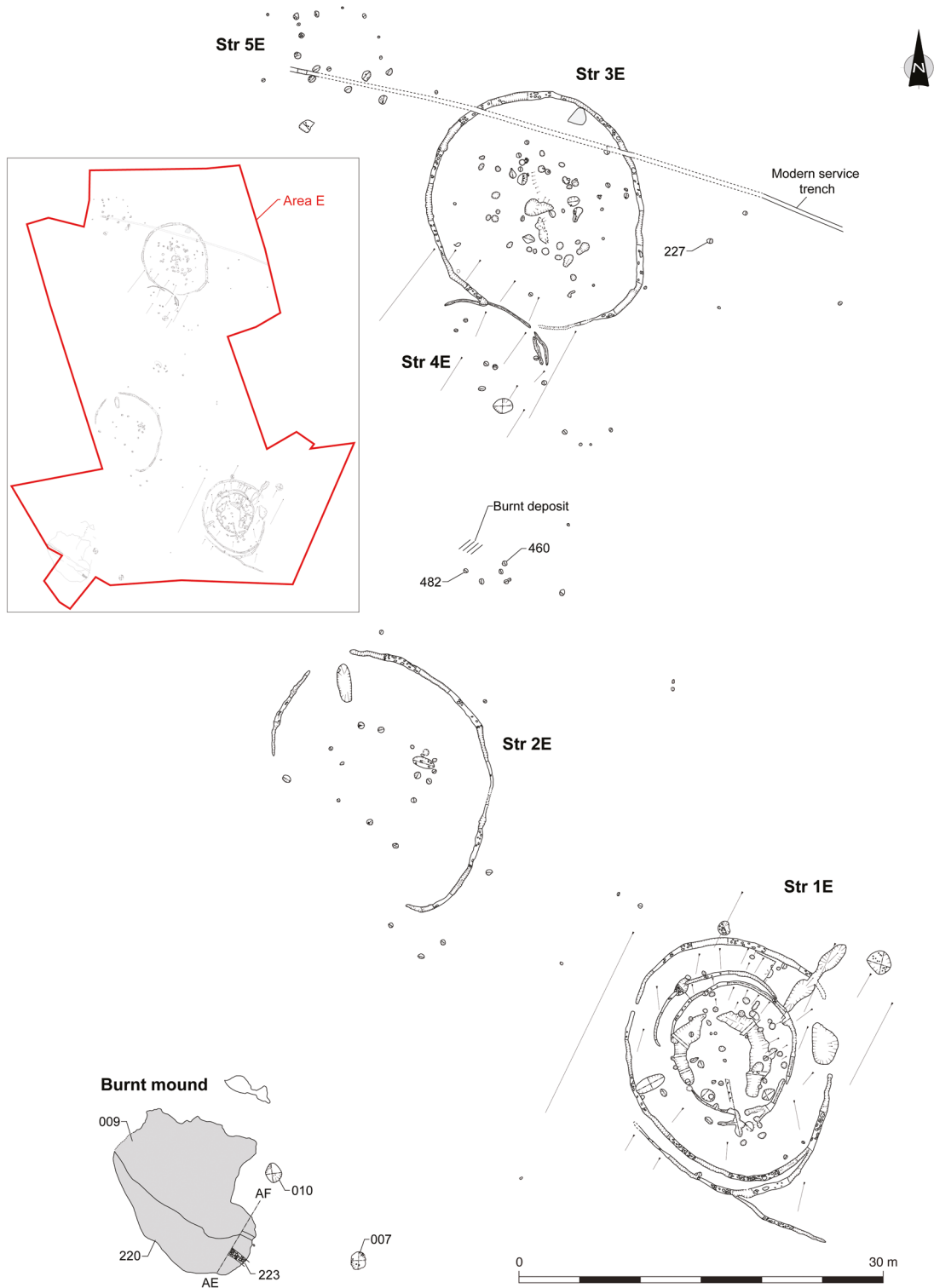


5. BRONZE AGE PALISADED STRUCTURES
(AREA E)

This area (Illus 20) contained two post-built circular structures enclosed by palisades, Structures 1E and 3E, and two truncated palisades, Structures 2E

and 4E, with 2E containing a ring of post holes forming another possible circular structure. Another grouping of post holes to the north-west of Structure 3E also formed a circular pattern in plan and may represent another post-built structure, 5E. These structures occupied a ridge of relatively flat ground,



Illus 20 Area E site plan

which fell away down to a small watercourse to the west. It appears that the flat ground occupied by the structures in this area has been subject to erosion, as a section of the putative palisade on the south-west side of Structure 2E was missing. This missing element corresponds with the break of slope at this point.

Across the site there was a scatter of features that could not be assigned to the identified structures, and a deposit of heat-affected material in the southern part of the excavation area was interpreted as remnants of a burnt mound.

The radiocarbon dates returned a range from the Mesolithic to the LBA, with the majority of dates falling within the MBA.

5.1 Structure 1E

5.1.1 General summary

Structure 1E was a multi-phase post-built roundhouse which measured 12m N–S and 11m E–W (Illus 21). The main architectural elements of the structure included two ring grooves and two post rings. The entrance, framed by a porch, was to the south. Internal elements included a segmented ring ditch and a suite of smaller pits. The structure was enclosed within a probable palisade. This structure was built in an area where the subsoil had a high content of sand, and this is reflected in the characteristics of the fills within features which were generally sandy silts, darkened with charcoal flecks, the silt content probably reflecting the ancient topsoil layer.

5.1.2 Description

The more complete Ring Groove 279/420 measured 0.2m wide by 0.15m deep in profile. It formed a near-continuous ring around the house except on the western side, where it was truncated by the external edge of Ring Ditch 321, and on the south side where it broke at the entrance. Three short slots (351, 355 and 357) may have been part of a complex entrance here (or they could be the remains of an earlier feature, see below). The entrance was framed by a series of opposing post holes forming the porch (334–319, 341–438 and 339–436), which ranged in size from 0.57m diameter by 0.08m deep to 1.16m by 0.5m by 0.23m deep, although Pit 438 may have represented conjoined pits. The porch architecture

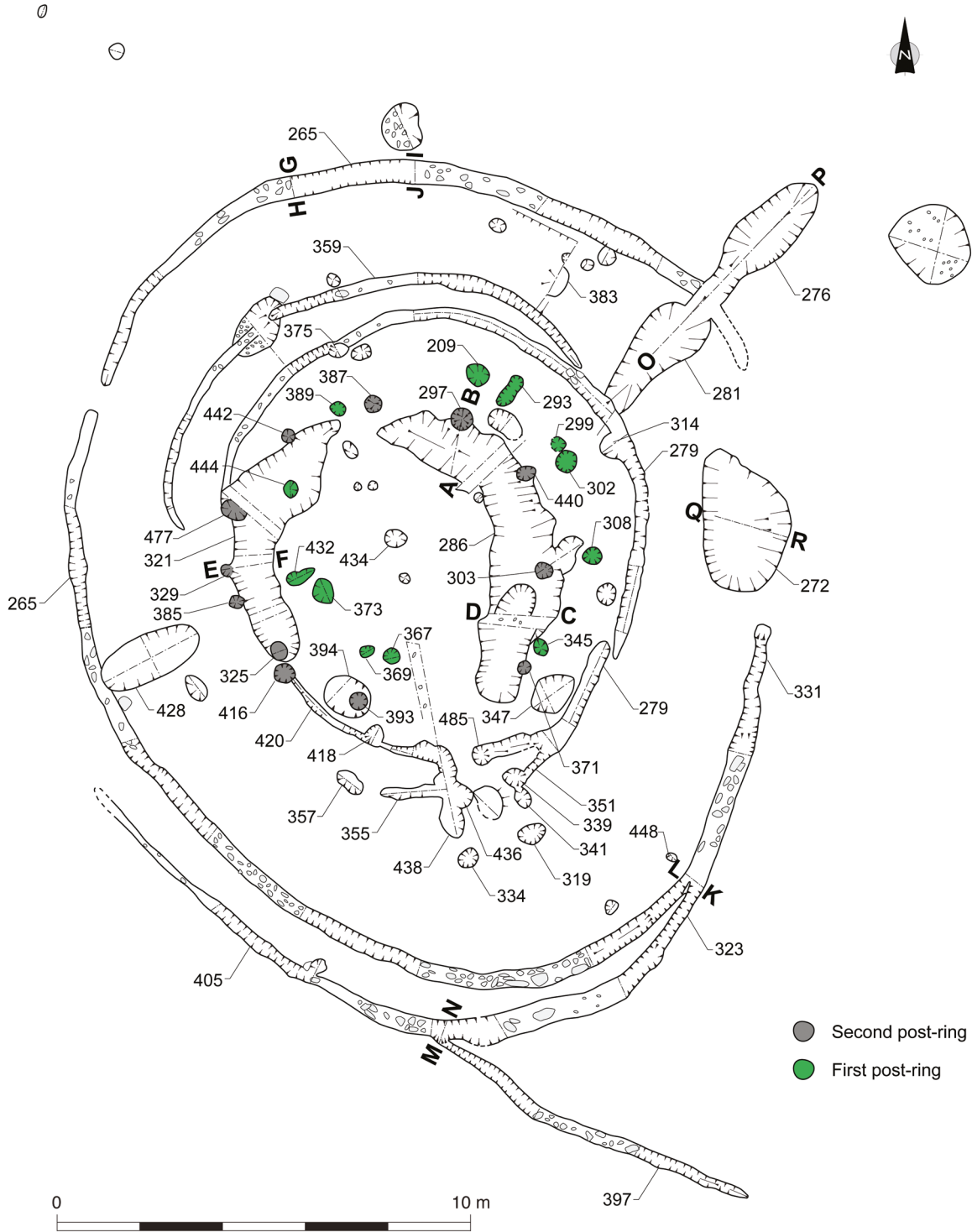
is similar to the Candlestone Iron Age structure in Aberdeenshire (Cameron 1999, illus 3). Four post holes cut the ring groove (375, 314, 485 and 418), and were thus stratigraphically later. It was also cut by the ring ditch (321).

An arc of pits on the east and north-east side of the structure, running concentric with the ring groove, comprised a partial post ring of five post holes (209, 293, 299, 302, 308 and 345) ranging in size from 0.5m diameter by 0.18m deep to 1.26m by 0.97m by 0.15m deep. Post Hole 302 cut Post Hole 299 and may represent a post replacement episode. A possible continuation of this ring on the west side of the structure may be made up of six post holes (389, 444, 432, 373, 369 and 367). Post Hole 444 was found below the fill of the ring ditch (321) and may have been truncated by this feature.

To the north of the more intact ring groove were the partial remains of a second ring groove, 359, which measured 0.2m wide by 0.1m deep, but had no physical relationship with the more complete ring groove. Potentially the short fragments of slot to the south (357, 355 and 351) could form continuations of this groove. Slot 351 was cut by Post Hole 339, which appears to have formed part of a porch associated with the more complete ring groove.

The ring ditch comprised a western segment, 321 (8.5m by 1.5m by 0.3m deep) and an eastern segment, 286 (6m by 1.5m by 0.3m deep). The eastern ring ditch had two fills; the upper was dark brown silt (287) and the lower a dark grey-black firmly compacted silt with 5% charcoal inclusions (288; Illus 22a & b). Ring Ditch 321 had an upper fill of loosely compacted mid-grey-black sandy silt with charcoal inclusions (396), and a similar but darker basal fill (322; Illus 22c). Pit 394 may also have formed part of the ring ditch. Both Ring Ditch 321 and Pit 394 were shallow, and together they may represent the truncated remains of a ring ditch with an undulating base.

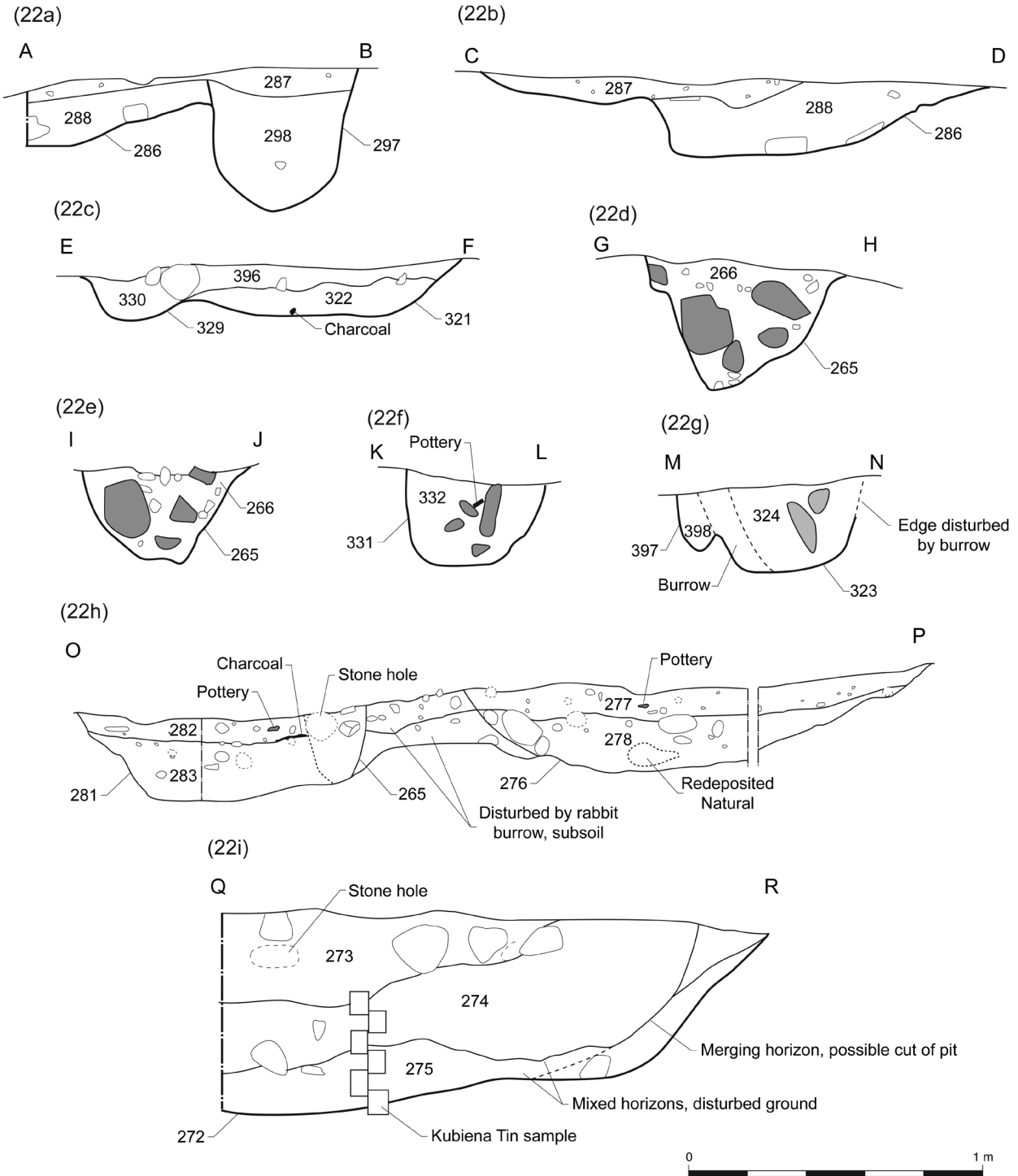
A ring of 12 post holes (393, 416, 325, 385, 329, 477, 442, 387, 297, 440, 303, 371) ranged in size from 0.3m diameter by 0.1m deep to 0.86m diameter by 0.15m deep. The diameter of this post ring was *c* 8m. Four of these post holes (477, 329, 385 and 325) were cut into the outer edge of Ring Ditch 321, and five (371, 345, 303, 440 and 297) appeared to have been cut into the outer edge of Ring Ditch 286,



Illus 21 Plan of Structure 1E, Area E

although it is possible that the posts were abutted by the fill rather than cutting it. Three (387, 389 and 442) were cut into the natural subsoil (002) and one (393) cut Feature 394. Ten of the post holes were evenly spaced, the exceptions being 325 and 329, which may represent post replacement episodes.

There were six internal features within the structure, which ranged in size from 0.25m diameter by 0.2m deep to 0.6m diameter by 0.09m deep. Feature 434, although very truncated, may be the remains of a central firepit as there was evidence of in-situ burning of the subsoil in the bottom of the



Illus 22 Selected sections within Structure 1E, Area E

feature. The function of the other features could not be determined through excavation, and the features did not show any spatial patterning indicative of internal structures.

The palisade, 265 and 331, measured *c* 21m N–S and 18m E–W. It was 0.6m wide by 0.5m deep

(Illus 22d–f), and enclosed the house on all sides, with a 1m break on the north-west and a 6.5m break on its east side. The break on the north-west is interpreted as a result of truncation rather than an entrance, as the depth of the palisade at this point was reduced to 0.05–0.1m and there were no

terminal post holes within the cut suggestive of an entranceway. A similar situation was documented on the eastern arm, as well the presence of a large pit within the break. Therefore a palisade entrance could not be established. The palisade slots were generally filled with deposits that had a high concentration of sand. There was no evidence for post impressions within the palisade slots, however there were large numbers of stones within their upper fills, possibly representing packing material for holding posts in place. In plan it was seen that the palisade had two spurs: 323/405, which measured 17m long by 0.57m wide by 0.4m deep; and 397, which measured 8.5m long by 0.3m wide by 0.15m deep (Illus 22g). Spur 323 branched off 331 to the south and ran concentrically with the arc of 265. Spur 397 branched off 323 at a 45° angle and was orientated north-west/south-east. However, the relationship in section between these two features was obscured by animal burrowing.

Ten other features were located between Palisade 265 and the outer ring groove. These ranged in size from 0.23m by 0.25m by 0.16m deep to 2.1m by 4.2m by 0.15m deep. Pits 281 and 276 (Illus 22h) were disturbed by rabbit burrows, making determination of their cuts at the intersection with the palisades difficult to resolve. A large pit (272; Illus 22i) occupied the eastern gap in Palisade 265, but as the palisade was also truncated at this point it could not be determined whether the pit pre- or post-dated the palisade. Soil micromorphology of Pit 272 (see Ellis, Section 5.9.4 below) suggests that it was filled with both midden-like material and windblown deposits, perhaps suggesting that it was used for the deposition of organic waste and was kept open for a period of time for that purpose. A further large pit, 428, to the west was also recorded, but its function is uncertain.

5.1.3 Interpretation and phasing

It is likely that these features represent multiple phases of construction, with new structures being built on top of previous ones, as well as replacements of elements of structures, such as posts, as part of a presumed ongoing maintenance regime. A possible interpretation based on three phases is presented below, but it is recognised that there are other possibilities.

The earliest structure on the site appears to be represented by the partial ring groove (359, 357, 355, 351), which was cut by a porch post hole presumed to belong to the more complete ring groove. No internal features have been identified which could be associated with this phase.

The second phase is represented by the more complete ring groove (279, 420) and the first post ring (209, 293, 299, 302, 308, 345, 367, 369, 373, 432, 444 and 389). This group of features was cut by the ring ditch segment (321).

The third phase is represented by the ring ditch (321 and 286). The ring ditch appears to have been replaced by the second post ring (393, 416, 325, 385, 329, 477, 442, 387, 297, 440, 303, 371) as many of the post holes associated with this post ring have been cut into or very close to the ring ditch.

Both the ring ditch and the more complete ring groove appear to have had an entrance at the south, but the position of the entrance in the first-phase structure is uncertain.

The palisade encircled all of these putative phases of building, but cannot be assigned to any phase. The relationship between the palisade and Groove 323 to the south-east could not be determined from the section, but in plan they appear to represent a rebuilding phase which probably took place in conjunction with one of the rebuilding phases of the structure. The similarity between this structure group and Structure 3C has already been noted (Section 4).

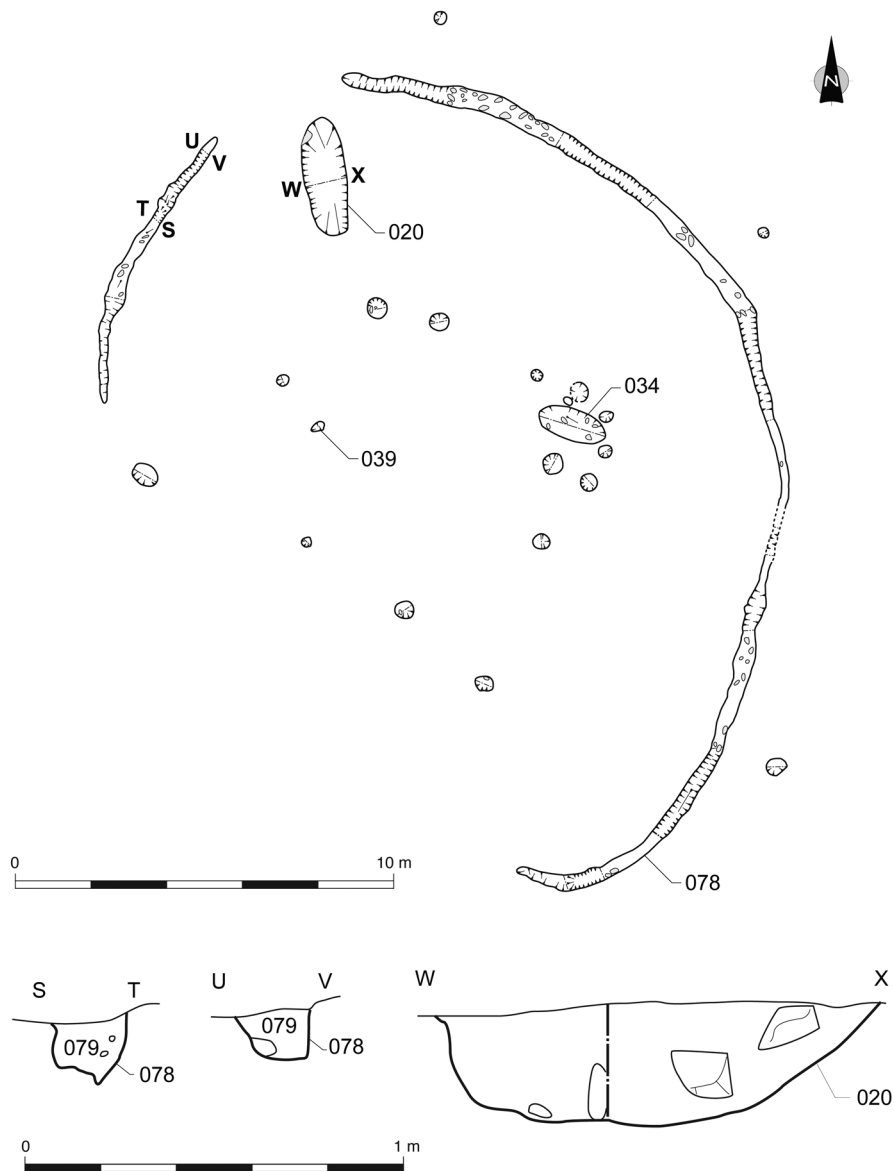
5.2 Structure 2E

5.2.1 General summary

This structure consisted of the partial remains of a probable palisade, inside which were 18 features (Illus 23). The internal diameter was *c* 16m E–W and 20m N–S.

5.2.2 Description

The curvilinear cut of the palisade (078) had a stony fill (079; Illus 23), which probably represents packing material for securing the palisade. The palisade cut measured 21.5m in length by 0.4m by 0.25m deep. It had two breaks: one to the north-west, the other to the south-west. These breaks were interpreted as a result of truncation rather than



Illus 23 Plan and selected sections of Structure 2E, Area E

design as the cut of the feature was shallower at these points, being reduced in places to a stain in the subsoil, and with no evidence of terminal post holes at these junctures.

The 18 internal features, including two large pits (020 and 034), ranged in size from 0.4m diameter by 0.2m deep to 1.1m by 3.37m by 0.36m deep.

5.2.3 Interpretation and phasing

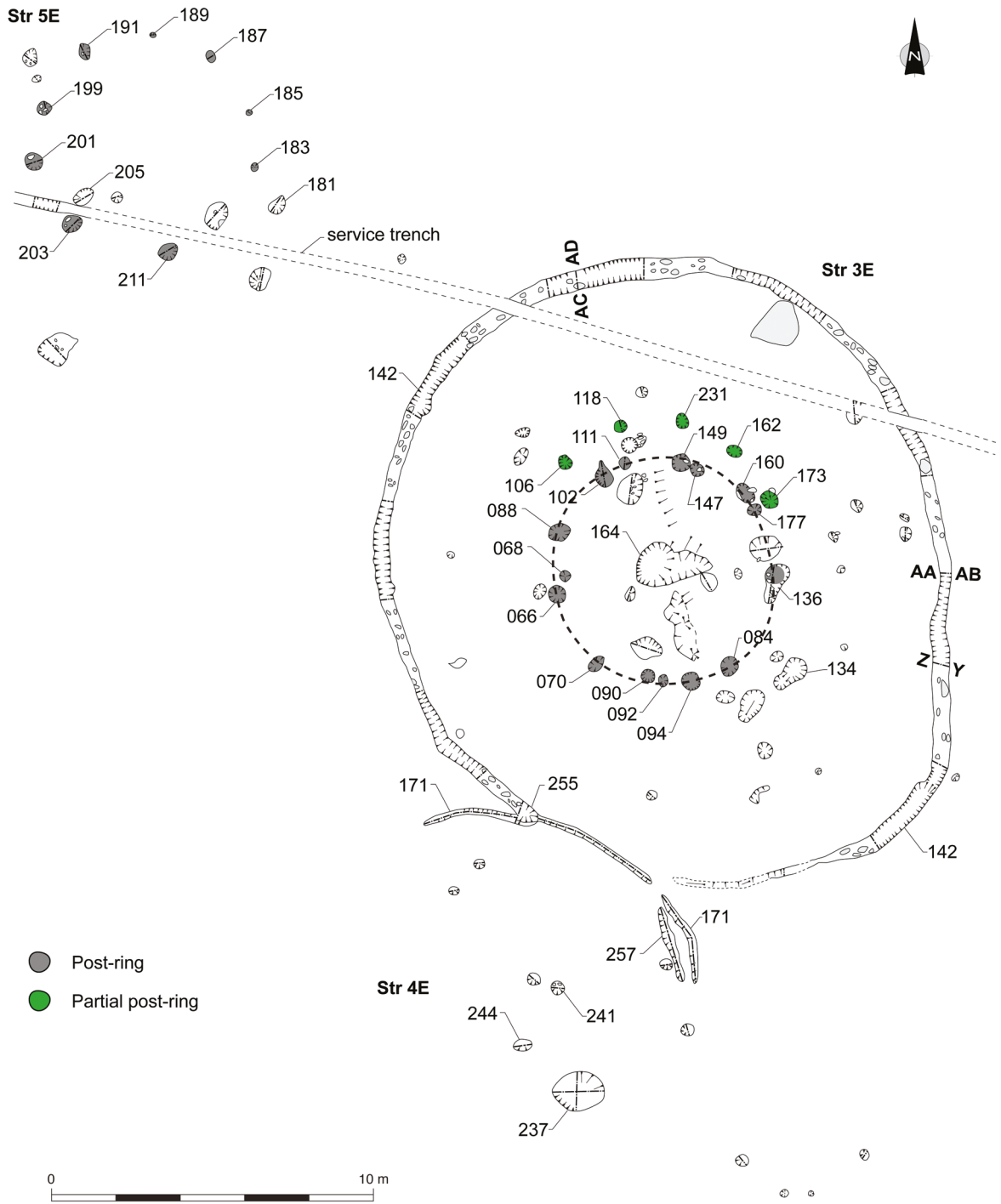
There was no evidence to suggest what the function of these features may have been, and no stratigraphic

relationships were identified. Potentially the post holes could represent the remains of a single-phase post ring structure within the palisade.

5.3 Structure 3E

5.3.1 General summary

Structure 3E was a post-built structure enclosed within a palisade (Illus 24). The structure had an inner post ring and the partial remains of an outer ring. Within the structure were a number of internal features. Structure 3E was enclosed within a sub-



Illus 24 Plans of Structures 3E, 4E and 5E, Area E

circular palisade with a number of features located between the palisade and Structure 3E. A modern service trench bisected the area.

5.3.2 Description

The post ring, of c 7m diameter, contained at least 15 post holes (147/149, 160/177, 136, 084, 094,

092, 090, 070, 066, 068, 088, 102 and 111), which ranged in size from 0.45m diameter by 0.15m deep to 1.43m by 0.67m by 0.43m deep. Based on their proximity to each other, possible post replacements were identified as paired Post Holes 066/068, 102/111, 147/149 and 160/177. There was an arc of five pits running to the north of the post

ring which may represent the remains of another post ring (106, 118, 231, 162 and 173) and which ranged in size from 0.47m by 0.49m by 0.11m deep to 0.3m by 0.66m by 0.15m deep. No entrance to the structure(s) was clearly discernible.

The 17 internal features within the structure ranged in size from 0.2m by 0.35m by 0.11m deep to 0.6m by 2.2m by 0.34m deep. The large central pit (164) contained evidence of in-situ burning, with a charcoal and ash-rich fill (165) and burnt natural subsoil in its base, and as such was interpreted as a central hearth. Again, the function of the rest of these internal features was not determined by excavation and there was no discernible patterning in their spatial arrangement.

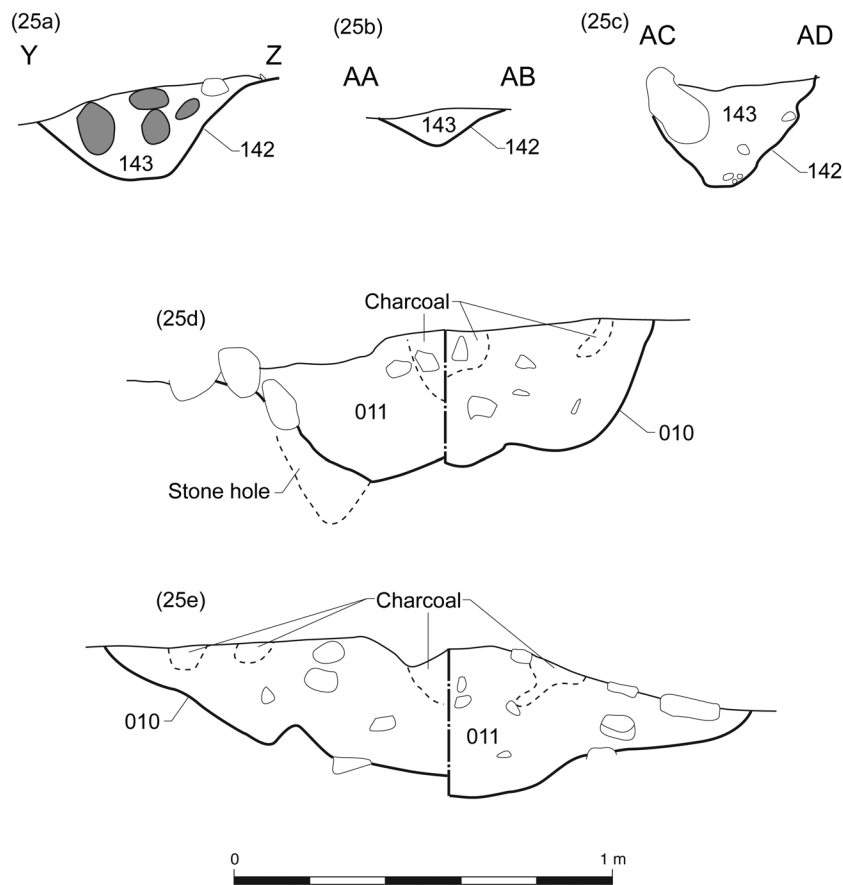
Structure 3E was bounded by a sub-circular palisade foundation trench (142), which had overall dimensions of 20m N–S and 17m E–W, and was 0.4–0.6m wide by 0.05–0.42m deep. There was a break on its south side with one terminal end post hole (255), which was interpreted as the probable

remains of the entrance. The palisade cut the stratigraphically earlier curvilinear Feature 171 and was cut on its northern side by a modern service trench. The palisade contained a stony fill (143) interpreted as packing material (Illus 25a–c). No post holes were found within the palisade.

5.3.3 Interpretation and phasing

The palisade and the post rings of this structure were concentric and respected each other, the implication being that they were contemporary. Other than paired post holes interpreted as post replacements within the same structure, there were no intercutting features, but if the partial post ring ran where suggested, it may have been earlier than the more complete one. The palisade, 142, cut the external Feature 171, thus making 142 the stratigraphically later feature, and by inference suggests that Structure 3E was later than 4E.

The palisade may have been multi-functional, offering protection from the elements and wild



Illus 25 Sections of Structure 3E and Pit 010, Area E

animals as well as corralling animals. The presence of a central hearth suggests the structure was a house.

5.4 Structure 4E

5.4.1 General summary

Structure 4E is represented by three curvilinear cuts and a group of eight internal features (Illus 24).

5.4.2 Description

The inner curvilinear cut (257) measured 2.5m by 0.3m by 0.24m deep, and the outer curvilinear cut (171) measured 11m in combined length by 0.25m wide by 0.1m deep. Feature 171 was cut by the palisade surrounding Structure 3E (142), making Feature 171 the earlier structure.

There were eight features partially bounded by the curvilinear Features 171 and 257, which ranged in size from 0.44m diameter by 0.12m deep to 1.5m by 1.8m by 0.12m. With the exception of 237, the largest pit associated with Structure 4E, the other features were all heavily truncated small pits with single fills. Two pits, 241 and 244, contained moderate quantities of charred plant remains (see Hastie, Section 5.9.3 below).

5.4.3 Interpretation and phasing

Comparable with Structure 2E, and based on the projection of the arc of the outer curvilinear feature, it is possible that these features represent the remains of a further, heavily truncated structure bounded by a palisade.

5.5 Structure 5E

5.5.1 General summary

A group of 19 pits was found located to the north-west of Structure 3E, nine of which appear to form a circular post ring.

5.5.2 Description

The possible circular post ring measured *c* 7m diameter (183, 185, 187, 189, 191, 199, 201, 203, and 211; Illus 24). The pits were fairly evenly spaced at 2m apart. Pit 181 was out of alignment with the post ring, and may represent a post defining an entrance. The features ranged in size from 0.4m by

0.43m by 0.06m deep to 0.9m diameter by 0.15m deep. Both within and outside this putative circular structure were pit features, the functions of which are unknown. The structure was also bisected by a modern service trench.

5.5.3 Interpretation and phasing

The 7m diameter of this structure was the same as the inner post ring of Structure 3E. It appeared to be a simple post-built structure with an entrance to the south-east. The paucity of evidence means that the function of the structure could not be ascertained.

5.6 Spread of burnt material

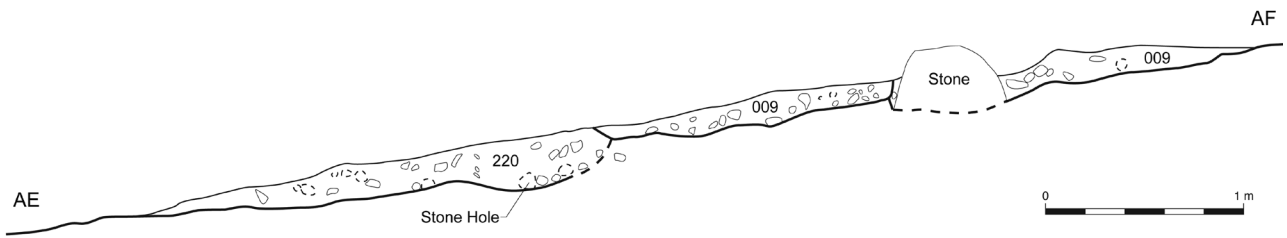
5.6.1 General summary

A spread of burnt material, a possible burnt mound, was located at the south-west of Site E, next to a small watercourse (Illus 20).

5.6.2 Description

The area of burnt material measured 12m by 13m by 0.38m deep. It contained two deposits (009 and 220; Illus 26). Deposit 009 was a charcoal-rich material with fire-cracked red sandstone inclusions, which did not seal any underlying features, but directly overlay the natural subsoil (002). The interface between 009 and 220 was not clear, but Deposit 220, grey clay, was recorded predominantly on the downslope of this spread of material and abutted 009. Deposit 220 was thought to be material that had accumulated at the edge of the watercourse, which at this juncture was an area of waterlogged ground. The spread was cut by a modern service trench (005) and a rubble field drain (223).

Late Mesolithic radiocarbon date ranges of 4839–4723 cal BC (95% probability; UBA-15228) and 4995–4790 cal BC (95% probability; UBA-15229) were returned from burnt hazelnut shell recovered from 009, and if the dated material is associated with the use of the burnt mound then this burnt mound would be an unusually early example, as the majority of burnt mounds are dated to the Bronze Age (see Section 11.1 for further discussion).



Illus 26 Section through burnt material, Area E

5.7 Pit features

5.7.1 General summary

As with all the areas of excavation, there were additional features not associated with structural elements of the buildings, the functions of which were not determined.

5.7.2 Description

There were 32 additional features across this excavation area, which ranged in size from 0.12m diameter by 0.05m deep to 2.17m by 2.04m by 0.32m. Of particular note were Pits 007 and 010 (Illus 25d & e), close to the burnt mound at the south of the site, both of which contained evidence of in-situ burning. Pit 007 produced a relatively large assemblage of charred grain (see Section 5.9.3), and two barley seeds produced radiocarbon dates (Table 11: 1504–1317 BC at 95.4% probability) which are broadly contemporary with Structure 1E (1494–1056 BC) (see Section 5.10). Pit 227 contained a relatively large assemblage of pottery (see Johnson, Section 5.8 below). Pit 460, located close to a burnt deposit at the centre of the site, contained a small quantity of burnt grain (see Hastie, Section 5.9.3 below).

5.8 Artefacts

5.8.1 Pottery

Melanie Johnson

The MBA/LBA assemblage from this area is very unevenly distributed between the various structures (Table 6), with the vast majority of the pottery coming from Structure 1E, the most complex of the buildings, and isolated Pit 227 to the east of Structure 3E.

Fabrics are coarse, thick and sandy, with up to 30% sand and grit inclusions and stones recorded up to 12mm in size. Wall thickness ranged between 6mm and 15mm, with base thickness up to 20mm. Colours tended to be greys, browns and oranges. Surfaces tended to be finished by smoothing, and finger-marking often remains. Many of the sherds are abraded.

Structure 1E

Pottery from this building came from the outer palisade (265, 323, 331, 405), large pits on the east and north-east (272, 276, 281), the ring groove of the building (279, 359), the east ring ditch (286), the west ring ditch (321), the porch (319, 341, 438), large pits (347, 394) and a post hole in the post ring (416), and small pits lying between the building and the palisade (383, 448).

Table 6 Pottery distribution, Area E

Structure	No. sherds	Wt (g)	No. vessels
Structure 1E	127	3052	38
Structure 3E	33	589	10
Structure 2E	12	194	5
Structure 5E	4	62	3
Isolated pits & unstrat	123	3773	23

The largest single deposit of sherds comprised a single vessel (P234) from C286, the eastern ring ditch, and was the only pottery found in this feature. The vessel comprised rim and body sherds from a pot with a thick flat-topped rim.

The diagnostic sherds from the outer palisade included flat and rounded rims (P227 Illus 27; P226), flat and footed bases (P239, P240), and body sherds with external bulges (P228 Illus 27; P225); it is unclear if these latter are thick cordons. Also within the western ring ditch (321) and a post hole (319) at the porch were body sherds ornamented with thick external bulges (P235, P236). A rim diameter of 130mm and a base diameter of 140mm were recorded.

Within the ring groove of the building, the only diagnostic sherds found were rim sherds from a vessel with a flat-topped rim, a neck and carination and a diameter of 260mm (P249 Illus 27). It was sooted

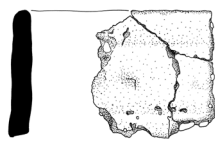
on the exterior and was fairly roughly finished, with finger marks visible.

Two earlier sherds were recovered from the ring groove and are likely to be residual. A Food Vessel rim sherd (P232) came from Ring Groove 279. This bipartite bowl has a wide internal bevel on a thick everted rim, decorated with impressed maggot decoration comprising short diagonal impressions along the exterior of the rim, chevrons along the internal rim bevel, and vertical zigzags across the neck and below the carination. A further body sherd (P248), also from the ring groove, was decorated with parallel incised lines. Both sherds are likely to be of EBA date (2200–2000 BC).

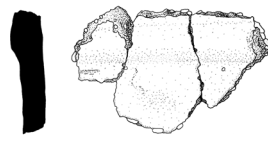
Structure 3E

The assemblage from Structure 3E was mainly plain body sherds, some of which were still a fairly large size; the overall average sherd weight for this assemblage is 18g. Sherds were recovered from post

Structure 1E



P227



P228



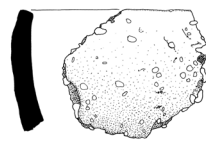
P249

Structure 3E



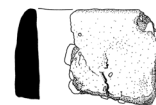
P199

Structure 2E



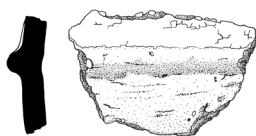
P197

Pit 227



P212

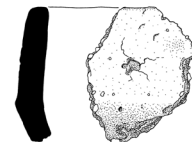
Pit 227



P216



P217



P218



Illus 27 Pottery from Area E

hole/pit features forming the building (134, 136, 147) and from the fill of the palisade (142). Two rim sherds were identified; one of these was a simple flat-topped upright rim with a diameter of 180mm (P203), while the other was an unusual form (P199 Illus 27). Its rim was inturning with a flat top and was expanded to the interior, with a bulge/ridge on the exterior.

Structure 2E

A very small assemblage (12 sherds) was recovered from three features associated with Structure 2E, including the palisade slot (078), a large internal pit (020) and a small internal pit/post hole (039). Of the two sherds found in 020, one of these was a rim sherd (P197 Illus 27) with a flat top and internal bevel; the remainder were plain body sherds.

Structure 5E

A very small assemblage (four sherds) was recovered from two pits/post holes (187 and 205) forming Structure 5E. One of these was a base sherd (P207), although very little of it survived apart from a section of the wall.

Isolated pits

A pit (227) lying to the east of Structure 3E contained 112 sherds from 15 different vessels, weighing 3,556g. This is the single largest deposit of pottery across the whole of this area. A number of the sherds were diagnostic and several large groupings of plain body sherds were recorded, including one which weighed just over 1kg.

Where recognisable, the rims were flat-topped from plain vessels with straight sides (P212 Illus 27), rounded slightly inturning rims from barrel-shaped vessels with slight necks (P217 Illus 27), shouldered bowls with upright flat-topped rims (P218 Illus 27), and flat-topped and slightly necked (P219, P220). P217 had a diameter of 180mm. An applied cordon was also recorded on a body sherd (P216 Illus 27). This sherd had a thick charred deposit adhering to its outer surface above the cordon. Four flat bases were recorded, two with diameters of 130mm.

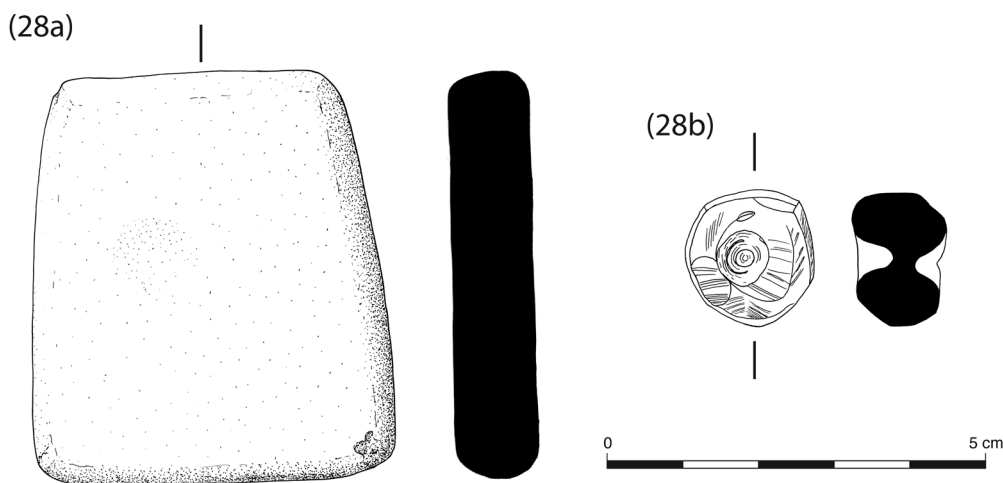
A further three pits, in a small group of pits lying between Structure 4E and Structure 2E, contained two plain body sherds and a small, very abraded flat-topped rim sherd.

5.8.2 Chipped and coarse stone

Ann Clarke

Just two small flakes of flint, one burnt, and a blade of orange flint were found in this area. The blade was unstratified, but was found during the site preparation of Structure 2E, and it could be of any date from the Mesolithic to the Bronze Age.

A fine whetstone/grinding stone was found in the fill of Ring Ditch 321 in Structure 1E (Illus 28a). This fine-grained sandstone slab has been shaped by grinding the edges to form a regular trapezoid. Both faces are worn smooth with slight undulations and there are random light incisions made by a fine metal blade. The careful



Illus 28 Stone and cannel coal objects from Area E

shaping of the slab and its size may suggest that it was a personal and portable object used for the maintenance of metal blades.

5.8.3 Cannel coal

Fraser Hunter

An unfinished globular bead (D 11mm, H 11.5mm), with faceted surfaces covered in extensive abrasion scars, was recovered from Post Hole 149 in Structure 3E (Illus 28b). The production sequence involved creating a faceted cylinder, roughly rounding it by cutting facets into the top edges, then abrading it to shape. The biconical perforation is incomplete; the two tapering rounded conical holes do not meet. Both show rotary wear, implying they were bored rather than pecked. There is no obvious reason why manufacture was abandoned. Hints of conchoidal fracture suggest it is probably a cannel coal.

5.9 Environmental evidence

5.9.1 Calcined bone

Sue Anderson

Burnt bone totalling 24.15g was recovered from 43 contexts. Structure 1E produced the largest quantity (13.25g), including some large pieces of animal bone from Ring Ditch 321 and Post Hole 389. Structure 3E contexts contained 5.6g, the majority from Pit 164. Only 0.25g was recovered from five contexts in Structure 2E, and 0.15g from two contexts in Structure 4E. Structure 5E produced 3.95g, most of which came from a burnt spread (218). Another deposit of burnt material, 484, contained 0.95g of bone.

5.9.2 Charcoal

Michael Cressey

Forty-three samples of charcoal were analysed from this area, of which seven were from Structure 1E, 15 from 2E, 14 from 3E, one from 4E and six from 5E. Material from 20 samples was below the level of identification (BLOI) or indeterminate. The numbers of identifications by species for each of the structures is shown in Table 7 (Structure 4E contained only BLOI fragments). Four species of wood are represented, with oak attaining 69% of the assemblage and lower amounts of hazel (27%). Both birch and alder are extremely low at below 3%.

5.9.3 Charred plant remains

Mhairi Hastie

A spread of cereal grains and other plant remains were recovered from this area, with high concentrations of cereal grains being present in several of the features associated with two structures (1E and 4E), and from other related structures and deposits. Compared to the other excavated areas, the largest and most varied plant assemblages were recovered from this area, including thousands of cereal grains, rare fragments of cereal chaff, a small wild taxa assemblage, fragments of nutshell and a number of flax seeds (Tables 8–10). No other flax seeds have been recovered from any other excavated area.

Composition of plant remains

Barley was by far the most common cereal and the majority of grains were identified as the naked variety. Wheat grains were also present, including emmer wheat (*Triticum dicoccum*), which was confirmed by the presence of emmer chaff found in deposits associated with Structure 1E, and bread/

Table 7 Charcoal distribution by species, Area E

Species	Str 1E		Str 2E		Str 3E		Str 5E		Totals		
	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	%
<i>Alnus</i>					1	0.2			1	0.2	0.2
<i>Betula</i>	7	1.3	1	1	1	1			9	3.3	3.3
<i>Corylus</i>	39	17.7	21	3.6	3	4.1	13	1.7	76	27.1	27.3
<i>Quercus</i>	50	67.3	4	1.2					54	68.5	69.1
Total	96	86.3	26	5.8	5	5.3	13	1.7	140	99.1	-

club wheat (*Triticum aestivum/compactum*). Bread/club wheat has not been identified from any other of the excavated areas. Preservation of the grain varied, although several extremely well-preserved large concentrations of grain were recovered, chiefly from internal features of Structure 1E, including Ring Ditch 321, Pit 394, Post Hole 418 and Ring Groove 420 in the south-west portion of the structure. The well-preserved nature of these grain concentrations suggests that they had probably been heated for a prolonged period in an enclosed area, rather than having burnt quickly in an open fire (Dickson et al 2008).

Small amounts of weed seeds were present throughout a variety of features and deposits, the largest quantity of weed seeds being recovered from features containing increased quantities of grain. Only a limited range of wild taxa was present, consisting of small-seeded species of sedge chickweed (*Stellaria* sp.), corn spurrey (*Spergula arvensis* L.), knotgrass (*Polygonum aviculare* agg.), fat hen and cleavers (*Galium aparine* L.). One or two large-seeded species were also present, such as black mustard (*Brassica* sp.), hemp nettle and corn cockle, but these were few.

Flax seeds were recovered from three samples taken from Structure 1E. As with the wild taxa seeds, these were present in samples that also contained very large amounts of cereal grain. The majority of the flax seeds showed the distinctive bulging end of cultivated flax.

Six samples, spread throughout Area E, contained small pieces of underground stem or rhizomes. One of the fragments showed the characteristic bulbous features of onion couch (*Arrhenatherum elatius* subsp. *bulbosum*), which was a common weed of arable fields. Small quantities of charred heather stem fragments and twigs were also present in samples taken from the inner ring groove of Structure 1E.

Distribution of plant remains

A general spread of cereal grains, similar to the other excavated areas such as Areas B, C and F, is recorded throughout many of the structures and deposits from Area E. Three large assemblages of cereal grains were particularly noted from the ring ditch, palisade ditch and several internal post holes of Structure 1E, two pits associated with Structure 4E and an isolated firepit (007).

Comparable high concentrations of cereal grains have been recovered at Kintore (Holden et al 2008). There, a number of distinct large assemblages of grain were recovered from one or two roundhouse structures, and it was argued that the general low-level spread of carbonised grain noted across the rest of the area had originated from larger burning events (Holden et al 2008). The spatial distribution of grain across Area E is very similar in nature, suggesting that much of the grain present across this area originated from only one or two large burning incidents.

Structure 1E (Table 8)

Large concentrations of cereal grains, including naked barley and emmer wheat, were recovered from the ring ditch (321) and inner ring groove (420), although the bulk of the grain appears to be from two closely associated pits (394 and 418) that were located at the southern end of the ring ditch. This shows clearly that the main concentration of grain was towards the south-west corner of the structure.

On a similar note, soil thin-section analysis from excavations at Birnie (Hastie & Lancaster 2005) identified a large charcoal-rich deposit arranged around the perimeter of a roundhouse structure. This deposit, along with the recovery of woody tissue pseudomorphs (revealing the presence of uncharred wood) indicated the presence of large quantities of wood in the ring ditch. These deposits were interpreted as the remains of a partial floor or platform around the internal edge of the house which had collapsed and charred when the roundhouse was burnt down. Although no evidence for the storage of grain at the time of its destruction was recovered, it is possible that such platforms could have been used for storage of processed grain and other food material, lifting them clear off the floor and away from rodents.

The bulk of the grain recovered was very well preserved. Chaff remains and weed seeds were also recovered with the cereal grain. Occasional fused grains were present and some of these still had fragments of rachis attached. The presence of attached rachis fragments and the increased number of chaff remains recovered from the house potentially suggests at least some of the grain was being stored on the ear when burnt.

Table 8 Charred plant remains from Structure 1E

Weed seeds																			
<i>Polygonum persicaria</i>	Nutlet	Pericaria/pale periscaria	1	10												1	1	2	2
<i>lappifolium</i> L.																			
<i>Polygonum</i> sp.	Nutlet	Knotgrass	1																
<i>Rumex</i> sp.	Nutlet	Dock	1																
<i>Chenopodium album</i> L.	Seed	Fat hen	1																
cf <i>Attriplex</i> sp.	Seed	Orache	1																
<i>Galeopsis</i> sp.	Nutlets	Hemp-nettle	1													2			
<i>Plantago lanceolata</i> L.	Seed	Ribwort	1																
Gramineae indet. (medium)	Caryopsis	Medium-grained grass																	
cf Gramineae (medium)	Caryopsis	Medium-grained grass																	1
cf <i>Bromus/Lolium</i> sp.	Caryopsis	Brome/rye grass	1						1										
cf <i>Danthonia</i> sp.	Caryopsis	Heath grass	1																
<i>Scripus</i> spp.	Nutlet	Club rush							3										
<i>Carex</i> spp.	Nutlet	Sedge	1																
Indeterminate	Seed	Seed indet.	1						4										
Potential economic species																			
<i>Linum usitatissimum</i>	Seed	Cultivated flax	5													2			1
<i>Corylus avellana</i> L.	Shell	Hazel	3						1						4				4
<i>Malus/Pyrus</i> sp.	Pip	Apple/pear																	1

Table 8 cont

Other plant remains												
Monocotyledon	Fragment	Rhizome	1									1
Indeterminate	Bud/fruit	Indeterminate	1	1								
Cereal remains												
<i>Triticum dicoccum</i>	Caryopsis	Emmer wheat	2	3								
<i>Triticum cf dicoccum</i>	Caryopsis	Emmer wheat							1			2
<i>Triticum</i> sp.	Caryopsis	Wheat	4	2	15			1		10		17
<i>Triticum cf dicoccum</i>	Spikelet forklet	Emmer wheat	1									4
<i>Triticum cf dicoccum</i>	Glume base	Emmer wheat	1									2
<i>Triticum cf spelta</i>	Caryopsis	Spelt wheat			1							
<i>Triticum aestivum/compactum</i>	Caryopsis	Bread/club wheat										3
<i>Triticum cf aestivum/compactum</i>	Caryopsis	Bread/club wheat										4
<i>Triticum/Hordeum</i> sp.	Caryopsis	Wheat/barley	2	8	8	1		1				
<i>Hordeum</i> var. <i>nudum</i> (TW)	Caryopsis	Naked barley				4		2	1	119		2
<i>Hordeum</i> var. <i>nudum</i> (ST)	Caryopsis	Naked barley	1			59		20 (e)	6	4	598	7
<i>Hordeum</i> var. <i>nudum</i>	Caryopsis	Naked barley	2		9	45		184	2	6	686	7
								(e)				9
<i>Hordeum</i> sp.	Caryopsis	Barley	275	183	223	46	219	1636	80	73	1353	55
								(e)				47
cf <i>Hordeum</i> sp.	Caryopsis	Barley	14		13		9	44 (e)		4	64	4
												11

Table 8 cont

Cut number	286	286	321	321	420	308	394	410	416	418	442	343	331	
Fill number	288	287	322	396	421	307	395	411	417	419	443	344	332	
Feature type	RD	RD	RD	RD	RG	PH	PH	PH	PH	PH	PH	Pal	Pal	
Cereal indet.	Caryopsis	Indeterminate	30	56	37	18	22	92 (e)	9	183	19	14	21	
Cereal indet. (small frags)	Caryopsis	Indeterminate	70											
	Culm node	Straw	1	7	7									1
	Caryopsis	Fused barley grain	+	+	+	+	+	+	+	++	+	+	+	

Key: RD = ring ditch, RG = ring groove, PH = post hole, Pal = palisade

Modern ethnographical parallels (Holden et al 2008) suggest that the bulk of the cereal crops would probably have been stored outside, close to the building in stacks and only brought into the building to be processed, on a piecemeal basis, as and when required. Indeed, a similar large concentration of cereal grain and chaff, recovered from the burnt remains of a Mid-Iron Age roundhouse (RH23) at Kintore (Cook & Dunbar 2008), has also been interpreted as grain that had been stored on the ear. It would be advantageous to store the grain in this way, as the grain would be enclosed in tough husks, making it more resistant to spoiling or attack by insects or rodents.

Occasional seeds of cultivated flax were recovered along with the cereal grain; however, there were no large concentrations of flax seeds to suggest that any seed store had been present in the house at the end of its life. Instead the seeds, if directly associated with the stored grain, are more likely to have been part of the weed assemblage in the fields being brought in with the cut crop. This may suggest that cereals were being grown on fields that were previously used to cultivate flax and potentially indicates a rotational growing system.

The seed was an important source both of fibres for the production of linen cloth, and also of oil which could have been used for many purposes, for instance cooking, as a base for medicinal tonics, or as oil for wood finishing. The seed itself could have also been added to food; today it is regarded as a good source of fibre and added to morning cereals and breads.

Due to the time-consuming cultivation of flax (it requires good preparation of the soil prior to sowing, heavy manuring of soil, and intensive weeding during the growing period (Boase 1918; Grieve 1971)) it is thought that the plant was probably cultivated in small garden-type plots during prehistory (Miller et al 1998: 807).

Structure 4E

Two pits within the arc of Structure 4E produced quantities of barley grains and some weed seeds (Table 9).

Isolated Pits 007 and 460

Two large assemblages of poorly preserved barley grains and one or two charred weed seeds were recovered from the fill of Firepit 007 (near the burnt

Table 9 Charred plant remains from Structure 4E

		Sample no.	875	876
		Feature	Pit 241	Pit 244
Weed seeds				
Gramineae indet. (medium)	Caryopsis	Medium-grained grass		1
<i>Carex</i> spp.	Nutlet	Sedge	2	
Cereal remains				
<i>Hordeum</i> var. <i>nudum</i>	Caryopsis	Naked barley	9 (1 attached internode)	
<i>Hordeum</i> sp.	Caryopsis	Barley	134 (5 attached internodes, 1 germ)	76
cf <i>Hordeum</i> sp.	Caryopsis	Barley	15	5
Cereal indet.	Caryopsis	Indeterminate	38	15
Cereal indet. (small frags)	Caryopsis	Indeterminate	++	

mound) and Pit 460 (centre of Area E) (Table 10). In these cases it is most probable that the grain was burnt during food preparation or corn-drying carried out on or near to the features. Ethnohistorical evidence (Fenton 1999) from northern Scotland shows that small amounts of grain which had been stored on the ear were dried over the hearth or a fire. The grain was either dried in the ear with the husks being set alight, or the grain removed by pounding from the ear, just before drying through pounding, and either placed on stones close to the fire or in baskets/pots to dry. Both pits were external features, suggesting that the processing of the corn, in this area, was being carried out in the open and away from the main structures.

5.9.4 Soil micromorphology

Clare Ellis

Six Kubiena samples were taken through a sequence of fills within Pit 272 (Sample <897> 1–6; Illus 22i) in Structure 1E. The lowermost context (002, natural) is a moderate to well sorted coarse sand. The fine material is confined to thin coatings of the mineral grains and rock fragments. The boundary into 275, a poorly to moderately sorted coarse sand with few grit-sized rock fragments, is faint and diffuse. The matrix was fine silt with charred organic matter that has been largely replaced by iron oxides, there are very few silt-sized charcoal fragments, very few fragmentary phytoliths and very few burnt and

Table 10 Charred plant remains from Pits 007 and 460

		Feature	007	460
Weed seeds				
cf <i>Brassica</i> sp.	Seed	Mustard family		
<i>Artemisia</i> sp.	Achene	Mugwort	1	
<i>Galium aparine</i> L.	Seed	Goosegrass/cleavers	1	
Cereal remains				
<i>Hordeum</i> var. <i>nudum</i>	Caryopsis	Naked barley	25	
<i>Hordeum</i> sp.	Caryopsis	Barley	50	53
cf <i>Hordeum</i> sp.	Caryopsis	Barley	9	
Cereal indet.	Caryopsis	Indeterminate	72	41

unburnt fungal spores. The fine material occurs as intergrain microaggregates within a granular microstructure. C274 is very similar to 275 but contains more fine organo-mineral matter and is much more compact, with a channel microstructure. The upper poorly sorted coarse silty sand (272) has a bimodal distribution of mineral grains and rock fragments; otherwise it is very similar in character to 275.

Subsoil 002 is the natural sand, which has a high natural iron content that imparts an orange appearance to the unit when observed by eye and also in OIL. The cut of the pit in thin-section is not obvious; a change in contexts is apparent only by the appearance of microaggregates of silt with occasional charcoal fragments. The source of fine material in 275 may have been a mixed deposit comprising both ash residues and unburnt decomposed organic matter such as might be found within a midden. The fact that in the lower portion the microaggregates of fine material (often with a coarse sand component) are a similar size to the mineral grains and rock fragments indicates that this deposit may be aeolian in origin, ie windblown into the pit. Deposits 273 and 274 are basically a more compact and organic-rich version of 275 and have been much affected by post-depositional bioturbation.

5.10 Radiocarbon dating

Twenty-five radiocarbon dates were returned from this area, including 12 paired dates (Table 11; Illus 29).

The earliest date ranges were returned from hazelnut shells recovered from the putative burnt mound which produced Late Mesolithic dates of 4995–4790 cal BC (95% probability; UBA-15229) and 4839–4723 cal BC (95% probability; UBA-15228). These are the earliest dates produced by the Blackford excavations, and represent the only Mesolithic activity on site, although an unstratified flint blade was also recovered from this area, in Structure 2E, which could originate from any period from the Mesolithic to the Bronze Age (see Clarke above). Similarly, there is no record of Mesolithic habitation within the Blackford area that could explain the source of these hazelnut shells as contaminants. However, the fire that burnt the hazelnut may not have been human in origin; it may have been a natural event.

Radiocarbon dates from features associated with the structures all returned MBA dates.

The Mesolithic date aside, the earliest date came from Structure 4E at 1622–1466 cal BC (95% probability; UBA-13328). The overall date range represents a period of 778 years, covering both the MBA and LBA, but the majority of dates fall within the MBA. Of the 12 paired dates only four (from C387 and C442 in Structure 1E, the burnt mound and isolated Pit 007) passed a chi-squared test to show that they were not statistically significantly different. Stratigraphically, Structure 4E was earlier in date than Structure 3E, and potentially some of the earlier dated material from the latter could be redeposited from the former. The latest date range of 1010–894 cal BC (95% probability; UBA-13331) from a pit in Structure 5E represents LBA activity, but the other date range from the pit, 1605–1433 cal BC (UBA-13332) represents MBA activity. Both these dated materials could have become incorporated within the fill of the pit at any time during their depositional history, highlighting the taphonomic difficulties in obtaining secure radiocarbon dates from fills of features which could have accumulated during the use of the structure or post-abandonment.

5.11 Discussion

5.11.1 Phasing

There was very little evidence of intercutting features that allowed the phasing of the site to be determined. With the exception of Structures 3E and 4E, each of the structures stood in stratigraphic isolation, although they were all cut through the same subsoil horizon.

It was clear that the suggested palisade of Structure 3E cut Feature 171 of Structure 4E, making 3E the later structure.

5.11.2 Finds distribution and taphonomy

The distribution of finds and radiocarbon dating is shown in Illus 30.

The globular bead was recovered from the base of a post hole in Structure 3E. It is possible that such a small item could have sifted its way through the packing material within the post hole, and as such may be classed as a lost and thus secondary item. Alternatively, it may have been intentionally

Table 11 Radiocarbon dates, Area E. Calibration was conducted using OxCal v4.1.7, using the IntCal09 calibration curve

Lab no.	Material	Context description	Date BP	95% probability	$\delta^{13}\text{C}$ ‰
UBA-15228	Hazel charcoal	Material of Burnt Mound 009	5916±24	4839–4723 BC	–25.1
UBA-15229	Hazel charcoal	Material of Burnt Mound 009	5997±42	4995–4790 BC	–25.6
Str 4E					
UBA-13328	Barley indet.	Fill of Linear Feature 257	3274 ± 27	1622–1466 BC	–24.3
UBA-13428	Barley indet.	Fill of Pit 251	3081 ± 25	1419–1273 BC	–29.4
UBA-13429	Barley indet.	Fill of Pit 251	3182 ± 24	1498–1416 BC	–28.8
Str 2E					
UBA-13329	Barley indet.	Fill of Pit 028	3194 ± 27	1519–1418 BC	–22.1
UBA-13330	Barley indet.	Fill of Pit 028	3070 ± 26	1411–1269 BC	–26.7
Str 5E					
UBA-13331	Hazelnut shell	Single fill of Pit 181	2793 ± 25	1010–894 BC	–25.5
UBA-13332	Barley indet.	Single fill of Pit 181	3231 ± 26	1605–1433 BC	–27.2
Str 1E					
UBA-13430	Barley indet.	Lower fill of Ring Ditch 286	3063 ± 25	1406–1268 BC	–26.4
UBA-13431	Barley indet.	Lower fill of Ring Ditch 286	2950 ± 23	1262–1056 BC	–28.3
UBA-13333	Naked barley	Fill of Post Hole 297 in inner post ring	3039 ± 30	1404–1213 BC	–27.9
UBA-13334	Hazelnut shell	Fill of Post Hole 297 in inner post ring	3155 ± 25	1494–1395 BC	–24.7
UBA-13335	Wheat indet.	Fill of Post Hole 387 in inner post ring	3042 ± 30	1406–1214 BC	–24.4
UBA-13336	Naked barley	Fill of Post Hole 387 in inner post ring	3018 ± 25	1385–1134 BC	–26.7
UBA-13337	Barley indet.	Fill of Post Hole 442 in inner post ring	3070 ± 28	1412–1268 BC	–22.7
UBA-13338	cf Emmer wheat	Fill of Post Hole 442 in inner post ring	3078 ± 27	1416–1270 BC	–24.7
Str 3E					
UBA-13339	Emmer wheat	Fill of Post Hole 090 in inner post ring	3199 ± 27	1516–1422 BC	–17.5
UBA-13340	Hazelnut shell	Fill of Post Hole 090 in inner post ring	2777 ± 27	1000–844 BC	–21.5
UBA-13341	Naked barley	Fill of Pit 104	2941 ± 25	1260–1052 BC	–23.5
UBA-13342	Naked barley	Fill of Post Hole 104 in outer post ring	3011 ± 25	1380–1132 BC	–26.4
UBA-13343	Barley indet.	Fill of Palisade Cut 142	3076 ± 28	1415–1269 BC	–19.8
UBA-13344	Barley indet.	Fill of Palisade Cut 142	3200 ± 25	1514–1425 BC	–28.3

Table 11 *cont*

Lab no.	Material	Context description	Date BP	95% probability	$\delta^{13}\text{C}$ ‰
Isolated feature					
UBA-15213	Barley indet.	Fill of Pit 007	3134±29	1493–1317 BC	–26.8
UBA-15214	Barley indet.	Fill of Pit 007	3187±27	1504–1414 BC	–28.8

deposited during the original excavation of the post hole.

There is a skewed distribution of calcined bone, grain and pottery in Structure 1E, with the majority of this material within the house having been deposited in features in the south and west. Some sherds of pottery could have been caught up in the porch, the southern ends of the ring ditches and in the peripheral ring grooves as the house was swept clean. Similarly, the large amounts of grain found in features in the south-west of the house may also be the result of sweeping the house clean. It would not be possible to store grain in the pits if these features were in use as foundations for posts and walls, although it would be possible to store grain in the western ring ditch during the occupation of the house, as the ring ditch was an open feature. Indeed, ring ditches have been interpreted as storage facilities elsewhere (see Section 11 for more detailed discussion on the function of ring ditches). Outwith the house, pottery was recovered from the palisade slots and Pits 272 and 276, and may also reflect cleaning episodes as the space enclosed by the palisade was swept, or the palisade trench may have acted as an artefact trap.

Other features across the site with material remains in them could also be classed as artefact traps with no element of structured deposition. The pottery recovered from Pit 482 near the centre of the site was next to a deposit of burnt subsoil (484) from which burnt bone was recovered, and the pit may have been a cooking event.

5.11.3 Structure use

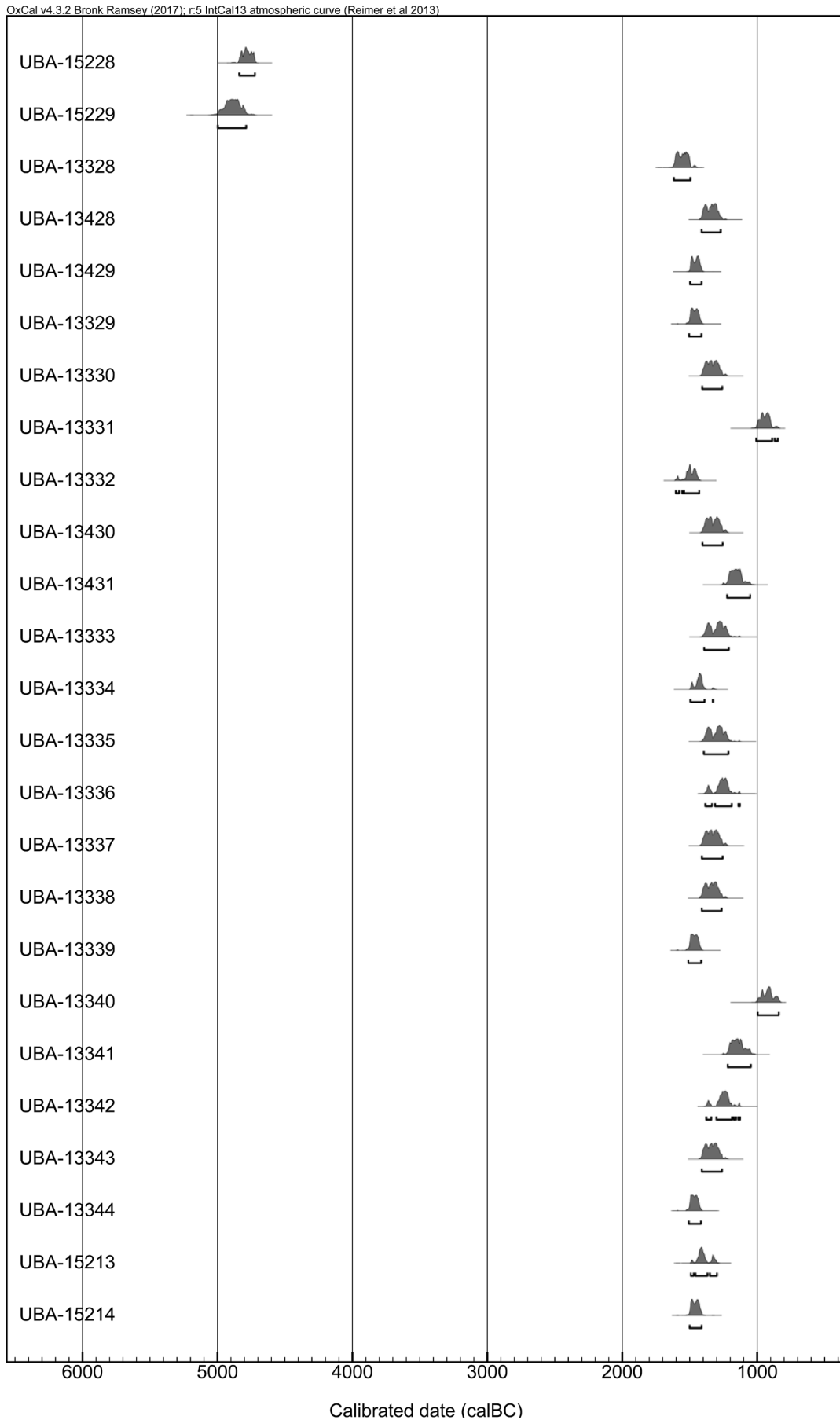
The complexity of Structure 1E architecture is due to the probable palimpsest of the features representing more than one phase of building (see above) (Illus 31). It is most likely that this was an enclosed homestead. The post ring and ring groove suggests a walled and roofed building. The south-

east entrance framed by a porch may also be taken as evidence for a roofed structure and of human occupation. Similarly, the probable central hearth (434), the pottery and deposit of grain found within the structure were also suggestive of human use and occupation. The presence of ring ditches within the structure may also indicate a capacity to stall livestock overnight or overwinter. The presence of a large cache of cereal grain and a whetstone within the fill of the ring ditch in Structure 1E may originate from activity on the floor of the roundhouse or be material which has fallen in from an upper storage level in the rafters of the structure following its dilapidation.

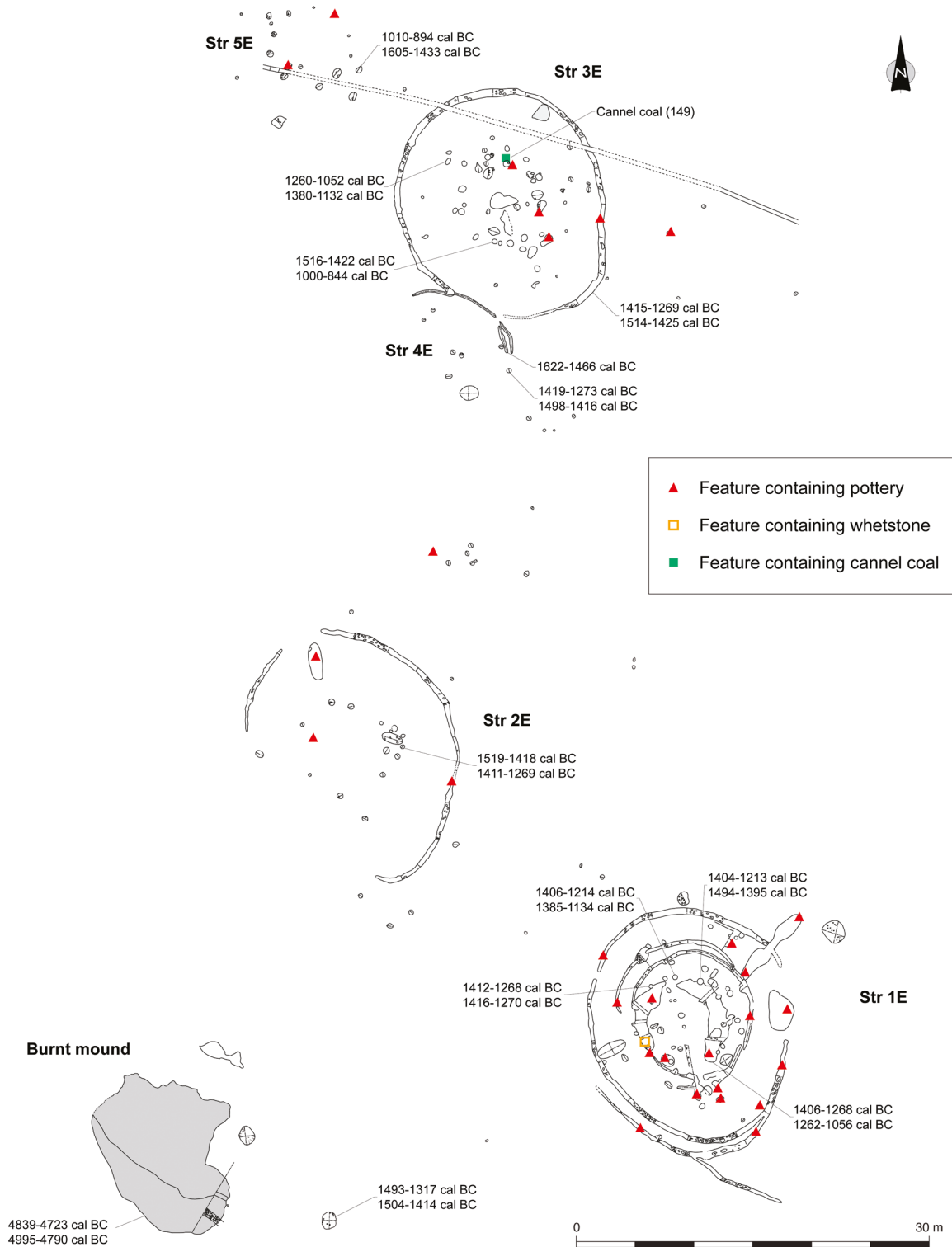
The ring ditches within Structure 1E, although shallow due to truncation, appeared to have been deliberately excavated rather than resulting from wear patterning. Their edges were defined and the sides reasonably steep-sided, when compared to other ring ditches at Blackford, such as those from Structures 6B and 3C. This suggests that the ring ditches in this structure were unlikely to have been used for stalling livestock.

Structure 2E is thought to be the foundations for a palisade constructed from either contiguous planks or posts. Although no post holes were discovered within its cut, its fill included a high percentage of stone thought to have been packing material. There were 18 features within the palisade, two of which, Pits 020 and 039, contained pottery, as did the cut of the palisade. Taphonomically, the pottery and charred archaeobotanical remains could have become deposited within the features either during use or during the post-abandonment phase and therefore cannot be used to infer with certainty the function of the palisade. Structure 2E therefore could have been either a stock enclosure or a palisade around a homestead.

Structure 4E, as Structure 2E, was defined by the vestigial remains of two curvilinear gullies with



Illus 29 Radiocarbon dates, Area E



Illus 30 Finds and dating distribution plan, Area E



Illus 31 Structure 1E, Area E

an associated group of pits to the south-east. The curvilinear features, being so heavily truncated, could represent a number of architectural features, including ring grooves and palisades.

As was argued for Structure 1E, Structure 3E was also probably a house. There was evidence for possibly two post rings interpreted as the foundations for the upright posts upon which a ring-beam would have been secured. Central Pit 164 showed signs of in-situ burning and was probably a hearth, and the recovery of a shale bead from Post Hole 150 and pottery from other features associated with the structure were suggestive of human occupation.

Structure 5E appeared to be a simple post-built structure (the only type of its kind at Blackford), and although some pottery was recovered from its post holes there was no other evidence suggestive of occupation.

5.11.4 Economy

The inhabitants of this area were growing emmer wheat, naked barley and flax. Hastie (Section 5.9.3) suggests that the flax was probably grown in small garden plots. Perhaps the gully (397), running at a tangent to the south of Structure 1E, formed part of a boundary around such a plot. Alternatively, it may have functioned as a drain.

It appears that processing of cereal grain took place outside the building, with a probable corn-drying event occurring in Pit 007 in the southern part of the site.

Burnt animal bone was also recovered, although it was not known whether the material represented domesticated or wild species. Its presence attests to an element of meat in the occupants' diet.

Although there was no direct evidence of metalworking on site, metal objects were being

used as the cut marks, made by a knife, on the whetstone recovered from Ring Ditch 321 testify. The inhabitants were also manufacturing and using flint blades.

An unfinished cannel coal globular bead was recovered from a post hole in Structure 3E. Whether the jewellery was manufactured on site or whether it was traded in this unfinished form cannot be known, but raw material for probable jewellery making was found in the MBA house Structure 2B (Section 4), and demonstrates that access to suitable raw materials from the wider region was possible (see Hunter, Section 5.8.3). The fact that it is unfinished indicates that there may have been some working or finishing of products on the site, either to prepare the items for future working or to finish prepared items being brought to site.

5.11.5 Abandonment

There is some evidence of a burning event in Structure 1E with the presence of charcoal in the

upper fills of the ring ditches, and a large cache of burnt grain in the western ring ditch. It cannot be determined with certainty during which phase of construction the putative conflagration took place. However, as the cereal grains were believed to have been burnt in situ, it seems unlikely that this material would have been left while another structure was built over it. Equally, there is no evidence that the deposit of grain was moved again, suggesting that the putative fire was the final phase in the life history of the structure. The charred grain gave a combined radiocarbon age range of 1414–1346 BC, and by inference this dates the putative fire. However, a note of caution must be sounded, for if there was indeed a conflagration which burnt this structure down, then that would have included the roofing materials being burnt and dropping down from the roof into the structure. The roof may have been thatched or have included turfs, and archaeobotanical material from the burnt roofing materials should therefore have been deposited into the upper fills of the structure's features.