

SCIENTIFIC DATING OF THE EARLY BRONZE AGE LOG COFFIN BURIALS AT SPROXTON AND EATON, LEICESTERSHIRE

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Scientific dating of burials from the excavated Bronze Age barrows at Sproxton and Eaton has been undertaken as part of a wider study of the log coffin burial tradition in England and Wales. The results have provided a more precise and reliable chronology for the interments at both sites. The log coffin burials at the sites lie within the temporal boundaries for that tradition established elsewhere in Britain, with the examples at Sproxton occurring about a century after the Eaton ones.

INTRODUCTION

The analysis of the burials at Sproxton and Eaton were carried out as part of a wider project to improve understanding of the log coffin burial tradition in Bronze Age Britain, with financial support from a British Academy/Leverhume small research grant. The aim of the re-analysis was to obtain modern reliable scientific dating evidence for the log coffin burials at the two sites. Two new radiocarbon dates were obtained from each barrow, providing much greater temporal resolution for the burial activities on the sites and for the log coffin inhumations. The results have allowed these log coffin burials to be placed in the development of the tradition across the UK.

The excavations at Eaton and Sproxton were directed by Patrick Clay and assisted by Deborah Sawday, both of the Leicestershire Museums Archaeological Field Unit, in 1978 (Sproxton) and 1979 (Eaton), and were published soon after (Clay 1981). Despite more recent investigations (Hughes 2000; Thomas 2008 and 2013; Finn 2011), the number of complete barrow excavations in Leicestershire is still relatively low compared with other regions, which means that the Sproxton and Eaton excavations remain very important for the understanding of Bronze Age burial practices in the county. A more precisely defined chronology of Early Bronze Age burial traditions remains a key aim of the East Midlands research agenda and strategy (Knight *et al.* 2012, 46).

THE LOG COFFIN BURIAL TRADITION

In the Bronze Age, log coffins were used to contain inhumations or cremations in barrows across Britain (Parker Pearson *et al.* 2013). Very occasionally the wood itself survives in waterlogged conditions, but more often the shape of the coffin is

preserved as a stain or carbonised remnant. In some cases, as at Sproxton, it can be hard to determine if the wooden container was a log coffin or a plank-built container, both of which are known in the archaeological record. The log coffin tradition was almost certainly more common than its current recorded frequency because in many conditions no traces of organic material such as wood survive. Log coffin burials are known from Bronze Age sites in many other countries, including the Netherlands, Germany, the Czech Republic, Denmark and even the Tarim basin in western China (Harding 2000, 105–7; Malloy and Mair 2000, 132–5; Holst *et al.* 2001; Drenth and Lohof 2005, 439–40; Parker Pearson *et al.* 2013). The best preserved sites are the famous examples from Denmark (Glob 1973), where iron panning created waterlogged conditions (Breuning-Madsen and Holst 1996).

The current project sought more scientific dating evidence for the tradition in the UK, because very few sites had reliable radiocarbon dates. Dendrochronological analysis was tried, without success, where significant amounts of wood survived, because it had worked well on Danish examples (Holst *et al.* 2001). As a result of the project, the number of well dated log coffin burials in Britain was increased to 21. This has allowed the results from Sproxton and Eaton to be placed securely within the wider tradition in the UK.

EATON

The Eaton barrow lies between the villages of Eastwell and Scalford in Eaton parish (Fig. 1 SK762266 Leicestershire HER ref MLE 3626). Crop marks suggest the presence of several other barrows in the vicinity (Leicestershire HER ref MLE 3667). The excavation of the Eaton round barrow revealed four concentric ditches and four central interments, two of which were inhumations and two cremations (Fig. 2). The stratigraphy suggested that the cutting of each ditch was associated with the creation and subsequent enlargement of the barrow. The four central interments were sequentially intercutting and Clay interpreted each one as being associated with the excavation of a ditch, and the associated creation and then enlargement of the barrow (Clay 1981, 35). There was, however, no clear stratigraphic proof for this assumption. Over 120 stake holes were recorded and interpreted as the sequential rebuilding of revetments at the outer edge of the barrow.

The inner ring ditch enclosed two cremations and two inhumations (Fig. 3). The earliest human remains were from a pit (F19) containing a cremation ‘in a small composite wooden coffin’, 1m by 0.4m by 0.12m deep (Clay 1981, 30). The remains of the coffin, preserved by manganese oxide replacement, were identified as oak. The cremated individual was a young adult, 20–23 years old. A single flint flake and charcoal, presumed to be from the funeral pyre, was also present in the feature.

A rectangular pit (F10), 2.4m long, 0.4m wide and 0.12m deep, cut the F19 grave (Fig. 3). It contained the outline of a log coffin, again shown by manganese oxide replacement. Only the teeth survived from the presumed inhumation within the coffin, suggesting an adolescent of 12–15 years of age was present. The log coffin was 1.8m long, 0.6m wide, tapering to 0.45m at the northern (head) end, and was 0.25m deep. Possible impressions of bark were noted at the southern end (*ibid* 30–1).

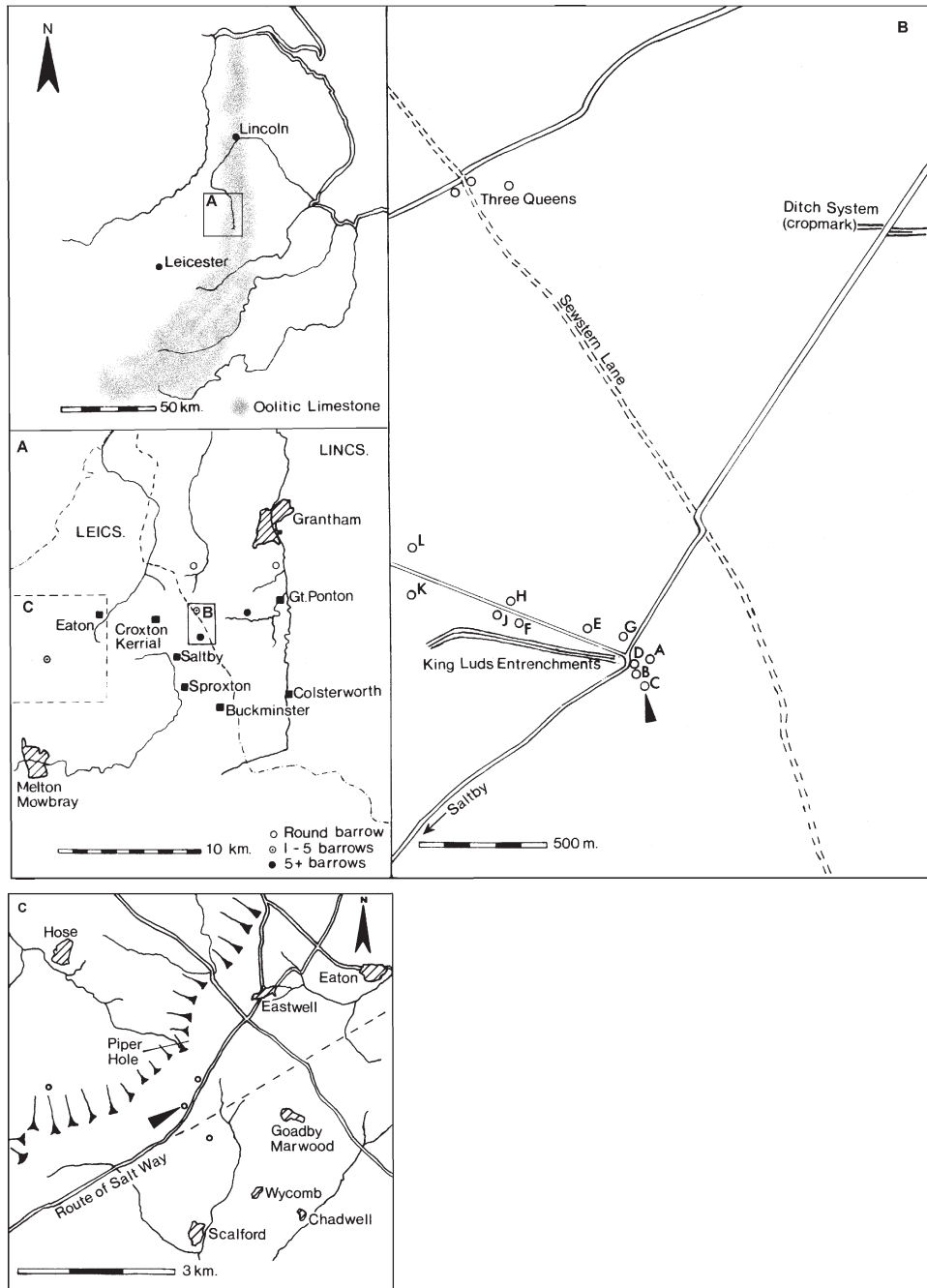


Fig. 1. Location of Eaton and Sproxton barrows, after Clay (1981) (reproduced with the permission of Patrick Clay).

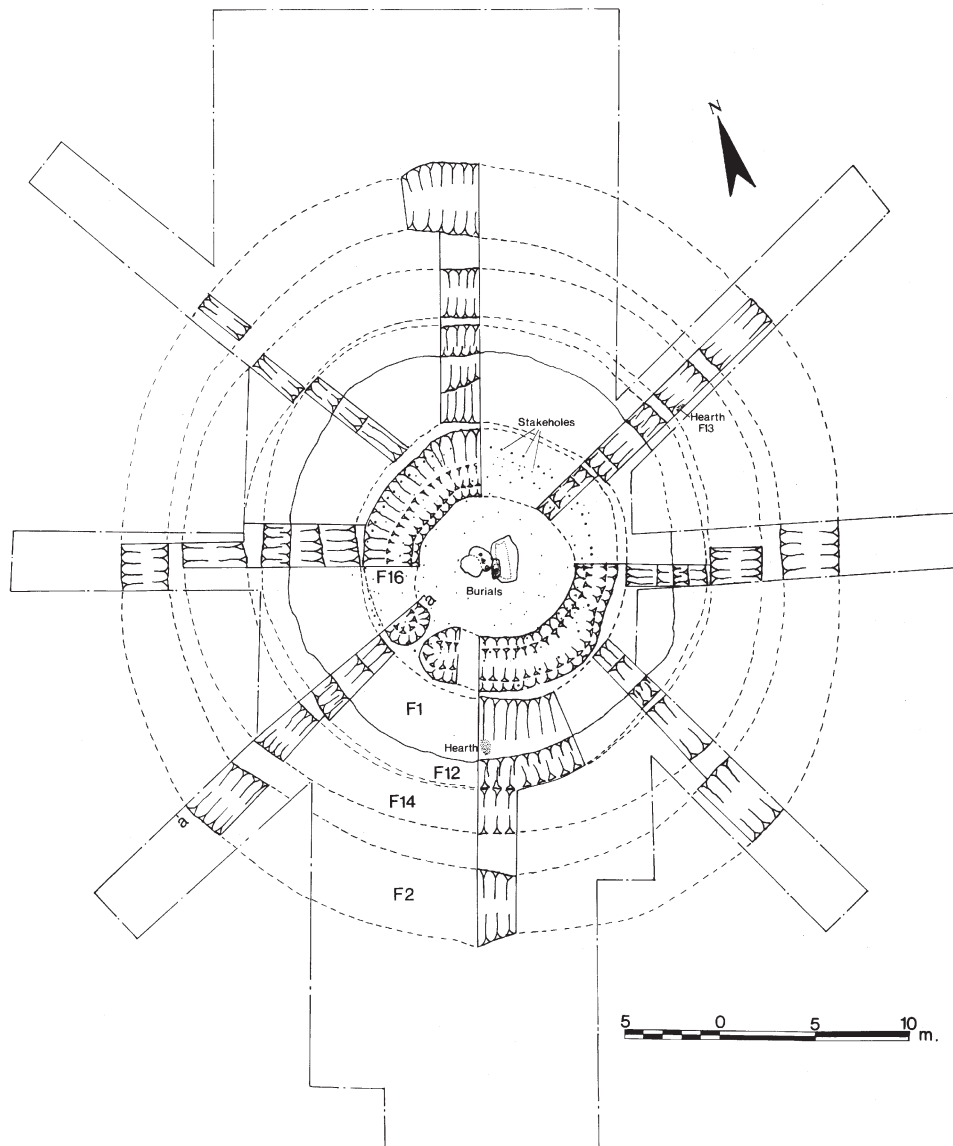


Fig. 2. Plan of the main features of the Eaton barrow excavation, after Clay (1981) (reproduced with the permission of Patrick Clay).

The log coffin burial was cut by an oval pit (F11), containing cremated human bone, a flint flake, a sherd of Beaker pottery and some charcoal. This in turn was cut by another oval pit (F24), 1.4m in diameter and 0.25m deep, which contained one fragmentary piece of bone, suggesting the presence of a crouched burial.

Dating evidence from the sequence of ditches was fairly limited. The 17m diameter innermost ditch (F16) had flint, Beaker and other Early Bronze Age pottery in its fill. In the second ditch (F1), 20m in diameter, a hearth was created after it had partially

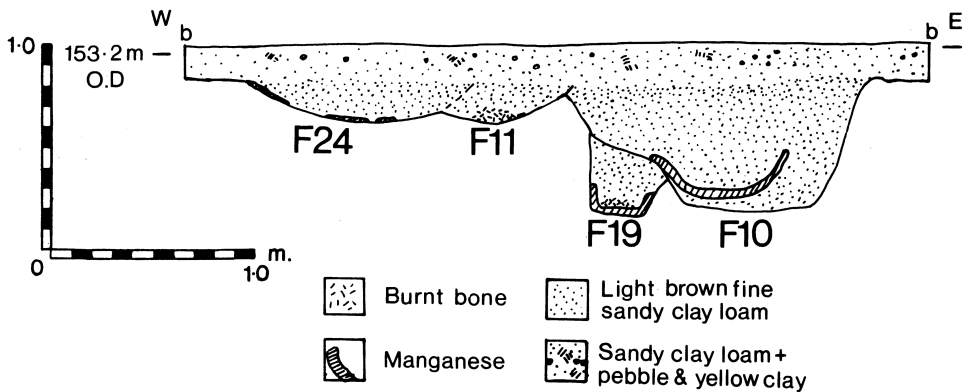
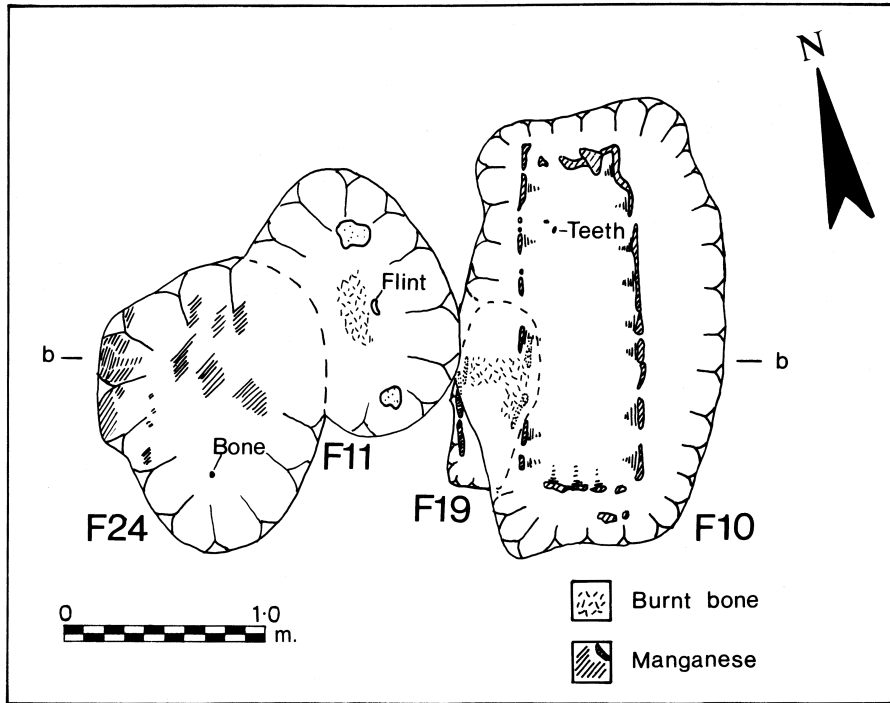


Fig. 3. Plan and section of the central burials at Piper Hole Farm, Eaton, from Clay (1981) (reproduced with the permission of Patrick Clay).

filled up, and in the upper fills were some Early Bronze Age pottery fragments and flints, including two plano-convex knives and a leaf-shaped arrowhead. The third ditch (F12), 30m in diameter, also contained a hearth (F13) with two flint flakes and a sherd of Early Bronze Age pottery, while a plano-convex knife came from

elsewhere in the fill. The fourth ditch (F2), 40m in diameter, contained a few pieces of Bronze Age pottery in its fill.

Radiocarbon dating

Two radiocarbon determinations were obtained soon after the original fieldwork (Table 1). They were both from charcoal; one from the F11 cremation and one from the hearth in the second ditch (F1) (Table 1). As they were obtained fairly early in the use of radiocarbon dating, and were bulked samples for radiometric, rather than AMS determinations, they have a comparatively wide span and cannot be completely relied upon. This potential lack of precision is supported by a comparison with the

Feature sampled	Lab code	Date BP	Cal BC (Probability %)	Substance dated
Piper Hole Farm barrow, Eaton				
Cremation F11	SUERC-64505 (GU39419)	3599 ± 37	2120–2095 (2.5%) 2041–1879 (92.4%) 1838–1830 (0.5%)	Human bone
F10 coffin burial	—	—	2115–1915 cal BC (95.4%)	—
Cremation F19 in box	SUERC-61577 (GU38030)	3669 ± 29	2138–1961 (95.4%)	Human bone
F11 cremation	HAR – 3941	3450 ± 70	1949–1611 (95.1%) 1572–1566 (0.3%)	Charcoal
F1 hearth charcoal	HAR – 3942	3430 ± 80	1938–1595 (90.1%) 1589–1531 (5.3%)	Charcoal
Sproxtton barrow				
Cremation F51 Possible log coffin	SUERC-64506 (GU39420)	3537 ± 37	1965–1751 (95.4%)	Human bone
Cremation F46 in log coffin	SUERC-64507 (GU39421)	3461 ± 37	1886–1688 (95.4%)	Human bone
F46	HAR – 3129	3500 ± 80	2030–1628 (95.4%)	Charcoal
F51	HAR – 3131	3440 ± 70	1940–1608 (94.1%) 1582–1561 (1.3%)	Charcoal
F41 satellite burial	HAR – 3132	3390 ± 90	1922–1497 (95.0%) 1472–1465 (0.4%)	Charcoal
F49 satellite burial	HAR – 3130	3330 ± 90	1877–1840 (3.4%) 1826–1794 (2.4%) 1784–1431 (89.6%)	Charcoal
F64 roothole	HAR – 3133	3220 ± 90	1732–1720 (0.7%) 1693–1279 (94.7%)	Charcoal

Table 1. Old and new radiocarbon dates for Piper Hole Farm and Sproxtton barrows. Calibrated with OxCal 4.2.4.

new dates, especially for the cremation F11, where the body has now been dated several centuries earlier than the charcoal date from the late 1970s. In addition, the charcoal samples included long-lived species such as oak and field maple, which meant that the dates obtained could be earlier than the burning event that charred them. The absence of a clear stratigraphic link between the ditch and the burial sequence also meant that the date from the hearth was not terribly useful for dating the central burial sequence. In other words, it is possible that, as has been found, the barrow ditches may be considerably later than the primary central burial sequence, or, as at Cossington and Lockington, they had been maintained (Hughes 2001; Thomas 2013).

Two new radiocarbon dates were obtained, both of which were from human remains (Table 1, Figs 4 and 5). No viable samples survived from the log coffin inhumation itself, but it was possible to take samples from the earliest cremation (F19) and from the cremation in F11, which was from a feature that cut the log coffin burial pit (Table 1). As these two dates bracket the log coffin burial, it was possible to use Bayesian statistics to estimate the date of the log coffin burial itself (Figs 4 and 5). The date of death for the individual in the primary cremation (F19) was 2138–1960 cal BC (95.4%) (SUERC 61577 3669±29 cal BP), and the date of death for the cremation from F11 was 2120–2095 (2.5%), 2041–1879 (92.4%) and 1838–1830 (0.5%) (SUERC 64505 3599±37 cal BP). The Bayesian modelling suggested a date range for the log coffin burial (F10) of 2115–1915 cal BC (95.4%) (Fig. 6).

SPROXTON

Barrow ‘C’ at Sproxton (SK867278, Leicestershire HER ref MLE 4091) is one of a cemetery of 11 barrows running roughly East–West along the plateau at Saltby Heath (Fig. 1b barrows labelled A–L), many of which have been damaged or destroyed by ploughing, forestry and building work. The Duke of Rutland first investigated Barrow C in the eighteenth century, finding it ‘full of bones’ according to Nichols (1795, 305, fig. 53), who noted two holes from that excavation when he

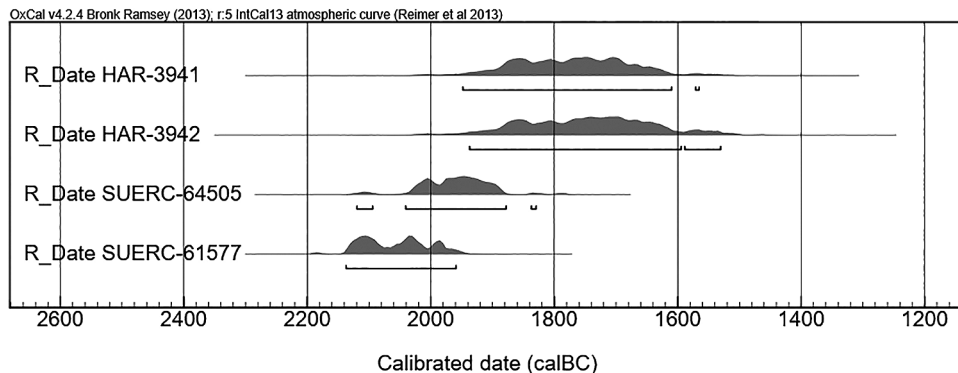


Fig. 4. Radiocarbon dates for Piper Hole Farm, Eaton. Calibrated with OxCal 4.2.4.

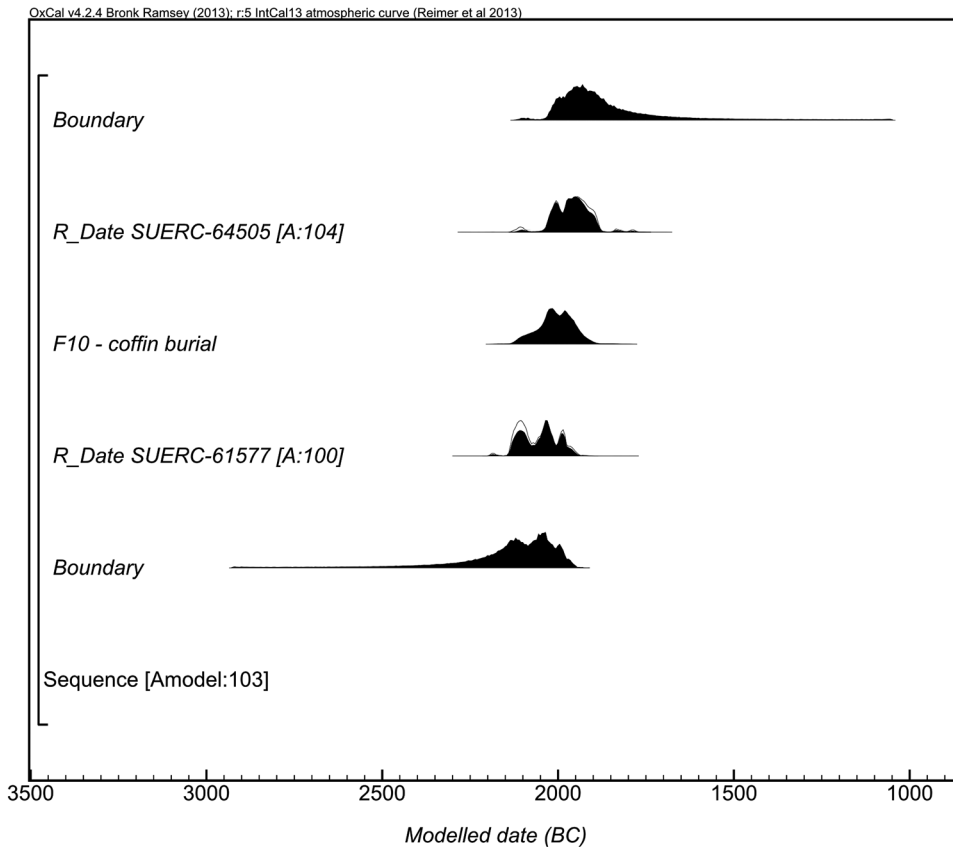


Fig. 5. Chronological model for the burial sequence at Piper Hole Farm, Eaton. Each distribution represents the relative probability that an event occurred at some particular time. For each of the radiocarbon measurements two distributions have been plotted: one in outline, which is the result of simple radiocarbon calibration; and a solid one, which is based on the chronological model used. The probability of the F10 burial has been modelled by its known stratigraphic relationship to the two radiocarbon dated burials.

visited the mound later in the same century. In 1860, Thomas Bateman put a small trench into the mound but found no human remains or other finds (Bateman 1861, 109–11). No finds from any of those investigations survive.

Clay's excavation of the barrow revealed a complex series of events, the first of which was the stripping of turf and the burning of a funeral pyre, possibly supported on four posts. The cremated bone was placed in an oval pit (F46), aligned roughly NE–SW, 0.45m long, 0.35m wide and 0.40m deep (Fig. 7). The cremation, of a mature male, was lying at the bottom of the pit on a carbonised oak base, 0.35m by 0.27m, with 'traces of sides, suggesting the remains of a hollowed log on which the body may have been burned' (Clay 1981, 4). It is perhaps more likely that the deposition of material from the funeral pyre into the log coffin, while still hot,

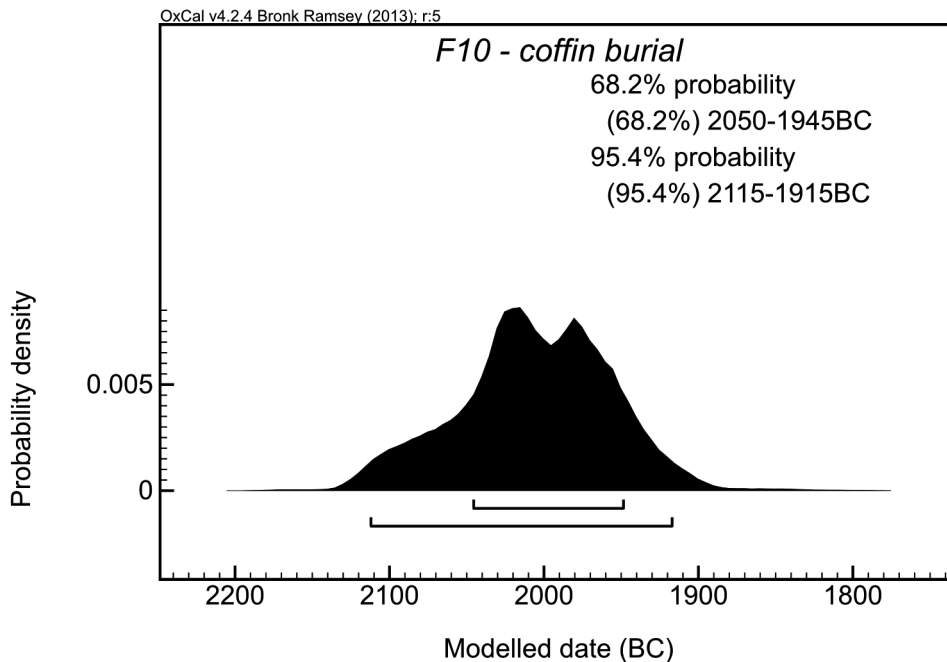


Fig. 6. The relative probability for the F10 burial as determined by the chronological model outlined in Fig. 5.

caused the inside to char and thus be preserved. Bateman's excavation of a nearby barrow (Clay's Barrow A) also found 'masses of charred oak, the grain of the wood perfectly retaining its specific character' (Bateman 1861, 110), which provides a tantalising hint that something similar may also have occurred in that mound.

A small pit (F45) was dug next to the burial but contained no finds. The turves appear to have been replaced as a low mound demarcated by a ring of nine or ten stakes (Fig. 7). Just outside this ring were two other pits, one of which (F54) contained a small sherd of Early Bronze Age pottery and the other (F55) a limestone fragment that may be the remains of a grave marker (Clay 1981, 4–5).

A series of four concentric stake rings were created around the primary burial, eventually covered by a larger mound with a limestone inner and outer kerb. The mound contained 11 sherds of Early Bronze Age pottery and was capped in limestone rubble excavated from a surrounding ditch. Four satellite cremations, all of young adults, were excavated beyond the outer kerb and under the capping. Two of these, that of a young male and a young female in an inverted collared urn, were in pits (F49 and F48) dug underneath the capping. The other two cremations (F41 and F44) were in pits within, but sealed by the capping.

Another cremation was placed in a 0.60m square by 0.35m deep pit (F51), located in the berm between the limestone capped mound and the ditch. The sides of the pit showed signs of burning and the cremated remains of a young adult,

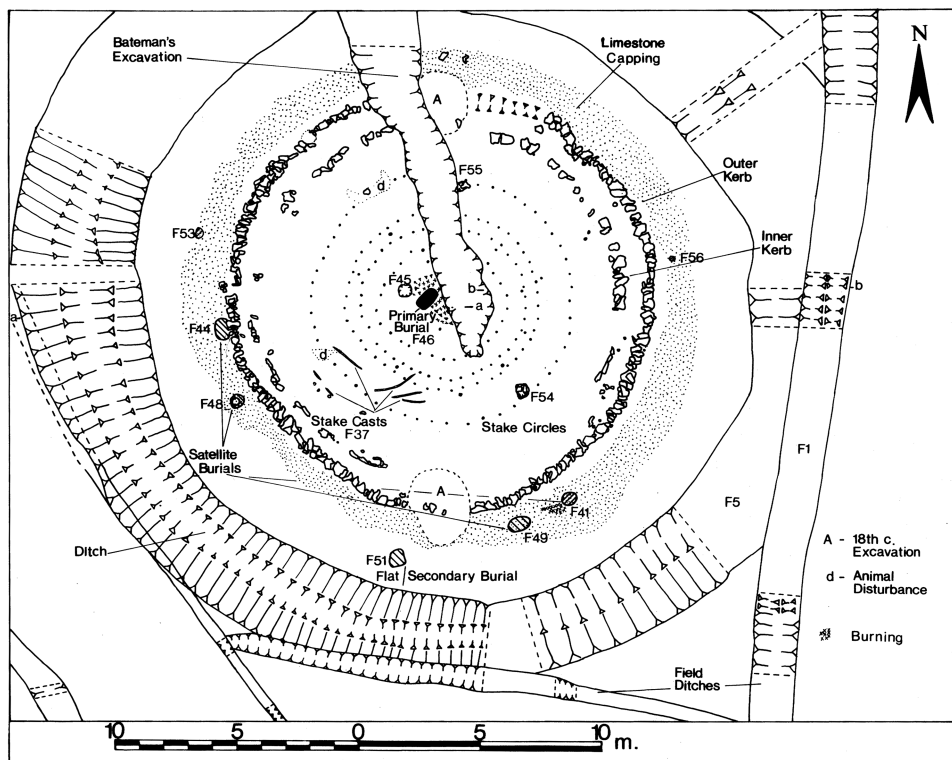


Fig. 7. Plan of the excavated features at Sproxton, after Clay (1981) (reproduced with the permission of Patrick Clay).

probably female, were found associated with a collared urn on a bed of charcoal. Some of the charcoal was in large fragments up to 0.3m long: 'possibly derived from a plank, on which the body may have been burnt, similar to that found with the primary burial' (Clay 1981, 9). This may also represent the poorly preserved remains of a log coffin, although a composite wooden coffin cannot be ruled out. The top of the pit was disturbed and it was therefore impossible to determine where it fitted in the stratigraphic sequence, although it was thought to be of a later phase, after the satellite burials.

Radiocarbon dating

Four radiometric radiocarbon dates were obtained from the burials soon after the original fieldwork (Table 1, Fig. 8). They were all from bulked charcoal, from the primary (F46, HAR 3129), satellite (F41, HAR 3132 and F49, HAR 3130) and secondary burials (F51, HAR 3131). One other date was obtained from charcoal from a roothole in the early land surface (HAR 3133). As was the case with Eaton, they were obtained fairly early in the use of radiocarbon dating, they have a comparatively wide date span and cannot therefore be completely relied upon.

In addition, the charcoal samples included long-lived species such as oak and ash, which meant that the dates obtained could be earlier than the burning event.

Two new radiocarbon determinations were obtained from cremated bones from the primary burial (F46) and from the ‘secondary’ burial (F51). The probable male in F46 died between 1886 and 1688 cal BC (95.4%) (SUERC 64507 3461±67 cal BP), and the date of death for the probable female from F51 was 1965–1751 cal BC (SUERC 64506 3537±37 cal BP) (Table 1, Fig. 8). These results suggest that the ‘secondary’ burial (F51) is likely to be part of the earliest activity on the site, at a roughly similar time to the primary burial or even preceding it.

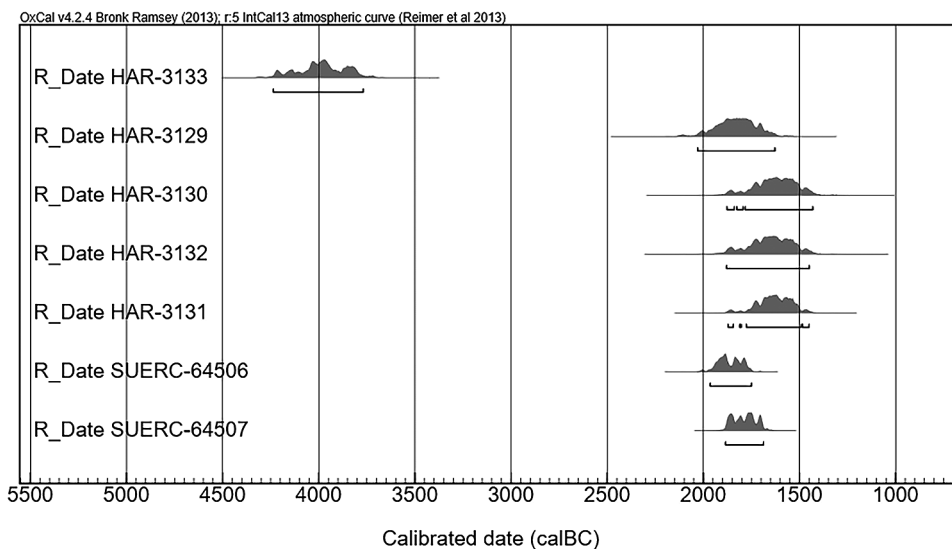


Fig. 8. Radiocarbon dates from the Sproxton barrow. Calibrated with OxCal 4.2.4.

DISCUSSION

The project has shown the value of obtaining new radiocarbon dates to answer specific research questions from significant archaeological archives, now made more possible because of the small sample size required. It has also highlighted the imprecision and unreliability of radiocarbon dates obtained in the 1970s. This has been seen at other sites studied in the project, and it is the opinion of the principal authors (Bunning and Jones) that dates from before *c.*1979 are potentially misleading and are relatively worthless for the degree of precision required in the present day.

The barrows from Eaton and Sproxton produced four possible log coffin burials, three containing cremations and one an inhumation. Of these four, it is possible that the three cremations were contained in wooden coffins made of planks rather than hollowed out coffins, because the surviving evidence, in the form of charred wood or wood surviving by manganese oxide replacement, was inconclusive. The size

and tapering shape of the wooden container for the inhumation (F10) in the Eaton barrow, and the presence of bark, suggests that burial was indeed in a log coffin.

Although all ages and both male and females have been identified (Parker Pearson *et al.* 2013, 36), the majority of burials found within log coffins have been recorded as being of adult males. The Leicestershire evidence is more varied with a young adult (F19) and an adolescent (F10), both of indeterminate sex, from Eaton, and from Sproxtton a mature male (F46) and a young adult, probably female (F51). The relatively small number of accompanying grave goods fits with the wider national pattern (Melton *et al.* 2013, chapter 4). Despite the fact that some log coffin burials are accompanied by ‘high status’ artefacts including copper alloy daggers, many are without grave goods or are accompanied by a more humble range of artefacts.

Cremated remains are fairly commonly found in association with log coffins (*ibid.*, 53–65), although they are more frequent in southern Britain and especially in the Wessex region, where examples include sites at Latch Farm and Bishop’s Waltham and in Hampshire (Piggott 1938; Ashbee 1957). Indeed, the Wessex area has produced evidence for a variety of rites associated with log coffins (Jones, Brunning and McKinley 2017), and burials of this type appear to be less standardised than those found in other areas, such as East Yorkshire, where the majority of identified burials are single inhumations (for example, Melton *et al.* 2013; Jones, Brunning, Keefe and Holst 2017). The evidence of Sproxtton and Eaton suggest that the Leicestershire tradition more closely resembles that of Wessex to the south rather than Yorkshire to the north. There are perhaps localised differences too. At both sites, the log coffin burials are found under barrows associated with other forms of non-log coffin burial, and at both there is evidence that they were multi-phased. This makes them similar to other recently excavated sites in Leicestershire, many of which appear to have been remembered and used over several centuries (Hughes 2000; Finn 2011; Thomas 2013).

The new dating evidence for these four probable log coffin burials places them firmly in the Early Bronze Age, with the two from Sproxtton occurring perhaps a century later than the Eaton ones. Both log coffins and burials in composite wooden coffins are known from this period in the UK (Brunning 2007, 297–302; Melton *et al.* 2013, chapter 4). With the notable exception of the recently dated Late Bronze Age log coffin from Rylstone (Melton *et al.* 2016), this date is consistent with the majority of the 21 reliably dated log coffin burials from the UK (Parker Pearson *et al.* 2013, 41; Jones, Brunning and McKinley 2017). The two possible log coffin burials at Sproxtton are towards the end of the Early Bronze Age log coffin burials in the UK and at least 250 years after its dated inception.

This project has shown the value of obtaining new scientific dates, providing more precise and more reliable probable time periods for the log coffin burials than was previously possible. The Leicestershire log coffin examples can now be more accurately placed within that burial tradition in the UK. This is of especial interest because of the new ADNA data, which shows that during the early Bronze Age, 95 per cent ($\pm 2\%$) of the Neolithic gene pool in the UK was replaced by migrants from continental Europe associated with the Beaker artefact package (Olalde *et al.* 2018). The new arrivals had different skin and eye pigmentation than the Neolithic

population (*ibid*) and brought with them different burial customs, amongst which were log coffin burials.

ACKNOWLEDGEMENTS

We would like to thank the British Academy for funding the log coffin dating project. Helen Sharp, of Leicestershire County Council, was a huge help in granting permission for the dating, and in sampling and dispatching samples. Her assistance is greatly appreciated. The dating was undertaken at the SUERC laboratory in Glasgow under the supervision of Gordon Cook, with Bayesian modelling by Tony Krus.

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