Archive Report

Early and Middle Bronze Age burnt mounds at Hugglescote, Coalville

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Excavation of four early and middle Bronze Age burnt mounds at Hugglescote, Coalville

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Summary

Oxford Archaeology excavated four burnt mounds beside a minor tributary stream of the River Sence at Hugglescote, Coalville. Radiocarbon dating indicated that the earliest mound was probably in use during the late Neolithic/early Bronze Age (and possibly earlier in the late Neolithic/early Bronze Age) while the other mounds were considerably later, dating from the middle Bronze Age. Troughs of various forms in varying numbers were found below the mounds. The mounds and troughs were associated with few finds. Micromorphological analysis of the soils preserved below the mounds suggest that little change in the soils had occurred between the late Neolithic/early Bronze Age and the middle Bronze Age.

Acknowledgements

OA would like to thank Miller homes (East Midlands) Ltd for funding the excavation and post-excavation programme. Thanks are due also to Simon Mortimer of CgMs Consulting, who prepared the desk-based assessment and mitigation strategy and acted as consultant throughout the project, and to Richard Clark, who monitored the project on behalf of Leicester County Council. The fieldwork was managed by Richard Brown and supervised on site by Mariusz Gorniak. The post-excavation programme was managed by Chris Hayden, and the illustrations were prepared by Charles Rousseaux.

1 INTRODUCTION

1.1.1 During 2014 and 2015, Oxford Archaeology excavated a group of four burnt mounds in the valley of a minor tributary stream of the River Sence at Hugglescote, Coalville, North West Leicestershire. The mounds were initially identified by a combination of magnetometer survey and evaluation trenching. They were arranged in two pairs, *c* 250m apart, and two excavation areas were opened up in order to investigate them. The investigation was occasioned by a plan to develop the area for residential housing, and was commissioned by CgMs Consulting on behalf of Miller Homes (East Midlands) Ltd as a result of discussions with Richard Clark, Principal Planning Archaeologist for Leicestershire County Council. The excavation was undertaken in accordance with a mitigation strategy that was prepared by Simon Mortimer of CgMs Consulting and agreed with Richard Clark. The work was undertaken between July and September 2014, with a brief additional phase of work during March 2015 when a small extension was added to the western end of Excavation Area 1 in order to further investigate the troughs beneath Burnt Mound 1, which extended beyond the limits of the original trench.

1.2 Location, topography and geology

1.2.1 The site was located at the western edge of Hugglescote, a village at the southern limit of Coalville, *c* 18km north-west of Leicester, at NGR SK 418 135 (Fig. 1). The development area was irregular in plan and was situated to the rear of houses that fronted onto Standard Hill and Highfield Street, as well as extending into the fields to the west. It comprised three large fields with a total area of 19.3ha. The southern Field 1 was under grass, the northern Field 2 was used for arable cultivation, and the eastern Field 3 was overgrown with rough grass, shrubs and trees. Field 3 was separated from the other two by a small brook that rises near Coalville and flows southward through the site to a confluence with the River Sence near Ibstock. The development area encompassed both sides of the valley associated with the brook. It sloped down from high points of 159m OD at the north-western tip of Field 2 and at the junction of Standard Hill and Highfield Street to the valley floor at c 133m OD. A tributary stream rises to the north-west of the site and flows across Field 1 to join the brook at the south-western edge of the site.

1.2.2 The British Geological Survey records the geology west of the brook as comprising Tarporley siltstone and that to the east as mudstone of the Radcliffe member, with alluvium within the base of the valley.

1.3 Archaeological background

1.3.1 The initial phase of archaeological investigation comprised a desk-based assessment prepared by CgMs Consulting (CgMs 2011) following which Northamptonshire Archaeology undertook a programme of magnetometer survey and fieldwalking (Northamptonshire Archaeology 2011). The latter surveys were restricted to Fields 1 and 2, since Field 3 was densely overgrown and therefore inaccessible; the same restriction applied to the subsequent phase of evaluation trenching, which was undertaken by OA (2011). A trench evaluation of Field 3 was eventually undertaken concurrently with the main phase of excavation, but the only features identified were post-medieval field boundary ditches (OA 2014).

1.3.2 The magnetometer survey identified anomalies indicative of areas of burning located at the northern edge of Field 1 and near the north-eastern corner of the Field 2. Polygonal anomalies in Field 1 were identified as either enclosures or natural features, and other linear features were thought to represent field boundaries and a trackway. The fieldwalking survey recovered only two flint flakes and a small quantity of medieval and more recent material that probably derived from manuring.

1.3.3 The evaluation of Fields 1 and 2 comprised a total of 26 trenches, each measuring 50m long, and confirmed that most of the polygonal and linear anomalies were natural in origin. The areas of burning were demonstrated to be burnt mounds but produced no artefactual evidence. A sample taken from a pit associated with the mound in Field 2 produced a radiocarbon date of 2430-2060 cal BC (95.4%), suggesting use of the mound in the late Neolithic/early Bronze Age. The evaluation of Field 3 was intended to comprise 26 trenches, but in the event only the south-eastern half of the field was accessible and so only 11 trenches were excavated. The only features identified in this area were post-medieval field boundary ditches.

1.3.4 In addition to these investigations, the desk-based assessment established that there are a number of entries in Leicestershire Historic Environment Record relating to material recorded as being recovered from within the proposed development area. These comprise the chance find of a Palaeolithic hand-axe, Mesolithic material and also medieval/post-medieval pottery scatters identified by fieldwalking, as well as a record from the Finds Liaison Officer of the Portable Antiquities Scheme relating to the discovery of Roman coins within Field 1.

1.4 Fieldwork methodology

1.4.1 Two areas, targeted on the burnt mounds, were selected for excavation. Excavation Area 1 lay 55m north-west of the brook and comprised a roughly triangular area situated at the northern edge of Field 1, encompassing an area of 0.35ha. Excavation Area 2 lay at the eastern edge of Field 2, beside the western bank of the brook, and had an area of 0.38ha. The topsoil and subsoil were stripped using a mechanical excavator with a flat-bladed bucket working under close archaeological supervision. The archaeological features thus exposed were digitally mapped using GPS and then excavated by hand. Each of the burnt mounds was initially characterised by the excavation of two hand-dug slots at right angles to each other in order to achieve longitudinal and transverse profiles through the deposits. The remainder of the mound was then excavated, again by hand, in order to expose any features beneath. A single trough was exposed beneath Burnt Mound 1, extending beyond the edge of the excavation area. In order to enable the feature to be fully excavated, a small extension was added to the western edge of the excavation area. This exposed further troughs, as a result of which a second phase of extension was excavated in order to establish the full extent of the group of features. All discrete features were half-sectioned, and the troughs beneath the mounds were subsequently fully excavated, with the exception of the troughs in the extension to Excavation Area 1, where only sufficient excavation to characterise the features and establish their stratigraphic relationships was undertaken.

2 ARCHAEOLOGICAL DESCRIPTION

2.1 Excavation Area 1 (Figs 2-6)

2.1.1 Two burnt mounds were uncovered in Excavation Area 1, although neither was completely exposed since both continued beyond the limits of the trench (Fig. 2). Burnt Mound 1 was situated at the western end of the excavation area and Burnt Mound 2 lay against the southern baulk approximately half way along the trench. Both mounds covered subrectangular troughs and other features that were associated with their use.

2.1.2 A few other features were identified that had no direct stratigraphic relationship with the mounds. A substantial posthole (154), 0.7m deep with a distinct postpipe and stone packing, lay close to Mound 2. Four features that were interpreted as tree-throw holes (140, 144, 146 and 151) were situated a short distance west of Mound 2. Two shallow pits (110 and 118) in the north-eastern part of the trench appeared to have each been dug specifically in order to bury large stones. The stones measured 0.42m and 0.65m long and, although roughly rectangular, were not obviously shaped. There was no evidence to indicate whether they were prehistoric or of more recent origin.

2.1.3 A ditch extended across the central part of the excavation area on a N-S alignment. A stone-lined drain had been inserted into the base of the ditch, which corresponded with the alignment of a field boundary that appears on the 1st Edition Ordnance Survey map of 1884 and on all subsequent maps up to 1975. The boundary is depicted on the 1884 map as forming part of an orthogonal arrangement of fields that is characteristic of Enclosure boundaries and may have been established when the parish of Ibstock was enclosed in 1774. Furrows extended on a similar alignment and are likely to date from pre-enclosure ridge and furrow cultivation.

Burnt Mound 1

2.1.4 Burnt Mound 1 was the most extensive of the four mounds. The part that was exposed within the excavation area measured *c* 30 x 30m and the feature extended beyond the western and southern edges of the excavation. Sealed beneath it were a group of four intercutting troughs, a possible hearth, a posthole alignment and an isolated pit or tree-throw hole.

Features beneath the mound (Figs 3-5)

2.1.5 The burnt mound sealed a buried soil of firm, brown clay silt, 0.27m thick (186), and an associated subsoil of hard reddish brown clay silt, 0.2m thick (195). A thin, intermittent layer of grey silty material on the surface of layer 186 was interpreted as trample, probably associated with the activities related to the burnt mound. The troughs and other features beneath the mound were cut into the buried soil.

2.1.6 The earliest of the group of troughs was feature 301, which comprised a rectangular, flat-based trough that lay on an E-W alignment and measured 1.4m wide and at least 1.6m long (Fig. 4, section 53). Its full original length could not be established as the ends had been truncated by troughs 299 and 309. Trough 301 was the shallowest of the troughs, measuring only 0.12m deep, and was filled by a single deposit of fire-cracked stone mixed with black, charcoal-rich soil (302).

2.1.7 Trough 299, which cut the eastern end of trough 301, was the most elaborate of the group, comprising a subrectangular pit with a posthole at each corner (Fig. 4, section 53 and Fig. 5). The posthole at the northern corner appeared to be integral to the cut of the trough, while the posthole at the eastern corner lay slightly outside the trough. The postholes at the south-eastern end were both situated slightly outside the trough and were connected to it by slots that had been deliberately cut into the underlying natural. The trough measured 3.4m by 1.5m, was 0.25m deep, and had vertical sides with a more gently sloping north-western end. The south-eastern end was vertical at the bottom, but the upper part sloped gently outward, reaching the surface in line with the associated postholes. A very thin layer of light yellowish brown sand (327) lay on the base of the south-eastern half of the feature and was overlain by a layer of black, charcoal-rich silty clay and fire-cracked stone (328) that was 0.04-0.08m thick. A sample of charcoal from this deposit returned a radiocarbon date of 1420-1210 cal BC (95.4%). The main fill of the trough (300) was very similar to fill 328, from which it was distinguished by virtue of containing a greater component of burnt stone, and was identical in composition to the overlying burnt mound.

2.1.8 The western end of trough 301 was cut by trough 309. This feature lay on a similar NNW-EES alignment to trough 299, although it is uncertain whether this indicates that the two were in use concurrently. Only the south-eastern part of the feature survived, the north-western end having been truncated by trough 311/332. It was 1.04m wide and 0.2m deep and contained a single fill of fire-cracked stone and black soil (310).

2.1.9 Trough 311/332 was the largest of the group, measuring 4.4m x 2.0m and 0.42m deep. It was aligned E-W, cutting laterally across the north-western end of trough 309. The sides were sloped rather than vertical but as with the other troughs the base was flat. A deposit of brown clay (319) had slipped down the southern side but most of the trough was filled by a deposit of fired-cracked stone and black soil (312) that was similar to the fills of the other troughs.

2.1.10 Trough 311/332 was cut by a large feature (333) whose form and function were uncertain since it extended beyond the north-western edge of the extension to the excavation area. It appeared to be subrectangular in plan and may have been a further trough, although it was rather larger than the other troughs, measuring 3.8m wide and at least 3.8m long, and its fills were of a rather different character. The feature was 0.45m deep, with a layer of dark grey clay (335) at the base that was 0.1m thick and contained flecks of charcoal and fragments of organic material. A middle fill of almost stone-free, bluish-grey clay (336) was overlain by an upper fill of stonier clay (337). The relationship of this feature with the burnt mound was uncertain.

2.1.11 An amorphous spread of burnt material that extended to the south of the troughs probably represented material at the base of the burnt mound that lay in a slight hollow in the underlying natural.

2.1.12 This was the only mound that was associated with evidence for a hearth, although the large quantities of burnt stone that formed the mounds clearly indicated that fires of some sort were an essential element of the activities associated with all four monuments. The possible hearth was only observed in section in the slot that was initially excavated through the mound. The hearth was represented by an area of *in situ* burning (187) on the surface of buried soil 186, situated a little over 1m east of trough 299. It comprised a thin layer of

charcoal beneath which the surface of the underlying part of layer 186 was discoloured to a reddish hue.

2.1.13 The posthole alignment was situated beneath the eastern part of the mound, 6.8m from the group of troughs. It extended for 4.5m on a WNW-ESE alignment and comprised nine closely-spaced postholes that penetrated the natural to depths that ranged between 0.04-0.34m. Their fills comprised black soil and fire-cracked stone identical to the overlying mound material. None of the postholes yielded any artefactual material.

2.1.14 Pit 268 was situated at the eastern edge of the mound. It was a shallow, sub-circular feature that measured 0.92 x 0.82m and 0.26m deep. Charcoal flecking was noted in the lower part of its fill, although there was insufficient evidence to be certain whether the feature was a deliberately dug pit or a tree-throw hole.

2.1.15 A possible gully (188) was recorded when the initial slot was excavated through the mound, but could not subsequently be identified after the rest of the mound material was removed. The feature appeared to be below the buried soil beneath the mound and may have been no more than a natural undulation in the surface of the natural.

The mound

2.1.16 The mound itself was composed of heat-shattered stones up to *c* 0.1m across, mixed with black, charcoal-rich soil. The stones present included a range of types, consisting of heat-shattered quartzite and quartzitic sandstone pebbles as well as fragments of reddened siltstone. The primary mound (185=198) measured *c* 14.5m N-S and 12m E-W and was up to 0.48m thick at the centre, thinning toward the edges. Beyond this, toward the southern and eastern limits of the mound, was a deposit that was noticeably less stony (196 and 197) and which may have comprised redeposited material that had been eroded from the mound. A sample of charcoal from a bulk sample taken from the primary mound (185) returned a radiocarbon date of 1420-1260 cal BC (95.4%). A flint flake from layer 197 represented the only artefactual material from the mound.

Burnt Mound 2

2.1.17 The northern part of burnt mound 2 was exposed within the confines of the excavation area but the southern extent lay beyond the southern baulk. Two troughs were uncovered beneath the mound, one of them associated with an arrangement of postholes, as well as five features of less certain origin.

Features beneath the mound (Fig. 6)

2.1.18 The mound sealed a buried soil layer (168/177), which in turn overlay two features (171 and 203) that may have been significantly earlier than the activity associated with the burnt mounds. Pit 171 was oval in plan and had straight, fairly steep sides and a flat base that indicated that it may have been a man-made feature. It was 0.58m deep and contained a sequence of fills of redeposited natural clay which contained no artefacts. Feature 203 was a shallow, slightly irregular feature and may have been natural in origin. Its fill (204) was very similar to the overlying buried soil.

2.1.19 The buried soil (168/177) comprised a layer of light yellowish brown silty clay up to 0.18m thick that was only preserved beneath the mound, where it was protected from truncation by more recent ploughing. A stone rubber was recovered from the buried soil.

2.1.20 Trough 269 (Fig. 4, section 40) was situated toward the northern edge of the mound. It comprised a rectangular, flat-bottomed trough, aligned NW-SE, that measured 2.9m x 1.4m across and 0.38m deep. It was filled by a deposit of burnt stone and black soil (270) that was identical to the material forming the overlying mound, with a slightly less stoney patch at the north-western end (271) that may indicate some form of disturbance. A radiocarbon date of 1620-1320 cal BC (95.4%) was obtained for a sample of charcoal from fill 270. Possible evidence for a post-built structure over the trough was represented by a group of four postholes at the northern end. Postholes 276 and 278 were situated *c* 0.5m from the north-eastern and north-western corners of the trough and postholes 272 and 274 formed an intercutting pair roughly half way along the eastern side and 0.6m from the trough. The postholes were very shallow, with depths of 0.07-0.17m, and each contained a black, charcoal-rich fill with burnt stones.

2.1.21 Trough 161/244 (Fig. 4, section 28) lay on the same NW-SE alignment as trough 269 but was situated 2.8m further west and extended beyond the north-western limit of the overlying mound. It was rather less regular in plan than the other troughs, with somewhat sinuous sides and partly rounded ends, and measured 5.5m long and 1.5-2.8m wide. The sides were generally steep and the base flat, with a depth of 0.39m. In contrast to the other troughs, which were filled with material that appeared to be identical to the overlying mound, this feature had a more complex sequence of fills. The basal fill (245) was 0.19m thick and was composed of dark grey clay that may have accumulated in standing water. Above this was a layer that contained heat-shattered stones (246) and the final fill was another relatively stone-free deposit (247). A shallow hollow (242) had formed around the north and west sides of the trough, perhaps caused by trampling associated with the use of the feature.

2.1.22 Pits 169, 181 and 183 were of less certain purpose. Pit 169 was a shallow feature with a sterile fill and may have been a tree-throw hole. Pit 183 was recorded against the southern edge of the excavation area and was 0.54m deep, with a single sterile fill (184). It was overlain by a localised layer of redeposited natural clay (179/180) that may have been heat-discoloured. This deposit was in turn overlain by pit 181, which was 0.34m deep and, following the deposition of a thin primary fill, appeared to have been left open to be filled by material from the burnt mound.

The mound

2.1.23 The mound extended for 13m from the southern edge of the excavation area and measured 25m east-west. It comprised a homogenous layer of burnt and fire-cracked stones and dark grey, charcoal-rich soil (200) that was up to 0.38m thick. A deposit of similar but less stony material at the eastern edge of the mound may represent material eroded from it. A single flint flake was recovered from the excavation of the mound. The upper surface had been truncated by several medieval furrows.

2.2 Excavation Area 2 (Figs 7-10)

2.2.1 Excavation Area 2 contained Burnt Mounds 3 and 4, which were situated 13m apart (Fig. 7). Mound 3 lay against the eastern edge of the area, with Mound 4 to the north.

2.2.2 Five discrete features were also situated within the excavation area. The most substantial of these was pit 318, which was exposed at the southern edge of the area, some 21m south of Burnt Mound 3. The pit was 2.0m across and extended beyond the edge of the

trench. It was 0.47m deep and contained a sequence of three fills that would be consistent with use as a trough associated with the burnt mounds (Fig. 8, section 57). The basal fill was a layer of fire-cracked stone and charcoal (317) that would be consistent with debris from the final usage of such a trough and was overlain by deposits that probably represent deliberate backfilling, comprising a substantial deposit of light grey clay that contained some large cobbles (316) and a dump of charcoal that contained very little stone (315). Pit 256 was a shallow and slightly irregular feature 8m west of Mound 3 that had a thin layer of charcoal at its base. Three shallow, irregular or oval features between the burnt mounds were interpreted as tree-throw holes (215, 249 and 251).

Burnt Mound 3

2.2.3 Mound 3 was the only mound that did not overlie any associated features but was instead cut by trough 230. It was not completely exposed by the excavation and continued beyond the eastern edge of the trench, the part of the layer that lay within the trench measuring 11m NE-SW and 7m NW-SE. The mound had formed over a buried soil of light grey sandy silt (224) that was up to 0.12m thick. A clear distinction could be made between the primary mound and surrounding deposits that may have represented material that had eroded from it. The primary mound was 0.12m thick and was composed of black soil and burnt stone (218) that measured 7m NE-SW, and extended for a distance of 2.5m from the eastern baulk. To the west, north and south lay deposits of light grey redeposited material (217). Several large stones, measuring between 0.5m and 0.7m in length, were located within the mound. They appeared to be neither deliberately shaped nor burnt and it was uncertain whether they had been placed deliberately or were natural outcrops.

2.2.4 Trough 230 (Fig. 8 section 58) was cut into the north-eastern part of the mound. It was 0.31m deep, penetrating through the mound material and into the natural substrate beneath. The trough was sub-circular in plan with vertical sides and a flat base and had an integral posthole at each corner except for the south-east. It was filled by a single deposit of fire-cracked stone and black soil (229) that was very similar to the surrounding mound material. A sample of hazel roundwood charcoal from a bulk soil sample collected from the fill was dated by radiocarbon to 1510-1400 cal BC (95.4%).

Burnt Mound 4

2.2.5 This was the only mound that was completely exposed within the excavated area and was rather amorphous in plan, comprising a main area with an irregular curved projection on the north side (Fig. 7). Including the northern projection it measured 11m N-S and 10m E-W. The mound sealed a buried soil layer and overlay two troughs and a gully.

Features beneath the mound (Fig. 9)

2.2.6 The buried soil layer beneath the mound was composed of light grey sandy silt (237) and had a maximum thickness of 0.08m. It was cut by troughs 326 and 2402 and gully 322.

2.2.7 Trough 326 (Fig. 8, section 61 and Fig. 10) was situated beneath the northern part of the mound and was encircled on it northern and eastern sides by gully 322. The trough was slightly trapezoidal rather than strictly rectangular and had three vertical sides and a more gently sloped east side. It measured 1.6m x 1.3m across and 0.36m deep, with the long axis aligned east-west. A thin layer of blackened soil with some fire-cracked stones (325) extended across the base and most of the way up the sides of the feature. Above this was the main fill

(324), which contained a much higher proportion of burnt stone and included one particularly large, apparently unburnt stone that measured 0.3m across. A sample of charcoal from fill 324 was submitted for radiocarbon dating and returned a date range of 2030-1890 cal BC (95.4%). Gully 322 (Fig. 8 section 60) was crescentic in plan and may have been the surviving part of a feature that enclosed an area around trough 326. It was up to 1.05m wide and 0.16m deep, with an open profile, and was filled by material similar to the overlying mound (323).

2.2.8 Trough 320 lay toward the eastern edge of the mound and was almost completely excavated during the evaluation as feature 2402 (Fig. 8 section 2404). It measured 2.0m x 1.25m across and 0.38m deep. The basal fill comprised a thin layer of pale brownish grey clay (2405) that may have settled on the base of the pit while it was full of water. Above this was a layer of black, charcoal-rich clay silt (2406) that may have been associated with the final use of the feature. A sample of charcoal from this deposit was dated by radiocarbon to 2430-2060 cal BC (95.4%). The final fill (2407) was composed almost entirely of burnt and fire-cracked stones.

The mound

2.2.9 The mound was composed of burnt stones and blackened soil (236) that was visually identical to the material forming the other mounds. It was 0.2m thick, petering out at the edges. A sample of charcoal recovered from a bulk sample produced a radiocarbon date of 2120-1900 cal BC (95.4%).

3 RADIOCARBON DATING

Chris Hayden

3.1 Introduction

3.1.1 A series of seven radiocarbon dates (Table 1; Fig. 11) were obtained from the burnt mounds and related features. The aim of the dating programme was to provide a broad characterisation of the chronological relationships between the mounds: did they, for example, form a chronological sequence, with one mound replacing another over time, could they all have been contemporaneous, or were there significant hiatuses in activity?

3.1.2 The results suggest that the mounds belong to two distinct phases. The earliest, burnt mound 4, probably dates from the early Bronze Age, with activity probably at some time in the period between 2050-1940 cal BC and 2000-1860 cal BC (although an earlier date from this mound could be taken to imply that activity began in the late Neolithic/early Bronze , in the period 2320-2060 cal BC). The other three burnt mounds belong to a later phase of activity in the middle Bronze Age, probably in the period between 1530 cal BC and 1260 cal BC. The dates are not sufficient to show whether the three burnt mounds in this later phase formed a sequence, but they do suggest that either they were very close in date or that there was some overlap between the periods in which they were in use. Although the number of dates is not sufficient to give good estimates of how long the activity associated with each burnt mound lasted, what evidence there is does not suggest that the later mounds were used over a long period.

3.1.3 The radiocarbon dates were all measured at Queen's University, Belfast, Centre for Climate, the Environment and Chronology with the exception of the first date (SUERC-36546) which was measured at Scottish Universities Environmental Research Centre AMS Facility. They have been calibrated using the IntCal13 calibration data (Reimer *et al.* 2013) using OxCal v. 2.4.2 (Bronk Ramsey 2009).

3.2 Selection of samples

3.2.1 A single determination (SUERC-36546) obtained from burnt mound 4 immediately after the excavation gave a date of 2430-2060 cal BC (95%). Whilst this early date can be paralleled at a number of other burnt mounds (Beamish 2009; Ripper and Beamish 2012), given that the majority of burnt mounds date from the middle or late Bronze Age (Topping 2003, 3), the date was sufficiently early to suggest that further dating, to test this early date, would be worthwhile. At the same time, the presence of four burnt mounds also raised the question of whether they represented extensive contemporaneous activity in one phase, or had formed over several phases of activity. It should be stressed again that the resources available for dating were not sufficient to provide a precise chronology of the periods over which the mounds were in use; it was, however, hoped that they would provide some indication of the overall chronological pattern.

3.2.2 A further six dates were therefore obtained during post-excavation analysis. Two were obtained from burnt mound 4 in order to check the early date suggested by the first determination (making a total of three dates for this mound). Burnt mound 4 lay at the north-eastern end of the site. If there had been a regular shift in the location of burnt mounds over time, then burnt mound 1, which lay at the opposite (south-western) end of the site, would

have been the latest. A further two dates were, therefore, taken from burnt mound 1 which lay furthest away from burnt mound 4, and single dates were obtained from mounds 2 and 3 which lay in between.

3.2.3 There were two significant issues involved in selecting samples for dating. The first involves the stratigraphic integrity of the contexts from which the samples came, and the second the material selected for dating.

Post-depositional disturbance

3.2.4 In the cases of burnt mounds 1 and 4, where two dates were obtained from a burnt mound, one was taken from within the main burnt mound deposit and the other from within a pit. In both cases, the pits appeared to lie below the main burnt mound deposits. Whilst there was thus a stratigraphic relationship between the two dated samples, it is unclear whether the samples from the pits were necessarily earlier than the samples from the overlying burnt mound deposits. If it is accepted that the burnt stone was used to heat water in the troughs, then it follows that during the use of the troughs, they cannot have been covered with burnt mound deposits, and that the burnt stone involved in the process must have been discarded elsewhere (albeit presumably in the vicinity of the troughs). The fact that the burnt mound deposits now cover the troughs, and that the troughs were filled with burnt material identical to that which formed the mounds suggests that the burnt mound material has been redistributed and suffered considerable disturbance since the troughs fell out of use (indeed, this is such a common pattern that a case could perhaps be made that the troughs were deliberately filled when the location was abandoned). Since it is unlikely that the burnt material in the troughs all derives from the last use of the troughs, but rather consists of redeposited burnt mound material, it is impossible to be certain how it was related chronologically to the burnt mounds themselves (beyond the fact that both the mound deposits and their associated trough fills are likely to derive from the same broad phase of activity). In the Bayesian models which are presented below, this stratigraphic information has not, therefore, been included, and the mounds and their associated pit deposits have simply been modelled as deriving from a single phase of activity. One consequence of the stratigraphic uncertainty is that the only way to be reasonably certain that the whole chronological range of the activity associated with the burnt mound is included in the samples selected for radiocarbon dating would be to take much larger numbers of samples than was possible with the resources available.

Sample materials

3.2.5 The second issue involves the material which has been selected for dating. It can be plausibly assumed that the large amounts of charcoal associated with the mounds derive from the fires which were used to heat the stones of which the mounds were formed. There is thus a clear functional association between the charcoal and the activity which we wish to date. Unfortunately, in the case of Hugglescote much of the charcoal consists of oak which, because of its potentially old age at the time it was burnt, usually does not provide good material for dating. To avoid any such potential age off-set, charcoal from short-lived species has been selected for dating. In the case of Hugglescote, most of the dated samples (Table 1) consist of hazel and in one case alder, both of which do, in fact, form good proportions of the charcoal from all of the burnt mounds. In two cases, related to burnt mounds 2 and 1, however, samples of holly and blackthorn/cherry-type charcoal were dated. Both of these types of

charcoal form only a very small proportion of the charcoal from the burnt mounds, and the possibility that they were residual and not associated with the burnt mound activity is thus higher than is the case for the hazel and alder. In the case of the blackthorn/cherry charcoal, from a pit below burnt mound 167, the date is very close to that obtained from alder charcoal from the burnt mound deposits, and it thus seems likely that the blackthorn/cherry charcoal was derived from activity associated with the burnt mound. The holly charcoal from a pit below burnt mound 166, however, was the only dated sample from this burnt mound. The result is close to those from three of the other burnt mounds and there is, therefore, no strong reason to believe that it was residual. Simply because the sample consists of atypical material, the argument, independent of the date itself, for believing that this date was associated with burnt mound activity is, however, weaker than that for the other samples.

3.3 The model

3.3.1 An attempt has been made to refine the calibrated date ranges indicated by the radiocarbon dates by adding constraints derived from archaeological information using Bayesian statistics as they are realised in OxCal (Bronk Ramsey 2009). For the reasons pointed out above, the stratigraphic relationships between the samples are not regarded as necessarily reliable (despite some intriguing differences in the charcoal from the pits and the burnt mound deposits, see below), and this stratigraphic information has not, therefore, been included in the model. The only constraint imposed by the model on the dates, therefore, is the assumption that each of the burnt mounds represents a single phase of activity. Multiple dates, to which this assumption can be added, were obtained only from burnt mounds 1 and 4 (and, as is discussed in more detail below, in the case of burnt mound 4, even this assumption is open to question, and one of the dates has been excluded from the model presented here). The structure of the models used is indicated by the boxes surrounding the dates in Figure 11.

3.4 The results

3.4.1 The dates (Fig. 11; Table 1) suggest that the burnt mounds derive from two phases of activity, one in the early Bronze Age, represented by burnt mound 4, and another in the middle Bronze Age, represented by the other three burnt mounds. Although it should be stressed that the number of dates obtained is clearly not sufficient to indicate the length of time over which the mounds were formed, the available dates suggest a hiatus of at least 50 years (Table 1) and up to as much as 700 years (but more probably of between 340 and 530 years) between the two phases of activity.

Burnt mound 4: the early Bronze Age

3.4.2 Three dates were obtained from contexts which were related to burnt mound 4. The earliest date from this mound (SUERC-36546) is, however, noticeably earlier than the other two dates (UBA-30016 and UBA-30015), and whether the earliest date should be regarded as having derived from activity related to the burnt mound is open to question.

3.4.3 The two later dates place burnt mound 4 in the early Bronze Age, probably beginning 2050-1940 cal BC and ending 2000-1860 cal BC (68% probability). If the earliest date is, however, regarded as having been related to the use of the mound, then the period in which it was in use extends back into the late Neolithic/early Bronze Age, probably beginning in the

period 2320-2060 cal BC and ending 2010-1800 cal BC (68% probability; not shown in Table 1 or Fig. 11).

3.4.4 Together, all three dates would suggest that burnt mound 4 was in use for a much longer period (of between 120 and 520 years at 68.2% probability and up to 910 years at 95.4% probability) than has been suggested for a number of well-dated burnt mounds elsewhere (Beamish 2009, 67-8; Beamish and Ripper 2012; and see below) and is also longer than is suggested by the admittedly very inadequate sample of two dates for burnt mound 1 at Hugglescote. It is worth noting that burnt mound 1 at Willington, which also dates from the early Bronze Age, may been in use for a longer period (80 to 320 years at 68% probability and 20 to 430 years at 95%) than the later (middle/late Bronze Age) mound 2 at that site (40-150 years at 68% and 20-210 years at 96%; Beamish 2009, 67-8). Burnt mound 4 appears to have been similar in size to the others at Hugglescote and at other sites, and such a long period of use would, therefore, imply either that the use of this burnt mound was much more sporadic than that of the others or that smaller quantities of stone were used.

3.4.5 The early date (SUERC-36546) was obtained from hazel charcoal which is represented, albeit sometimes in small quantities, in all but one of the samples from burnt mound 4. The hazel charcoal is not, therefore, clearly residual, but the possibility that it was residual, or that the trough (2403) from which the sample came predated the burnt mound and the other pit (231) which lay below the burnt mound, perhaps provides a more plausible explanation than the suggestion of either more sporadic or less intensive use of the mound. The latter possibility - that the trough predated the burnt mound - is considered unlikely since the upper fill of the trough was very similar to the deposits which formed the overlying burnt mound. The trough did, however, contain an end scraper which is consistent with a late Neolithic/early Bronze Age date.

3.4.6 Removing the early sample from the model suggests a duration of up to 150 years (at 68.2% probability (or up to 480 years at 95.4%). Although, again, this is based upon a clearly inadequate sample of just two dates, it is comparable to the duration suggested by the two dates from burnt mound 1 (up to 150 years at 68.2% probability, and up to 500 years at 95.4%), and is comparable (given the small number of dates at Hugglescote) to periods of use suggested for other sites: the duration of the burnt mound at Watermead, Country Park, Leics, was up to 45 years, 20-210 years at Willington, Derbys, and 35-165 years at Northwold, Norfolk (Beamish and Ripper 2012, 97).

3.4.7 It is perhaps worth noting that there is a possible parallel between the pattern of dates at Hugglescote and those at Watermead Park. Initial interpretation of the dates from Watermead Park (Meadows *et al.* 2010, 4) suggested two phases of activity (with the earlier phase represented by charcoal from below the wooden planks of the wooden trough and from one of the spreads of burnt stone and charcoal) which together had a duration of between 320 and 520 years (at 95% probability). The final interpretation (Ripper and Beamish 2012, 181), however, which places most of the dates into a single phase, suggests that the mound was in use for a much shorter period of up to 100 years (95%) and probably up to 40 years (68%).

3.4.8 Although more dates would be required to resolve the issue, it is suggested that the most plausible scenario is that the early hazel charcoal was residual. Although the model presented in Fig. 11 shows this early date, it was not included in the model.

Burnt mounds 1 to 3: the middle Bronze Age

3.4.9 The dates for the remaining three burnt mounds are much more consistent. All of them fall somewhere in the period between around 1530 cal BC and 1290 cal BC (at 68%). Overall, the available dates suggest that these three burnt mounds were probably in use over a period of between 90 and 280 years (68%) and more certainly for a period of between 40 and 520 years (95%).

3.4.10 There are too few dates to give a clear indication of whether the three mounds were in use at the same time or formed a sequence (and if so in what order they were used). The dates from burnt mounds 2 and 3 (UBA-30013 and UBA-30017), however, pass a chi-squared test (T=0.5 (5% 3.8), df=1) indicating that they could have been contemporaneous (Ward and Wilson 1978). It therefore seems likely that there was either some overlap between the periods of use of these two mounds or that they were at least close in date. If the dates from burnt mound 1 are included in the test, however, it fails (eg T=6.78 (5% 3.8), df=1, for a test using the two closest dates, UBA-30017 and UBA-30014, from burnt mounds 3 and 1). Although it is possible, then, that burnt mound 1 was the latest of the mounds, the two dates from burnt mound 1 and, even more clearly, the single dates from burnt mounds 2 and 3 are insufficient to indicate how long these mounds might have been in use, and it is quite possible that further dates would indicate a greater degree of overlap in the periods of use. The dates are, however, sufficient to suggest that the activity associated with these three mounds all belonged to a single broad phase of activity, with activity associated with the individual mounds either overlapping or being very close in date (without any very significance hiatuses in activity).

3.5 Conclusions

3.5.1 The early Bronze Age mound from Hugglescote joins a growing body of evidence from both the Midlands (Beamish 2009; Ripper and Beamish 2012) and other parts of Britain (Beamish 2009, 158-9; Morigi *et al.* 2011, 322-4) for the formation of burnt mounds in that period. Although there was a hiatus of some length - probably over 350 years - between the early and middle Bronze Age burnt mounds at Hugglescote, there is very little clear difference between the mounds from the two phases and their associated features. The middle Bronze Age has, however, often been seen as a period characterised by some of the most significant developments in British later prehistory which are marked by the transition from the monument-dominated record of the Neolithic and early Bronze Age to a later Bronze and Iron Age record dominated by settlements and field systems (Brück 2000). Although still often seen as typically later Bronze Age in date, burnt mounds form one element of continuity through the significant transformations which occurred in the middle Bronze Age. Whilst the discovery of field systems which seem to date from the early Bronze Age (eg Martin *et al.* 2012; Bradley and Fraser 2010, 20-1; Ladle and Woodward 2009) provides another element which blurs the distinction between the two periods, both perhaps contrast with the more gradual transformation in burial practices associated with barrows from the early to the middle Bronze Age (Bradley and Fraser 2010, 18-19), and with perhaps more marked changes in the form of settlements (Brück 2000).

4 FINDS

4.1 Stone rubber from buried soil 168

Ruth Shaffrey

4.1.1 The rubber from buried soil 168 comprised a large cobble of quartzitic sandstone weighing 1.7kg and measuring 195mm in length. It has not been shaped but has some wear on one face suggesting it was used for rubbing. Its flat surface is not typical of a rubber used for grinding grain on a saddle quern and it might instead have been used for rubbing skins or textiles. It has only been used very lightly, so there are insufficient use-wear traces to support a more definite identification. The stone could probably have been obtained from the river terrace deposits within the site or from glacio-fluvial deposits within a distance of a mile or two.

4.2 Worked flint

Geraldine Crann

4.2.1 Although just 13 flint artefacts were recovered during the excavation (Table 2), they do provide evidence for activity on the site preceding the formation of the burnt mounds.

4.2.2 Most striking, perhaps, are a retouched obliquely blunted point and a microdenticulate which can be dated to the early Mesolithic. A further two pieces - a burin spall and a small blade - could date from the Mesolithic or the early Neolithic. The only clearly later piece, which might have been contemporaneous with the earliest burnt mound, was a side-scraper. The eight remaining flints do not retain any technologically diagnostic features that would allow them to be securely dated.

4.2.3 The finds were widely distributed across the site, without any clear concentrations, four pieces, including the microdenticulate and the burin spall coming from subsoil contexts, and others, including the microlith, from Bronze Age contexts associated with the burnt mounds in which they were clearly residual. Much of the assemblage is in relatively poor condition with pieces having suffered edge damage, snapping or rolling.

4.2.4 It is often suggested that isolated finds such as the microlith reflect incidental use of a site for hunting. Mesolithic activity is, however, very often represented in the archaeological record only if it has generated flint debris, and, as a result, there must be a very wide range of activity which is not represented archaeologically at all. It is, therefore, impossible to say with any certainty what kind of activity the sparse quantities of flint might represent.

4.3 Wood charcoal and charred plant remains

Sheila Boardman

Introduction

4.3.1 Twenty bulk soil samples (20-40 litres in volume) from burnt mound layers and the fills of troughs and pits associated with the four burnt mounds were selected for assessment and analysis of wood charcoal and charred plant remains. The aims of the charred plant investigation were to establish whether any of the mound deposits were associated with plant

food processing, food consumption or other plant-related activity. The aims of the wood charcoal investigation were to establish which fuels were used in the burnt mounds, primarily for heating the stones, to investigate variations in the fuels used in different parts of the site, including the trough and pit deposits, and if there was evidence for changes in fuel use over time, and, from all the above, to assess the nature of the local vegetation and how this changed over time.

Methods

4.3.2 The bulk samples were processed using a modified Siraf tank with mesh sizes of 250µm and 500µm for the collection of flots and residues respectively. Once dried, the different fractions were scanned (residues) or sorted (flots) for charred plant remains, including cereal grains and chaff, smaller seeds and nutshell fragments. Very few remains were recovered. For the wood charcoal investigation, the flots were dry-sieved at 10mm, 4mm and 2mm. Individual fragments extracted randomly from the various size fractions were fractured by hand and sorted into groups based on features observed in the transverse sections at magnifications of x10-40. These were then fractured along their radial and tangential planes, and examined at magnifications of up to x400 using a Brunel SP400 metallurgical microscope with brightfield/darkfield illumination. Identifications were made using keys in Hather (2000), Gale and Cutler (2000) and Schweingruber (1990), and by comparison with a modern slide reference collection held by OA. On the basis of the quantities of wood charcoal and range of different taxa present, 18 samples were investigated in detail, with 44-127 charcoal fragments identified per sample. Plant nomenclature follows Stace (2010).

Wood charcoal (Tables 3-4)

4.3.3 The full range of families, genera and species can be found in Tables 3-4. The most common taxa overall were alder (*Alnus glutinosa*) and oak (*Quercus*), followed by alder/hazel (*Alnus*/*Corylus*), hazel (*Corylus avellana*) and ash (*Fraxinus excelsior*). There were moderate quantities of hawthorn group (Pomoideae), lime (*Tilia*) and blackthorn (*Prunus spinosa*) type or blackthorn/cherry (*Prunus*), plus a few fragments of willow/poplar (*Salix*/*Populus*), holly (*Ilex aquifolium*) and elder (*Sambucus nigra*) charcoal.

Mound 1 (Table 3)

4.3.4 Five samples were assessed, of which four produced sufficient charcoal (greater than *c* 50 fragments) for further investigation. The single wheat grain was the only cultivated plant remain from the site. Of the four samples analysed, sample 51 came from a lower fill (328) of pit 299, sample 52 was from a lower fill (335) of trough 333, and samples 23 and 25 were from different parts of the large burnt mound layer (185). A blackthorn (*Prunus spinosa*)-type fragment from sample 51 was dated to 1420-1210 cal BC (95.4 %; UBA-30018). Three of the analysed samples were dominated by alder (*Alnus glutinosa*), with moderate to large amounts of ash (*Fraxinus excelsior*), and some hazel (*Corylus avellana*), hawthorn group (Pomoideae), alder/hazel (*Alnus*/*Corylus*) and blackthorn/cherry (*Prunus*) charcoal. Sample 52 from trough 333 had a mixture of oak (*Quercus*), alder and alder/hazel, with a few fragments of hazel charcoal. With the exception of three ash roundwood fragments in sample 51, there was little narrow roundwood in these samples.

Mound 2 (Table 3)

4.3.5 Burnt mound 2 is represented by five wood charcoal samples. Sample 40 came from a fill (270) of trough 269, located below the burnt mound. A single holly (*Ilex aquifolium*) fragment from this sample was dated to 1620-1320 cal BC (95.4 %UB; A-30013). Sample 35 came from pit 164, among a group of features located beside the mound. Samples 11, 13 and 19 came from different parts of burnt mound layer 200. An additional sample (34) from pit 164 produced no charred plant remains and too little wood charcoal to warrant further analysis.

4.3.6 The main variation in the samples associated with mound 2 seems to be in the oak (*Quercus*) charcoal, which was present in all three burnt mound samples, but was almost absent from the pit and trough samples. In the latter samples, the charcoal was largely a mixture of alder (*Alnus glutinosa*), alder/hazel (*Alnus*/*Corylus*), hazel (*Corylus avellana*) and hawthorn group (Pomoideae), and there were one or two occurrences of cherry/blackthorn (*Prunus*) and willow/poplar (*Salix*/*Populus*) charcoal. In contrast, the burnt mound samples from layer 200 were dominated by oak or alder, with small amounts of alder/hazel, hawthorn group, hazel, and blackthorn (*Prunus spinosa*) type or blackthorn/cherry (*Prunus*) charcoal. There were also a few fragments of willow/poplar (*Salix*/*Populus*) and ash (*Fraxinus excelsior*). The oak charcoal was a mixture of slow-grown heartwood timber and immature wood. Narrow roundwood was again largely absent from these samples.

Mound 3 (Table 3)

4.3.7 Three samples from burnt mound 3 were examined in detail. Samples 23 and 25 came from burnt mound layers 218 and 226 and sample 44 was from a fill (229) of trough 230. Hazel (*Corylus avellana*) roundwood from the latter was dated to 1510-1400 cal BC (95.4 %; UBA-30017). This sample (44) was dominated by oak (*Quercus*), most again from mature trunk wood. The other charcoal remains were not well preserved. They included hazel (*Corylus avellana*) and alder (*Alnus glutinosa*), but most were identified as alder/hazel (*Alnus*/*Corylus*). Samples 23 and 25, from the burnt mound layers, had a mixture of oak (heartwood and sapwood), alder, hazel and alder/hazel charcoal, with moderate amounts of ash (*Fraxinus excelsior*) and one or two holly *(Ilex aquifolium*) fragments. Apart from the dated hazel fragment, narrow roundwood was largely absent from these samples. Also, in contrast to the mound 2 samples, charcoal of sometimes shrubby taxa (such as blackthorn and hawthorn) was also absent from the mound 3 samples.

4.3.8 A single hazel nutshell fragment in sample 25 was one of only two fragments of charred plant remains from the site, and this may represent material brought onto site and charred with fuel rather than with other collected foodstuffs.

Mound 4 (Table 4)

4.3.9 A hazel (*Corylus avellana*) fragment from a trough (320) beneath the mound, produced the earliest date from the site: 2430-2060 cal BC (95.4%; SUERCC-36546). The wood charcoal was a mixture of oak (*Quercus*), alder (*Alnus glutinosa*) and hazel, with a few fragments of lime (*Tilia*) and ash (*Fraxinus excelsior*). This range of taxa is identical to that from the other mound 4 samples (below), although the oak charcoal here was dominated by short-lived material with curved growth rings, probably from young branches.

4.3.10 A hazel roundwood fragment in sample 45, from the main fill (324) of trough 326, which cut the mound, produced a date of 2030-1890 cal BC (95.4%; UBA-30016). Oak

heartwood dominated this sample, and it included material from slow grown trees. Other possible woodland trees present in this sample (45) included lime and hazel, although only one fragment of definite hazel was identified. Lime was again present in samples 28 and 32, suggesting that some of the original wildwood of the region persisted close to the mound during the late Neolithic/early Bronze Age. The presence of alder charcoal in all six samples points to damp woodland in the vicinity of the site. Alder was the dominant taxon in 10 of 8 wood charcoal samples from the site overall, suggesting that this was an important component of the local landscape.

4.3.11 Samples 28, 29 and 31 were from burnt mound layer 236, and sample 32 was from burnt mound layer 232. Three of these samples (excluding sample 28) were dominated by oak, again largely from heartwood but sapwood and roundwood fragments were also noted. The oak heartwood seems to include a mixture of slow-grown and fast-grown trees, so may reflect wood collected from both closed forests and from lighter woodland. Ash charcoal was also present. This tree is sometimes found growing along river banks but is most frequent in lighter woodland and areas of woodland regeneration. Ash was present in three burnt mound samples, and some fragments also had quite dense growth rings, suggesting slow growth. In contrast to the other burnt mound samples, sample 28 was dominated by alder with not dissimilar amounts of oak and lime charcoal. Hazel charcoal was also present. Notably absent from the Mound 4 samples were sometimes shrubby taxa such as blackthorn (*Prunus spinosa*) type and hawthorn (represented by Pomoideae), or other shrubby taxa such as dogwood (*Cornus*) and buckthorn (*Rhamnus cathartica*), as seen elsewhere in the region (Gale 2006; 2009).

Charred plant remains

4.3.12 Despite detailed scanning and sorting of the different sample fractions, only a single wheat (*Triticum* sp.) grain, resembling emmer (*T*. cf. *dicoccum*), and one hazelnut (*Corylus avellana*) shell fragment were recovered (Table 3). The grain came from sample 8, from a burnt mound layer (185) associated with mound 1. The nutshell fragment was from sample 25, from another burnt mound layer (226) associated with mound 3.

Other sites

4.3.13 Several late Neolithic and Bronze Age sites with burnt mound features have been excavated across the region. The sites at Watermead Country Park, Leicester (Ripper and Beamish 2011), Willow Farm, Castle Donington (Coward and Ripper 1999), and Willington Quarry, Derbyshire (Beamish 2009), all lie within 10-15 km of Hugglescote, while Cox Bank Farm, near Uttoxeter (Hollins and Carne 2007) is some 25 km to the north-west.

4.3.14 At Watermead, on the River Soar at Birstall, deposits sampled for wood charcoal included a burnt mound, trough, fills of two hearths and other burnt features (Morgan 2010). The burnt mound was dated to the late Neolithic to early Bronze Age (2550-2479 cal BC to 2150-1930 cal BC at 95% probability; Meadows *et al*. 2010). The majority of the charcoal was identified as alder/hazel, but definite alder was recovered from the mound, hearth and other burnt features. Other charcoal taxa included hawthorn group, blackthorn type, hazel, elm, willow/poplar and oak (Morgan 2010). The late Neolithic-early Bronze Age pollen evidence from Watermead points to mixed lime, oak, and elm wood on drier land, with oak-alder carr in the wetter valley bottoms (Monckton *et al*. 2010).

4.3.15 To the north of Hugglescote, at Willow Farm near Castle Donington on the River Trent, multidisciplinary investigations of a late Bronze Age (after 1145-835 cal BC) burnt mound and related features, have so far included assessments of charred and waterlogged plant macrofossils, pollen and insect remains (Monckton 2002a; 2002b; Smith *et al*. 1999), but not the wood charcoal remains. Possible wood and scrub remains were poorly represented among the waterlogged remains, with occasional seeds of alder, elder, blackthorn and bramble (Monckton 2002a). Charred hawthorn seeds and hazel nutshells were also present (Monckton 2002b). Some of these remains may represent food waste. Many could have arrived on site with wood fuels. Overall, the plant macrofossils, insect remains and pollen point to an area of open, disturbed ground around the burnt mound, with nearby stands of alder, either along the water course or in areas of alder carr interspersed with open areas and scrub across the floodplain. Mixed deciduous woodland probably grew on drier ground, some distance from the site (Smith *et al*. 1999).

4.3.16 Two burnt mounds and associated deposits, plus a range of Neolithic and Bronze Age occupation deposits were investigated by Gale (2009) at Willington Quarry, Derbyshire. The early Neolithic landscape was apparently well-wooded, with oak, hazel, hawthorn group, blackthorn and probable birch all represented in the early fuel deposits. Work by Monckton (2009) points to little or no local cultivation at this time, although early Neolithic cereal cultivation is known from nearby Lismore Fields (Jones 2000). The earliest evidence for tree clearance dates to the 3rd Millennium BC and continues into the 2nd Millennium. Scorching and surface burning across the site was accompanied by tree-throw holes. Charcoal remains associated with these deposits were mostly oak, suggesting that this was the main tree cover being removed. The other taxa were alder, birch, blackthorn-type, hawthorn group, and in the later periods, ash and elder.

4.3.17 The earliest burnt mound at Willington was dated to the late Neolithic (Gale 2009). Unusually, at Willington this was located on slightly elevated ground away from a watercourse. Sampled deposits included burnt mound layers, a hearth and two troughs. They produced charcoal from a range of broadleaf trees: oak, hazel, ash, hawthorn group, blackthorn and hazel. One sample from the trough had mostly oak (Gale 2009). Samples from a second, middle Bronze Age burnt mound at Willington, located on a water course, came from a hearth, a timber-lined trough and several burnt mound layers. There was also a charcoal-rich layer between the edge of the trough and its wooden lining. Gale (2009) suggested this layer would have acted as a filter, cleaning water coming into the trough. The charcoal here was better preserved than elsewhere in the mound and included noticeably more roundwood. The identified taxa included oak, alder, hazel, ash, hawthorn group, blackthorn, dogwood, willow/poplar and elm. Although much of the oak was from heartwood, this seems to have been predominantly from short-lived trees and branch wood. Increases in alder and willow/poplar charcoal hint that conditions became wetter while mound 2 was in use (*c* 1100 cal BC; Gale 2009).

4.3.18 Samples investigated for wood charcoal and waterlogged wood at Cox Bank Farm near Uttoxeter, included middle to late Bronze Age burnt mound layers and an associated trough (Hollins and Carne 2007; Gale 2006). Charcoal from the burnt mound was entirely alder, largely from narrow branches and stem wood. Wood charcoal from the trough included alder, hazel and ash roundwood. Gale (2006) suggested that charcoal in the trough may have originated in hearths used for purposes other than heating the stones. The trough also

produced waterlogged wood, mostly abraded oak heartwood with eleven largewood oak chips, debris from some unknown activity. Thus, in the burnt mound at Cox Bank Farm, as in the mounds at the multi-period sites of Willington and Hugglescote, the inhabitants made very good use of alder, despite this being a poor quality firewood (Edlin 1949; Gale and Cutler 2000). One reason may have been the easy access to abundant supplies. Some other possible explanations are discussed below.

Discussion

4.3.19 Burnt mounds were generally (but not solely) built along water courses, so alder might be expected in the vicinity of some such sites. Charcoal evidence from Willington and Hugglescote also points to the availability of a wide range of other broadleaf trees, which makes the large quantities of alder charcoal even more intriguing. Clearly, this was being used to heat large proportions of the stones in the burnt mounds. Alder makes a poor wood fuel when fresh due to its high moisture content (Gale and Cutler 2000). It requires a long seasoning before it will burn easily, but alder charcoal does make a reasonable charcoal fuel. The latter was highly valued by gunpowder manufacturers in more recent times (Edlin 1949; Gale and Cutler 2000). There is no evidence for charcoal production for fuel at Hugglescote or the other sites above, but some of the properties of charcoal must have been appreciated when it was packed behind the timber lining of the burnt mound trough at Willington, at least as a way of cleaning the water entering the trough (Gale 2009).

4.3.20 Concentrations of alder charcoal have been noted in samples from burnt mound sites elsewhere in the midlands and east of England (Murphy 2001) and further afield (eg at Bexhill in East Sussex; Boardman 2019). Alder wood has a wide variety of possible uses. It is very durable under water so was frequently used in revetment timbers in the past. Alder is easily worked into hurdles, pegs, bowls, axe hafts, paddles and so on (Edlin 1949; Gale and Cutler 2000). Large quantities of alder charcoal in the burnt mounds may therefore reflect a range of origins: the burning of a readily available if inefficient fuel (alder), plus the recycling of artefacts, structural timbers, linings of troughs etc, as fuels, and possibly some limited charcoal use.

4.3.21 One important way in which the charcoal assemblage from Hugglescote differs from assemblages at other sites in the region is in the small proportions of narrow roundwood present. In some samples from Hugglescote there were just a few roundwood fragments among hundreds, or even thousands, of timber fragments. One reason for this may be that wood was so abundant that there was no need for timber conservation. Alternatively, the wood used as fuel may have been part of wider tree clearance operations, possibly in order to increase summer grazing in the low-lying areas. The use predominantly of roundwood as fuels may highlight areas where timbers were in scarce supply, or conversely, this may have been part of a deliberate cropping strategy, to increase animal browse or promote coppicing for a wide variety of purposes.

Summary and conclusions

4.3.22 With an almost complete absence of food plants in the 20 Hugglescote samples, it seems very unlikely that the burnt mounds were associated with processing of crops or preparation of plant foods. Seventeen of the 18 charcoal samples, representing all four burnt mounds, were dominated by alder or oak charcoal, indicating that these were the main fuels. One sample (52) from mound 1 was dominated by alder/hazel charcoal. Hazel and alder/hazel

charcoal were consistently present through the deposits. Several other taxa were present in only some burnt mound groups. Lime charcoal occurred exclusively in the mound 4 samples, which also had the earliest dates from the site. Together with oak, hazel and ash, this may represent some of the original wildwood of the area, growing on drier ground. Meanwhile, alder may have grown in damper woodland, in or low-lying areas as alder or alder-oak carr (and possibly later as alder-willow carr). Willow/poplar charcoal was only present in the mound 2 samples, which also had concentrations of alder, hinting that local conditions became damper at this time (sometime after 1620-1320 cal BC).

4.3.23 Ash charcoal was fairly well represented in samples associated with mounds 1, 3 and 4, but there was only one fragment in the samples from mound 2, which may reflect small scale or cyclical changes in local woodlands. Blackthorn, blackthorn/cherry and hawthorn group charcoal were found in samples from mounds 1 and 2, but not those from mounds 3 and 4. These remains occurred in small quantities at Hugglescote, and were also found largely as timber (cf roundwood), so are more likely to have come from trees growing in lighter woodland or at woodland margins, rather than from thorny scrub.

4.3.24 The main temporal change in the wood charcoal assemblage appears to be the absence of lime charcoal in deposits which post-date *c* 2000 cal BC. This probably reflects wider changes in the regional woodland at this time, in particular the loss of wildwoods. There was also an apparent decrease in oak charcoal in the mound 1 samples (sometime after 1420-1210 cal BC, based on the dating of sample 51 (UBA-30018)). This may also reflect wider changes in the landscape, or possibly more localised practices and preferences.

4.4 Early and middle Bronze Age buried soils beneath the burnt mounds

Based upon an assessment by Richard I Macphail

4.4.1 Monoliths taken through the burnt mound deposits forming burnt mounds 4 and 1 and the soils buried below them were assessed by Richard Macphail (2016). Radiocarbon dates indicate that burnt mound 4 probably dates from the early Bronze Age (although possibly from the late Neolithic/early Bronze Age; see radiocarbon dating above), whilst burnt mound 1 dates from the middle Bronze Age, with a period probably of between 350 and 530 years between them. The monoliths thus provide an opportunity to examine whether any significant changes had occurred in the soils on the site between the early and middle Bronze Age. The assessment indicated that both soils consisted of stagnogleyic argillic brown earths (Ragg *et al.* 1983), suggesting that there was very little change in the soils on the site. The analysis was not, therefore, pursued any further.

5 DISCUSSION

5.1.1 The investigations uncovered four burnt mounds that represent activity spanning a considerable period of time, extending from the late Neolithic/early Bronze Age to the middle Bronze Age. This evidence contributes to our understanding of the distribution and chronology of this rather enigmatic site type.

5.1.2 Burnt mounds have long been recognised in the north and west parts of Britain (Buckley 1990; O'Kelly 1954) and in recent years have been increasingly identified in the south and east also (eg Beamish and Ripper 2000; Lambrick 2014, 134-5; Dunkin 2001). This increase in known sites has occurred largely as a result of fortuitous discoveries arising through developer-funded investigations and it is now apparent that they were a quite common feature of the late Neolithic and Bronze Age landscape. Such mounds have been identified at numerous other locations in Leicestershire, such as Birstal (Ripper and Beamish 2012), Castle Donnington (Coward and Ripper 1999), Brooksby Quarry (Parker and Jarvis 2007), Scraptoft and Thurnby (Coward 2010), Sutton in the Elms (Jarvis 2003) and Hoby with Rotherby. Mound-like deposits have also been recorded by a test-pit survey at Syston (Beamish 2003, 147) but a reported mound at Dunton Bassett Primary School (Priest 2005), appears to comprise a group of cooking pits rather than the site of a burnt mound. The discovery of four mounds within a distance of only 36m is not atypical. A group of three mounds have been excavated at Brooksby Quarry (Parker and Jarvis 2007), and sites with two mounds were found at both Castle Donington (Coward and Ripper 1999) and Willington, Derbyshire (Beamish 2009).

5.1.3 The mounds at Hugglescote exhibit the typical elements that characterise such sites, comprising a mound of charcoal and burnt stone associated with one or more hearths and troughs. It is usually suggested that stones were heated on the hearths and used to boil water in the troughs, repeated use causing the stones to fracture until they were no longer useable and were discarded, along with spent charcoal from the hearth, to form the mound. Only Mound 1 at Hugglescote produced evidence for an *in situ* hearth, although it is possible that further hearths lie undiscovered beneath the parts of Mounds 2 and 3 that extended beyond the excavation area. Alternatively, since the hearth is the shallowest of the required elements, the other hearths may have been completely truncated by medieval and modern ploughing.

5.1.4 The troughs at Hugglescote were typically rectangular or sub-rectangular features (Table 5), although circular examples have been recorded elsewhere, examples from the East Midlands including features at Birstal (Ripper and Beamish 2012, 175-7), Brooksby Quarry (Beamish and Jarvis unpublished, cited in Ripper and Beamish 2012, fig. 18) and Mound I at Willington, Derbyshire (Beamish 2009, 40-43). The troughs at Birstal and Brooksby Quarry were provided with timber lining, as was a rectangular trough associated with Mound II at Willington (Beamish 2009, 48-55 and 152-4). The waterlogged conditions that allowed the preservation of the linings at these sites did not prevail at Hugglescote, but the postholes at the corners of trough 299 beneath Mound 1 (Table 5) correspond closely with the stakes that had been driven into the corners of the trough at Willington Mound II in order to hold the side timbers in place (Beamish 2009, 127 and figs 22 and 60). Fired clay suggestive of a daub superstructure was recovered from a trough at Castle Donington (Coward and Ripper 1998, 89) but no such evidence has been recovered elsewhere and it is generally assumed that troughs were uncovered. The postholes at the northern end of trough 269, beneath Mound 2, may be evidence that this end of the trough was provided with some form of barrier,

perhaps a screen or windbreak. It is possible that gully 322 provided a similar function in relation to trough 326 beneath Mound 4, and a very similar curvilinear gully lay adjacent to the trough associated with Mound I at Willington (Beamish 2009, 42 and fig. 19).

5.1.5 The posthole alignment beneath Mound 1 is an unusual feature. The features were closely spaced and are perhaps best interpreted as forming a palisade or screen associated with the activities beside the mound. The fills of the postholes comprised burnt stone identical to the overlying mound material and leave no doubt that the features were contemporary with the formation of the mound.

5.1.6 The mounds themselves were up to 0.48m thick and would originally have been more substantial upstanding features, which have since become denuded and spread by the effects of ploughing. This spreading of the mounds might explain why Mounds 1, 2 and 4 covered their respective troughs, although it is also possible that disused troughs could become buried by the continued expansion of the associated mound. The quantity of material comprising each mound clearly represents the accumulated debris from very many boiling episodes and is evidence that the site was used repeatedly over a period of years.

5.1.7 Burnt mounds rarely produce any artefactual material and consequently their date can only be established where scientific dating techniques are employed. Modelling of the radiocarbon dates from Hugglescote indicates that Mound 4 was significantly old than the other mounds, with a date range of 2470-2030 to 2030-1480 cal BC at 95.4% confidence, or 2310-2050 to 2010-1820 cal BC at 68.2% confidence, placing it within the late Neolithic/early Bronze Age. The other mounds may all have been broadly contemporary, with date ranges in the middle Bronze Age. The hiatus between Mound 4 and the other mounds is indicated as spanning 50-700 years at 95.4% confidence, although the date range at 68.2% confidence suggests that the true span is likely to lie within upper end of this estimate, probably exceeding 340 years. These dates are consistent with those obtained for burnt mounds elsewhere. Although they are commonly regarded as predominantly a phenomenon of the middle-late Bronze Age (eg Bradley 2007, 214), a reassessment and recalibration of some 87 dates from 58 burnt mounds from Britain and Ireland demonstrated a broadly even distribution between the mid-3rd millennium cal BC and the second quarter of the 1st millennium cal BC (Beamish 2009, 158). The dating of Mound 4 places it in the early part of this sequence, and is consistent with the suggestion that the phenomenon of burnt mounds began in central Britain and East Anglia (Beamish 2009, 158). A similarly early date was obtained for the mound at Birstall, the date range for which was modelled as 2200-2000 to 2180-1950 cal BC at 95% confidence (Bayliss et al., 181), while a mound at Castle Donington was associated with a middle Bronze Age date of 1145-835 cal BC at 95% confidence (Coward and Ripper 1999, 89). The apparent hiatus between the mounds at Hugglescote can be paralleled at Willington, where the date of Mound I was modelled as 2340-2060 to 2120-1840 cal BC and that of Mound II as 1290-1100 to 1170-1000 cal BC at 95% confidence (Marshall *et al.* 2009, 66-8).

5.1.8 Dating of the mounds is not straightforward, however, as each mound clearly accumulated as the result of repeated episodes that extended over a considerable period of time. It can therefore be expected to include material of different ages, a situation that was recognised at Willington, where two samples from Mound I produced statistically inconsistent dates of 2300-2040 and 2040-1880 cal BC (Beamish 2009, 40). There is no reason to doubt the accuracy of the dates from the mounds at Hugglescote but the small number of samples

that were dated is clearly insufficient to definitely establish the true duration of each mound's use. It is also possible that the hiatus between the late Neolithic/early Bronze Age dates from Mound 4 and the later dates from the other mounds may be more apparent than real, with material from this period perhaps lying unrecognised in unsampled parts of the mounds.

5.1.9 The function of burnt mounds has been much debated but they have resisted easy interpretation due to their characteristic absence of artefactual evidence, and environmental data, though useful in its own right, has typically provided no indication regarding their purpose. When they were first recognised as a distinct class of site they were assumed to be cooking places, and this interpretation has persisted, supported by experimental evidence that confirmed the practicality of cooking food in this way (Cantrill and Jones 1911; O'Kelly 1954). However, this interpretation has come into question due to the absence of food remains at most burnt mound sites, although there are exceptions, including Mound I at Willington. Animal bone was completely absent from the mounds at Hugglesscote and the only plant remains from food species were a single wheat grain from a sample from Mound 1 and a single fragment of hazelnut shell from Mound 3. The lack of further similar material is likely to indicate that these examples were incidental inclusions within the mound rather than associated with its primary function and so a cooking function is unlikely in this case. Other interpretations that have been put forward for burnt mounds include brewing (Quinn and Moore 2007), the processing of leather or textiles (Jeffrey 1991; O'Drisceoil 1988) or production of steam for use as sweat lodges (Barfield and Hodder 1987). All these activities would have required the boiling of large quantities of water and are therefore consistent with the arrangements at burnt mounds, but no positive evidence has been found to support any of them. Processing of leather would most likely have involved rubbing of the skin in order to remove hairs or increase its flexibility, and fulling or felting of textiles would similarly have required vigorous rubbing, both processes that might provide a context for the rubber found beneath Mound 2 while the large stones in Mound 3 could have provided a hard surface on which to carry out such activities, but in the absence of more compelling evidence this can be no more than speculation.

5.1.10 Although the function of burnt mounds remains elusive, their place within the prehistoric landscape is rather better understood. The mounds at Hugglescote share the riverside location that is common to almost all such sites, providing a vivid indication that the activities that created the mounds required ready access to a large quantity of water. Mounds 3 and 4, in particular, lay immediately adjacent to the brook that flows through the site, although Mounds 1 and 2 were a little more distant, lying 75m and 45m respectively from its current course. The size of watercourse does not appear to have been a factor in the selection of a site for burnt mound activities, the location at Hugglescote beside a minor stream being paralleled by the mound beside the Thurnby Brook at Scraptoft and Thurnby, while more major valleys such as that of the Trent attracted several known mounds (Ripper and Beamish 2012, fig. 1). The rate of flow was clearly not important either, since the mounds at Birstall and Castle Donington were located beside channels that were largely silted and may have been no more than reed-filled marshland (Ripper and Beamish 2012, 188; Coward and Ripper 1999, 89).

5.1.11 The evidence from the charcoal indicates that Mound 4 stood in a landscape of lime, oak, hazel and ash woodland that may represent survival of some of the original wildwood of the area growing on drier ground, with alder growing on the damper ground around the

brook. This environment is very similar to the situation of the contemporary mound at Birstall (Monckton *et al.* 2011, 187) and is probably typical of the locations chosen for such mounds. The charcoal assemblages from the other mounds indicate that by the middle Bronze Age continued felling of the wildwood had probably resulted in the loss of lime in the local area, at a time that was characterised more broadly by clearance and the spread of cultivation and pasture (Clay 2006, 82-3).

5.1.12 The absence of domestic material or other features clearly indicates that the mounds were not associated with areas of settlement and the damp character of the immediate environment may have rendered it marginal to contemporary landuse. That is not to say, of course, that these places were unimportant, since the accumulation of such large mounds of spent material clearly indicates repeated use over a long period of time, but activity here probably comprised periodic, task-specific visits rather than longer-term occupation. The burnt mound sites will have comprised one of a large number of locations that prehistoric communities exploited for various resources, but given the elusiveness of Neolithic and Bronze Age settlements it is difficult to estimate the extent of the area exploited by a typical group. The hiatus between Mound 4 and the other three mounds is intriguing, assuming it is not an artefact of the dating evidence. Burnt mound activities may have continued elsewhere during this period, but if so it lay beyond the area of the geophysical survey.

5.1.13 The lack of definitive evidence regarding the activities with which burnt mounds were associated is currently a rather intractable problem, but their importance to the communities that created them is not in doubt. The four mounds at Hugglescote represent activity that took place over a period of several centuries, each mound accumulating over a period of years, decades or perhaps even generations. The period over which they were used spanned the transition from the mobile pastoralism of the late Neolithic/early Bronze Age to the more sedentary agriculture that characterised the middle Bronze Age, but the activities associated with the mounds continued to be part of the changing lifestyles of prehistoric people. As such, the mounds represent the remarkable persistence of the importance of these places.

6 LOCATION OF THE ARCHIVE

6.1.1 The project archive will be deposited with Leicestershire County Council Museums Service under accession code X.A.51.2014.

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8 TABLES

Table 1: Summary of radiocarbon dates from the burnt mounds and associated troughs

Associated burnt mound/Model element	Feature	Context	Lab. no.	Material (all charcoal)	Uncal. date BP	Unmodelled date cal BC		Modelled date cal BC	
						68% prob.	95% prob.	68% prob.	95% prob.
Boundary End burnt mounds								1360-1090	1400-650
Boundary End mound 1								1380-1260	1410-1130
Burnt mound 1	Burnt mound	185	UBA-30014	*Alnus glutinosa*	3073±27	1400-1290	1420-1260	1400-1300	1410-1270
Burnt mound 1	Trough 299	328	UBA-30018	*Prunus domestica/spinosa*	3055±38	1400-1260	1420-1210	1400-1290	1420-1260
Boundary Start mound 1								1450-1310	1720-1270
Burnt mound 3	Trough 230	229	UBA-30017	*Corylus avellana*	3167±27	1500-1410	1510-1400	1500-1410	1510-1400
Burnt mound 2	Trough 269	270	UBA-30013	*Ilex aquifolium*	3206±51	1530-1420	1620-1320	1530-1420	1620-1390
Boundary End mound 4								2000-1860	2030-1610
Burnt mound 4	Burnt mound	236	UBA-30015	*Corylus avellana*	3621±27	2030-1940	2120-1900	2020-1930	2030-1900
Burnt mound 4	Trough 326	324	UBA-30016	*Corylus avellana*	3601±28	2020-1910	2030-1890	2020-1920	2030-1890
Burnt mound 4 (excluded from model)	Trough 2403	2406	SUERC-36546	*Corylus avellana*	3800±35	2290-2150	2430-2060	2300-2150	2430-2060
Boundary Start mound 4								2050-1940	2160-1900
Boundary Start burnt mounds								2210-1960	2650-1910
Intervals									
Difference BM 4 to BM 1								410-640	50-700
Difference BM 4 to BM 3								400-550	130-610
Difference BM 4 to BM 2								340-530	80-620
Span all burnt mounds								670-1130	580-1800
Span MBA mounds								90-280	40-520
Span burnt mound 1								0-150	0-500
Span burnt mound 4								0-140	0-480

Table 2: Summary of the worked flint

Context	Feature	Description	Date
101	Subsoil	Core rejuvenation flake, hard hammer struck, retouched distal end, rolled condition	-
101	Subsoil	Microdenticulate on blade with platform preparation, rolled condition	Early Meso
101	Subsoil	Burin spall	Meso-EN
101	Subsoil	Debitage flake, proximal edge damage, rolled condition	-
152	Posthole 154	Short snapped blade section, proximal end, edge damage	-
153	Posthole 154	Small blade, distal end broken	Meso-EN
163	BM2 trough 164	Chip	-
163	BM2 trough 164	Irregular rolled flake	-
177	BM2 buried soil	Thick irregular core rejuvenation flake	-
197	BM1	Obliquely blunted microlith (Clark's A.2.a type), tip broken	Early Meso
200	BM2	Irregular flake, retouched ventral surface to proximal margin	-
229	BM3 trough 230	Chip	-
2203	**Topsoil**	**Side-scraper**	**LN/EBA**

Table 3: Summary of charcoal and charred plant remains from burnt mounds 1, 2 and 3

Sample No.		51	52	4	8	40	35	11	13	19	23	25	44
Context No.		328	335	185	185	270	165	200	200	200	218	226	229
Feature		Trough 299	Trough 333	Burnt mound	Burnt mound	Trough 269	Trough 164/244	Burnt mound	Burnt mound	Burnt mound	Burnt mound	Burnt mound	Trough 230
Mound		1	1	1	1	2	2	2	2	2	3	3	3
Litres		20	37	36	38	38	37	40	40	40	40	40	40
Wood charcoal													
Rosaceae													
Prunus spinosa type	blackthorn type							2	1				
Prunus sp.	cherry/blackthorn	2		1		2	2	2	5	4			
Pomoideae	hawthorn group	3		5	8	22		10	3	3			
cf. Pomoideae	cf. hawthorn group	1	1		2	8			1	1			
Fagaceae													
Quercus	oak	7hs	9sh	13sh		2	2	48sh	10sh	24hs	11hs	30hs	58hs
Betulaceae													
Alnus glutinosa	alder	24	8	68	20	26	40	31	59	30	32	31	12
Corylus avellana	hazel	5	3	5		20	2	3	3		10	25	2
Alnus/Corylus	alder/hazel	2	12		10	4	14	9	21	6	10	9	34
Salicaceae													
Salix/Populus	willow/poplar					2		2	2				
Oleaceae													
Fraxinus excelsior	ash	20rh	3	28hr	2			1			13	5	
Aquifoliaceae													
Ilex aquifolium	holly											1	2
Caprifoliaceae													
Sambucus	elder								2				
Indet. charcoal fragments		8	8	5	18	16	5	5	7	9	3	6	8
Total charcoal fragments		72	44	125	76	102	65	127	114	77	79	107	116
Other material													
Corylus avellana	hazelnut shell											1F	
Triticum sp.	wheat grain				1								

KEY: h - heartwood; s - sapwood; r - roundwood; F - frags. Pomoideae* inc: *Pyrus* (pear), *Malus* (apple), *Crataegus* (hawthorn) and *Sorbus* (rowan,service, whitebeam) species.

Table 4: Summary of charcoal from burnt mound 4

Sample No.		1	45	28	29	31	32
Context No.		2406	324	236	236	236	232
Feature		Trough 320	Trough 326	Burnt mound	Burnt mound	Burnt mound	Burnt mound
Mound		4	4	4	4	4	4
Litres		0.5	40	40	40	40	40
Wood charcoal							
Fagaceae							
Quercus	oak	17sh	44hs	19hs	67hsr	35hsr	57hs
Betulaceae							
Alnus glutinosa	alder	15	15	21	16	6	14
Corylus avellana	hazel	13	1	8	7		16
Alnus/Corylus	alder/hazel	2	4	2	6	6	4
Malvaceae							
Tilia	lime	5	6	14			12
Oleaceae							
Fraxinus excelsior	ash	2			6	7h	4
Indet. charcoal fragments		2	2	8			3
Total charcoal fragments		56	72	72	102	54	110

KEY: h - heartwood; s - sapwood; r - roundwood

Table 5: Summary of dimensions and form of troughs associated with the burnt mounds

Trough	Shape in plan	Length and width (m)	Depth (m)	Associated features/notes
Burnt mound 4				
326	irreg. rectangular	1.6 x 1.3	0.36	
320/2402	irreg. rectangular	2.0 x 1.25	0.38	
Burnt mound 2				
269	rectangular	2.9 x 1.4	0.38	postholes to north and east
161/244	irregular, elongated	5.5 x 1.5-2.8	0.39	
181			0.34	cut pit 183
Burnt mound 3				
230	rectangular		0.31	postholes at each corner (apart from SE); cut burnt mound deposit
Burnt mound 1				
301	irreg. rectangular	>1.6 x 1.4	0.12	cut by troughs 299 and 309
309	rectangular	1.0 x ?	0.2	cut trough 301; cut by trough 311/332
299	rectangular	3.4 x 1.5	0.25	postholes at each corner; cut trough 301
311/332	irregular	4.4 x >2.0	0.42	cut trough 309
Unrelated to a burnt mound				
318	circular?	2.0 x ?	0.47	

9 FIGURES

Figure 1: Site location plan

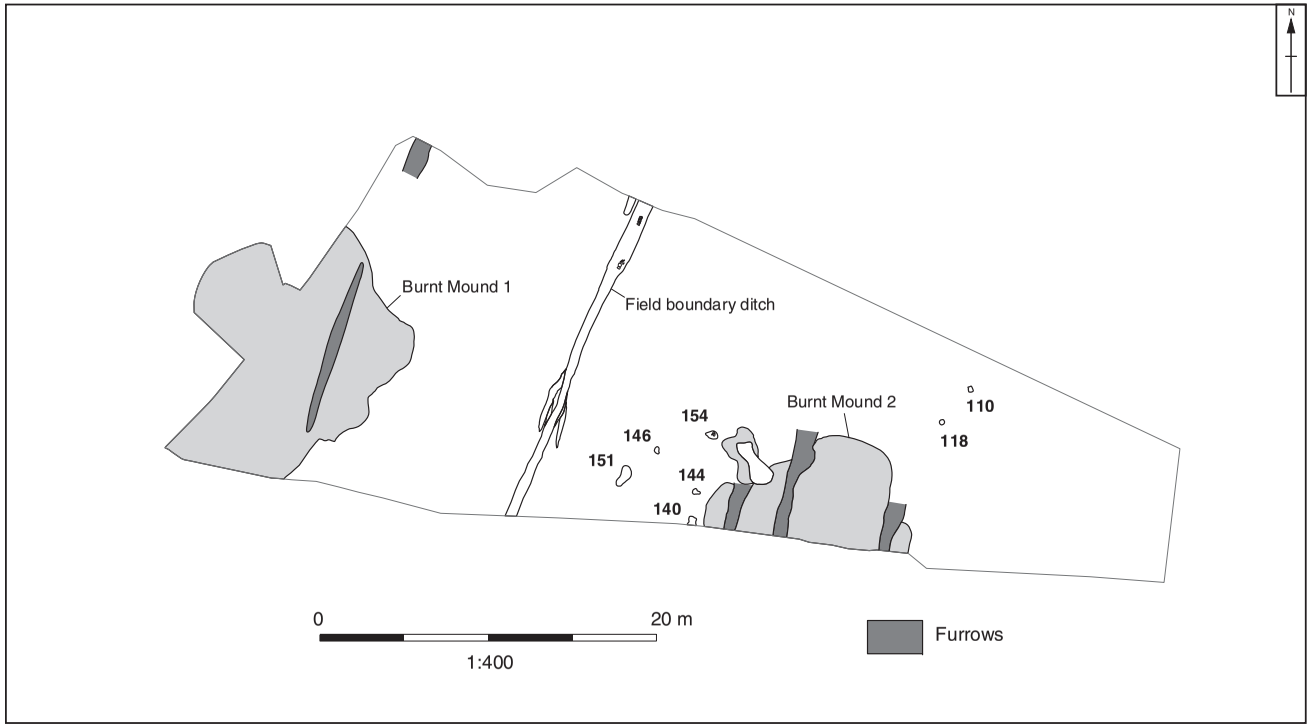

Figure 2: Plan of Excavation Area 1

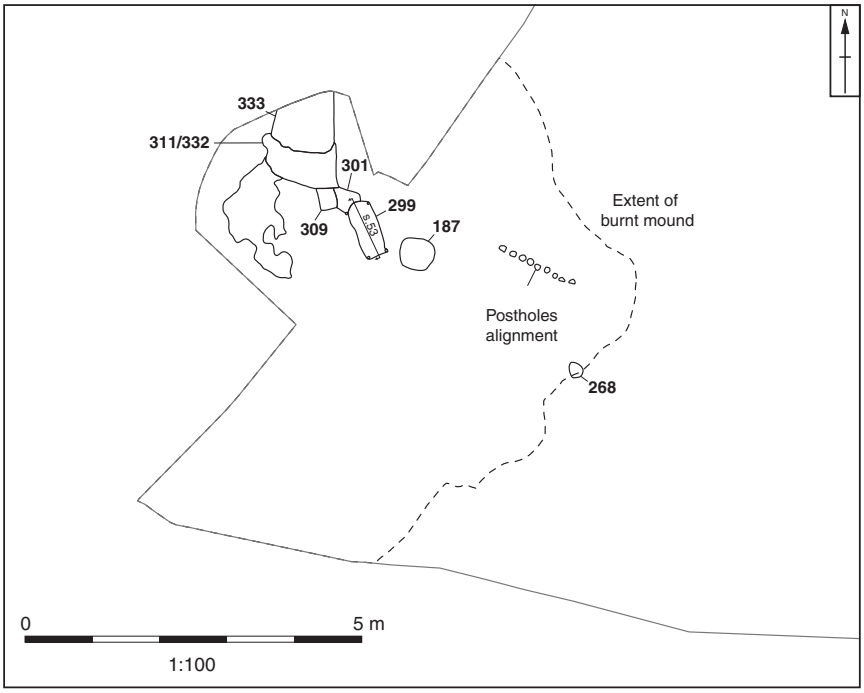

Figure 3: Plan of features beneath Burnt Mound 1

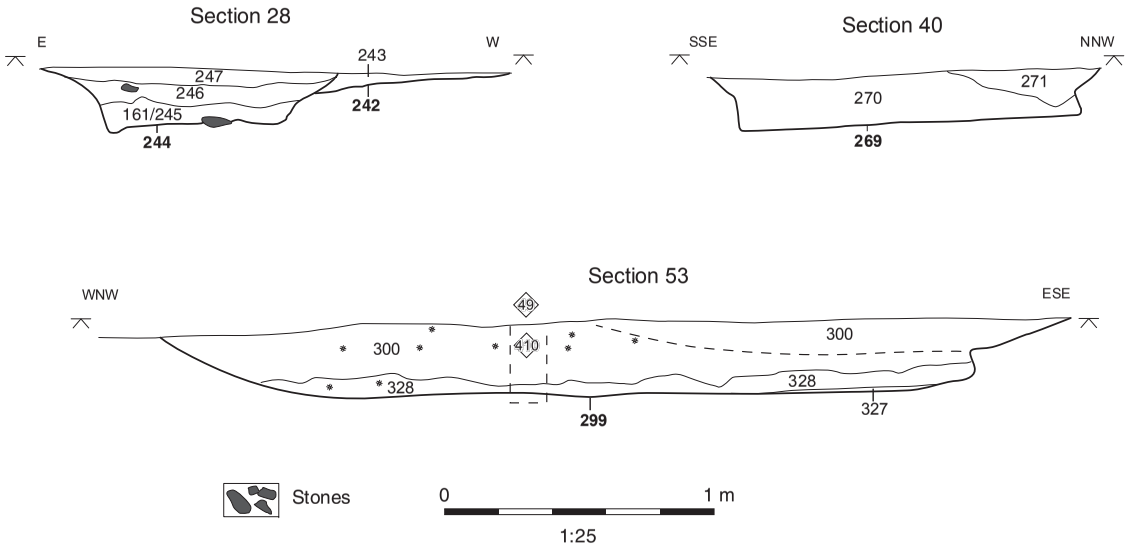

Figure 4: Sections through features beneath Burnt Mounds 1 and 2

Figure 5: Trough 299 viewed from the south-east end, with integral postholes visible at the corners of the trough in the foreground and further troughs to the rear (scales are 2m and 0.5m)

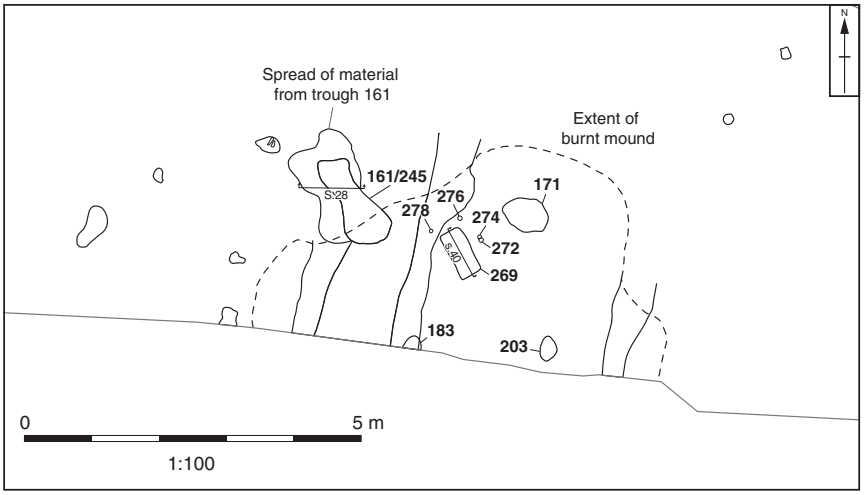

Figure 6: Plan of features beneath Burnt Mound 2

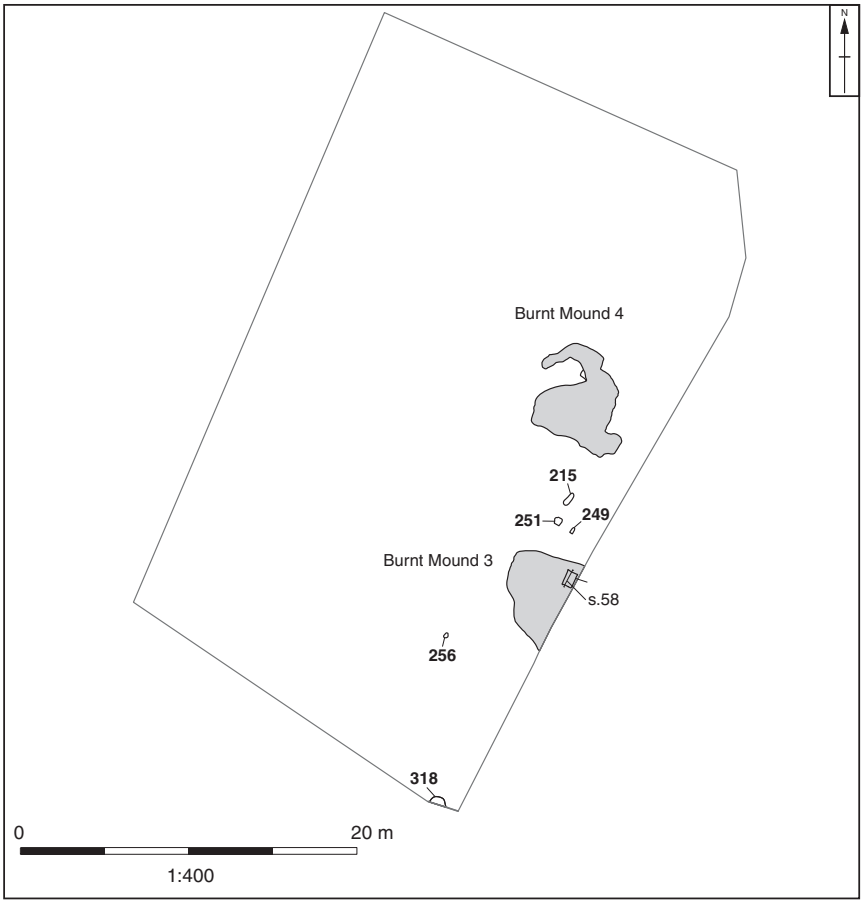

Figure 7: Plan of Excavation Area 2

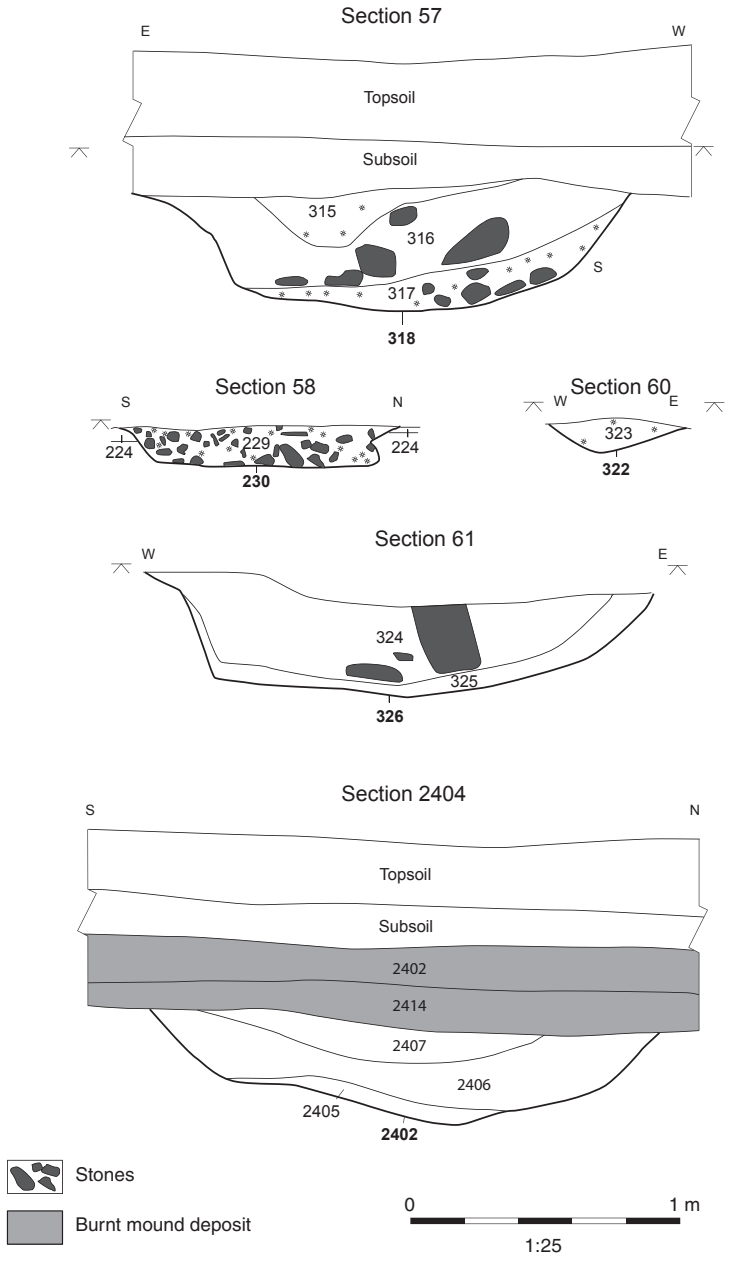

Figure 8: Sections through pit 318 and features associated with Burnt Mounds 3 and 4

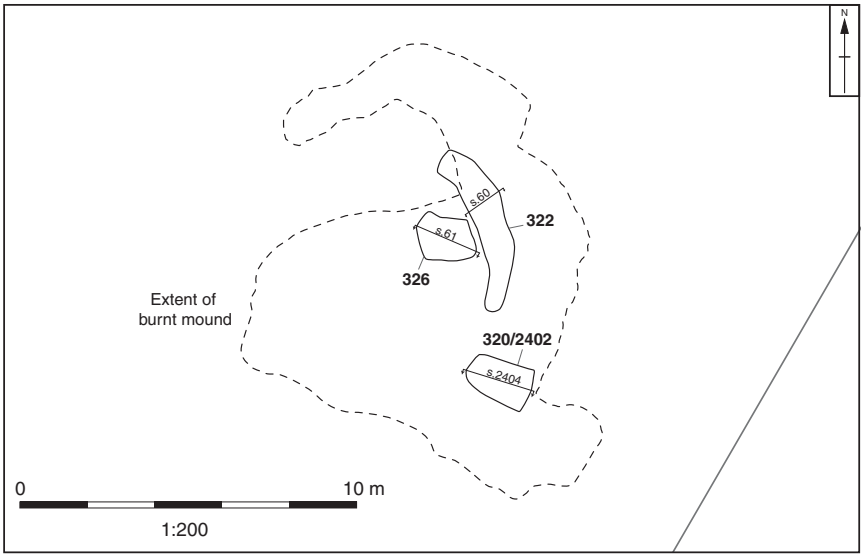

Figure 9: Plan of features beneath Burnt Mound 4

Figure 10 : Trough 326 and gully 322 during recording (scale is 0.5m)

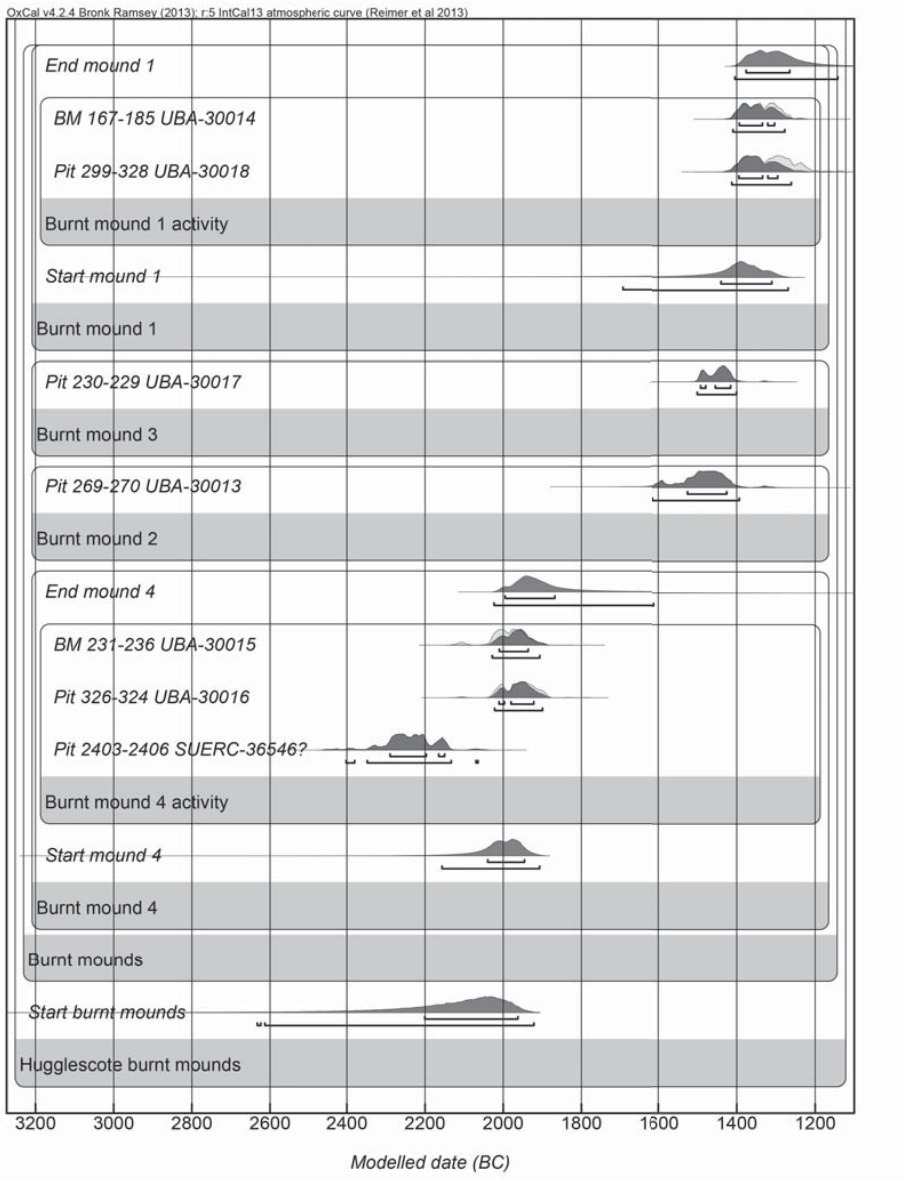

Figure 11: Modelled radiocarbon dates from the burnt mounds and associated troughs

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