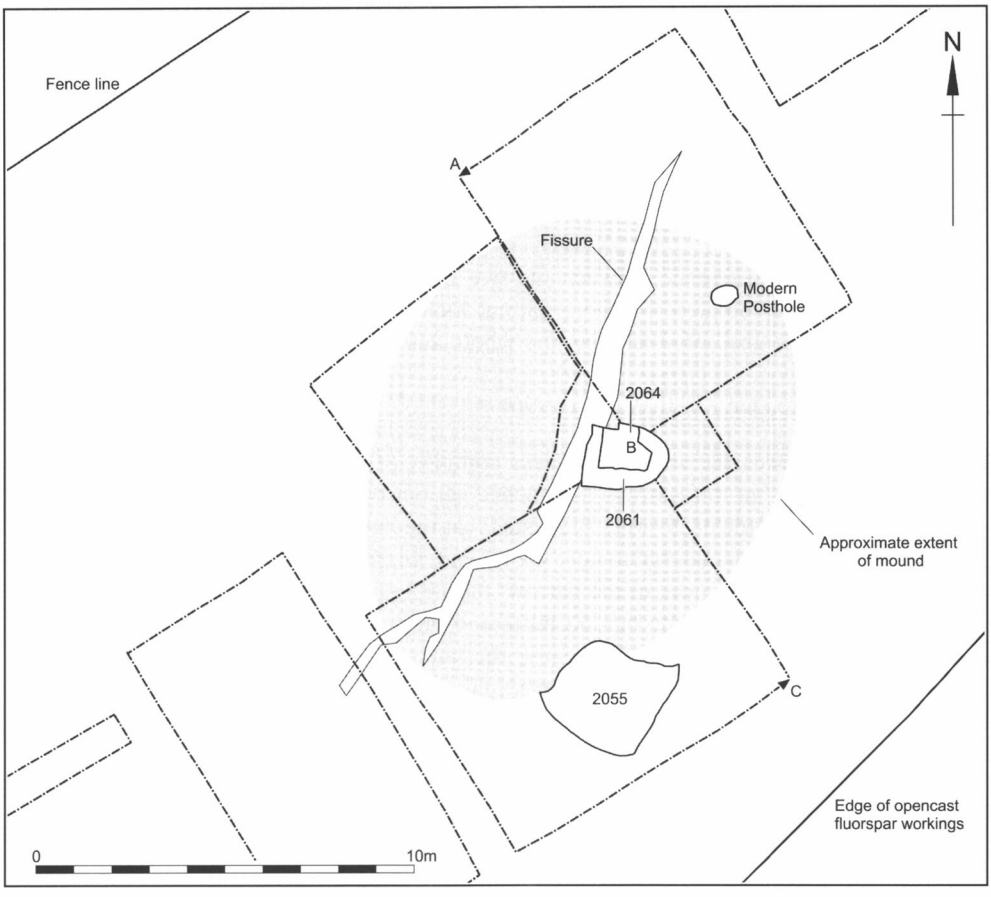

Fig. 5: General plan of Barrow 2 (letters refer to location of profile shown in Fig. 6).

As excavated in 1996, the grave had maximum dimensions of *c.* 1.4 x 1.25m at the top; the main part was *c.* 0.9m deep, although the base was irregular and a small triangular area towards the west side, also noted by Bateman, was deeper (1.3m). The cist slabs had been randomly redeposited in the emptied feature. Possible tool marks on the sides of the grave are pointed out in the video record but not otherwise recorded. Fig. 7 shows that while the plan by Jewitt in Bateman's report does not correspond precisely to that drawn in 1996, its orientation is clear from the general shape and the location of the triangular hollow, indicating that the 'two vases' (Food Vessels) and the child skeleton were originally placed on the southern side of the grave. The results from Longstone Edge support the opinion that although it may not be easy to establish the precise location of barrows excavated by Bateman, once they are identified his notes provide reliable information on their morphology (Marsden 1999, 58).

The majority of the grave was filled with the same loose stony backfill as Bateman's trench. It contained human remains (some teeth higher up and a group of mainly cranial bones lower down) which the excavators thought might be remnants of the child skeleton found by Bateman, either missed by him or replaced, as at Roystone Grange (Marsden 1982). Although the lower parts of the grave contained a series of clay/silt fills that looked like in-

Fig. 6: Profile through Barrow 2 (for location see Fig. 5).

wash (deposits 2063 and 2065–7) these too almost certainly post-date Bateman's excavation, since he states that the grave was 'cleared out' (Bateman 1861, 42) and a lead plaque bearing the word 'BATEMEN' (*sic*) – as found in other re-excavations of his sites (Marsden 1970, 194) – was retrieved from the base of the deep triangular hollow (Fig. 8).

The Subsoil

The area beneath the mound had in part been cleaned down to the underlying bedrock; elsewhere a thin, orange-brown, silty clay subsoil survived (numbered 2009 in Area 5, 2058 in Area 6, 2078 in Area 4 and 2080 in Area 3). There are few other deposits that may be indicative of pre-mound activity. In Area 5, a thin layer (2008) comprising 60–70% limestone pieces, mixed with silty clay apparently derived from the subsoil, lay between that and the mound proper; while in Area 4, layers of packed stones (2075 and 2076) had been placed in patches between the subsoil and the lower mound material.

Twenty-two sherds of prehistoric pottery came from these deposits, although most were crumbs weighing less than 1g. Two fabrics appear to be represented, one associated with Beakers and one of Neolithic date (Beswick, below). The greatest concentration of sherds

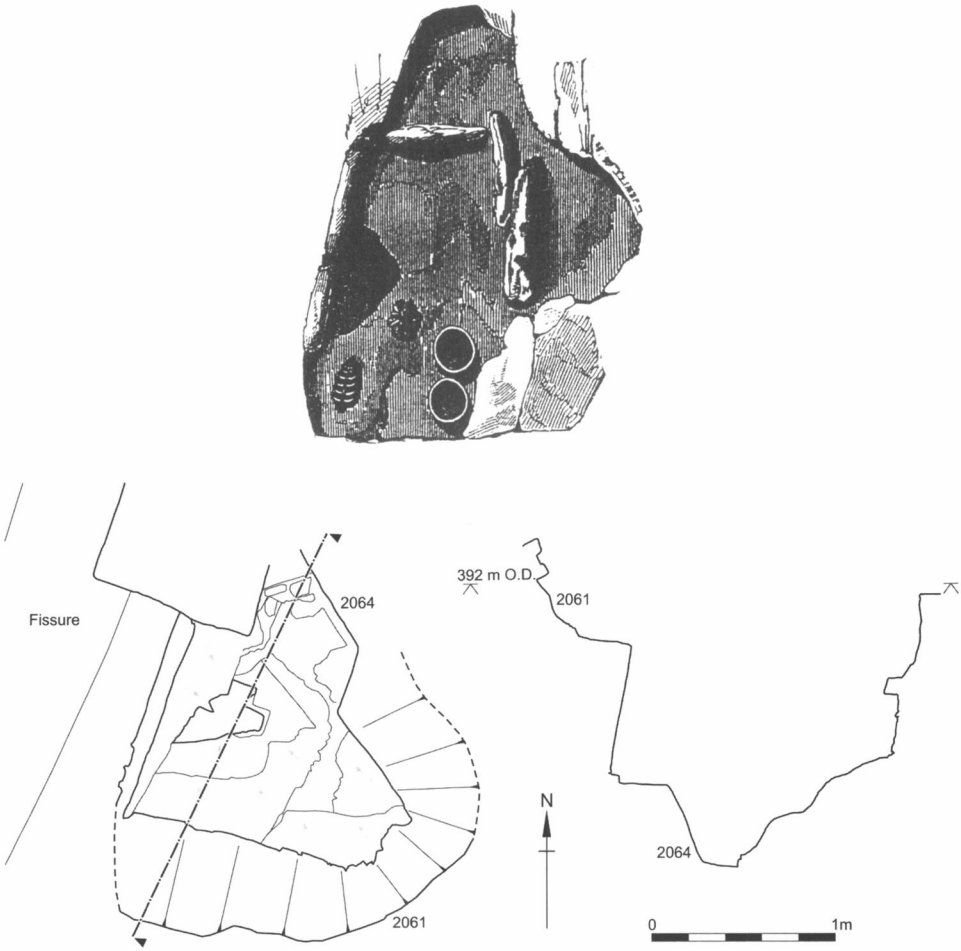

Fig. 7: Rock-cut grave in Barrow 2 as recorded by Bateman (drawing by Llewellynn Jewitt) and during the recent excavation (plan and profile).

lay just to the south of the cist grave (Fig. 9). Similarly, most of the flint from the subsoil, including a side-scraper of Late Neolithic/Early Bronze Age date (Fig. 24.7), lay close to the grave. These distributions suggest the subsoil finds are associated with the construction or use of the grave.

A number of fragments of human and animal bone also came from the subsoil or the cleared rock surface below (2059 in Area 6); some of the human remains were apparently covered with small flags of limestone, although the archive provides no further details. Bateman (1861, 42) noticed similar deposits, writing that 'we found a portion of the cranium of another subject just outside the lining stones of the grave'. Skeletal remains from a three-year-old child were found within subsoil 2058; although dispersed and sparse, these appear to be from one individual (Mays, below). Part of the left femur, found about 0.5m south-east of

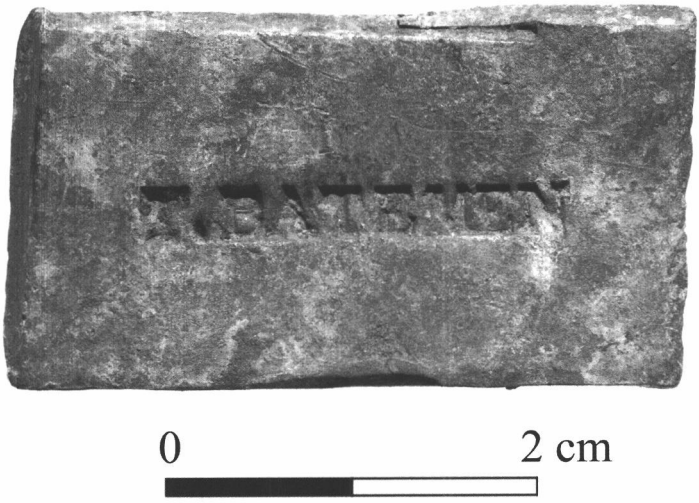

Fig. 8: Bateman's plaque from Barrow 2.

the edge of Bateman's excavation, was dated to the late 3rd millennium cal BC (Marshall *et al.*, below). It seems that the fragments retrieved from the grave fill may belong to the same individual. If so, they are presumably not part of the child found by Bateman, unless we take his description of the skeleton as 'decayed' to mean incomplete, in which case it may be that some of the bones had been redeposited in antiquity.

Distribution of the human and animal remains is even more closely centred on the grave than are the artefacts (Fig. 9). All the human bone lay within 1m, while the majority of the animal bone fragments, including a large part of a cattle jaw from 2078 (Popkin, below), were found within 2m of the grave.

The Mound

Some time after the burials the barrow mound was raised over the grave (Fig. 5). Its circumference was reportedly delineated by a discontinuous circle of small, upright limestone blocks, although on the site plans this feature has little coherence; moreover, in Area 5 the blocks appeared to stand upon the lower layers of mound construction. Certainly there is no indication of a free-standing structure pre-dating the barrow mound, as with Barrow 1 (see below).

Above these basal deposits the mound was composed of a series of layers, although the sections suggest they varied in extent. Its lower part (2007 in Area 5, 2074 in Area 4) comprised 70–80% loosely packed limestone blocks up to 200mm in size, and 20% dark brown sandy silt soil. Above this in turn were less stony layers (2004 and 2003 in Area 5, 2073 in Area 4) with up to 40% soil and smaller limestone fragments (20–50mm), while the uppermost layer (2002 in Area 5, 2072 in Area 4) was predominantly soil (60%) with even smaller stones (<20mm), and was heavily disturbed by plant roots. Overall, the stones in the mound of Barrow 2 were smaller than in Barrow 1. The sequence, though not the extent, of the mound deposits is clear

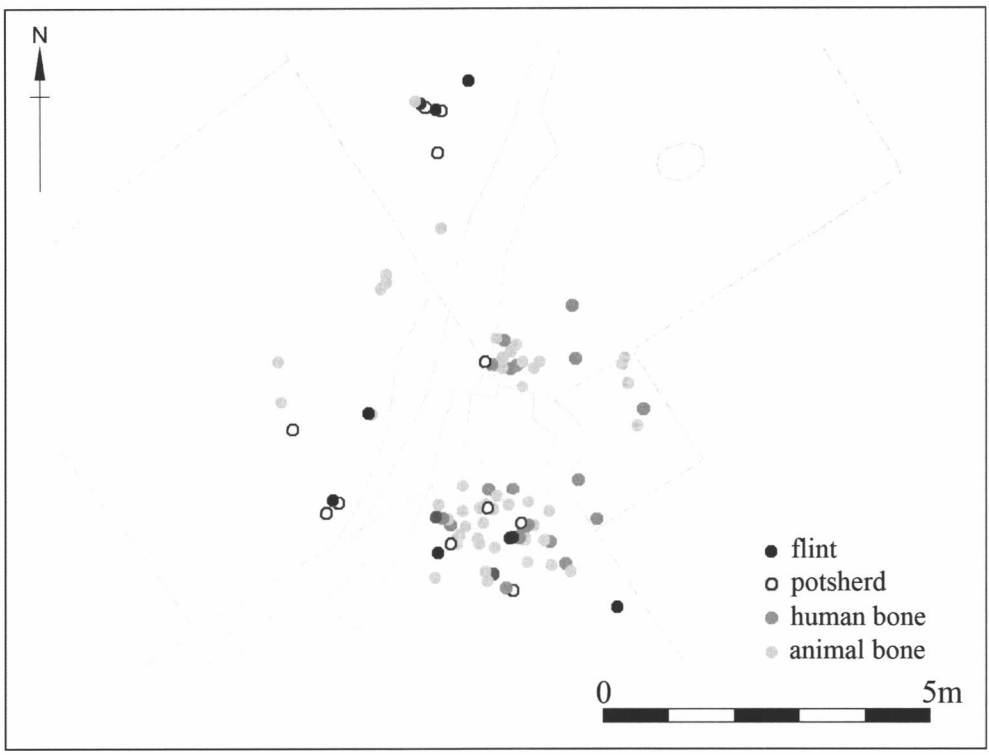

Fig. 9: Barrow 2 pre-mound finds distribution.

for Areas 4 and 5; in Area 6, however, the mound material was removed as a single deposit (2057) which had probably been disturbed by the later quarrying. The south-eastern edge of the monument in Area 3 was not planned, presumably because of truncation by fissuring and the water tank construction (Fig. 3).

Relatively few finds were recovered from the mound of Barrow 2. Prehistoric artefacts probably represent material redeposited from the grave and old land surface. Only four small fragments of pottery (one probably Early Neolithic) and four flints were recovered, from contexts 2002, 2003 and 2074. With only a couple of exceptions, the individually recorded human and animal bone is concentrated in 2003 and 2004, within 1m of the grave (Fig. 10).

Apart from the recent disturbances referred to above there was little sign of reuse of the monument. No secondary or satellite burials were located and no definite evidence for later insertions was found, though Romano-British sherds came from contexts 2057 and 2073 (Leary, below).

Although Bateman's excavation had removed evidence for the stratigraphic relationship between grave and mound deposits, Barrow 2 appears to be a simple, single-phase burial site with a mound raised over a cist grave. However, the presence of material in the subsoil and the possibility that human remains in the grave had been disturbed hint at a sequence of events prior to construction of the mound – although even if this is the case, the complexity of activity was considerably less than that associated with Barrow 1.

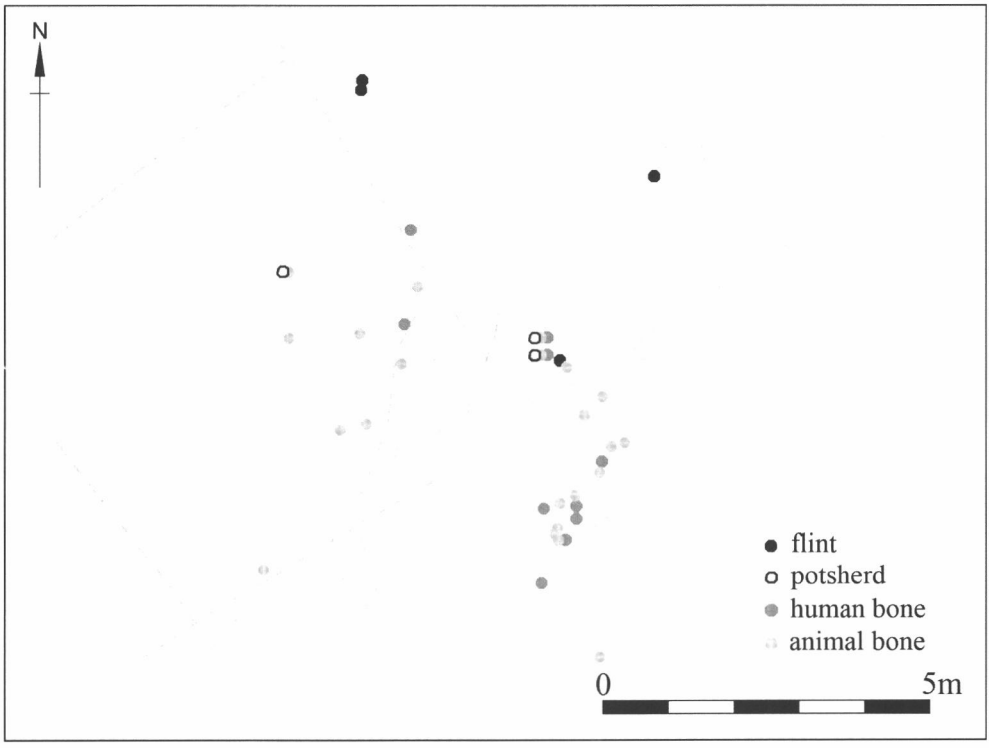

Fig. 10: Barrow 2 finds distribution from the barrow mound.

BARROW 1

Barrow 1 (Fig. 11) was both better preserved than Barrow 2, because of the lack of previous excavation, and more disturbed, because of the erosion, fissuring and compression seen in Area 12. As recorded on plan, the surviving mound measured 12–16m in diameter. From the drawn sections (Fig. 12), the mound survived to a height of about 1m. A number of phases of activity could be recognised, some represented only by the presence of artefacts and organic remains within or beneath the barrow. They have been numbered as follows:

PhaseDate

1 Mesolithic (flints and charred plant remains; no features)
2 Neolithic (human remains and artefacts)
(2 or 3 enclosure wall or bank)
3 Early Bronze Age (Beaker) (graves, human remains and artefacts)
(3 or 4 'stone mound'?)
4 Early Bronze Age (Food Vessel) (cremation vessel, human remains and artefacts; main barrow mound)
5 Late Bronze Age/Iron Age (pottery; no features)
6 Romano-British (pottery; stone-capped features)
7 Post-medieval and modern (various disturbances and artefacts)

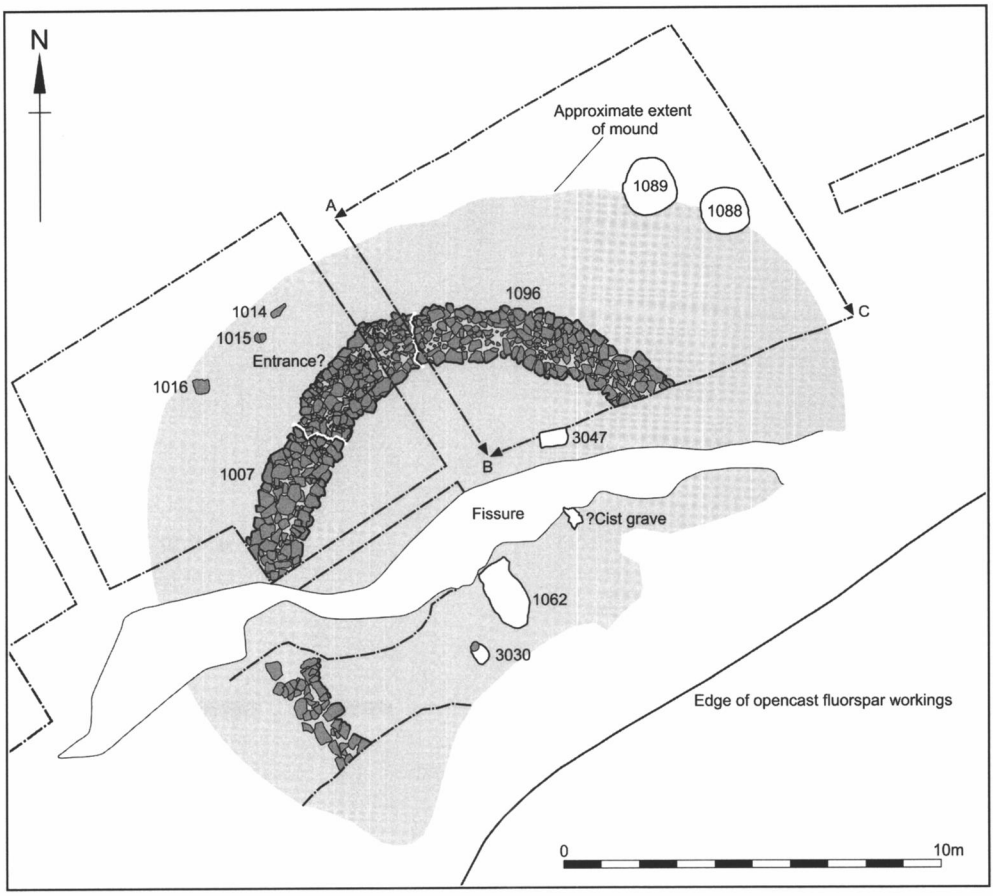

Fig. 11: General plan of Barrow 1 (letters refer to location of section shown in Fig. 12).

Phase 1

Early use of the site is demonstrated by the presence of struck flints of Mesolithic type (Fig. 24.2) found beneath the mound and incorporated into later deposits. Charred hazelnuts submitted for radiocarbon dating because they were thought to be associated with the Food Vessel cremation burial also turned out to belong to this phase; the dates span the mid 8th to mid 7th millennia cal BC (Marshall *et al.*, below), a period broadly consistent with the lithic evidence (Makey, below).

Phase 2

Mesolithic activity was followed by an apparently long-lived Neolithic mortuary phase that remains rather mysterious and is hard to disentangle from the succeeding phases. A roughly circular drystone wall or bank (1007/1096; Figs. 11–13; described below), which was incorporated into the later barrow, could originally have been either a free-standing ring-cairn or a kerb added to an original small mound (J. Barnatt *pers. comm.*). During excavation it was thought to be the former, defining an open area used for excarnation, as suggested by

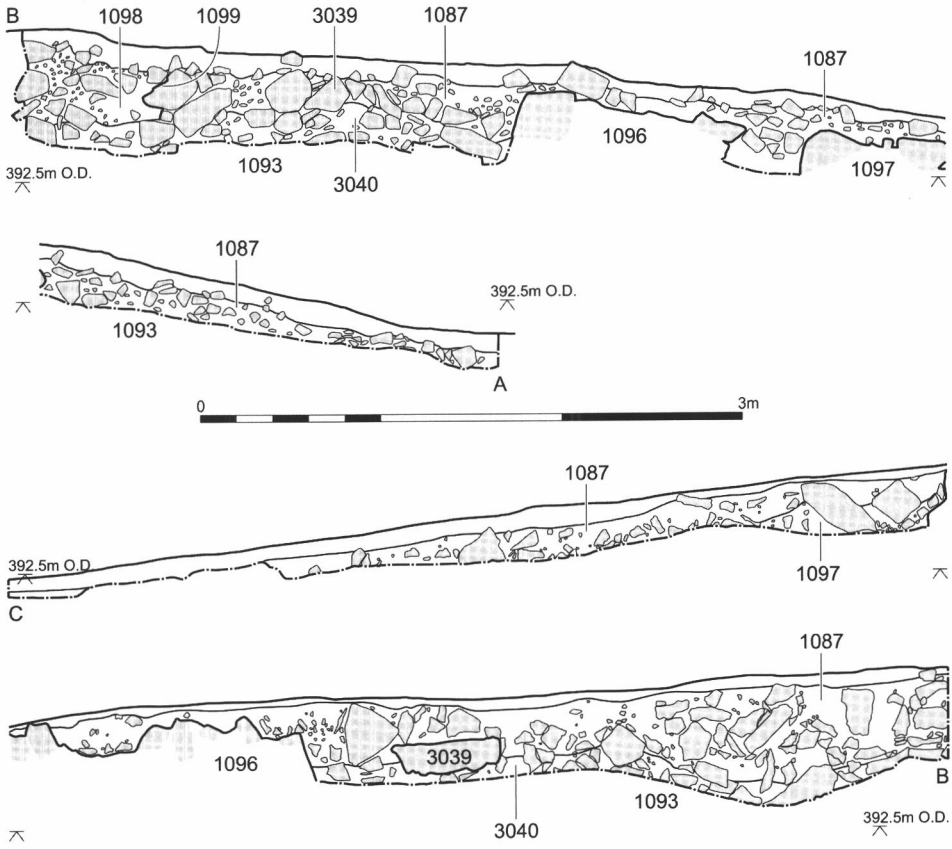

Fig. 12: Section through Barrow 1 (for location see Fig. 11).

the retrieval of numerous crushed and broken fragments of human bone in association with Neolithic pottery. These remains came from a thin deposit below the basal layer of the barrow mound and from the underlying subsoil; they were also found within the make-up of the later mound. The excarnation or 'sky burial' theory was publicised at the time of excavation, notably in a *Guardian* article of 18th October 1996, but now requires substantial qualification, since analysis of the human remains by Simon Mays (below) has shown no definitive evidence for exposure of bodies. Moreover the pre-barrow deposits clearly conflate remains of very different date, since radiocarbon determinations on two bone fragments produced dates in the mid 4th and early 3rd millennia cal BC, consistent with the range of pottery and flintwork from this phase of the site (see below).

Phase 3

The second mortuary phase, dated to the Early Bronze Age (in Needham period 2 1996), probably includes two or three graves (Fig. 11), each covered by slabs. The central rock-cut grave in Area 12 (1062) contained a cist of limestone slabs with two incomplete inhumations,

Fig. 13: Enclosure bank looking south (with 'marker stones' on right).

disturbed at its northern end by the recent fissure (Fig. 14). One of the skeletons (75501) had fallen into the fissure and was recovered from disturbed context 1050; the other (75502) was also disturbed but remained largely within the grave, with its head to the north. Both date to the late 3rd millennium cal BC and may well be contemporary (Marshall *et al.*, below). The whole cist had slumped eastwards because of the movement of the bedrock but its dimensions appear to have been at least 1.0m north-south, 0.6m east-west and 0.6m deep. The upper fill (1059) is described as a loose silty layer while the lower fill around the skeletons (1060) was a firmer clayey silt; both deposits contained large numbers of microfauna (up to 80% of the deposit). Among the finds from the cist grave, a thumbnail scraper (Fig. 24.8), several Beaker fragments (Fig. 25.6), a fragment of polished bone (or antler?), possibly part of a pin (Fig. 15.1; co-ordinates not recorded), and a pig bone (Popkin, below) might represent the remains of grave goods. However, the smaller objects could be residual or intrusive, like other material recovered from the lower fill, including a Mesolithic microlith (Fig. 24.1) and a later prehistoric potsherd (with two more from the upper grave fill).

The second feature, found at the end of the excavation under the baulk between Areas 1 and 12, about 4m north-east of cist grave 1062, was a rock-cut grave (3047) covered by a limestone slab 0.75m long; its fills (a greyish clayey silt interpreted as in-wash beneath a mid-brown sandy silt) contained just one fragment of human bone, perhaps suggesting that an inhumation had been removed. The depth of this feature is not recorded. A single small pottery fragment, probably Neolithic, came from the upper fill but it seems most likely that the feature belongs to the same phase as the main cist grave.

It is possible that a third, un-numbered grave was marked by a capstone measuring 0.9 x 0.4m in size which lay within Area 12, between graves 1062 and 3047. No other information about this feature was recorded.

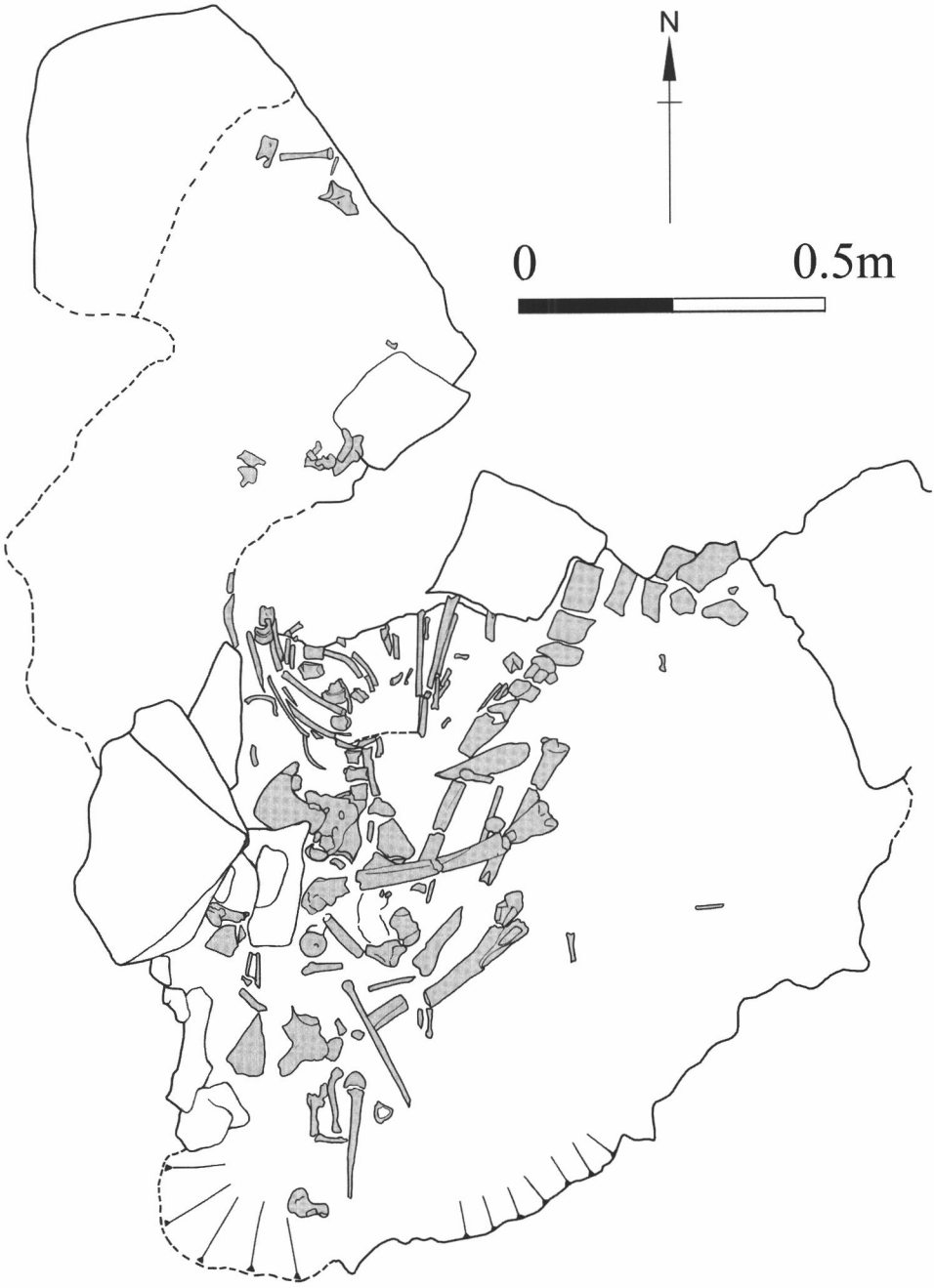

Fig. 14: Barrow 1 cist grave and burials.

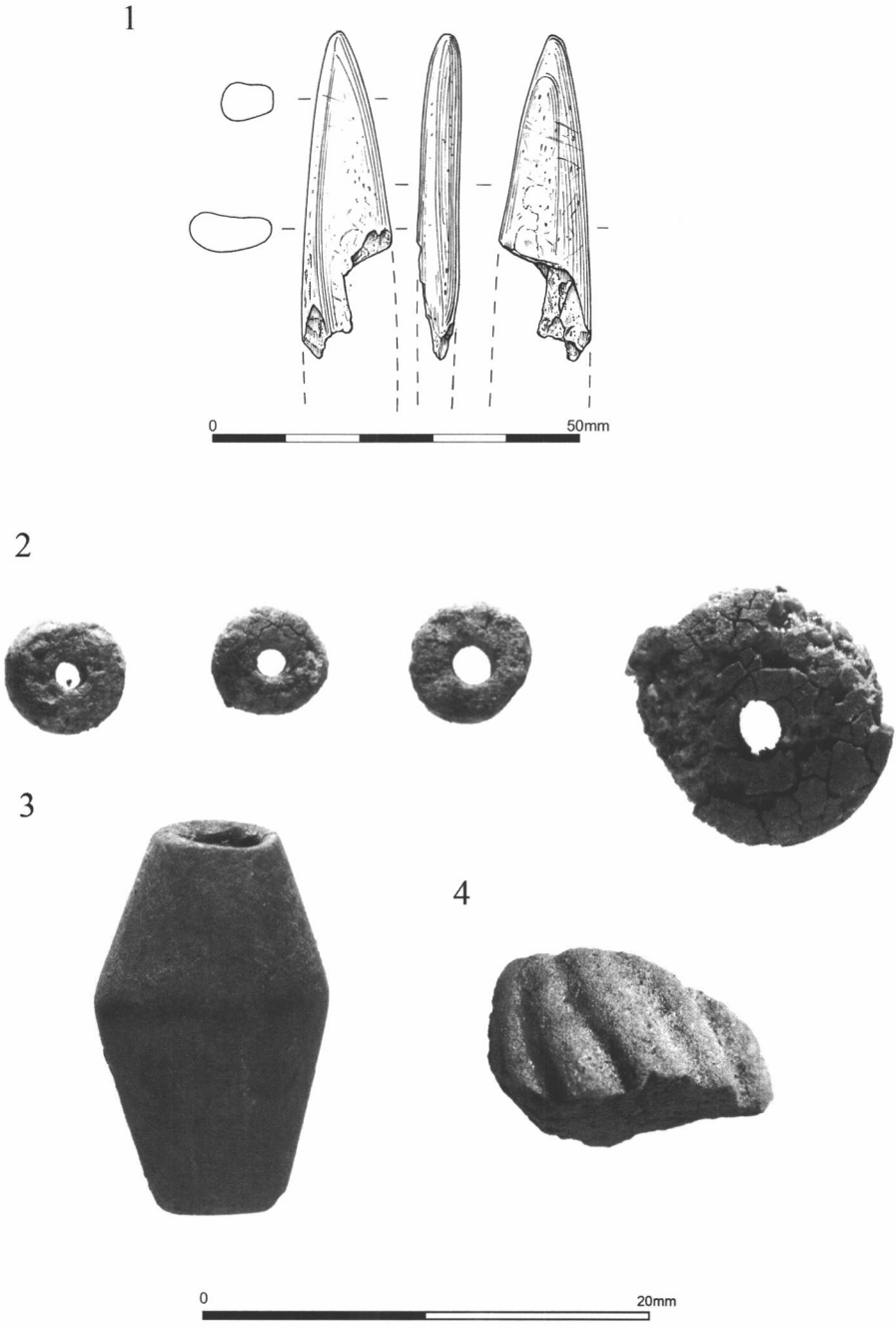

Fig. 15: Worked bone from the Barrow 1 cist grave and beads from the mound.

Phases 2–3

Much of the activity in Phases 2 and 3 is hard to disentangle because, apart from the graves, the human remains are a palimpsest of material from the subsoil and rock surface below the barrow. In Area 2 the subsoil comprised an orange-brown sandy silt (1002) on the edge of the barrow and a darker, more clayey deposit with 10% limestone fragments (1021) under the core of the mound. In Area 12 a similar orange-brown clayey silt deposit was divided into three sectors (1053, 1057 and 1082), the first to the north of the fissure, the second to the south and the last to the east, which was more disturbed. The last two of these contexts underlay a thin pre-mound deposit (1056 and 1082 respectively) which contained large numbers of microfauna. The subsoil beneath the baulk between Areas 1 and 12 was darker and contained up to 20% stones, while in Area 1 proper it is described as a yellow-brown clayey silt with small stones. From the sections, the subsoil and associated pre-mound layers appear to have been about 0.1m thick.

Nearly all the individually recorded finds from these deposits came from Area 12, either side of the fissure (Fig. 16); the vast majority are human or animal bone. Additional finds came from the samples, those in Area 12 producing more bone, along with pottery and flint. Among the latter there were only two diagnostic pieces, a Neolithic blade and a Late Neolithic/ Early Bronze Age spalling flake (Makey, below). Pottery was more common, with sixteen sherds found to the west of the cist grave. Beaker and Neolithic fabrics are represented, along with pieces of the Phase 4 Food Vessel, presumably pressed downwards when the vessel was crushed (Beswick, below).

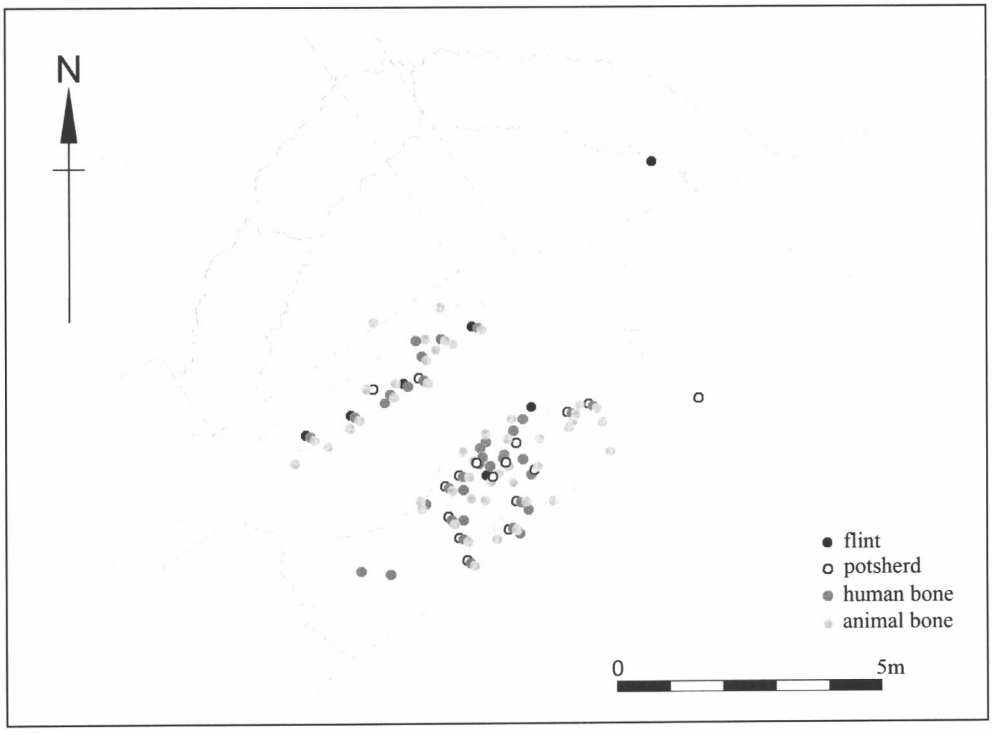

Fig. 16: Barrow 1 pre-mound finds distribution.

The drystone enclosure wall or bank may be Neolithic (Phase 2), as originally thought, but could equally well belong to Phase 3, since it appears to be centred on the main cist grave (Fig. 11). The bank, which enclosed an area some 9–10m in diameter and measured about 1.5m wide, comprised four courses of squared limestone blocks with distinct inner and outer facings around a central rubble core. As mentioned above, an alternative interpretation would see it not as free-standing but an enlargement of an existing mound, as at Wigber Low (Collis 1983). However, as drawn on plan, the inner face of the bank does appear to be such, rather than an earlier outward-facing kerb. Hence the enclosure interpretation is tentatively preferred. Finds from the core of the bank in Area 2 comprise a few fragments of animal bone.

The enclosure had a possible north-facing entrance which spanned Areas 1 and 2. In Area 2 an arc of three 'marker stones' (1014–1016) was apparently placed outside the entrance (Figs 11 and 13). These were small limestone orthostats set onto bedrock, two of which remained upright, with a maximum height of 0.25m. A group of three stones apparently set on edge in Area 1 (not shown on the plan) may be equivalent or could simply represent later collapse. At some point the gap was blocked, apparently using an identical construction method to the original bank; alternatively this was not an 'entrance' at all but reflects a segmentary method of construction (J. Barnatt *pers. comm.*). Beneath the bank a buried soil was sampled at different locations for mollusc remains (Murphy, below); the only other finds from these deposits were animal bones.

Phase 3 or 4

Sketch plans made by the excavators suggest that at some point the graves were covered by a cairn of large limestone blocks (1018/1019 in Area 2, 1095 in Area 1) from which some scattered human bones were recovered. Dimensions of the blocks are not recorded but they seem to have been carefully placed with little or no interstitial material (1095 is described as 90% limestone), whereas the main barrow mound make-up comprised smaller stones and up to 60% soil. The precise extent of this primary 'stone mound' compared with the larger overlying barrow mound is unclear from the formal plans, although it appears to fill the area within the enclosure bank in Areas 1 and 2. No cairn material seems to have been recorded in Area 12, however, where the cist graves were found; indeed, deposit 1058, which had slumped into the top of grave 1062, is equated with the main Phase 4 barrow make-up, 1055 (see below). Therefore the relationship of the cairn to the Beaker mortuary site remains unclear, and it seems possible that it was merely the first stage of construction of the main barrow mound (Phase 4).

The distribution of finds from the 'stone mound' (Fig. 17) shows an even spread of animal bone, but human bone is concentrated in the southern part of Area 1, perhaps indicating a connection to grave 3047. The sparse artefacts do not suggest an early date for the cairn; rather they show evidence for later contamination, comprising three flint flakes of Late Neolithic/ Early Bronze Age type and a sherd of later prehistoric pottery (Fig. 25.10), along with a small fragment of Beaker and crumbs of Romano-British pottery (co-ordinates not recorded).

Phase 4

The 'stone mound' was subsequently covered by layers of small limestone fragments mixed with soil, similar to the structure observed in Barrow 2 (Fig. 11). These represent the main barrow mound and are probably contemporary with the Food Vessel cremation (3030) found in Area 12, which belongs to the early 2nd millennium cal BC (Marshall *et al.*, below), most

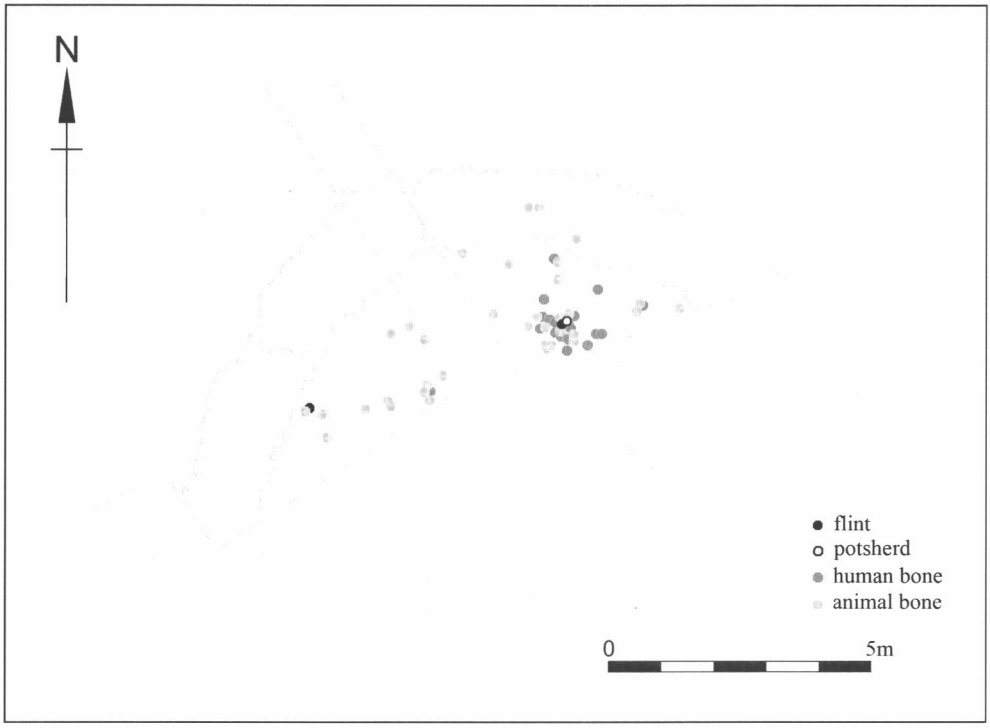

Fig. 17: Barrow 1 stone mound finds distribution.

likely to Needham's 1996 period 3 of the Early Bronze Age. The cremation had been placed in a shallow cut about 1.5m south-west of the earlier cist grave and was much disturbed by the movement of the limestone (Fig. 18). The badly crushed vessel (Fig. 25.6) overlay some unburnt human bones adjacent to the cremated remains (75504).

In Area 1, the stone mound was overlain by deposits 1087, which comprised 60% limestone blocks, and 1086, which included 40% small stones. Both contained Romano-British sherds and the latter appears to have slumped outwards, since it sealed two features of Phase 6, described below. In Area 2 the stone mound was overlain by lower mound make-up (1013 etc.) comprising 80–90% limestone. This was followed by the upper mound material (1004 and 1011), with 40–60% limestone. In Area 12 the barrow material was removed as a single deposit in three parts (1052 to the north of the fissure, 1055 to the south and 1081 at the disturbed eastern end); context 1058 probably represents the lower part of 1055 where it slumped into the top of the central grave. Mound material in the baulk between Areas 1 and 12 was also removed as a single context (3041); within it was a 'concentrated deposit of human bones' in a pocket of fine soil between the stones (3042). This was excavated as a discrete burial but analysis does not support the initial interpretation (Mays, below), though it could represent a deliberate deposit of secondary material (J. Barnatt *pers. comm.*). Deposits in the fissure across Area 12 represent collapsed mound material as well as part of the Phase 3 cist grave; these were recorded as contexts 1050 and 1080, the latter covering the eastern end of the fissure.

Fig. 18: Barrow 1 cremation grave.

The secondary mound extended over and beyond the earlier enclosure bank, also covering the orthostats that marked the possible entrance (though some of this could reflect later disturbance or slippage). Mound construction apparently caused some tumble or collapse of the bank, recorded as 1097 in Area 1.

The mound produced a large number of finds, with a particular concentration either side of the fissure in Area 12 (Fig. 19). Few came from the more peripheral samples in all three areas. Beyond this the impression is of an even distribution of all materials, consistent with them being randomly redeposited from pre-mound contexts rather than deliberately inserted into the mound. An unusual find from deposit 1055 was a fragment of large mammal cortical bone worked into a point (not illustrated), while several beads, including four annular forms in amber (Fig. 15.2) and one biconical example in jet or shale (Fig. 15.3), all from context 1052, presumably derive from graves. The intrusive Romano-British (Phase 6) pottery follows the same general pattern, though the largest group by weight came from Area 1 (1086).

The mound also contained numerous disarticulated human remains. Originally interpreted as insertions made during construction, analysis suggests they are part of the same assemblage of comminuted bone found beneath the mound. The material had been, deliberately or inadvertently, scraped up and incorporated within the structure.

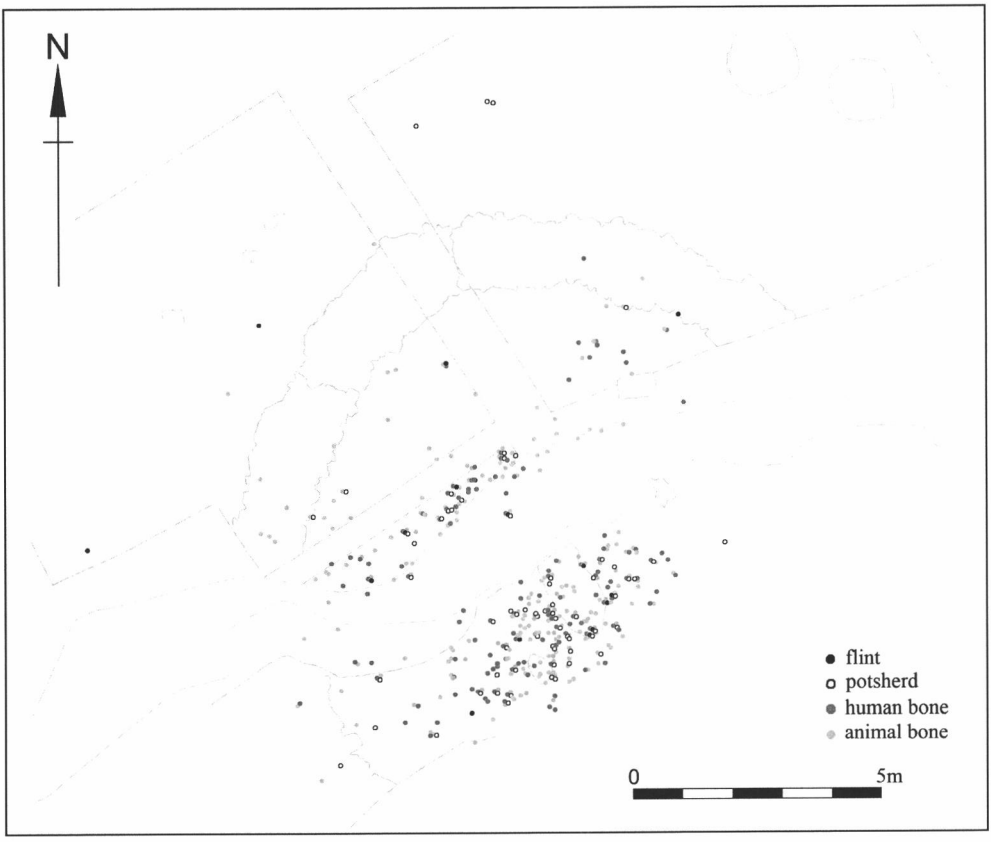

Fig. 19: Barrow 1 mound finds distribution.

Phases 5–7

Three discrete phases of later re-use or disturbance of the barrow mound were recognised. Late Bronze Age or Iron Age sherds (Beswick, below) from various mound contexts (1052, 1055, 1058, 1081, 1086, 1087 and 1095) as well as the fills of the cist grave (see above) provide rare evidence for later prehistoric activity at a barrow site (Phase 5), though the nature of that activity is unclear.

Subsequently, two shallow features, each capped with layers of stone (1088 and 1089), were placed on the edge of the barrow during the Romano-British period (Phase 6; Fig. 11); neither of them seem to have contained any human bone and they were covered by slumped mound material. Structure 1088 was a circular layer of limestone pieces, about 1.5m in diameter, overlying a deposit (1094) that differed little from the natural subsoil but contained some pottery. 'Cut' 1091, about 1m to the north-west of 1088, may have been a natural hollow in the bedrock some 0.4m deep; it was filled with a sandy silt deposit (1090) that looked like redeposited subsoil and also contained pottery. This was in turn overlain by a limestone capping (1089), with a diameter of 1.4m.

Further disturbance of the mound at this time is shown by finds of Romano-British potsherds from several other contexts (Fig. 20), as well as a fragment of a blue glass bead

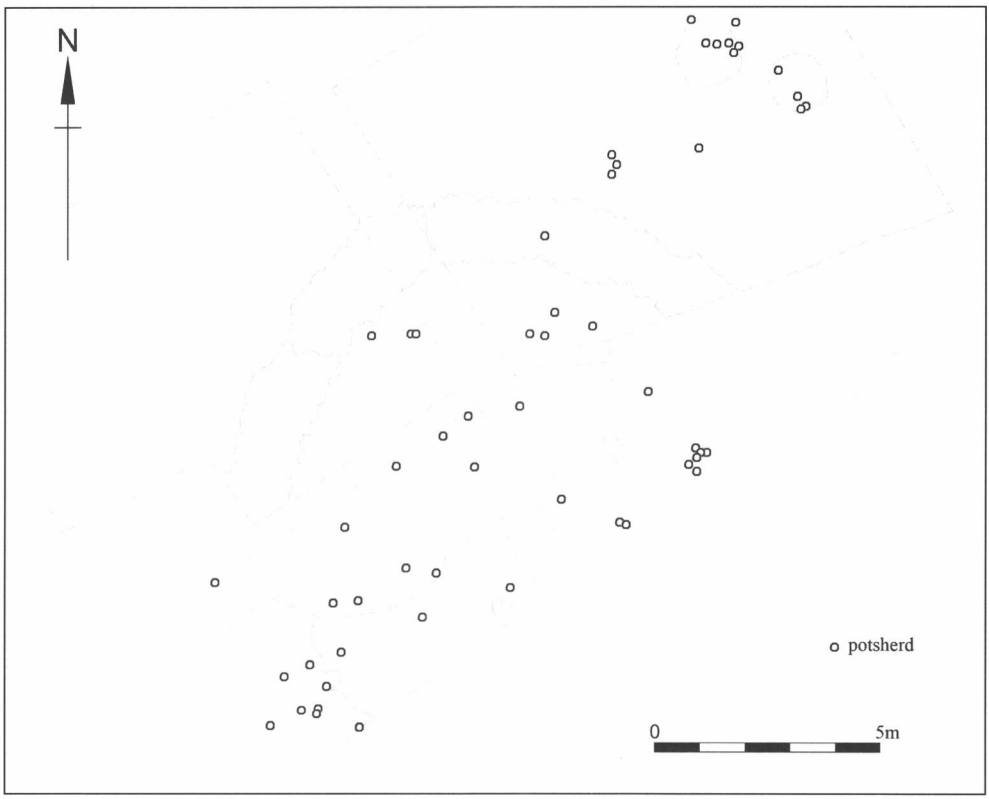

Fig. 20: Distribution of Romano-British sherds (all contexts).

(Fig. 15.4); the presence of small pottery fragments in lower, otherwise undisturbed deposits can be explained by the activity of soil fauna or gravity, as soil gradually filled voids within the cairn. It is not entirely clear whether any of the human bones within the mound belong to this period (*cf.* Leary, Mays and Popkin, below), although the lack of articulated elements suggests they are most likely to be residual prehistoric remains.

More recent disturbance of the upper levels of the mound (Phase 7) is shown by finds of post-medieval sherds, bottle glass, worked stone (mainly Coal Measures sandstone) and a fragment of clay pipe stem.

RADIOCARBON RESULTS

By Peter Marshall, Jonathan Last, Christopher Bronk Ramsey and Johannes van der Plicht

Nine radiocarbon age determinations were obtained on samples of charcoal and human bone from Longstone Edge. Objectives of the dating programme were:

- to determine the date and duration of mortuary activity prior to the construction of Barrow 1 mound;
- to provide a date for human remains below Barrow 1;

- to date the Food Vessel cremation burial associated with construction of the Barrow 1 mound;
- to date the mortuary activity from Barrow 2, as a comparison with that beneath Barrow 1.

Eight samples were processed by the Oxford Radiocarbon Accelerator Unit in 2004. The two charred plant remains were prepared using the methods outlined in Hedges *et al.* (1989), the five human bones according to Bronk Ramsey *et al.* (2004a), and the cremated bone as outlined in Lanting *et al.* (2001). The samples were all measured using Accelerator Mass Spectrometry (Bronk Ramsey *et al.* 2004b).

One sample of cremated bone was submitted to the Centre for Isotope Research of the University of Gröningen, Netherlands, for Accelerator Mass Spectrometry (AMS) radiocarbon dating in 2004. The sample pre-treatment followed the method described by Lanting *et al.* (2001) and was processed according to procedures set out in Aerts-Bijma *et al.* (1997; 2001) and van der Plicht *et al.* (2000). Both these laboratories maintain continual programmes of quality assurance procedures, in addition to participation in international inter-comparisons (Scott 2003). These tests indicate no laboratory offsets and demonstrate the validity of the precision quoted.

The radiocarbon results are given in Table 1, and are quoted in accordance with the international standard known as the Trondheim convention (Stuiver and Kra 1986). They are conventional radiocarbon ages (Stuiver and Polach 1977).

Calibration

Calibrations of the results, relating the radiocarbon measurements directly to calendar dates, are given in Table 1 and in outline in Fig. 21. All have been calculated using the calibration curve of Reimer *et al.* (2004) and the computer program OxCal (v4.0.5) (Bronk Ramsey 1995; 1998; 2001; 2009). The calibrated date ranges cited in the text are those for 95% confidence. They are quoted in the form recommended by Mook (1986), with the end points rounded outwards to 10 years. The ranges quoted in italics are *posterior density estimates* derived from mathematical modelling of archaeological problems (see below). The ranges in plain type in Table 1 have been calculated according to the maximum intercept method (Stuiver and Reimer 1986). All other ranges are derived from the probability method (Stuiver and Reimer 1993).

Methodological Approach

A Bayesian approach has been adopted for the interpretation of the chronology from this site (Buck et al. 1996). Although the simple calibrated dates are accurate estimates of the dates of the samples, this is usually not what archaeologists really wish to know. It is the dates of the archaeological events represented by those samples which are of interest. In the case of Longstone Edge, it is the chronology of the use of the site for funerary activity that is important, not just the dates of individual burials. This can be estimated by using the stratigraphic relationships between samples as well as the radiocarbon measurements.

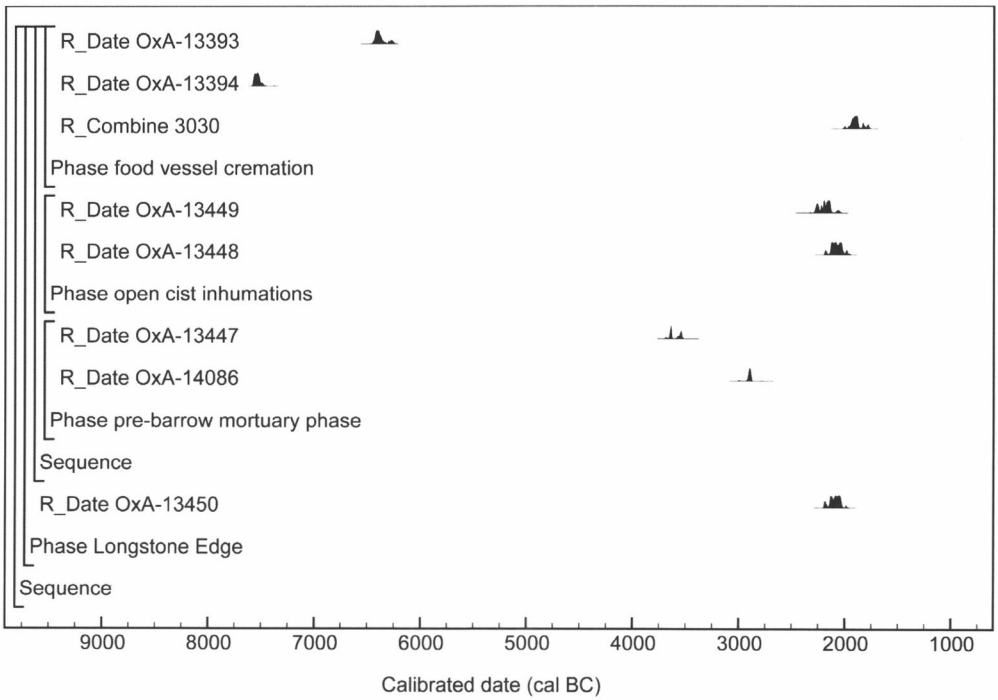

Fig. 21: Probability distributions of dates. Each distribution represents the relative probability that an event occurred at a particular time. These distributions are the result of simple radiocarbon calibration (Stuiver and Reimer 1993).

Fortunately, a methodology is now available which allows the combination of these different types of information to produce realistic estimates of the dates of archaeological interest. It should be emphasised that the *posterior density estimates* produced by this modelling are not absolute. They are interpretative estimates, which can and will change as further data become available and as other researchers choose to model the existing data from different perspectives. The technique used is a form of Markov Chain Monte Carlo sampling, and has been applied using the program OxCal v4.0.5 (http://c14.arch.ox.ac.uk/). Details of the algorithms employed by this program are available from the on-line manual or in Bronk Ramsey (1995; 1998; 2001; 2009). The algorithm used in the models described below can be derived from the structure shown in Fig. 21.

The Sequence

This section describes the archaeological evidence which has been incorporated into the chronological model, explaining the reasoning behind the interpretative choices made in producing the models presented. These archaeological decisions fundamentally underpin the choice of statistical model.

The pre-mound deposits beneath Barrow 1 contained human bone fragments in association with Neolithic pottery. Originally interpreted as an exposure platform, analysis of the human remains suggests they do not represent excarnation; an alternative interpretation was that the remains might be contemporary with the disturbed burials in the cist grave (Mays, below).

Lab Number	Context (Sample Number)	Description	Material	Radio-carbon Age (BP)	Weighted mean	^{13}C (‰)	^{15}N (‰)	C:N ratio	Calibrated date range (95% confidence)	*Posterior Density Estimate (95% probability)*
OxA-13393	3030 (5136A)	Barrow 1, cremation	Hazelnut shell fragment	7519±40		-22.4			6450–6240 cal BC	–
OxA-13394	3030 (5136B)	Barrow 1, cremation	Hazelnut shell fragment	8475±40		-24.7			7590–7480 cal BC	–
OxA-14087	3030	Barrow 1, cremation	Human bone, cremated	3560±40	3558±28 BP (T'=0.0; T'(5%)=3.8; v=1, Ward and Wilson 1978)				2010–1770 cal BC	*2020–1770 cal BC*
GrA-26548	3030	Barrow 1, cremation	Human bone, cremated	3555±40						
OxA-13447	1057 (72572)	Barrow 1, inhumation	Human bone, proximal end of right ulna	4832±31		-20.8	9.0	3.2	3660–3530 cal BC	*3700–3620 (39%) or 3540–3520 (56%)*
OxA-14086	1082 (72776)	Barrow 1, inhumation	Human bone	4283±32		-22.1	11.7	3.2	2930–2870 cal BC	*3010–2870 cal BC*
OxA-13448	75501	Barrow 1 (cist grave), inhumation	Human bone, left femur base	3691±29		-20.6	10.4	3.2	2200–1970 cal BC	*2200–1980 cal BC*
OxA-13449	75502 (72711/2)	Barrow 1 (cist grave), inhumation	Human bone, left femur distal shaft	3771±29		-20.5	10.8	3.3	2290–2040 cal BC	*2290–2130 (91%) or 2090–2050 (4%) cal BC*
OxA-13450	2058 (72634)	Barrow 2, inhumation	Human bone, left femur mid-shaft fragment	3704±29		-21.2	12.3	12.3	2200–1980 cal BC	*2200–2020 (94%) or 2000–1980 (1%) cal BC*

Table 1: Radiocarbon results

Two measurements on human bone from the purported excarnation platform (OxA-13447 and OxA-14086) are not statistically consistent (T'=151.2; T'(5%)=3.8; v=1, Ward and Wilson 1978) and clearly represent material of two different ages. However, both are considerably older than the two inhumations from the grave. Measurements on these (OxA-13448 and OxA-13449) are statistically consistent (T'=3.8; T'(5%)=3.8; v=1, Ward and Wilson 1978) and could thus be of the same age.

The Food Vessel cremation was subsequently placed close to the main cist grave and sealed by the main barrow mound. Replicate samples of charred hazelnut fragments and cremated human bone were submitted as part of a wider programme to assess the accuracy of the dating of cremated bone (Lanting *et al.* 2001). The four measurements are not statistically consistent (T'=11384.2; T'(5%)=7.8; v=3, Ward and Wilson 1978) and clearly represent more than one phase of activity. The two replicate measurements on cremated bone (3030) are statistically consistent (T'=0.0; T'(5%)=3.8; v=1, Ward and Wilson 1978), and thus a weighted mean can be taken before calibration (3558±28 BP). The two measurements on charred hazelnut fragments from the cremation deposit (OxA-13393 and OxA-13394) are not statistically consistent (T'=283.9; T'(5%)=3.8; v=1, Ward and Wilson 1978) and the material represents the remains of two distinct periods of activity.

The measurement on the partial remains of a child skeleton found on the ground surface beneath the mound of Barrow 2 (OxA-13450) is statistically consistent with measurements from the main cist grave of Barrow 1 (T'=4.4; T'(5%)=6.0; v=2, Ward and Wilson 1978) and could all be of the same actual age.

The Model

In the model in Fig. 22 the two measurements on charred hazelnut fragments from the Food Vessel cremation burial have been excluded from the analysis because they are clearly residual and probably relate to Mesolithic activity in the vicinity of the site. The model shows good agreement between the radiocarbon results and stratigraphy, ($A_{overall}$=99.8%) and provides an estimate for the start of mortuary activity of *3880–3540 cal BC (68% probability; Boundary_Start*). The cist grave burials date to the end of the 3rd millennium cal BC, following which they may have been covered by the first (stone) mound which, if it is a separate phase, is estimated to have been constructed in *2070–1930 cal BC (68% probability; mound construction*). The estimate for the date of the Food Vessel cremation is *2020–1770 cal BC (95% probability; R_Combine 3030*) and probably *1950–1850 cal BC (68% probability)*. This estimated date of the cremation also provides a *terminus post quem* for construction of the main barrow mound.

The two individuals dated from below Barrow 1 are clearly Neolithic in date and indicate the presence of a much earlier mortuary phase. The presence of (undated) burnt bone in the mortuary deposit shows that at least some of these remains have been redeposited.

Stable Isotopes

The ratio of carbon isotopes is used to distinguish between a marine protein diet (expected consumer's $\delta^{13}C$ is 12‰) and a C3 plant protein diet (most vegetables, fruits and grain; expected consumer's $\delta^{13}C$ is 20‰) (Schwarcz and Schoeninger 1991). Carbon isotope values between 12‰ and 20‰ indicate consumption of a mixture of marine and terrestrial resources.

Nitrogen isotopes are primarily used to determine the input of plant *vs* animal protein in the diet, although there is some evidence that $\delta^{15}N$ values are also influenced by the nitrogen balance of an organism (Fuller *et al.* 2004). In an ecosystem each step up the food chain

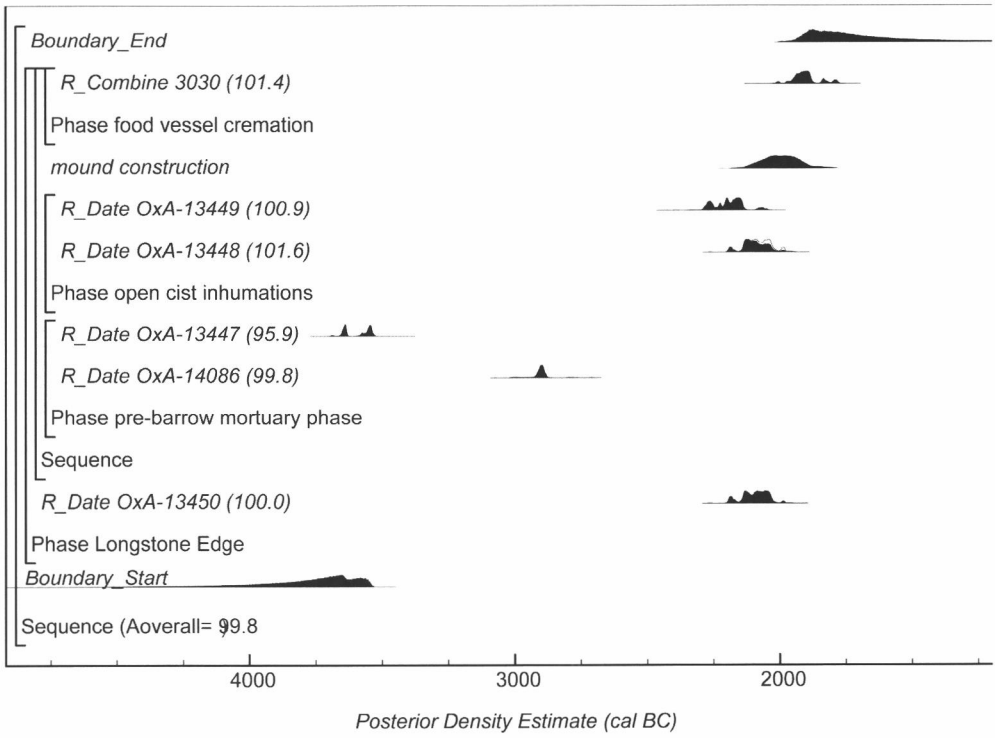

Fig. 22: Probability distributions of simulated dates. Each distribution represents the relative probability that an event occurred at some particular time. For each of the simulated radiocarbon measurements two distributions have been plotted, one in outline, which is the result of simple radiocarbon calibration, and a solid one, which is based on the chronological model used. The other distributions correspond to aspects of the model. For example, the distribution '*mound construction*' is the estimated date for the construction of the first mound at Longstone Edge. The large square brackets down the left hand side along with the OxCal keywords define the overall model exactly.

results in consumer tissue, in this case bone collagen, being enriched in $\delta^{15}N$ by approximately 3–4% relative to diet (Schoeninger and DeNiro 1984). Thus people who eat more animal protein compared to plant protein will display higher $\delta^{15}N$ values (O'Connell and Hedges 1999).

The $\delta^{13}C$ stable isotope values (Table 1 and Fig. 23) are consistent with a very largely terrestrial diet and are not likely to have any effect on the radiocarbon dating (Chisholm *et al.* 1982). As no faunal samples are available from Longstone Edge it is not possible to make a direct trophic level comparison of human $\delta^{15}N$ values with domestic or wild animal $\delta^{15}N$ values. The $\delta^{15}N$ values for the young child from barrow 2 (OxA-13450; +12.3‰) and child from the mortuary deposit below Barrow 1 (OxA-14086; +11.7‰) are, though, significantly enhanced compared with the adults. These values might be evidence that the children were breast-fed (Richards *et al.* 2002), but as they died at a young age they might have been fed different diets or died of malnutrition, potentially altering the expected $\delta^{15}N$ values (Hobson *et al.* 1993).

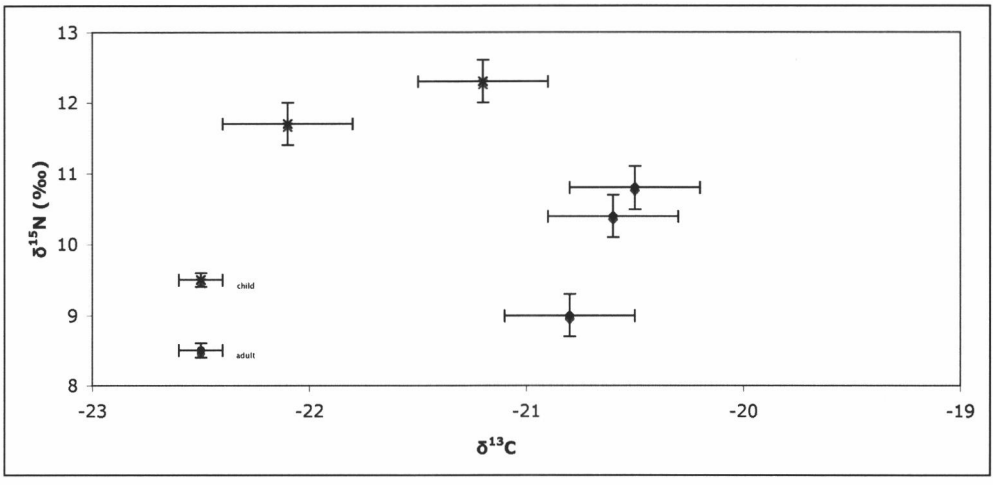

Fig. 23: Human bone isotope data.

The C:N ratios suggest that bone preservation was sufficiently good to have confidence in the radiocarbon determinations (Masters 1987; Tuross *et al.* 1988).

Conclusions

The radiocarbon programme has confirmed the existence of Neolithic mortuary activity pre-dating Barrow 1, though it has not clarified the formation processes of this assemblage. Subsequent mortuary activity prior to the completion of Barrow 1 comprised cist grave burials just before 2000 cal BC, and a Food Vessel cremation burial just after 2000 cal BC. The radiocarbon results from graves beneath Barrows 1 and 2 suggest that the Early Bronze Age burial activity at each site may have been contemporary.

STRUCK AND BURNT FLINT

By Peter Makey (report written in 2002)

The combined lithic assemblage from the excavation totals 100 struck pieces of flint and chert, weighing 119.5g (Table 2). Sixty-nine of these pieces came from the area of Barrow 1 and 25 from Barrow 2; a further six came from the topsoil in Areas 8 and 11. The retouched component of the assemblage totals ten pieces: those shown in Fig. 24 and a piercer/retouched point from subsoil 1053. The remaining 90 pieces are considered to be knapping debitage. All but one of the retouched pieces came from Barrow 1, mostly from pre-mound deposits.

The small size of the Barrow 2 assemblage and the lack of retouched implements (the exception is a scraper from subsoil 2058) may in part be related to the prior removal of flints by Bateman. Bateman's backfill contained four pieces of debitage, so it must be considered probable that he left debitage but retained retouched tools.

Flint ID	Total	Broken	Edge-use	Weight (g)	Subsoil		Enclo-sure wall	Cist grave	Stone mound	Food Vessel	Barrow mound		Post-Bronze Age/ Unstratified/Disturbed		
Barrow					1	2					1	2	1	2	Other areas
Debitage															
Cores	1	1		2.3									1		
Chunks	9	n/a		58.6	1		1	2			1	1	1	1	1
Chippings	12	n/a		2.8	4	1		3				1		2	1
Spalls	3	n/a		0.3	2							1			
Flakes	60	20		36	8	5	1	15	3		9	4	5	7	3
Blades and Bladelets	5	2		1.4	1					1	1	1			1
Retouched															
Edge-retouched Blades	1	1	1	1.5							1				
Piercers/Points (edge-retouched)	1	n/a	1	3.4		1									
Spurs	1	1		1.7							1				
Scrapers	3	1	3	4.8		1		1			1				
Arrowheads - leaf	1	1		2.7			1								
Arrowheads - tanged	1	1		2.1			1								
Microliths	2	n/a	2	1.9	1			1							
Total	**100**	**28**	**7**	**119.5**	**17**	**8**	**4**	**22**	**3**	**1**	**14**	**8**	**7**	**10**	**6**

Table 2: Composition of the flint assemblage.

Assemblage Traits

Despite the residual nature of much of the material, the majority of the assemblage has not been subject to extensive edge damage and abrasion. Fourteen of the struck lithics are in a fresh state: it is notable that this material came from subsoil deposits and particularly from the Barrow 1 cist grave fill around skeleton 75502. Only 28 pieces have been broken but these include half the retouched implements. Barrow 2 produced a higher proportion of broken pieces than Barrow 1 (40% *vs* 23%), which may reflect the fact that much of this material is derived from unstratified contexts and Bateman's backfill.

None of the debitage possesses macroscopic traces of edge use-wear but all three scrapers, both microliths, the edge-retouched blade and the retouched point appear to have been used. Eight pieces were burnt, three of them from Barrow 1 (all within or above the cist grave). Pieces with traces of patina, mostly dense and light grey to white in colour, do not show any spatial or temporal relationships.

Raw Material

Raw material appears to have been scarce since both flint and chert (22 pieces) were utilised. The chert, which occurs locally in the Carboniferous Limestone, is coarse-grained and tends to be olive-black in colour (Munsell 5Y 2/1). It appears to be evenly distributed throughout all contexts and occurs in both barrows. However, none of the retouched implements are chert.

Of the 78 pieces of struck flint, 61 are a medium-grained, olive-grey (Munsell 5Y 4/1) raw material, characteristic of that obtainable from till deposits in the Yorkshire and Lincolnshire Wolds. The remaining seventeen pieces are of a markedly coarser granularity.

Technology

With the exception of an unclassifiable possible core fragment from the Barrow 1 fissure (Area 12), no other cores or core rejuvenation flakes were recovered. The quality of knapping is generally low, with only ten pieces exhibiting traces of platform preparation. The majority of the flint and chert has been knapped via the application of hard hammers.

Over half of the struck material comes from tertiary stages of lithic reduction. The distribution of tertiary debitage, which is generally small and squat, appears to slightly favour Neolithic and Beaker contexts, i.e. the subsoil and burials. It is notable that the Barrow 1 subsoil produced two tertiary spalls that refit; this demonstrates that some degree of knapping or tool trimming took place prior to barrow construction.

The scraper assemblage (Fig. 24.6–8) comprises one side scraper and two side and end scrapers (one broken). They exhibit a dense white to grey patina and appear to have been used. The flaking is fine, convex and scalar, with primary flake edge angles of 55°, 60° and 65°.

Two arrowheads were recovered, one leaf type and one tanged. Both examples are poor and have been manufactured on a markedly coarse-grained chalcedonic flint that can almost be classed as chert. The arrowheads were found in tumble from the Barrow 1 enclosure bank in Area 1. They are both damaged and are clearly residual. The leaf arrowhead (Fig. 24.5) is a very poor basal fragment with minimal flaking, while the other (Fig. 24.9), which does not possess barbs, has four minute, crude serrations down its lateral margins; the tang has been broken but the tip is intact, though it cannot be determined whether the projectile has been fired. The type is not listed as a notable form in Green's (1980) corpus and serrated pieces are rare: although some Scottish barbed-and-tanged arrowheads have serrated edges, in most instances the serration is far finer than on the Longstone Edge piece. One of the

closest parallels is a specimen on chalcedonic flint from Urquhart near Elgin in Moray, in the National Museum of Scotland (Evans 1897, 387, fig. 325). The Longstone Edge tanged arrowhead was manufactured on a type of flint consistent with Wolds material, though the precise source is not certain. However, one would normally expect imported pieces to be of a higher quality, and it should be noted that projectile points are usually found in their area of manufacture.

Barrow 1 contained two microliths: a small edge-blunted point (Fig. 24.2) and an obliquely blunted point made on a bladelet and possessing ancillary retouch (Fig. 24.1). These came respectively from the fill around skeleton 75502 and from the subsoil (1053). Both were manufactured on till flint.

Chronology and Discussion

Despite the small size of the assemblage, it does appear to contain a broad variety of chronologically discrete items. Based primarily on the Barrow 1 assemblage, the lithic component includes pieces from at least four separate archaeological phases:

Mesolithic (= Phase 1)
Early to Middle Neolithic (Phase 2)
Beaker (Late Neolithic/Early Bronze Age) (Phase 3)
Early Bronze Age (Phase 4)

The most chronologically diagnostic pieces in the assemblage are the microliths and arrowheads. The microlith forms fall within the broad blade/narrow blade division and probably date from the middle part of the Mesolithic. The leaf arrowhead fragment is indicative of an Early to Middle Neolithic date; such pieces are frequently found in assemblages associated with Peterborough Ware. The tanged arrowhead is typically a Beaker form. Small scraper assemblages cannot be dated with any great degree of accuracy, although on stylistic and metrical grounds the Longstone Edge examples are similar to ones most frequently found in Beaker and Early Bronze Age assemblages. The same date would encompass the remaining retouched component. The small size and lack of clear preparation and flake scars on the debitage are suggestive of an Early Bronze Age date, although one or two of the flakes and blades appear to be Neolithic. The inclusion of chert in the assemblage may be significant: Hart (1981, 35) has demonstrated that local chert appears to have been exploited to a lesser degree in the Neolithic than in the Mesolithic or Early Bronze Age.

It is probable, therefore, that the majority of the assemblage is Beaker and Early Bronze Age. A discrete Middle to Late Neolithic pre-barrow phase may be present in the subsoil with a minor residual Mesolithic background scatter, though the shortage of distal flake and blade fragments indicates that only limited flint-knapping was being conducted in pre-barrow phases. The mix of material is a fairly close match to the assemblage from the nearby barrow at Wigber Low (Phillips in Collis 1983, 61–6).

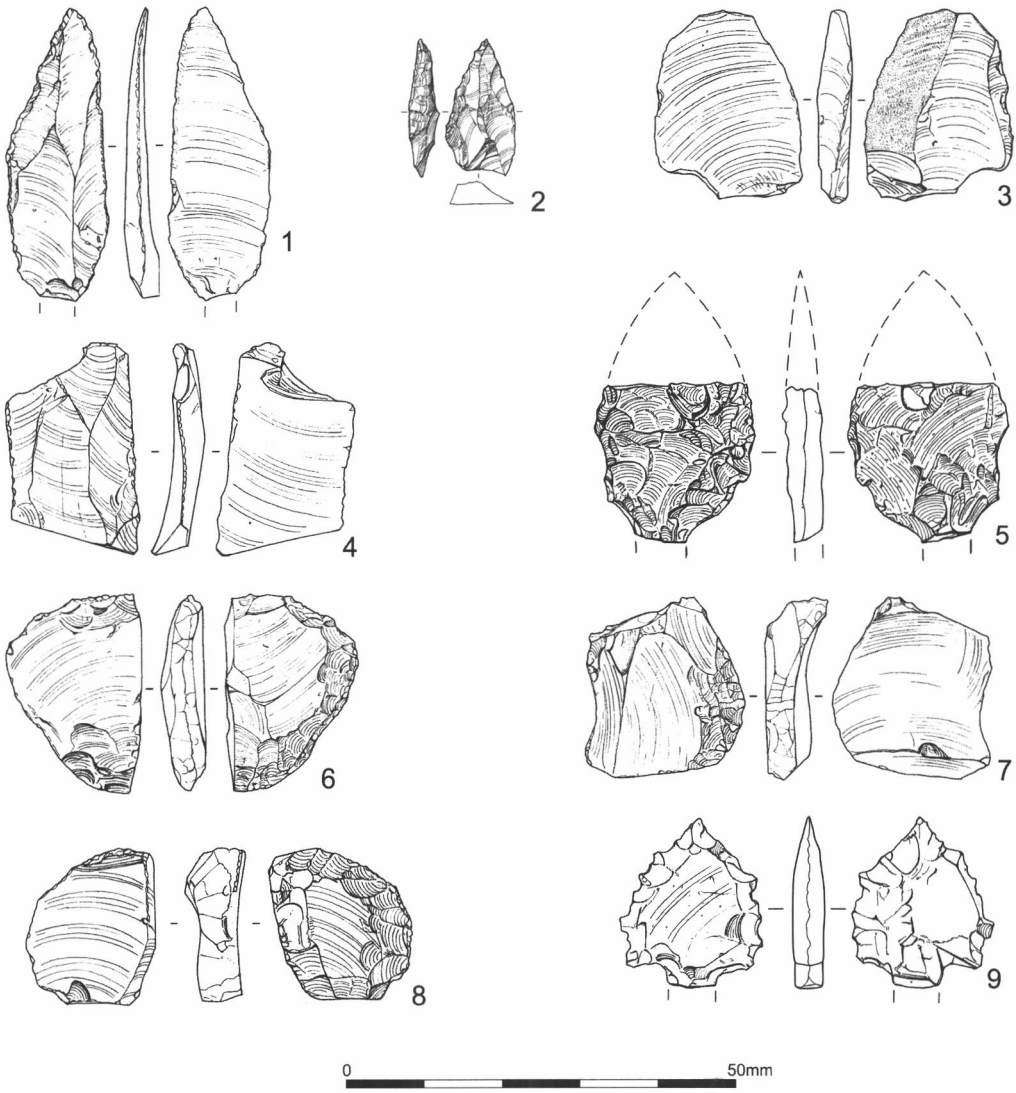

Fig. 24: Lithics

Illustrated Flints (Fig. 24)

1 Obliquely blunted broad blade microlith with slight ancillary distal right-side retouch. Light olive-grey flint with dense light grey patina. Earlier/Later Mesolithic; Barrow 1, fill around skeleton in cist grave (75502).

2 Squat microlith point with left-side edge blunting. Light olive-grey flint with dense light grey patina. Later Mesolithic; Barrow 1 subsoil (1057).

3 Broad single-crested flake with spur defined by a shallow notch. Flint with dense white patina. Later Mesolithic or Early/Middle Neolithic; Barrow 1 mound (3040).

4 Fine parallel-sided edge-retouched blade (broken). Flint with dense white patina. Early/Middle Neolithic; Barrow 1 mound (1055).

5 Broken arrowhead, possibly a leaf form. Poor quality light olive-grey flint. Early/Middle Neolithic; Barrow 1 enclosure bank tumble (1097).

6 End- and side-scraper fragment (right side). Flint with dense white patina. Later Neolithic; Barrow 1 mound (context 1052).

7 Side-scraper (right side). Light olive-grey flint with dense light grey patina. Late Neolithic/Early Bronze Age; Barrow 2 subsoil (2058).

8 Side- and end-scraper (left side). Flint with dense white patina. Beaker? Fill of Barrow 1 cist grave (1060).

9 Broken barbed-and-tanged arrowhead. Coarse olive-grey flint. Early Bronze Age; Barrow 1 enclosure bank tumble (1097).

PREHISTORIC POTTERY

By Pauline Beswick (report written in 2003, revised 2009)

A total of 250 sherds and 1134 fragments, weighing at least 1013g, were recovered (Table 3); because of the sampling strategy (only 80 pieces were retrieved by hand) a high percentage (94%) weighed less than 3g and 77% were abraded. Fabric identification was uncertain for 19% (252), while 15% (191) were unidentifiable. There is evidence for at least three Neolithic vessels, a Beaker and an Early Bronze Age Food Vessel, as well as rims of four Late Bronze Age/Iron Age vessels. Only one vessel, the Food Vessel, was found *in situ* in Barrow 1; most of the remaining sherds were found in the southern sector of the same barrow, both within and under the mound, with a few located within Barrow 2.

Each sherd and fragment was examined using a hand lens (x10 and x20) and weighed to the nearest 1g (excluding fragments that weighed less than 1g). Fabrics were analysed using the system recommended by the Prehistoric Ceramics Research Group (1997). Size and condition codes were assigned to each piece (details in archive) to help determine the nature of the excavated contexts and what the sherds might represent in terms of past activities (Orton *et al.* 1993, 168). Condition is a subjective judgement and no universally accepted method has yet been devised. For this analysis it was based on perceived degrees of wear:

Fabric		Size			Condition			Totals	
		Sm	Med	Lg	Ab	Av	Fs	Sherds/ Fragments	Weight (g)
Beaker	F1	55	12	1	59	4	5	68	97
	?F1	(36)	(1)		(34)	(3)		(37)	16
?Neolithic	F2	31			31			31	5
	?F2	(22)			(22)			(22)	1
Neolithic	F3	26	5		22	9		31	37
	?F3	(26)	(1)		(25)	(2)		(27)	10
LBA/IA	F4	148	14	1	159	4		163	131
	?F4	(61)			(61)			(61)	16
Neolithic	F5	38			38			38	4
	?F5	(82)	(1)		(83)			(83)	21
Food Vessel	F6	563	37	10	314	135	161	610	660
	?F6	(22)			(22)			(22)	3
Unidentified		190	1		191			191	12
Total (incl. ?)		**1300**	**72**	**12**	**1061**	**157**	**166**	**1384**	**1013**

Table 3: Prehistoric pottery analysis by fabric, size and condition.

NB: Weights do not include fragments less than 1g; see text.
Key: Sm (small) - under 3 g; Med (medium) - 3 to 10g; Lg (large) - over 10g Ab (abraded); Av (average); Fs (fresh)

Fresh No abrasion on surfaces or edges, therefore likely to have been *in situ* since burial.

Average Slight abrasion on surfaces and edges, therefore likely to have been moved since breakage.

Abraded All surfaces and edges worn, including pieces with no original surface remaining, and therefore likely to have been disturbed considerably since initial breakage.

Fabrics

Six fabric types were recognised:

Fabric 1 Fine fabric, reddish-brown surface with moderate grog and sparse limestone inclusions, up to 2–3mm in size and poorly sorted, rare flint and chert trimmings. In some acidic contexts leaching of the limestone has taken place. Late Neolithic/Early Bronze Age (Beaker).

Fabric 2 Brownish-grey, smooth, sandy and fine fabric with sparse angular quartz inclusions up to 2mm in size. ?Neolithic; no diagnostic sherds.

Fabric 3 Very dark grey or reddish surface, smooth fabric with moderate to common voids averaging 1mm in size, probably where calcite type inclusions have leached out. Early Neolithic; at least two vessels.

Fabric 4 Dark brown or dark grey coarse fabric with uneven surface and occasional inclusions of rounded ?sandstone or weathered igneous and gritstone up to 5mm in size. Late Bronze Age/Iron Age; at least four vessels.

Fabric 5 Very dark grey or reddish brown surface with sparse voids and occasional angular, ?dolomitic limestone inclusions (no reaction to acid) up to 2mm in size. Middle to Late Neolithic; one vessel.

Fabric 6 Reddish-brown surface, smooth, soapy fabric with abundant grog, angular and up to 3mm in size. Early Bronze Age (Food Vessel).

The site lies near the eastern margin of the limestone plateau and the fabric range reflects this, with three (Fabrics 1, 3 and 5) having limestone-derived inclusions, while one (Fabric 4) has inclusions derived from sandstone or gritstone and possible igneous sources. The former are found on the gritstone Edges east of the River Derwent or on Eyam Moor to the north (Fig. 1). Recent thin-section analysis of similar fabrics excavated on Gardom's Edge (Beswick 1995; 1999; 2003), however, has shown that inclusions thought to be weathered sandstone are in fact mainly degraded basic igneous ultimately derived from the White Peak limestone (K. Cootes 2012; and *pers. comm.*).

The sandy, quartz-rich clay in Fabric 2 would have been widely obtainable in the Derwent Valley or from glacial deposits on the limestone. Fabric 3 closely resembles an Early Neolithic

Grimston Ware fabric from sites in the Peak District such as Lismore Fields, Buxton (Garton 1991, 18) and Mount Pleasant, Kenslow (Garton and Beswick 1983, 23). The Food Vessel from Barrow 1 (Fabric 6) was so heavily grog-tempered and poorly fired that when crushed and disturbed the fabric shattered into many fragments (Table 3 – note that all tiny fragments, some still mixed with soil, could not practically be included in the fragment or weight totals), suggesting that it may have been made solely for burial and not for everyday use. The presence of abraded sherds of this vessel in pre-mound contexts could suggest that the grave was disturbed before completion of the final barrow mound.

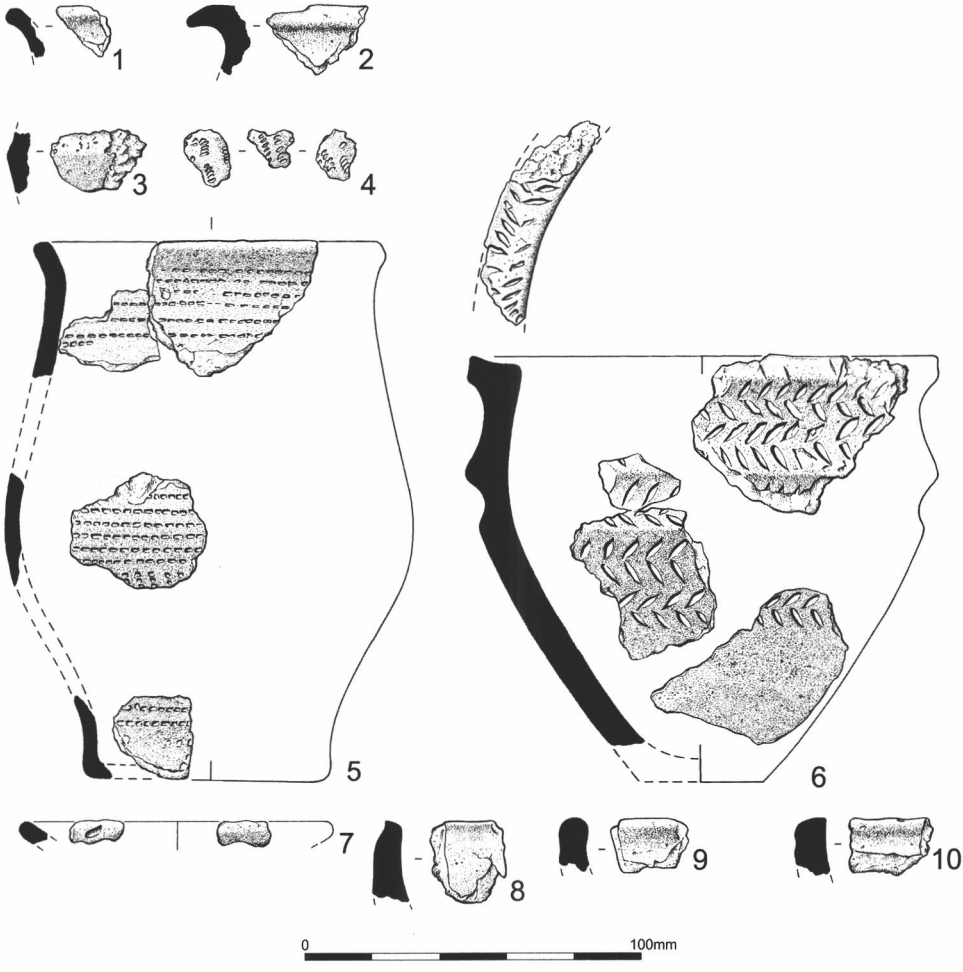

Fig. 25: Prehistoric pottery

Forms

Diagnostic sherds are illustrated (Fig. 25) and described individually below in chronological order, followed by general comments within a chronological framework.

1 Rim sherd; everted and rounded. Probably from an open, round-bottomed bowl of Early Neolithic Grimston Ware style. Fabric 3; Barrow 1 mound (context 1055).

2 Rim sherd; sharply everted and pointed with a flattened top and deeply concave neck, but much of the original surfaces are missing. Probably from a round-bottomed bowl of the Early Neolithic. Fabric 3; Barrow 1 mound (1052).

3 Body sherd; exterior carination but internal surface missing. Probably from a round-bottomed bowl in an Early Neolithic style. Fabric 3; Barrow 1 basal mound (1058).

4 Body sherds (3 examples); deeply impressed, closely spaced, cord maggots in surviving exterior surface. Middle to Late Neolithic, probably Peterborough Ware (Mortlake or Ebbsfleet style). Fabric 5; one from Barrow 1 subsoil (1057), two from Barrow 1 mound (1055).

5 Rim and body sherds of Beaker; incomplete, rim diameter *c.* 100mm internally, height and base diameter unknown, body 5–6mm thick. Total weight of likely pieces *c.* 113g (Table 3). Decoration AOComb, i.e. multiple horizontal lines of comb impressions, average size 1mm long, irregularly applied in 20mm-deep, six-line zones over the upper part of the body and the belly. Below was a band of diagonal comb impressions with at least two horizontal lines above a slightly protruding base. Fabric 1.

Illustrated sherds shown in possible reconstruction (Fig. 25.5): rim sherds from Barrow 1 mound (1055; abraded and fresh) and pre-mound surface (1056; fresh); body sherds from mound (1055; abraded and fresh) and pre-mound surface (1056; abraded and fresh); base sherd from mound (1055; abraded).

Classification: Clarke's (1970) Wessex/Middle Rhine or Northern British/Middle Rhine Groups; Lanting and van der Waals' (1972) Steps 2–3; Case Style 2, Group ?D (Case 1993) or ?Ba (Case 2001); Needham's (2005) Tall Mid-Carinated Beaker (TMC).

Chronology: from typology, probably later 3rd millennium cal BC.

6 Food Vessel; incomplete because much of it shattered (see above), rim diameter 140mm, shoulder diameter 140mm, height over 120mm, base largely missing, body 9mm thick. Total weight of measurable pieces *c.* 663g (Table 3). None of the sherds join; therefore, although the reconstructed shape is the most likely it is not absolutely certain in the shoulder area (Fig. 25.6). The neck, postulated narrow shoulder groove (no evidence for lugs) and upper body are decorated with five horizontal lines of fingernail-impressed chevrons forming a herringbone pattern, and another line of chevrons decorates the slightly concave rim bevel, with irregular diagonal nail

impressions on the rim edge. Fabric 6. Illustrated sherds from Barrow 1 grave fill (3030; fresh), accompanied by the partial cremated remains of two individuals.

An abraded sherd and fragments of the same vessel were found in Barrow 1 subsoil (1057).

Classification: probably Type 2 (Abercromby 1912, 93–4), with shoulder groove; Yorkshire vase Type 2(ii) (Manby 1957, 4), with deep shoulder groove. If originally lugged it could be a Type 1a, lugged and grooved form.

Chronology: from typology, probably early part of 2nd millennium cal BC.

7 Rim sherd; everted and rounded with a probable fingertip/nail impression on the internal edge. Late Bronze Age/Iron Age. Fabric 4; Barrow 1 mound (1081/1082).

8 Rim sherd; upright, bevelled and tapered. Late Bronze Age/Iron Age. Fabric 4; Barrow 1 mound (1052).

9 Rim sherd; upright, rounded and slightly beaded. Late Bronze Age/Iron Age. Fabric 4; Barrow 1 mound (1086).

10 Rim sherd; upright, tapered flat on inner edge, rounded and slightly beaded on outer edge. Late Bronze Age/Iron Age. Fabric 4; Barrow 1 stone mound (1095).

Neolithic Pottery

Probable Neolithic sherds and fragments in Fabrics 2, 3 and 5 comprise 17% (232) of the assemblage but only three vessels can be recognised, two in Fabric 3 from the rims (Fig. 25.1–2) and one in Fabric 5 from the distinctive cord maggot impressions (Fig. 25.4).

Fig. 25.1 resembles in shape rims of Early Neolithic Grimston Ware pottery found in earlier 4th millennium contexts in the Peak District (e.g. Lismore Fields: Garton 1991, 19). Sherds in the same vesicular fabric have been found in flint scatters on the central limestone plateau of the White Peak at Mount Pleasant (Garton and Beswick 1983, 23) and Astonhill (May 1971), as well as at the burial monuments of Green Low, Aldwark (Manby 1965) and Liffs Low (Barnatt 1996c). The carinated sherd (Fig. 25.3), could be from the same vessel. The rim sherd (Fig. 25.2) in the same fabric is more developed in shape but could be from a similar earlier Neolithic carinated plain bowl style (*cf.* the range of rim forms from Broome Heath, Norfolk: Wainwright 1972).

Decorated Neolithic pottery based on the carinated bowl styles of the earlier Neolithic developed around the mid 4th millennium cal BC and continued into the very early 3rd millennium cal BC (Gibson 1995, 30; Beamish 2009) in the form of Peterborough impressed wares. Cord maggots are favoured particularly in the Ebbsfleet and Mortlake styles (e.g. Manby 1988, 52, 54), although the fragments from Longstone Edge are too tiny to characterise as one particular style. Peterborough Wares in general are relatively common in the Peak District from open sites and caves, both domestic and funerary (Garton and Beswick 1983, 19), with the Mortlake style dominant but Ebbsfleet examples also present (e.g. at Wigber Low: Collis 1983, 53–7).

Small abraded pieces of the two pottery types represented by Fabrics 3 and 5 were found within the mounds and subsoil of both barrows (but chiefly Barrow 1). Similar finds of Neolithic sherds, often small and abraded and of different types and ages, have been recognised regionally and elsewhere in association with Bronze Age burial sites (Woodward 2000, 51). Regional examples include Abingdon/Mildenhall and Peterborough style pottery from Wigber Low (Collis 1983, 53–7), possible Mildenhall style and plain Neolithic ware from below Hognaston Barrow, Carsington (Collis 1996, 160–2), plain Neolithic sherds from Liffs Low (Barnatt 1996c, 113–15) and possible Peterborough Ware and Grooved Ware with rusticated Beaker from a barrow at Roystone Grange (Barnatt 1996d, 20–3).

Beaker Pottery (Fig. 25.5)

Detailed examination of the Beaker sherds strongly indicated that only one vessel was present, despite their apparently different appearance resulting from differing burial conditions (see above). A complete, similar-sized Beaker from Rampton, Nottinghamshire, weighed 394g (Knight and Beswick 2000, 16), over three times the weight of the likely surviving sherds of the Longstone Edge Beaker (*c.* 113g).

Debate over typologies and dates has dominated Beaker studies over the last 30 or 40 years (Clarke 1970; Lanting and van der Waals 1972; Case 1977; 1993; 2001; Needham 2005). This vessel would perhaps best fit into Clarke's Wessex/Middle Rhine (W/MR) or Northern British/Middle Rhine (N/MR) groups, retaining elements of earlier Bell Beaker shapes with its everted rim and simple comb decoration in horizontal zones, using European Motif Group 1, motif numbers 1 and 2 (Clarke 1970, 424). Examples similar to the Longstone Edge Beaker include an N/MR Beaker from Rock, Northumberland (*ibid.*, fig. 239) and another from Hanging Grimston, Yorkshire (*ibid.*, fig. 245). The lack of neck development and simple decoration on the Longstone Edge Beaker would place it in Lanting and van der Waals' Steps 2 or 3, while it would appear to fall within Case's Middle style (Case 1977) or style 2 (Case 1993), and possibly within his regional group D or Ba (Case 2001). Typology therefore suggests this vessel is likely to belong to the earlier stages of Beaker development, a view reinforced by the latest appraisal of Beaker styles and culture, together with associated radiocarbon dates, by Needham (2005). This Beaker most resembles his Tall Mid-Carinated Beaker group (TMC) (*ibid.*, 186–8), which do not appear before the 23rd century cal BC and terminate before the end of the millennium, a chronology consistent with the dates of the cist grave in Barrow 1 (Table 1).

Other earlier Beakers recorded from Derbyshire include four Step 1–2 Beakers (All-Over-Cord or European) from burial sites (Ashbee and Ashbee 1981, 21–2; Clarke 1970, nos. 146 and 136; Marsden 1970, 201) but the majority are more developed in shape, with more complex decoration. The probably earlier Beaker from Hindlow (Ashbee and Ashbee, *ibid.*), a site closely comparable with Barrow 1, was fragmentary and incomplete and could not be associated directly with any of the burial deposits.

At Longstone Edge a few fragments, probably from the same Beaker, were found in and under Barrow 2 but the majority came from the main mound of Barrow 1, including sherds from the pre-mound surface associated with the crushed human bone. It is therefore possible that this Beaker was originally deposited complete with a burial in the cist but was removed and broken up, with fragments being incorporated into the later mound structure.

Food Vessel (Fig. 25.6)

Food Vessels occur widely in Britain but are concentrated in northern England, especially Yorkshire and the Peak District, where they usually accompany inhumation burials but occasionally cremations, as at Longstone Edge. On the Yorkshire Wolds inhumations outnumber cremations by around ten to one (Simpson 1968, 202) but in Derbyshire cremations appear to form a higher proportion (Manby 1957).

Manby's (1957) classic study of Food Vessels of the Peak District identified and classified 56 vessels; 50 of the Yorkshire Vase type, most highly decorated and from the limestone plateau. Implicit in his typological scheme, adapted from Abercromby's of 1912, was the then-current idea that simple shapes and decoration were early and the more developed styles represented later stages. Although his classification is still useful for describing Yorkshire Vases, radiocarbon dating has yet to demonstrate its chronological validity. There do, however, appear to be regional preferences for particular styles of Food Vessel, as Manby originally suggested (1957, 11; Pierpoint 1980, 63–122), with his types 2 and 3 being most common in the Peak District. The herringbone impressions on the upper half of the Barrow 1 Food Vessel are the most commonly found motif on Yorkshire Vases in Yorkshire, the Peak District and Northumberland (Pierpoint 1980, 84–7, fig. 4.11). In the Peak District they occur on some 41% of the 75 extant vessels, 16% of which have horizontally zoned herringbone as the sole motif (T.G. Manby, pers. comm.; Manby 1957, e.g. fig. 2. A1, fig. 4. A17, A40).

The date for the cremation burial in Barrow 1 (Table 1) is consistent with the suggestion from other sites that while the earliest Food Vessels are contemporary with Beakers at the end of the 3rd millennium cal BC they flourished alongside early urn styles in the early 2nd millennium (Needham 1996, 124–30; 2005, 206). A Food Vessel similar in type and decoration to the Longstone Edge example came from burial pit 2 under a cairn on Harland Edge, Beeley Moor (Riley 1966, fig. 8.2), with a radiocarbon date providing a *terminus post quem* of 2200–1420 cal BC (3440±150 BP; BM-178; see also Barnatt 1995, 13); this site lies east of the River Derwent, only *c.* 7km from Longstone Edge.

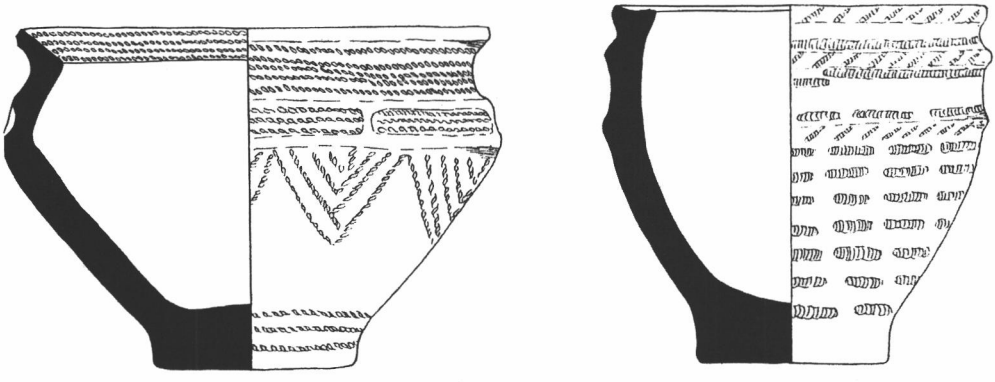

Fig. 26: Food Vessels from Bateman's excavations (after Manby 1957, figs. 2 and 3).
Left: A15 (Type 1a(ii). Hard smooth orange-buff, black core. Thick cord-line decoration. Eight unperforated lugs. Height 147mm, rim diameter 198mm, Base diameter 86mm).
Right: A14 (Type 2(ii). Smooth coarse buff with reddish tones, black core. Wrapped cord decoration. Height 150mm, rim diameter 155mm, base diameter 79mm).

The two Food Vessels found by Bateman in the central cist grave in Barrow 2 (Howarth 1899, 105-J 93.785; 109-J 93.792; Manby 1957, 17, A14, A15; Fig. 26) are slightly bigger and more elaborately decorated than that found in Barrow 1, and lack the herringbone motif, which could suggest a later date (although Manby's current thoughts on the dating of similar herringbone-decorated Beakers might imply that the vessel from Barrow 1 is later). Vessel J 93.785, the same Type 2(ii) as that found in 1996, has a rim diameter of 165mm and shallow impressions all over, including the shoulder groove (not shown on Manby's illustration: 1957, 15), of wrapped cord maggots up to 25mm long in regular horizontal lines on the body and diagonals on the rim edge and on both carinations. Vessel J 93.792, Type 1a(ii), has a broad shoulder groove with lugs, a rim diameter of about 200mm and is decorated with thick (3mm) twisted cord horizontal lines on the deep rim bevel, neck and shoulder groove and above the base with pendant triangles, crisply impressed on the body. Both vessels have been consolidated and reconstructed but their fabrics appear to be grog-tempered. It is not uncommon for two Food Vessels of different types to be found together (Manby 1957, 4–5) but more interesting is the recovery from radiocarbon-dated pit 2 of the cairn at Harland Edge, mentioned above, of two vessels of the same types as those from Barrow 2, one with similar decoration to the Type 1a(ii) from Barrow 2 (Riley 1966, 46, fig. 8.2, 9).

Later Bronze Age/Iron Age

Sherds and fragments probably in Fabric 4 amount to 16% (224) of the total assemblage, a similar quantity to the Neolithic material, and only four vessels can be identified from their rims (Fig. 25.7–10).

The similar fabric excavated recently from circular house sites on Gardom's Edge included examples of the same simple rim styles with tapered and occasional everted rims and the use of fingernail/tip decoration. A preliminary chronological model estimates a start date for the settlement of *1260–1010 cal BC (95% probability)* and *probably 1180–1050 cal BC (68% probability)* (P. Marshall *pers. comm.*). Stylistically close parallels can also be found in the assemblage from Mam Tor, which is generally thought to date from the early 1st millennium cal BC (Knight 2002, 124–5) and in part to span a transition from 'PDR plainwares' (Barrett 1980) to decorated wares within the first half of the millennium (Guilbert and Vince 1996, 49). However, the pottery styles of this period are poorly dated and understood in the Midlands, and in Derbyshire especially (Knight 2002, 126–7).

At Longstone Edge the pieces found were mainly small (less than 3g) and abraded (Table 3) but were confined principally to Area 12, i.e. the mound of Barrow 1 and features south of the fissure. None of the pieces has been burnt but seventeen have visible evidence of charred internal residues relating to food preparation. Their occurrence mainly as small abraded pieces in earlier deposits could be attributable to a number of factors, such as geological disturbance, animal activity and weathering, human ritual or burial activities (though none can be directly associated with a burial), Romano-British disturbance or even grave-robbing in the Late Bronze Age/Iron Age or Roman periods. Another possible reason for activity in the Late Bronze Age/Iron Age may relate to a search for lead for bronze alloys.

ROMANO-BRITISH POTTERY

By Ruth Leary (report written in 2003)

A total of 84 sherds (369g) and 35 crumbs were recovered from the excavations and individually recorded by fabric and form. The sherds were examined by eye with selected use of a x30 binocular microscope and x10 hand lens. They were divided into fabric groups (Fulford and Huddleston 1991, 41) such as grey ware or oxidised ware, with distinctive known fabrics such as the Nene Valley ware and grog-tempered ware being given their own fabric codes:

Colour	narrative description only
Hardness	after Peacock (1977)
Fracture	after Orton (1980)
Inclusion Type	after Peacock (1977)
Shape	after Orton (1980)

Fabrics and Forms

DBY: Derbyshire ware; very hard with hackly or conchoidal fracture and rough feel, like 'petrified goose-flesh' (Gillam 1939); common ill-sorted, medium to coarse, angular quartz, including polycrystalline examples. Derbyshire ware was produced in both reduced and oxidised ware with a very wide range of colours (Gillam 1939; Tomber and Dore 1998: DER CO) from grey to orange, buff, maroon and red. There are two types here: a light grey example (DBYa) and a darker grey example with red-brown core (DBYb).

OAC1: orange, soft fabric with hackly fracture and rough feel; moderate, ill-sorted medium to coarse, sub-angular quartz, including some polycrystalline quartz, sparse, ill-sorted, fine to coarse, brown-red inclusions and ill-sorted, fine to medium-sized, rounded, soft white inclusions.

FLA: off-white to buff fabric; soft with powdery feel and smooth fracture; rare medium-sized, ill-sorted, rounded red-brown inclusions, sparse, fine, well-sorted, rounded red-brown inclusions, rare, medium, sub-angular quartz and possibly some sub-visible quartz. This compares with flagon fabrics common in the late first to second century in Derbyshire.

Fabric	*Sherd count*	*Sherd weight (g)*
DBYa	17	227
DBYb	91	123
FLA	6	12
OAC1	5	8
Total	**119**	**370**

At least five vessels were represented by these sherds: a DBYa plain cupped-rim jar, a DBYa jar with a beaded, cupped rim, a jar of unknown rim form in DBYb, six white ware sherds

from a jar or flagon and one large OAC1 sherd with four scraps from a jar. The FLA sherds from the Barrow 1 mound showed signs of burning in that they were darker in colour than the normal cream or white, with some blackening. Although not all the sherds were burnt, the fabrics were so similar that it appears unlikely more than one vessel was represented. Both they and the OAC1 sherds were very abraded.

Many tiny crumbs of DBYb were recovered through sieving. Some of the larger, intact sherds had surface cracks perhaps formed during firing or post-firing burning and the splintering may have been caused by frost action on these existing weaknesses or excessive ground movement. Alternatively, post-firing burning might have resulted in this disintegration. The DBYa group sherds were larger and at least one of them had surface cracking and orange 'halos' around some of the inclusions. It is difficult to be sure if this happened during manufacture or later burning but a sherd from one of the Roman features looked more burnt than overfired.

White wares are most common in the 1st to 2nd centuries AD and become less common in the 3rd century. The OAC1 sherds are of 'pre-Derbyshire' ware type (Brassington 1971, 59; 1980, 33). This 'ware' was used to make rebated-rim jars at the Derby Racecourse kilns, a form also made in the finer oxidised and reduced wares from the kilns (Brassington 1971, nos. 204–25). The fabric is very similar to Derbyshire ware, except in respect of the hardness of firing. It has been identified in Derbyshire ware forms in Antonine and early 3rd century deposits but may have been superseded in the 3rd and 4th centuries (Leary 2003). The DBY cupped-rim jars (cf. Kay 1962, fig. 6, A19; fig. 7, A70; fig. 5, type A) were made at both Holbrook and Hazelwood kilns, Derbyshire. These two types are both common throughout the life of the Derbyshire ware kilns. The plain cupped form is present in mid to late Antonine contexts at Derby (Dool *et al.* 1985, fig. 42, no. 90; fig. 43, no. 119) and the beaded, cupped rim form is present in an Antonine context at Chesterfield (UMAU report to developer and author's archive report). The sherds are therefore not closely datable. If they were viewed as a contemporary group it would suggest a date somewhere in the mid 2nd to early/mid 3rd century. The DBY sherds, however, could be dated as late as the 4th century.

Distribution

All but six fragments of DBYb came from Barrow 1. Tiny crumbs were recovered from sieved samples taken from the pre-mound surface (1056), the stone mound (1095) and tumble from the enclosure bank (1097). Given the evidence for ground movement and the tiny size of the fragments, these might be satisfactorily explained as intrusive material.

Fifty-eight sherds and crumbs (60g) of DBYb were recovered from the mound (contexts 1004, 1052, 1055, 1081/1082, 1086, 1087 and 3041/3042; Fig. 20), along with four sherds of DBYa, including the beaded, cupped rim sherd. There were also two relatively large and abraded sherds and two crumbs of FLA, as well as one abraded sherd and four crumbs of OAC1.

Surface and fissure deposits yielded a further twenty sherds (53g) of Roman pottery, generally slightly larger. They comprise nineteen of DBYb and a scrap of FLA. A number of large DBYa sherds came from the stone-capped Roman features (deposits 1090 and 1094; Fig. 20).

The pottery from Barrow 2 exclusively comprised small body sherds and crumbs of fabric DBYb from Bateman's backfill (2060) and mound make-up (2057 and 2073).

Interpretation

The larger sherds of DBYa came from the area of the two stone-capped features in Area 1 (Fig. 11). The fabrics of these sherds compare so closely as to suggest they come from the same vessel: a jar with a beaded, cupped rim, although no joins were found. If it is accepted that some of these sherds are burnt, this may be a ritual deposit linked to cremation or feasting. The burnt FLA sherds from the mound deposits also suggest a cremation rite. Most of the other Roman sherds were found in contexts containing human bone, although much of that is likely to be prehistoric.

The DBYb sherds had a widespread distribution. Although few joins were found (none of which were cross-context), the fabrics were so similar as to again suggest only one jar is represented. DBYb sherds were found in association with the other fabrics, but not with sherds of the beaded, cupped-rim DBYa jar, except in one disturbed context. Since some of the sherds are burnt, most are found with human bone fragments, and it appears that sherds from the same jar were found in different locations (and different barrows), it is suggested that the Roman pottery on the site is part of a non-domestic incident. Although scatters of human bone are present in the mound resulting from Neolithic and Bronze Age activity, the selection of sherds and the peculiar distribution of the Romano-British pottery raises the possibility that some of this bone scatter may belong to a much later period and ritual. This may include deliberate deposition of broken sherds in the barrow and possibly also parts of cremation deposits and burnt 'grave pots'. All the pots are incomplete, however, and the FLA and OAC sherds represent a very small proportion of the original vessels.

Flagons are commonly associated with Roman inhumations in the 1st and 2nd centuries and at Derby deposits of burnt sherds, predominantly flagons, along with burnt bone scatters, were found within both inhumation and cremation pits. Here it was suggested these scatters were not fortuitous but resulted from associated cremation rites involving offerings of food left on the burning cremation pyre (Birss 1985, 267; Virgil, *Aeneid* VI, 211ff). A high proportion of burnt sherds was also noted at the Derby Racecourse cemetery and interpreted variously as offerings to the dead set on potsherds, for which we have documentary evidence elsewhere in the Empire (Ovid, *Fasti* II, 533–70), debris from meals eaten at the grave (Toynbee 1971, 50) or token grave goods (*cf* Wenham 1968, 52). Romano-British burial studies tend to concentrate on more or less complete burials within grave pits, and this sort of archaeological evidence is frequently dismissed as a residual scatter rather than a deliberate deposition. It may be that the scatter of sherds here is part of a widespread ritual pattern in the Roman period which is manifested here at an existing ritual site.

Jones (1997, 26ff) has noted four possible primary cremation burials in Derbyshire barrows. At Minninglow the pottery, from three incomplete Derbyshire ware jars, was fragmentary and burnt. The pottery from Friden Hollow is described as 'partially hardened by the fire' (Bateman 1848, 54), and at Harley Hill at least seven cremations were found, one with a melon bead (*cf.* the example from Barrow 1), along with layers of charcoal and burning in every part of the mound. Jones (*ibid.*) notes deposits of Roman pottery and coins in as many as 48 Derbyshire barrows and suggests a ritual interpretation. The pottery includes samian, Derbyshire ware, colour-coated ware, grey wares and possibly Black-burnished ware and mortaria. The Roman sherds from barrows are universally small in size and at Minninglow Bateman suspected deliberate breakage had occurred. In no case have whole pots been reconstructed. Sadly the burnt or unburnt condition of the sherds has seldom been noted and they are mostly dismissed as casual losses (Barnatt 1996b, 56) or left by visiting shepherds

(Collis 1983, 101). The evidence outlined above suggests that these sherds may reflect hitherto unrecognised Romano-British ritual activity. This is worthy of study in its own right and the material should not simply be viewed as intrusive or disturbed.

HUMAN REMAINS

By Simon Mays (report written in 2003)

Human skeletal remains from the following contexts were examined:

Barrow 1
Phase 2/3: four pre-mound contexts (1053, 1056, 1057 and 1082), originally thought to represent material from a Neolithic excarnation platform.

Phase 3: the commingled remains of two individuals from the Beaker-period cist grave (75501 and 75502). Although both individuals were adult, differences in size and robusticity allowed most skeletal elements to be assigned to one or other with reasonable confidence. Material which could not be confidently allocated to an individual (some of the smaller bones and bone fragments) was not recorded. Consistent with their rather disturbed nature, these contexts also contained a small amount of fragmentary bone not belonging to either individual; this too was not recorded.

Phase 4: a deposit of burnt bone (context 75504) associated with a Food Vessel.

Phase 4?: a possible discrete burial deposit (3042) within mound make-up 3041 between Areas 1 and 12; and a deposit within the stone mound (1095) thought in the field to represent the disturbed remains of a secondary burial inserted into the mound. Each of these contexts proved to contain a small amount of fragmentary bone representing several individuals. It seems likely that they represent redeposited material rather than discrete burials. This material was not therefore recorded.

Barrow 2
Bone from context 2058 was thought to represent the remains of a child burial from outside the cist grave in this barrow. Contexts 2063 and 2065–7 from within the cist grave were also examined to determine whether they contained additional elements from the same child. The skeletal material from 2058, although sparse, appeared to be from one individual, so this was treated as a discrete burial deposit. Contexts 2063 and 2065–7 contain a few fragments (mainly cranial bones) of a child: this is probably the same individual as 2058, but as no fragments adjoin it is impossible to determine this with absolute certainty.

Methods used for age and sex determination are detailed alongside the results for particular contexts. In addition, for inhumations 75501 and 75502, cranial and post-cranial measurements were recorded using the definitions of Brothwell (1981), and non-metric traits were recorded following the definitions of Berry and Berry (1967) and Finnegan (1978). These results are held in the archive.

For the material from the pre-mound deposits under Barrow 1 and for the cremated bone from other contexts, bone fragments were, where possible, identified to skeletal element, and for each context bone was weighed and a fragment count obtained. Minimum numbers of individuals represented by the deposits were estimated. For the contexts relating to the putative excarnation platform, attempts were made to evaluate the likelihood of this interpretation using observations on the composition and condition of the material.

Material from the Pre-Barrow Contexts

Human remains from these contexts comprised 856 fragments weighing a total of 405.8g. Approximately 152 fragments (about 18% of the total) showed evidence of burning. Most burnt fragments were white in colour but some blue, grey and, occasionally, black pieces were also present.

All the bone was intensely comminuted; even the small bones of the hands and feet rarely survived intact. Mean fragment size was about 12mm. Because of this, only 170 fragments (a total which includes nineteen teeth), all unburnt, could be identified to skeletal element (20% of the total). Of these, 63 were from immature skeletons and 107 from adult individuals. A full list of identifications is held in the archive.

Amongst the adult material there was no duplication of skeletal elements. However, differences in size and robusticity of skeletal parts suggested the presence of two individuals, a probable male and a probable female. The juvenile material contained fragments of perinatal infant-sized remains as well as those of older children. Duplication of the body of the sphenoid indicates the presence of a minimum of two perinatal infants. Comparison of the state of growth and development of the sphenoid bodies with those for a large series of infants (from medieval Wharram Percy) for which age could be accurately assessed from long-bone lengths, suggested that the sphenoid bones from Longstone Edge came from infants aged about 34 and 36 weeks *in utero*. Full term gestation is about 38–41 weeks (Tanner 1989), so both infants were somewhat pre-term.

Among the remains of the older juveniles, dental elements suggest the presence of at least three individuals. Their approximate ages at death, estimated using the dental development standards of Gustafson and Koch (1974), were 1–1.5 years, 4 years and 6–7 years. The minimum number of individuals for the unburnt bone is thus seven, two of which are adult. Little should be inferred from the observation that juveniles outnumber adults in the MNI estimates: in the absence of duplications of skeletal parts it is easier to identify the presence of different individuals in commingled juvenile remains due to differing degrees of growth and development of skeletal elements, whereas unless there are marked differences in size and robusticity, different adult individuals are difficult to distinguish. Consistent with this, adult fragments outnumber those from juveniles by about 2:1. If it is assumed that the cremated material comes from at least one other individual (an adult of unknown sex), then the overall MNI is eight.

The total amount of bone is very small considering that there are bones from at least eight individuals. Despite the sparseness of the remains, most skeletal elements appear to be represented, at least for the adults. The most frequently occurring parts are from crania, comprising 27% of total identified fragments. The small bones of the hands and feet are also well represented, at 23% of the total. The high proportion of these bones amongst the identified fragments likely reflects their ease of recognition. By contrast even quite large fragments of major long and flat bones are generally insufficiently distinctive to be identifiable to skeletal element.

In an attempt to evaluate the likelihood that these remains represent residues from the excarnation of corpses, as suggested by the excavators, a number of observations were made concerning the condition and composition of the assemblage.

Although the degree of post-depositional erosion of surfaces varies, in general the unburnt bone is well-preserved and erosion minimal. A few fragments showed root-etching. There was no sign of mosaic and longitudinal surface cracking and flaking of the type which has been described in animal bone exposed to sub-aerial weathering (Lyman 1994), and which has been reported for Neolithic human remains (from Parc le Breos Cwm long cairn) where there was also other evidence interpreted as indicating excarnation (Whittle *et al.* 1998). The Longstone Edge assemblage contains fragments of very delicate elements, such as neonatal bones, there are many pieces of cancellous bone, and the teeth recovered have invariably survived intact. Thin, delicate perinatal bones and spongy bone tissue would rapidly be destroyed if left unburied, and teeth would tend to shatter due to the differential expansion of dentine and enamel (Lyman 1994).

Corpses exposed on the surface to decay would be expected to have attracted carnivore attention. In the Parc le Breos Cwm assemblage carnivore gnawing was observed in about half the fragments recovered from most parts of the tomb (Whittle *et al.* 1998). By contrast, no Longstone Edge fragment showed any evidence for carnivore gnawing, despite the generally good bone preservation which would be expected to have allowed the survival of such evidence had it existed. There was some evidence for rodent gnawing but the loosely packed nature of the barrow structure would likely have permitted small rodents access to buried bone, so this does nothing to support the idea that remains were exposed on the surface.

Although there are some fresh breaks, the post-mortem fractures in the material from the putative excarnation platform generally have patinated edges, indicating that they occurred in antiquity. Fractures in tubular bones are generally transverse and with ragged edges. These observations, together with the degree of comminution, are consistent with breakage when the bones were 'dry' (i.e. when the organic component had decayed rendering them fragile) rather than soon after death when the bone was fresh (Villa and Mahieu 1991). In the degree of comminution and the very high proportion of breaks which show patinated edges, the material from the excarnation platform resembles that from disturbed, redeposited contexts which were examined as part of the assessment phase.

The presence of cremated material among the remains from the putative excarnation platform indicates that, in the absence of evidence for *in situ* burning on the platform itself, this material must have been redeposited from elsewhere, either deliberately or by natural or inadvertent disturbance. Disturbed contexts at Longstone Edge likewise often contain a mixture of cremated and unburnt bone, and the presence of the Food Vessel cremation indicates that the barrow was used for the deposition of cremated remains long after the Neolithic period. Were the material from the 'excarnation platform' in fact to represent redeposited material then later prehistoric cremation burials would be plausible candidates for the origin of the burnt bone.

Given the above it is of value to try and determine whether any of the unburnt bone from the 'excarnation platform' in fact represents redeposited material from disturbed inhumation burials. An obvious strategy would be to determine whether any fragments belonged to 75501 or 75502. Given the degree of comminution of the remains, it would be time-consuming, and probably unrewarding, to attempt to re-fit bone fragments. However, it was found that three of the teeth from context 1057 fitted sockets in the jaws of burial 75502. This indicates that not

all the unburnt material from the putative Neolithic excarnation platform is Neolithic in date and that some at least has been redeposited.

Whether the bulk of the material from contexts 1053, 1056, 1057 and 1082 represents residues from a Neolithic exposure platform cannot be resolved conclusively from the bones. However the most parsimonious explanation for the above observations is that it simply represents mixed, redeposited bone.

Burials from the Barrow 1 Cist Grave

Context 75501

Material: skeleton about 50% complete, bone moderately preserved
Sex: female (pelvic and cranial indicators – Brothwell 1981)
Age: approx. 35–45 (dental wear – Brothwell 1981)

Dental formula:

X	.	.	.	.	.	.	X	X	X	.	.	.	.	.	.
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
X	X	.	X	X	X	X	X	X	X	X	X	X	.	X	X
LEFT								RIGHT							

Key: . = tooth present in socket; X=tooth lost post-mortem from socket

Context 75502

Material: skeleton 80% complete, bone well preserved
Sex: male (pelvic and cranial indicators – Brothwell 1981)
Age: approx. 35–45 (dental wear – Brothwell 1981)

Dental formula:

0	.	.	.	.	.	X	X	.	.	.	.	.	.	.	-
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
.	.	-	-	-	-	-	-	-	-	.	.	.	X	-	-
LEFT								RIGHT							

Key: . = tooth present in socket; X=tooth lost post-mortem from socket; 0 = tooth absent congenitally; - tooth and socket missing post-mortem

Includes three teeth from context 1057 (see above)

Stature: 1.75m (Trotter and Gleser 1952; 1958).

The arm bones of this individual are markedly asymmetrical, with the right side more robust. In view of the rather commingled nature of the remains, it might be suggested that the left/right differences mean the two sets of arm bones belong to different individuals. However, in the human skeleton the left and right arm bones regularly show slight asymmetries, with

the right generally being the more robust, reflecting the predominance of right-handers at the population level. It seems probable that all the arm bones derive from this individual: they certainly do not come from 75501 and there is no indication, in the form of duplication of skeletal elements, of the presence of a third individual in the rock-cut grave.

The mandibular canine shows dental enamel hypoplasia. This is a transverse line of depressed enamel indicating disturbance to crown development, normally due to disease or poor nutrition. The linear defect is located about 3.2mm from the cemento-enamel junction. This indicates that the episode causing formation of the hypoplasia occurred when this individual was about 5 years of age (Goodman and Song 1999).

Two thoracic vertebrae show Schmorl's nodes. These are depressions in the vertebral bodies caused by herniation of material from within the intervertebral disc. They are generally due to minor injury to the spine during adolescence and early adulthood through excessive compression, such as may occur in heavy lifting (Schmorl and Junghanns 1971, 158–68).

The cranium is notably asymmetrical, its length being greater on the right than the left side; this is most marked for the frontal bone. It is probably due to deficiency of growth at the left side of the coronal suture due to premature synostosis here. Cranial distortion due to this cause is termed plagiocephaly (Aufderheide and Rodriguez-Martin 1998, 53).

Cremated Bone Associated with the Food Vessel

Context 3030, burial 75504

Material:

	Weight (g)	*Mean fragment size mm*	*Max. fragment size mm*	*Approx. fragment count*
Skull	486.6	20	65	500
Post-cranial and unidentified	1980.6	12	60	3200
Total	**2467.2**			**3700**

Colours: generally white/light grey. Some endosteal surfaces are black, as are the interior parts of some skull and long bone fragments revealed at post-depositional breaks.

Minimum number of individuals: duplication of left petrous temporal bone, nuchal crest area of occipital bone and right supra-orbital region indicates the presence of two individuals. All remains are adult.

Sex: robusticity of skeletal elements indicates one clear male. The other individual is also probably male.

Age: cranial suture closure (Perizonius 1984) and the degree of wear evident on molar dentine fragments (Brothwell 1981) suggests one individual over about 40 years and one younger than about 40 years. The older individual is the one more clearly identified as male.

Colour of bone fragments may be used as an approximate guide to firing temperature: the predominance of white and light grey indicates exposure to temperatures in excess of about 650°C while black coloration indicates temperatures lower than about 400–550°C (Mays 1998, table 11.1). The observation that most external bone surfaces were white whereas some internal and endosteal parts were black suggests either that the blaze was of insufficient duration for the full heat effectively to penetrate thoroughly the bone in some instances or, alternatively, that after shattering on the pyre early in the cremation process some fragments fell to cooler areas.

Cremation of an adult male corpse might be expected to yield 2–3kg of bone (Trotter and Hixon 1974) so at 2.5kg for two individuals, the remains are only about half the total expected if all bone had been collected for burial and the deposit had suffered no post-depositional losses.

Barrow 2

Context 2058

Material: skeleton <20% complete, fragments of skull and leg bones only. Bone moderately well preserved.
Sex: unknown
Age: 3 years (dental development – Gustafson and Koch 1974)

ANIMAL BONE

By Peter Popkin (report written in 2007)

A small quantity of macrofauna was recovered from the barrows by hand excavation. The small size of the assemblage limits its usefulness with regards to investigating local animal economy, although very general conclusions can be reached. The assemblage has greater potential to inform on the depositional history and activities directly associated with the monument.

The remains are poorly preserved, with most consisting of weathered unidentified fragments (1124 in total). A total of 311 identifiable bones were recorded, 291 from Barrow 1 and twenty from Barrow 2 (Table 4); the latter do not merit further discussion. Three fragments of antler from large cervids (likely red deer) were also recovered but are not included in the total. Small mammal remains were by Andrews (below).

All of the bones were recorded in detail where identifiable to taxon and examined under a binocular light microscope (25x) to assist the identification of bone modifications such as cutmarks and carnivore gnawing. Details of the bones and bone parts recorded and the methods used are in the archive.

Taxonomic Distribution

The taxonomic distribution is listed by area and phase in Table 4. Cattle, sheep/goat and pig dominate the assemblage. Canid bones and teeth are common also and derive both from dogs and foxes. Less common taxa include equid, cervid, hare and bird.

Area	Phase	Description	Cattle	Sheep/ Goat	Pig	Equid	Large cervid	Roe deer	Dog	Large canid	Fox	Hare	Bird	Total
Barrow 1														
1/2/12	1-3	Subsoil	4	8	3			1	2	1	2	1		**22**
12	2/3	Enclosure wall			1									**1**
12	3	Cist grave and skeleton	11	14	14		1		2	1	6			**49**
2	3/4	Stone mound	1			1	[1 antler]							**2**
12	4	Cremation grave	2			1								**3**
12	4	Barrow mound	47	61	29	3	2+[2 antlers]	4	11	19	16		5	**197**
12	4/7	Fissure	1	8	1		2		1	4				**17**
Total			**66**	**91**	**48**	**5**	**5+[3 antlers]**	**5**	**16**	**25**	**24**	**1**	**5**	**291**
Barrow 2														
4		Subsoil	12											**12**
5		Basal grave fill			1									**1**
4/5/6		Barrow mound	7											**7**
Total			**19**		**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**20**

Table 4: Hand-collected animal bone: taxonomic distribution by area and phase (bone counts).

In order to compare the macrofaunal remains from Longstone Edge with other sites the relative percentages of the three main taxa groups (cattle, sheep/goat and pig) were calculated as 33%, 41% and 26% respectively. Counts are based on the number of identified specimens (NISP) and exclude mound contexts with later disturbance or which contain human remains. Other Bronze Age sites in central and southern England show average sheep/goat, cattle and pig representations of 40%, 43% and 17% respectively, though it should be noted that many of them are Middle or Late Bronze Age in date. Nevertheless this is a major shift from Late Neolithic (Grooved Ware) sites where pigs typically make up the majority of the assemblage and cattle dominate over sheep/goat (Grigson 1982).

It may be inappropriate to ascribe a single interpretation to faunal assemblages from a variety of site types and ecological regions, and a broad temporal range, but the assumption that an increased proportion of pigs on British Bronze Age sites reflects the occurrence of feasting potentially explains the relatively high proportions of pig recovered from Longstone Edge and other barrow sites at Wigber Low in the Peak District and Poors Heath in Suffolk. The high percentage of pig remains (>27%) at later midden sites such as Wallingford, Potterne and Runnymede has also been ascribed to feasting (Serjeantson 2007) and seen as an indicator of high status.

Butchery

Four sheep/goat bones and a pig bone showed evidence of cutmarks, suggesting that limbs were divided into smaller joints. Overall, however, too little evidence of butchery practice is available for detailed analysis.

Element Distribution

Deposits of single and articulated animal bones were noted during the excavations (P. Reeves, Site Diary) and thought to represent 'offerings': human and animal bones had apparently been placed on the surface below Barrow 2, while a 'leg of pork' noted alongside one of the skeletons in the cist grave beneath Barrow 1 has been identified as comprising a single, unarticulated immature left pig humerus. The distal end of this bone is unfused, indicating that the animal was less than one year of age when it died (Silver 1969). Figure 27 shows this pig humerus was clearly associated with the lower legs and feet of one of the skeletons recovered from the Early Bronze Age cist grave (75502). A juvenile left pig ulna of a similar size and showing a similar state of weathering was also recovered in association with 75502. Although they were not recovered in articulation it is possible that these two bones were once associated.

Twelve identifiable bones and teeth were recovered from the subsoil beneath Barrow 2 (2058, 2059, 2078), all of which belong to cattle; a further nineteen unidentifiable medium mammal bones were recovered from the same contexts. All the cattle remains were either mandibular or maxillary elements, including both bone fragments and loose teeth. These elements may all derive from a single individual (there is no repetition of teeth), perhaps intentionally placed in association with the human remains, as suggested by the excavators.

Otherwise no clear deposition of animal skeletons or part carcasses was identified within the assemblage, though in Barrow 1 subsoil context 1053, three bones of a foetal/neonatal caprine (scapula, radius, humerus) show a similar stage of ossification and may be associated.

The breakdown of the hand-collected remains into elements by NISP and percentage values show that all parts of the skeleton of sheep/goat, pigs and dogs were deposited within the

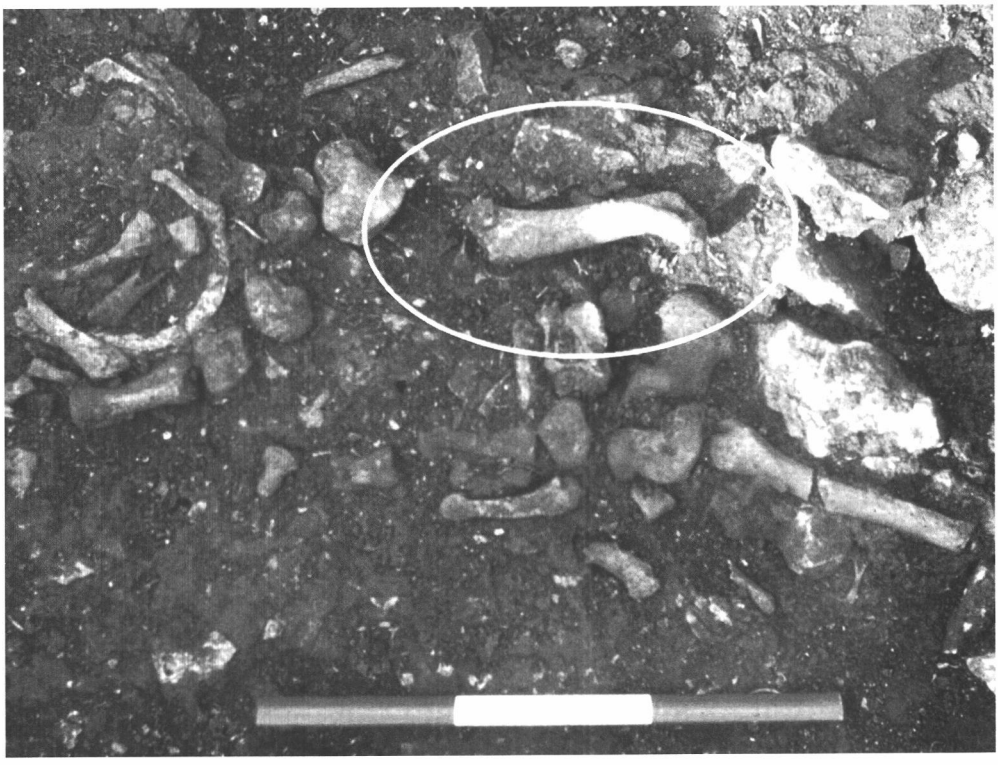

Fig. 27: Immature pig humerus (circled) associated with human burial in context 75502.

barrow. Cattle show a very different profile, however, dominated by head and feet elements. This is typically associated with primary butchery waste and suggests cattle may have been killed and prepared for consumption at the site but consumption and disposal of the 'meaty' parts of the animal took place elsewhere. However, the unidentified large mammal remains were principally composed of limb shaft fragments, indicating that cattle limb bones were deposited on site, albeit in a very fragmented state.

Apart from a lack of foot elements, possibly because many of these small bones were missed during hand-collection, all parts of the fox skeleton were deposited within the barrow and considering the high number of foetal/neonatal remains it is likely that they represent natural accumulation through denning activity.

Age at Death

Relatively few bones and teeth provide fusion or tooth wear data, but the state of ossification of many other specimens suggests they are from juvenile animals. A total of 102 identified bones were recorded as juvenile/sub-adult, a full third of the assemblage, not including the 32 bones identified as foetal/neonatal. A more detailed division of ageing stages is not possible due to the small number of specimens.

Considering only the faunal remains from undisturbed contexts it is possible to age 95 bones as foetal/neonatal, juvenile/sub-adult or adult. The majority of the cattle, sheep/goat and pig bones are from juvenile/sub-adult animals (87%, 70% and 58% respectively), which

were noted in most deposits. High amounts of juvenile/sub-adult pig bones are not uncommon as pigs are typically raised for meat and often slaughtered before their bones are fully fused (Dobney *et al.* 1996, 44). When cattle and sheep/goat are killed young, the usual interpretation is that they have been targeted for meat alone: given the ceremonial nature of the site it is possible that juvenile animals were preferred for funerary/feasting purposes.

Little comparative material relating to Bronze Age barrow sites is available; however, Levitan and Serjeantson (1999) report that at the Barrow Hills complex in Oxfordshire most of the pig bones recovered were juvenile, along with many of the cattle and roughly half of the sheep/goat. These findings indicate, if nothing else, that the high number of juvenile remains at Longstone Edge is not unique amongst barrow sites.

A total of seventeen foetal/neonatal bones was recovered from undisturbed contexts of Barrow 1, including examples from cattle, sheep/goat, pig, fox and dog. Seven of these belong to red fox (distinguished from dog on the basis of size), making up nearly half of the entire fox assemblage (47%) from Barrow 1 and suggesting denning within the mound.

Measurements

Very few measurements were recorded for the main domestic animals and these provide limited information about livestock. The presence or absence of wild boar and domestic pig is often possible to determine metrically: the few available measurements of pig bones from Longstone Edge (an astragalus and two mandibular M3s) suggest that they derive from large examples of domestic animals.

A greater number of canid bones and teeth provide measurements, although the sample size is still very small and most of these remains were not found in secure contexts. The dogs recovered are all of a very large type: the one complete long bone (tibia) indicates a shoulder height of approximately 628.5mm (Harcourt 1974). Two large calcanei (50.0 and 50.1mm) were also recovered, consistent with a very large breed of dog. Harcourt (1974) has suggested that a single type of large dog existed in Britain during the Bronze Age, though his available sample size was small.

Taphonomy

The unidentified fauna from three groups of contexts were examined in detail to determine whether they can provide information about taphonomy or depositional processes. This showed that the macrofauna from disturbed mound contexts (1052, 1087), those associated with human remains (1098, 3041, 3042) and the fissure (1050, 1080) have a different taphonomic history to those in the rest of Barrow 1. They display a greater degree of burning, carnivore gnawing and fragmentation than those from the undisturbed mound contexts and pre-mound phases.

Leary (above) suggests that contexts within the Barrow 1 mound containing human bone fragments may result from Romano-British cremation events, since they also contain a number of Roman sherds that display post-firing burning, but the human remains recovered from these contexts (particularly 3042) were not thought to represent discrete deposits and did not show high amounts of burning. Andrews' thorough analysis of the microfauna (below) cannot be used to verify the difference in taphonomic history suggested for the macrofauna because he did not analyse those mound contexts associated with human remains and only included a single sample from the disturbed mound. In the end the evidence for cremation deposits inserted into Barrow 1 is equivocal, although the macrofaunal taphonomic analysis,

especially the evidence of burning found in those contexts, supports Leary in suggesting some human remains within the mound may be intrusive rather than residual.

MICROFAUNA

By Peter Andrews (report written in 2003)

Some of the Neolithic and Bronze Age deposits at Longstone Edge have a great abundance of microvertebrates, and it was considered that if their mode of accumulation could be identified they might provide information about the contemporary environment and the taphonomic history of the barrows. For example, if the microfaunal assemblages were accumulated by predators their ecological preferences could be used both to indicate aspects of the local environment (e.g. the hunting territory from which the predator draws its prey) and the amount of human activity at the site, for some predators are more tolerant of disturbance by people than others. This contribution summarises the results of analysis, which are described more fully by Andrews and Fernandez-Jalvo (2012).

The remains were recovered from flotation samples (sieve sizes were 1, 2 and 4mm). The material comes mostly from Barrow 1, though four samples from Barrow 2 were analysed for comparison. There is considerable variation in quantities, with some samples extremely rich and others very poor. It is likely that the latter represent no more than the background scatter of bone, almost certainly from more than one source, but the rich samples can only be the result of predation, for no other process is likely to accumulate such large quantities of small vertebrate bone.

The most common species in the samples is the Northern water vole (*Arvicola terrestris*). The other common rodent in the samples is the field vole (*Microtus agrestis*). Other mammals present are as follows:

Mouse, *Apodemus* sp., which could not be identified to species as the remains are very fragmentary.

Bank vole, *Clethrionomys glareolus*, present in the Barrow 1 mound, cist grave, fissure and subsoil deposits. It was absent from Barrow 2.

Dormouse, *Glis glis*, present only in the subsoil.

Two species of shrew, *Sorex araneus* and *S. minutus*, the former present throughout but the latter only in the Barrow 1 mound and cist grave and Barrow 2.

Mole, *Talpa europaea*, present throughout.

Hedgehog, *Erinaceus europaeus*, present only in the Barrow 1 mound and cist grave.

Red squirrel, *Sciurus vulgaris*, present only in the Barrow 1 mound and cist grave.

Weasel, *Mustela nivalis* present in the Barrow 1 mound, cist grave, fissure and Barrow 2.

Bones of large amphibians (mainly toad) are common (discussed by Gleed-Owen, below) and there are small numbers of a smaller species of amphibian. Small lizards are also present in many samples, identified by their jaws, and smaller numbers of bird post-crania and fish vertebrae, but these have not been identified to species. Element counts (MNE) were made for all these taxa.

The methodology follows that of Andrews (1990) and is fully detailed by Andrews and Fernandez-Jalvo (2012). Most of the work was done with a binocular light microscope but some specimens were investigated in more detail under a higher power microscope and a sample of the teeth was investigated with scanning electron microscope (SEM).

Taxonomic Composition of the Fauna

The small vertebrate fauna from all levels is dominated by microtines. The water vole, *Arvicola terrestris*, and field vole, *Microtus agrestis*, make up 80–90% of the fauna, with the former being nearly twice as abundant as the latter. A full breakdown of the taxa identified is provided in Andrews and Fernandez-Jalvo (2012, table 1) while relative proportions from different contexts are shown in Fig. 28 (data tables showing the taxonomic breakdown for all samples analysed are available in the archive). In two Barrow 1 contexts (the disturbed sediments in the fissure and the Phase 3/4 stone mound) and the Barrow 2 deposits *Arvicola* is approximately three times as abundant as *Microtus*. The levels associated with the subsoil, cist grave and main mound in Barrow 1 have generally lower proportions of *Arvicola,* although it still dominates the fauna, but in some individual samples from the mound and the cist grave, *Microtus* actually outnumbers *Arvicola*.

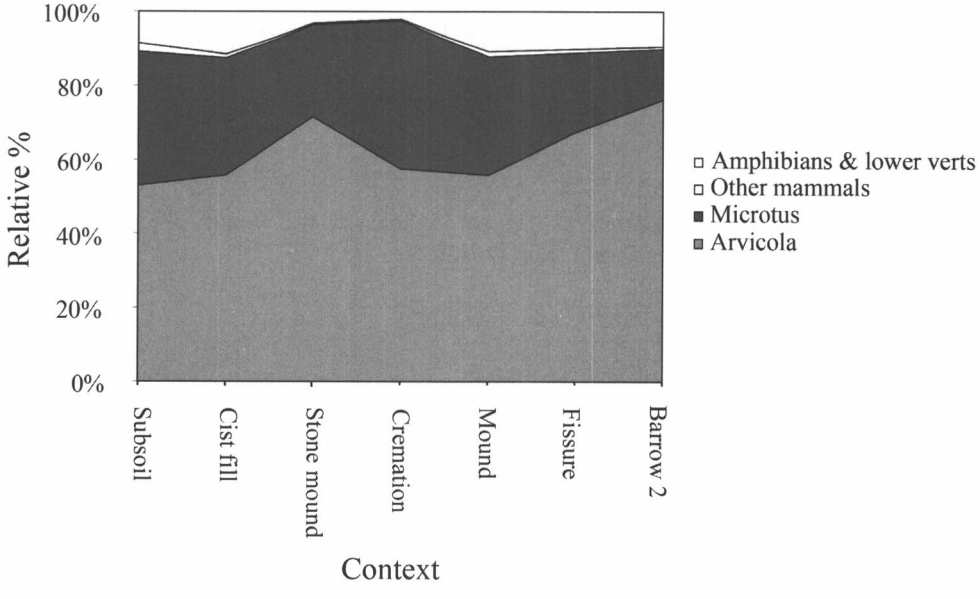

Fig. 28: Summary of the taxonomic composition of all small vertebrate samples analysed.

Skeletal Element Preservation

Sufficient numbers of *Arvicola* and *Microtus* are available to allow analysis of skeletal element proportions. For the Barrow 1 mound samples the representation of major cranial and post-cranial elements for *Arvicola* shows a high degree of uniformity. In contrast, there are much greater variations in *Microtus*, much of which appears to stem from two large samples from contexts 1055 and 1058, but whereas the former has small elements over-represented (e.g. molars, tali and calcanea), the latter has the same elements under-represented. There is a strong suggestion of selection in these results.

For the Barrow 1 cist grave deposits there is generally greater uniformity in the skeletal element distributions, with two exceptions. These are again the small elements, such as tali and calcanea, that are over-represented in some samples and under-represented in others, but whereas the pattern of tooth representation is the same for the *Microtus* sample, it is opposite for the *Arvicola* sample, with teeth less common in the samples where foot bones are more common. The two samples that show this contrast are the two largest analysed from the cist grave, one from context 1059 (sample 5091) and one from 1060 (5094). Both were taken from a wide range of sieve sizes and have good taxonomic representation. It is not likely, therefore, that these discrepancies are due to sampling error.

In terms of element distributions, the strong similarities between the four main components of Barrow 1 (subsoil, cist grave, mound and fissure) are very apparent in Fig. 29. All four context groups have similar proportions of different skeletal elements, shared between *Arvicola* and *Microtus*. By contrast, the Barrow 2 *Microtus* assemblage is rather different, being dominated by teeth.

Specimen numbers for *Microtus* and *Arvicola* have also been compared with the numbers of bones expected, based on a complete microtine skeleton. In the Barrow 1 subsoil, cist grave and mound, there is a strong similarity between the archaeological contexts and the standard rodent skeleton in terms of the proportions of elements present, which indicates that entire skeletons made up the small mammal faunas preserved at the site. There is more variability in the *Microtus* samples, but this is likely to be due to the loss of some of the smaller and more fragile bones.

Breakage

Bone breakage has been analysed for a series of features that have been found to be diagnostic of the whole assemblage (Andrews 1990). Too few skulls were preserved intact to use in the analysis. Of more value was counting numbers of maxillae retaining the zygomatic process, but even these were low, with lower rates in the Barrow 1 cist grave and mound deposits than in the fissure and subsoil. Similarly, mandible breakage for *Arvicola* was lower in the cist grave and mound than in the fissure and subsoil deposits while Barrow 2 showed even greater breakage. Values for *Microtus* were again lower, with no apparent difference between contexts.

Breakage of post-crania is less than that of the skulls and jaws. In the Barrow 1 cist grave less than half the *Arvicola* bones are broken and even fewer for *Microtus*; in the mound there is a similar pattern but with greater variability while the fissure and subsoil have a slightly higher degree of breakage. This uniformity of breakage suggests similar environmental conditions for all contexts. By contrast, Barrow 2 has a higher degree of post-cranial breakage. In all cases there is great uniformity in the way the bones are broken, with distal humerus, proximal ulna, proximal femur and distal tibia always being the dominant fragmentation pattern.

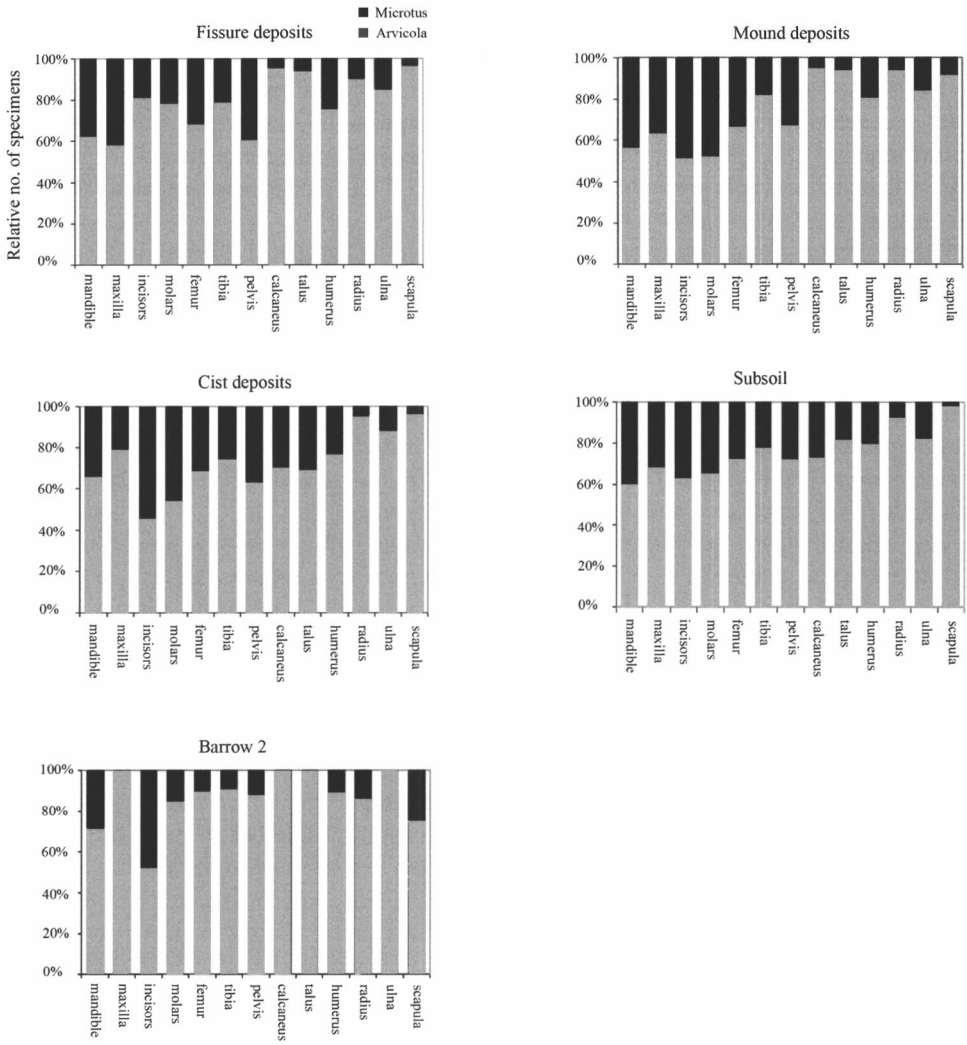

Fig. 29: Skeletal element representation in deposits from different contexts.

Digestion

The degree and percentage occurrence of digestion of teeth and limb bones at Longstone Edge has been analysed in some detail, because experience has shown this to be the single most useful taphonomic indicator in small mammal assemblages. There is considerable variation in levels and degree of digestion, but the most common degree is light. The data on which the following descriptions are based are provided in Andrews and Fernandez-Jalvo (2012).

There is no significant difference in the numbers and degree of digestion between the barrow mound and the cist grave. However, *Microtus* teeth from both cist grave and mound deposits show greater evidence of digestion than *Arvicola* teeth. There is little digestion of *Clethrionomys* teeth and none at all on murid or soricid teeth. Two samples have higher than

usual proportions of heavily digested teeth: one from context 1058 (sample 5090) and one from 1059 (5091), which are in close proximity to each other and almost certainly from the same deposit, even though they are identified as coming from different contexts. This is discussed further below. Both *Microtus* and *Arvicola* teeth from the fissure have similar levels of digestion to those from the mound and cist grave. Digestion levels from the subsoil show greater variability, partly because the sample sizes are generally small. Once again, *Microtus* teeth show greater evidence of digestion than *Arvicola*. A summary of the percentage occurrence of digestion for *Microtus* and *Arvicola* is shown in Andrews and Fernandez-Jalvo (2012, fig. 3).

There appears to be a pattern in these results, although it is only partly supported by statistical analysis. The specimens of *Arvicola* in the fissure and subsoil have low degrees of digestion and lower numbers of teeth affected, compared both with *Microtus* specimens in the same samples and with *Arvicola* in the cist grave and mound deposits. This suggests a different mode of accumulation of *Arvicola* in the fissure and subsoil deposits compared with the rest of the site.

Post-cranial digestion was difficult to identify because of the extensive post-depositional modifications to the bones. It was examined for the head of the femur, which shows one of the earliest signs of digestion. Estimations of digestion were extremely conservative, eliminating large numbers of specimens where it was difficult to distinguish potential digestion from post-depositional corrosion. The results show that three samples (including 5090 and 5091) have high levels of digestion, with 25% or more of the femora showing signs of digestion. The other samples from the cist grave and the mound have digestion percentages of 6–20%, similar to values from the fissure and subsoil.

Post-Depositional Modifications

Damage sustained by the bones from all contexts is very similar. There is extensive root damage and many of the bones show evidence of sub-surface corrosion, which was difficult to distinguish from the effects of digestion, for example on the head of the femur. Weathering is not common, but some was seen in a sample from context 1081 in the Barrow 1 mound that probably included some surface material. All samples also include at least two colour phases, light-coloured bone making up the majority of specimens, but 4–8% being darker brown to black in colour. This is not attributed to burning but it does suggest a secondary source, probably independent of the main accumulation agent for the majority of bones.

Discussion

The results show that there is strong evidence for the accumulation of the microvertebrates at Longstone Edge by predators. The question is whether there was a single source or multiple sources for the bone assemblages, and were all parts of the fauna accumulated as the result of predation or were other processes operating as well? The patterns of breakage and digestion preserved on the bones show that one predator was probably a species of owl that produced low levels of modification – categories 1–2 of Andrews (1990) – but there is evidence of greater digestion in some of the samples, a category 3 predator. There are also indications that some of the bones accumulated through natural attrition.

The present day vegetation of the region consists of rough grass and heather on the top of the plateau above and north of the steep escarpment of Longstone Edge. Today the area is mostly given over to grazing for sheep but trees (mainly ash, sycamore, hawthorn, elder)

are present on the escarpment slopes, quite dense in places, interspersed with rough grass and bush. At the bottom of the escarpment, fields divided by stone walls pass down to rich bottomlands with trees and wetlands. Some of these habitats are likely to have been present in the past, particularly the wet lowlands, which would have been swampy with impeded drainage, and stands of large trees on better drained land. The escarpment would almost certainly have been heavily wooded and there would undoubtedly have been woodland on the high plateau, although the extent of clearance by early human inhabitants is uncertain. The location of the barrows places them in the transition zone between these three types of ecosystem and the prehistoric fauna, whether predators or prey, could have been active in any or all of them.

The physical setting of the two barrows at Longstone Edge provides few clues as to what might have attracted predators to the site. There may have been a drystone bank around the Barrow 1 cist grave and/or a small stone cairn over it, as discussed above, and there could have been trees growing close to the barrows: although none are there at present, trees are now plentiful further along the escarpment. It seems most probable, however, that the predators were ground-nesting or ground-roosting species.

There are indications that some of the bones derived from animals living and dying at or near the site (Armour-Chelu and Andrews 1992). This is likely to have been the source of most of the rare species, e.g. red squirrels, hedgehogs, weasels, dormice, moles and birds, most of which are rare in raptor pellets too. Undoubtedly this background fauna would include some of the more common rodents as well, and it may be that the bones stained a darker colour, which are present at most levels, represent this autochthonous element. However, it is also possible that they represent a third source as, for example, the Barrow 2 bone assemblages are generally more heavily stained than the Barrow 1 bones, and they have fewer root marks, which would suggest an independent source. But for information on how the main part of the bone assemblage was accumulated, the evidence of the two most abundant species *(Arvicola terrestris* and *Microtus agrestis)* will be used.

There is a high degree of similarity in the skeletal elements preserved and their manner and degree of breakage from all contexts of Barrow 1; with a couple of exceptions (samples 5090 and 5091), the bones of *Arvicola* have more extensive breakage than those of *Microtus*. Barrow 2 differs in having a bias towards teeth, with much loss of post-cranial elements.

The lower digestion seen in *Arvicola* in all deposits, particularly in the fissure and subsoil, suggests they were subjected to different processes from the *Microtus* remains. Three possibilities emerge from this. Firstly, the *Arvicola* remains may have been accumulated by a different predator that produced a lower degree of digestion. This is inherently unlikely, given the close association between the *Microtus* and *Arvicola* remains. Secondly, the same predator may have accumulated both, but because of the larger size of the water vole it did not ingest the whole body, with the bones being discarded uneaten; the higher breakage of the *Arvicola* bones lends some support to this. Thirdly, some of the *Arvicola* bones may represent the remains of animals living at or near the site; though it might be expected in this case that some of the *Arvicola* bones would have been preserved in articulation, the excavation records do not provide any evidence of this.

It is concluded from this that the remains of the two arvicolids were accumulated by the same predator, except for samples 5090 and 5091. The difference in breakage and the lower digestion in *Arvicola* suggest that the predator dismembered the larger prey so only those parts of the skeleton ingested show signs of digestion. Digestion was light, indicating a category

2 predator (Andrews 1990), which in the vicinity of Longstone Edge could only have been short-eared owl (*Asio flammeus*). This is a vole specialist, today predating mainly *Microtus* species (Mikkola 1983; Andrews 1990), but in England also eating *Rattus norvegicus*, a rodent similar in size to *Arvicola* (Glue 1977). It is one of the larger owls (females 400–430g) and swallows small prey whole but dismembers larger prey (Chitty 1938). It nests on the ground and hunts over open ground by slowly quartering the ground while searching for prey. In the context of Longstone Edge, the open moorland would have been the preferred habitat for short-eared owls, and they would have hunted along the upland region rather than the valley below the escarpment. It has also been shown (Gleed-Owen, below) that some toad bones have signs of small carnivore chewing marks, but this type of modification has not been seen on any of the small mammal remains.

Two samples stand out as being different from all the others. These are 5090 from the mound and the one immediately below it in the cist grave, 5091, and they are two of the richest samples; in both *Microtus* is more abundant than *Arvicola* and both have rich subsets of other small vertebrates present (see Andrews and Fernandez-Jalvo 2012, table 3). There is also a difference in age distribution of the *Arvicola* individuals making up the assemblages with both samples containing water voles of greater age and size. Both also have higher degrees of digestion, particularly affecting the *Microtus* teeth. These modifications suggest that the two assemblages come from the same source, and the nature of the taphonomic modifications indicates a category 3 predator (Andrews 1990). Sample 5111 from mound context 1055 also has high levels of digestion and older and larger *Arvicola* individuals, but it differs in that *Microtus* is much less common. It is still likely, although less certain, that this sample was accumulated by the same category 3 predator.

In prehistoric England, category 3 predators could have been either the tawny owl (*Strix aluco*) or the European eagle owl (*Bubo bubo*), but the frequency of digestion supports the latter as the agent of accumulation. This is also consistent with the taxonomic variety of the fauna in these samples. The European eagle owl is the largest of the world's owls, nesting frequently on the ground, where it usually sites its nest next to large boulders, fallen trees or cliff face (Mikkola 1983). It preys on a wide variety of prey, including especially brown rats and *Arvicola* (Mikkola 1983). Unlike the short-eared owl, the eagle owl is mainly nocturnal, but it is similar in its hunting methods, so that it too was probably hunting over the upland habitats along the top and slopes of the escarpment at Longstone Edge. The short-eared owl hunts diurnally, and although it is unlikely that it could have occupied the site at the same time as the eagle owl, it is possible that the two species of predator replaced each other seasonally.

The Barrow 2 microvertebrate accumulations are too small to come to any definitive conclusions. Levels of digestion are higher on *Arvicola* teeth than on *Microtus* but the degree of digestion is very light. This suggests a category 1 predator (Andrews 1990) but there is too little information to indicate what this might be.

Although two species of predator have been identified as accumulating agents for parts of the microvertebrate assemblage, there are still questions remaining about the huge numbers of water voles. It has long been known that they are sometimes found in large numbers in prehistoric barrows (Stubbs 1926) and various explanations have been given for their presence, e.g. hibernation, eating the dead bodies, mustelid predation and owl predation. Stubbs actually favoured human intervention as a form of 'mouse worship', but this can be dismissed for Longstone Edge on the grounds that some of the bones had been digested by a carnivore. It has been suggested at another site that the abundant water voles were part of

the human diet (Radley 1966) but little is known about the modifications produced by human digestion, and although the human population might have eaten the flesh of water voles, they are unlikely to have eaten the entire skeletons and skulls, which are the parts shown here to have evidence of digestion.

It might be surmised that if the bones found in the cist grave differed markedly from the 'background' bone assemblage, as seen for example in the Barrow 1 subsoil or in Barrow 2, this would be evidence for human intervention (Grayson 1991). Although some differences have been noted above, they are not sufficient to justify such a distinction, and in particular the bone assemblages of the mound and cist grave in Barrow 1 are extremely similar both taxonomically and taphonomically. No evidence was found during the excavation that the cist grave acted as a natural trap (Whyte 1991) and the lack of articulations and moderate degree of breakage of the *Arvicola* bones does not indicate that they were living in the grave.

The environments present today in the vicinity of Longstone Edge are not associated with the water vole, but there is considerable evidence that in the past it had a much wider range than it does today (Montgomery 1975; Stallibrass 1991). The high diversity of the microfauna, with 11 small mammal species, abundant amphibians, and snakes, birds and fish all represented, suggests a rich environment of mixed woodland and open country. Analysing just the mammal species represented in this analysis by weighted averages of species scores (Gauch 1982; Andrews 1990) gives highest scores of the taxonomic habitat index for deciduous forest, with little difference between contexts.

Occupation of the site by humans is inherently unlikely. The area of Longstone Edge at the interface between upland (open?) woodlands and moorland, escarpment dense woodlands and lowland swamps and river valley, would have been a prime site for hunting or agriculture, but the evidence that the great concentrations of small mammals were accumulated by short-eared owls and eagle owls strongly suggests there was no human occupation close to the barrows. Both predators habitually nest on the ground, which makes them vulnerable to interference, and the quantity of bone shows that they occupied the site over several years.

AMPHIBIAN AND REPTILE BONES

By Chris Gleed-Owen (report written in 2004)

It is rare for amphibian and reptile remains from archaeological excavations to be investigated in any detail, probably owing to a lack of comparative material, expertise and perceived value. Herpetofaunal remains are useful as palaeoenvironmental and biostratigraphic indicators in Quaternary science (e.g. Gleed-Owen 1999) but also in archaeological investigations (Gleed-Owen 2003a; b). An assessment was carried out in the hope that it could shed some light on certain questions, although it was not expected to answer all of them.

The assessment aimed to examine a representative sample of sorted bone from a range of contexts, to estimate the number of identifiable elements (MNE) for each species and to extrapolate these to the rest of the material, whilst considering various questions such as the environment, the agent of accumulation and use of the site by humans or animals. Selected samples were chosen from a range of contexts, mostly from the Barrow 1 mound, cist grave, fissure and subsoil. Sorted remains were examined from 23 samples, both directly and using a binocular microscope.

Taxonomic Composition

Table 5 summarises the results for each context and fraction, showing MNE for each amphibian and reptile species. Although amphibian and reptile remains are moderately abundant within many of the samples seen, the herpetofauna it represents is quite impoverished. This is not surprising for an upland site, as most UK species are largely found in lowland habitats. Common toads (Bufo bufo) make up the majority of the remains, with very few common frog (Rana temporaria) remains. This is quite unusual in itself, as common frogs are normally the most common amphibian in archaeological deposits. Both are quite 'commensal' species, reflecting their tolerance of a wide range of environments.

There were large numbers of slow-worm (*Anguis fragilis*) vertebrae and osteoderms in some samples, and this is the second most numerous herpetofaunal species in MNE terms. However, a single slow-worm has over 500 bones and 5000+ osteoderms, compared with fewer than 150 bones in a frog or toad. Common lizard (*Zootoca vivipara*) remains were less numerous but fairly ubiquitous in any sample with a retained residue finer than 4mm.

Local Environment

The preponderance of common toad implies a scrubby, deciduous wooded or moorland environment, with a breeding pond nearby, typically deep, and often vegetationless. However, the common toad is a fairly ubiquitous species and may inhabit a range of environments. The common frog is an open-country species, suggesting grass and herb cover, rather than woodland. The slow-worm is also a species of rank grass, herbs, scrub and moorland. It is only found on unploughed land, as it inhabits the interface between topsoil and damp leaf litter and roots. It is a secretive species but emerges for basking on a daily basis in sunny or bright weather. This is the time it is most likely to be picked off by avian or mammalian predators. Common lizards also require a relatively undisturbed environment, typically with tussocky grass, brambles, mature heather and gorse. There were no newt remains at all, and almost no grass snake, these being mainly lowland species. This also suggests that the herpetofauna represents the local environment, rather than that from further afield which could conceivably be within the reach of avian predators.

Predation and Taphonomy

The majority of the remains examined showed some signs of digestion by predators, often with very heavy reduction and etching. This is particularly evident in the frog and toad remains; it is less easy to identify digestive evidence in the smaller bones of the other species. There is clearly a bimodality or polymodality in the types of digestion damage seen within samples. This may or may not be due to the presence of more than one predator species, as argued by Andrews (above). Amphibians are most active at night, and especially in the spring breeding season (March to April for common toads); therefore this is the most likely time that predators will find them. It is quite possible that owls or mustelids predated the majority of the toads during breeding migrations. Common toads often travel several kilometres to traditional breeding ponds where they might gather in large numbers; common frogs tend to gather in much smaller numbers. This could also help explain the bias towards toads and the paucity of frog remains.

The reptile species identified are almost exclusively active during the day, which means that nocturnal animals could not be responsible for their accumulation. As there is definite evidence of digestion, it implies accumulation by a diurnal predator. Beyond the possibility

Feature	Phase	Context	No. Samples	Fraction	Bufo bufo/sp *(common toad)*	Rana temporaria/ *sp (common frog)*	Anura indet. *(frog/toad)*	Anguis fragilis *(slow-worm)*	Zootoca (Lacerta) vivipara *(common lizard)*	Vipera berus *(adder)*	Natrix natrix *(grass snake)*
Barrow 2											
Topsoil		2001	1	>1mm	3		4	1			
Bateman's trench		2060	1	>4mm	14	1					
Cist grave		2065-7	3	>4mm	21						
Subsoil		2058	8	>4mm	5	1					
Subsoil		2058	1	>1mm				1			
Barrow 1											
Mound	4	1052/1055/1058	5	>4mm	*c.* 380+	*c.* 5	*c.* 100+				
Mound	4	1055/1058	3	2-4mm	*c.* 104	*c.* 9	*c.* 20	*c.* 220	*c.* 40		
Cist grave	3	75502	4	>4mm	*c.* 236	*c.* 18	14	3			
Cist grave	3	75502	1	2-4mm				2	3	1	
Cist grave	3	75502	4	<1mm	*c.* 5	*c.* 1		*c.* 2500+	*c.* 56		
Fissure	u/s	1080	3	>4mm	*c.* 142	6	2	9	1	2	
Fissure	u/s	1080	3	<4mm	*c.* 78	11	13	*c.* 157	*c.* 35	4	1
Stone mound	3/4	1095	1	>4mm	2						
Subsoil	1-3	1053	1	>4mm	1						
Subsoil	1-3	1057	1	<4mm	2						

Table 5: Amphibian and reptile remains from selected samples.

of short-eared owl suggested by Andrews (above), other species should be considered, including diurnal raptors such as the kestrel, and small mustelids such as stoats and weasels. At least three toad bones examined were crushed/splintered before or at the time of death, and have small teeth marks like those of a small mustelid (*cf.* Gleed-Owen 1998). The range of digestive evidence would support Andrews' suggestion that avian predators, perhaps eagle owl or tawny owl, may have been responsible for many of the accumulated bones. The circumstantial evidence requires both nocturnal and diurnal predation, probably implying two or more predator species.

The cist grave fill seemed to have lower frequencies of digestion damage, the barrow mound higher occurrences. Barrow 2 samples had very few remains compared to Barrow 1, but the few herpetofaunal remains that were present all seemed to be digested. Some of the amphibian remains were totally undamaged and apparently undigested. Assessing the agent(s) of accumulation for these is somewhat speculative. All of the species identified could find their way into crevices and voids deliberately, e.g. using them as hibernacula. Pitfall is also an obvious possibility at a site with natural fissures in the bedrock. Three possible partial skeletons in the cist grave may represent pitfall or hibernation deaths, or could even have been interred accidentally by humans.

CHARRED PLANT REMAINS

By Wendy Smith (report written in 2002)

In total, 110 samples and/or sub-samples were collected and assessed for charred plant remains, covering all main phases of Barrow 1 and Barrow 2. Sixty samples (from a total of seventeen contexts) were selected for full analysis on the basis of their archaeological significance and/or archaeobotanical content.

Analysis was undertaken in order to assess whether any of the plant remains provide information about:

- the ritual use of plants at the site and any patterning in the data;
- the wider environment of the site;
- agricultural practices in the period.

Sample volumes ranged from 2.5 to 100L but typically were around 10L. The bulk soil samples were processed using water flotation. The sorted heavy residues only produced charcoal (Campbell, below) and therefore the archaeobotanical results presented here are limited to the flots, which were sorted using a low-power binocular microscope.

In almost all cases the flots contained modern root, worm cases and insects, which suggests that the sediments sampled were subjected to bioturbation. The abundance of modern root indicates that all of the deposits sampled were located quite near to the surface. As a result, any ancient charred plant remains within these deposits were subjected to freezing and thawing action, as well as wetting and drying. Both conditions are likely to have a detrimental effect on preservation.

Context	1002	1053	1056	1057	1059	1060	
No. of samples analysed from context	1	9	1	14	4	2	
Description	Subsoil	Subsoil	Subsoil	Subsoil	Cist grave	Cist grave	
Phase	1 - 3	1 - 3	1 - 3	1 - 3	3	3	
Total sample volume (L)	10	90	15	135	120	20	
Total flot volume (ml)	800	1570	175	840	2675	465	
Seeds per litre of sediment	1.4	0.3	0.7	0.3	1.8	1.1	
LATIN BINOMIAL							**COMMON NAME**
Cultivated plants	-	-	-	-	-	-	**Cultivated plants**
cf. *Hordeum* sp. – hulled grain	-	-	-	-	1	-	possible hulled barley grain
Triticum sp. – indeterminate grain	-	-	-	-	-	-	indeterminate wheat grain
Cereal/POACEAE – basal rachis internode	-	-	-	-	-	-	cereal/ wild grass
Wild plants							**Wild plants**
Corylus avellana L. – nutshell fragments	-	1	-	1	4	1	hazel
Prunus sp. – fragment of small-sized stone	-	-	-	-	1	-	sloe/ bullace/ damson
Vicia sp./Lathyrus sp.	-	-	1	-	-	1	vetch/ pea
cf. *Conopodium majus* (Gouan) Loret - tuber	-	-	-	-	-	-	possible pignut – tuber

Context	1002	1053	1056	1057	1059	1060	
cf. *Plantago media* L./*Plantago lanceolata* L.	-	1	-	-	1	-	possible hoary/ ribwort plantain
Galium sp.	-	-	-	-	-	-	bedstraw
ASTERACEAE – unidentified	-	-	-	-	-	-	daisy family
POACEAE – unidentified basal rachis internode	-	-	-	-	1	-	grass family
POACEAE – unidentified culm base	1	1	-	1	10	-	grass family
Unidentified – possible nutshell fragment	-	1	-	-	1	-	-
Unidentified – plant stem	-	1	-	-	1	-	-
Unidentified root – cf. *Arrhenatherum elatius* (L.) Beauv. ex J & C Presl type	3	4	-	3	1	1	onion couch grass type
Unidentified tuber – type A – spherical tuber (*Ranunculus/Conopodium* type)	-	-	1	-	-	1	buttercup/ pignut type
Unidentified tuber – type B (? bulblet)	-	-	-	2	1	-	-
Unidentified tuber – amorphous parenchyma fragments	1	5	7	14	45	3	-
Unidentified	2	5	-	4	2	-	-
Indeterminate	-	-	-	5	53	-	-
Fungal bodies*	+++	+++	++	+++	+++	+	-
Total	**14**	**24**	**10**	**37**	**220**	**21**	

Table 6: Charred plant remains

(a) Barrow 1 (ordered by phase)

Context	2009	2058	2078	2076	2008	2001	
No. of samples analysed from context	1	2	3	2	3	1	
Description	Subsoil	Subsoil	Subsoil	Stone layer	Barrow mound	Topsoil	
Phase	3	3	3	3/4	4	7	
Total sample volume (L)	10	20	30	17	110	2.5	
Total flot volume (ml)	200	95	450	400	2010	400	
Seeds per litre of sediment	5.6	2.1	1.5	0.4	3.3	0	
LATIN BINOMIAL							**COMMON NAME**
Wild plants							**Wild plants**
Ranunculus acris L/ *R. repens* L./ *R. bulbosus* L.	-	1	1	-	1	-	meadow/ creeping/ bulbous buttercup
Quercus sp. – nutshell fragment	-	-	-	-	1	-	oak
Corylus avellana L.. *– nutshell fragments*	13	4	-	-	7	-	hazel
cf. *Rumex sp.*	-	-	-	-	1	-	possible knotgrass
cf. *Conopodium majus (Gouan) Loret - tuber*	-	1	-	-	-	-	possible pignut – tuber
cf. *Plantago media* L./*Plantago lanceolata* L.	-	-	1	-	1	-	possible hoary / ribwort plantain

Context	2009	2058	2078	2076	2008	2001	
POACEAE – unidentified culm base	-	1	1	1	6	-	grass family
POACEAE – unidentified culm node	-	-	4	1	4	-	grass family
POACEAE – small caryopsis	-	-	-	-	2	-	grass family
Unidentified – plant stem	4	6	-	-	4	-	-
Unidentified root – branched structure	17	9	16	2	148	-	-
Unidentified root - cf. *Arrhenatherum elatius* (L.) Beauv. ex J & C Presl type	2	1	2	-	8	-	onion couch grass type
Unidentified tuber – type A – spherical tuber (*Ranunculus/ Conopodium* type)	-	-	-	-	4	-	buttercup/ pignut type
Unidentified tuber – type B (? bulblet)	7	4	7	-	1	-	-
Unidentified tuber – type C (elongated oval shape < 1.5 cm long)	-	-	-	-	2	-	-
Unidentified tuber – amorphous parenchyma fragments	11	5	3	2	140	-	-
Unidentified	-	7	7	1	6	-	-
Indeterminate	2	2	3	-	31	-	-
Fungal bodies*	+++	++	++	++	+++	+	-
Total	**56**	**41**	**45**	**7**	**367**	**0**	

Table 6: Charred plant remains

(b) Barrow 2 (ordered by phase)

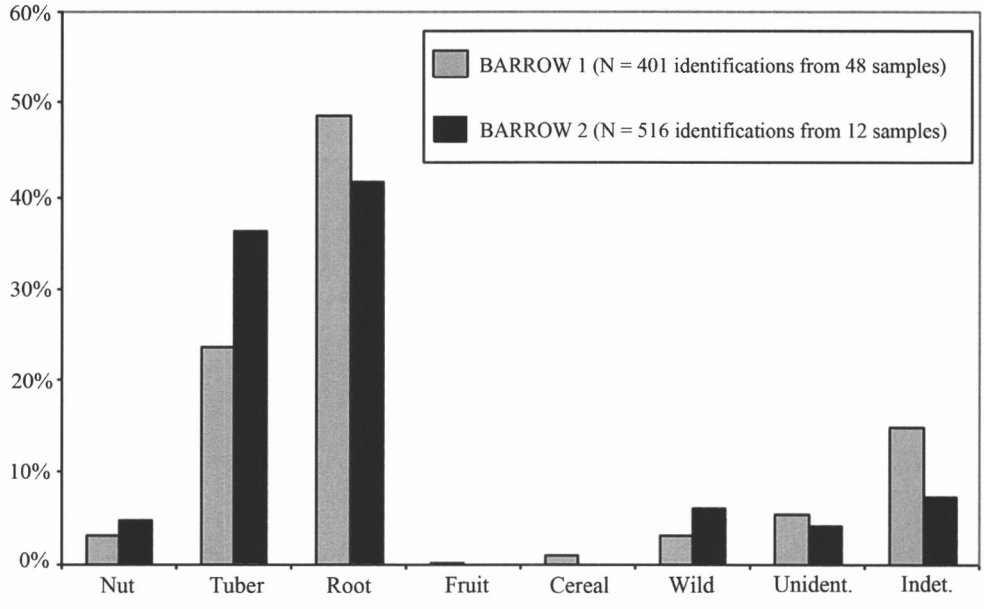

Fig. 30: Proportions of plant remains in Barrow 1 and Barrow 2.

Results

The results are presented for each archaeobotanical sample in order of context in Table 6. Fig. 30 summarises the main results for Barrows 1 and 2.

Charred tuber and root fragments dominate the assemblages recovered from both barrows, accounting for 72.3% of all charred identifications in Barrow 1 and 77.7% in Barrow 2. Small quantities of edible plants such as nuts (hazel and unidentified nutshells), fruit (sloe/bullace/damson) and cereals (barley and indeterminate wheat) were also present in the Barrow 1 assemblage, and nuts (hazel, acorn and unidentified nutshells) also were recovered from Barrow 2.

Three cereal grains were recovered from Barrow 1. One possible barley grain was identified in the cist grave fill (context 1059) and two indeterminate wheat grains were identified in the stone mound (context 1095). In all cases, the cereal grain preservation was fairly poor and secure identification was not possible. It was not possible to determine if the wheat grains were free-threshing or glume wheats.

A small quantity of charred wild plant seeds was recovered; many of these taxa are typical of grassland habitats (e.g. *Ranunculus acris/repens/bulbosus*, *cf Rumex* sp., *Vicia* sp./*Lathyrus* sp., *Plantago media/ lanceolata*), as are several species of bedstraw (*Galium* sp.).

One acorn, one sloe/bullace/damson (*Prunus* sp.) stone fragment, two possible pignut (*cf. Conopodium majus*) and several possible onion couch grass (*cf. Arrhenatherum elatius* type) tubers were identified, although there was not an adequate range of Poaceae (grass family) tuber/root comparative material to securely identify these remains.

Discussion

The recovery of tuber and root fragments from all phases of use at Barrow 1 and from Barrow 2 suggests this material is repeatedly involved in charring events, perhaps associated with funerary pyres. Moffett (1991, 189; 1999, 245) has argued that it is unlikely pignut tubers would be uprooted by accident since they easily break away from the plant stem. If the tubers were not collected for food, the only way they could have entered the assemblage is if whole turves were used as kindling/fuel for the cremation (Moffett 1991, 189). Certainly tubers of onion couch (sometimes just termed 'couch grass') are fairly commonly recovered from Neolithic and Bronze Age cremations (Moffett 1991, 187; Robinson 1988).

The limited recovery of cereal crops from Neolithic and Bronze Age 'ceremonial' or 'ritual' deposits is a well known trend (Jones 2000; Robinson 2000, 86–7). The funerary context of the Longstone Edge archaeobotanical assemblage is highly likely to be a factor in the quantity and range of plant remains encountered. Since the site was not occupied it is only possible to say that those people who used the barrows had access to cereal crops. Although it is tempting to suggest these were simply accidental inclusions, this may be an over-simplistic interpretation. There is a growing recognition that cereal crops themselves may have had some form of 'symbolic power' (e.g. Fairbairn 2000; Richmond 1999) and, therefore, consideration of a possible 'symbolic' meaning for the presence of charred cereals in these deposits should not be ruled out.

Although there is evidence for wild foodstuffs and grassland taxa, both appear to be highly associated with the funerary rituals taking place on site and do not directly contribute to any wider understanding of the nature of the landscape in and around Longstone Edge.

One comparable site is known from this period in Derbyshire: the Bronze Age barrow (including Neolithic features) at Big Lane, Hognaston (Hunt 1996). A total of eight samples were reported, three of which produced a total of seven charred seeds. Such a limited assemblage is difficult to interpret, but in her discussion of the results, Hunt (1996, 159) does discuss the recovery of 'well-preserved grass rhizomes [which are not listed in her table of results], together with some leaves, stems and seeds, strongly suggest[ing] that these samples represent the remains of turves'. As a result, this assemblage does appear to be quite similar to that produced at Longstone Edge.

CHARCOAL

By Gill Campbell (report written in 2002)

Following the assessment of charred plant remains, it was decided to assess thirteen contexts for charcoal. This was based on the amount of charcoal observed during the assessment of charred plant remains and on the identification of contexts by the excavator which were of archaeological interest, and where there was no evidence of contamination. The aim of this assessment was to see if the charcoal assemblages could provide evidence for:

- changes in the type of woods used over time which might reflect changes in local vegetation;
- the types of wood used in funerary rites;

- the types of wood burnt as part of the activities taking place prior to construction of the barrows.

Samples chosen for assessment were sieved through 4 and 2mm sieves, and each fraction sorted for charcoal. Fragments of charcoal greater than 2mm across were sorted into rough taxonomic groups using a binocular dissecting microscope at magnifications up to x40. A few fragments from each of these groups were then identified using a transmitted light microscope at magnifications up to x400.

Discussion

No sample produced more than twenty fragments of charcoal >2mm in diameter and in many samples pieces larger than 4mm were absent. Surfaces of the majority of fragments were covered with sediment, with the exception of fragments of pine charcoal from context 1058. These were very fresh in appearance, suggesting that they may be of recent origin.

Samples from contexts associated with the subsoil under Barrow 1 (1053, 1057) produced small amounts of charcoal, principally hazel, with ash and *Prunus* sp. (sloe, plume, cherry etc.) also present. Contexts associated with pre-barrow activity under Barrow 2 (2008, 2009, 2078) produced ash, Pomoideae (hawthorn, apple, *Sorbus* spp.) and hazel fragments. Many fragments showed evidence of charring at high temperature, which might suggest that they derive from cremation pyres or large bonfires.

Charcoal associated with the cist grave (1059, 75502) produced ash and Pomoideae charcoal, and a possible fragment of oak. The sample from the cremation (context 3030) appeared to contain only ash charcoal, although the fragments were small and rather friable. A single twig which had been burnt at high temperature was also present. Subsequently radiocarbon dating proved at least some of this material is residual from Mesolithic activity (see above).

Samples from both phases of the Barrow 1 mound (1019, 1058) each produced heather-type charcoal. This may be of recent origin, but did not have the fresh appearance of the pine charcoal recovered from context 1058.

Results indicate the use of ash, hazel *Prunus* sp., and Pomoideae-type wood at the site. The presence of heather-type charcoal in the Barrow 1 mound may, if not of recent origin, indicate a change to heathland conditions in the local area or a shortage of wood fuel. The apparent absence of Pomoideae-type charcoal in the contexts associated with pre-barrow deposits may indicate a slight change in wood use/local woodland at the site, or it may relate to the nature of later activity.

MOLLUSCS AND CARBONIFEROUS FOSSILS

By Peter Murphy (report written in 2003)

The monuments sealed thin buried soils developed on Carboniferous Limestone and an extensive series of samples was collected for palaeoecological analysis. Nineteen samples were processed specifically for analysis of molluscs, following standard methods (Evans 1972, 44). The samples showed little sign of intrusive material being present, though fibrous roots were noted in some samples.

Following assessment, eight samples from well-sealed buried soils were selected for analysis. They were fully sorted under a binocular microscope at low power. Shells were identified by comparison with the writer's reference collection and with reference to Evans (1972) and Kerney and Cameron (1979), from which ecological information has been taken. Taxa identified are listed in Table 7.

The writer did not collect samples at this site, but received sieved and processed material. In the sample record sheets the buried soil beneath these monuments is very variously described from black humic silt loam to light brown sandy loam (Table 7). However, it seems likely that the mineral fabric of buried soils at the site was composed of insoluble residues from Carboniferous Limestone; and judging from the numbers of shells per kg of sample an A horizon was sampled in most cases. Rapid scanning of shells extracted from flotation samples, which were unsuitable for detailed analysis, nevertheless proved them to be very consistent in composition, including an identical range of larger species to the samples listed in Table 7: *Discus* and *Cepaea* were predominant, with *Helicigona, Oxychilus* and Clausiliidae. Hand-collected material described as 'marine mollusc shell' was in all cases fossil shell from the Carboniferous Limestone. They are assumed to be of local origin and there is a possibility that some of them were intentionally placed.

Shell Preservation

Shell preservation was extremely variable. Some contexts included abundant well-preserved shells, but in others only weathered, pitted and perforated shells and fragments of large species were noted. In an attempt to examine this more rigorously, preservation of the commonest species (*Discus rotundatus*) was recorded in detail. Intact adult and sub-adult shells and those with more than two whorls were scored on a three-point scale, as follows:

1) Well-preserved shells. Striations sharp and unabraded; pigmentation usually present; surface glossy (though lacking periostracum).
2) Intermediate preservation. Striations variably abraded; pigmentation faint or lost; shell surface matt with some pitting.
3) Poor preservation. Striations lost or only patchily present; no pigmentation, or only very faint traces; shell surface very abraded with extensive pitting and some perforations; often very fragmented.

Any scoring system of this type is subjective but the results obtained are believed to be at least consistent in their subjectivity. Results for assemblages with >30 shells whose preservation could be scored are given in Fig. 31. *Discus* shells from Barrow 1 mainly fell in the poor/intermediate category, whereas a higher proportion of those from Barrow 2 were well preserved. In general terms, shell preservation is related to soil pH; differences in preservation between the two monuments could therefore be related to differences in bedrock and/or soils.

Pyramidula rupestris

It seems that this species has not previously been reported from an archaeological context in England, so criteria for identification should be given. It has been identified here from the size of the apex (intermediate between *Discus rotundatus* and *Punctum pygmaeum*), the low conical form of the apex, its darkish brown coloration and, in more mature shells, the well-defined fine growth ridges which give the shell a silk-like texture. Its presence at this site is unsurprising, for today it is common in limestone regions, often occurring on dry, exposed rocks and walls.

Sample	**5147**	**5148**	**5155**	**5156**	**5158**	**5159**	**5151**	**5152**
Context	1107	1108	1103	1104	1105	1106	1109	1110
Barrow	1	1	1	1	1	1	2	2
Context type	Buried soil beneath enclosure wall	Buried soil beneath enclosure wall	Buried soil within gap in enclosure wall, sealed by stone block	Buried soil within gap in enclosure wall, sealed by stone block	Buried soil beneath enclosure wall	Buried soil beneath enclosure wall	Buried soil	Buried soil
Description (from sample sheets)	Grey/dark brown sandy silt loam	Light brown sandy loam	Dark brown silty sand loam	Light/medium brown sandy clay loam	Loose black humic silt loam	Light brown sandy clay loam	Dark brown/ grey silty sand loam	Light brown sandy clay loam
Mollusca								
Pyramidula rupestris (Draparnaud)	5		5	2	2		24	4
Ena obscura (Mueller)	2		1			1		
Discus rotundatus (Mueller)	170	14	31	38	42	182	188	84
Vitrea contracta (Westerlund)	10		9	5		1	11	7
Vitrea sp.	12	1	17	6	2		12	25
Aegopinella nitidula			5	3		7	15	
Nesovitrea hammonis	1							
Oxychilus sp(p)	8		4	5	3	3	5	9
Zonitidae indet.	12		3	2	6	5	6	5
Limacidae indet.							4	
Clausilia bidentata (Strom)	1							5

Sample	**5147**	**5148**	**5155**	**5156**	**5158**	**5159**	**5151**	**5152**
Context	1107	1108	1103	1104	1105	1106	1109	1110
Clausilia sp.							1	
Clausiliidae indet.	7			2	2	2	1	
Trichia hispida (L)		1					2	4
Helicigona lapicida (L)				1	1	2	2	
Cepaea hortensis (Mueller)					1		1	
Cepaea sp.					1			
Cepaea/Arianta spp.	7	1	3	2	1	1	5	3
Unidentified apical fragments etc.	16	3	6	4		6	12	16
Vertebrata								
Small bone	xx	x	x	x	x	xx	xx	x
Bone fragments	xx	x		x	x	x	xx	x
Charred plant macrofossils								
Charcoal	x	x	x	x	x	x	x	x
Corylus avellana L. (nutshell)		x						
Fabaceae indet. cotyledon fragment		x						
Root?				x				
Tuber fragments								x
Sample weight (kg)	2	2	0.5	0.5	2	2	2	2

Table 7: Samples analysed for molluscs and taxa identified.

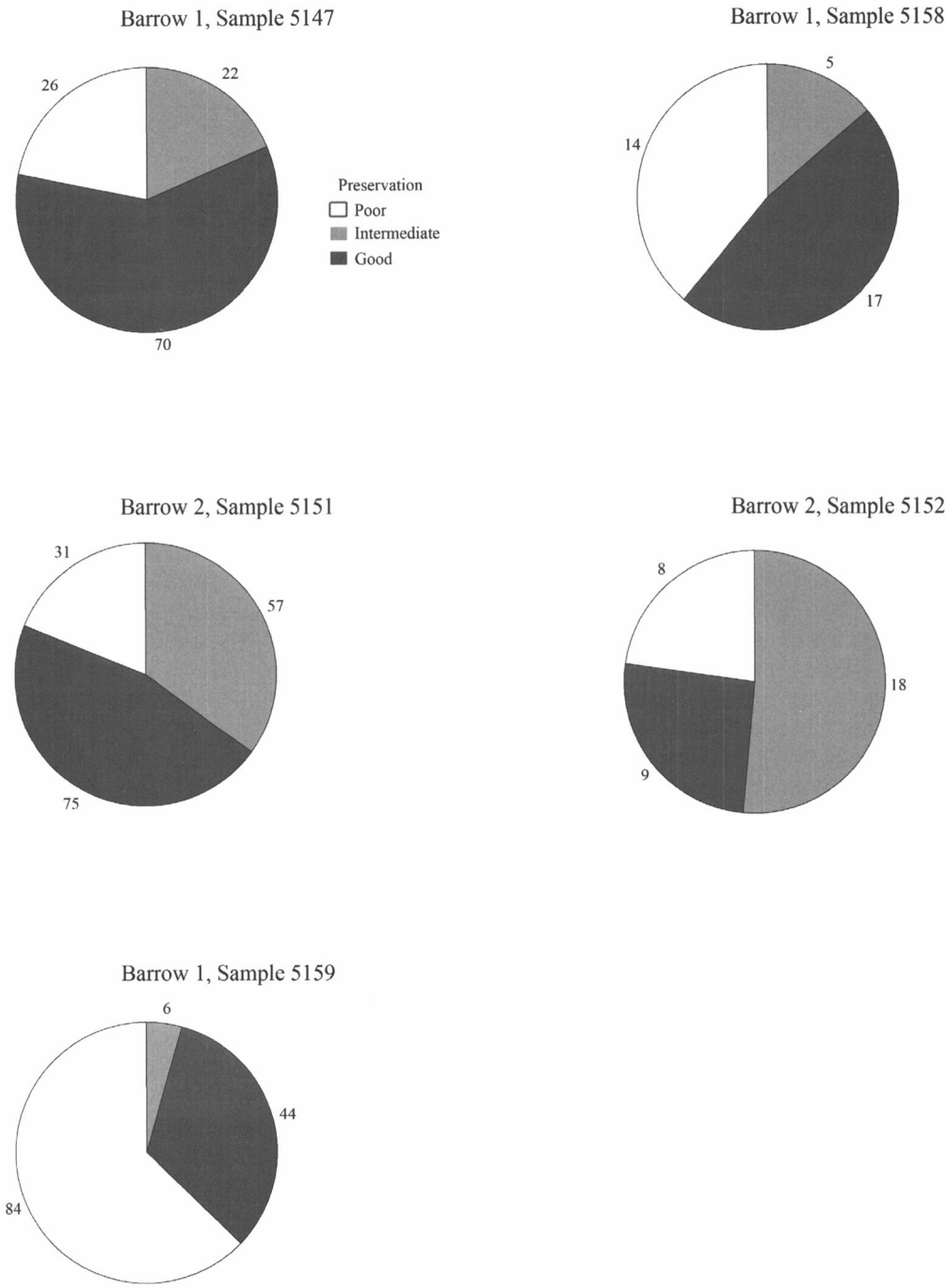

Fig. 31: Shell preservation

Assemblage Composition and Local Habitats

Buried soils from beneath Barrows 1 and 2 produced very similar mollusc shell assemblages and it is thought that the two monuments were constructed in similar local habitats. The number of taxa identified is low, reflecting the high altitude, exposed situation and remoteness of the site from environments more congenial for most mollusc species. The assemblages are remarkably homogeneous in composition, dominated consistently by *Discus rotundatus*, with Zonitidae, Clausiliidae, *Pyramidula rupestris* and rare shells of *Ena obscura*, *Helicigona lapicida*, and *Cepaea hortensis*. Evans (1972, 287 and 308–10) includes samples of this general type in his group of 'limestone scree' faunas, composed of species commonly associated with woodland. In this situation, however, some species colonised shaded, moist cavities within limestone rubble, which mimicked woodland conditions (from a snail's point of view), whilst others were rupestral, living on rubble surfaces. Open conditions and stone-strewn surfaces are apparently indicated throughout. Some taxa characteristic today of such habitats were not recorded at Longstone Edge (e.g. *Abida secale, Lauria cylindracea*) and their absence does seem to be real, for the shell assemblages were scrutinised carefully to detect these species.

The only other published study of molluscs from a Derbyshire barrow is that by McMillan at Glebe Low, Great Longstone (Appendix II in Radley 1966). She found that a sample from the 'Bronze Age turf-line' included no shells, but a substantial shell assemblage came from a secondary burial. This was dominated by *Discus rotundatus* and *Vitrea contracta*, closely resembling assemblages from the present site.

DISCUSSION

The specialist analyses above have greatly enhanced the bare sequence of activity laid out in the stratigraphic narrative, despite the uncertainties in the latter. They allow us to tell a more nuanced story of the Longstone Edge barrows that also informs our broader understanding of the environment and human occupation of the White Peak through prehistory and the Roman period, as well as providing insights into the work of the region's best-known antiquarian, Thomas Bateman.

There are several previously excavated Peak District barrows of similar type, including Glebe Low (Radley 1966), Liffs Low (Barnatt 1996c), Wigber Low (Collis 1983), Hindlow (Ashbee and Ashbee 1981) and Bee Low (Marsden 1970) – all on the limestone plateau and all bar Glebe Low previously investigated by Bateman or his protégés. Environmental evidence has also come from Hognaston (Collis 1996), which lies off the limestone. The main features of Longstone Edge (pre-barrow activity, multiple phases, cists or rock-cut graves, later reuse and quantities of water vole remains) are all found at one or more of these sites. While it fits various regional patterns, however, the details of the finds from Longstone Edge offer new insights into both the barrows and the prehistoric societies of the Peak District. At Barrow 1, as at many sites across Britain, detailed examination with modern techniques of what ostensibly appeared to be a straightforward round barrow has revealed a long and complex history of activity, the interpretation of which is complicated by the site formation processes, with objects from the pre-mound phases apparently disturbed and incorporated into the barrow structures, while some intrusive material has worked its way downwards.

Mesolithic and Neolithic

The Mesolithic activity at the site consists not only of the lithics described by Makey but also the burnt hazelnuts that were subsequently incorporated in the cremation deposit. These items imply occasional small scale activity on different occasions (the radiocarbon determinations, which do not overlap, lie in the mid 8th and later 7th millennia cal BC), perhaps as part of the kind of occupation practices described for the Late Mesolithic by Hind (2004), who notes a high density of Mesolithic and Neolithic findspots around the Wye/Derwent interfluve. The present finds add to the picture of Mesolithic material across all major geological zones in the Peak (Myers 2006), the presence of microliths at a high vantage point along Longstone Edge perhaps suggesting a temporary hunting camp or look-out, while the leaf-shaped arrowhead may be indicative of a continuity of life-ways into the Early Neolithic, supporting Hind's argument. These finds also suggest that the presence of Mesolithic and Early Neolithic material beneath a round barrow may not be coincidental: while continuity of use over millennia seems unlikely, this could have been a place that people knew about and gave a name to – a place with ancestral resonance that later became an appropriate spot for the deposition of ancestral remains (*cf.* Whittle *et al.* 2007).

On the other hand, while numerous round barrows across the country overlie older material – perhaps too many to be coincidental (Last 2007) – Mesolithic material is more often found under Early Neolithic long barrows. Perhaps the difference at Longstone Edge is that the mortuary aspect of Barrow 1 also goes back to the Early Neolithic and spans more than a millennium, adding a new element to our understanding of unchambered round barrows in the Peak (though the nature of any Neolithic structures at the site remains obscure). The earliest evidence comes from the dated human ulna fragment from subsoil 1057, which pre-dates 3500 cal BC and is therefore more than 1200 years older than the individuals in the Beaker cist grave. It is probably contemporary with some of the occupation at Lismore Fields (Barnatt 1995, 7), which is consistent with the ceramic resemblances noted by Beswick.

Early Neolithic monuments from the White Peak comprise long barrows, such as Gib Hill (McGuire and Smith 2008), and chambered cairns like Five Wells (Piggott 1954, 267–9), but detailed regional chronologies are lacking for both classes so it is not possible to say whether the Longstone Edge human remains are contemporary with the use of any given tomb. Two such monuments lie in the vicinity: a long barrow on Longstone Moor, 2km to the north-west, for which there are no documented excavations (Barnatt 1996b, 85), and a possible chambered cairn at Wardlow, now destroyed (*ibid.*, 90). The deposits within the excavated Neolithic monuments of the Peak District are also unfortunately poorly documented and understood, but there is some suggestion that disarticulated remains were interred, though complete inhumations are also found (*ibid.*, 37). At Green Low chambered tomb, 15km south of Longstone Edge, an oval cairn contained two concentrations of human bone beyond the chambers, one apparently a complete skeleton but the other disarticulated (Manby 1965, 5).

The nature of Barrow 1 in the Early Neolithic remains mysterious, however. Even though construction of the later mound could well have destroyed an earlier monument, it seems unlikely that a large Neolithic tomb was ever present. On the other hand, bones would not have survived unless buried or contained within a structure, while the presence of lithics and potsherds of this period, albeit in small quantities, suggests the dated long bone is not an individual 'relic' that was brought to the site at a later date. One possible clue to the nature of the Neolithic monument is the enclosure bank, which seems originally to have been independent of the barrow mound into which it was later incorporated. However, there is

no dating evidence for this structure and no precedent for it being 4th millennium in date – elsewhere in the region ring-cairns tend to be Bronze Age (Barnatt 1990).

The matter is further complicated by the second Neolithic human bone, dated to the beginning of the 3rd millennium. This period – nationally, the time of transition from Peterborough Ware (which was found at Longstone Edge) to Grooved Ware (which was not), and from cursus monuments to henges – generally lacks burial monuments and human remains, especially unburnt ones. The best-known mortuary site of this period is the cremation cemetery at Stonehenge: a burial from the ditch was recently dated to 2920–2870 cal BC (OxA-17957; 4271±29 BP; Parker Pearson *et al.* 2009), which is statistically consistent (T'=0.1; T'(5%)=3.8; v=1, Ward and Wilson 1978) with the Longstone Edge bone (hence potentially of the same actual age), while two unburnt skull fragments are probably slightly later in date. Rather closer to the Peak District, recent work at Duggleby Howe in Yorkshire has dated two inhumations, which apparently pre-date the raising of the primary Neolithic mound, to the decades around 2900 cal BC (Gibson 2008). Parker Pearson *et al.* (2009, 36) interpret Stonehenge as the burial place of a ruling elite, while isotope studies of the Duggleby dead suggest most of the interred were not local to the Wolds (Montgomery *et al.* 2007). It would be stretching the evidence to see Longstone Edge as a regional centre or elite burial place, especially in the absence of non-dietary isotope data, but it appears that human remains were being interred here at a time when such practices were nationally very rare and largely confined to some of our most significant monuments. It is possible, of course, that similar results might be found at other barrows in the Peak District – or indeed elsewhere in Britain – if we dated disturbed or disarticulated human remains, which are frequently mentioned by Bateman (J. Barnatt *pers. comm.*).

Just two pieces of bone were dated from the pre-barrow assemblage, so these provide only a minimum time-span of 600 years; it could be considerably longer. One way round the absence of evidence for Neolithic structures at the site is to follow the excavators' interpretation of the remains as an excarnation assemblage. Evidence for excarnation has been recovered from other sites in the region: in particular the primary flat-topped cairn at Wigber Low is interpreted as an exposure platform, though all this activity seems to be Early Bronze Age in date (Collis 1983). However, Simon Mays' analysis has shown that the Longstone Edge material, though crushed, is not weathered and therefore seems unlikely to represent exposure for excarnation. Moreover it is intermingled with elements that probably belong to the Beaker burials in the cist grave, which raises further questions about site formation processes. Although the precise locations of the refitted teeth are uncertain (they could have come from the edge of the disturbed grave) the presence of Beaker sherds in the pre-mound deposits supports the assertion that some of the more widely spread material also derives from the grave.

The lack of weathering suggests there must have been some structure or protective container that was used for interments during the Neolithic. This could have been destroyed at the time of the barrow mound construction, when the Beaker cist grave was also disturbed, leading to remains from the earlier phases being (deliberately?) scattered and crushed on the cleared surface on which the barrow was raised. Alternatively, the cist grave may have been a Neolithic structure with its contents cleared out when it was reused for the Beaker inhumations (noting that the grave did contain a small amount of fragmentary bone not belonging to either of the identified skeletons). But this is a rather convoluted explanation, requiring two episodes of disturbance.

Beaker and Bronze Age

Assuming that the Beaker cist grave was a new addition to an existing mortuary site it shows the reconfiguration of Barrow 1 at the turn of the Bronze Age (if the two skeletons are contemporary, as the statistically consistent radiocarbon measurements might suggest, they probably belong to the 22nd century cal BC). There is nothing particularly unusual about the Beaker mortuary rite that might reflect the site's earlier history, although the Beaker itself is typologically early and burials of two adults are relatively rare among the region's round barrows, occurring in less than 10% of inhumation graves, according to Barnatt's survey (Barnatt 1996b, table 1.6). Beakers, scrapers and bone pins are common grave goods; faunal remains perhaps less so, though the pig humerus (if it was indeed a deliberate offering) has a parallel in barrow 2 at Gayhurst Quarry, Buckinghamshire (Chapman 2007). The lack of 'fancy' or exotic items in the grave supports Barnatt's (1999) argument that Peak District barrows are essentially 'family' monuments.

An interesting feature of Barrow 1 is the empty rock-cut grave (or graves), though it remains an assumption that this is contemporary with the cist grave. Empty graves have been found at other Peak District barrows: at Glebe Low the main cist grave, although apparently undisturbed, lacked human remains and 'was possibly designed to remain empty except for the grave goods' (Radley 1966, 60). At Longstone Edge, however, the juxtaposition of a grave with one bone in it and bone fragments on the old ground surface makes it seems more likely that human remains had been present but were removed at some point. This is not particularly unusual: although the disturbance of burials has traditionally been seen as a Neolithic practice associated with long barrows and chambered tombs, the reopening of graves is also a relatively common occurrence in the Beaker period (Gibson 2007).

The high numbers of microfauna associated with the cist grave in Barrow 1 strongly suggest that the grave was accessible, though not completely open, between the interment of the two bodies and the raising of the mound, a period almost certainly spanning more than a century. Whether a small mound and/or the dry-stone enclosure bank were present at this time remains uncertain, though it seems unlikely that the site was not marked by some above-ground feature. Just as for the Neolithic, we have no local parallels for Beaker ring-cairns, however; all the known embanked stone circles and ring-cairns lie on the eastern gritstone moors (Barnatt 1990, 13) where Beaker graves are as yet unknown, though Barnatt (1999, 38) notes in respect of barrows throughout the Peak District that there has been 'little serious investigation of the possibility of kerbs being structurally independent'. Further afield, a possible parallel is the site of Gray Hill, Monmouthshire, where a ring-cairn roughly 12m in diameter surrounded a small mound overlying a disturbed Beaker grave. As with Barrow 1, this structure was subsequently 'transformed from an open, bank-defined monument ... to an essentially "closed" construction' (Chadwick and Pollard 2005). On the other hand, additions to existing mounds are known at Hindlow (Ashbee and Ashbee 1981) and Wigber Low (Collis 1983), so this alternative sequence of construction remains a possibility in the absence of conclusive stratigraphic evidence.

Also in relation to the Beaker grave, Andrews' detailed analysis has finally shed some light on the 'rats' bones' common in Bateman's reports. The presence of these deposits has been a puzzle for archaeologists researching his notes; though many regarded them as exaggerated or mistaken (Radley 1966, 67), more recent work has confirmed Bateman's descriptions, with 'thousands of rodent bones' found at Glebe Low (*ibid.*) and 'vast numbers' at Green Low (Manby 1965, 5); the quantities retrieved from Barrow 1 are further confirmation of

the phenomenon. Radley (1966, 68) suggested various possible scenarios, including human consumption, deliberate deposition and accumulation by owls, but the Longstone Edge analysis conclusively implicates the last of these. Not only has it solved the puzzle, it also provides proxy information on the local and regional environment, as Andrews explains. The results imply that the area around the Barrow 1 cist was used as a roost and/or nest, probably for two species of owl, which also indicates that the monuments (like all the other sites where such remains have been found in quantity) were not frequented by people. The suggestion from the herpetofaunal evidence of other active predators merely strengthens this view: the barrows were sites of occasional interments, not routine activity.

The nature of any pre-mound activity at Barrow 2 is even more uncertain. Although Beswick notes the uncertainty about the relative dating of the Food Vessels from the two barrows, on the basis of Bateman's finds we might assume there was no burial activity at Barrow 2 until the start of the 2nd millennium. However, the radiocarbon date for the child burial, which is contemporary with the individuals in the Barrow 1 cist grave, shows this was not the case. It seems quite likely, therefore, that the Barrow 2 cist grave also dates to the Beaker phase and, unlike that in Barrow 1, was subsequently reused. This may imply that in both monuments the inhumations were associated with Beakers and the cremations with Food Vessels, although at a regional level Food Vessels may accompany either method of disposal (Barnatt 1996b, table 1.8).

Organic residue analysis undertaken by Lucija Šoberi as part of a PhD project showed that the Food Vessel from Barrow 1 had been used prior to the deposition, as it displayed a strong presence of ruminant dairy fats, which is typical for funerary pottery of the Early Bronze Age (Šoberi and Evershed 2014).

A comparison with Bee Low, which lies about 10km south of Longstone Edge and is of similar size to Barrow 1, may be informative, since it has also been suggested as an open site in its original form. Its main difference is that it contained upstanding Beaker cists, which ended up within the barrow mound, rather than rock-cut graves. Cist 1 held the remains of several individuals, most disarticulated, implying re-access on several occasions, along with 'a proliferation of water-vole remains' (Marsden 1970, 191). Like Longstone Edge, scattered bones were also found on or near the natural surface, suggestive of disturbance by antiquarians or in antiquity, though some seem to 'represent burials desecrated during the construction of the cist'. A total of at least 23 inhumations and five cremations are reported, and clearing-out of graves or burial of token remains is evidenced. Without radiocarbon dates, it is unclear whether any of the remains outside the cists are Neolithic, but the absence of artefacts that pre-date the Beaker phase suggests not.

Further afield, at Hardendale Nab near Shap in Cumbria (Williams and Howard-Davis 2004), another above-ground stone cist was found with remains of voles and shrews within the fill. In this case the exposed roof of the cist (suggested to have been of turf and timber) could have served as a roost for raptors before it collapsed. It is also suggested that a low mound surrounded the cist, though its top stood proud (which is unlikely to have been the case with the rock-cut graves at Longstone Edge). The cist and primary mound were subsequently enclosed by a ring-cairn with a south-west-facing entrance, and then covered by a cairn. While this may parallel Barrow 1, the radiocarbon dates suggest that, with the possible exception of the primary cist, all the activity at Hardendale Nab took place in the 2nd millennium BC.

At some point after 2000 cal BC a decision was taken to make the monuments at Longstone Edge more visible, through construction (or enlargement) of the barrow mounds. In both

cases this activity was preceded by deposition of Food Vessel cremations, though in Barrow 1 this was on the cleared ground surface while in Barrow 2 the cist grave was reopened. The process was not respectful of earlier deposits at the site, crushing and scattering the existing assemblage of human remains, although it is notable that whereas the skeletons in the Barrow 1 cist grave were merely disturbed, the Beaker (if indeed it was originally placed in the grave) was removed and smashed, with some pieces even found within Barrow 2. It is unclear whether the treatment of ancestral remains in such a way (at a site that had apparently been rarely frequented since their interment) was deliberate, or whether the location was more important than the material already present, the destruction of the latter merely 'collateral damage' from the process of barrow building. The previous history of Barrow 1 may be referenced by the presence of two adults in the cremation deposit, just as in the cist grave (though the cremation appears to comprise two males). Barrow 2 certainly saw a slightly more respectful process, with the two Food Vessels found by Bateman deposited in the cist grave, though earlier burials may have been disturbed here too.

Barnatt (1996b, 38) suggests that 'barrows with diameters of over 12m always have five or more individuals'. This is true for Barrow 1, since the minimum number represented is twelve (though many of them may pre-date the Bronze Age), but Barrow 2 may be an exception, as it seems to have contained no more than three individuals.

Landscape and environment

The specialist reports paint a relatively consistent picture of the landscape around the barrows as 'a rich environment of mixed woodland and open country' (Andrews, above), with the small mammal species primarily indicating deciduous forest, the herpetofauna a mixture of woodland and scrub, the charred plant remains grassland (though they may tell us more about funerary activity than the local environment), the charcoal possibly heathland and the molluscs generally open conditions with stone-strewn surfaces (which is not contradicted by the presence of ground-nesting owls). In other words, the immediate environs seem to have been rather open but dense woodland was not far away, perhaps on the escarpment slopes.

What we lack is a detailed picture of the settlement context to which the barrows related – how this landscape was inhabited. Barnatt argues that by 2000 BC lifestyles in the Peak were based on sustained (but not necessarily sedentary) mixed farming, with settlement 'spreading from the sheltered valleys into the more favourable areas of the limestone plateau' where claims to seasonal pastures 'were reinforced by the building of monuments dedicated to the ancestors' (Barnatt and Smith 1997, 23). While the model is eminently plausible, there is currently no excavated settlement evidence from the White Peak to compare with that from the eastern gritstone moors (Barnatt *et al.* 2002) – and even there the idea that the field systems and house platforms go back as early as the beginning of the Bronze Age remains conjectural.

Later history of the monuments

The later prehistoric settlement pattern of the White Peak is not understood in great detail either (Barnatt 2000, 12–13) but barrows on the higher pastures were periodically revisited in the Late Bronze Age/Iron Age and Romano-British periods, as well as in the Anglian period – though Anglian finds are rare locally (Barnatt 1996b, fig. 1.24) and not in evidence at Longstone Edge. It is unclear whether the later prehistoric activity was motivated by ritual or practical concerns (if such a distinction is even valid), but the Romano-British activity does appear to indicate a continued ritual interest in the barrows, whether or not accompanied by

the interment of human remains (as discussed above by Leary, Mays and Popkin). Romano-British activity is also attested at Green Low chambered tomb, including a concentration of Derbyshire ware near the entrance (Manby 1965, 15), and a number of similar examples are known from elsewhere in the country (Williams 1998). Whatever the precise nature of the activity, the interventions suggest that Longstone Edge remained a significant place in the landscape and perhaps retained some symbolic power.

After that, there is little suggestion of further interest in the barrows before Thomas Bateman visited the site in 1848 and excavated Barrow 2. His records of the cist grave appear reliable, though as with nearly all antiquarians he showed little interest in the rest of the monument and it is still unclear why he did not excavate Barrow 1, even though it is the larger of the two. A century and a half after Bateman, we have finally come to understand something of the site beyond the Barrow 2 cist grave. Although many details remain uncertain or elusive, the complex and lengthy series of events at Barrow 1 is unlikely to be unique in the Peak District; indeed, Barnatt (1996c) has previously noted the high frequency of multi-phase sites in the region. While not exactly a site of 'sky burial', as originally reported, the high vantage point above Longstone Edge where the barrows sit was both a persistent place in the Peak District landscape – witnessing Mesolithic hunter-gatherers, Neolithic and Bronze Age funeral rites, as well as more enigmatic Iron Age and Roman visitations – and a remote one, abandoned for lengthy periods to the owls who clearly found it a happy hunting ground.

ACKNOWLEDGEMENTS

This text draws on interim and draft reports by Peter Reeves and Alex Gibson; and archive reports by the authors whose results are summarised above. The fieldwork was undertaken by Peter Reeves with Sarah Burgess, Catherine Coutts, Jon Hall, Mhairi Hastie and Jane Kenney, and support from Adrian Brown, Claire de Rouffignac and Jan Summerfield. Video recording was undertaken by Sarah Reilly. The co-operation and assistance of Laporte Mining/Minerals and Ken Smith of the Peak District National Park Authority is gratefully acknowledged. Additional advice and assistance during the assessment and analysis stage was received from Polydora Baker, John Barnatt, Tom Cromwell, Judith Dobie, the late Glynis Edwards, Valerie Fryer, Jon Humble, David Peacock, Jamie Quartermaine, David Earle Robinson, Sue Stallibrass and Jim Williams. John Barnatt kindly commented on an earlier draft of this report.

REFERENCES

Abercromby, J. (1912) *A Study of the Bronze Age Pottery of Great Britain and Ireland and its Associated Grave-Goods* (2 vols.). Oxford.

Aerts-Bijma, A.T., Meijer, H.A.J. and van der Plicht, J. (1997) AMS sample handling in Gröningen. *Nuclear Instruments and Methods in Physics Research B* 123: 221–5.

Aerts-Bijma, A.T., van der Plicht, J. and Meijer, H.A.J. (2001) Automatic AMS sample combustion and CO_2 collection. *Radiocarbon* 43(2A): 293–8.

Andrews, P. (1990) *Owls, Caves and Fossils*. London: Natural History Museum and University of Chicago Press.

Andrews, P. and Fernandez-Jalvo, Y. (2012) Bronze Age barrows at Longstone Edge: taphonomy and site formation. *Quaternary International* 275: 43–54.

Armour-Chelu, M. and Andrews, P. (1992) Some effects of bioturbation by earthworms (Oligochaeta) on archaeological sites. *Journal of Archaeological Science* 21: 433–43.

Ashbee, P. and Ashbee, R. (1981) A cairn on Hindlow, Derbyshire: excavations, 1953. *DAJ* 101: 9–41.

Aufderheide, A.C. and Rodriguez-Martin, C. (1998) *The Cambridge Encyclopaedia of Human Palaeopathology*. Cambridge: Cambridge University Press.

Barnatt, J. (1990) *The Henges, Stone Circles and Ring Cairns of the Peak District.* Sheffield: University of Sheffield Press.

Barnatt, J. (1995) Neolithic and Bronze Age radiocarbon dates from the Peak District: a review. *DAJ* 115: 5–19.

Barnatt, J. (1996a) Barrows in the Peak District: a corpus. In J. Barnatt and J. Collis, *Barrows in the Peak District: Recent research*: 171–263. Sheffield: J.R. Collis Publications.

Barnatt, J. (1996b) Barrows in the Peak District: a review and interpretation of extant sites and past excavations. In J. Barnatt and J. Collis, *Barrows in the Peak District: Recent research*: 3–94. Sheffield: J.R. Collis Publications.

Barnatt, J. (1996c) A multiphased barrow at Liffs Low. In J. Barnatt and J. Collis, *Barrows in the Peak District: Recent research*: 95–129. Sheffield: J.R. Collis Publications.

Barnatt, J. (1996d) Excavations at a barrow at Roystone Grange, Ballidon, Derbyshire: 1993. *DAJ* 116: 5–26.

Barnatt, J. (1999) Taming the land: Peak District farming and ritual in the Bronze Age. *DAJ* 119: 19–78.

Barnatt, J. (2000) To each their own: later prehistoric farming communities and their monuments in the Peak. *DAJ* 120: 1–86.

Barnatt, J. and Penny, R. (2004) *The Lead Legacy: The prospects for the Peak District's lead mining heritage*. Peak District National Park Authority.

Barnatt, J. and Smith, K. (1997) *English Heritage Book of the Peak District*. London: Batsford.

Barnatt, J., Bevan, B. and Edmonds, M. (2002) Gardom's Edge: a landscape through time. *Antiquity* 76: 51–6.

Barrett, J. (1980) The pottery of the later Bronze Age in lowland England. *Proceedings of the Prehistoric Society* 46: 297–330.

Bateman, T. (1848) *Vestiges of the Antiquities of Derbyshire and the Sepulchral Usages of its inhabitants, from the Most Remote Ages to the Reformation.* London. John Russell Smith.

Bateman, T. (1861) *Ten Years' Digging in Celtic and Saxon Grave Hills in the Counties of Derby, Stafford and York*. London and Derby.

Beamish M. G. (2009) Island visits: Neolithic and Bronze Age activity on the Trent Valley Floor. Excavations at Egginton and Willington, Derbyshire, 1998-1999. *DAJ* 129: 17–172.

Berry, A.C. and Berry, R.J. (1967) Epigenetic variation in the human cranium. *Journal of Anatomy* 101: 361–79.

Beswick, P. (1995) Gardom's Edge pottery and shale 1995. Unpublished report in Peak District National Park Authority Archive.

Beswick, P. (1999) Gardom's Edge pottery and shale etc. 1998. Unpublished report in Peak District National Park Authority Archive.

Beswick, P. (2003) Gardom's Edge pottery and shale 1999 and 2000. Unpublished report in Peak District National Park Authority Archive.

Birss, R.S. (1985) The coarse pottery. In J. Dool *et al.*, Roman Derby: excavations 1968-1983. *DAJ* 105: 259–67.

Brassington, M. (1971) A Trajanic kiln complex near Little Chester, Derby, 1968. *Antiquaries Journal* 51: 36–69.

Brassington, M. (1980) Derby Racecourse kiln excavations 1972-3. *Antiquaries Journal* 60: 8–47.

Bronk Ramsey, C. (1995) Radiocarbon calibration and analysis of stratigraphy. *Radiocarbon* 36: 425–30.

Bronk Ramsey, C. (1998) Probability and dating. *Radiocarbon* 40: 461–74.

Bronk Ramsey, C. (2001) Development of the Radiocarbon Program OxCal. *Radiocarbon* 43 (2A): 355–63.

Bronk Ramsey, C. (2009) Bayesian analysis of radiocarbon dates. *Radiocarbon* 51: 337–60.

Bronk Ramsey, C., Higham, T.F.G., Bowles, A. and Hedges, R.E.M. (2004a) Improvements to the pretreatment of bone at Oxford. *Radiocarbon* 46: 155–63.

Bronk Ramsey, C., Ditchfield, P. and Humm, M. (2004b) Using a Gas ion source for radiocarbon AMS and GC-AMS. *Radiocarbon* 46: 25–32.

Brothwell, D.R. (1981) *Digging Up Bones* (3rd edn.). London: Oxford University Press/British Museum (Natural History).

Buck, C.E., Cavanagh, W.G. and Litton, C.D. (1996) *Bayesian Approach to Interpreting Archaeological Data*. Chichester: Wiley.

Case, H.J. (1977) The Beaker culture in Britain and Ireland. In R.J. Mercer (ed.) *Beakers in Britain and Europe*: 71–101. (British Archaeological Reports, International Series S26). Oxford.

Case, H.J. (1993) Beakers: deconstruction and after. *Proceedings of the Prehistoric Society* 59: 241–68.

Case, H.J. (2001) The Beaker Culture in Britain and Ireland: groups, European contacts and chronology. In F. Nicolis (ed.) *Bell Beakers Today: Pottery, people, culture, symbols in prehistoric Europe. Proceedings of the International Colloquium at Riva del Garda 11–16 May 1998*: 361–77. Trento: Servicio Beni Culturali, Provincia Autonoma di Trento.

Chadwick, A. and Pollard, J. (2005). A ring cairn and Beaker burial at Gray Hill, Llanfairdiscoed, Monmouthshire. *Past* 50: 11–14.

Chapman, A. (2007). A Bronze Age barrow cemetery and later boundaries, pit alignments and enclosures at Gayhurst Quarry, Newport Pagnell, Buckinghamshire. *Records of Buckinghamshire* 47: 81–211.

Chisholm, B.S., Nelson, D.E. and Schwarcz, H.P. (1982) Stable carbon isotope ratios as a measure of marine versus terrestrial protein in ancient diets. *Science* 216: 1131–2.

Chitty, D. (1938) A laboratory study of pellet formation in the short-eared owl. *Proceedings of the Zoological Society of London* 1938: 267–87.

Clarke, D.L. (1970) *Beaker Pottery in Great Britain and Ireland.* Cambridge: Cambridge University Press.

Collis, J. (1983) *Wigber Low, Derbyshire: a Bronze Age and Anglian burial site in the White Peak.* Sheffield.

Collis, J. (1996) *A Bronze Age barrow in Hognaston, Derbyshire*. In J. Barnatt and J. Collis, *Barrows in the Peak District: recent research*: 137–70. Sheffield: J.R. Collis Publications.

Cootes, K. (2012) *Ceramic Production, Distribution and Prehistoric Society in the Peak District.* PhD Thesis, University of Sheffield.

Dobney, K., Jaques, D., and Irving, B. (1996) Of butchers and breeds. *Lincoln Archaeological Studies* 5.

Dool, J., Wheeler, H., *et al.* (1985) Roman Derby: excavations 1968–1983. *DAJ* 105.

Evans, J. (1897) *The Ancient Stone Implements, Weapons and Ornaments of Great Britain*. (2nd edn.). London: Longmans, Green and Co.

Evans, J.G. (1972) *Land Snails in Archaeology*. London: Seminar Press.

Fairbairn, A.S. (2000) On the spread of crops across Neolithic Britain, with special reference to southern England. In A.S. Fairbairn (ed.) *Plants in Neolithic Britain and Beyond*: 85–90. (Neolithic Studies Group Seminar Papers 5). Oxford.

Finnegan, M. (1978) Non-metric variation of the infracranial skeleton. *Journal of Anatomy* 125: 23–37.

Fulford M.G. and Huddleston K. (1991) *The Current State of Romano-British Pottery Studies*. English Heritage Occasional Paper 1.

Fuller, B.T., Fuller, J.L., Sage, N.E., Harris, D.A., O'Connell, T.C. and Hedges, R.E.M. (2004) Nitrogen balance and $\delta^{15}N$: why you're not what you eat during pregnancy. *Rapid Communications in Mass Spectrometry* 18: 2889–96.

Garton, D. (1991) Neolithic settlement in the Peak District: perspective and prospects. In R. Hodges and K. Smith (eds.) *Recent Developments in the Archaeology of the Peak District*: 3-21. Sheffield: J.R. Collis Publications.

Garton, D and Beswick, P. (1983) The survey and excavation of a Neolithic settlement area at Mount Pleasant, Kenslow, 1980–1983. *DAJ* 103: 7–40.

Gauch, H.G. (1982) *Multivariate Analysis in Community Ecology*. Cambridge: Cambridge University Press.

Gibson, A. (1995) First impressions: a review of Peterborough Ware in Wales. In I. Kinnes and G. Varndell (eds.) *'Unbaked Urns of Rudley Shape': Essays on British and Irish Pottery for Ian Longworth*: 23–39. (Oxbow Monograph 55). Oxford.

Gibson, A. (2007) A Beaker veneer? Some evidence from the burial record. In M. Larsson and M. Parker Pearson (eds.) *From Stonehenge to the Baltic. Living with cultural diversity in the third millennium BC*: 47–64. (British Archaeological Reports, International Series 1692). Oxford.

Gibson, A. (2008) Gypsey Race Neolithic Round Barrows. Unpublished report for English Heritage.

Gillam, J.P. (1939) Romano-British Derbyshire ware. *Antiquaries Journal* 19: 429–37.

Gleed-Owen, C.P. (1998) *Quaternary Herpetofaunas of the British Isles: Taxonomic descriptions, palaeoenvironmental reconstructions and biostratigraphic implications*. Unpublished PhD thesis, Coventry University.

Gleed-Owen, C.P. (1999) The palaeoclimatic and biostratigraphic significance of herpetofaunal remains from the British Quaternary. In P. Andrews and P. Banham (eds.) *Late Cenozoic Environments and Hominid Evolution: A tribute to Bill Bishop*: 201–215. London: Geological Society.

Gleed-Owen, C.P. (2003a) Holocene herpetofaunas from Scania and Halland, southern Sweden. *Quaternary Newsletter*.

Gleed-Owen, C.P. (2003b) Amphibian and reptile remains. In C. Evans (ed.) *Power and Island Communities: Excavations at the Wardy Hill ringwork, Coveney, Ely*. East Anglian Archaeology Report 103.

Glue, D.E. (1977) Feeding ecology of the short-eared owl in Britain and Ireland. *Bird Study* 24: 70–8.

Goodman, A.H. and Song, R-H. (1999) Sources of variation in estimated ages at formation of linear enamel hypoplasias. In R.J. Hoppa and C.M. Fitzgerald (eds.) *Human Growth in the Past: Studies from bones and* teeth: 210–240. Cambridge: Cambridge University Press.

Grayson, D.K. (1991) The small mammals of Gatecliff Shelter: did people make a difference? *Illinois State Museum Scientific Papers* 23: 99–109.

Green, H.S. (1980) *The Flint Arrowheads of the British Isles*. (British Archaeological Reports, British Series 75 i–ii). Oxford.

Grigson, C. (1982) Porridge and pannage: pig husbandry in Neolithic England. In S. Limbrey and M. Bell (eds.) *Archaeological Aspects of Woodland Ecology*: 297-314. (British Archaeological Reports, International Series 146). Oxford.

Guilbert, G. and Vince, A. (1996) Petrology of some prehistoric pottery from Mam Tor. *DAJ* 116: 49–59.

Gustafson, G. and Koch, G. (1974) Age estimation up to 16 years of age based on dental development. *Odontologisk Revy* 25: 297–306.

Harcourt, R.A. (1974) The dog in prehistoric and early historic Britain. *Journal of Archaeological Science* 1: 151–75.

Hart, C.R. (1981) *The North Derbyshire Archaeological Survey to AD 1500*. Chesterfield. The North Derbyshire Archaeological Trust.

Hedges, R.E.M., Law, I.A., Bronk Ramsey, C. and Housley, R.A. (1989) The Oxford Accelerator Mass Spectrometry facility: technical developments in routine dating. *Archaeometry* 31: 99–113.

Hind, D. (2004) Picking up the trail: people, landscapes and technology in the Peak District of Derbyshire during the 5th and 4th millennia BC. In A. Chadwick (ed.) *Stories from the Landscape: Archaeologies of inhabitation*: 130–76. (British Archaeological Reports, International Series 1238). Oxford.

Hobson, K.A., Alisauskas, R.T. and Clark, R.G. (1993) Stable nitrogen isotope enrichment in avian tissues due to fasting and nutritional stress: implications for isotopic analyses of diet. *Condor* 95: 388–94.

Howarth, E. (1899) *Catalogue of the Bateman Collection of Antiquities in the Sheffield Public Museum*. London: Dulau & Co.

Hunt, C. (1996) Plant macrofossils. In J. Barnatt and J. Collis (eds.) *Barrows in the Peak District: Recent research*: 158–60. Sheffield: J.R. Collis Publications.

Jones, G. (2000) Evaluating the importance of cultivation and collecting in Neolithic Britain. In A.S. Fairbairn (ed.) *Plants in Neolithic Britain and Beyond*: 79–83. (Neolithic Studies Group Seminar Papers 5). Oxford.

Jones, H.E. (1997) *The Region of Derbyshire and North Staffordshire from* c. *AD 350–AD 700: An analysis of Romano-British and Anglian barrow use in the White Peak*. Unpublished PhD thesis, University of Nottingham.

Kay, S.O. (1962) The Romano-British pottery kilns at Hazelwood and Holbrook, Derbyshire. *DAJ* 82: 21–42.

Kerney, M.P. and Cameron, R.A.D. (1979) *A Field Guide to the Land Snails of Britain and North-West Europe*. London: Collins.

Knight, D. (2002) A regional ceramic sequence: pottery of the first millennium BC between the Humber and the Nene. In A. Woodward and J.D. Hill (eds.) *Prehistoric Britain: The ceramic basis*: 119–142. (Prehistoric Ceramics Research Group Occasional Publication 3). Oxford.

Knight, D. and Beswick, P. (2000) A possible Beaker burial at Rampton, Nottinghamshire. *Transactions of the Thoroton Society of Nottinghamshire* 104: 15–20.

Lanting J.N. and van der Waals J.D. (1972) British Beakers as seen from the continent: a review article. *Helinium* 12: 20–46.

Lanting, J.N., Aerts-Bijma, A.T. and van der Plicht, J. (2001) Dating of cremated bones. *Radiocarbon* 43(2A): 249–54.

Last, J. (2007) Covering old ground: barrows as closures. In J. Last (ed.) *Beyond The Grave: New perspectives on barrows*: 160–80. Oxford: Oxbow Books.

Leary R.S. (2003) The Romano-British pottery from the kilns at Lumb Brook, Hazelwood, Derbyshire. *DAJ* 123: 71–110.

Levitan, B. and Serjeantson, D. (1999) Animal bone. In A. Barclay and C. Halpin (eds.) *Excavations at Barrow Hills, Radley, Oxfordshire. Volume 1: the Neolithic and Bronze Age monument complex*: 236–241. (Thames Valley Landscapes Volume 11). Oxford.

Lyman, R.L. (1994) *Vertebrate Taphonomy*. Cambridge: Cambridge University Press.

McGuire, S. with Smith, K. (2008) *Arbor Low and Gib Hill Conservation Plan 2008*. Peak District National Park Authority.

Manby, T.G. (1957) Food Vessels of the Peak District. *DAJ* 77: 1–29.

Manby, T.G. (1965) The excavation of Green Low chambered tomb. *DAJ* 85: 1–24.

Manby, T.G. (1988) The Neolithic period in Eastern Yorkshire. In T.G. Manby (ed.) *Archaeology in Eastern Yorkshire*: 35–88. Sheffield.

Marsden, B.M. (1970) The excavation of the Bee Low round cairn, Youlgreave. *Antiquaries Journal* 50: 186–215.

Marsden, B.M. (1982) The excavation of the Roystone Grange round cairn (Ballidon 12), Ballidon, Derbyshire. *DAJ* 102: 23–32.

Marsden, B.M. (1999) *The Early Barrow Diggers*. Stroud: Tempus.

Masters, P.M. (1987) Preferential preservation of non-collagenous protein during bone diagenesis: implications for chronometric and stable isotope measurements. *Geochimica et Cosmochimica Acta* 51: 3209–14.

May, J. (1971) A Neolithic site at Astonhill, near Minninglow, Derbyshire. *DAJ* 91: 31–6.

Mays, S. (1998) *The Archaeology of Human Bones*. London: Routledge/English Heritage.

Mikkola, H. (1983) *Owls of Europe*. Calton: T. and A.D. Poyser.

Moffett, L. (1991) Pignut tubers from a Bronze Age cremation at Barrow Hills, Oxfordshire, and the importance of vegetable tubers in the prehistoric period. *Journal of Archaeological Science* 18: 187–91.

Moffett, L. (1999) The prehistoric use of plant resources. In A. Barclay and C. Halpin (eds.) *Excavations at Barrow Hills, Radley, Oxfordshire. Volume I. The Neolithic and Bronze Age monument complex*: 243–7. (Thames Valley Landscapes 11). Oxford.

Montgomery, W.I. (1975) On the relationship between sub-fossil and recent British water voles. *Mammal Review* 5: 12–19.

Montgomery, J., Cooper, R.E. and Evans, J.A. (2007) Foragers, farmers or foreigners? An assessment of dietary strontium isotope variations in Middle Neolithic and Early Bronze Age East Yorkshire. In M. Larsson, and M. Parker Pearson (eds.) *From Stonehenge to the Baltic: Living with cultural diversity in the third millenium BC*: 65–75. (British Archaeological Reports, International Series 1692). Oxford.

Mook, W.G. (1986) Business meeting: recommendations/resolutions adopted by the twelfth international radiocarbon conference. *Radiocarbon* 28: 799.

Myers, A. (2006) The Mesolithic. In N. Cooper (ed.) *The Archaeology of the East Midlands: An archaeological resource assessment and research agenda*: 51-68. Leicester.

Needham, S. (1996) Chronology and periodisation in the British Bronze Age. *Acta Archaeologica* 67: 121–40.

Needham, S. (2005) Transforming Beaker Cultures in North-West Europe: processes of fusion and fission. *Proceedings of the Prehistoric Society* 71: 171–217.

O'Connell, T.C. and Hedges, R.E.M. (1999) Investigations into the effects of diet on modern human hair isotopic values. *American Journal of Physical Anthropology* 108: 409–25.

O'Neill, R. (2008) Archaeological evaluation at High Rake, Longstone Edge, Derbyshire, July 2008. ARCUS Project Report 947.2(1).

Orton, C. (1980) Introduction to the pottery reports. In D.M. Jones, *Excavations at Billingsgate Buildings 'Triangle', Lower Thames Street 1974*. (Transactions of the London and Middlesex Archaeological Society Special Paper 4).

Orton, C., Tyers, P. and Vince, A. (1993) *Pottery in Archaeology.* Cambridge: Cambridge University Press.

Parker Pearson, M., Chamberlain, A., Jay, M., Marshall, P., Pollard, J., Richards, C., Thomas, J., Tilley, C. and Welham, K. (2009) Who was buried at Stonehenge? *Antiquity* 83: 23–39.

Peacock, D.P.S. (1977) *Pottery and Early Commerce.* London: Seminar Press.

Perizonius, W.R.K. (1984) Closing and non-closing sutures in 256 crania of known age and sex from Amsterdam (AD 1883–1909). *Journal of Human Evolution* 13: 201–6.

Pierpoint, S. (1980) *Social Patterns in Yorkshire Prehistory 3500–750 BC.* (British Archaeological Reports, British Series 74). Oxford.

Piggott, S. (1954) *The Neolithic Cultures of the British Isles*. Cambridge: Cambridge University Press.

Prehistoric Ceramics Research Group (1997) *The Study of Later Prehistoric Pottery: Guidelines for analysis and publication.* (Prehistoric Ceramics Research Group Occasional Publication 3). Oxford.

Radley, J. (1966) Glebe Low, Great Longstone. *DAJ* 86: 54–69.

Reimer, P.J., Baillie, M.G.L., Bard, E., Bayliss, A., Beck, J.W., Bertrand, C., Blackwell, P.G., Buck, C.E., Burr, G., Cutler, K.B., Damon, P.E., Edwards, R.L., Fairbanks, R.G., Friedrich, M., Guilderson, T.P., Hughen, K.A., Kromer, B., McCormac, F.G., Manning, S., Bronk Ramsey, C., Reimer, R.W., Remmele, S., Southon, J.R., Stuiver, M., Talamo, S., Taylor, F.W., van der Plicht, J. and Weyhenmeyer, C.E. (2004) IntCal04 terrestrial radiocarbon age calibration, 0–26 Cal Kyr BP. *Radiocarbon* 46: 1029–58.

Richards, M.P., Mays, S. and Fuller, B.T. (2002) Stable carbon and nitrogen values of bone and teeth reflect weaning age at the medieval Wharram Percy site, Yorkshire, UK. *American Journal of Physical Anthropology* 119: 205–10.

Richmond, A. (1999) *Preferred Economies: The nature of the subsistence base throughout mainland Britain during prehistory.* (British Archaeological Reports, British Series 290). Oxford.

Riley, D.N. (1966) An Early Bronze Age cairn on Harland Edge, Beeley Moor, Derbyshire. *DAJ* 86: 31–53.

Robinson, M. (1988) The significance of the tubers of *Arrhenatherum elatius* (L.) Beauv. from site 4, Cremation 15/11. In G. Lambrick (ed.) *The Rollright Stones: Megaliths, monuments and settlements in the prehistoric landscape*: 102. (English Heritage Archaeological Report 6). London.

Robinson, M. (2000) Further considerations of Neolithic charred cereals, fruit and nuts. In A.S. Fairbairn (ed.) *Plants in Neolithic Britain and Beyond*: 85–90. (Neolithic Studies Group Seminar Papers 5). Oxford.

Schoeninger, M.J. and DeNiro M.J. (1984) Nitrogen and carbon isotopic composition of bone collagen from marine and terrestrial animals. *Geochimica et Cosmochimica Acta* 48: 625–39.

Schmorl, G. and Junghanns, H. (1971) *The Human Spine in Health and Disease* (2nd American edn., translated by E.F. Beseman). New York: Grune and Stratton.

Schwarcz, H.P. and Schoeninger M.J. (1991) Stable isotopic analyses in human nutritional ecology. *Yearbook of Physical Anthropology* 34: 283–321.

Scott, E.M. (2003) The third international radiocarbon intercomparison (TIRI) and the fourth international radiocarbon intercomparison (FIRI) 1990–2002: results, analyses, and conclusions. *Radiocarbon* 45: 135–408.

Serjeantson, D. (2007) Intensification of animal husbandry in the late Bronze Age? The contribution of sheep and pigs. In C. Haselgrove and R. Pope (eds.) *The Earlier Iron Age in Britain and the Near Continent*: 80–93. Oxford: Oxbow Books.

Silver, I.A. (1969) The ageing of domestic animals. In D. Brothwell, E. Higgs and G. Clark (eds.) *Science in Archaeology* (2nd edn.): 283–302. London: Thames and Hudson.

Simpson, D.D.A. (1968) Food Vessels: associations and chronology. In J.M. Coles and D.D.A. Simpson (eds.) *Studies in Ancient Europe*: 197–211. Leicester: Leicester University Press.

Šoberi, L. and Evershed, R.P. (2014) *Organic Residue Analysis of the Longstone Edge Barrow Pottery.* Unpublished report. Organic Geochemistry Unit, School of Chemisty, Bristol University.

Stallibrass, S. (1991) *The Animal Bones from a Bronze Age Cairn at Hardendale Nab, Cumbria, 1986.* Ancient Monuments Laboratory Report 89/91.

Stubbs, F.J. (1926) The water vole in relation to prehistoric man. *The Naturalist* 833: 141–4; 177–80.

Stuiver, M. and Kra, R.S. (1986) Editorial comment. *Radiocarbon* 28(2B): ii.

Stuiver, M. and Polach, H.J. (1977) Discussion: reporting of ^{14}C data. *Radiocarbon* 19: 355–63.

Stuiver, M. and Reimer, P.J. (1986) A computer program for radiocarbon age calculation. *Radiocarbon* 28: 1022–30.

Stuiver, M. and Reimer, P.J. (1993) Extended ^{14}C data base and revised CALIB 3.0 ^{14}C age calibration program. *Radiocarbon* 35: 215–30.

Tanner, J.M. (1989) *Foetus Into Man* (2nd edn.). Ware: Castlemead.

Taylor, D., Griffiths, H., Pedley, H. and Prince, I. (1994) Radiocarbon-dated Holocence pollen and ostracod sequences from barrage tufa-dammed fluvial systems in the White Peak, Derbyshire, UK. *The Holocene* 4 (4): 356–64.

Tomber, R. and Dore, J. (1998) *The National Roman Fabric Reference Collection: A handbook.* (MoLAS Monograph 2). London.

Toynbee, J. (1971) *Death and Burial in the Roman World.* London: Thames and Hudson.

Trotter, M. and Gleser, G.C. (1952) Estimation of stature from long-bones of american whites and negroes. *American Journal of Physical Anthropology* 10: 463–514.

Trotter, M. and Gleser, G.C. (1958) A re-evaluation of estimation of stature based on measurements of stature taken during life and long-bones after death. *American Journal of Physical Anthropology* 16: 79–123.

Trotter, M. and Hixon, B.B. (1974) Sequential changes in weight, density and percentage ash weight of human skeletons from an early foetal period through to old age. *Anatomical Record* 179: 1–18.

Tuross, N., Fogel, M.L. and Hare, P.E. (1988) Variability in the preservation of the isotopic composition of collagen from fossil bone. *Geochimica Cosmochimica Acta* 52: 929-35.

van der Plicht, J., Wijma, S., Aerts, A.T., Pertuisot, M.H. and Meijer, H.A.J. (2000) Status report: the Gröningen AMS facility. *Nuclear Instruments and Methods in Physics Research B* 172: 58–65.

Varley, R.A. (1991) Lost finds from Blake Low, Longstone, Derbyshire. *DAJ* 111: 31–9.

Villa, P. and Mahieu, E. (1991) Breakage patterns of human long bones. *Journal of Human Evolution* 21: 27–48.

Wainwright, G.J. (1972) The excavation of a Neolithic settlement on Broome Heath, Dichingham, Norfolk. *Proceedings of the Prehistoric Society* 38: 1–97.

Ward, G.K. and Wilson, S.R. (1978) Procedures for comparing and combining radiocarbon age determinations: a critique. *Archaeometry* 20: 19–31.

Wenham, L.F. (1968) *The Romano-British Cemetery at Trentholme Drive, York.* London: H.M.S.O.

Whittle, A., Wysocki, M., Richards, M., Rouse, A., Walker, E. and Zienkiewicz, L. (1998) Parc le Breos Cwm transepted long cairn, Gower, West Glamorgan: date, contents and context. *Proceedings of the Prehistoric Society* 64: 139–82.

Whittle, A., Barclay, A., McFadyen, L., Benson, D. and Galer, D. (2007) Place and time: building remembrance. In D. Benson and A. Whittle (eds.) *Building Memories: The Neolithic Cotswold long barrow at Ascott-under-Wychwood, Oxfordshire*. Oxford: Oxbow Books.

Whyte, T.R. (1991) Small animal remains in archaeological features. *Illinois State Museum Scientific Papers* 23: 163–76.

Williams, H. (1998) The ancient monument in Romano-British ritual practices. In C. Forcey, J. Hawthorne and R. Witcher (eds.), *TRAC 97: Proceedings of the Seventh Annual Theoretical Roman Archaeology Conference:* 71–87. Oxford: Oxbow Books.

Williams, J. and Howard-Davis, C. (2004) Excavations on a Bronze Age cairn at Hardendale Nab, Shap, Cumbria. *Archaeological Journal* 161: 11–53.

Woodward, A. (2000) *British Barrows: A matter of life and death.* Stroud: Tempus.

The Society gratefully acknowledges the financial support of English Heritage in the publication of this paper.