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East Chisenbury Midden 2015–17: further investigations of the late prehistoric midden deposits, enclosure and associated settlement

by Phil Andrews

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After a gap of almost two decades further investigations were initiated at this remarkable late prehistoric midden site, supported by Operation Nightingale/Breaking Ground Heritage. Geophysical survey clarified the extent of the broadly contemporary enclosure surrounding the midden, as well as other related features, while subsequent excavations provided new information on the midden, the enclosure and settlement. Two small trenches in the northeast half of the midden revealed a different sequence and produced far fewer finds than the 1992–3 excavations in the southwest half, demonstrating that it is not a homogeneous mound. A substantial ditch and associated bank, largely levelled by the late Roman period, may have been contemporary with or pre-dated the early development of the midden, while some 150 postholes attested to the presence of numerous roundhouses and other structures within the enclosure. Overall, a date range of c. *1000–500 cal. BC and possibly later is suggested from radiocarbon dating and pottery, the main phase of midden development perhaps later than the majority of the settlement. Furthermore, recent results of radiocarbon dating of material from the earlier excavations suggest the site sequence may continue as late as* c. *400 cal. BC. Radiocarbon dating of the few human remains has also highlighted the likelihood that some were curated, the probable intervals between the dates of death and deposition ranging from a few decades to three centuries. Finds and environmental assemblages are generally consistent with those previously found, but a few sherds of scratch cordoned bowl represent a significant new discovery, as does a unique copper alloy 'pendant' of possible continental origin. Evidence now indicates that cattle, as well as sheep and pigs, were intensively managed and slaughtered on site, with the isotope data suggesting local origins for most of the animals, though some cattle may have been raised on pasturage further afield.*

Introduction

The circumstances of the (re)discovery of this important, perhaps unique Late Bronze Age–Early Iron Age site have been fully described in an earlier article in this journal (McOmish *et al.* 2010, 37–40). What also comes across clearly both from the description of the small-scale 1992–3 excavations and the detailed discussion of the site which follows is the vast quantity of finds present in the mound—approximately 17,300 finds (including 77kg of pottery and 26kg of animal bone) were recovered from the 13 cubic metres of deposits excavated—and,

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by inference, the very substantial cost involved in fully analysing even a small percentage of such an assemblage. It is probably this more than anything else that has discouraged further excavation of this remarkable but enigmatic and relatively poorly understood monument.

Therefore, for almost two decades after the 1992–3 excavations the site was left, fenced but unscheduled as it was not under any immediate threat from farming or military activity. However, an increase in burrowing by badgers in recent years prompted further investigations, initially to simply recover finds which had been brought to the surface of the mound as a result of burrowing, but in 2015–17 with the aim of learning more about particular aspects of the monument. The investigations since 2011, carried out in conjunction with the Defence Infrastructure Organisation (DIO), have also provided an ideal opportunity for injured service personnel participating in Operation Nightingale to learn and develop a range of archaeological skills, with logistical and other support from Breaking Ground Heritage (BGH). In addition, Chisenbury midden has provided a site where young people taking part in John Egging Trust (JET) projects can get actively involved in archaeology.

The site

The site of East Chisenbury midden (NGR 414600 153250) is located towards the northern limit of the Salisbury Plain Training Area, at a height of 143m OD, some 600m northeast of the village of East Chisenbury and 12km north of Amesbury (Figure 1). The midden mound itself is monumental in scale and forms a noticeable hill at the end of a spur of Upper Chalk geology which protrudes on a northeast to southwest alignment into the valley of the River Avon, some 3km south of and providing panoramic views over the Vale of Pewsey. Clay-with-flints has been recorded beneath the monument in previous investigations (Norcott 2006; McOmish *et al.* 2010, 46) but is not mapped in the immediate area by the British Geological Survey (sheet 266). The area generally supports thin calcareous rendzina soils.

The surviving midden mound has been shown to be almost 3m deep in the centre and covers an area approximately 150m in diameter, the western side defined by a complex of lynchet features thought to post-date the mound (McOmish *et al.* 2010, 40).

Archaeological background, *by David Norcott*

In relatively recent years a number of sites of a previously unrecognised type have been discovered in and around the Vale of Pewsey, Wiltshire of which that at East Chisenbury is one of the best examples. These sites have been referred to as 'middens', although archaeologically speaking this is not precisely accurate (e.g. Needham and Spence 1996), but which seems to have become a commonly used descriptive term and so will be used here also.

These sites all share similar characteristics: dating from the Late Bronze Age/Early Iron Age or 'Earliest Iron Age' *c.* 800–600 cal. BC (Needham 2007), they are composed of dark, seemingly organic deposits and are extremely rich in artefacts. The deposits are generally very extensive—for example at East Chisenbury they were found to be up to 2.7m deep, covering approximately two hectares and with a remaining volume in excess of 40,000 cubic metres (McOmish 1996; McOmish *et al.* 2010, 40; Wessex Archaeology 2008). They seem to represent a chronologically and functionally discrete phenomenon in later prehistoric society, but despite some detailed analyses they are still poorly understood in terms of formation processes and function.

The sites also share similarities with several others throughout southern England; broadly contemporary extensive 'dark earth' type deposits have been investigated at Runnymede Bridge, Berkshire (Needham and Spence 1996) and Brean Down on the Somerset coast of the Severn Estuary (Bell 1990). Very recently potentially similar sites have been discovered even further afield, at Llanmaes in the Vale of Glamorgan (Madgwick and Mulville 2015) and Whitchurch in Warwickshire (Waddington and Sharples 2011).

Although work on these sites is by no means extensive, results from Potterne (Lawson 2000), East Chisenbury (McOmish *et al.* 2010), All Cannings Cross and Stanton St Bernard (Barrett and McOmish 2009; Tubb 2011) suggests that the Wessex midden sites (and potentially similar sites further afield) share a common factor in the package of activities which lead to the build-up of large quantities of material. These activities, some of them seasonal, included animal husbandry (probably very intensive in nature), exchange, and conspicuous consumption/feasting on a grand scale (Madgwick 2016).

Small-scale excavations carried out in 1992–3

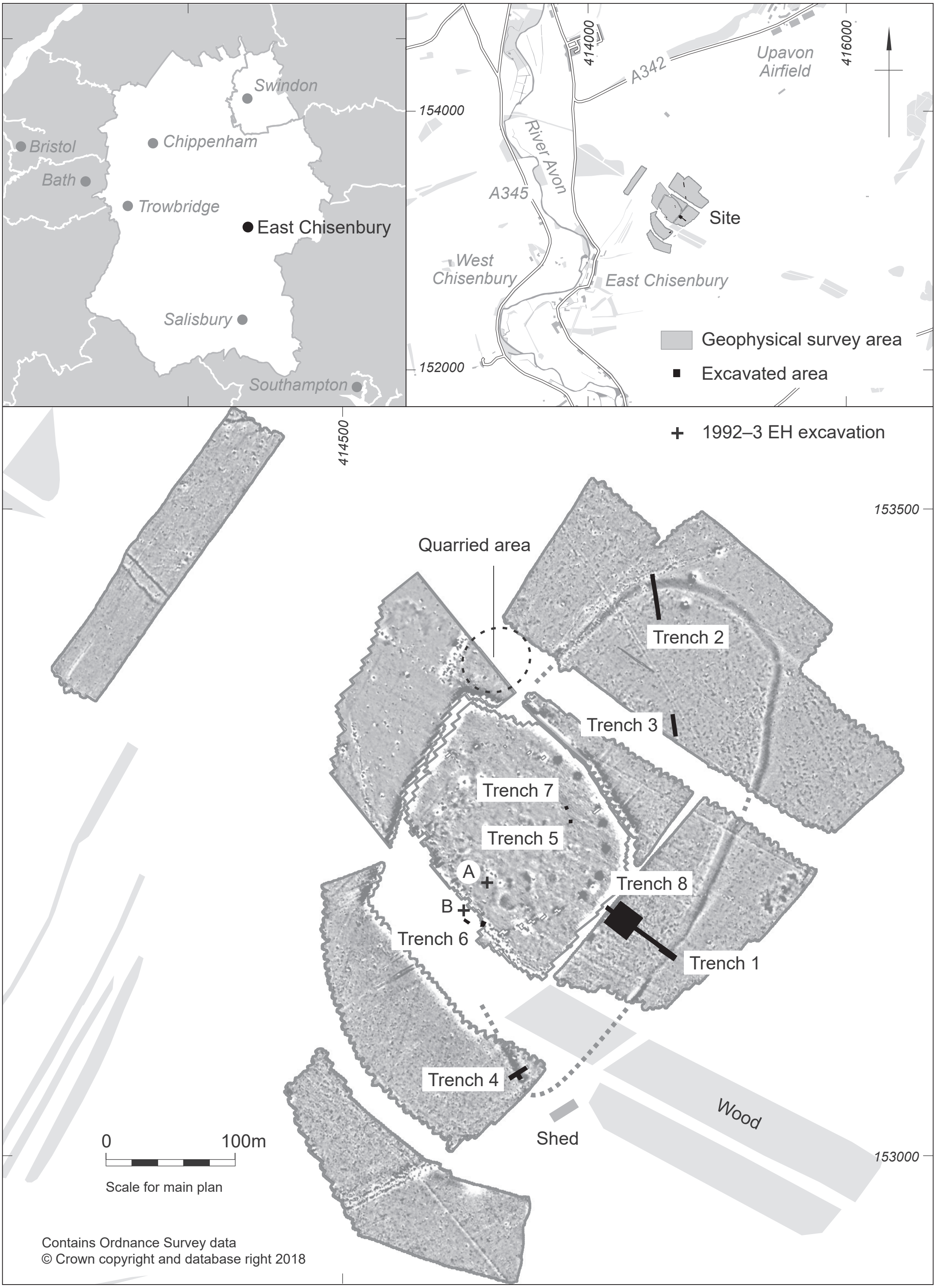

Fig. 1 Site location, showing magnetometry results

in the southwestern part of the midden at East Chisenbury revealed chalk 'floors' within the deposit, as well as hearths and a series of postholes and stakeholes at the base. The evidence suggested that the midden probably accumulated between around 850–600 BC and that a substantial component of the site comprises disposed domestic rubbish (McOmish *et al*. 2010).

At East Chisenbury a large oval or elliptical enclosure immediately surrounds—and is possibly partially overlain by—the midden itself, although prior to 2016 no formal investigation had previously been carried out upon the generally slight earthwork that survives (McOmish *et al.* 2010, 42, fig. 3). The absolute chronological relationship between the enclosure and the midden remained unresolved, however it was thought possible that this embanked enclosure may also have been associated with settlement. A contemporary, adjacent settlement does seem to have existed at the considerably smaller midden site at Westbury (Wessex Archaeology 2004).

Located to the northwest of the midden at East Chisenbury are a number of well-preserved strip lynchets (Monument No. 220476), and it has also been suggested that possibly as many as six linear ditches and a pit alignment converge on the midden itself (McOmish *et al.* 2010, 90).

A study of these midden sites conducted as part of a post-graduate dissertation (Norcott 2006) suggested that geophysical survey of them (and possible subsequent targeted excavation) would be a useful further step in understanding the middens in their immediate context.

Research questions

There is a great deal left to learn about these enigmatic sites, but examples of some of the main questions that can be addressed at East Chisenbury are:

- Was the midden built up *in situ* by occupation/animal husbandry or other activity, or does it represent transported and dumped deposits?
- What activities are indicated by the artefactual and environmental evidence from the deposits?
- What is the relationship of the midden to the enclosure shown in the previous earthwork and geophysical surveys?
- Is there evidence for contemporary archaeological activity away from the midden itself, either internally or externally to the enclosure ditch?
- Is there evidence of exploitation of the midden as a horticultural resource?
- Are the deposits revealed in the previous small-scale excavations typical of the midden as a whole?
- Are there archaeological settlement features within or below the midden, as suggested by previous excavations?
- What is the distribution and function of the 'chalk floors' thought to be present within the midden?
- What is the geographical origin of the livestock remains at the site? Are there indications of non-local animals being brought to the site?

This list is by no means exhaustive but is intended to provide an indicative framework. It was anticipated that the investigations in 2015 – 17 would address several of these questions and allow others to be refined. Furthermore, East Chisenbury midden is under consideration for designation by Historic England. As such, there is a requirement to establish the nature of surviving deposits and provide the DIO with cultural heritage data on the site which will enable them to consider any designation aspirations and facilitate future required management regimes of the area.

Geophysical survey, *by Nicholas Crabb*

Surprisingly perhaps, East Chisenbury midden had not previously been the subject of any geophysical prospection and so in the winter of 2015 a gradiometer survey was undertaken which covered the midden itself and a significant area around and beyond it (Wessex Archaeology 2016). In total, the survey covered approximately 13.91 hectares, extending across various areas of what is now rough open pasture but avoiding several tracks, fences and scrub or woodland (Figure 1).

The anomalies identified as being of archaeological interest were primarily ditch- and pit-like features. The most significant amongst these was a large curvilinear ditch that appears to encompass the midden, though the full circuit could not be determined due to the presence of areas of trees and scrub, and no entrances were apparent. The location of this ditch corresponds closely to a very slight bank recorded earlier which defines the northern, eastern and part of the western extent of the enclosure (McOmish *et al.* 2010, 41–42, fig. 3) but, in addition, there was a short length of a strong linear anomaly that looked as though it might possibly define the extent to the south, where no bank survived. There were also several areas of increased magnetic response within the circuit of the probable enclosure ditch, perhaps reflecting settlement activity rather than specific features.

The results from the midden mound itself are notable for the absence of definable archaeological features (two partially complete concentric circles of discrete anomalies reflect modern posts defining its approximate extent). Given the nature of the deposits that form the midden, rubbish deposition over many decades to a height of approximately 3m, and the nature of the archaeological features underlying the midden—scatters of postholes and hearths, it is not surprising to see little in the gradiometer results. The depth range of the gradiometer is approximately 1m in ideal conditions and, therefore, it is likely that any relatively substantial archaeological cut features present in this area lie beyond the detection range of the gradiometer. As a result, in 2016, a relatively limited ground penetrating radar survey comprising several linear transects was undertaken over parts of the mound to better understand the depth of material, and possibly detect any buried surfaces that may be present. As chalk surfaces had been identified in 1992–3 (McOmish *et al.* 2010) it was hoped that further evidence of such remains might be revealed, but the results proved to be equivocal and it was not possible to clearly identify any distinction between deposits, most likely due to their mixed and disturbed nature. However, it is possible that a more extensive survey, with an alternative antenna frequency could reveal additional, deeply buried features/deposits.

Approximately 150m northwest of the midden the gradiometer survey revealed two parallel linear ditch-like features, tentatively suggested to be part of a larger 'Wessex Linear' system probably dating to the Late Bronze Age–Early Iron Age (Bradley *et al*. 1994). Their alignment broadly corresponds with that of a ditch and pit alignment recorded approximately 100m to the southeast during a watching brief some years ago when the hard track on the west side of the midden was constructed (McOmish *et al.* 2010, 51). In addition, several anomalies identified as being of possible archaeological interest were revealed, these most likely representing former field boundaries as well as evidence for historic cultivation.

Excavations

Work in 2011–15 comprised almost entirely the collection of unstratified material from badger burrowing within the midden mound, largely along the southwestern edge where disturbance was most intense (e.g. the area designated trench 6, see Figure 1)—the finds being recovered from the badger spoil by either hand excavation or by sieving through a 10mm mesh (the spoil was also scanned with a metal detector). Relatively large quantities of finds including pottery, animal bone and worked flint were collected and processed each year but have not been further assessed or analysed.

Also, in late 2015, a small number of test-pits were dug within the wooded area immediately to the southwest of the midden. Most were dug to shallow depth, not reaching natural, and the results are mainly noteworthy because they produced some Romano-British material.

Investigations in 2016 and 2017 were undertaken on a larger scale, each excavation season spanning two weeks in July and September respectively, and involving up to 20 or so people.

The investigations in 2016–17 (Figure 1), apart from recovering further material from badger spoil (trench 6), had three principal points of interest: very limited work on the midden mound itself (trenches 5 and 7), recording sections through the enclosure ditch and bank (trenches 1, 2 and 4), and exposing settlement remains—specifically structural features—within the enclosure (trenches 1, 2, 3 and 8). The precise locations of the 2016 trenches (trenches 1–7) were determined by the results of the geophysical survey and/or visual inspection of the ground conditions. Trenches 5 and 7 in the midden were 1m square and hand dug, while trenches 1–4 were machine excavated, 1.8m wide and between 15m and 60m in length. The 2017 investigation (trench 8) comprised an open area excavation (20m by 20m) focused on the concentration of postholes uncovered in trench 1 in 2016. The results of the 2016 work were set out in an evaluation report (Wessex Archaeology 2017), but those from 2017 have not been separately reported on and are included together here with those from 2016.

Natural deposits and soil sequence

Natural Clay-with-flints was encountered in all but trench 4, between 144m above Ordnance Datum (OD) in trenches 1 and 2 in the east and north of the site respectively and 146m OD in trenches 5 and 7

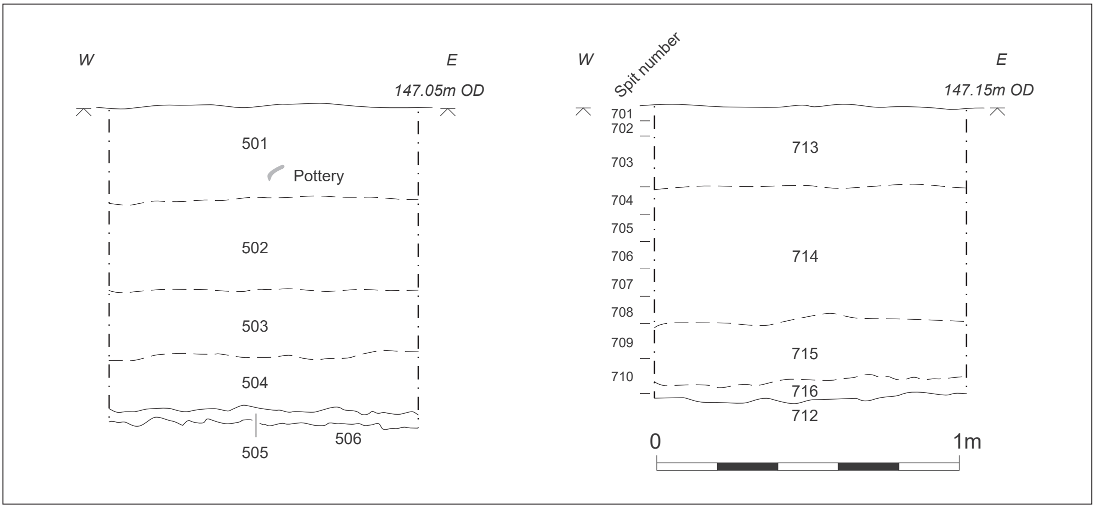

Fig. 2 Midden sections (trenches 5 and 7)

towards the centre of the midden. Where penetrated by archaeological features this reddish orange superficial deposit was seen to be approximately 0.1–0.3m thick and overlay Chalk. In the south of the site natural Chalk was exposed at 141.50m OD in trench 4. Overall, natural deposits were located at a depth of between around 0.2m (trench 2) and 0.9m (trench 4) below the current ground surface.

The natural stratigraphic sequence of the site was seen to vary somewhat, particularly between midden and off-midden areas. On the midden, the topsoil was typically a dark greyish brown or dark brown silty loam up to 0.3m thick which overlay what has been interpreted as colluviated midden material. Off midden, the topsoil was a mid-greyish brown silty clay loam 0.1–0.4m thick, with subsoil (where present, in trenches 1 and 4) 0.3–0.5m in depth. The subsoil towards the northwest end of trench 1 was a dark greyish brown silty clay loam and contained a notable quantity of finds, reflecting material eroded from the adjacent midden, whereas in trench 4 it was a mid-yellowish brown silty clay loam with relatively abundant small chalk fragments and largely devoid of finds.

Midden mound

Trench 5, a 1m^2 test pit, was targeted on an area approximately half-way between the deepest parts of the midden and its eastern edge (Figure 1), as estimated by the 2008 auger survey (Wessex Archaeology 2008), and on a side of the site not previously explored. The main aims of the test pit were to see whether 'intact', finely layered, artefact-rich midden deposits similar to those recorded by McOmish *et al.* (2010) were present in this part of the monument, and to determine the presence or absence of cut features below the midden material. After turf removal, the test pit was dug in spits of 100mm, in anticipation of the need to three-dimensionally record the expected large numbers of archaeological finds. In the event however, artefacts were relatively sparse (only 529g of pottery, for example).

As expected from preliminary auger probing, deposits overlying geology were approximately 1m in depth (Figure 2). The uppermost deposit was a former (modern) ploughsoil (501), overlying largely homogeneous dark greyish brown silt loams with bands of worm-sorted inclusions and artefacts (502–505), interpreted as probable colluviated midden material with worm-sorting (see Wessex Archaeology 2017 for detailed soil descriptions of trenches 5 and 7). This overlay Clay-with-flints (506) and Chalk geology; no cut features were present in the base of the trench.

Trench 7, the second 1m^2 test pit, was undertaken following completion of trench 5, in order to test whether the results there might or might not be typical of this (eastern) side of the midden mound. It was located 15m to the NNE of trench 5, approximately equidistant between the highpoint and edge of the midden (Figure 1).

The results were broadly similar to those from trench 5, with a modern former ploughsoil (713) overlying largely homogeneous dark greyish brown silt loams with coarser material worm-sorted down profile (714–716), the latter interpreted as probable colluviated midden material (Figure 2). However, unlike the sequence recorded in trench 5, there was no evidence for separate phases of ploughing and subsequent stabilisation here. The midden material directly overlay Clay-with-flints (712) and Chalk geology, again with no features cutting natural. Possibly also of note is that this test-pit produced rather more pottery (2257g) than trench 5, though still substantially less than anticipated, but including the only scratch cordoned bowl sherds yet found at Chisenbury (three small pieces; see below). Also, from context 708, in the lower third of the sequence, came a unique copper alloy 'pendant' (ON 14; see below).

Together, the results from the trenches 5 and 7, including the absence of chalk surfaces, do seem to indicate that this area of the midden is significantly different to that previously explored on the west side. There were two apparent phases of accumulation in trench 5 and subsequent long periods of stabilisation, as indicated by the worm-sorting of material. This would normally be taken to indicate two widely spaced phases of ploughing activity. However, given the known badger activity on the site, and the lack of two deposition episodes in trench 7, it is quite possible that the uppermost of these accumulation phases in trench 5 is actually a result of badger upcast. More generally, whilst the wider context of the deposits recorded remains speculative, it can be said with some confidence that the deposits within the midden extents are more heterogeneous than previously suspected.

Enclosure

Trench 1 was primarily intended to investigate a section of the presumed Late Bronze Age/Early Iron Age enclosure ditch, which appeared from the results of the gradiometer survey to be slightly narrower here than elsewhere (Figure 1).

The earliest material present was a small but moderately dense assemblage of struck flint of probable Late Bronze Age date, from layer 110 towards the southeast end of the trench. This reddish brown clayey silt deposit, limited in extent, formed part of the uppermost fill of a fairly substantial, undated tree-throw hole (151) which, though not fully exposed, measured 4.40m by at least 1.90m and was approximately 1m deep (Figure 3). Tree-throw hole 151 was probably oval in plan, with somewhat irregular sides and a rounded base, and was largely filled with fragmentary chalk containing lenses of brown loamy soil, the upper deposit being particularly compact.

The final fill of tree-throw hole 151 on the northwest side was a compact bioturbated chalk (109), cut by what may have been a NNW–SSE alignment of three or more small postholes, two of which (162 and 164) were excavated. The date and function of these postholes are unclear, but it is thought most likely that they pre-dated the enclosure bank (see below). They could have been related to it, but their alignment is at variance to its projected course, and there is nothing that would suggest they are later.

Late prehistoric enclosure ditch 149 was exposed at the southeastern end of the trench, where the ground surface began to drop away slightly. The trench was widened here in advance of hand-excavation to allow stepping of the sides as necessary and, although a complete ditch section was not achieved, the base was reached in two places allowing a complete profile across the feature to be reconstructed (Figure 3).

Enclosure ditch 149 was approximately 6.5m in width, with an additional 2.5m wide shallow step on the inside. The purpose of this 0.3m deep step is unclear, though it may have functioned as a berm, the material from it being used to increase the height of the bank. The ditch itself was 1.80m deep, the base projected to have a slightly rounded profile, with the sides fairly steeply sloping, that on the outside (to the southeast) flaring slightly towards the top.

The ditch fills comprised a fairly straightforward sequence, though only a very limited quantity of finds was recovered to help date this, the majority comprising fragments of animal bone with most layers containing no pottery or only occasional small abraded sherds. At the base of ditch 149 was a layer of chalk (180) up to 0.20m thick which represented material eroded from the ditch sides. Above this was a distinctive, homogeneous deposit of grey loamy clay (131), 0.40m thick, which contained very little chalk and may have accumulated in wet conditions, though no lamination was apparent. The middle fills of the ditch (128, 129, 130) may all represent slumped or levelled bank material, layer 130 mainly comprising loose small–medium sized chalk (<100mm), whilst 128 and 129 were yellowish brown/grey brown clay loams containing relatively little chalk, the three layers together up to 0.85m thick. These were sealed by a noticeably darker deposit (127) which contained abundant small chalk fragments, and though undated it was directly overlain by a similar very dark greyish brown silty clay loam (111), again with common small chalk

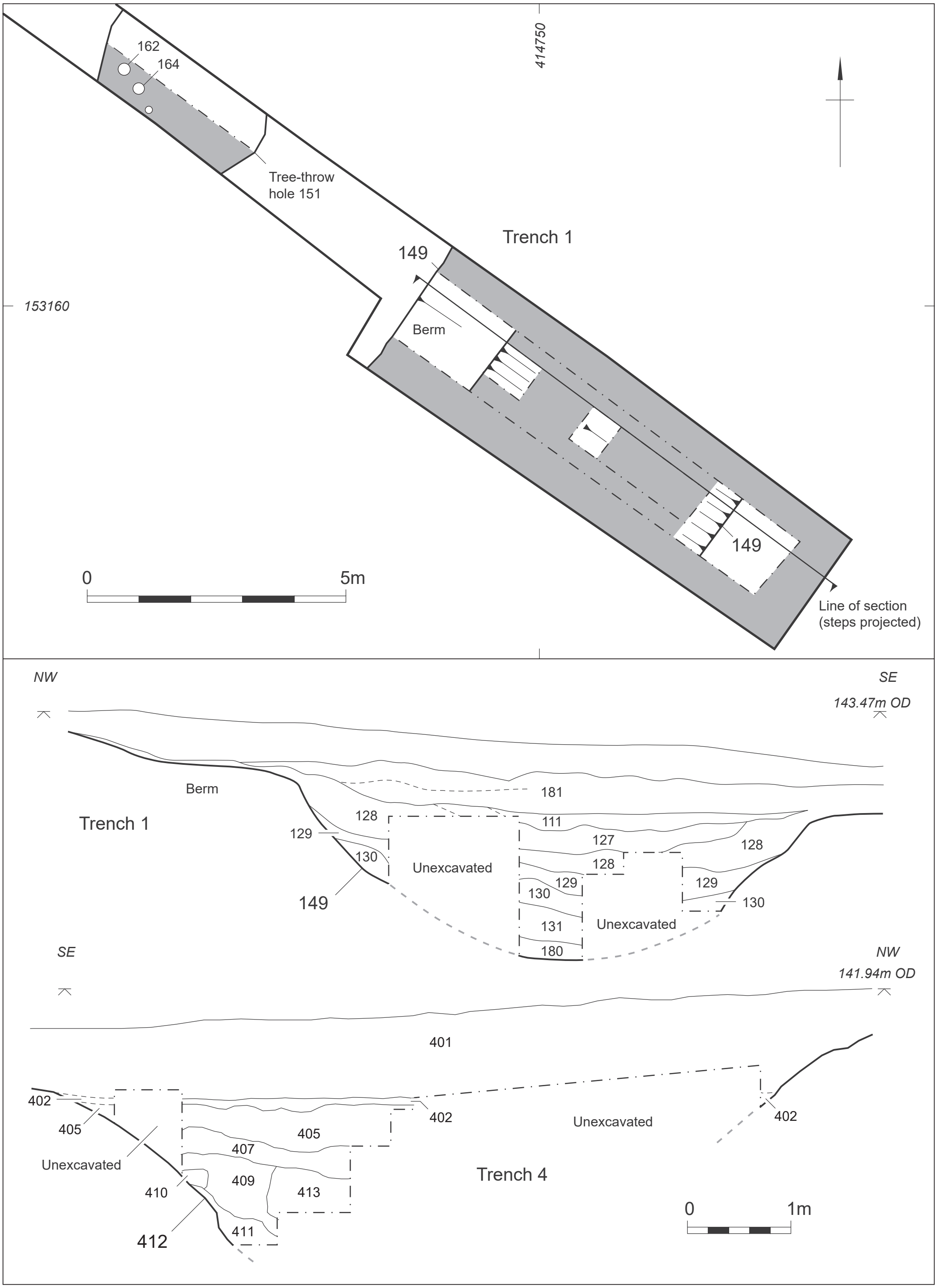

Fig. 3 Plan and sections of enclosure ditch (trenches 1 and 4)

inclusions, which produced a small assemblage of late Romano-British pottery. The presence of this material provides a clearly dated horizon within the uppermost part of the ditch, showing this section at least to have become largely infilled by the 3rd–4th centuries AD. The final fills comprised a relatively substantial layer of pale brown silty loam (182) up to 0.50m thick which extended across virtually all of the ditch, interpreted as a medieval or later deposit, possibly colluvial in origin and deriving from agricultural activity, and (181), on the inside of the ditch, perhaps the last remnant of a levelled bank.

Although the earlier English Heritage earthwork survey identified vestiges of a bank in this area (McOmish *et al*. 2010, fig. 3), none was visible in 2016, though this may in part have been due to the height of the vegetation. Certainly, no earthwork or related deposits were apparent in the section exposed in trench 1. However, that there had been a bank here was indicated by a band of 'clean' natural Clay-with-flints which extended from the northwestern edge of ditch 149 to just beyond (earlier) tree-throw hole 151, a distance of a little over 10m. Here it can be surmised that the presence of the bank inhibited bioturbation, which to the northwest of this 'clean' zone was reflected in the slightly darker colour of the surface of the natural with noticeably more root and worm holes. A similar pattern was noted on the inside of the ditch in trench 2, where some bank material also survived (see below).

Trench 2 was positioned across the northern extent of the enclosure boundary ditch, clearly visible in the gradiometer survey (Figure 1) and where English Heritage had recorded a low but clear bank in their earthwork survey (McOmish *et al*. 2010, fig. 3). However, because of the height of the grass these earthworks were difficult to make out at the time of the 2016 excavation, though they may have suffered further denudation by ploughing during the intervening 25 years or so.

At the north end of the trench was ditch 207, its location corresponding with that on the geophysical survey, a substantial feature which formed part of the enclosure recorded in trench 1 and trench 4. Ditch 207 was not excavated but was up to 8.75m wide with evidence for a bank on the inside. The principal fills were pale reddish brown silty clay loams with moderate flint and some small chalk inclusions, but on the inside (south) was a similar layer, 2m wide, that contained abundant chalk fragments, possibly levelled or eroded bank material, or a shallow step or berm as recorded on the inside of the enclosure ditch in trench 1.

In trench 2 the location of an internal bank up to 11m wide was indicated by a combination of a relatively 'clean' zone of natural Clay-with-flints, where it had been protected by the bank, and some surviving bank material. A thin patch of yellowish brown silt may have been the remnant of a buried soil, and this was overlain by a dark greyish brown soil with a band of reddish chalky silt and some gravel, which in turn was sealed by a layer of redeposited chalk 1.80m wide. These layers were together up to 0.25m thick, are thought to be the last vestiges of the remaining bank.

Trench 4 to the south of the midden was targeted on a substantial and very clear ditch-like geophysical anomaly, only traceable for 25m or so because of woodland to the northwest and a track and a shed ('Archie's shed') to the southeast (Figure 1). It was thought that the size and alignment (northwest to southeast) could make it part of the enclosure ditch recorded in trenches 1 and 2, but the possibility that it was a modern, military feature was also considered. No earthworks were recorded here in the earlier English Heritage earthwork survey (McOmish *et al*. 2010, fig. 3).

Excavation of a trench across the anomaly confirmed that it was a large ditch and though there was very little dating evidence, the profile and fills make it likely that it was part of the late prehistoric enclosure. Ditch 412 was not fully excavated but was demonstrated to be approximately 10m wide, with straight sides sloping at approximately 45°, and at least 1.8m deep (Figure 3). Unlike the ditch in trench 1, and possibly that in trench 2, there was no shallow step or berm on the inside to the northeast.

The lowest fills and base were not reached, but layer (411) on the southwest side represented an accumulation of weathered and eroded chalk. Above this was a succession of secondary and tertiary deposits which contained very sparse finds, mainly fragments of animal bone with virtually no pottery. These layers mostly comprised a very similar sequence of deposits, generally dark greyish brown clay loams with variable but low quantities of small chalk fragments, none of which clearly represented redeposited or levelled bank material. Also, there was no evidence for a Romano-British horizon as was clearly identified towards the top of the fill sequence in the ditch in trench 1.

Settlement

Between the enclosure ditch and the southeast edge of the midden 1 was an area of increased magnetic response indicated by the geophysical survey,

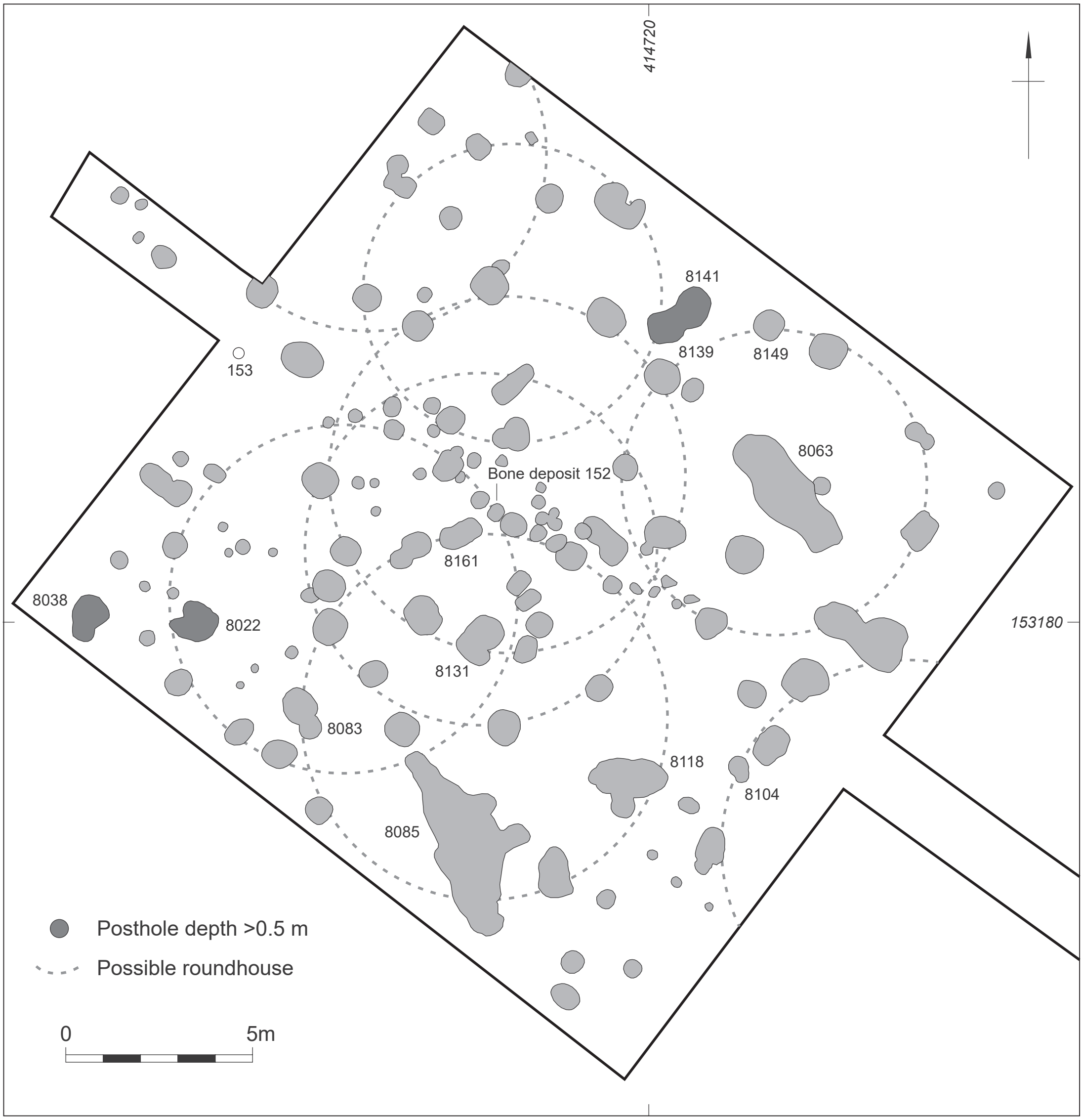

Fig. 4 Plan of postholes, indicating possible roundhouse (trenches 1 and 8)

thought possibly to represent an area of occupation, and so in 2016 trench 1 was positioned to cross this area as well as the ditch (Figure 1). The topsoil was darker and the finds more abundant at the northwest end of the trench, the soil colour lightening and the quantity of finds present decreasing noticeably over a distance of 20m or so, most probably reflecting material washed and/or ploughed off the midden rather than *in situ*, disturbed midden material. Some 30 postholes were recorded approximately 20m from the postulated inside edge of the bank, of which 21 were excavated. Due to the narrow nature of the trench it was not possible to define any coherent structural plans amongst this group of postholes, more than two-thirds of which were concentrated within a 10m long area just over 10m from the northwest end of the trench. However, it was clear from several intercutting postholes that a sequence of structures was represented, and it was decided, therefore, that a more extensive area (trench 8) should be opened and investigated in 2017 to better understand the structural sequence (Figure 4). The description below incorporates the results in this area in 2016–17, though it should be noted that a few smaller postholes (< 0.15m diameter) may have escaped attention in the area excavated in 2017 as this was not subject to the same level of exhaustive cleaning as had been carried out in 2016.

In total, approximately 140–150 postholes were identified and planned, of which two-thirds were excavated, these comprising virtually all of the medium and large examples as well as a representative sample of the smaller ones. Nothing that might be interpreted as a pit was identified.

Of the excavated postholes, most were sub-circular or sub-oval, with some rather more irregular in plan. The smallest excavated example measured 0.30m long by 0.25m wide and the largest (8022) 1.21m by 0.92m. Posthole 8022 was also the deepest at 0.60m, with other examples ranging from 0.16m in depth upwards. The average depth was approximately 0.33m, with 24 less than 0.25m deep, 72 were 0.25–0.50m deep, and just four at more than 0.50m deep. Many postholes, particularly the larger examples, had flint packing, and a number also had evidence for having held at least two posts, several clearly representing the replacement of one post by another.

Other than the flint packing in some of the postholes, the fills were generally consistent mid- or dark greyish brown silty clay loams with varying amounts of fine to medium sized chalk and flint inclusions. Most produced small quantities of pot and animal bone, a little worked flint and, rarely, other finds (e.g. bone points from posthole 8131 and tree-throw hole 8085, and ceramic spindlewhorls from 8118 and 8149), though virtually all of these are likely to have found their way into the features following the removal of the posts. Only in a very small number of cases can the finds be interpreted as representing deliberate deposition, for example the two flint hammerstones in posthole 8083, the cattle scapula in the base of 8022 (the largest of the postholes) and the deposit of sarsen stone almost completely filling shallow posthole 8104.

Making sense of the numerous postholes in coherent structural terms was not as straightforward as was anticipated would be the case following the limited excavation in 2016. However, the large number did at least confirm the presence of multiple structures of more than one phase in the 400 square metre area exposed. Furthermore, some attempt has been made to identify roundhouses with diameters of 7–8m with varying degrees of success (Figure 4), though alternative arrangements might be discerned; no four-post structures were apparent. For this exercise the smaller, unexcavated postholes were excluded, as well as those less than 0.25m deep. Eight possible roundhouses are highlighted in Figure 4, including several overlapping sequences. Of the four structures which lay wholly within the excavation area, only one has what may have been a central post and none has a clearly defined entrance or porch.

One aspect of interest is that virtually none of the four or five most substantial postholes, 8022, 8038, 8139 and 8141, fitted the plans of any of the eight roundhouses defined, and it might be surmised that they held free-standing posts. As has been noted above, posthole 8022 was the largest and part of a cattle pelvis had been placed on the base, possibly after the post was removed as the bone had not been crushed. Posthole 8038 in the eastern corner represented a succession of two posts, with 8139 and 8141 to the northeast showing a similar sequence, both with clearly defined post-pipes approximately 0.3m in diameter.

In addition to the postholes there was a shallow scoop (153) containing the truncated remains of a pot. One other feature worthy of note was a small but discrete deposit of animal bone (152) immediately to the northwest of posthole 159 (Figure 4). This deposit was approximately 0.40m in diameter and 0.10–0.15m high, seemingly having been placed on the ground rather than in a small pit; although it rested directly on the surface of the natural, no trace of a cut could be identified. If deposit 152 had been placed on the ground rather than in a small pit or posthole, then no contemporary or other surfaces were apparent, here or anywhere else, and no hearths survived. However, the remnants of a thin, possible 'occupation spread' (8065) were present approximately 4m to the south of deposit 152, identified by a slightly higher concentration of animal bone. Deposit 152 comprised largely cattle bone, but amongst it were three fragments of human skull, two with evidence for trauma (see Egging Dinwiddy, below).

Two, relatively large but irregular and generally shallow features, 8063 and 8085, are considered most likely to have been tree-throw holes, the latter with some animal burrows to the south. As far as could be ascertained, the tree-throw holes appeared to pre-date several postholes in the vicinity.

Further evidence for settlement, though perhaps the remains of another, much smaller midden deposit, was present in trench 2, immediately to the south of the remains of the enclosure bank at the north end of the enclosure (Figure 1). Layer 202, again represented by an area of increased magnetic response in the geophysical survey, overlay natural and was up to 0.1m thick. It is interpreted as an 'occupation deposit' that built up against the bank and contained a moderate quantity of late prehistoric pottery, animal bone and a limited range of other finds. Layer 201 at the south end of the trench was probably part of the same (truncated) deposit as 202 and contained a similar assemblage of material though in slightly larger quantity. The removal of layers 201 and 202 revealed only one feature, a small square posthole (208), but it was not certain whether it was sealed or cut layer 202; also, its form did not closely resemble any of the late prehistoric postholes recorded in trench 1 and, therefore, it is possible that it was a relatively modern feature.

Trench 3, just 15m long, was located in the centre towards the northeast end of the enclosure, just north of a modern track, in an area where no geophysical anomalies were apparent (Figure 1). The aim was to confirm whether this area was devoid of archaeological features as the gradiometer suggested, or whether small, undetectable features such as postholes were present.

Topsoil in trench 3 was very thin, no more than 0.3m thick, and it was clear that the area had suffered some truncation from ploughing in the past. Some later prehistoric pottery was recovered from the topsoil but only three small possible features were present. Two of these were possibly the result of animal burrowing, while a shallow posthole partly exposed on the east side of the trench was undated.

Finds

Worked flint, *by Phil Harding, with Kathy Garland*

The worked flint assemblage is quantified in Table 1, ordered by artefact type and by trench. The results show that artefact density is relatively low, with most material recovered from features in trenches 1 and 8. The largest individual totals were collected from context 110, which represents the upper fill of a tree-throw hole pre-dating the enclosure bank. The remaining material was collected predominantly from postholes. Artefacts were relatively rare in midden trenches 5 and 7, with increased quantities from the badger scrapes (trench 6; badger disturbed material recovered in 2017 has not been included). Sample sieving produced broadly the same range of pieces though, unsurprisingly, increased the number of chips recovered.

The assemblage is dominated by primary or secondary flakes, which accounted for 94% of the collection when chips are excluded. Removal was by hard hammer percussion with no clear emphasis of refined platform preparation. Only one flake core was found, but two hammerstones were present in posthole 8083. Artefacts are mostly in mint condition, unpatinated or only lightly patinated.

Retouched material comprises three end scrapers from tree-throw hole 110, and two flakes with miscellaneous retouch. This catalogue of technological features and retouch forms is characteristic of Late Bronze Age assemblages, a

Table 1: Worked flint by artefact type and trench

Trench	No of contexts	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	**Total**
1	24	-	3	1	4	91	51	1	-	3	1	2	1	158
2	3	-	3	1	1	33	47	-	3	-	-	9	-	97
3	3	-	-	-	-	12	6	-	-	-	-	-	-	18
4	5	-	-	-	-	17	5	-	-	-	-	-	1	23
5	4	-	-	-	-	4	2	-	-	-	-	2	-	8
6	4	-	1	-	-	20	17	-	-	-	1	1	-	40
7	7	1	-	-	-	9	2	-	-	-	-	-	-	12
8	46	-	-	1	-	83	15	-	2	1	5	-	3	110
8*	9	-	1	-	1	25	5	1	62	-	-	-	-	91
Unstrat	1	-	-	-	-	1	-	-	-	-	-	-	-	1
Total		**1**	**8**	**3**	**6**	**291**	**150**	**2**	**67**	**4**	**7**	**14**	**5**	**558**

Key:
1) Cores 2) Blades 3) Broken blades 4) Bladelets 5) Flakes 6) Broken flakes 7) Rejuvenation flakes 8) Chips 9) Scrapers 10) other tools 11) Debitage 12) Misc retouch
* Recovered from soil samples (210 litres)

conclusion substantiated by the associated Late Bronze Age–Early Iron Age artefact assemblages. This is also reflected in the rather larger assemblage of worked flint (1043 pieces) excavated in 1992–3, which comprised a similar range of material (Field 2010, 81–3). This period of British prehistory marks a stage when flint working was in decline but was retained for some basic scraping, piercing and cutting activities. Assemblages from the period can include residual material, however excavations across much of southern England (Ford *et al.* 1984) including contemporary settlements (Harding 1992) and midden deposits (Healy 2000) have made it possible to define collections of similar composition, condition and character.

None of the individual groups from 2016–17 are of sufficient size to justify detailed analysis, nevertheless the entire collection retains interest as an additional example documenting flint working of relatively late date that is in a mint, unpatinated condition.

Pottery *by Briony A. Lalor*

Introduction

Assessment of the pottery from the 2016 excavation identified the majority of the assemblage (97.6% by weight) as being of Late Bronze Age/Early Iron Age date, the remainder comprising almost exclusively Romano-British material (Wessex Archaeology 2016; see below).

The opening of trench 8 in 2017 over an occupation area provided the opportunity to undertake analysis of the prehistoric pottery recovered from both here and trench 1, the latter partly subsumed within trench 8. The features here comprised almost entirely postholes, in addition to the enclosure ditch.

Pottery from 'occupation deposit' 201 in trench 2 at the north end of the enclosure was also examined, as was the assemblage from trench 5 within the midden itself. Material from trench 6 (badger-disturbed midden) and trench 7 (midden) was subject to a rapid scan.

Methods

The pottery from trenches 1 and 8 was examined macroscopically to identify the main inclusions present, and then a x10 hand lens and binocular microscope were used to make finer distinctions between fabric types. The assemblages from trenches 2 and 5 were not subjected to this level of analysis but were simply grouped according to their main tempering agents.

The fabrics were allocated a code based upon the dominant inclusion in the fabric following the Prehistoric Ceramics Research Group (PCRG) guidelines (2010). Full descriptions of the fabrics and examples of each are available in the archive.

Fabrics

A range of fabrics was identified including nine flint-tempered (FL01–09), seven quartz-tempered (QU01–07), one chalk-tempered (CH01), one shell-tempered (SH01), two limestone-tempered (LI01 and LI02) and one (a single sherd) grog-tempered (GR01). Where the sherds were too small for the fabric to be identified, the codes FL0, QU0 or U were utilised. The majority of the U fabrics are small sherds recovered from samples. It is recognised that because of the generally small size, and lack of joining sherds, that some of these fabrics might be amalgamated.

The flint-tempered fabrics all have a quartz element and are generally hard fired. FL03 and FL05 also contain glauconite pellets, while FL06 includes a moderate amount of mica. The majority of the flint is moderately to well sorted and generally fine, with the bulk being between 0.5–3mm with very rare pieces up to 5mm. FL09 has very sharp flint making it rough to the touch.

Within the quartz-tempered fabrics, QU03 and QU04 contain glauconite pellets, though QU04 also contains a variety of rare to sparse mixed inclusions (flint and shell). QU03, QU06 and QU07 all contain mica. QU01, QU05 and QU07 contain rare mixed inclusions which are probably incidental rather than deliberate tempering.

The one chalk-tempered fabric (CH01), represented by two sherds from posthole 8038, is extremely hard fired. The shell fabric (SH01) appears to be tempered with fine shell, some of which appears fossilised. Limestone fabric LI01 is tempered with oolites, whilst LI02 has larger, more frequent limestone grits as well as fossilised shell, and is not as hard fired. One grog-tempered sherd was recovered from posthole 8011.

Results

In total, 1021 sherds weighing 6.970kg, with a mean sherd weight (MSW) of 6.8g, were recovered from trench 8. Additionally, 420 sherds weighing 1.794kg (MSW 4.3g) were included from trench 1. Overall, this amounts to 1441 sherds weighing 8.764kg (MSW 6.1g) for the excavated 'occupation area'.

The majority of sherds are only lightly abraded, suggesting little movement has taken place since deposition. In comparison, the largest sherds recovered from unstratified upcast from badger setts within the midden have a MSW of 100–110g and exhibit little abrasion.

Fabric analysis for trenches 1 and 8 (Table 2) shows that 60% of the sherds by number (871) and weight (5.246kg) are flint-tempered, with quartz-tempered sherds accounting for 30% by number (427) and 32% by weight (2.848kg). Limestone-tempered sherds make up just 2% by number (30) and 3% by weight (258g), whilst shell-tempered ware comprise 4% by both number and weight (53 sherds, 320g). Only two chalk-tempered sherds were recovered, weighing 16g.

Trench 2 yielded 623 sherds weighing a total of 3.867kg (MSW 6.2g; abrasion is light to moderate). Of these, 372 (60%) weighing 2.908kg (75%) came from 'occupation deposit' 201. Flint-tempered sherds make up 83% of the total recovered while only 9% are quartz-tempered (Table 3). When considering layer 201 only, flint-tempered sherds account for 82% by number (304) and 86% by weight (2.509kg), with quartz being 11% by number (40) and 8% by weight (221g). The remaining sherds comprise shell- and chalk-tempered fabrics.

In comparison, all the pottery recovered from trench 5, within the midden, is quartz-tempered, apart from one flint-tempered sherd from context 505 just above the Clay-with-flints natural.

The number of diagnostic sherds recovered is limited (Table 4), with only one almost complete profile being recovered, from posthole 8061 (Figure 5, 1). With the exception of distinctive sherds from furrowed bowls (Figure 5, 2), positively identified forms are limited, however a biconical bowl was identified from posthole 8016 (Figure 5, 3).

The 102 rim sherds (5% of the assemblage) all have rim percentages of less than 10%. Of these, 19 came from trench 1 and 59 from trench 8. Of the 24 rims from trench 2, all but one came from layer 201. The majority of rims from 201 are flat-topped, with the exception of two hooked rims, one of which has an unusual profile (Figure 5, 4). No hooked rims came from trenches 1 and 8, where most of the rims were simple rounded types (Figure 5, 5–5, 6) or with a slight internal bevel (Figure 5, 7).

Of the 43 base sherds, nine came from trench 1, 10 from trench 2 and 24 from trench 8. These sherds show a variety of finishes including vertical finger wiping, smoothing and pinching, with five having heavy flint gritting, a Late Bronze Age/Early Iron Age phenomenon, on the underside of the bottom. Finger pinched sherds came from scoop 153, tree-throw hole 8085 and posthole 8090.

Surface finishes from Trench 8 include smoothing, wiping and vertical finger wiping, with the majority of sherds having no specific finish. Burnishing occurs on 70 sherds, with no

Table 2: Prehistoric pottery fabrics by number and weight (grammes) from the postholes and other features in trenches 1 and 8

Fabric	**Tr 1 No**	**Tr 1 Wt**	**Tr 8 No**	**Tr 8 Wt**	**Total No**	**% No**	**Total Wt**	**% Wt**
FL0	45	28	-	-	45	3	28	0.3
FL01	102	567	225	1514	327	23	2081	24
FL02	13	66	59	408	72	5	474	5
FL03	4	7	26	231	30	2	238	3
FL04	82	519	169	1091	251	17	1610	18
FL05	-	-	17	92	17	1	92	1
FL06	3	10	3	18	6	0.4	28	0.3
FL07	2	7	38	291	40	3	298	3
FL08	4	12	51	180	55	4	192	2
FL09	7	55	21	150	28	2	205	2
Flint Total					**871**	**60%**	**5246**	**60%**
QU0	8	5	-	-	8	0.5	5	0.05
QU01	58	204	210	1379	268	19	1583	18
QU02	19	122	70	518	89	6	640	7
QU03	2	15	31	205	33	2	220	3
QU04	-	-	15	299	15	1	299	3
QU05	2	9	8	77	10	0.7	86	1
QU06	2	7	1	5	3	0.2	12	0.1
QU07	-	-	1	3	1	0.07	3	0.03
Quartz Total					**427**	**30%**	**2848**	**32%**
LI01	-	-	8	59	8	0.5	59	0.7
LI02	-	-	22	199	22	2	199	2
Lime-stone Total					**30**	**2%**	**258**	**3%**
GR01	-	-	1	2	1	0.07	2	0.02
CH01	-	-	2	16	2	0.1	16	0.2
SH01	10	87	43	233	53	4	320	4
Other Total					**56**	**4%**	**338**	**4%**
Unident	57	74			57	4	74	0.8
TOTAL	**420**	**1794**	**1021**	**6970**	**1441**		**8764**	

Table 3: Prehistoric pottery fabrics by number and weight (grammes) from trench 2 (all contexts and 'occupation deposit' 201 only)

Fabric	**Tr 2 No**	**%**	**Tr 2 Wt**	**%**	**Layer 201 No**	**%**	**Layer 201 Wt**	**%**
CH	7	1	39	1	7	2	39	1
FL	515	83	3229	84	304	82	2509	86
GR	2	< 1	32	1	0	0	0	0
QU	55	9	287	7	40	10	221	8
SH	44	7	280	7	21	6	139	5
Total	**623**		**3867**		**372**	**60**	**2908**	**75**

obvious pattern as to which fabrics were likely to be burnished; however, no limestone-tempered sherds are burnished. A slurry was found on five sherds, while 17 sherds have some form of red (possibly ferrous oxide) finish, but these are not always burnished. Red-finished sherds, some from carinated and furrowed bowls, came from tree-throw holes 8063 and 8085, and postholes 8006, 8032, 8038, 8057, 8080, 8088, 8100, 8104, 8143 (Figure 5, 8), 8147 and 8175, scattered across the site.

The majority of sherds from trench 1 have no specific finish. A few are smoothed or wiped, six have an applied slurry, 11 are burnished and only two sherds have a red finish. The overview of the trench 2 material shows the majority of the sherds to have no specific finish; no burnished sherds were identified and only a few have a red, unburnished finish. A few sherds have a slurry which covered the flint temper.

Decorated sherds are limited in number. Trench 8 has only 22 sherds (2%) with some form of decoration, trench 1 has four sherds (0.9%), and trench 2 a further four decorated sherds (0.6%).

The decorative styles can be summarised as: finger nail or finger print impressions (16 examples), some on cordons or carinations; incised or scored patterns (7), four of which appear to be from rough furrows; three well finished furrowed sherds; and two with cordons and pinching. One flint-tempered sherd from layer 201 has bird bone impressions, and a grog-tempered sherd from posthole 8011 has an impressed corded pattern, suggesting both derive from Beakers of the Early Bronze Age.

Decoration of note includes an incised triangle infilled with diagonal hatching (Figure 5, 9), from posthole 8006; sherds from a possible jar with an applied, finger pinched cordon (Figure 5, 1), from posthole 8061; and a small sherd with incised horizontal lines and a dot and triangle pattern from posthole 138 (not illustrated). Significantly, three small, abraded sherds of scratch cordoned bowl were recovered from trench 5 within the midden, one from layer 501 at the top of the test pit and two from layer 504, 0.75–0.95m down, 0.10m above the Clay-with-flints natural (Figure 5, 10). This distribution may be a result of worm sorting; however, these are the first scratch cordoned bowl sherds to have been identified from the midden material.

Discussion

The analysis of the pottery from the 1992–3 excavation of the midden deposit (Raymond 2010) clearly places the assemblage within the Late Bronze Age/Earliest Iron Age transition, with the lower layers of the midden showing a strong plain ware affinity.

Table 4: Numbers of rim, body and base sherds from trenches 1, 2 and 8

Trench	Rims	Body	Base	Total
Tr 1	19	392	9	420
Tr 2	24	589	10	623
Tr 8	59	938	24	1021
Total	**102**	**1919**	**43**	**2064**

Raymond's (2010) analysis of the fabrics showed flint, sand, iron ore, mica, chalk, organic filler, glauconite-limonite, shell, fossil shell, limestone and ooliths to be present, mirroring those that were identified at Potterne by Morris (2000, 140). The creation of a fabric series for the 2016–17 excavations at Chisenbury provides further evidence for this variety of tempering agents and indicates that some of the vessels (or the raw materials) were imported from further afield. This is particularly evident from the glauconitic inclusions which originate from the greensands in the Vale of Pewsey and the limestone tempers probably from the outcropping of oolitic limestone in the Bath area (Morris 2000, 140).

Changes in temper over time were originally highlighted by Raymond (2010). The lowest horizons of the midden, where evidence of occupation was identified, were dominated by a flint/quartz mix (82% in trench A and 83% in trench B), with only 16% quartz and shell and 9% micaceous sand. Over time this flint/quartz mix declines with micaceous sandy wares becoming dominant (65% in the central deposits to 94% in the upper deposits of trench A).

In trenches 1 and 8, 60% (by both number and weight) of the temper in the assemblage comprises a flint/quartz mix, suggesting that the period of occupation was during the time when the central deposits of the midden (contexts 9–15 in trench A; McOmish *et al*. 2010) were being laid down. Trench 2, however, shows 83% of sherds to be flint/quartz-tempered (84% by weight) with 82% (86% by weight) coming from layer 201, 'the occupation deposit'. This suggests that this was broadly contemporary with the lower levels of the midden deposits (contexts 18–20 in trench A).

This chronology is further supported by the radiocarbon dates obtained from animal bone in trenches 1/8 and 2 (see Table 6). Animal bone from context 140 in posthole 139 is dated to 971–826 cal. BC, while that from deposit 152 provided a similar date of 919–817 cal. BC. In trench 2 the animal

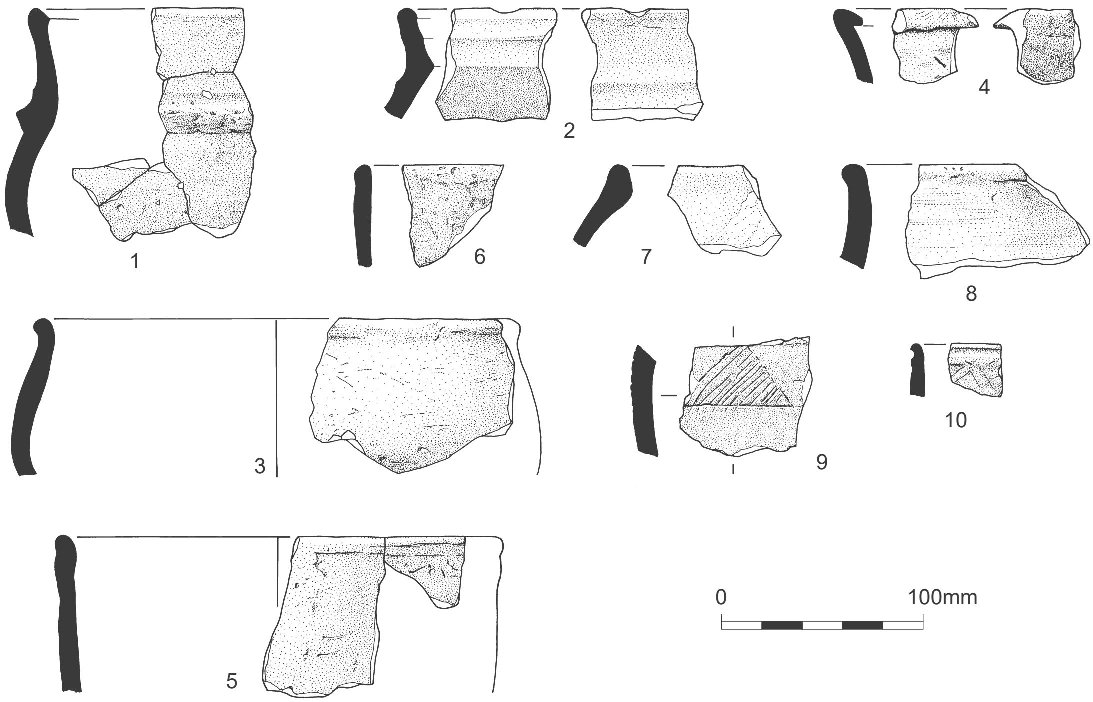

Fig. 5 Pottery (details in catalogue)

bone and human bone from 'occupation deposit' 201 provide very similar dates of 1043–907 cal. BC and 1044–910 cal. BC respectively.

The chronology for the plain ware tradition within Wessex, as highlighted by Barrett (1980; 309, 314), is complex, with the dating evidence suggesting that it continued at least into the 9th century BC.

The more highly decorated All Cannings Cross forms appear around 800 BC, and are also evident at Potterne. The Early All Cannings Cross decorated wares are dated from 850–600 BC and comprise red-finished bowls with carinations, cordons and furrowed shoulders and necks. The chalk-filled incised decoration from this series, which indicate a date in the 9th–8th centuries BC (Morris 2000, 166), was entirely lacking from trenches 1–4 and 8, but sherds were recovered from the midden (trenches 5 and 7).

During the later All Cannings Cross period the larger decorated jars became less common and the furrowed bowls more predominant with the necks becoming longer. The limited number of sherds with red coating, decoration and furrows suggests that that the occupation area in trenches 1/8 and 2 was established prior to the beginning of this Early All Cannings Cross style continuum.

Although the midden deposits at Potterne and All Cannings Cross have been well documented, occupation sites for this transitional period within Wessex have been less common. Nevertheless, Battlesbury hillfort (Ellis and Powell 2008) and Houghton Down (Cunliffe and Poole 2000) both provided assemblages for the Earliest Iron Age and placed in Cunliffe's (1984, 234) ceramic phases of CP1 (i.e. 8th–7th centuries BC) and CP2 (i.e. *c.* 600–*c.* 470 BC).

Three sherds of scratch cordoned bowl from trench 5 are part of the All Cannings Cross–Meon Hill group which developed in the Early Iron Age (Cunliffe 2005, 99). Produced in central Wessex the bodies of these fine, red-finished bowls are decorated by cordons and geometric patterns scratched on the surface after firing. More recently, at Barton Stacey, scratch cordoned bowls were recovered from an occupation site with a significantly earlier, secure radiocarbon date of 790–530 cal. BC (De'Athe 2013; Jones 2013, 17).

Raymond (2010, 68) highlights that material belonging to this later stylistic series 'was entirely absent' from trenches A and B of the 1992–3 midden excavations, as well as from the unstratified material recovered. This led to the conclusion that activity at the midden ceased by the end of the 6th century BC. However, the recovery of three sherds of scratch cordoned bowl in 2016 might suggest that the midden at East Chisenbury continued in use for a longer period than originally thought.

Catalogue of illustrated sherds (Figure 5, 1–10)

1. Shouldered vessel with slightly out-turned rim, bevelled internally. Pinch decorated, applied cordon at neck and shoulder junction; fabric FL01; Pottery Record Number (PRN) 69, context 8017, posthole 8016
2. Furrowed bowl with round topped, flaring rim and furrows internally and externally. Internal and external surfaces oxidised and well burnished; QU05; PRN 90, context 8101, posthole 8100
3. Biconical bowl (Type 1 Potterne) with simple rounded rim, burnished shoulder externally and coarse wiped internally; QU01; PRN 32, context 8017, posthole 8016
4. Internally hooked rim, poorly finished externally with coarse horizontal wiping internally; FL01; PRN 201, context 201, occupation deposit
5. Simple upright rounded rim with coarse, horizontal wiping externally with burnt residue externally; FL01; PRN 10, context 8007, posthole 8006
6. Plain upright rounded rim externally and straight internally; FL03; PRN 148, context 148, posthole 147
7. Shouldered vessel, upright rounded rim with slight internal bevel; QU1; PRN 03, context 8007, posthole 8006
8. Simple rounded rim, slightly thickened externally, burnished externally with incipient furrows and possible red finish; QU02; PRN 108, context 8144, feature 8143
9. Decorated shoulder sherd with incised geometric motif of triangle with infill of diagonal lines and horizontal border above and below. Burnished internally and externally; QU1; PRN 07, context 8007, posthole 8006
10. Fine scratch cordoned bowl with rounded rim, slight horizontal cordon with zig-zag scratched motif below, burnished red coating internally and externally; QU03; PRN 501, context 501, midden deposit

Romano-British and later

The bulk of the Romano-British material came from the upper fills of the enclosure ditch, primarily from trench 1. There, the material comprised 77 sherds (425g) of greyware, probably relatively local, deriving from five or six everted-rim jars; 12 sherds (40g) of oxidised ware probable flagons, one of which was white-slipped and probably a north Wiltshire/ south Gloucestershire product; seven sherds (42g) of Wareham–Poole Harbour Black Burnished Ware (including a drop-flanged bowl and an everted-rim jar); and one sherd (16g) from a New Forest Parchment Ware jar. The assemblage dates to the late Roman period.

Elsewhere, two joining sherds (22g) of a Whiteware flagon rim and two sherds (3g) of oxidised ware came from the top of the enclosure ditch in trench 4.

Medieval ceramics were limited to one sherd (4g) of Kennet Valley ware from fill 402 of the enclosure ditch in trench 4 and one sherd (1g) of Laverstock-type fineware from the topsoil in trench 7. One sherd (2g) of post-medieval redware was recovered from topsoil in trench 1.

Copper alloy 'pendant' *by Jennifer Foster*

This is a unique copper alloy object (ON 14, from context 708 in the lower third of the midden sequence in trench 7; see Figure 2), length 23mm and width 8mm, weighing 2.7g; it is slightly thinner from the side (width 7mm) (Figures 6 and 7). At the top is a circular loop (6mm diameter, 1.5mm thick) with a rounded collar below, then a circular solid globule terminating in two delicate horns with tiny circular knobs at each end. It is very expertly cast using lost-wax casting.

The whole surface is polished, suggesting a free hanging object, but it is not very worn, even on the horns, indicating occasional use. It is unlikely to have been a practical object, such as a weight, as it is very delicate, and the horns would be very vulnerable; it is probably a decorative item. Decorative pendants are found in France, Italy and Austria on objects such as belt fastenings and brooches, often associated with glass beads. Most

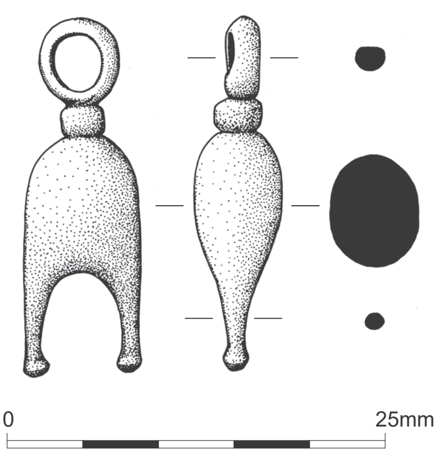

Fig. 6 Copper alloy pendant

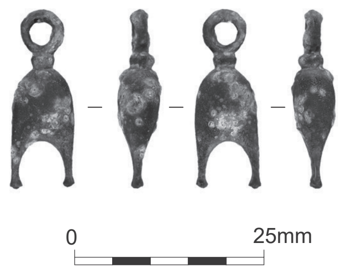

Fig. 7 Orthographic views of pendant at scale of 1:1 based on 3D photogrammetry model (free to view online at https://skfb.ly/6OXQ7)

are from contexts, mainly graves, of La Tène II date (*c*. 400–150 BC); for example, there are some from the Morel Collection in the British Museum (Stead and Rigby 1999, nos 1410–1411, fig. 191 and nos 1646—50, fig 133). They are known in France as danglements (Challet 1992). However, all of the pendants are very individual in shape and none are similar to this object; it could have been imported from the Continent or could have been made in Britain.

It is very difficult to date an object for which there are no parallels. However, it is very unlikely to be Bronze Age in date, as copper alloy objects from this period are much bigger and clunky, and tend to be cut and beaten from copper alloy sheet rather than cast. The look of the copper alloy is very similar to Iron Age objects, rather than Roman; this, and the use of pendants on the Continent, suggest a date in the Iron Age.

Other metalwork and coins

A small fragment of copper alloy sheet came from occupation deposit 201 in trench 2, but is not certainly prehistoric. A Roman *nummus* of Constantine I dating to the period AD 323–324 (Reece period 16) was recovered from the topsoil in trench 8; this is a SARMATIA DEVICTA reverse type depicting Victory advancing right holding trophy pushing captive (mint of Trier. RIC Vol VII, 202, no. 435). This coin adds to a second 4th-century issue found earlier in the one of the test pits in the wooded area to the south. A further, very worn and unidentifiable Roman copper alloy coin came from the ploughsoil in trench 5, this with a relatively large flan and likely to be of 1st–2nd century AD date.

Worked bone

Twenty-one worked bone objects were recovered, eight of these comprising broken points or needle/pin shanks (three from topsoil in trench 1, one from topsoil in trench 8 and four from badger spoil in trench 6) (cf Lawson 2000, figs 89–90), along with two more complete but broken pins or needles (from layer 505 in trench 5 and posthole 8131 in trench 8). Single, fragmentary examples of large, medium and small pointed tools and a gouge were also identified. There were two worked ribs, one decorated with incised lozenge patterns (two joining fragments from topsoil in trench 1) (cf Lawson 2000, figs 91–92) and one plain example (from topsoil in trench 8). One fragment of probable weaving comb handle was also recovered (from subsoil in trench 1).

Two small virtually complete 'panels' and one broken possible example (from topsoil in trench 8, unstratified and badger spoil in trench 6 respectively) all had holes for suspension or attachment. One of the complete examples had a central perforation at either end, the other a single perforation at one end; the incomplete possible example had two slightly larger perforations 5mm apart (centre to centre), though it was not clear if these were near the end of the strip. These thin strips of bone, perhaps pendants, varied somewhat in shape. The broken panel appears to have been rectangular, while the complete example with a single hole is 75m long and up to 12mm wide with slightly bowed sides, and the other panel with two perforations has relatively narrow ends and a slightly swelling central section; this is 85mm long and between 10mm and 18mm wide. A fourth object (from badger spoil), possibly also a pendant, comprised a circular disc of bone, 40mm in diameter, with a pair of centrally placed holes 10mm apart. A rectangular plate of bone with a central pair of perforations is recorded from All Cannings Cross (Cunnington 1923, 121, pl. 19.5) and the same site produced a similar range of perforated bone strips possibly used as pendants (*ibid*., 74, pl. 6) amongst the large number of worked bone objects.

The number and range of worked bone objects recorded is broadly consistent with the 29 found in 1992–3, though the earlier excavations produced relatively large numbers of worked ribs (eight), large pointed tools (six) and small pointed tools (five) (Morris 2010, 73–6). However, the 2016–17 excavations produced no objects of antler, in contrast to the nine picks or pointed tools and smoothed/polished pieces found in 1992–3 (*ibid*., 76)

Worked stone

Approximately 25kg of sarsen was collected during the 2016–17 excavations, almost 80% of this total from a single, shallow posthole (8104) in trench 8. A hemispherical rubber/grinding stone came from posthole 124 in trench 1, worn smooth on the grinding face and with battered edges (cf Lawson 2000, fig. 84). A fragment of a rectangular-section possible whetstone was recovered from the subsoil in trench 1, with moderate wear evident on two faces (cf Lawson 2000, fig. 85). Amongst the other lumps and flakes of broken sarsen (some with traces of burning) are six pieces with smoothing evident on one face, perhaps fragments of querns. Sarsen was relatively common in the 1992–3 excavations and also included querns (Field 2010, 82).

A small fragment of shale bracelet or armlet, of square or quadrant section, came from one of the badger scrapes in trench 6 (cf Lawson 2000, fig. 80). The 1992–3 excavations produced a single example (Morris 2010, 72). In addition, approximately half of a small, sub-rectangular shale bead, broken across the central (?) perforation, came from posthole 8161. This bead measured at least 10mm in length, 7mm wide and 3 mm thick, with rounded corners and a bevelled edge.

Fired clay

An almost complete cylindrical spindlewhorl was recovered from one of the badger scrapes in trench 6. Weighing 33g and hard fired, it is decorated around the outer edge with three central, slightly irregular, circular grooves, and with bands of finer, parallel slash marks above and below these; the ends are plain. Two further, fragmentary, spheroidal, ceramic spindlewhorls came from postholes 8118 and 8149, both examples undecorated. The 1992–3 excavations produced eight ceramic spindlewhorls, five of them cylindrical, as well as three chalk disc-shaped examples (Morris 2010, 72–3).

Human bone, *by Kirsten Egging Dinwiddy*

Redeposited human bone came from eight contexts across the site. The material, mostly extracted from the animal bone assemblage, was recovered from five features and deposits associated with the Late Bronze Age to Early Iron Age enclosure, midden and settlement. A few pieces were also found in the overlying subsoil and upcast spoil from badger scrapes.

Methods

The bone was analysed in order to assess its condition, calculate the minimum number of individuals, estimate the age and sex of the individuals, determine the potential for indices and note the presence of pathological lesions. Assessment of age and sex was based on standard methodologies (Buikstra and Ubelaker 1994; Scheuer and Black 2000). Grading for bone condition followed McKinley (2004, fig. 6).

Results

A summary of the results is presented in Table 5.

The material was found in the fills of several features in trench 1 and trench 8 (the enclosure ditch, two postholes, a discrete deposit that included animal bone and the subsoil), an occupation deposit in trench 2 and soils disturbed by badgers in trench 6.

Most of the bone is in excellent condition with only minimal erosion and/or etching (grades 0–2); some from the ditch was slightly less well-preserved (grade 2–3). Most damage had occurred in antiquity, frequently when the bone was still green or semi-green, i.e., relatively plastic due to high levels of the protein collagen. Usually this suggests that the damage occurred around or shortly after death, though the rate at which collagen is lost can be affected by the *post-mortem* treatment, for example particular burial conditions, manipulation and curation. Most damage, however, appears to have been incidental, associated with post-depositional trampling and re-working.

The colour and texture of bone can be affected by the burial environment and various mortuary treatments. In this assemblage the bone ranges from very light–mid greyish-buff to yellowish/reddish brown; some is particularly smooth and shiny. Longitudinal fissuring and apparent bleaching, as well as an example of canid gnawing, suggests that some of the bone (e.g. contexts 128 and 140) had been exposed to scavengers and the elements.

The assemblage is derived from a minimum of two adults (at least one female *c.* 18–30 yr.), a juvenile and possibly an infant/juvenile (Table 5). Pathological changes and morphological variations were noted, the most interesting being two injuries to the skull of an adult female (context 152). A small

Table 5: Summary of human bone results

Context	Feature	Quantification	Age/sex	Pathology	Condition and comments
102	subsoil	1 frag. l.	adult >18 yr	–	1–2; old & new breaks (dry), very light buff; posterior femur fragment
128*	149 (ditch)	1 bone u.	subadult/ adult >12 yr	–	1; old breaks (dry), faint longitudinal fissuring, bleached very light buff (exposed); left ulna shaft
140*	139 (posthole)	1 bone u.	adult >18 yr	–	0–1; old breaks (splintered & snapped; semi-green) & canid gnawing (end), yellowish buff; right radius mid-shaft
152*	deposit	3 frags s.	adult >18 yr	penetrating trauma – *anti-* and *peri-mortem*	1–2; slight erosion, old & fresh breaks (dry, green/semi-green), light/mod red/yellow brown; thin left parietal fragments (refitting)
201*	occupation deposit	4 frags s. l.	min 1 adult 18–30 yr ?female	–	1–2; slight erosion/root etching, old breaks (?semi-green & dry), light buff; right posterior parietal (refitting), small, narrow right tibia (no refit), ?same individual
600*	badger spoil	1 frag. s.	adult 18–30 yr female	mv – supra-orbital foramina; curated and ?tool marks	0–1; breaks & scratches (green/semi-green), stained grey/ brown, shiny; thin right frontal including orbit & glabella
601	badger spoil	1 frag. s.	adult 18–30 yr ???female	–	0–2; old breaks (dry), some erosion, red/yellow brown (*cf* 152) ?fungal stains; left parietal (temporo-mastoid & occipital sutures); larger & more robust than 201
8132	posthole close to 152	1 frag. s.	adult >20 yr	–	1–3; old breaks & erosion, possibly a semi-green bone break above auditory meatus; best preserved areas have a sheen, & soapy texture potentially associated with repeated handling in antiquity (i.e. curation). May or may not be the same individual as that found in 152. No joining edge & generally different colour.

* – C14 date (see Table 6)

conical depression on the fragment of parietal is consistent with a long-healed wound inflicted by a pointed implement. An adjacent oval aperture with endocranial bevelling indicates a direct blow from a small-tipped/pointed implement or projectile around the time of death or not long after.

Discussion

The assemblage provides evidence for mortuary treatment including the manipulation and curation of human remains, themes which have been recorded in material from across the temporal range including the Late Bronze Age and Early Iron Age (Keith 1923, 41; Whimster 1981, 189; Brück 1995; McKinley 2000, 100; Aldhouse-Green 2001, 97–109; Egging Dinwiddy and McKinley 2014, 152–3, fig. 4.58–4.59; Armit 2012). It adds to the small assemblage previously found on the site (Inskip 2010, 65–6; seven bones/fragments of skull and upper limb from a juvenile and possible subadult), whilst further human bone is certain to be present in the extensive unexcavated parts of the site, and possibly also within the (yet to be analysed) material recovered during other recent small-scale investigations (confined to finds from badger scrapes).

The evidence from the midden site at Potterne, Wiltshire, was consistent with the deliberate selection of certain elements and defleshing of the skulls, whilst surface polish was indicative of repeated handling (McKinley 2000, 96). At Battlesbury Bowl, near Warminster, Late Bronze Age and Iron Age contexts, including midden deposits from pits and postholes, held disarticulated human bone exhibiting signs of exposure (gnaw marks, fissuring, abrasion, trampling and curation), possibly excarnation, which led to discussions on the transformation of the corpse, fertility and regeneration (McKinley 2008, 71–6). Further afield, at Runnymede Bridge, Surrey, fragments of human bone were found scattered over the Late Bronze Age living floors; some showed evidence for canid gnawing (Longley 1980, 79).

Seven human bones were recovered in the 1992–3 excavations, probably representing a minimum of two (juvenile and ?subadult) and a maximum of six individuals (Inskip 2010, 65–6).

Radiocarbon dating, *by Thomas Booth*

Paired samples of disarticulated human and faunal bones from five contexts were sampled for radiocarbon dating at the Bristol Radiocarbon Accelerator Mass Spectrometer (BRAMS) facility as

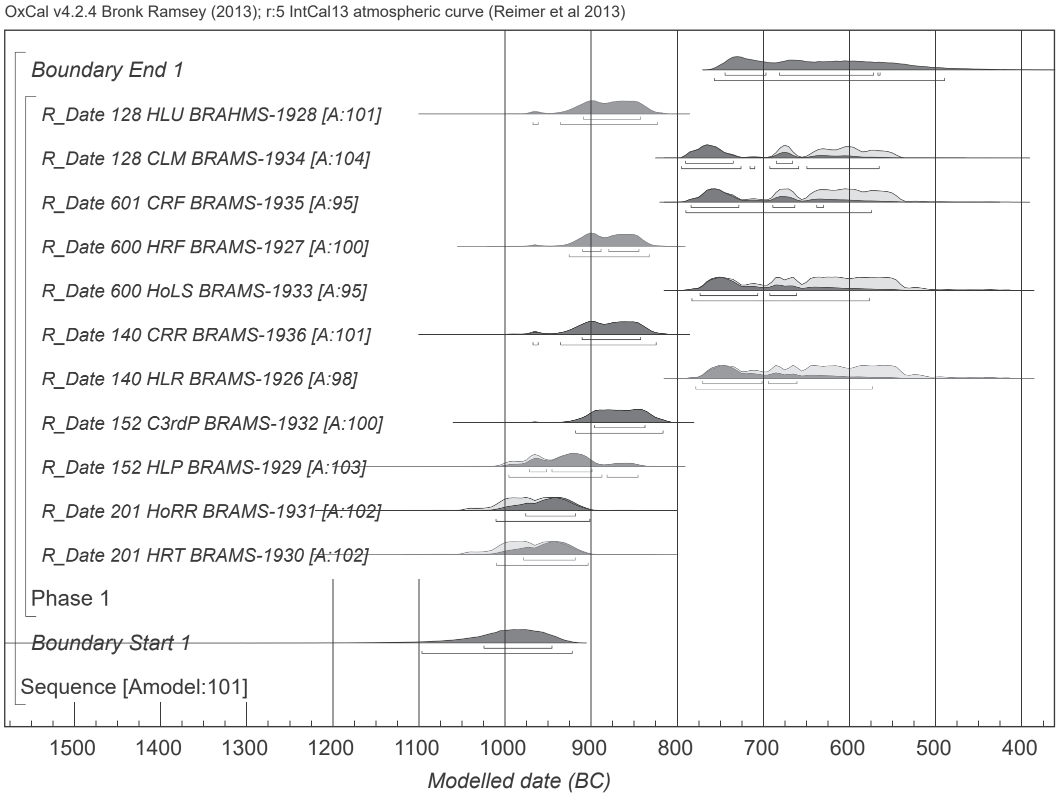

Fig. 8 Radiocarbon dating

part of a University of Bristol project investigating evidence for the curation of human bone in all phases of the Bronze Age in Britain. Our assumption was that the death of the animal would be broadly coincident with the date of deposition and would provide a date, or at least a *terminus ante quem*, for deposition of the associated human bone. Significant discrepancies between the date of the human bone representing the individual's death and the date of deposition would indicate that the human bone was already old when it was deposited and had possibly been curated.

All radiocarbon dates were calibrated using Oxcal 4.3 and IntCal 13 (Bronk Ramsey 2009; Table 6; Figure 8). The human frontal bone from context 600 was dated twice. These two dates were combined using the R_Combine function in Oxcal to produce a refined probability distribution (X^2 test: df=1, T=0.6(5% 3.8); Ward and Wilson 1978). The 95% confidence distributions of all dates range from the 11th to the 6th centuries cal. BC. We tested whether dates of the human bones were significantly older than the dates from the faunal remains using the Combine function, which performs a X^2 test of the probability that two radiocarbon dates relate to the same event (Ward and Wilson 1978). This was used to test to assess whether the date of death of the person represented by the disarticulated human bone was likely to have been broadly coincident with the deposition of their bones. Dates of bones from contexts 201 and 152 passed the X^2 test, producing refined combined probability distribution for the dates of these deposits (Table 7). However, dates for human and faunal material from contexts 600, 140 and 128 failed X^2 tests, suggesting they probably did not relate to the same event.

A cattle right radius from context 140 was significantly older than the human bone. Assuming the date of death of the human individual was broadly coincident with the date of deposition within the resolution of radiocarbon dating, comparison of the two dates using the Difference function in Oxcal suggests that the cattle radius was 392−84 (95% confidence) or 330−154 (68% confidence) years older when it was deposited. This could mean that the cattle bone had been retained and curated for a

Table 6: Radiocarbon and stable isotope measurements

Context	Material	Lab No. (BRAMS)	C:N	Radiocarbon Age BP	Calibrated date
201	Human R. tibia	1930	3.2	2821±26	1044–910 cal. BC
152	Human L. parietal	1929	3.2	2784±26	1005–846 cal. BC
128	Human L. ulna	1928	3.2	2745±26	971–825 cal. BC
600	Human R. frontal	1927	3:1 3:2	2732±26 2761±26	928–833 cal. BC (combined)
140	Human L. radius	1926	3.2	2485±26	771–516 cal. BC
201	Horse R. radius	1931	3.2	2818±26	1043–907 cal. BC
140	Cattle R. radius	1936	3.2	2746±26	971–826 cal. BC
152	Cattle 3rd phalanx	1932	3.2	2727±26	919–817 cal. BC
128	Cattle l. mandible	1934	3.2	2520±26	793–543 cal. BC
600	Horse L. scapula	1933	3.2	2491±26	775–521 cal. BC
601	Cattle R. femur	1935	3.2	2505±26	768–556 cal. BC

Table 7: Results of the X^2 tests and Difference functions applied to radiocarbon determinations of paired human and animal bone samples from East Chisenbury

Con-text	Human bone	^{14}C Determination	Faunal bone	^{14}C Determination	X^2	Combined date (95% confidence)	Combined date (68% confidence)	Difference (95%)	Difference (68%)
201	R. tibia	2821±26bp	Horse r. radius	2818±26bp	**PASS** (df=1 T=0.003 (5% 3.841)	1012–921 cal. BC	1001–936 cal. BC	-	-
152	L. parietal	2784±26bp	Cattle 3rd phalanx	2727±26bp	**PASS** (df=1 T=1.986 (5% 3.841)	967–838 cal. BC	920–849 cal. BC	-	-
600	R. frontal	2732±26bp, 2761±26bp	Horse scapula	2491±26bp	**FAIL** df=1 T=49.509 (5% 3.8)	-	-	Human frontal 371–85 years older	Human frontal 328–157 years older
140	L. radius	2485±26bp	Cattle R. radius	2746±26bp	**FAIL** (df=1 T=41.517 (5% 3.8))	-	-	Cattle radius 392–84 years older	Cattle radius 330–154 years older
128	L. ulna	2745±26bp	Cattle L. mandible	2520±26bp	**FAIL** df=1 T=31.257 (5% 3.8)	-	-	Human ulna 355–65 years older	Human ulna 322–89 years older

significant duration of time. It is also possible that the cattle bone had been retrieved from an earlier monument or accidentally incorporated into this deposit after being disinterred from its original context.

Disarticulated human bones from contexts 600 and 128 are significantly older than the accompanying faunal bone. A human right frontal bone from context 600 is 371–85 (95% confidence) or 328–157 (68% confidence) years older than the accompanying horse scapula. A human left ulna from context 128 is 355–65 (95% confidence) or 322–89 (68% confidence) years older than the accompanying cattle mandible. Radiocarbon dates from human bones can look too old if individuals obtained a substantial amount of their dietary protein from marine or freshwater resources, producing a marine or freshwater reservoir effect (Lanting and van der Plicht 1998). However, dietary stable isotope analysis of these bones (Madgwick, see below) suggests individuals represented at East Chisenbury ate little marine or freshwater protein, and reservoir effects cannot explain the observed discrepancies in radiocarbon dates.

These results are consistent with others we have obtained from Bronze Age sites around Britain where about half of human remains identified as potentially having been curated show anomalously early radiocarbon dates. In addition, the probable intervals between the dates of death and deposition of the significantly old human bones from East Chisenbury, ranging from a few decades to three centuries, are consistent with intervals calculated for old ancient human remains from other Bronze Age sites. Human remains seem to have been curated for relatively short periods of time encompassing a few generations, before they were deposited. They probably represented the remains of people who had lived within living or cultural memory and whose identity was known to the communities handling their remains. It is possible that these remains were deposited when the identity of the individual was about to pass out of living or cultural memory.

Animal bone, *by L. Higbee*

The assemblage comprises 5050 fragments (or 37kg) of animal bone. Once conjoins are considered the total count falls to 3989 fragments. Bone was recovered from the midden deposit, the enclosure ditch and bank, and from postholes and tree-throw holes within the enclosure's interior. Additional material was also recovered from badger disturbance and topsoil.

Methods

The following information was recorded where applicable: species, skeletal element, preservation condition, fusion and tooth ageing data, butchery marks, metrical data, gnawing, burning, surface condition, pathology and non-metric traits. This information was directly recorded into a relational database (in MS Access) and cross-referenced with relevant contextual information. The assemblage has been quantified in terms of the number of identified specimens present (or NISP) by feature or deposit type (see Table 8).

Results

Bone preservation is generally good, though some cut features (e.g. the enclosure ditch) include redeposited material from the adjacent midden deposit, and this has eroded cortical surfaces and abraded edges. Gnaw marks are common and indicate that scavenging carnivores had open access to the midden material accumulating inside the enclosure.

The bones of larger animals such as cattle, and to a lesser degree horse, are quite fragmented having been extensively exploited for meat and marrow. This has affected identification and probably over-inflated the significance of sheep in the assemblage. It is, however, worth mentioning that regardless of this, cattle would have provided the bulk of the meat consumed in the enclosure during the Late Bronze Age–Early Iron Age.

Midden deposit

Animal bone was recovered from *in situ* or reworked midden deposits in trenches 1, 2, 5 and 7, and from areas of badger disturbance to this deposit in trench 6 (and possibly trench 3). Due to the fragmented nature of the assemblage only 18% of the 1787 fragments recovered can be identified to species.

Sheep bones dominate accounting for 49% NISP, followed by cattle (41%) and then pig (5%). All parts of the mutton and beef carcass are present, and this indicates that animals were brought to the enclosure on the hoof to be slaughtered and butchered for local consumption. The range of pig body parts suggests a similar scenario, although this is based on limited data. Age information from epiphyseal fusion and tooth eruption and wear indicates that sheep and cattle of prime meat age were selected for slaughter, and there is also evidence that significant numbers of lambs and calves were also slaughtered for meat. This indicates that the husbandry regime was intensively geared towards meat and secondary products.

The dominance of sheep bones in the midden assemblage is potentially misleading because it is clear from the butchery evidence that cattle carcasses

Table 8: Animal bone: number of identified specimens present (or NISP) by feature/deposit

Species	Midden	Enclosure ditch & bank	Postholes	Badger disturbance	Topsoil & unstrat	Total
cattle	134	20	140	41	3	338
sheep/goat	160	26	186	84	9	465
pig	17	9	34	14	1	75
horse	8	3	15	3	-	29
dog	1	-	2	1	-	4
red deer	1	-	3	1	-	5
roe deer	1	-	-	-	-	1
deer	-	-	1	-	-	1
rabbit	-	-	-	1	-	1
domestic fowl	-	-	1	-	-	1
duck	1	-	-	-	-	1
corvid	1	-	1	-	-	2
Total identified	*324*	*58*	*383*	*145*	*13*	*923*
Total unidentifiable	*1463*	*213*	*968*	*387*	*35*	*3066*
Overall total	**1787**	**271**	**1351**	**532**	**48**	**3989**
Overall %	**45**	**7**	**34**	**13**	**1**	**100**

were more extensively exploited than other livestock and this has resulted in higher rates of fragmentation and, therefore, few positively identified cattle bones. The evidence indicates that cattle bones were systematically processed for marrow and some bones, notably the astragalus, show signs of charring consistent with direct exposure to fire such as might occur when dressed joints are cooked over an open flame.

Eight horse bones were also recovered from the midden deposit. They include fragments of humerus, radius, pelvis, 1st and 2nd phalanx, astragalus and a few loose teeth. Other less common species include dog, red deer, roe deer, duck and corvid. Both deer species are represented by fragments of antler thought to represent off-cuts from object manufacture.

A discrete deposit of animal and human bones (context 152) was identified in trench 1 adjacent to postholes 119 and 159. The deposit included 33 cattle bones, mostly from the fore- and hindquarters, a sheep horn core and metatarsal, and a horse humerus. Many of the cattle bones had been processed for marrow.

The animal bone assemblage recovered from the badger disturbed areas of the midden deposit (in particular trench 6) is broadly like the material from the *in situ* deposit. Sheep bones dominate, followed by cattle and then pig, and less common species include horse, dog, red deer (antler), and a few intrusive rabbit bones.

Enclosure ditch and bank

A total of 271 fragments came from the enclosure ditch and bank investigated in trenches 1, 2 and 4. The composition of the assemblage is similar to the midden deposit. Sheep and cattle bones dominate, and there are also a few pig and horse bones. Differences in preservation state indicate that the ditch assemblage includes residual material that is likely to have been redeposited from surface accumulations of midden material.

Internal postholes and tree-throw holes

A further 1351 fragments of animal bone came from internal features within the enclosure, mostly postholes, located in trenches 1, 3 and 8. The amount of bone recovered from each posthole varies from one to 100 fragments, with the largest quantities from postholes 8022, 8038 and 8149, and tree-throw holes 8063 and 8085.

Sheep and cattle bones dominate, followed by pig, horse, red deer (antler), dog, domestic fowl and small corvid, most probably crow. The assemblage includes elements from most parts of the beef, mutton and pork carcass, and there is little difference in the general composition of bone waste between postholes and the midden deposit. Both include mixed material from different stages in the carcass reduction sequence, from butchery through to consumption.

The mortality pattern for livestock is like that described above for the midden deposit, most of the cattle and sheep bones belong to adult animals, while most of the pig bones are from immature animals, such as the near complete skeleton of an immature pig aged between 7–14 months (mandible wear stage C, after Hambleton 1999) from posthole 8088. There are also a few bones from calves, and neonatal lambs and pigs. The evidence implies that livestock were raised within the enclosure, or at least brought into the enclosure during the spring when livestock such as sheep and pigs birth their young.

Horse bones came from postholes 8022, 8038, 8118 and 8139, and tree-throw hole 8085. The identified elements include teeth and fragments or radius, tibia, metacarpal and first phalanx. The long bones are all from pony-sized equids and one of the bones provided a withers (or shoulder) height estimate of approx. 13.1 hands. Red deer antler came from postholes 8036, 8040 and 8173. Two of the pieces show signs of charring at one end, which is consistent with the use of fire branding to weaken the antler so that it can be broken (see Serjeantson 1995, 420–1). The dog bones came from posthole 8061 and tree-throw hole 8085, and they include a vertebra and metapodial. The bones are from a small to medium-sized animal and the vertebra shows signs of osteoarthritis. Bird bones are relatively rare from the assemblage, but the skull from a domestic fowl was identified from tree-throw hole 8085 and the radius from a crow came from posthole 8122. Domestic fowl bones have been identified from only a small number of Early Iron Age sites in Britain (Poole 2010, 157–8).

Discussion

Significant assemblages of animal bones have been recovered from Late Bronze Age–Early Iron Age midden deposits at a few sites in Southern England (Levitan 1990; Locker 2000; Serjeantson 1996). The animal bone assemblage from recent excavations at East Chisenbury is broadly comparable to the material recorded by Serjeantson *et al.* (2010) from previous investigations at the site, and the new data has helped clarify the use and role of cattle in the livestock economy.

Serjeantson *et al.* (2010) showed that the livestock economy at East Chisenbury was primarily geared towards sheep- and cattle-farming, that sheep were butchered within the enclosure and that sheep flocks were intensively managed for meat and secondary products. The main evidence for this was the high kill-off rate amongst lambs and under-representation of old adult sheep. The lack of butchery waste amongst the cattle bones suggested that beef was brought to the site as dressed joints, and it was further suggested that this was obtained from cattle herds primarily managed for secondary products and probably traction.

The new data, nevertheless, indicates the presence of whole beef carcasses, hence it is highly likely that cattle, like sheep, were brought into the enclosure to be slaughtered. The presence of calves and preponderance of young adult cattle in their prime also suggests that these animals were drawn from intensively managed herds. It is, however, worth emphasising that the animal bones recovered from the midden deposit at East Chisenbury do not necessarily reflect the livestock economy of the local area. The scale of the midden deposit indicates that the enclosure was the focus for community gatherings and feasting on a large scale, and livestock are essentially a form of portable wealth that can be gifted to show benevolence between peoples. Certain aspects of what took place within the enclosure is also likely to have been ceremonial in nature, hence greater importance might have been placed on the slaughter of younger livestock than would occur under normal economic circumstances.

$\delta^{13}C$ and $\delta^{15}N$ isotope analysis of the fauna, *by Richard Madgwick*

Introduction

A total of 36 faunal specimens from the 2016 excavations were analysed. The aim was to add to the limited corpus of isotope data from this transitional, Late Bronze Age/Early Iron Age phase and to explore variation in husbandry regimes in comparison with existing data from the broadly contemporaneous sites of Potterne and Llanmaes. A secondary objective was to assess the potential to extend analysis to other isotope systems to investigate the origins of animals. The interpretative potential of this sample is relatively limited, and preparation is underway to bolster the dataset with analysis of remains from the midden itself. Therefore, detailed data interrogation and interpretation is reserved for a future publication once a larger dataset has been produced.

Materials and methods

Twelve specimens from each major domesticate were analysed. Sample details are provided in Table 9. Mandibles and maxillae with teeth were targeted as a priority, as these could be subject to multi-isotope ($\delta^{18}O$, $^{87}Sr/^{86}Sr$) analysis in the future. As the faunal assemblage was modest in size it was not possible to repeat sample the same sided zones of specific elements in order to ensure that each sample derived from a different individual. However, with the exception of similar results from two pairs of caprine samples, which may have been from the same individuals, it is clear that repeat sampling of the same individual did not occur. They derived

Table 9: Isotope samples—contextual and anatomical information

Sample number	Context	Taxon	Element	Side
EC01	103	Cattle	Radius	Right
EC02	103	Cattle	Radius	Right
EC03	118	Cattle	Mandible	Left
EC04	118	Cattle	Metacarpal	Left
EC05	118	Cattle	Scapula	Right
EC06	152	Cattle	Mandible	Left
EC07	152	Cattle	Maxilla	Left
EC08	152	Cattle	Tibia	Left
EC09	201	Cattle	Mandible	Left
EC10	204	Cattle	Mandible	Left
EC11	601	Cattle	Mandible	Left
EC12	715	Cattle	Mandible	Left
EC13	111	Pig	Maxilla	Left
EC14	111	Pig	Mandible	Left
EC15	111	Pig	Mandible	Left
EC16	111	Pig	Maxilla	Left
EC17	111	Pig	Scapula	Left
EC18	118	Pig	Femur	Right
EC19	130	Pig	Femur	Left
EC20	138	Pig	Maxilla	Left
EC21	306	Pig	Maxilla	Left
EC22	407	Pig	Hum	Left
EC23	601	Pig	Maxilla	Right
EC24	601	Pig	Mandible	Right
EC25	143	Sheep/Goat	Mandible	Right
EC26	505	Sheep/Goat	Mandible	Left
EC27	600	Sheep/Goat	Mandible	Left
EC28	600	Sheep/Goat	Maxilla	Right
EC29	601	Sheep/Goat	Mandible	Right
EC30	601	Sheep/Goat	Mandible	Right
EC31	602	Sheep/Goat	Mandible	Right
EC32	602	Sheep/Goat	Mandible	Left
EC33	602	Sheep/Goat	Mandible	Left
EC34	602	Sheep/Goat	Maxilla	Left
EC35	603	Sheep/Goat	Mandible	Right
EC36	709	Sheep/Goat	Mandible	Right

from different contexts and locally-raised, broadly contemporaneous animals would be expected to have similar values.

The collagen extraction protocol followed a modified Longin method (Brown *et al.* 1988). Bone (*c.* 0.5g) was cleaned using a diamond burr, demineralised in 8ml of 0.5M HCl at 4°C and gelatinised in a pH3 HCl solution (70°C) for 48 hours. The supernate was collected using an 8μm ezee-filter and transferred to polypropylene tubes for freeze-drying. Collagen was weighed into tin capsules and analysed in duplicate. Isotope ratios were measured by continuous flow-elemental analysis-isotope ratio mass spectrometry (CF-EA-IRMS) using a Flash 1105 elemental analyser coupled to a ThermoFinigan Delta V Advantage at the Cardiff University Stable Isotope Facility. Collagen $\delta^{13}C$ and $\delta^{15}N$ isotope values are reported in per mil (‰) relative to VPDB and AIR standards respectively. Laboratory standards comprised supermarket gelatine and caffeine and 1σ analytical precision was 0.07 ($\delta^{13}C$) and 0.08 ($\delta^{15}N$). All samples produced acceptable C:N ratios (DeNiro 1985).

Results and discussion

Results are presented in Tables 10 and 11 and Figure 9. Pigs have the highest mean value for both isotope proxies (Madgwick *et al.* 2012a; Madgwick *et al.* 2019a; Worley *et al.* 2019), which is relatively common in a British later prehistoric context. Higher mean $\delta^{13}C$ values have been observed in pigs compared to other domesticates at the three broadly contemporaneous middens of Llanmaes, Potterne and Runnymede (Madgwick *et al.* 2012a). Only Llanmaes also has a markedly higher $\delta^{15}N$ mean in pigs (Madgwick and Mulville 2015). This is strongly suggestive of input of animal protein in the diet of some of the pigs. $\delta^{15}N$ values are not typically omnivorous, as none are above 7.0‰, but this can be explained by the low absolute $\delta^{15}N$ values for all taxa, which is common at sites on Chalk geology. Therefore, most pigs are consistent with having been fed some animal protein (meat scraps, dairy waste or excreta) deriving from locally-raised herbivores. Values are comparable to pigs that have been analysed from the Late Neolithic Wiltshire sites of Durrington Walls, Marden and West Kennet Palisade Enclosures (Madgwick *et al.* 2019b). Alternatively, they could have been raised on a herbivorous diet, but in a different area with higher landscape $\delta^{15}N$ values, either relating to geology or the manuring of the land. The potential for this scenario is exemplified by the fact that the highest

Table 10: Isotope results

Sample number	Taxon	$\delta^{15}N$ (‰ AIR)	$\delta^{13}C$ (VPDB)	%N	%C	C:N
EC01	Cattle	4.0	-21.7	10.2	28.1	3.2
EC02	Cattle	3.9	-21.4	7.8	21.0	3.2
EC03	Cattle	3.9	-21.7	10.2	28.1	3.2
EC04	Cattle	5.2	-22.0	7.1	20.1	3.3
EC05	Cattle	4.1	-22.5	6.0	16.9	3.3
EC06	Cattle	3.3	-21.9	3.7	10.6	3.4
EC07	Cattle	3.3	-21.3	13.2	37.0	3.3
EC08	Cattle	5.3	-21.8	6.5	17.7	3.2
EC09	Cattle	3.9	-22.0	4.9	14.0	3.4
EC10	Cattle	2.7	-21.4	9.7	27.2	3.3
EC11	Cattle	2.9	-21.4	8.2	22.8	3.2
EC12	Cattle	1.6	-21.8	5.8	16.3	3.3
EC13	Pig	5.0	-21.2	7.9	22.4	3.2
EC14	Pig	6.5	-21.3	10.2	29.4	3.3
EC15	Pig	6.2	-20.9	4.1	11.5	3.3
EC16	Pig	6.7	-20.9	12.0	34.7	3.4
EC17	Pig	7.0	-21.4	8.9	25.4	3.3
EC18	Pig	2.7	-21.6	10.0	28.3	3.3
EC19	Pig	6.0	-21.3	12.3	34.6	3.3
EC20	Pig	5.9	-21.4	6.2	17.4	3.3
EC21	Pig	5.2	-21.8	8.6	25.8	3.5
EC22	Pig	5.7	-21.2	10.8	29.8	3.2
EC23	Pig	5.2	-21.2	9.8	26.3	3.2
EC24	Pig	2.4	-21.6	11.7	32.1	3.2
EC25	Sheep/Goat	2.8	-21.6	9.1	25.1	3.2
EC26	Sheep/Goat	3.7	-21.5	11.8	32.7	3.2
EC27	Sheep/Goat	5.5	-21.8	7.9	21.6	3.2
EC28	Sheep/Goat	3.9	-21.2	13.3	37.6	3.3
EC29	Sheep/Goat	4.2	-21.8	12.5	34.8	3.3
EC30	Sheep/Goat	4.1	-21.6	7.0	19.6	3.3
EC31	Sheep/Goat	3.3	-21.9	6.2	17.9	3.4
EC32	Sheep/Goat	4.2	-21.5	7.2	20.0	3.2
EC33	Sheep/Goat	3.4	-21.9	12.8	34.3	3.1
EC34	Sheep/Goat	4.1	-21.3	7.8	19.8	3.3
EC35	Sheep/Goat	4.2	-21.6	7.7	21.6	3.3
EC36	Sheep/Goat	3.6	-21.4	10.3	28.7	3.3

Table 11: Summary statistics for the isotope dataset

	$\delta^{13}C$		$\delta^{15}N$	
	Mean	1 SD	Mean	1 SD
Cattle	-21.7	0.3	3.7	1.0
Pig	-21.3	0.3	5.4	1.5
Caprine	-21.6	0.2	3.9	0.7

herbivore $\delta^{15}N$ value is higher than five of the pig values. Two pigs are clear outliers with $\delta^{15}N$ values below 3‰. This is lower than any of the herbivore and omnivore samples analysed from Potterne and Llanmaes and lower than most herbivores from East Chisenbury (Madgwick *et al.* 2012a). However, some pigs from Durrington Walls have produced values in this range (Madgwick *et al.* 2019b). These values are strongly suggestive of a herbivorous diet, most likely from the local Wessex chalkland. These two pigs and one further individual (EC21) are noteworthy

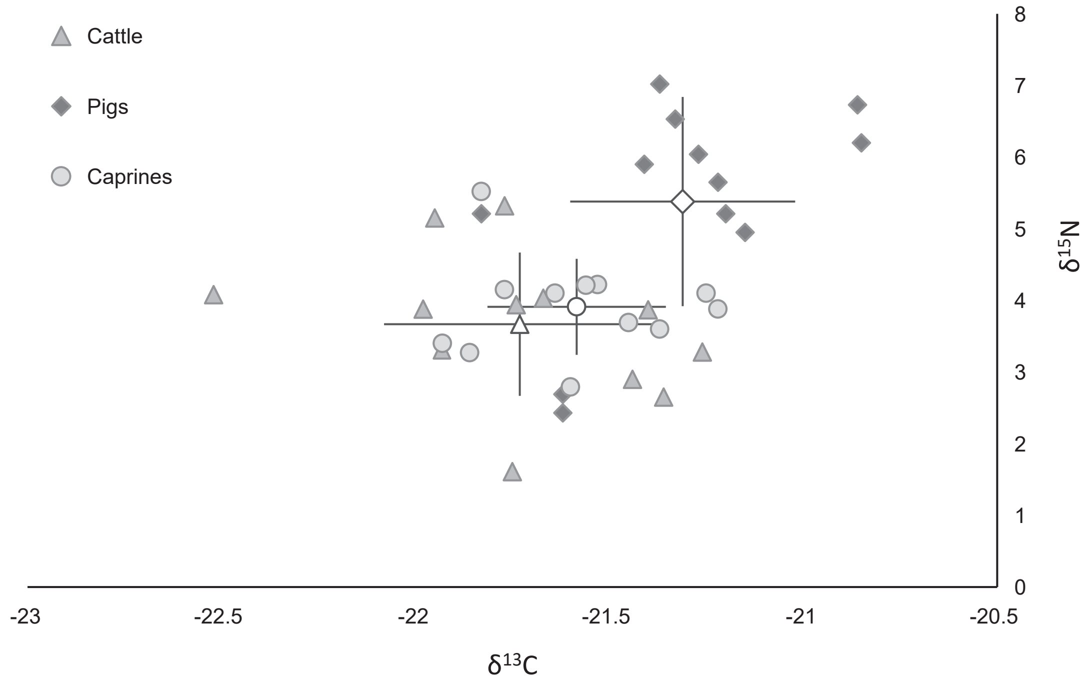

Fig. 9 $\delta^{13}C$ and $\delta^{15}N$ isotope data. Hollow markers represent the mean and error bars are one standard deviation

in having considerably lower $\delta^{13}C$ than the other pig samples. Equifinality remains a problem in interpreting variation, but being raised in open landscapes on a principally herbivorous diet could explain this pattern. Higher $\delta^{13}C$ values in pigs may relate to a reliance in forest fodder (Madgwick *et al.* 2012a), an important resource in pig husbandry from prehistory to the present day. It is possible that this was exploited in raising the other pigs, especially the two with the highest $\delta^{13}C$ values, but varied origins with different landscape baseline values could also be responsible for the pattern.

Cattle and caprines (certain to be dominated by sheep) show very similar mean values for both isotope proxies. Cattle are slightly more variable, having outliers with very low $\delta^{15}N$ (EC12, 1.6‰) and $\delta^{13}C$ (EC05, -22.5‰). The slightly greater variation may reflect the greater potential for the movement of cattle, either resulting from the exploitation of varied pasturage or cattle being brought to the site from locations with different landscape baseline values. These locations need not be distant and varied values can be obtained in a relatively homogenous landscape, particularly if it is heavily exploited for agricultural production (see Stevens *et al.* 2013). Caprines show less variation and the degree of homogeneity in values suggests that they are locally-raised. This might be expected given the unusually high proportion of young sheep in midden deposits, suggesting intensive sheep breeding was taking place locally (Serjeantson 2007). Overall the isotope values are typical for British herbivores, and the relatively low $\delta^{15}N$ are particularly characteristic of herbivores raised in the Wessex chalklands (Stevens *et al.* 2013), but this by no means discounts origins elsewhere. It is clear that these animals did not regularly graze on manured pasture, as none have $\delta^{15}N$ values higher than 5.5‰.

Summary conclusions

The analysis of these faunal remains from the 2016 excavations at East Chisenbury adds to the limited corpus of Late Bronze Age/Early Iron Age faunal isotope data. Results suggest the exploitation of forest forage and animal protein in the raising of some pigs, but the diverse values indicate that some were probably entirely herbivorous. Cattle and sheep had values characteristic of being raised on unmanured open pasture. The greater variation in cattle suggests that more wide-ranging pasturage may have been exploited, with caprines probably more locally raised. Equifinality represents a substantial hurdle to confident interpretation in a restricted dataset such as this. Consequently, interpretations relating to variation in the dataset must be considered tentative. Future extension of the dataset with analysis of remains from the midden itself will allow for more confident interpretation. The relatively limited range of values is not strongly suggestive of wide-ranging origins, but $\delta^{13}C$ and $\delta^{15}N$ isotope analysis provides only very coarse indications of this. It would certainly be of benefit to extend analysis of these individuals through the application of other isotope systems, particularly sulphur ($\delta^{34}S$), oxygen ($\delta^{18}O$) and strontium ($^{87}Sr/^{86}Sr$) to explore origins, as limited analysis has identified non-local animals at other middens (Madgwick *et al.* 2012b).

Charred and mineralised plant remains, *by Inés López-Dóriga*

Materials and methods

A total of 38 bulk sediment samples, of an average of 16 litres, was taken from a range of deposits including posthole and ditch fills, as well as midden layers, from all trenches across the site. The samples were processed on a Siraf-type flotation tank; the flot retained on a 0.25mm mesh, residues on a 1mm mesh. The coarse fractions of the residues (>4mm) were sorted by eye. The flot and the <4mm residue fractions were sorted using a microscope at a magnification of 10–40x. Identifications follow the nomenclature of Stace (1997) for wild plants and Zohary *et al*. (2012) for cereals, and were made with reference to specialised atlases and modern reference collections. Abundance of remains was qualitatively quantified (as an estimation of the minimum number of individuals). ArboDat's PCodes (Kreuz and Schäfer 2002) have been used to refer to cereals in the results table (Table 12).

Results

The flots were of variable volumes and had variable proportions of bioturbation proxies (roots, uncharred seeds, earthworm eggs, mycorrhizal fungi sclerotia, and burrowing snails) that may be indicative of some stratigraphic movement and the possibility of contamination between deposits. Nevertheless, a range of similar environmental remains were recorded consistently but in varying degrees of preservation across the site (Table 12), comprising terrestrial molluscs, skeletal remains from small animals or fish, mineralised insects, wood charcoal (including roundwood with cut marks) and a large number of plant remains. The latter were mostly preserved by charring, with some minor occurrences of mineralisation, although the extent of this was restricted in comparison to other midden sites (e.g. Potterne, Carruthers 2000). Spherical nodules typical of mineralisation processes by phosphate replacement (McCobb *et al*. 2003) were often found in the samples. A number of mineralised and charred seeds, seed fragments, endocarp fragments and fragments of parenchymatic/mesocarp tissue could not be taxonomically determined and are recorded as 'indet'.

The charred plant remains comprised cereal grains and chaff, other potential crops, seeds of wild plants, and remains of wild fruits. The cereals were dominated by barley (*Hordeum vulgare*) grains, sometimes within the spikelet, and of the hulled variety (*H. vulgare* var. *vulgare*), where determinable. Hulled wheat (*Triticum* sp.) grains and chaff were also abundant, with both emmer (*T. dicoccum*) and spelt (*T. spelta*) present. There was an instance of barley grains preserved within spikelets and another of wheat sprouted grains, probably unintentional as a result of spoilt crops. Other potential crops present in the samples were legumes, possibly pea or lentil (*Pisum*/*Lens* and tp. *Lens culinaris*), although this identification could not be positively ascertained. Remains of wild fruits included hazel (*Corylus avellana*) nutshell fragments, hawthorn (*Crataegus monogyna*) stones and elder (*Sambucus* sp.) berry seeds. The seeds of wild plants included a diversity of taxa, which can be broadly split into main habitats (some plants occurring in several):

- Grassland: sedges (Cyperaceae), grasses (*Bromus* sp., *Avena*/*Bromus*, *Poa*/*Phleum*), buttercups (*Ranunculus* sp.), vetches (Vicieae), trefoil/clover/medick (Trifoliae);
- Arable weeds: field madder (*Sherardia arvensis*), bedstraw/cleavers (*Galium* sp., Rubiaceae), composites (Asteraceae), mallow (Malva sp.), cornsalad (*Valerianella* sp.);
- Synanthropic or ruderals from disturbed ground: henbane (*Hyoscyamus niger*), sorrel/docks (*Rumex* sp., *Polygonum* sp.), ivy-leaved speedwell (*Veronica hederifolia*), crucifers (Brassicaceae), ribwort plantain (*Plantago lanceolata*), mint family (Lamiaceae), goosefoot/orache (Chenopodiaceae, *Chenopodium* sp., *Atriplex* sp.), pink (*Dianthus* sp.), viper's bugloss (*Echium vulgare*), pimpernel (*Anagallis* sp.), dog violet (*Viola* sp.) and poppy (*Papaver* sp.).

Fully or partially mineralised plant remains from

Table 12: Charred plant remains

Sample ID	Volume (sample, flot)	Grain, chaff, other	Taxa	Other environmental remains
[149] (111) <1>	27l., 60ml.	C; -; C	HOVUL grain fragment, *Veronica hederifolia*	Charcoal, Moll-t
[114] (115) <2>	9l., 40ml.	C; -; C	HOVUL, TRIT grains, *Poa/Phleum*	Charcoal, Moll-t
[121] (122) <3>	8l., 150ml.	A*; A; A	TRIT grains and chaff (inc. *spelta* and *dicoccum* glumes), *Bromus* sp., cf. *Plantago lanceolata*, Lamiaceae, Indets.	Charcoal, Moll-t, Sab/f, Phosphate nodule
[123] (124) <4>	8l., 50ml.	A; C; -	TRIT grains and glume base, HOVUL grains	Charcoal, Moll-t, Sab
[119] (120) <5>	9l., 100ml.	A; -; C	HOVUL and TRIT grains, Chenopodiaceae, indet fruit endocarp frag, Vicieae	Charcoal, Moll-t, Sab/f, Phosphate nodule
[116] (117) <6>	8l., 100ml.	A; B; C, C (mineralised)	HOVUL and TRIT grains, TRIT (inc. *spelta*) glume bases, Vicieae seed, cf. *Sherardia arvensis*. Mineralised: *Viola* sp., *Rumex* sp., indet	Charcoal, Moll-t, Sab/f, Phosphate nodule
[112] (113) <7>	4l., 50ml.	C; C; C	TRIT glume base, HOVUL grain, *Polygonum* sp., *Dianthus* sp., Lamiaceae	Charcoal, Sab, FAS
[121] (122) <8>	10l., 250ml.	A**; A**; A	HOVUL and TRIT (inc. *dicoccum* and *spelta*) grains (one sprouted). TRIT chaff (*dicoccum* and *spelta* glume bases and spikelet forks), Asteraceae, Chenopodiaceae, Poaceae (Panicoideae, *Avena/Bromus*, *Lolium/Festuca*), Vicieae, *Veronica hederifolia*, Cyperaceae, *Corylus avellana*, *Sherardia arvensis*, Indet.	Charcoal, Moll-t, Sab/f
[–] (131) <9>	20l., 20ml.	A*; C; C	HOVUL and TRIT grains, TRIT chaff (glumes, inc. *spelta*), Parenchymatic tissue, *Galium* sp., Trifoliaeae	Charcoal, Moll-t
[133] (134) <10>	12l., 40ml.	A; C; C	HOVUL and TRIT grains, TRIT chaff (inc. *spelta* glumes), *Galium* sp., *Veronica hederifolia*, *Hyoscyamus niger*	Charcoal, Moll-t
[135] (136) <11>	10l., 50ml.	B; C; A	HOVUL and Triticeae grains, TRIT glume base, *Galium* sp., *Bromus* sp., Vicieae, *Corylus avellana*, *Echium vulgare*, Chenopodiaceae (inc. *Atriplex* sp.), *Hyoscyamus niger*, Trifoliae, *Malva* sp., Poaceae	Charcoal + roundwood, Sab, Moll-t
[137] (138) <12>	11l., 50ml.	C; A; C (mineralised)	TRIT glume bases, HOVUL grain and Triticeae grains, Mineralised: *Papaver* sp., indets	Charcoal, FAS, Sab/f (A**), Moll-t (A***), Foraminifera, Phosphate nodules
[139] (140) <13>	12l., 100ml.	A*; B; C	HOVUL (inc. var. *vulgare*) and TRIT grains and chaff (glume bases), *Galium* sp., (*Poa/Phleum*), Brassicaceae?, Indet seed frag.	Charcoal, Moll-t
[–] (504) <14>	24l., 80ml.	C; A*; A, B (mineralised)	TRIT (inc. *spelta*) and HOVUL (inc. var. *vulgare*) grains, TRIT *spelta* chaff (glume bases), Viciae, *Veronica hederifolia*, *Galium* sp., Poaceae (*Poa/Phleum*), Chenopodiaceae, Cyperaceae, Indet parenchymatic tissue. Partly mineralised: *Lithospermum* sp., *Veronica hederifolia*, *Urtica urens*, root	Charcoal, Moll-t, Sab/f, Phosphate nodules
[–] (709) <15>	27l., 100ml.	A; A; A, C (mineralised)	HOVUL and TRIT grains and chaff (glume bases, inc. *spelta*), Poaceae (Bromus, *Poa/Phleum*), *Veronica hederifolia*, *Galium* sp., *Rumex* sp., *Crataegus monogyna*, Vicia, Chenopodiaceae, indet fruit endocarp. Mineralised: *Urtica* sp., *Ranunculus* sp. and indet	Charcoal, Moll-t, Sab/f
[155] (156) <16>	10l., 60ml.	C; C; C (mineralised)	HOVUL grains, TRIT chaff (glume bases), Uncharred, possibly partly mineralised: Indet seed	Charcoal, Moll-t
[153] (154) <17>	9l., 50ml.	C; C ; -	TRIT, HOVUL	Moll-t
[143] (144) <18>	10l., 60ml.	C; C; C	TRIT grain and glume base, HOVUL grain, Poaceae	Rounwood (with cut marks), Moll-t
[–] (118=106) <19>	38l., 175ml.	A*; C; C, A (mineralised)	HOVUL (inc. var. vulgare) and TRIT grains and chaff, Parenchymatic tissue, *Veronica hederifolia*, *Galium* sp. Uncharred, possibly partly mineralised: Cyperaceae, *Plantago lanceolata*, *Trifolium* sp., Apiaceae	Charcoal, Moll-t, Sab/f, Phosphate nodules
[159] (160) <20>	10l., 50ml.	A; C; C, C (mineralised)	HOVUL, TRITcf. *dicoccum*, Triticeae, TRIT glume fragment, *Chenopodium* sp., *Rumex* sp., Trifolieae, Poaceae, Brassicaceae. Mineralised: *Malva* sp.	Charcoal + roundwood, Phosphate nodule
[–] (201) <21>	17l., 120ml.	A; C; C , A (mineralised)	HOVUL and TRIT grains, TRIT chaff (glume bases), Uncharred, possibly partly mineralised: *Ranunculus* sp., *Plantago lanceolata*, Cyperaceae, Trifoliae	Charcoal, Moll-t

Table 12: Charred plant remains (cont.)

[149] (131) <22>	27l., 10ml.	A*; B; C	HOVUL (var. vulgare) and TRIT grains and chaff (glume bases), *Hyoscyamus niger*, *Galium* sp., Parenchymatic tissue, *Trifolium* sp.	Charcoal, Moll-t, Sab/f
[164] (163) <23>	4l., ml.	C; -; -	Triticeae (inc. TRIT, HOVUL)	Moll-t
[–] (409) <24>	17l., 20ml.	B; -; C	HOVUL grains (two husked), *Galium* sp., *Rumex* sp.	Charcoal, Moll-t
[–] (410) <25>	8l., 10ml.	A*; C; A	HOVUL and TRIT grains and chaff (glume bases), *Galium* sp., *Sherardia arvensis*, *Polygonum* sp., *Rumex* sp., Poaceae (*Poa/Phleum*, *Bromus* sp.), indet.	Charcoal, Moll-t
[–] (413) <26>	27l., 10ml.	C; -; C	TRIT grain fragments, Rubiaceae seed fragment	Charcoal, Moll-t
[–] (152) <27>	2l., 30ml.	B; -; -	HOVUL grains and TRIT grain and chaff (glume base)	Charcoal, Moll-t, bone frags
[8006] (8007) <30>	20l., 90ml.	C; C; B, B (mineralised)	HOVUL grains, TRIT grains and chaff (glume base), Triticeae culm node, Rumex sp., *Galium* sp., *Sambucus* sp., *Chenopodium* sp., *Anagallis* sp., *Pisum/Lens*. Mineralised: *Brassica* sp., Asteraceae tp. *Crepis* sp., Caryophyllaceae	Charcoal + roundwood, Moll-t, fired clay, Sab, phosphate nodule
[8038] (8039) <31>	40l., 80ml.	C; C; C	Triticeae, TRIT cf. *spelta* grains and glume base, HOVUL grains, Trifoliae, cf. Vicieae	Charcoal, Moll-t, Sab
[8063] (8064) <32>	38l., 150ml.	A; C; C	HOVUL (A), TRIT (inc. *spelta*) grains and glume bases, Triticeae, *Galium* sp., Vicieae (tp. *Lens culinaris*), *Polygonum* sp., indet.	Charcoal, Moll-t, Sab, burnt bone, FAS
[8143] (8144) <33>	10l., 60ml.	C; C; C	TRIT *dicoccum* chaff (glume base), HOVUL, TRIT *spelta* and Triticeae grains, *Viola* sp., *Ranunculus* sp., *Galium* sp.	Phosphate nodules, Moll-t
[8139] (8140) <34>	35l., ml.	A; C; A, C (mineralised)	TRIT (inc. *spelta*) grains and chaff (glume bases), HOVUL grains, Triticeae culm node, *Galium* sp., Chenopodiaceae. Mineralised *Lithospermum* sp. and indet. seed	Charcoal + roundwood, Moll-t, Sab, fish scale, phosphate nodule
[8133] (8134) <35>	18l., 50ml.	A*; C; C	TRIT (inc. *spelta*) grains and glume base, HOVUL grains, Triticeae culm node, Galium sp., *Corylus avellana*, *Rumex* sp., *Chenopodium* sp., Vicieae, *Poa/Phleum*, *Valerianella* sp., *Papaver* sp.	Charcoal + roundwood, phosphate nodule, mineralised insect
[8149] (8148) <36>	1l., 9ml.	C; -; C	HOVUL, *Galium* sp., Chenopodiaceae	Moll-t
[8161] (8162) <37>	18l., 55ml.	A; C; C	TRIT grains and glume bases, HOVUL grains and rachis segment, Triticeae grains, Poaceae (inc. *Poa/Phleum*), *Galium* sp., Trifolieae	Charcoal, Sab, Moll-t, phosphate nodule
[8167] (8168) <38>	19l., 35ml.	A; C; C	HOVUL grains, TRIT cf. *dicoccum* grains and glume bases, Triticeae grain fragments, Poaceae, *Valerianella* sp.	Sab

KEY: A** = 100+, A* = 30–99, A = >10, B = 9–5, C = <5;
Taxa: HOVUL = *Hordeum vulgare*, TRIT = *Triticum* sp.; Sab – Small animal bone; Sab/f – fish bone; Moll - t – mollusc, terrestrial; FAS – fuel ash slag

the samples comprised taxa also recorded in a carbonised condition (*Ranunculus* sp. *Viola* sp., *Rumex* sp., *Papaver* sp., *Malva* sp., *Veronica hederifolia*, Cyperaceae, *Plantago lanceolata*, Apiaceae, Trifoliae, *Brassica* sp., Caryophyllaceae) plus additional ones: nettle (*Urtica* sp., often identified to the small nettle species *U. urens*), gromwell (*Lithospermum* sp.) and hawk's-beard (tp. *Crepis* sp.).

Discussion

The charred assemblages recovered are characteristic of Late Bronze Age/Early Iron Age processing by-products, with plant resource exploitation based on the cultivation of hulled wheats and barley, and potentially some pulses, complemented by wild plant (hazelnuts, elderberries, hawthorn fruits) gathering. This is consistent with our general knowledge about plant exploitation practices in England (van der Veen and Jones 2007) and other sites in the local area, such as Potterne (Carruthers 2000; Straker 2000). The different proportions of charred plant remains between samples could possibly point to separate processing areas, activities or products. Although it may be misleading to distinguish in the case of deposits with mixed origins, those assumed to be in primary or secondary contexts (Fuller *et al.*

2014) and dominated by chaff and weed seeds may correspond to the latter stages of crop-processing of hulled cereals (dehusking), whilst samples dominated by cereal grains may have originated in food preparation (e.g. Hillman 1981; Jones 1984; van der Veen 2007). In spite of differential preservation partially accounting for this (chaff burns earlier than grain when near a fire, e.g. Boardman and Jones 1990, and is more susceptible to damage), the dominance of grain-rich samples at the site (with the exception of a chaff-rich sample from the midden itself) could perhaps point to products arriving almost fully processed from elsewhere, rather than this taking place on site.

The wild plants are not closely representative of specific habitats but fit well within the local chalk grassland as well as the disturbed ground to be expected around the site. Many of them could have been intentionally gathered for use as greens or medicines (Fern 1996–2012), but the arrival of most at the site is probably unintentional, the seeds possibly deposited in animal dung. Most of the charred wild plant seeds and the mineralised plant remains are nutrient-rich waste-ground taxa, notably nettle (*Urtica urens*); similar formation processes to those at Potterne (McCobb *et al*. 2003) probably explain this assemblage. In addition, gromwell has a thick and carbonate-rich seed coat that tends to easily mineralise in the right preservation conditions (Messager *et al*. 2010).

Discussion

Archaeological investigations at East Chisenbury midden in 2015−17 have added significantly to our understanding of this enigmatic Late Bronze Age/ Early Iron Age site, particularly when considered alongside the results of the preceding gradiometer survey (Wessex Archaeology 2016) and earlier fieldwork (McOmish *et al.* 2010), as well as a recently published radiocarbon dating programme (Waddington *et al.* 2018).

The gradiometer survey confirmed the existence of a large, roughly oval-shaped or elliptical enclosure, approximately 7ha in extent, its precise limits to the southwest unclear. In this area the presence of tree and scrub cover restricted the survey, though the formation of later, substantial lynchets on the west side may have obliterated all traces of the ditch here. It can be noted that no entrances could be distinguished in the otherwise clear length of enclosure ditch recorded to the north and east. The midden mound, as visible in the field and defined in extent by earlier augering, appears to lie within the enclosure, although this was not apparent from the results of the gradiometer survey, which did not show the midden material with any clarity. However, it does seem most likely that the enclosure ditch and midden were broadly contemporary, the midden coming to cover a large part of the interior in the southwest of the enclosure.

Very limited investigation on the northeastern side of the midden itself (in trenches 5 and 7) produced fewer finds than anticipated from the metre or so depth of deposits present, and there were no certainly intact midden layers or chalk surfaces within it. This contrasts with the quantity of finds from the southwest side (trench 6—badger upcast) and previous investigations, where structural remains were also encountered (though not consistently) within and, particularly, beneath the midden (McOmish *et al*. 2010), such remains being absent from the small areas exposed in trenches 5 and 7.

Geoarchaeological interpretation suggests a possible colluvial origin for the deposits in trenches 5 and 7, which—from appearance, character and components—are almost undoubtedly derived from midden material. However, the evidence also fits well with the possibility that this area of the midden is actually largely intact, but was subject to different contemporary use and a much slower rate of deposition. Rather than the finely-layered stratigraphy produced by the rapid accumulation of stabling waste, a peripheral location to the core activities may have resulted in a reduced—or less intensive—rate of deposition, leading to the incorporation of the material into an enriched, thickened anthropogenic soil (plaggen), which is effectively what is recorded here.

The enclosure ditch was revealed in three places on the east (trench 1), north (trench 2) and south (trench 4) sides respectively, and was shown, as the gradiometer survey indicated, to be a substantial feature. Time did not allow excavation of all three sections, and only in that to the east was the ditch bottomed, showing it to be approximately 8m wide (including the shallow step or berm on the inside) and 1.8m deep with moderately steeply sloping sides and a very slightly rounded bottom. The gradiometer survey suggested that the ditch was up to 3m narrower here than to the north and south, which excavation confirmed, whilst the paler 'shadow' along the inner edge of the ditch anomaly appears, on the east side at least, to reflect the presence of the step or berm, as also revealed here in the excavation.

There were few finds from the ditch in trench 1 and trench 4, the fills probably representing a combination of natural silting and deliberate later levelling of the bank. That very little of late prehistoric date found its way into the ditch perhaps in part reflects the barrier provided by the bank, best illustrated in trench 2 where a thin spread of presumed settlement debris within the enclosure extended up to the inner edge of the bank but not beyond. Late Romano-British pottery from a probable turf line near the top of the ditch in trench 1 clearly shows that at least this part of the ditch had become largely infilled by the time that Romano-British farming activity and related settlement was established in the area, the nature and scale of which is currently unknown.

The inner bank, recorded more than two decades ago by English Heritage (McOmish *et al*. 2002, fig. 3.8; 2010, fig. 3), was still visible in places as a very slight earthwork, particularly to the north where its presence was also confirmed by excavation. Remnants of bank material were identified in trench 2, though not elsewhere, but both here and in trench 1 the former extent of the bank was indicated by a 10–11m wide zone of 'clean' natural. In trench 1 the bank sealed a small assemblage of probable Late Bronze Age worked flint in mint condition, providing some dating evidence for the enclosure's construction.

In addition to the enclosure ditch, the other principal discovery—beyond the limits of the midden–was the evidence for probably contemporary settlement within the enclosure. This perhaps in part pre-dated the main phase of midden development which is thought likely to have taken place somewhat after 800 BC. In the western half of trench 1, subsequently enlarged as trench 8, were approximately 150 postholes, this concentration clearly continuing to the northeast and southwest beyond the limits of excavation, and probably also to the northwest into the area occupied by the midden. Many postholes were relatively substantial and some had flint post-packing, similar to those found beneath the midden in 1992–3 (McOmish *et al*. 2010, 48–50). The density of postholes in the 400 square metres exposed in 2017–18 made identification of individual structures difficult, however it is clear that more than one phase of multiple roundhouses are represented (Figure 10). That this sequence likely continued during the main phase of midden development is indicated by the presence of relatively small quantities of Early All Cannings Cross decorated wares in some of the postholes. Although of uncertain significance, given the small area exposed, it can be noted that the density of postholes recorded in the six square metre area of trench B in 1992–3, beneath the midden (McOmish *et al*. 2010, fig. 6), appears to be in the order of two times greater than that revealed in 2016–17 in trench 8. Figure 4 indicates the locations of several possible roundhouses with diameters of 7–8m, but other patterns may be discerned. None has any clearly defined doorways or porches but in this respect, as well as their size and posthole construction, these roundhouses are similar to broadly contemporary structures at, for example, Winnall Down, Winchester (Fasham 1985, 11–15). However, unlike that site, no four- or six-post structures have been identified at Chisenbury, nor any features that can be clearly classified as pits. Two pairs of large postholes may have held successive free-standing posts, possibly some form of totem posts.

No horizontal stratigraphy such as floor surfaces or hearths survived within the area investigated in trench 8, but a discrete deposit of animal bone adjacent to a posthole had somehow survived *in situ*, apparently undisturbed. The precise nature of this deposit is unclear, but it did not appear to be contained within an otherwise unidentified small pit or scoop, as was the base of a pottery vessel in the same area; perhaps some features and colour changes have been removed by subsequent soil formation. The presence of three fragments of human skull (two with evidence of trauma) amongst the animal bone (mainly cattle) hints that it was not simply a deposit of domestic refuse.

The structural evidence in trench 1 corresponded, perhaps coincidentally, with an area of enhanced magnetic response evident on the gradiometer survey, the latter probably in part reflecting a spread of midden material from immediately to the west. At least two other areas of enhanced magnetic response were indicated within the enclosure, in the northwest and northeast areas respectively, adjacent to the ditch and bank, and these may also indicate foci of settlement. Excavation in trench 2 investigated one of these, revealing a spread of occupation debris but no certainly contemporary structural features. The spread of debris lay almost 150m from the midden, too far to have been derived from it, and is more likely to represent a discrete deposit in the lee of the bank and possibly a further, relatively early midden deposit (the two radiocarbon

Fig. 10 Postholes in trench 8, from the east, with the fenced-off midden in the background

dates falling within the mid-11th–10th centuries cal. BC), perhaps associated with a nearby group of structures.

The programme of radiocarbon dating, only the second to be undertaken for the site, has provided very useful data regarding the time-span of activity, whilst recognising that only some elements of this very substantial midden, settlement and enclosure have been dated. Nevertheless, when considered in conjunction with the pottery, there is a strong indication that the earliest activity began around 1000 cal. BC, represented by the flint-tempered plain wares, continued beyond 800 cal. BC, marked by the appearance of decorated wares, with the final phase in perhaps the mid–late 6th-century cal. BC, possibly the 5th or even the 4th century, represented by just three sherds of scratch cordoned bowl. With a duration of possibly 500 years or more, this is considerably longer than the 150 years previously suggested for the midden itself (McOmish *et al.* 2010, 93), and similar to the 500 years or so suggested for the settlement and midden at Potterne (Lawson 2000, 261).

Furthermore, this longer timespan is supported by the recently published series of 28 radiocarbon dates obtained from animal bone and residues on pottery from the 1992–3 excavations (Waddington *et al.* 2018). This too identified an early phase, broadly between the late 10th and early 8th centuries cal. BC, followed by a gap until the main period of midden deposition beginning in the mid-7th century cal. BC (Waddington *et al.* 2018, 37), though such a gap is likely to reflect very localised differences in the site's overall development. However, this dating project had been designed, in particular, to better define the end-date of midden deposition at Chisenbury. The earlier Iron Age 'plateau' in the calibration curve presents a problem here, but the dates obtained have been combined with the stratigraphic sequence in a Bayesian chronological model. This has enabled the end-date to be moved forward to the mid–late-5th century cal. BC, adding a further century to the sequence as previously understood, with a suggested end-date of 450–400 cal. BC. The significance of this revised dating in terms of our understanding of the Late Bronze Age–Early Iron Age transition, the chronology of post-Deverel-Rimbury pottery and the possible overlap in time with Early Iron Age hillforts in the area is highlighted by Waddington *et al*. (2018, 37–42), and also potentially extends the Chisenbury sequence to 500 years. In all these discussions it should be remembered that only a tiny part of the midden at Chisenbury has been investigated, and it is almost inconceivable that these excavations have chanced upon the latest (and earliest) elements. In this respect, the copper alloy 'pendant' from trench 7 can be noted, perhaps not coincidentally the only place so far where scratch cordoned bowl sherds have been found. Finally, from the dating programme carried out on the 1992–3 material there is a late date of 369–201 cal. BC (Waddington *et al.* 2018, table 2, OxA-20174), not included in the Bayesian modelling, and this may not be quite as anomalous as it then appeared. In the sequence published there, an end-date in the mid–late 5th century BC was partly based on the absence of scratch cordoned bowls from the assemblage.

Although there were fewer finds than expected from the controlled excavation on the midden in 2016 (trenches 5 and 7), overall the range of artefactual material was broadly consistent with previous work, with significant assemblages of pottery and animal bone from a variety of contexts, only the ditch fills proving notably lacking. The significance of the red-finished furrowed bowls coming almost exclusively from the midden itself seems very likely to reflect the overall later development of this deposit relative to the enclosure and many of the settlement features, and this is supported by the first sherds of scratch cordoned bowl from the site. Interestingly these came from a part of the midden not previously investigated, suggesting not only that different processes were operating here (see above), but also that this part of the midden developed later, perhaps into the late 6th–5th century BC and beyond.

Contrary to previous evidence (Serjeantson *et al.* 2010), the animal bone suggests that cattle (as well as sheep and pigs) were intensively managed and that the animals were slaughtered on rather than off site, perhaps reflecting different activities, and maybe chronology, in the different parts of the enclosure investigated. It also appears to confirm that Chisenbury is unusual amongst midden sites in that there is comparatively few pigs, with sheep well represented. The limited isotope analysis of the faunal remains suggests relatively local origins, to be expected for the pigs, the evidence indicating a mixture of forest forage and animal protein in the raising of some, with others seemingly herbivorous. Both cattle and sheep appear to have been raised on unmanured local pasture, though for cattle some pasturage further afield may have been exploited.

The plant remains are consistent with the Late Bronze Age/Early Iron Age chronology of the site, with charred and mineralised material present. The cultivation of hulled wheat and barley was the mainstay of the arable economy, the remains indicating both food preparation and perhaps the later stages of crop processing, though some cereals may have been brought in ready processed. The wild plants reflect the local chalk grassland environment but also, as expected, disturbed ground characteristic of a midden site.

Turning to the other finds, the worked flint is entirely consistent with a late prehistoric date and unexceptional apart from its fresh condition. Stone objects comprise a rubber or grinder—with other sarsen fragments likely to be from quernstones, a whetstone, and fragments of a shale bracelet and a shale bead, the latter the first to be found at the site. Several bone points, pointed tools and two needles were recovered, along with what may have been part of a weaving comb and two 'blades', several of these items probably associated with textile working, as were two ceramic spindlewhorls. Other worked bone objects included four perforated objects that may have been pendants or other forms of decorative items. However, it is the small copper alloy 'pendant' from towards the base of the midden that is exceptional and stands out from the other artefacts in the assemblage. This object, currently without parallel, is of uncertain function and may have a continental origin. Fragments of human bone have been found before within the midden material but, as noted above, the three small fragments of human skull (two exhibiting trauma) amongst the small animal bone deposit adjacent to one of the postholes is of a more unusual nature. Radiocarbon dating of this and other human bone has provided further evidence for the curation of some of this material prior to deposition, for periods of perhaps a few decades up to three centuries, spanning several generations.

Together, the size and extent of the ditch and associated bank, combined with the topographically prominent location of the Late Bronze Age/Early Iron Age enclosure, confirms the East Chisenbury midden site as a significant monument within the landscape. With views into and beyond the Avon valley to the west, and into the more distant Vale of Pewsey to the northwest, the enclosure could have been utilised for defence as well as serving as a tribal centre, meeting and feasting place. What the geophysics has not demonstrated however, is that the enclosure lay at the focus of several linear ditches, though it did confirm the presence of a single pair of linear ditches/pit alignment approaching from the northwest seen during earlier monitoring work (McOmish *et al.* 2010, 90). In addition, the work in 2015–17 has corroborated the earlier evidence for broadly contemporary settlement and shown, significantly, that this continued for possibly at least 500 years and extends beyond the limits of the midden within the enclosure.

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The archive is currently stored at the Wessex Archaeology offices, Salisbury under the project code 70242 but will in due course be deposited at The Wiltshire Museum, Devizes.

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