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Excavations in a prehistoric landscape at Blackford, Perth & Kinross, 2007–8

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PREFACE

The critical role of local government planning archaeologists as the catalyst for development-led projects is almost always underplayed, if not omitted completely, from archaeological reports. The network of professionals that make up the *Association of Local Government Archaeological Officers: Scotland*, part of the wider UK body, maintain Sites and Monuments Records (or Historic Environment Records) for their areas and sift all planning applications, making recommendations to statutory planners on what work should happen where, based both on these records and their objective professional judgement. It is therefore rewarding that this excellent publication begins with the planning background. The planning history in fact goes back to 2002, a full four years before it is taken up in Section 1, when outline planning consent was granted for the development of golf courses, club houses and housing, with archaeological conditions attached on the basis of recommendations by Perth and Kinross Heritage Trust.

The striking landscape of Strathallan from Auchterarder to Greenloaning is as memorable from either road or rail, with unimproved undulating moraines that give a surprisingly untouched appearance compared with the same strath either to the south-west or north-east. The pastoral land-use importantly prevents cropmark development, which is so often the guide to archaeological potential on the gravels and sand river valleys elsewhere. As a result the trigger for the archaeological condition was based on records and sites in the vicinity of the proposed development: 'stone coffins found' at Westmuir of Drumford, in the 1860 Name Book of the Ordnance Survey, and the twin Cecilmount forts a kilometre to the south. The initial evaluations carried out in 2006 and 2008 were therefore truly prospective in nature, and from them an extensive rolling programme of work emerged that was to illuminate the important archaeological landscapes reported within. Alongside the 2010 excavations at the nearby Loaninghead junction, by Headland Archaeology, a wealth of hidden depth to prehistoric life in Strathallan has been uncovered for the benefit of all, and our understanding of the area has been enhanced considerably.

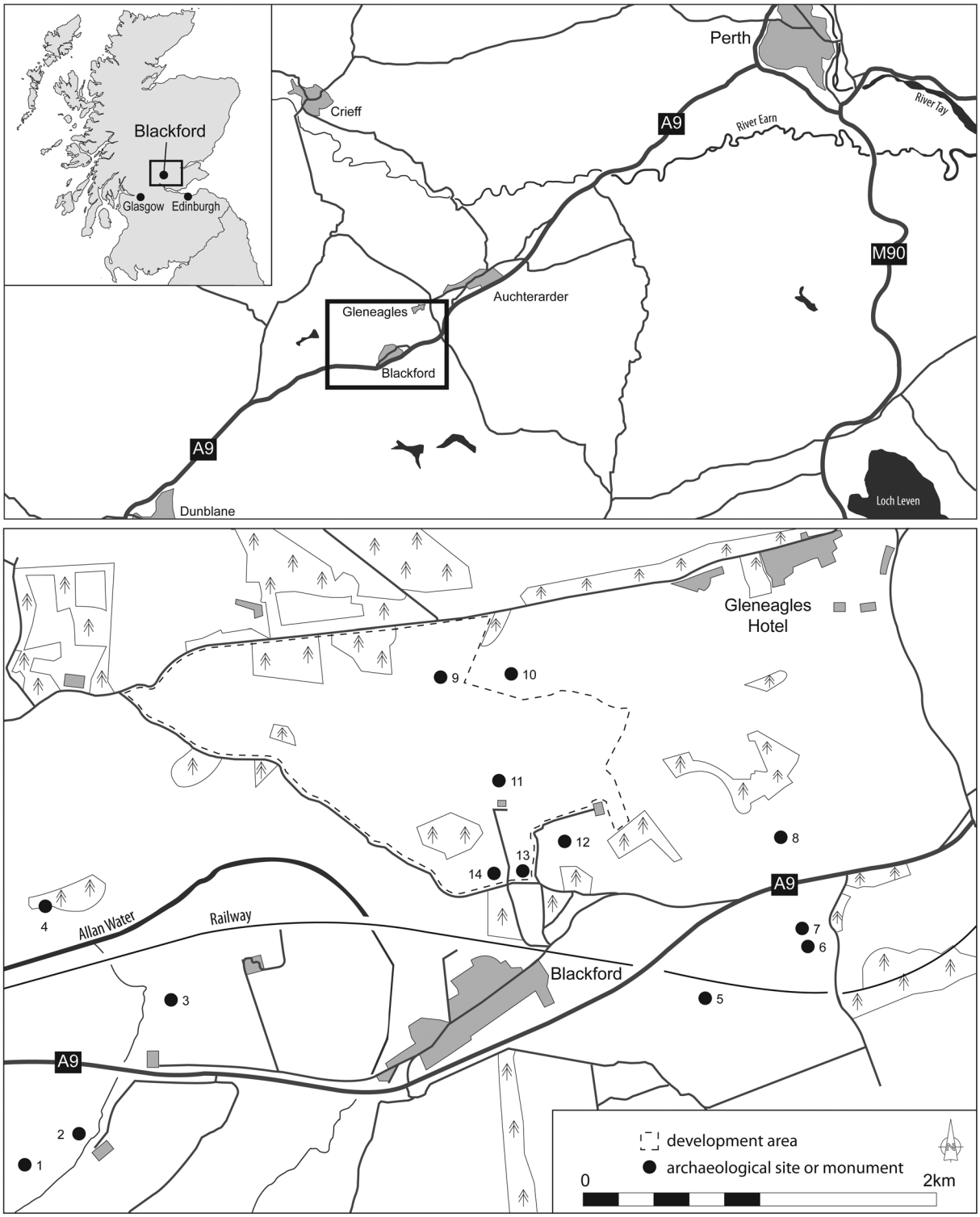
The Blackford project is undoubtedly one of the most significant pieces of development-led archaeology that the Trust have overseen over the last 19 years, and it was delivered in an exemplary fashion, from initial planning evaluation to project design, fieldwork to post-excavation, and it is now gratifying to see a conclusion in this excellent publication. At a time when change in the historic environment sector in Scotland is focused on national agencies, the role of local curators should not be forgotten. Since a proper planning archaeology service was put in place in Perth and Kinross in 2000, there has been a significant increase in both the quantity and quality of archaeological fieldwork carried out, all in a better environment for developers to operate. Change in the sector is inevitable, but future projects of this nature require objective local knowledge as a springboard to bring them forth.

David Strachan
Perth and Kinross Heritage Trust

1. ABSTRACT

The extensive remains of enclosed and unenclosed prehistoric settlements, including the remains of at least 14 circular structures, were discovered within ten areas of archaeological interest, situated on well-drained knolls in an undulating landscape north of Blackford village. The settlements have been dated principally to the Middle and Late Bronze Age, although continued habitation can be traced through to the Early Iron Age. Most of the structures were probably roundhouses, and were likely to have been the foci of domestic and economic life across generations. The remains ranged from single isolated structures to groups of closely spaced structures. Some were enclosed by palisades, possibly for defence, others were not. Diachronic changes in architecture are readily identifiable. The community made their living from a mixed farming economy, with some craft production also undertaken. Evidence for funerary rites was rare, but what little there was suggests that the dead were cremated and buried in urns.

2. INTRODUCTION



Illus 1 Location plan

2.1 Project background and circumstances of discovery

Archaeological investigations in an area of land to the north of the village of Blackford (Illus 1) were required by Perth and Kinross Council – advised by Perth and Kinross Heritage Trust (PKHT) – to mitigate the effects on cultural heritage features anticipated to arise from the construction of a golf course by Ochil Developments (UK) Ltd. Within the development area were four previously recorded find-spots (see below Section 2.4, nos 9, 11, 13 and 14).

The initial archaeological response in 2006 was a programme of evaluation by trial trenching amounting to 5% of the two areas identified by PKHT as archaeologically sensitive. Mechanical earth-moving machines equipped with smooth-bladed ditching buckets excavated 225 trenches, amounting to 10,532m^2 (Illus 2, Phase 1). The evaluation covering these areas discovered two areas of prehistoric activity identified as a series of pits and probable post holes: Areas E and F (Illus 2; Curtis & McKinney 2006). In 2007, as a response to these discoveries, PKHT requested that an archaeological watching brief be undertaken on two areas where the development of the golf course required ground-breaking works. Area X was examined as a response to the archaeological features discovered during the evaluation (Curtis & McKinney 2006) and Area Y was stripped because of the proximity of the development to the Scheduled Monuments (SM Nos 7584 and 7585), which are visible as cropmarks indicative of prehistoric forts or enclosures (O'Connell & Gray 2008a). The results are presented in Section 3. A further archaeological evaluation by trial trenching was then required by PKHT, covering 5% of the remaining development area and amounting to *c* 41,107m^2 across 380 trenches (O'Connell & Gray 2008b; Illus 2, Phase 2). Six more areas with concentrations of prehistoric features were discovered. These areas, as well as those identified in the initial evaluation of 2006, were subject to subsequent archaeological excavations during 2008. PKHT requirements, the excavation methodology, results and conclusions are set out in the series of Data Structure Reports (O'Connell 2008; O'Connell & Gray 2008c–h).

Table 1 Concordance of designations of excavation areas

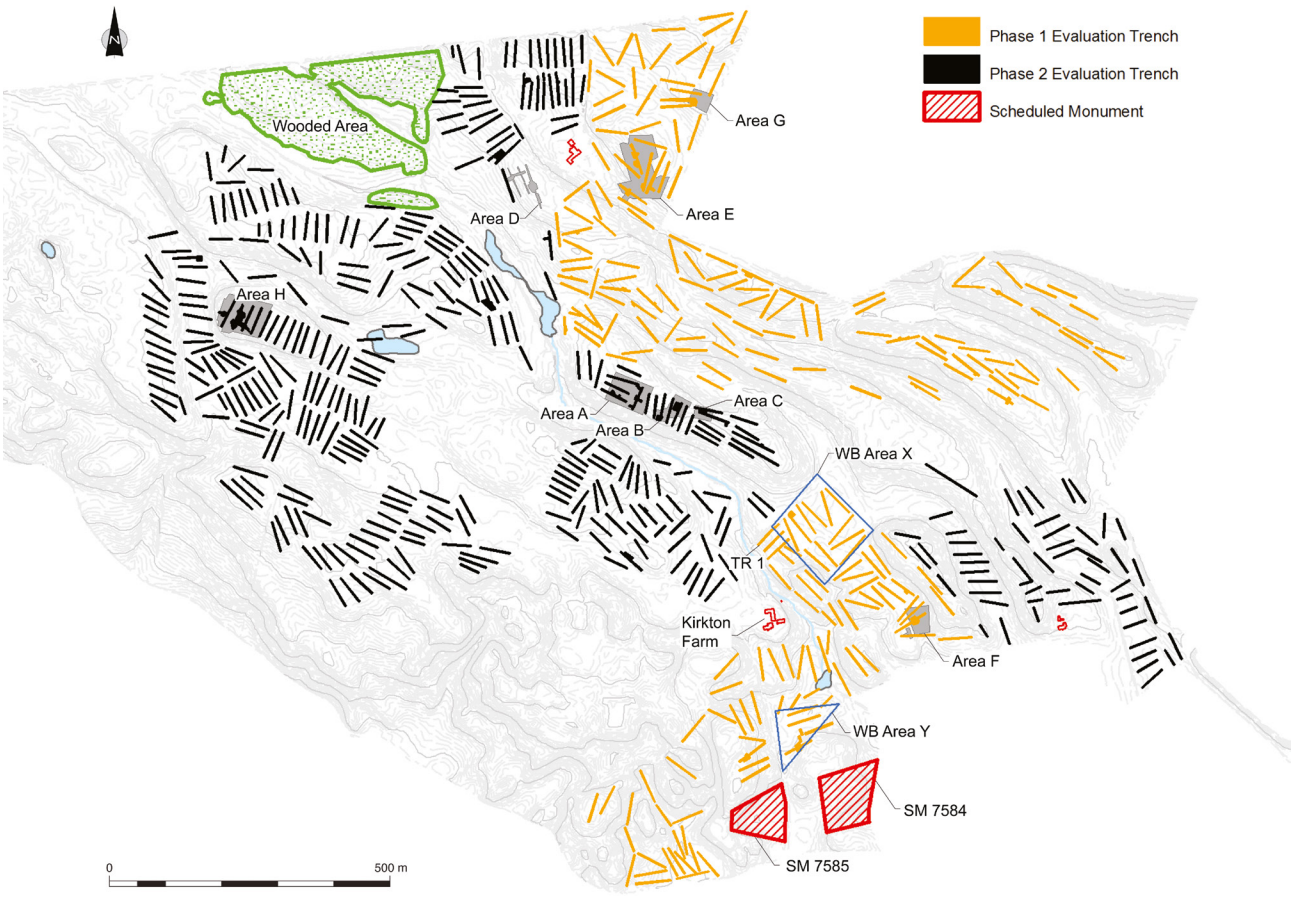
DSR designation	Area name (this report and in archive)
Watching Brief Area X	X
Watching Brief Area Y	Y
Golf Area P (Palisade)	A
Golf Area P (Houses)	B
Golf Area P (Houses)	C
Westmore House	D
Westmore House B	E
Brookfield House	F
Westmore House A	G
Golf Area H	H

The unpublished reports named these excavation areas according to the overall golf development plan. For ease of reporting and archiving, the area names used during the fieldwork have been retained here and a table of concordance is provided (Table 1).

The final stage of the archaeological programme of works was a walkover survey in a wooded area on the northern boundary of the development area (Kirby 2007), where the remains of field banks and stone cairns were discovered. The subsequent evaluation of the cairns concluded that they were likely to be field clearance cairns (Hill 2008). These features remain undated and are not considered further here, although it is of course possible that the cairns could be related to the excavated prehistoric settlements.

2.2 Layout of this report

This report presents the results of the project by area and in the chronological order established through radiocarbon dating, with the exception of Evaluation Trench 1 and watching brief areas X and Y, where these have been presented sequentially due to the nature of the investigations. Each area was excavated as an isolated unit during the excavation period in order to fit in with constraints arising from the commercial development of the site, which ran in conjunction with the excavations. Although



Illus 2 Limits of the excavated area showing evaluation and excavation trench locations

they are described individually, some of the areas produced radiocarbon dates that overlapped with other areas, suggesting a degree of contemporaneity between areas. Specialist reports are included in the relevant area descriptions, but only provide basic information in these sections. The discussion brings together a number of themes to provide an overview of the entire site.

2.3 Topography, geology and location

The landscape in which the excavation was situated is characterised by undulating small foothills separated by dry valleys and streams (Illus 2). The area was open, with little tree or shrub cover. The Soil Survey of Scotland describes the soil components as characterised by brown forest soils with gleying and some humus-iron podzols, and the vegetation cover as arable and permanent pastures, acid bent fescue grassland with oak and birchwood (Soil Survey of Scotland 1982). With the exception of Areas D and Y, the areas of prehistoric activity were all centred on top of natural knolls, providing all-round visibility, and were intervisible.

2.4 Archaeological background

There had been no archaeological work within the development area until these recent investigations. However, consultation of the Royal Commission on the Ancient and Historic Monuments of Scotland (RCAHMS) Database and PKHT's Historic Environment Record (HER) databases identified 14 records of archaeological significance or interest including artefacts and cropmarks, recorded either as prehistoric or undated, within the area and within a *c* 2km radius (Illus 1). These are as follows (references in brackets are RCAHMS record numbers):

1. A Middle Bronze Age dirk of Trump's Group 1 type (Trump 1962) added to the National Collection in 1860 (NN80NE 1).
2. A prehistoric cropmark settlement enclosed by a sub-circular enclosure with a diameter of 70m (NN80NE 10).

3. A find spot of a bronze spearhead with rivet holes, acquired by the National Museum in 1902 (NN80NE 2).
4. A cropmark enclosure (NN80NE 5).
5. A flint arrowhead, a flint knife and a scraper, found on the farm of Drumfad and donated to the National Museum in 1883 (NN90NW 4).
6. A bronze flanged axe of Coles' (1963) Class III Auchterhouse type (Middle Bronze Age) found at Drumfad (NN90NW 5).
7. Simply described as a cropmark (NN90NW 28).
8. A Bronze Age cinerary urn with only the rim and collar surviving, found in 1861 (NN90NW 14), and in 1966 a large shallow stone mortar found near the find spot during ploughing.
9. A water-worn sandstone block with pecked hollow on each face, found in 1890 at West Muir (NN81SE 6).
10. At least 21 former cairns, removed from a two-acre area within the farm of Westmuir of Drumford. A cist was found under the largest cairn. The earth around the cist purportedly showed traces of fire (NN81SE 4).
11. A small cinerary urn containing some 'black stuff', found *c* 1863 to the east of the development site (NN81SE 3).
12. A stone circle was purported to have once stood in this field, although there is no trace of this feature now (NN90NW 7).
13. Cecilmont Fort, visible as a cropmark. It comprises a D-shaped fort with two ditches and a narrow palisade trench running between them. The inner ditch is 2m wide and the outer ditch is 4m wide (NN80NE 8, Scheduled Monument 7584).
14. Another site, also designated Cecilmont Fort, visible as a cropmark and comprising a triangular multivallate enclosure with ditches 1.5m wide and 4m apart, enclosing an area of 75m by 70m (NN80NE 15, Scheduled Monument 7585).

2.5 Methodology

The detailed archaeological methodologies are set out in the Data Structure Reports (O'Connell 2008; O'Connell & Gray 2008 c–h). After the overburden was stripped using a mechanical excavator, the subsequent excavation of archaeological features was carried out by hand. All features were at least 50% excavated, or 100% if they contained artefacts, as were deposits of special interest, or where an understanding of the feature required more excavation. Two methods of palaeoenvironmental sampling were employed: bulk soil samples of contexts were collected for wet-sieving and flotation to retrieve material for radiocarbon dating, and Kubiena tins of selected contexts were taken for soil micromorphology studies. Recording was undertaken principally through written records, drawings and photography.

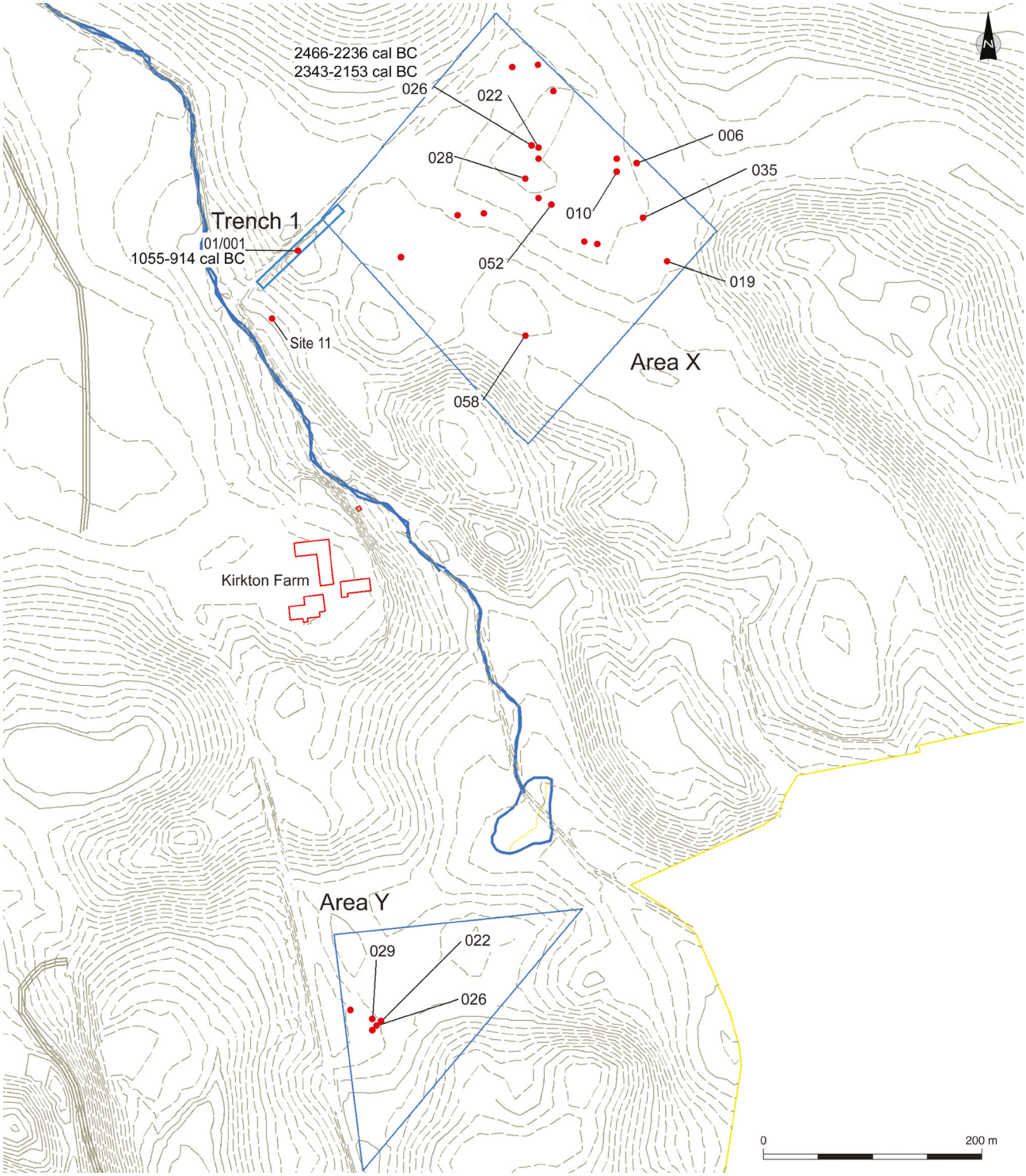
2.6 Chronology and radiocarbon strategy

Radiocarbon dates were obtained from organic samples of burnt bone (human and animal), carbonised cereal grains and wood charcoal. This material was either collected in the field during the excavation of features, or retrieved from bulk samples collected in the field but processed later in the laboratory. Bulk soil samples of the fills of features were routinely taken to provide maximum coverage and increase the potential retrieval of dateable material. Preference for dating was given to short-lived single entity samples, according to the principles set out by Ashmore (1999).

Radiocarbon dates were assayed by the ^{14}C Chrono Centre at Queen's University Belfast. Full details of the procedures, including sample pre-treatment and quality control, is provided in Reimer et al 2015. Calibration of radiocarbon dates was conducted using OxCal v4.1.7, using the IntCal09 calibration curve: $\delta^{13}C$ values were measured by accelerator mass spectrometry. The majority of dates derive from material selected from the bulk samples during the post-excavation phase of the work. In order to lessen the effects of possible contamination, bulk samples were taken from the bases of the lowest deposits within features, but the majority of features were shallow, heavily truncated, and contained single fill deposits. Priority was given

to material from the structural components of the houses, such as post holes or ring ditches in the absence of actual posts, in an attempt to date the construction and/or final use of these structures. An even spread of samples for dating was sought across each of the excavated areas, in order to give a broad-brush chronological overview of the site. To tie the relative artefact chronology to the absolute radiocarbon chronology, dateable material was also sought in conjunction with artefacts.

The majority of radiocarbon dates were returned from charred cereal grains. Both domesticated taxa of barley and wheat were represented in the sample. The dates returned from these grains reflect their



Illus 3 Areas X and Y site plan

time of death, either at harvest or shortly after, and as these plants are annuals with a short lifespan, the dates they return also reflect a narrow time range from sowing to harvesting.

The dates from the cremated human bone reflect the time of death of those individuals but not necessarily the burial or disposal of the bodies. The human bone samples from Blackford were small and fragmentary, making it difficult to establish whether the samples derived from one or more individuals, or whether they were redeposited or simply heavily truncated. Therefore the dates can only be indicative of the occupation of the site as a whole.

It must be acknowledged that there are reliability issues associated with radiocarbon assays from pits and post holes being used to infer calendar dates or periods of time for the construction or occupation of the whole structure or other suites of features, as posts could have been replaced throughout the life of the structure and dated entities lying within the fills of cut features could derive from an earlier period, becoming incorporated within the fill through a variety of taphonomic processes. Attempts were made to date samples from structural elements of the buildings but the lack of recovered suitable material meant that this was not always possible.

A relative chronology was established through the typological assessment of the artefacts, and by a comparative study of the architecture of the Blackford roundhouses.

3. EVALUATION TRENCH 1 AND WATCHING BRIEF AREAS X AND Y

The Watching Brief Areas X and Y were located within the south-east quarter of the study area (Illus 2 and 3), and Evaluation Trench 1 was located at the west corner of Area X.

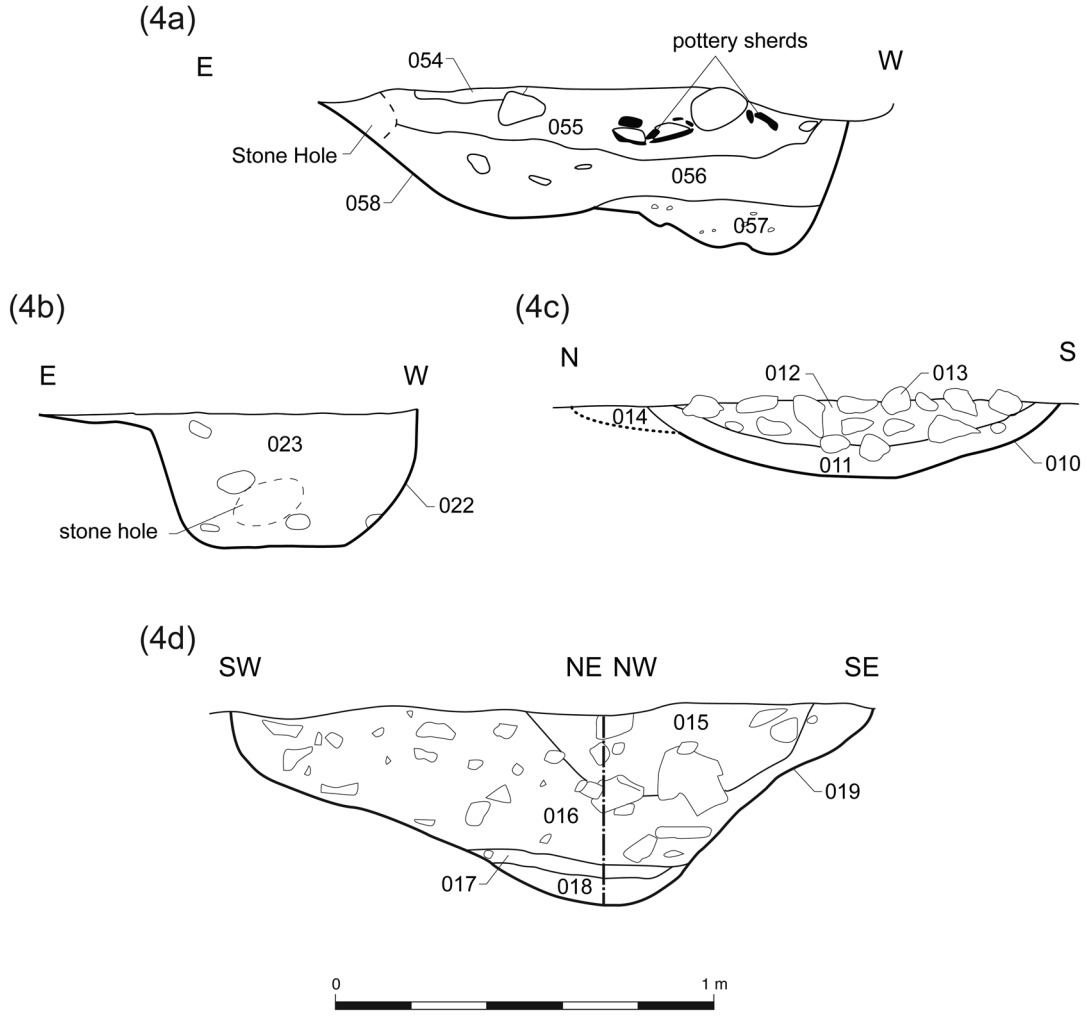
These areas revealed 27 pits, one of which contained burnt human bone from a probable cremation burial. Burnt bone, possibly human, was also recovered from another pit. Other pits contained Early Neolithic pottery and Beaker pottery. There were no stratigraphic relationships between features that would allow for site phasing.

3.1 Evaluation Trench 1

A small oval pit (01/001), measuring 0.77m by 0.62m by 0.16m deep and filled with a dark brown/black sandy silt (01/002), contained charcoal inclusions, heat-cracked stones and burnt human bone. The pit is likely to be the remains of an unaccompanied cremation burial, the burnt stones and charcoal deriving from the pyre material. The bone returned a date of 1055–914 cal BC (95% probability; UBA-15227), placing it in the Late Bronze Age (LBA). The individual's remains were too fragmentary to assign age and sex. It is probable that the individual was associated with the contemporary settlements at Blackford.

3.2 Area X

Twenty-one pit features were identified in this area. They varied in size from 0.22m by 0.1m by 0.08m deep (052), to 1.96m by 1.6m by 0.5m deep (019). These features were oval or circular in plan, and



Illus 4 Sections, Trench 1 and Area X

predominantly contained a single fill. All features were cut into the orange-brown sandy gravel subsoil and sealed by dark brown silty sand topsoil. Five pits contained artefacts, which are summarised below. There was no interpretable pattern indicative of relationships between features, other than that they occupied an area of relatively flat ground (Illus 3).

3.2.1 Pit 058

Pit 058 was oval in plan, measured 0.9m by 1.44m by 0.48m deep and contained four fills (Illus 4a). The primary fill (057) of orange-brown sandy silt contained <1% charcoal inclusions. The secondary fill (056) was a mid-brown to orange silt with <1% charcoal and small cobble inclusions. The tertiary fill (055) was firmly compacted greyish-pink sandy silt with 2–3% small to medium cobbles. It produced 91 sherds of pottery, the majority of which were from a single Early Neolithic vessel, the earliest prehistoric find at Blackford (see Johnson below, Section 3.4). The upper fill (054) was a deposit of loosely compacted mid-brown to black sandy silt with 1% charcoal inclusions.

The pottery, found in the tertiary fill of the pit, indicated that the pit had already been partially filled before the deposition of the pottery. The primary fill was thought to be the product of the eroding base of the pit, perhaps indicating that the feature was excavated and left open for a short time. The secondary fill may have been naturally deposited, as it appears to have slumped from the sides of the pit. The profile of the tertiary fill suggests that the pit may have been re-cut, and had subsequently become filled with Deposits 055 and 054, including the pottery sherds.

3.2.2 Pit 022

Pit 022 was a circular shallow pit with a diameter of 0.45m, and was 0.08m deep. It held a single fill of loose brown-orange silt and two large sub-rounded stones (023 Illus 4b). Recovered from the pit were fragments of burnt bone, possibly human, and eight sherds from four different Beaker vessels.

Even if the burnt bone was human, it is unlikely that this pit represents an in-situ cremation burial as there were fragments of four different Beaker vessels within the fill. The bone was very abraded and may have undergone a long period of exposure and weathering, and, if human, may have derived from a cremation pyre or cremation burial disturbed before it became deposited within the pit.

The lack of pottery within most of the other pits in this area makes this pit unusual. If the pottery derived from a background scatter of sherds in the area then one would expect the material would have been deposited within more pits. The interpretation proposed here is that Pit 022 represents a structured deposit; the pit was excavated and the fill, along with the pottery, was placed back in the pit within a very short time, as the pit showed no signs of weathering on its edges. Charred grain from the pit returned dates of 2466–2236 cal BC (95% probability; UBA-15211) and 2343–2153 cal BC (95% probability; UBA-15212), which accords well with the accepted date range of the Beaker pottery fragments: 2500–2100 cal BC (see Johnson, Section 3.4 below).

3.2.3 Pits 006, 010 and 019

These three pits all contained heat-affected deposits. Pit 006 was oval in plan and measured 0.4m by 0.5m by 0.13m deep. It had a concave profile and contained a single fill of charcoal-rich grey-black silty sand. The discoloration of the subsoil was suggestive of in-situ burning.

Pit 010 was a large circular feature with a diameter of 1.1m and was 0.2m deep. Its profile was bowl-shaped and it was lined with a deposit of charcoal-rich black silt, 011 (Illus 4c). Overlying this was a deposit predominantly made up of burnt and fire-cracked stones (013) in a brown silt matrix (012). This matrix was thought to derive from the topsoil that had sifted down through the loosely compacted burnt stones. On the northern edge of the pit was a small area of heat-affected natural soil (014).

Pit 019 was sub-circular in plan and concave in profile, and measured 1.96m by 1.6m by 0.5m deep. This pit was filled with four deposits (Illus 4d). The lower primary fill (018) was of black sandy silt with charcoal flecks. The secondary fill (017) was a thin band of reddish-orange gravel and was interpreted as redeposited natural subsoil. The tertiary fill, 016, was a loosely compacted dark brown to black sandy fill with inclusions of charcoal and angular stones. The upper fill, 015, possibly the fill of a re-cut, was

mid-brown sandy silt with stone inclusions and possibly derived from the topsoil.

The fire-cracked stones and deposits containing charcoal in these pits suggests that fires were being lit in the vicinity and the material from these fires became incorporated into the fill of the pits. In the case of Pit 006 the discoloured subsoil was suggestive of in-situ burning, but for Pits 010 and 019 no such conclusion can be drawn as no such discolouration was recorded.

The purpose of these pits may have been related to a cremation process, or cooking and food preparation, or simply to generate warmth. However, the pits did not contain any burnt animal or human bone. Pit 019 was analysed for charred grain but none was found. However, if food was being cooked in these pits then it may have been cooked in vessels or, in the case of meat, roasted bound in leaves within the embers, limiting the possibility of food material making its way into the burnt deposits. Ethnographic studies of the Maori of New Zealand have described how meat was wrapped in leaves and cooked over a pit of hot stones (Firth 1957: 94). At Lamb's Nursery, Dalkeith, Cook (Cook 2000) excavated a pit containing shattered stones and charcoal close to a Neolithic settlement, although the pit itself was undated.

3.3 Area Y

The five features discovered ranged in size from 0.3m by 0.1m by 0.1m deep (022) to 0.44m by 0.4m by 0.21m deep (029). Although the Area Y features were closely clustered, they do not show any spatial patterning recognisable as a structure and, as with Area X, there was no interpretable pattern indicative of relationships between features, other than that they occupied an area of relatively flat ground (Illus 3). The purpose, date of excavation and infilling remain undetermined. Only Pit 026 contained any finds: a small quantity of calcined bone.

3.4 Pottery

Melanie Johnson

Two features within Watching Brief Area X produced pottery, Pits 022 and 058 (Illus 3).

Pit 022 contained eight sherds (68g) from four different Beaker vessels (P185–188). Three of the vessels were represented only by body sherds while the fourth (P187) comprised a rim; this was flaring with a rounded top. Two (P187–188) were decorated with impressed twisted cord (All-Over Corded, AOC). The fabrics were fine and sandy, with well smoothed or polished surfaces. Fragments of abraded burnt bone, which is possibly human (see Section 3.5), were also found in this fill. The accepted date range for these vessels is 2500/2400 BC to 2200/2100 BC (Sheridan 2007). AOC Beakers are found in a variety of funerary and non-funerary contexts.

Pit 058 contained 91 sherds (weighing 516g). The majority were from a single vessel (P189) from Fill 055, with a single small abraded sherd from Fill 056. P189 was in very poor condition, abraded, badly cracked and possibly burnt, and included a number of neck and possible flaring rim sherds. The fabric was sandy and fine, red-brown in colour, and with walls up to 8mm thick. The surfaces had been well smoothed, with evidence to suggest the exterior had been polished. There was sooting on the interior. This vessel appears to be Early Neolithic in date, the sherds representing a plain, flaring rimmed round-bottomed bowl. It is unclear whether it was carinated as it was too fragmentary, so it is difficult to pinpoint its date or vessel type any more closely.

Both of these features, and the earlier prehistoric pottery contained therein, do not relate to the Bronze and Iron Age occupation across other areas of the site, but indicate that earlier activity was taking place at other locations within the development area, as they pre-date any of the excavated structures.

3.5 Environmental evidence

3.5.1 Calcined bone

Sue Anderson

A possible cremation burial was identified during the Phase 1 evaluation (01/002). Hand-collected burnt bone totalled 23.2g and was human. Identified fragments included pieces of skull (maximum dimension 23mm), tibia (max dim 35mm), femur and humerus. A full quantification is included in the archive.

Pit 022 (Area X) contained 5.4g of burnt bone which was very abraded but possibly human. This was found in association with pottery and the feature may have been a disturbed cremation burial.

3.5.2 Plant remains from Area X

Mhairi Hastie

Out of the nine samples processed from this area, only three contained any carbonised cereal grain and other plant remains. The bulk of the cereal grains were recovered from the fills of Pits 028 and 022. Pit 022 was also found to contain fragments of Beaker pottery and some cremated human bone.

The cereal grains were very poorly preserved and much abraded. All of the grains bar two were identified as barley, although none was sufficiently preserved to allow identification of the naked or hulled variety. Two grains of wheat were also recovered; again, preservation was not good and neither could be identified to species level.

A small assemblage of charred hazelnut shell was present in the fill of Pit 022 along with the cereal grain and one or two fragments were recovered from a second pit (035).

Four seeds of wild taxa were recovered from the samples, including two seeds of goosegrass from Pit 022, and one of nipplewort and a possible pea (Leguminosae indet.), from the fill of Pit 028. All of these species are common weeds of cultivated land and were probably harvested along with the grain.

The abraded nature of the cereal grains suggests that they had undergone some movement prior to being deposited in the pits, suggesting that the grains are unlikely to have been burnt in situ.

3.6 Radiocarbon dates

Three dates were returned from Area X that indicate Early and Late Bronze Age activity (Table 2). Pit 022 contained Beaker pottery dated to 2500/2400–2200/2100 BC (Sheridan 2007) and charred grain and a hazelnut shell retrieved from the pit fill returned similar date ranges of 2466–2236 and 2343–2153 cal BC. The cremated individual found in Pit 01/001 most probably died some time between 1055 and 914 cal BC, but this does not necessarily date the infilling of this pit, as the skeletal remains could have been curated before or after the cremation, and/or the burnt bone could have become incorporated into the pit during or after its infilling. The charred cereal grains could have undergone similar taphonomic processes; however, these dates match the dates for the pottery quite closely.

3.7 Discussion

Area X is an area that contained evidence for pit digging and the deposition of cremated remains. Cremation burials are known from both the Neolithic and the Bronze Age. In the Scottish Neolithic the cremation rite is more frequently associated with the west of Scotland and has links to the traditions of the Irish court tombs (Bradley 2007: 60).

At Blackford the cremation burial from Area H (Section 7) was dated to the Middle Bronze Age/Late Bronze Age (MBA/LBA), and the cremated bone recovered from 01/001 in Trench 1 was dated to the LBA. The small cinerary urn (NN81SE 3) found in *c* 1863 was located some 20m from 01/001 (Illus 3, Site 11). Cremated bone was also recovered from Pit 022 (Area X) in association with Beaker pottery and EBA radiocarbon determinations. The contents of neither Pit 01/001 nor Pit 022 are likely to have originated from redeposited pyre material, and the fragments of burnt bone within them were probably burnt elsewhere and became

Table 2 Radiocarbon dates from Area X and Trench 1. Calibration was conducted using OxCal v4.1.7, using the IntCal09 calibration curve

Lab no.	Material	Context description	Date BP	95% probability	$\delta^{13}C$ ‰
Area X					
UBA-15211	Hazelnut shell	Fill of Pit 022	3876±26	2466–2236 BC	–25.1
UBA-15212	Barley indet.	Fill of Pit 022	3820±21	2343–2153 BC	–25.3
Trench 1					
UBA-15227	Cremated bone	Fill of Pit 01/001	2836±23	1055–914 BC	–18.4

incorporated into the fills of these pits, either as a result of deliberate deposition or by means of natural processes. Either is possible given the small quantities of bone present.

The deposition of Early Neolithic pottery in Pit 058 may have been intentional. The structured deposition of pottery sherds in various contexts is a common occurrence in the Neolithic (Thomas 1999: 64; Chapman 2000; Pollard 2001). The tradition may have continued into the EBA here, with the deposition of Beaker pottery within Pit 022.

4. MIDDLE BRONZE AGE STRUCTURES (AREAS B AND C)

Areas B and C were located on top of a knoll and measured approximately 300m north-west to south-east and 100m north-east to south-west. The results from these two excavation areas (Illus 2 and Illus 5) are presented together as they were adjacent and the structures within them contemporaneous. The dates suggest Middle Bronze Age (MBA) occupation. The areas contained six structures in total: Structures 2B, 4B, 5B, 6B, 7B and 3C (Illus 5). Five of these post-built circular structures had a ring ditch component.

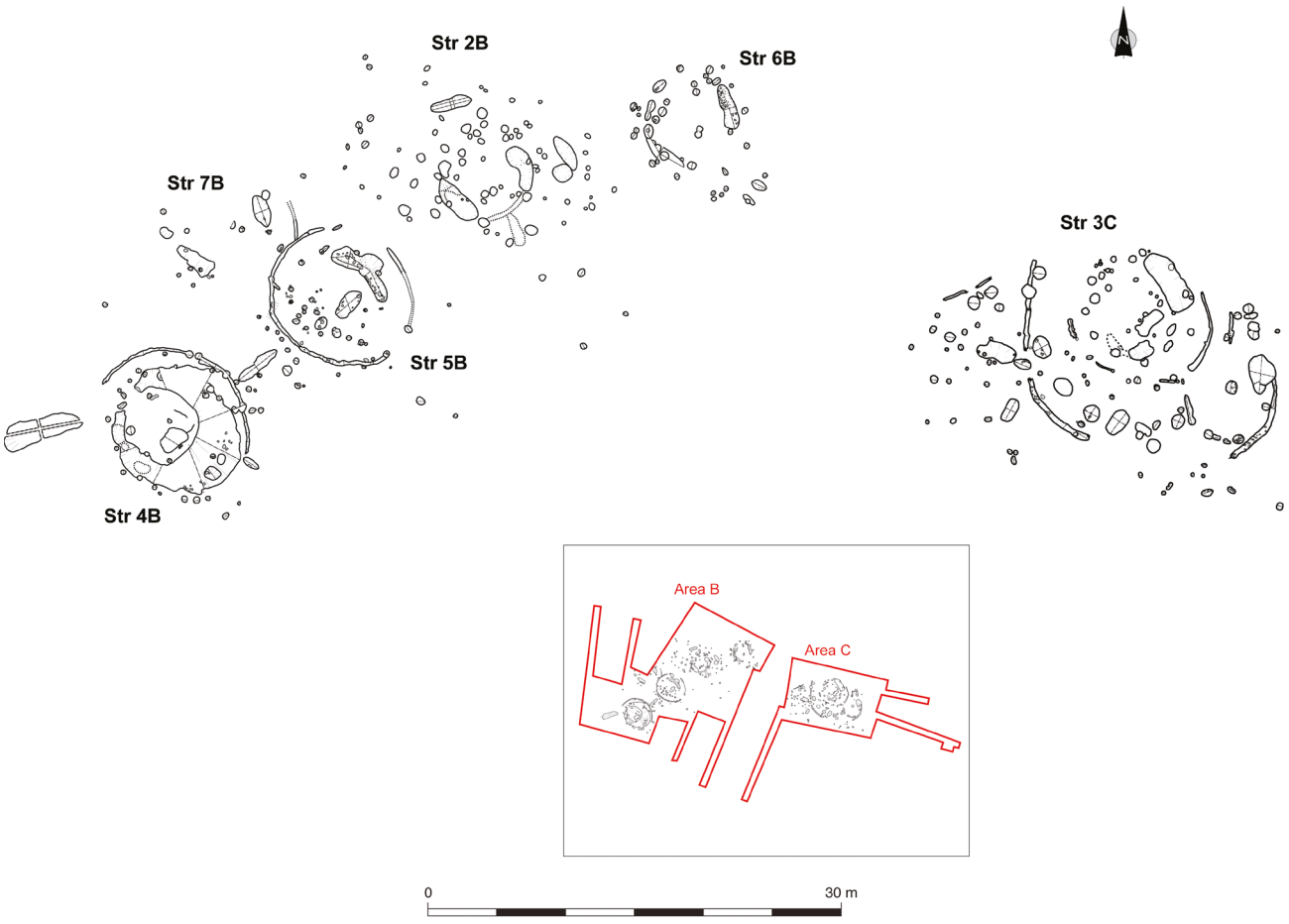
The interpretation of the group of features within Area C was made difficult because of truncation, particularly on its eastern side due to erosion downslope. However, within the centre of this cluster of features were architectural components recognisable as elements of a circular structure: these are ring grooves, a post ring, ring ditch and possible hearth.

The main structures in Area B will be described from south-west to north-east.

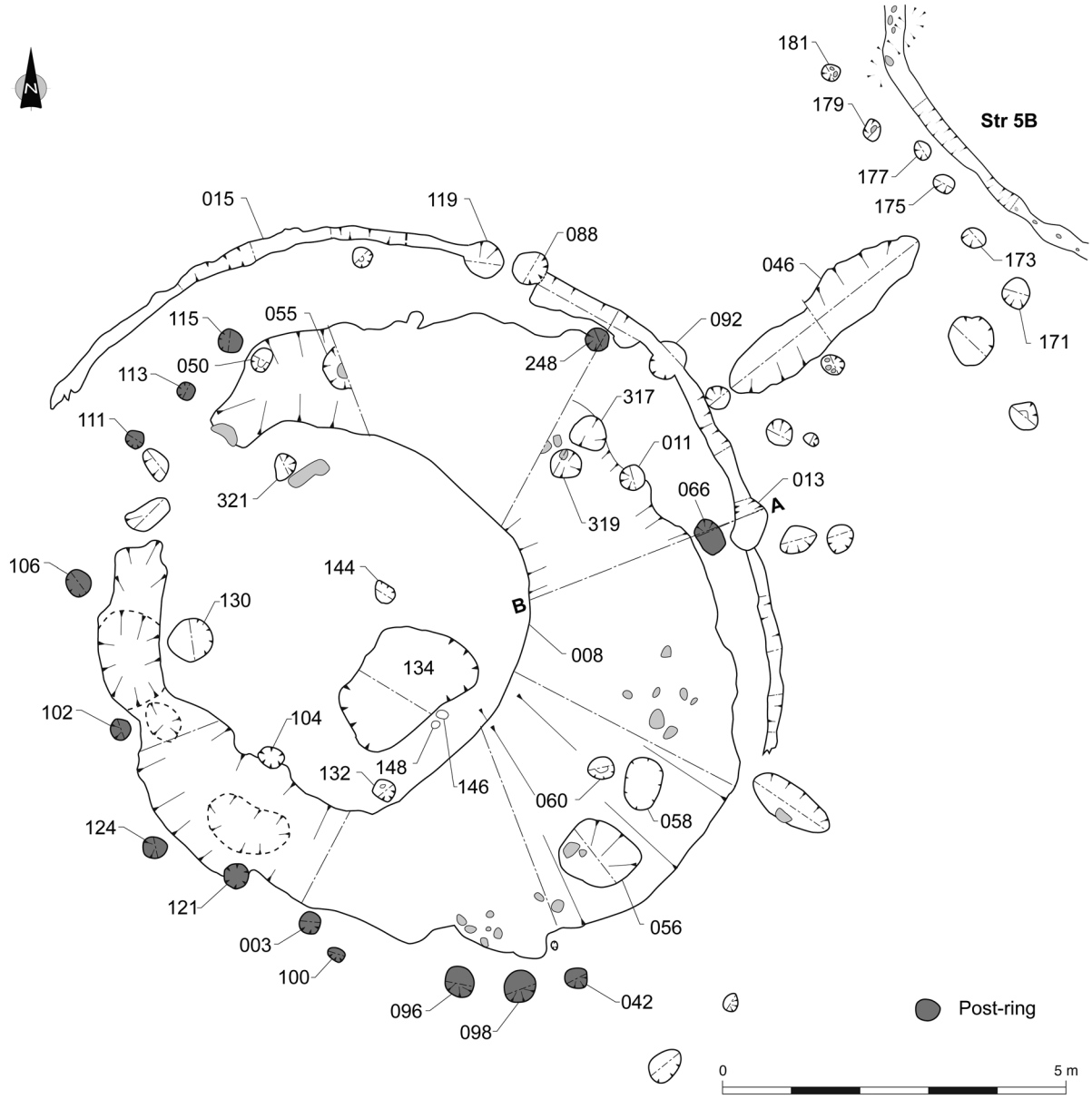
4.1 Structure 4B

4.1.1 General summary

This feature complex measured 10m by 12m overall (Illus 6). Its extent was defined by a ring groove on the north and east, which contained four post holes and the outer edge of a ring ditch and an arc of posts on the south and west. This post ring continued along the inside of the ring groove in the north and east. The post ring encircled the penannular ring ditch, which had pits cut into its base. An arc of four pits was present on the inner lip of the ring ditch. There were internal features including a possible firepit. All features were sealed beneath a charcoal-rich deposit.



Illus 5 Areas B and C site plan



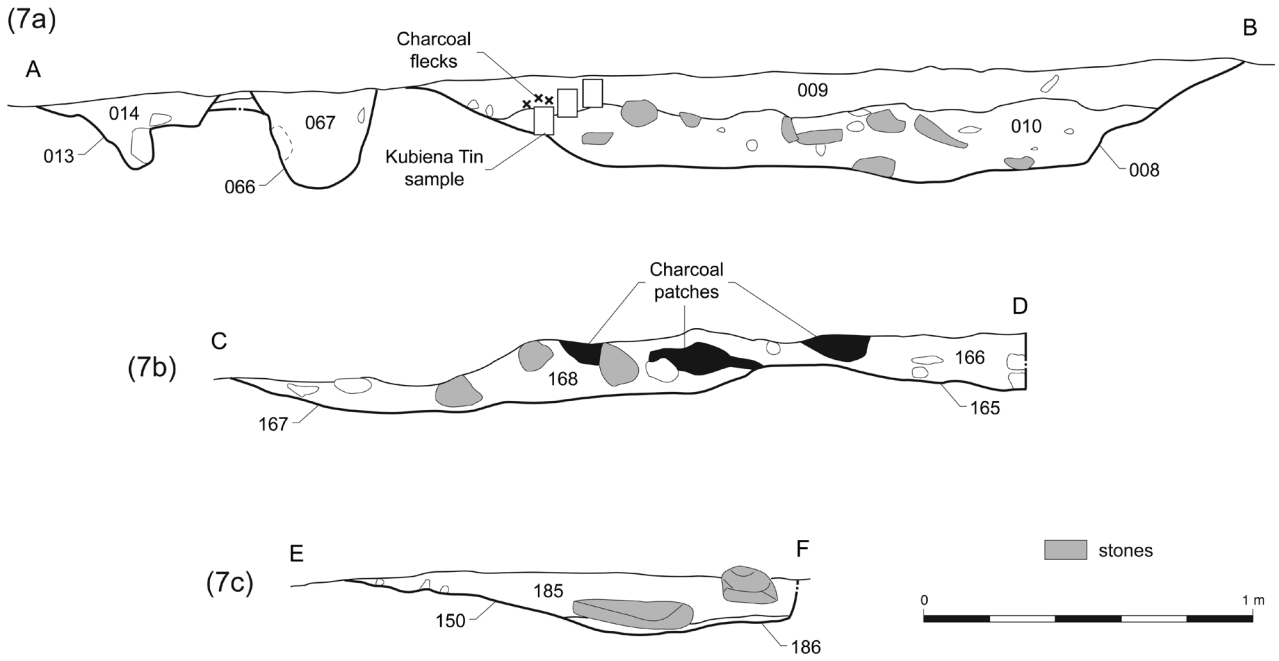
Illus 6 Plan of Structure 4B, Area B

4.1.2 Description

The ring groove (015) measured *c* 0.3m wide by 0.2m deep and was filled with firm dark brown/black silt. Within the ring groove were four post holes (119, 088, 092 and 013), all of similar form, which ranged in size between 0.3–0.4m in diameter by 0.07–0.1m deep. There was no stratigraphic relationship between the ring groove and the rest of the structure's features. The ring groove was not concentric to the penannular ring ditch (008), being 0.5m from the ring ditch at its southern tip and 2m away at its north-western tip. However, this could be due to truncation of the site or other wear patterns.

A ring of 14 post holes (clockwise from the south: 042, 098, 096, 100, 003, 121, 124, 102, 106, 111, 113, 115, 248 and 066) encircled the penannular ring ditch (008). They were similar in form and ranged in size from 0.3m diameter by 0.1m deep to 0.3m diameter by 0.28m deep. Post Hole 121 cut the ring ditch on its south-east side. This post ring was erratic and not concentric with the ring ditch or ring groove. The post holes were not evenly spaced, perhaps due to truncation.

Penannular Ring Ditch 008 measured up to 2m wide by 0.4m deep. It was filled with two deposits



Illus 7 Selected sections of Structures 4B and 5B, Area B

(Illus 7a): the lower was dark brown silt (010) that contained *c* 40% stones 0.2–0.3m in size, and the upper fill was the black charcoal-rich material (009), which also sealed all the other features of this structure. Soil micromorphological analysis carried out on the fills of the ring ditch (Ellis, Section 4.9.4 below) suggests that the fill (009) contained a high proportion of turf and herbaceous ash. This fill also contained the majority of the pottery recovered from this structure complex. The terminals of the ring ditch were orientated to the north-west.

Within the ring ditch base were eight pits (050, 055, 317, 319, 011, 058, 060 and 056) that ranged in size from 0.4m by 0.3m by 0.11m deep to 1.1m by 0.96m by 0.09m deep. These pits were cut into the subsoil within the base of the ring ditch and were sealed by the basal fill (010).

An arc of four pits (132, 104, 130 and 321) was recorded on the inner western edge of the ring ditch and ranged in size from 0.3m diameter by 0.1m deep to 0.45m by 0.5m by 0.3m deep. The pits were filled with dark brown silt and the spacing between them was erratic. Four other internal features (144, 134, 146, 148) ranged in size from stake holes to a large pit. Although Pit 134 contained charcoal and small amounts of burnt bone within its fill, there was no evidence of burnt subsoil on the pit's edges or base. However, its near-central position in relation to the ring groove may lend support to the firepit interpretation, with the lack of in-situ burning being the result of the regular cleaning-out of the pit, including any burnt soil on the sides. The function of Stake Holes 148 and 146 on the south-east side of Pit 134 is undetermined but may be associated with the use of Pit 134.

A line of six pits (171, 173, 175, 177, 179, 181) was recorded to the north-east of Structure 4B, running between Structures 4B and 5B, and ranged in size from 0.27m by 0.29m by 0.07m deep and 0.32m by 0.35m by 0.19m deep. A linear pit (046) was also recorded between Structures 4B and the line of pits, and measured 3.5m by 0.85m by 0.22m deep.

4.1.3 Interpretation and phasing

It is likely that the features identified as Structure 4B represent more than one structure. The ring groove (015) is not concentric with the post ring or the ring ditch, which would be expected if all these features were part of a single-phase structure. Post Hole 121 (a potential out-of-line post which

may be a later insertion in the post ring) cut the ring ditch, thus suggesting that at least a later phase of the post ring post-dated the ring ditch, which must have already been filled by the time 121 was excavated.

The ring ditch appears to represent a structure with an internal diameter of 5m. Within the base of the ring ditch were pits cut into the natural subsoil. These may be the truncated remains of larger pits that pre-dated the construction of the ring ditch and therefore represent an earlier phase of building, or they may simply be shallow pits cut through the existing ring ditch floor. The pits were filled with loosely compacted grey or brown silts which differed from the firm dark brown to black silt of the primary fill of the ring ditch (010) which sealed them, suggesting that there was a delay between the two deposition events. However, their function remains undetermined.

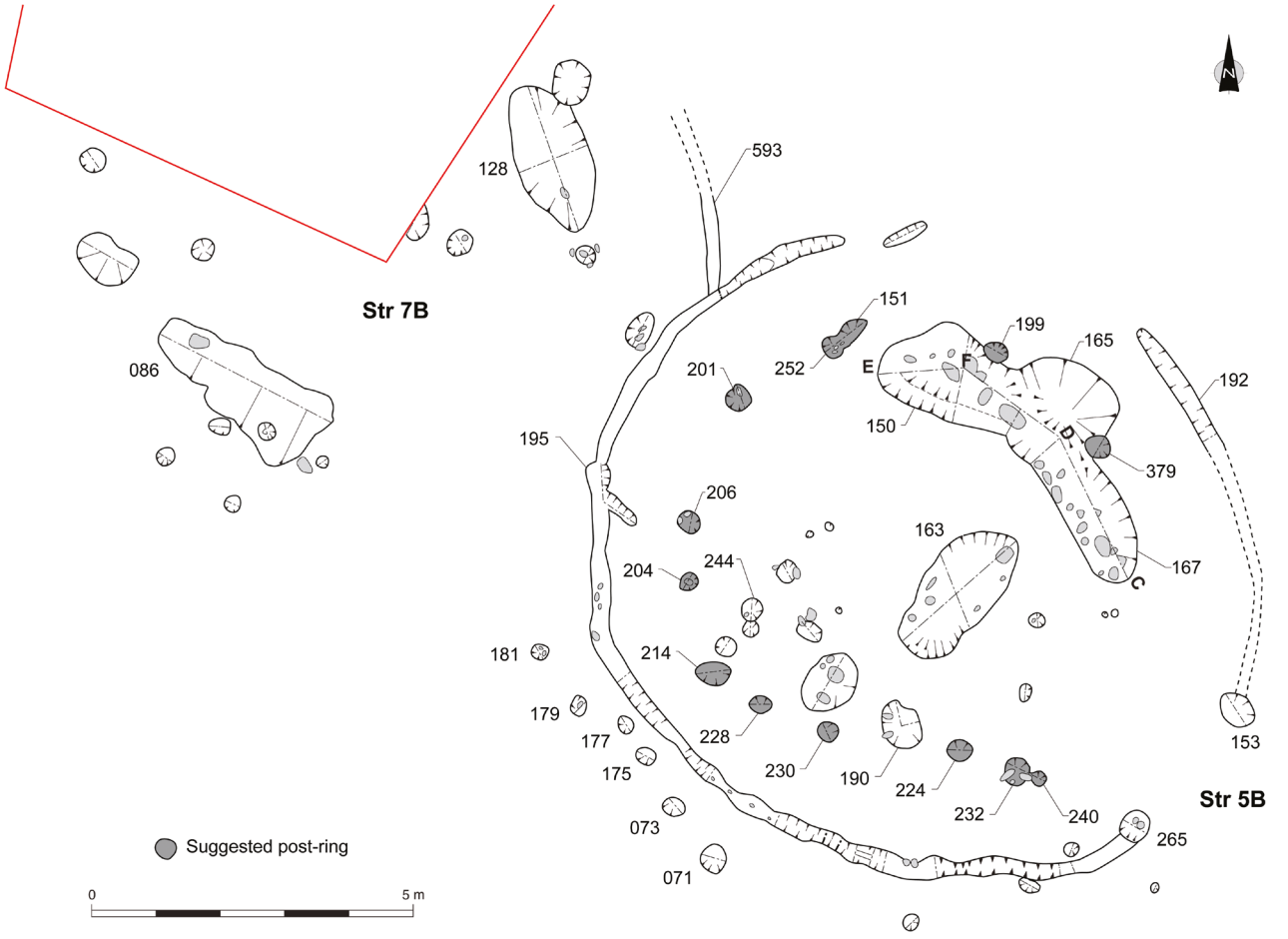
The projection of the ring groove suggests that it was not contemporary with the post ring and that these features represent different phases of the structure.

The arc of four internal pits (132, 104, 130 and 321) may represent an inner post ring or, alternatively, these inner pits were perhaps foundations for an internal division within the structure, and did not function as load-bearing posts.

4.2 Structure 5B

4.2.1 General summary

This post-built structure measured 9.5m by 11m (Illus 8). The features making up the house were heavily truncated, which hindered the interpretation of the plan of the structure. The house was defined by a ring groove with an entrance orientated to the south-east. A partial ring of post holes was present



Illus 8 Plans of Structures 5B and 7B, Area B

as well as a group of three conjoined and a number of internal features, including a possible firepit.

4.2.2 Description

The ring groove (192) was an intermittent feature which was truncated on its north and north-east sides. Its dimensions were *c* 0.45m wide by 0.3m deep. An upper fill comprised dark brown-orange silt with flecks of charcoal, and the lower fill was light orange-brown silt. There was one post hole (195) within the ring groove. The structure's south-east entrance was defined by a pair of opposing post holes, 153 and 265, at the terminal ends of the ring groove. The ring groove on its north-west side cut a curvilinear feature (593), which was heavily truncated and could only be seen in plan as a faint stain darker than the surrounding natural subsoil; it was 0.3m wide. This curvilinear feature is interpreted as the remains of a probable ring groove of another circular structure (see below, Structure 7B).

The degree of horizontal truncation and the concentration of post holes in the south-west quadrant of the structure make the post ring difficult to define. It is possible that a sequence of 13 post holes represents the post ring (clockwise from the south: 232/240, 224, 230, 228, 214, 204, 206, 201, 151/252, 199 and 379), ranging in size from 0.34m by 0.36m by 0.08m deep to 0.4m by 0.75m by 0.27m. The fills of these post holes were generally dark or light brown loosely compacted sandy silt. Post Holes 232/240 possibly represent replacement or support of the original post, as might 151/252. Potentially eight posts (224, 230, 214, 206, 201, 252, 199 and 379) form a roughly equally spaced set, with the others representing additions or replacements. Post Holes 199 and 379 were found below the fill of Pits 150 and 165 respectively.

There were 21 internal features, which varied in form and ranged in size from 0.1m diameter by 0.11m deep to 0.94m by 2.43m by 0.26m deep. Three conjoined pits were recorded in the north-east quadrant of the structure (150, 165 and 167 Illus 7b & c), which measured 2.2m by 1m by 0.2m deep, 1.5m diameter by 0.24m deep and 2.4m by 1m by 0.19m deep respectively. The pits were filled with loosely compacted dark brown sandy silt with some charcoal, similar in its characteristics to the fills of the pits in the post hole ring, see above. These features were amorphous, with irregular bases and edges, and were suggestive of wear patterns, rather than deliberately excavated features. The large, roughly central pit (163), dimensions 1.2m by 2m by 0.26m deep, was steep-sided and flat-bottomed and occupied a position in the structure that was suggestive of a firepit, but although there were some charcoal flecks included in its greyish silt fill, there was no evidence of in-situ burning; hence the function of this pit remains undetermined.

4.2.3 Interpretation and phasing

The defining feature of Structure 5B was the ring groove. It had an entrance orientated to the south-east, defined by a gap and opposed post holes. This suggests that the ring groove was the foundation slot for the structure's external wall, rather than a drip-gully in which post holes would serve no obvious purpose. A suggested post ring ran approximately concentrically with the ring groove. Two post ring post holes at the edge of the group of conjoined pits appear to have been cut before these features were filled, suggesting that the post ring pre-dates the infilling of these features. It seems likely that Structure 5B represents a single phase of building with some minor post replacement episodes. However, given the nature of the site with its shallow topsoil, which had previously been ploughed, truncation has played a significant part in the survival or otherwise of putative features.

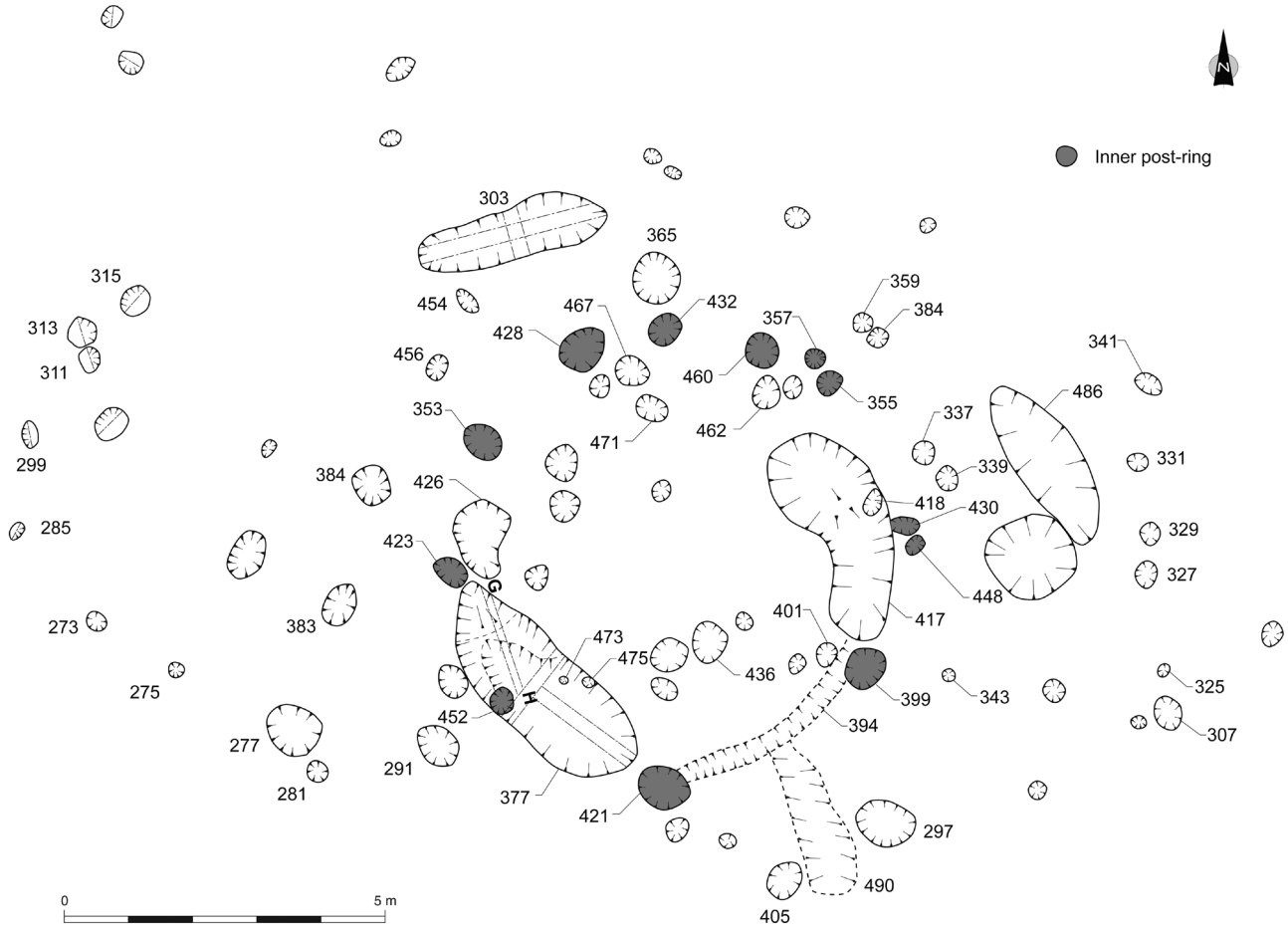
The structure stratigraphically post-dates the curvilinear Feature 593, a feature which may belong to an earlier but similar structure, 7B (see below).

Radiocarbon dating of material from features associated with Structure 5B produced date ranges of 1503–1427 cal BC (95% probability; UBA-13426) from Post Hole 244 and 1408–1292 cal BC (95% probability; UBA-13425) from Pit 150.

4.3 Structure 2B

4.3.1 General summary

This was a post-built structure measuring 8.5m E–W by 9m N–S and had an outer and an inner post ring (Illus 9). There was an entrance to the south-east which was framed by four large post holes. There were internal features throughout and a segmented ring ditch to the west and east within the house.



Illus 9 Plan of Structure 2B, Area B

As with Structure 5B, the concentration and number of internal features made it difficult to determine whether there was more than one phase within this structure. However, at least two possible post rings were identified, but they were only broadly concentric. The fills of pits within both post hole rings can be characterised as loosely compacted dark brown-orange sandy silt.

The discovery of a fragment of a stone 'napkin ring' and two unworked blocks of oilshale within this structure suggests that it may have been used for craft working.

4.3.2 Description

The larger post ring (9m diameter) comprised 12 post holes (405, 291, 384, 456, 454, 365, 359, 384, 337, 339, 343 and 297) which ranged in size from 0.31m diameter by 0.09m deep to 0.87m by 0.53m by 0.3m deep. The proximity of 359 and 384 may be taken to indicate that these pits represent a post replacement episode, as does the positioning of 337 and 339.

A possible smaller ring (6.6m diameter) of 12 post holes was identified (421, 452, 423, 353, 428, 432, 460, 357, 355, 430, 448 and 399); these ranged in size from 0.3m diameter by 0.13m deep to 0.63m by 0.94m by 0.2m deep. The paired Post Holes 357/355 and 430/448 may represent post replacement episodes. Both are close to the post replacements identified in the outer ring, perhaps suggesting a weakness in the structure.

A possible 3m-wide entrance through the inner post ring could be defined by two opposing post holes (421 and 399; Illus 9). These opposing post holes were linked by a linear feature 394, possibly a threshold. This entrance may have been augmented by a porch defined by Post Holes 405 and 297 to the south. Running between these two post holes,

Feature 490 looked convincingly like the result of wear, perhaps created by movement into and out of the structure, leading to the possible threshold (394) of the structure.

A putative ring ditch had survived as two large curvilinear pits (377 and 417), and Pit 426 may also be part of the truncated remains of the western ditch. The western ditch (377) measured 3.7m by 1.2m by 0.2m deep and was filled with two deposits (378 and 464; Illus 10a), and the eastern ditch (417) measured 3.5m by 1.3m by 0.24m deep and was filled with a single deposit (416). The fills within these ditches were of loosely compacted mid-brown sandy silt. Pit 377 contained a fragment of a stone napkin ring and a lump of unworked oilshale.

Four features had been cut into the sides and bases of the ditches, three on the west (452, 473, 475) and one on the east (418). Their stratigraphic relationship with the segments of ring ditch indicates that these were later features excavated after the ring ditch had been infilled. As Pit 452 is cut into Ditch 377 it would indicate that the smaller post ring post-dates the ring ditch, suggesting that there are at least two phases to this structure.

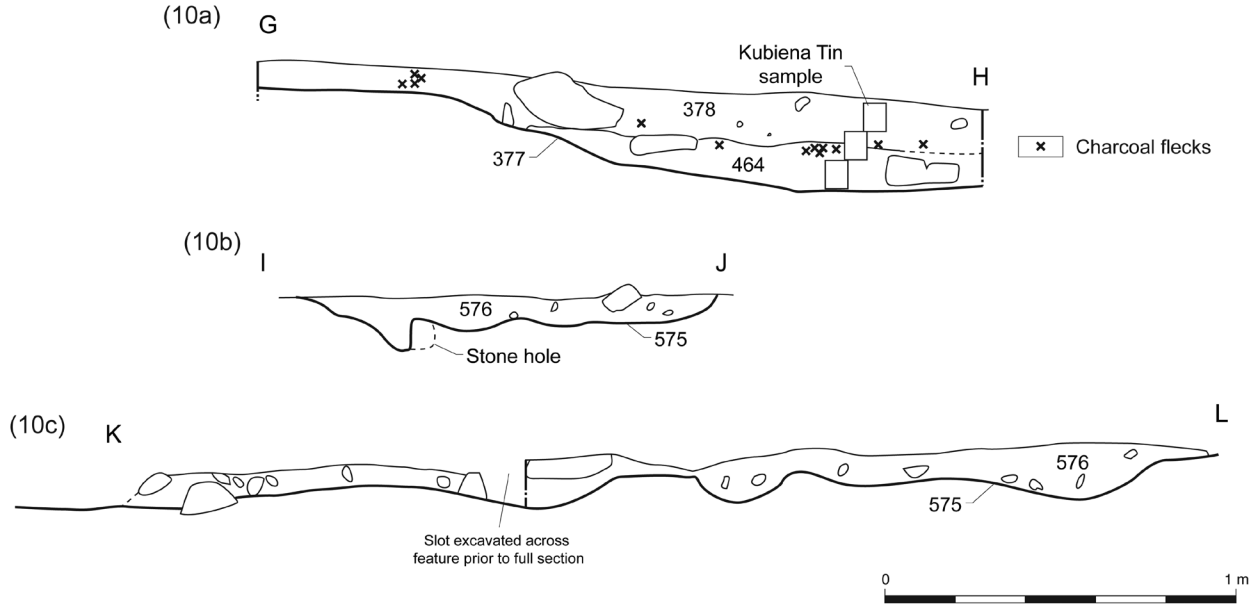
The remaining 18 internal features were mostly located to the north and south sides of the internal space, leaving a relatively uncluttered central floor space. Pit 436 contained burnt bone and charcoal but showed no signs of in-situ burning. Pit 467 contained a lump of unworked oilshale.

Several features clustered around the structure. One notable feature was a large oval pit to the north, 303, which contained a large quantity of pottery (see Section 4.8 below). This flat-bottomed pit measured 1m by 5m by 0.16m and was filled with a single fill of loosely compacted brown sandy silt containing flecks of charcoal. There were no stratigraphic relationships with other features, other than its proximity to the back of the structure. The pottery sherds were from a single vessel, but whether this vessel was deliberately deposited in the pit, either as a broken vessel or an intact one, cannot be determined. The size and elongated shape of the pit did not indicate the pit was a structural foundation and therefore, the function of the pit remains unknown although, together with Pit 486, it may form the remains of a further ring ditch, suggesting perhaps another phase of construction.

Other features include a row of pits, 307, 325, 327, 329, 331 and 341, similar to that seen between Structures 4B and 5B and of unknown function.

4.3.3 Interpretation and phasing

Structure 2B was one of two structures in this area where there was no evidence of a ring groove, the other being Structure 6B immediately adjacent.



Illus 10 Selected sections of Structures 2B and 6B, Area B

It is possible that a ring groove could have been truncated or eroded away, as evidenced elsewhere in this area. Alternatively, the construction of an outer wall did not require a foundation slot, the wall either being attached directly to the post ring, or tied to the ground by stakes, the associated stake holes having subsequently been truncated.

Some of the numerous pits within this structure can be assigned to probable inner and outer post rings. The proximity of the post rings to each other suggests that they may represent different phases, as it seems unlikely that there is a structural necessity to have two post rings to support a single roof. However, it cannot be ascertained in which order the post rings were built, but the smaller post ring appears to post-date the ring ditch as Post 252 cuts Pit 377, part of the ring ditch.

There was also evidence of post replacements, as demonstrated by Features 359 and 384. Whether the inner and outer post rings were contemporary remains unproven, and each post ring could in theory represent two different structures built in the same location. However, the positioning of the sets of replacement posts may be one argument against this, as it seems unlikely that two separate structures would fail in the same position when there was no underlying geological cause for it.

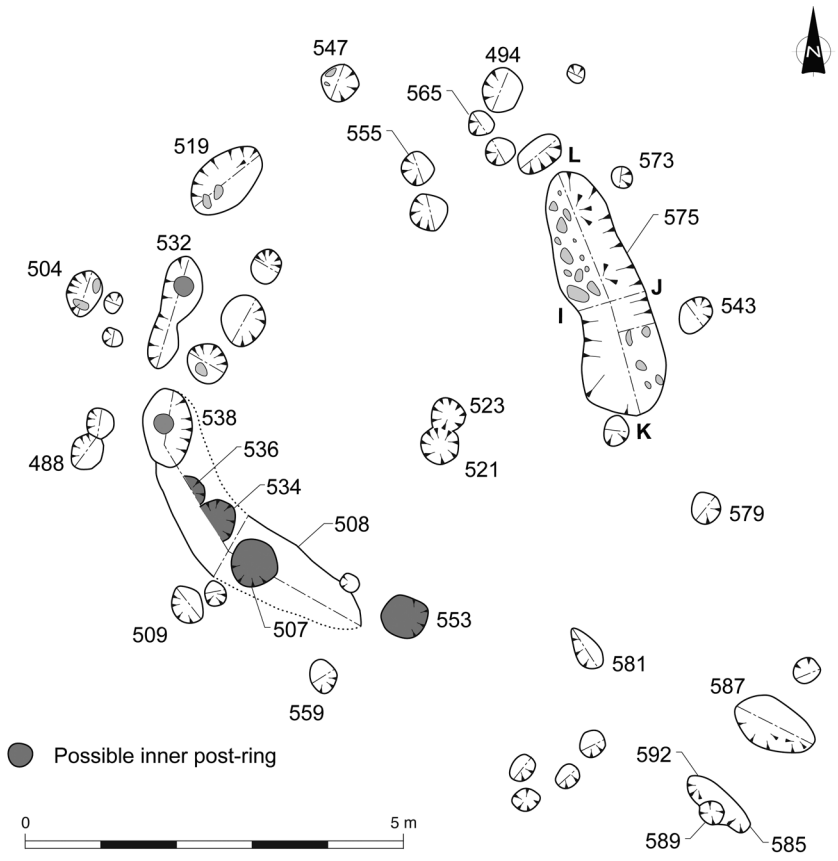
The entrance to the ring ditch structure is likely to have been orientated to the south-east, with evidence for a possible porch and threshold.

A fragment of a 'napkin ring', a distinctive Early–Middle Bronze Age dress fastener and two unworked blocks of oilshale found in features for Structure 2B suggest that this structure may have been used for craftwork.

4.4 Structure 6B

4.4.1 General summary

This post-built structure had a diameter of *c* 8m (Illus 11). Again, truncation made the interpretation of the structure difficult. However, it appears to have



Illus 11 Plan of Structure 6B, Area B

had an outer post ring, and the possible remains of a second visible as an arc of pits within the west part of the structure. The remains of a possible ring ditch were present on the structure's eastern side. The features of Structure 6B were sealed by a deposit of charcoal-rich black silt.

4.4.2 Description

Eleven post holes were identified within the outer ring (clockwise from the north: 547, 494, 573, 543, 579, 581, 559, 509, 488, 504 and 519), which ranged in size from 0.2m diameter by 0.08m deep to 1.29m diameter by 0.23m deep. The fills of these pits were loosely compacted light to dark brown-orange sandy silt.

The remains of a possible ring ditch (575) were found on the east side of the structure (Illus 10b & c). The feature measured 3.45m by 1.15m by 0.15m deep and was filled with a loosely compacted dark brown to black silt which contained small fragments of charcoal. A spread of dark soil (508) to the west may be the shallow remnant of a ring ditch in that half of the structure.

An arc of at least eight pits, running concentric with the outer post ring, may be the remains of another post ring (553, 507, 534, 536, 538, 532, 555 and 563). These features ranged in size from 0.5m diameter by 0.18m deep to 0.45m by 0.58m by 0.28m deep. The fills of these pits within the inner post ring were similar to the fills within the outer post ring, characterised by loosely compacted brown-orange silt. Alternatively, they may represent pits within a ring ditch.

An entrance was not clearly discernible, however an elongated pit (587) and a group of pits (585, 589 and 592) could have formed an entranceway to the south-east.

There were 14 other features internal to the structure which ranged in size from 0.2m by 0.25m by 0.15m deep to 3.5m by 1m by 0.15m deep. The function of these features is unknown. However, Pits 521 and 523 may represent a post replacement; they occupy a relatively central position within an otherwise clear floorspace and may have been the foundation for a central structural post.

4.4.3 Interpretation and phasing

This structure may have had an outer and inner post ring, although a structure this size would not have had, on structural grounds, any need for two post rings. Either these post rings represent two phases of construction on the site, or the inner one is merely a group of pits related to the ring ditch.

4.5 Structure 7B

4.5.1 General summary

A further possible structure was identified at the north-west limit of the excavation, the principle components of which were two large curvilinear pits, possibly the remains of a ring ditch, and a segment of a curvilinear feature, the remains of a possible ring groove (Illus 8).

4.5.2 Description

This possible structure was identified to the north-west of Structure 5. It was not fully exposed as it continued under the baulk. The curvilinear pits (086 and 128) measured 1m by 2.81m by 0.11m deep and 1.12m by 2.22m by 0.2m deep respectively. The distance between the outer edges of Pits 086 and 126 was *c* 7m, a similar distance to that between the ring ditch segments in Structure 2B and across the ring ditch in Structure 4B, and the two pits were reminiscent of truncated ring ditches seen elsewhere on the site. The pits were filled with moderately compacted dark brown sandy silt with inclusions of fragments of charcoal and burnt bone. Two sets of radiocarbon dates were produced from these pits: 1391–1216 cal BC (95% probability; UBA-13423) and 1407–1271 BC (95% probability; UBA-13424) from Pit 128 and 1381–1210 cal BC (95% probability; UBA-13421) and 1431–1316 cal BC (95% probability; UBA-13422) from Pit 086.

The curvilinear feature (593) survived as a 2.5m long stain in the subsoil with no measurable depth, cut by the ring groove of Structure 5B to the south and petering out to the north. It is likely to represent the remains of a ring groove.

4.5.3 Interpretation and phasing

This possible structure was defined by the following elements: ring ditches, pits and a short length of a

curvilinear feature. In plan, these features appear similar to, though more vestigial than those of the later Structure 5B, which cut one element of the group. There was no evidence that more than one phase of construction had taken place on this site and potentially 5B could represent a replacement in a slightly different position.

4.6 Structure 3C

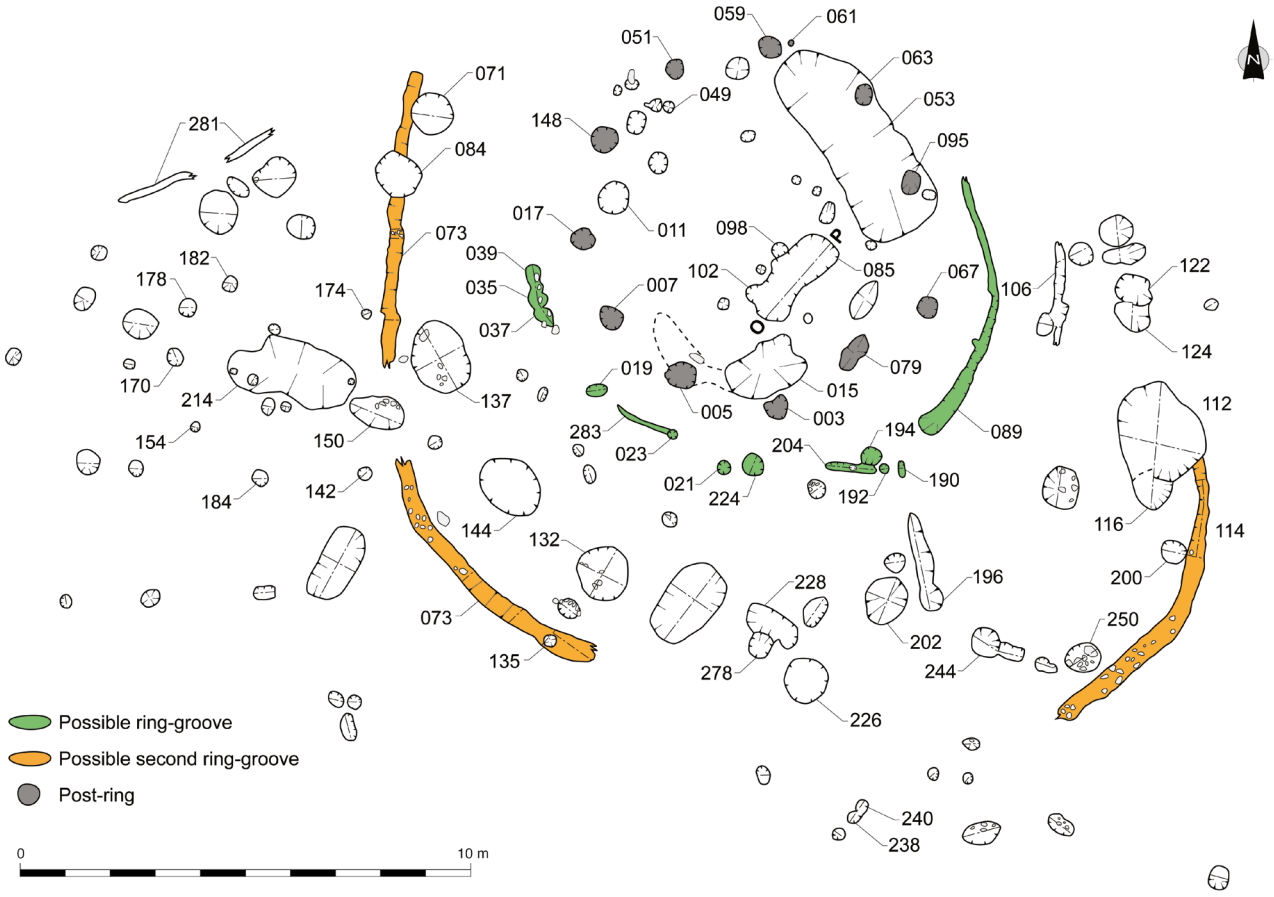
4.6.1 General summary

This structure comprised a ring ditch with the later intermittent remains of a possible ring groove which survived as curvilinear segments and post holes following the same alignment (Illus 12).

4.6.2 Description

The intermittent remains of a possible ring groove, *c* 10m diameter E–W, survived as curvilinear segments (089, 204, 283) and post holes following the same alignment (190, 192, 194, 224, 021, 023, 019, 037, 035 and 039) and which ranged in size from 0.29m by 0.31m by 0.08m deep to 0.4m by 0.48m by 0.15m deep. The curvilinear segments of this feature (089, 204 and 283) measured 6m by 0.2m by 0.1m deep, 1.3m by 0.15m by 0.1m and 1.5m by 0.1m by 0.02m deep respectively. The various segments of this putative ring groove were all filled with dark brown sandy silt with charcoal inclusions. The surviving post holes may represent part of a contiguous series of posts secured into a ring groove foundation, with only the base of its cut surviving. The conjoined nature of Post Holes 037, 035 and 039 is particularly suggestive of this form of construction.

The scant remains of another curvilinear gully (106) survived to the east of 089, suggesting that there was another ring groove feature running concentrically with the first. Within the ring groove a post ring of at least 12 pits was identified (003, 005, 007, 017, 148, 051, 059, 061, 063, 095, 067 and 079), which ranged in size from 0.23m by 0.24m by



Illus 12 Plan of Structure 3C, Area C

0.11m deep to 0.8m diameter by 0.39m deep and were filled with loosely compacted sandy silt which varied in colour from grey to dark brown. Pits 063 and 095 also cut a ring ditch (053), suggesting that the post ring post-dates the ring ditch.

The ring ditch (053) was situated on the east side of the structure, measured 5m by 2m by 0.25m deep and was filled with a single deposit of firm dark brown silt (054). Together with Pit 015, these two pits are thought to represent the remnants of a segmented ring ditch. Pit 015 was very truncated and during excavation the extent of the surviving pit was thought to be bigger based on its fill, which extended further to the north-west as a shallow spread of the same material. Pit 015 would then have mirrored Pit 053.

Other features inside the area enclosed by the ring groove were generally small, with the exception of 085. Although there was no evidence of in-situ burning, this near-central feature (Illus 13) was interpreted as a cooking pit on the basis of its position within the structure and its charcoal-rich deposits, which contained both pottery sherds and burnt bone. Five small features were present on the northern side of Pit 085, one of which (102) was cut into its side and one (098) was cut by the cooking pit. These five features may represent a structure associated with cooking, perhaps for suspending vessels over a fire. The functions of the remaining internal pits were not established.

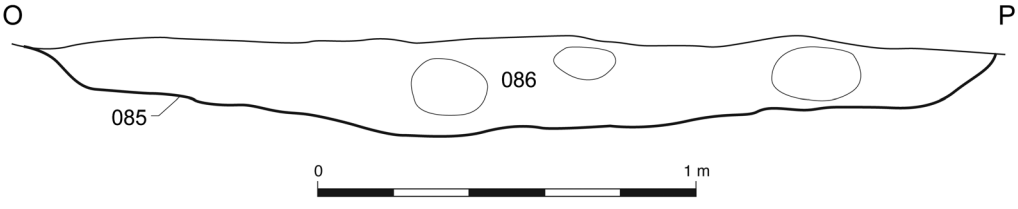
The intermittent remains of a curvilinear gully were present on the south-east and the west (073 and 114) and external to the circular structure. This feature measured 0.2m wide by 32m (surviving length) by 0.1m deep. The gully had survived as a slight stain in the subsoil on the north and north-east, completing a circle, but this vestigial evidence was lost owing to weather conditions during the excavation. A single pit, possibly a post hole (135), measuring 0.3m by 0.4m by 0.12m deep was found cut into the base of the southern part of 073. The feature was also cut by Pits 112, 084 and 071, making 073/114 stratigraphically earlier than these pits (but see radiocarbon dates, Section 4.10 below). The gully may possibly have been a foundation slot for an enclosure palisade, creating a narrow yard of irregular width between the house and enclosure.

Enclosed by the curvilinear gully (073/114) was an arc of seven pits ranging in size from 0.5m by 0.4m by 0.31m deep to 1.8m by 2m by 0.4m deep (071, 084, 137, 144, 132, 228 and 202). Most respected the curvature of the inner ring groove and the outer gully, but three pits cut through the remains of curvilinear Feature 073/114. Pits 228, 112 and 124 were also cut respectively by later Pits 278, 116 and 122. While some of the pits may be contemporary with the use of the roundhouse and putative palisade, it is clear that at least some were later.

There were several features in proximal association with Structure 3C whose relationships with each other were not clear. A few of these features were present on the inside of the curvilinear feature (073/117), but the majority were found outside in two concentrations to the west and south (Illus 12).

The cluster of ten features immediately south of 073/117 was generally uniform and the features show no relationship in plan except proximity, although Pits 238 and 240 appeared to be conjoined and may represent a post replacement event.

The features clustered immediately to the west of 073/117 were not uniform in size, shape or deposits contained therein. Pit 150 occupied a break in the curvilinear gully (073), although it cannot be said whether it pre- or post-dated the gully as there was no stratigraphic relationship



Illus 13 Selected sections of Structure 3C, Area C

between them. Pit 214 was surrounded by six smaller pits, three of which were excavated into the pit edge. A similar arrangement, interpreted as a cooking pit, was associated with Pit 085 within Structure 3C. Small amounts of charcoal and pottery were retrieved from the fill of 214, but otherwise there was little compelling evidence that this pit was also a cooking pit. A putative ring of small pits or post holes (142, 184, 154, 170, 178, 182 and 174) encircled Pit 214. Two sections of a linear feature, 281, were also noted on the north side of this cluster of features and are similar to the surviving remnants of the inner ring groove (089) of Structure 3C. Although these isolated features attest to prehistoric activity, what form this took could not be firmly established; perhaps the features to the west of Gully 073/117 could represent the remains of another structure.

4.6.3 Interpretation and phasing

The features making up this structure represent more than one phase and there are identifiable components within the group that indicate at least one round structure, including a ring groove, post ring and ring ditch. The interpretation of structural elements and their phasing was confounded by the closely grouped nature of the features, their unclear relationships, and by the number of features within this group.

4.7 External features in Area B

Sixty-four features could not be assigned to the circular structures (Illus 5). They varied in form and tended to group around the structures. The function of these features is difficult to determine. The larger pits may have been for storage and some of the smaller pits may have been post holes for tethering poles or possibly windbreaks and boundaries, such as the row of six between Structure 4B and Structure 5B (171, 173, 175, 177, 179 and 181, Illus 6 and 8) or another, east of Structure 2B (307, 325, 327, 329, 331 and 341, Illus 9). A group of seven post holes forming an approximate right-angle (281, 275, 273, 285, 299, 311 and 315, Illus 9) to the west of Structure 2B may represent the vestigial remains of a further roundhouse.

4.8 Artefacts

4.8.1 Pottery

Melanie Johnson

A large assemblage of MBA/LBA pottery was recovered during the excavations in this area, the largest of all of the excavated areas, comprising 509 sherds weighing over 10.6kg (Table 3). The average sherd weight is high, at 20.8g, due to the number of thick base and rim sherds.

The sherds were unevenly distributed between the structures, with the vast majority coming from contexts associated with Structure 2B and Structure 3C.

Fabrics were generally coarse, sandy and with up to 30% sand and grit inclusions and stones recorded up to 12mm in size. Wall thickness ranged between 6mm and 17mm, with base thickness up to 21mm. Colours tended to be greys, browns and oranges. Surfaces tended to be finished by smoothing, and finger-marking is often visible. Many of the sherds are abraded.

Structure 2B

A couple of contexts (east Ring Ditch 417, within Structure 2B, and Pit 303, to the north of Structure 2B) contained large deposits of pottery, between them containing 72% of the pottery from this building by weight. Other pottery-bearing contexts from within this building were a variety of pits and post holes (353, 399, 405, 423, 426, 436, 462, 471), and the portion of ring ditch on the west side (377). Others derived from a pit to the west (277), and an elongated pit to the east (486), both of which lie outside the structure.

The diagnostic sherds include very thick as well as thinner rounded rims (P24 Illus 14; P68),

Table 3 Pottery from Areas B and C

Structure	No. sherds	Wt (g)	No. vessels
2B	312	6448	53
3C	119	3134	52
4B	42	493	8
5B	7	146	6
6B	8	102	6
Other	21	281	9

flat-topped rims (P70), expanded to either side (P51 Illus 14; P80), slightly everted (P73), flat-topped bowls (P27 Illus 14; P76; P78), ridges on the exterior (P45 Illus 14), a barrel-shaped vessel with rounded rim (P64 Illus 14), inturning and necked (P79), and flat bases (P49). Rim diameters of 130mm, 180mm, 220mm, 270mm and 280mm, and a base diameter of 180mm were recorded.

Substantial portions of several vessels were recorded. P27 from Pit 303 consisted of 37 sherds from an open bowl with a flat-topped rim, diameter 280mm (Illus 14). From initial site cleaning, P79 consisted of part of a vessel with a slightly angled inturning rim, a closed mouth, a barrel/globular body and short concave neck.

P64 from Context 417 consisted of just 11 sherds weighing 1626g (Illus 14). This slightly barrel-shaped vessel had a neutral rounded rim of diameter 220mm. P65, also from C417, consisted of 43 body sherds weighing 1219g.

P78 was an open bowl with a flat-topped rim, and the neck kinks in to give a carinated shoulder. A fingertip has been run along the vessel above the carination (Illus 14).

Structure 3C

Within Structure 3C, pottery was recovered in small quantities from various pits and post holes within the structure itself (011, 049, 059, 085), located between the inner ring groove and the outer gully (144, 196, 200, 202, 226, 228, 244, 250, 278), or external to the gully (238). Only a single sherd was recovered from the portion of Ring Ditch 053 on the east side of the building, in contrast to Structure 2B, where the equivalent context was prolific. About a third of the pottery assemblage was recovered as surface finds during site preparation and so cannot be tied to individual features. The diagnostic sherds include rounded and flat-topped upright rims (P92 Illus 14; P129, P136, P130), slightly necked rims (P88, P100 Illus 14), rims slightly expanded to either side (P91 Illus 14; P80), expanded and necked (P134 Illus 14; P131), with ridges on the exterior (P132, P135 Illus 14; P119), thick and inturning rims (P133 Illus 14), and flat and footed bases (P81 Illus 14; P111). Rim diameters of 150–180mm, 220mm, 240mm and 290mm, and a base diameter of 140mm were recorded.

Body sherds with fingertip grooves on the exterior (P85, P128) may be the remains of an externally ridged rim.

There were fewer examples of substantial portions of vessels. P100 has just over half of the rim circumference surviving from a flat-top, upright neutral vessel, very slightly necked (almost imperceptible) with a diameter of 170mm.

An intrusive sherd from an earlier period was noted, in the form of a Beaker rim sherd (P120) recovered during cleaning of Structure 3C. This fine, tapered and slightly flaring rim sherd, with a diameter of 120mm, was decorated with two rows of closely spaced impressions (possibly made with the end of a bird bone or reed), then two horizontal grooves. Beaker activity on the site is also attested to in the Watching Brief Area X (Section 3).

Structure 4B

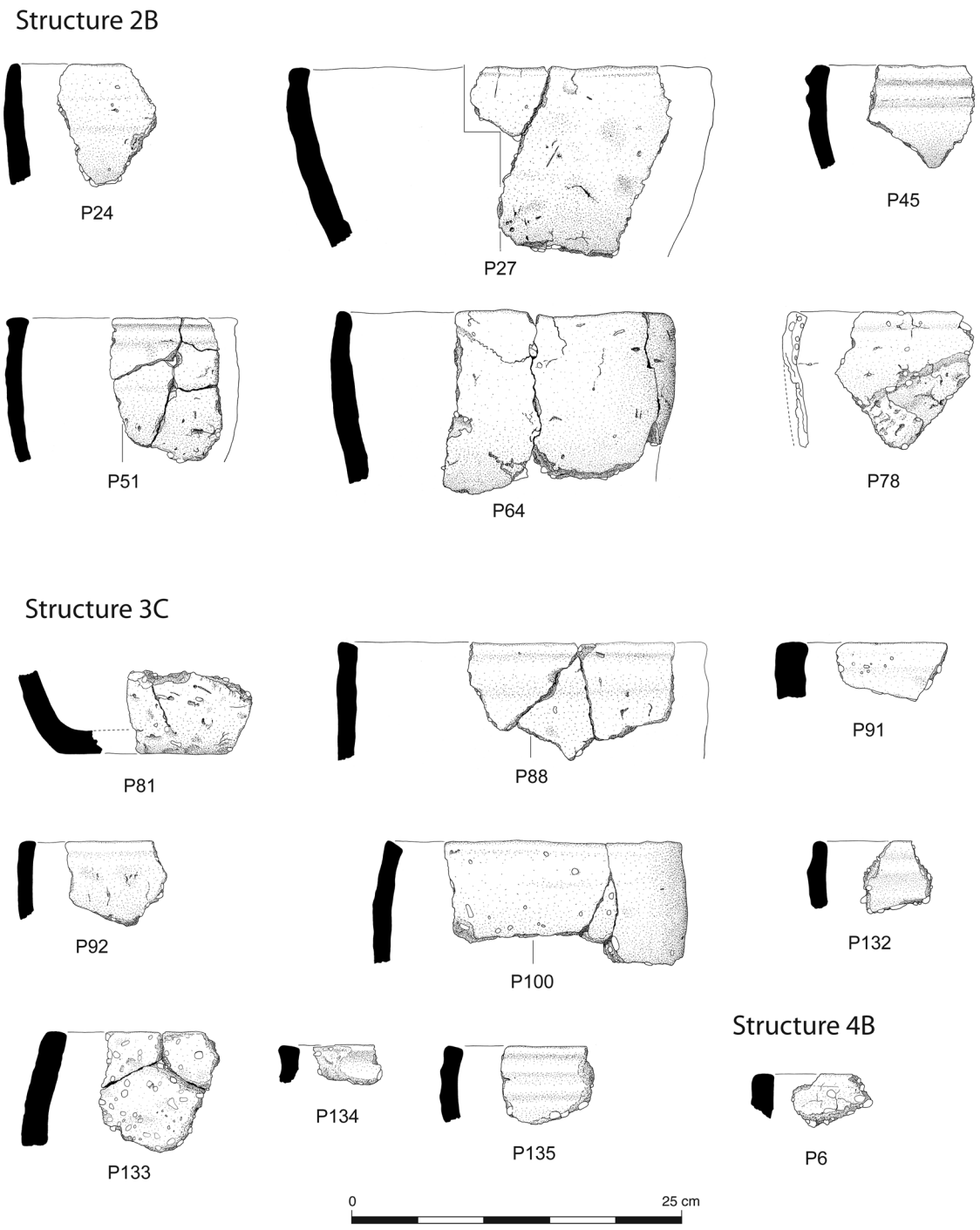
Most pottery within Structure 4B came from the upper fill (009) of the ring ditch (008). This comprised 43 sherds, including four rim sherds and six base sherds. The base sherds came from the same vessel, along with ten body sherds, and are from a thick base with a convex interior. A thick flat-topped rim (P6 Illus 14) has external ridges, while a thick rim with a slight internal bevel was found with a possible base and several body sherds (P9). A small, thin rounded rim sherd was also found, which is possibly Late Neolithic in date rather than Bronze Age. Further plain body sherds were recovered from Spread 044 and Post Hole 056. A large elongated pit (005) just to the west of Structure 4B contained a small amount of pottery, just three sherds from two different vessels, one of which was a thick, slightly rounded rim.

Structure 5B

Only seven sherds were recovered from Structure 5B. One plain body sherd came from 151, five from 163, and one base sherd from 190, all of which are pits/post holes within the building.

Structure 6B

A small assemblage was also recovered from Structure 6B, most coming from Post Hole 507 on the south-west side of the building. These included three base sherds from two different vessels with slightly footed bases, one of which had a diameter of 80mm, and a fragment of rounded rim. A small rim sherd was found in 509,



Illus 14 Pottery from Areas B–C

also to the south-west, and a plain body sherd in 521, a post hole in the centre of the building.

4.8.2 Lithics

Ann Clarke

This was the most productive area for stone finds, with small numbers coming from pits or post holes of Structures 2B, 3C, 4B and 5B as well as some external features.

The flint is an undistinguished assemblage comprising mainly chips, chunks and very small flakes. Where evidence for knapping technique survives it suggests the use of prepared flat platforms. A single flake from Pit 436 in Structure 2B was

retouched to form a small scraper of a horseshoe/thumbnail shape – this was later burnt and broken before being deposited in the pit.

Of most interest are four flakes of fine-grained sandstone that were found together in Post Hole 401 of Structure 2B (Illus 15a–d). The larger flake was detached from a multi-platform flake core and there are three smaller flakes, one of which has steep edge retouch down one side and across one end to form a shallow scraper. It is most likely that these flakes all came from the same stone blank. A larger corticated sandstone flake came from the eastern ring ditch (417, Fill 416) in Structure 2B.

Though the evidence from the flaked lithics is slim, the presence of flake manufacturing techniques and the shape of the scrapers would suggest a date from the Late Neolithic to the Middle Bronze Age for the formation of the assemblage. Given this wide dating for the lithics it is uncertain whether they could be residual from earlier activity or not, however, the group of flakes of fine-grained sandstone in one feature would indicate that these at least were made and used during the occupation of the site.

Unrelated to the above group is a large sandstone flake from an upper fill, 048, of the ring ditch of Structure 4B (Illus 15e). This is simple in shape and manufacture but bears a distinctive denticulate edge, most likely the result of edge damage from use wear. The use of large sandstone flakes is common at sites in the Northern Isles dating from the Neolithic through to the Early Iron Age (Clarke 2006). They are considerably less well known on Scottish sites but recently published examples are from Early Bronze Age contexts at Kilellan, Islay (Clarke 2005) and an Iron Age and Romano-British enclosure at Woodend Farm, Dumfriesshire (Banks 2000). The context of this sandstone flake, in the post-abandonment ring ditch fill of Structure 4B, could indicate a similar Middle Iron Age date for its fill.

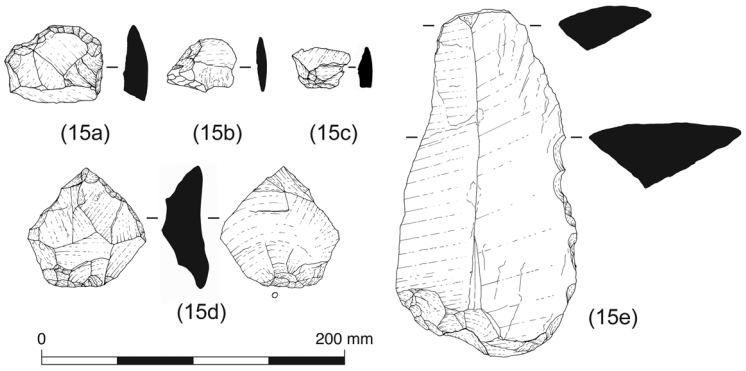
4.8.3 Coarse stone artefacts

Ann Clarke

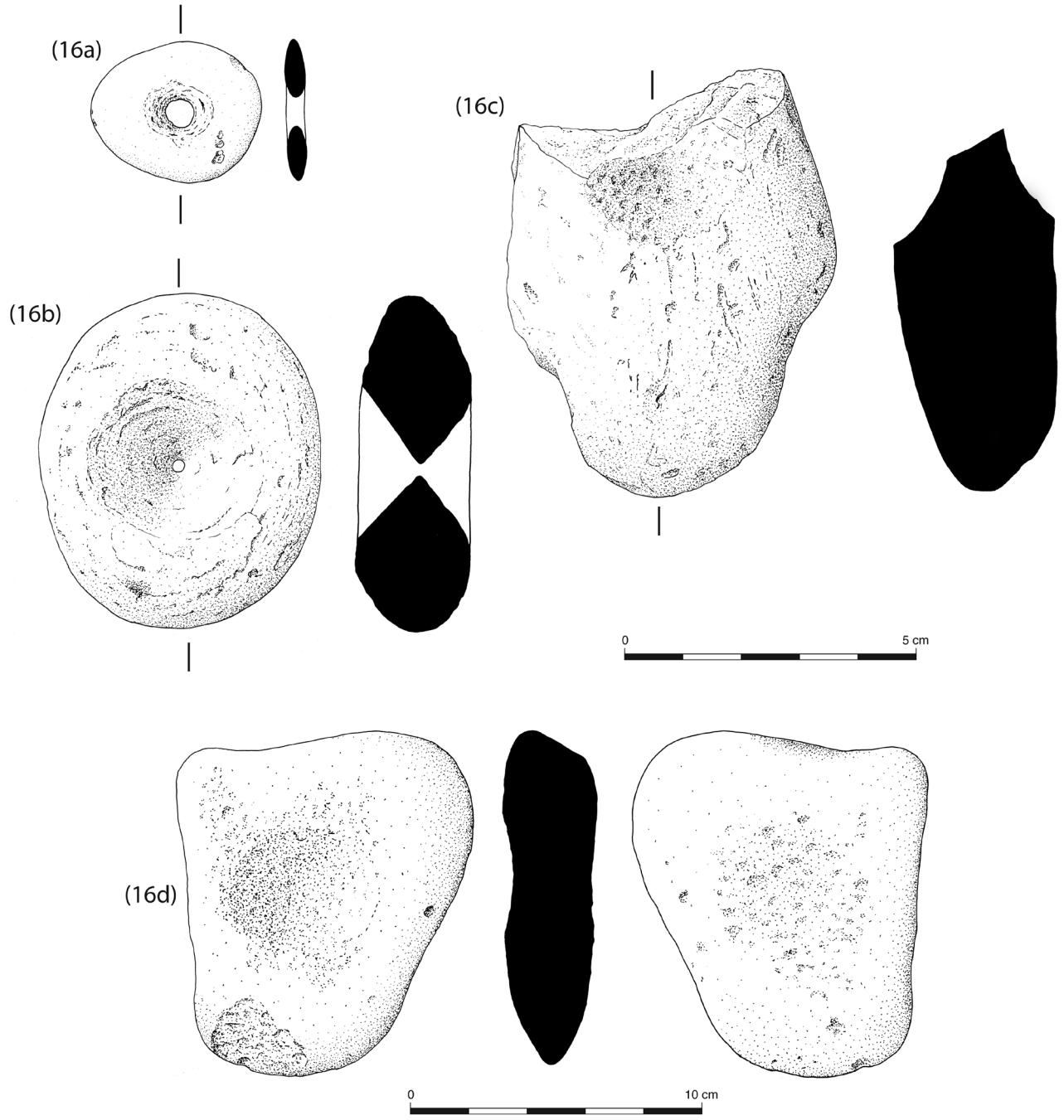
Two perforated stones were found during initial cleaning over Structure 3C. One was a simple flat oval pebble with a circular hole pecked in the centre of the face with a weight of 25g (Illus 16a). A possible shallow smoothed notch on the inside of the hole may indicate that the stone was suspended in some way, as a weight rather than having been used as a spindle whorl. The larger weight (650g; Illus 16b) has a wide and deep biconical cross-section formed by pecking from both faces and the hole is small, just 5mm in diameter, which would mean that a thin but strong twine would have been needed to suspend this weight.

A probable unfinished weight came from the curvilinear feature (073) in Area C. This large cobble was broken across the width truncating a deep pecked hollow on each face (Illus 16c). It is likely that the breakage occurred during the manufacture of a perforated weight intended to be similar to the larger one above. Breakage during manufacture must have been quite common – a similar broken weight is illustrated from a Bronze Age roundhouse in Sutherland (Dunbar 2007, illus 14).

A large anvil stone was placed in Pit 417 of Structure 2B (Illus 16d). On one face a wide



Illus 15 Lithic artefacts of sandstone from Area B



Illus 16 Coarse stone from Areas B and C

spread of pecking forms a shallow dished hollow, but its rough interior indicates that it could never have been used as a pivot stone. Spreads of pecking are also placed on the underside but these do not form hollows. This was most likely used as some kind of anvil stone – perhaps it played a role in the manufacture of the cannel coal artefacts; fragments of a 'napkin ring' came from the same context (see Hunter, Section 4.8.4 below) and worked fragments from other areas of Structure 2B.

A small hammerstone with light pecking and flake damage on one end had been deposited in Pit 163 in Structure 5B.

A fragment of sandstone with naturally produced tunnels and perforations appears to have been burnt and has slag adhering to the interior of the holes. It

was found in Post Hole 003 in Structure 4B and was most likely involved in some sort of metalworking activity.

4.8.4 Shale and cannel coal

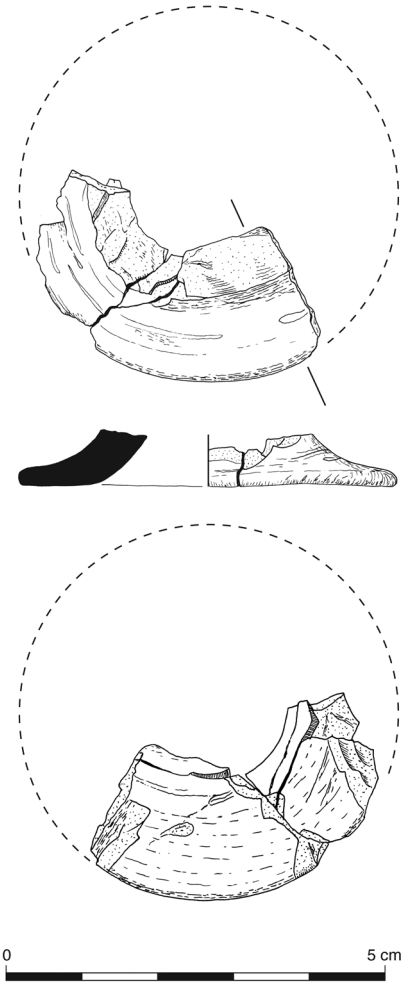
Fraser Hunter

One item of jewellery in black organic-rich stone was recovered from Structure 2B: a broken 'napkin ring'. Two unworked blocks of oil shale were also recovered from Structure 2B, suggesting import of raw materials. Most unusual is the fragmentary 'napkin ring', a distinctive Early–Middle Bronze Age type of dress fastener (Hunter 1998); this example sits at the northern edge of the distribution.

The two lumps of shale point to import of raw material. These latter differ from the 'napkin ring', which appears to be cannel coal, but both raw materials are locally exotic; the nearest suitable geological deposits (Coal Measures) are south of the Ochils, in the Central Coalfield (Cameron & Stephenson 1985: 84–91, fig 25). No specific accessible outcrops have been identified, but geological mapping indicates sources could be available within *c* 10–15km. There is a thin scatter of black organic-rich stone ornaments from later prehistoric sites in Perthshire (eight other find-spots are known to the writer), but the only other site with evidence of on-site working is the Iron Age fort of Castle Law, Abernethy; finds in the National Museums of Scotland include a block of part-worked material (NMS GP 22). As with Gleneagles, this is not too far from potential sources, with the Fife coalfields being some 20km distant; for sites in central and northern Perthshire, the distances to sources would have been much greater. The working evidence from Gleneagles and Abernethy indicates a willingness by the inhabitants to procure resources within 10–20km of the site, whether directly or through intermediaries.

Catalogue

'Napkin ring', badly broken during excavation; the five major fragments can be joined to form about a third of the ring, split horizontally with the lower face lost. As is usual, the flared, slightly angled upper surface and perforation are lightly polished, while the concave outer face (which would be hidden in use by attached textile or cordage) has extensive fine



Illus 17 'Napkin ring' from Area B

circumferential abrasion scars. Probably a compact cannel coal. D *c* 50mm, H 18mm, W 16mm, perforation D *c* 18mm. Structure 2B, east Ring Ditch 417 (Illus 17).

Two lumps of tabular oil shale, unworked but non-local and thus probably imported as raw material: 82 by 71mm by 18mm, 131mm by 73mm by 24mm. Structure 2B, west Ring Ditch 377 and Post Hole 467 (not illustrated).

4.9 Environmental evidence

4.9.1 Calcined bone

Sue Anderson

Seventy-five contexts in Area B produced a total of 103.3g of bone. Structure 2B produced 8.85g, of which 6.9g was from Pit 436. From Structure 4B there was 18.5g, of which the largest concentration was again from a central pit (134). Only 1.8g

was recovered from Structure 5B. Structure 6B produced the largest quantity (29.4g), with small concentrations in Pits 507 and 521, and possible Ring Ditch 575. The remaining 8.65g came from five external features. In general the fragments were small and abraded, but a few larger pieces could be identified as large mammal, including pieces of rib and skull, and there were a few tiny fragments from Structure 2B which were probably from a small rodent or amphibian.

A very small quantity of bone was recovered from eight features in Structure 3C (6.1g), three external features (0.9g), one internal feature (<0.1g) and the palisade (<0.1g). With the exception of one large fragment from Pit 085 which was certainly animal, none of this group was identifiable.

4.9.2 Charcoal

Michael Cressey

Sixty samples of charcoal were analysed from this area, of which 14 were from Structure 2B, six from Structure 4B, four from Structure 5B, 21 from Structure 6B, 12 from Structure 3C and three from other contexts. The numbers of identifications by species for each of the structures are shown in Table 4. A total of 636 identifications (534.4g) were made, of which two (0.2g; 0.03%) were alder, 80 were birch (127g; 23.8%), 277 (133.3g; 24.9%) were hazel and 277 (273.9g; 51.3%) were oak.

4.9.3 Charred grain

Mhairi Hastie

A total of 251 bulk samples were recovered from Areas B and C, of which 32 produced small quantities of grain.

The majority of the grains were identified as barley. None was sufficiently preserved to determine whether they were the naked or hulled varieties. One possible wheat grain and one possible oat grain were also recovered. A small quantity of weed seeds, charred fragments of hazelnut shell and occasional rhizomes were present along with the cereal grain. The weed seeds were generally typical seeds of arable fields, including corn cockle, hemp nettle, ribwort, buttercup and persicaria.

A low-level spread of abraded plant remains was found in both internal and external features associated with the five circular structures. There does not appear to be any specific meaning to the distribution of plant remains, instead the plant debris was present in a variety of features including pits, post holes and the remains of ring ditches. No large concentrations of plant remains were uncovered in these excavated areas to suggest any large-scale burning incidents.

This sparse but uniform spread of highly abraded burnt material has been noted at many prehistoric roundhouse sites throughout Scotland; recent examples include Kintore (Holden et al 2008) and Birnie (Hastie 2005). These are normally interpreted as the reworked and diluted remnants of debris produced by daily activities, including a mixture of grain accidentally charred during small-scale corn-drying, discarded or spoilt food deposited on the fire/hearth, and burnt food from floor sweepings, all of this material being trapped in open pits and ring ditches, and accumulating in post holes as the post decayed.

Table 4 Charcoal distribution by species, Areas B and C

Species	Str2B		Str4B		Str5B		Str6B		Str3C		Other	
	No.	Wt (g)	No.	Wt (g)	No.	Wt (g)	No.	Wt (g)	No.	Wt (g)	No.	Wt (g)
Alder							1	0.1	1	0.1		
Betula	25	59.0	4	2.3			11	2.2	40	63.5		
Corylus	77	52.3	7	1.4	4	6.3	49	4.0	136	66.5	4	2.8
Quercus	27	27.0	7	4.4	37	75.1	59	19.3	136	136.6	11	11.5
Totals	129	138.3	18	8.1	41	81.4	120	25.6	313	266.7	15	14.3

4.9.4 Soil micromorphology

Clare Ellis

Structure 4B: Ring Ditch 008

Three Kubiena samples (<397>, 1–3) were taken through two fills of Ring Ditch 008 in Structure 4B (Illus 7a). The lower fill (010) is a poorly sorted fine to medium silty sand loam with a few coarse mineral grains and rock fragments. Frequently the mineral grains and rock fragments have thin coatings of silt adhering that is orange in OIL (oblique incident light). This context has been extensively reworked and mixed by worms; more than one phase of bioturbation is evident. Compaction of the faecal pellets has resulted in a vughy microstructure. The relatively high amorphous organic content is burnt, with coarse and silt-sized charcoal occurring throughout the fine organo-mineral matrix. Possible fungal spores are also burnt. There are very few phytoliths. The upper fill (009) is a moderately sorted fine sandy silt with a few coarse mineral grains and rock fragments. There are zones and one band of amorphous and silt-sized charcoal; elsewhere the amorphous organic content is burnt and appears to be largely composed of dissolved charcoal. The very few fungal spores are both burnt and unburnt. There are very few phytoliths. This context has also been extensively mixed by the activities of soil fauna, resulting in the channel microstructure.

Bioturbation, which comprises, at this scale of observation, the activities of soil biota such as earthworms and enchytraeids, has resulted in the destruction of any original soil/sediment fabric and accounts for their open, relatively loose fabrics (Dawod & FitzPatrick 1992; Davidson 2002: 1248); there is minimal root penetration. Bioturbation has also introduced fine sandy silt loam material which has a much lower charcoal content; this material occurs in the form of veriforms (infilled passages) and granules. There are a few sub-rounded to rounded clasts of iron oxide in both contexts. The iron oxide has oxidised out of solution as infills or impregnations of voids, pores, root pipes etc., but has subsequently been reworked by soil fauna.

The presence of burnt amorphous organic matter, silt-sized charcoal fragments, mineral grains and rock fragments with silt coatings and the low quantities of biogenic silica indicate that the ash derivatives in both contexts were mainly derived from a mineral-based turf. The presence of burnt fungal spores suggests that some decomposition of the organic content had taken place prior to its combustion, as would be expected in a soil. The incomplete combustion of the woody/root component indicates a limited availability of oxygen, due to either the rapid build-up of fuel, or the use of damp fuel, or alternatively due to the deliberate dampening down of the fire, as well as a relatively low-temperature fire such as that found in the domestic hearth (around 400°C) (Courty et al 1989; Simpson et al 2003; Carter 2005). There is no evidence to indicate that the ash was produced in situ. In Upper Fill 009 the dipping band dominated by weathered, bioturbated charcoal shows that the deposits probably accumulated as a series of dumps. This band, rich in charcoal, is likely to be a consequence of incomplete combustion of a woody and/or herbaceous turf fuel, as opposed to a significant change in fuel type (eg Carter 2005). The few coarse fragments of charcoal scattered throughout the matrix are also likely to derive from woody and/or herbaceous organics that were integral to the turfs.

Structure 2B: Ring Ditch 377

Three Kubiena samples (<446> 1–3) were taken through the fills of Ring Ditch 377 in Structure 2B (Illus 10a). The lowermost fill (464) comprises a poorly to moderately sorted fine sandy silt with few rock fragments. It is dominated by burnt amorphous organic matter with frequent to common silt-sized charcoal and few clasts of coarse charcoal (roundwood). It contains very few phytoliths, sclerotia and roots. It has been extensively reworked by soil fauna. The upper fill (378) also comprises poorly sorted fine sandy silt dominated by burnt amorphous organic matter, few to frequent charcoal fragments, few burnt and unburnt fungal spores, few phytoliths and very few pieces of highly weathered bone.

The basic micromorphological characteristics of 464 are similar to Area A Structure 2A 006 (upper fill of Pit 005) (Section 10), although 464 contains more silt-sized charcoal. C464 is interpreted as the ashy remnants of a domestic hearth upon which a mixed fuel comprising mineral-based turf, woody and probably herbaceous inclusions were burnt. The boundary between Lower Fill 464 and the overlying Upper Fill 378 is diffuse

and faint due to post-depositional bioturbation. However, the lower fill is more compact and has a sub-angular blocky microstructure compared to the granular microstructure of the overlying 378; these sedimentary characteristics may be partially due to a hiatus in deposition. Ash of fine organics appears to comprise a high proportion of 378, and the presence of burnt fungal spores indicates that this too is predominantly a turf ash.

4.10 Radiocarbon dates

Twenty-seven dates were returned from this area, all of which were derived from material within the fills of structural components of the roundhouses (Table 5; Illus 18). Given the caveat that taphonomic processes will have influenced the depositional history of the dated material, these features were targeted for dating as it was assumed that this material probably derived from the occupation phase of these structures, and further it was assumed the processes that produced this material, such as cooking and eating, occurred within, or close to, the structure.

The dates indicated activity from the EBA to the MBA, although the majority of dates returned reflect MBA occupation.

Chi-squared (χ^2) tests were carried out to determine whether the dates within structures were significantly different from each other. From Structure 7B, three of the dates are not significantly different (giving an overall range of 1407–1210 BC), but the fourth (UBA-13422) was. Of the three dates from Structure 5B, UBA-13426 was significantly different from the other two (UBA-13425, UBA-13427), which were not significantly different from each other. Within Structure 2B, each of the paired dates produced significantly different results. However, it should be noted that the date from the upper fill of the ring ditch (UBA-13307, 1387–1133 BC at 95.4% probability) had a slightly earlier range than the date from the lower fill (UBA-13308, 1308–1091 BC at 95.4% probability), indicating that some material may have been redeposited and the dates may be in reverse order of deposition. The four dates from Structure 4B were not statistically different. In Structure 6B, the two dates from Post Hole 547 were not statistically significantly different and the other four dates also showed no significant difference from each other, again potentially dating two phases of use. Ignoring UBA-13311 in Structure 3C as it is clearly anomalous, the other five dates showed no significant differences.

The earlier group of dates from Structures 5B, 6B, 2B, 7B and 4B are not significantly different and suggest that these were broadly contemporary. The dates from 3C are also statistically the same as the latest dates in that earlier group. However, as the ring groove of Structure 5B cut the partial ring groove of 7B, it is unlikely that the two structures were standing at the same time. There is a significant difference between the earliest and latest dates, but the later dates from 2B and 6B are likely to be contemporary.

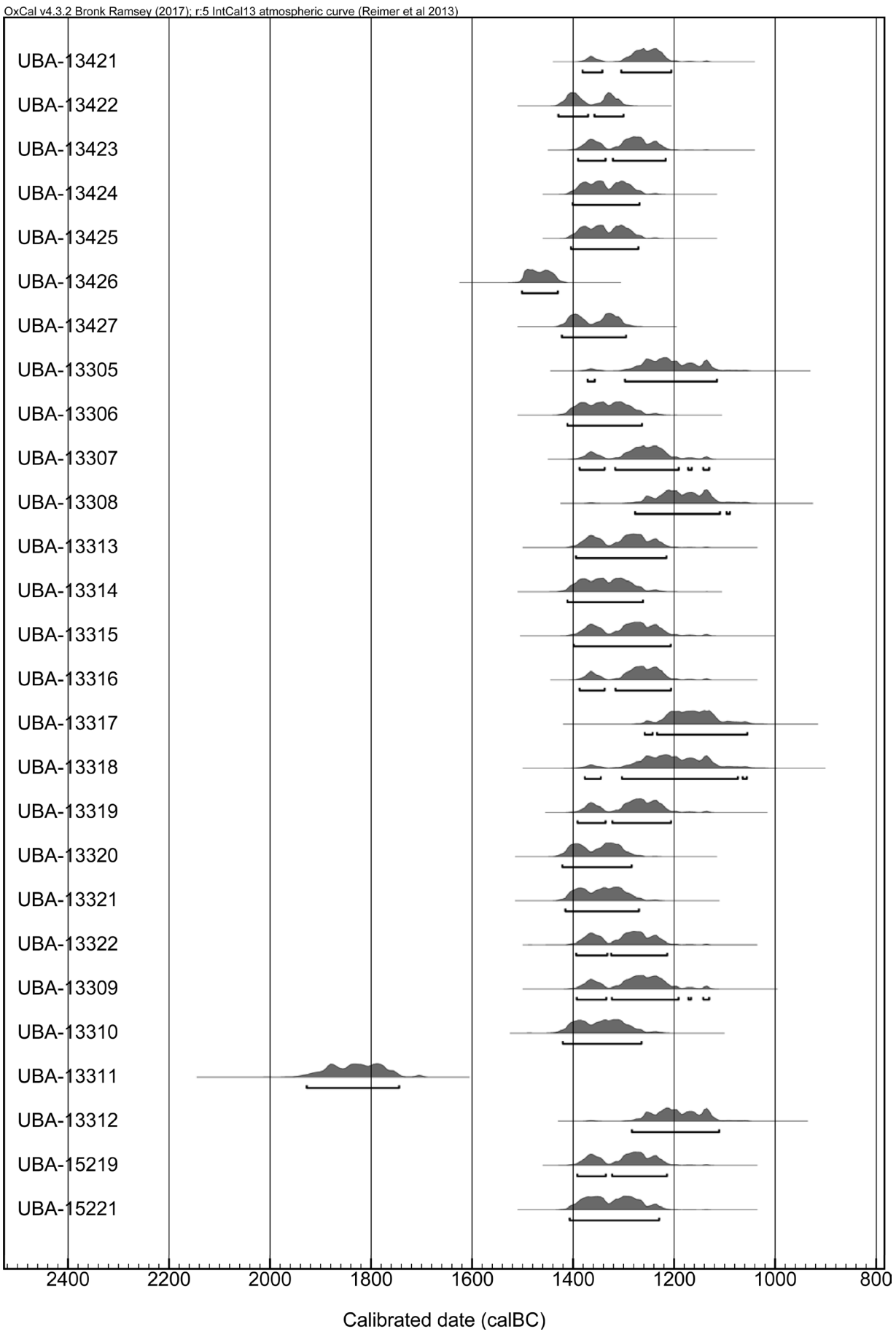
There is only so far that analysis of this kind can take the interpretation of factors such as contemporaneity, rebuilding or continuous occupation of individual structures, as there are many taphonomic processes that could result in mixing of deposits or the incorporation of earlier material into contexts, as suggested by the dates from the upper and lower fills of Structure 2B's ring ditch. The above analysis may suggest continuous occupation and rebuilding, but a more cautionary approach would suggest that the dating is more likely to give a general chronology rather than precision at the structural level, due to the spectre of uncertain taphonomy and insufficient temporal resolution.

4.11 Overview

4.11.1 Phasing

There were very few stratigraphic relationships between features in either Area B or Area C, although spatial and structural relationships do exist.

In Area B there were at least two identifiable phases represented by the earlier Structure 7B which was cut by a feature component of Structure 5B. Structure 7B returned two sets of radiocarbon dates; 1391–1216 cal BC (95% probability; UBA-13423) and 1407–1271 cal BC (95% probability; UBA-13424) from Pit 128 and 1381–1210 cal BC (95% probability; UBA-13421) and 1431–1316 cal BC (95% probability; UBA-13422) from Pit 086. The upper and lower date ranges for Structure 5B are 1503–1427 cal BC (95% probability; UBA-13426) from Post Hole 244 and 1408–1292



Illus 18 Radiocarbon dates, Areas B and C

Table 5 Radiocarbon dates, Areas B and C. Calibration was conducted using OxCal v4.1.7, using the IntCal09 calibration curve

Lab no.	Material	Context description	Date BP	95% probability	$\delta^{13}C$ ‰
Structure 7B					
UBA-13421	Hazel charcoal	Fill of Pit 086	3018±20	1381–1210 BC	–27.6
UBA-13422	Alder charcoal	Fill of Pit 086	3106±20	1431–1316 BC	–29.7
UBA-13423	Hazelnut shell	Fill of Pit 128	3036±24	1391–1216 BC	–24.7
UBA-13424	Hazel charcoal	Fill of Pit 128	3066±19	1407–1271 BC	
Structure 5B					
UBA-13425	Willow charcoal	Fill of ?Ring Ditch 150	3068±19	1408–1292 BC	–27.6
UBA-13426	Alder charcoal	Fill of Post Hole 244	3197±19	1503–1427 BC	–28.5
UBA-13427	Hazel charcoal	Fill of Post Hole 151	3097±21	1425–1313 BC	–25.2
Structure 2B					
UBA-13305	Barley indet.	Fill of Post Hole 460	2986±30	1370–1123 BC	–33.4
UBA-13306	Hazelnut shell	Fill of Post Hole 460	3073±27	1413–1269 BC	–26.5
UBA-13307	Barley indet.	Upper fill of Ring Ditch 377	3018±27	1387–1133 BC	–25.1
UBA-13308	Barley indet.	Lower fill of Ring Ditch 377	2970±27	1308–1091 BC	–23.0
Structure 4B					
UBA-13313	Barley indet.	Fill of Pit 056 in base of Ring Ditch 008, underlies 010	3039±27	1397–1214 BC	–26.7
UBA-13314	Barley indet.	Fill of Pit 056 in base of Ring Ditch 008, underlies 010	3071±27	1412–1269 BC	–23.7
UBA-13315	cf Wheat *sp.*	Fill of Post Hole 102 in post ring	3033±30	1400–1210 BC	–28.5
UBA-13316	Barley cf hulled	Fill in Post Hole 098	3023±24	1387–1210 BC	–24.6
Structure 6B					
UBA-13317	Barley indet.	Fill of Post Hole 547	2955±26	1266–1056 BC	–28.9
UBA-13318	Barley indet.	Fill of Post Hole 547	2983±38	1377–1057 BC	–32.0
UBA-13319	Barley indet.	Fill of Post Hole 579	3027±27	1392–1135 BC	–25.3
UBA-13320	Barley indet.	Fill of Post Hole 579	3093±26	1428–1303 BC	–23.7
UBA-13321	Barley indet.	Fill of Post Hole 543	3082±27	1420–1271 BC	–26.0
UBA-13322	Barley indet.	Fill of Post Hole 543	3037±27	1396–1214 BC	–25.3

Lab no.	Material	Context description	Date BP	95% probability	$\delta^{13}C$ ‰
Structure 3C					
UBA-13309	Barley indet.	Lower fill of Post Hole 005 in post ring	3023±30	1392–1133 BC	–30.2
UBA-13310	Barley indet.	Fill of Post Hole 051 in post ring	3084±31	1426–1270 BC	–30.3
UBA-13311	Barley indet.	Fill of Pit 071, cutting Gully 073	3511±34	1925–1745 BC	–27.6
UBA-13312	Barley indet.	Basal fill of Post Hole 132	2976±27	1311–1118 BC	–30.1
UBA-15219	Hazel charcoal	Fill of Pit 015	3035±26	1393–1214 BC	–27.5
UBA-15221	Barley indet.	Fill of Pit 015	3056±30	1411–1222 BC	–27.5

cal BC (95% probability; UBA-13425) from Ring Ditch 150, respectively. These dates may represent two phases of use or alternatively residual material entering the features. Although it can be shown stratigraphically that Structure 7B was the earlier, there is considerable overlap in the date ranges between the two structures, making it difficult to determine a more precise time frame for Structure 7B abandonment. Theoretically, Structure 7B could have been abandoned at any time between 1431 cal BC, the upper range date from Structure 7B, and 1292 cal BC, the lower date range of Structure 5B.

There was evidence of more than one possible phase in Area C (Illus 12). The curvilinear feature 073/114 was cut by three pits, making this feature stratigraphically earlier. Pit 071, which cuts curvilinear Feature 073, returned a radiocarbon date range of 1925–1745 cal BC (95% probability; UBA-13311). The pits were interpreted as part of a series forming an arc on the south and south-west of Structure 3C, one of which (132) contained barley grains which returned a date of 1311–1118 cal BC (95% probability; UBA-13312). The intercutting pits suggest that the gully (073) was abandoned at some point prior to the abandonment of the site itself.

In Area C the short curvilinear feature (106) may be the vestigial remains of a ring groove representing a later or earlier phase than those features assigned to Structure 3C. Alternatively, 106 may be the remains of a drip-gully associated with Structure 3C and therefore of the same phase as that structure. Unfortunately, no dates were obtained for this feature.

It is quite possible that the particular concentration of features around Structure 2B may also represent other undated phases of activity. For instance, it is possible that there exists an arc of pits on the eastern side of the structure that may represent the partial remains of a post ring from another structure, or possibly an encircling fence associated with Structure 2B.

Because Structures 4B, 5B, 2B, 6B and 3C show no stratigraphical relationships with each other, it is impossible to demonstrate whether or not they were contemporary.

4.11.2 Architectural features of the structures

The structures in these areas can be classified into three forms: post-built with ring ditches; post-built with ring ditches and ring grooves; and post-built with neither ring ditches nor ring grooves. The lack of apparent phasing within the structures means that it is unclear whether these structural features represent one complete individual structure or several phases of structures at the same location which use slightly different construction methods.

No ring groove was present in either Structure 2B or 6B. There are at least two explanations for the lack of a ring groove. First, the structures were built without a ring groove, the implication being that it was not necessary to set the structures' outer walls within a foundation trench (ring groove). Perhaps the post rings of these structures also functioned as the outer walls. Secondly, the putative ring grooves had been truncated away, which is entirely possible given the shallowness of the surviving ring grooves.

At least three of the structures' entrances (5B, 2B and 6B) were orientated to the south-east and it is

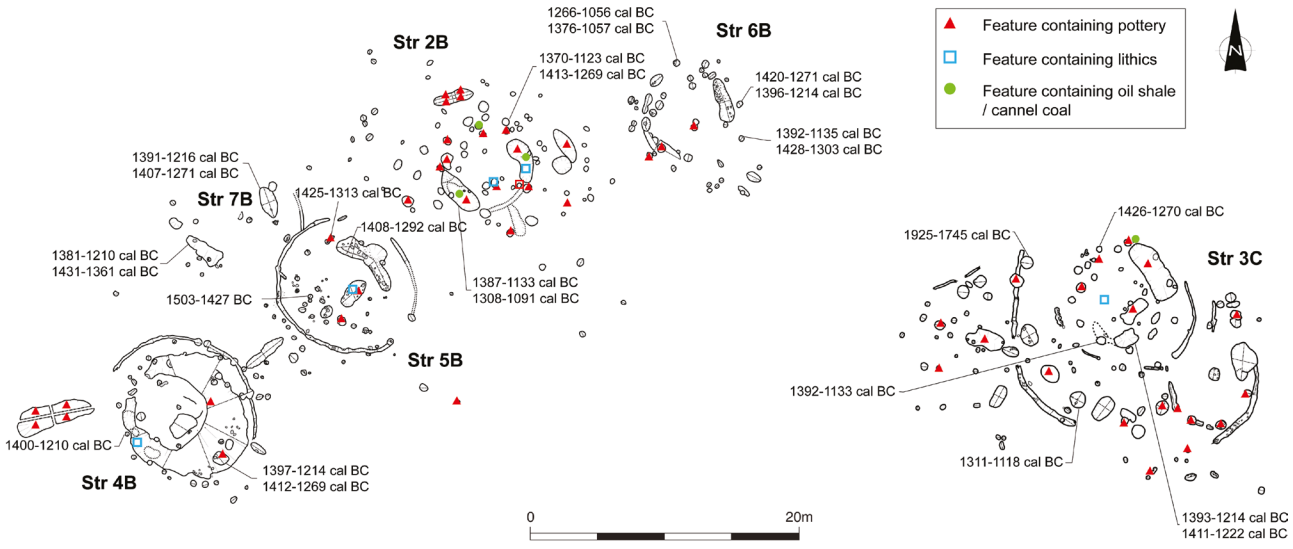
likely that 3C was similarly orientated. A south-east entrance is a common feature of Bronze Age circular structures across a wide geographical area including Scotland, for example at Kilphedir and Kilearnan Hill, Sutherland (Fairhurst & Taylor 1971; McIntyre 1998), Bannockburn, Stirling (Rideout 1995), Lairg (McCullagh & Tipping 1998), Navidale, Helmsdale (Dunbar 2007), Old Meldrum, Aberdeenshire (White & Richardson 2010) and Drumyocher and Hospital Shields, Aberdeenshire (Johnson 2017). However, recent work by Pope has questioned this south-east dominance in orientation. In her study of circular structures in northern and central Britain she found that the majority of structures in her study (76%), where orientation was identifiable, were orientated between the north-east and south, and of these 48% were orientated between the east and south (Pope 2003: 173). The significance of the entrance orientations is discussed further in Section 11.2.4.

Structure 2B also displayed a wear pattern in the entrance, 490, which intersected with an ill-defined curvilinear feature (394). This feature occupied a space in the inner post ring linking two post holes (399 with 421). Its function is undetermined but may represent some form of threshold construction.

4.11.3 Finds distribution and taphonomy

The finds were incorporated into a number of features across each of the structures (Illus 19). The fragmentary nature of the material suggests that much of it was accidentally incorporated. Generally the artefacts were found in the larger features.

The finds within Structure 2B were distributed throughout the structure, but the majority were found within peripheral contexts and may reflect patterns of cleaning, with the central area of the house being swept out and the detritus ending up in what were essentially artefact and sediment traps. However, the majority of the pottery sherds were recovered from the east ring ditch and the external pit (303) to the north of the structure. As Pit 303 was an external feature and was located outside at the rear of the building and not opposite the doorway, it may have been a rubbish pit. Alternatively, Pit 303 may have been the remains of another ring ditch – based on its dimensions and form, 3m by 1m by 0.16m deep, Pit 303 was similar in size and form to the east ring ditch (377) within Structure 2B. Another large external pit (005) just west of Structure 4B also contained pottery sherds. The sherds in both pits derived from more than one vessel, although no complete vessels were recovered, suggesting that the vessels had not broken in situ, the implication being that these pits were not used



Illus 19 Finds and dating distribution, Areas B and C

for storage, as one would expect whole artefacts to have been present. It cannot be ruled out, however, that these pits occupied a space in the 'courtyard' of the structures and it was these courtyards that were swept clean. Similarly, pottery was recovered from the fills within an arc of pits that had survived to the south and west of Structure 3C and may also reflect courtyard cleaning. However, there is increasing evidence of structured deposition at liminal places such as boundaries and this arc of pits with their deposits of pottery may have served as a metaphorical or symbolic boundary (Brück 2001).

4.11.4 Structure use

It is likely that all these structures were primarily houses, but they may also have served other functions such as animal byres and workshops.

There is evidence for craft specialisation represented by the production of jewellery. The finds from Structure 2B included a fragmented cannel coal 'napkin ring' which was recovered from the ring ditch (417), and unworked tabular oil shale from the eastern ring ditch (377) and Post Hole 467. Other material remains from Structure 2B, including flint tools, pottery and a large used anvil stone, are indicative of working and production, as are the weights fashioned from coarse stone, found in contexts associated with Structure 3C.

Features common to the majority of the structures within Areas B and C were internal ring ditches. There is much debate regarding the purpose of ring ditches, and this is reviewed in Section 11.2.2.

4.11.5 Economy

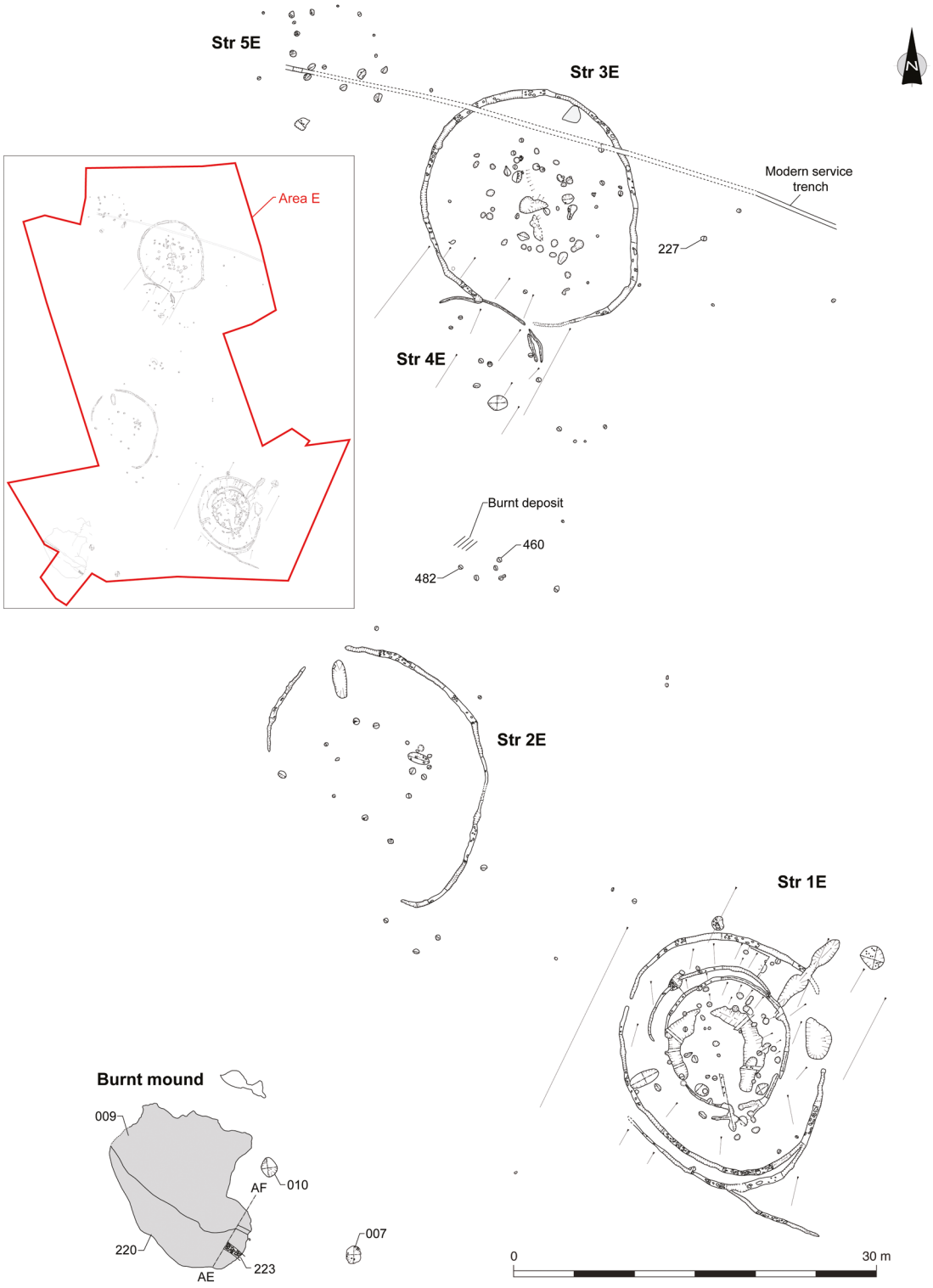
The cereal grain assemblage recovered from Areas B and C was dominated by barley, associated with weed seeds that were typical of arable fields, indicating that arable farming was being practised. Unfortunately, the species represented by the few fragments of calcined bone could not be determined, so it is uncertain whether these animals were domesticated or wild.

The evidence for craft specialisation in Structure 2B hints at possible manufacture of tradable commodities but unfortunately, it is impossible to determine whether the jewellery was produced in this structure, if it was meant for personal consumption or trade, or whether those who manufactured the jewellery collected the raw materials.

Two probable stone weights from Area C were recovered during pre-excavation cleaning of Structure 3C, and a third unfinished weight was recovered from curvilinear Feature 073. It is possible that the objects were related to weaving, which may have taken place in this structure, possibly indicating some specialisation of function.

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

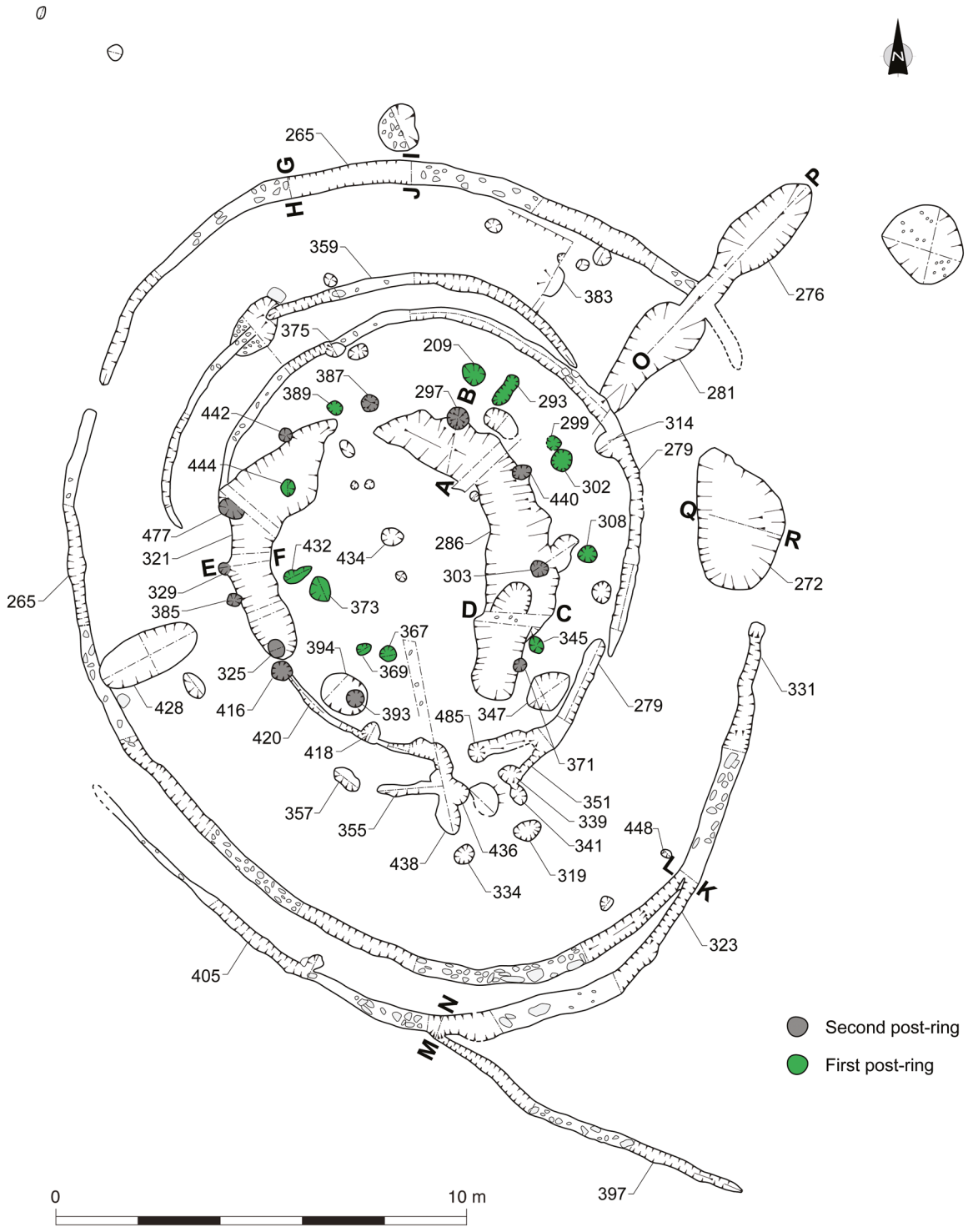
The more complete Ring Groove 279/420 measured 0.2m wide by 0.15m deep in profile. It formed a near-continuous ring around the house except on the western side, where it was truncated by the external edge of Ring Ditch 321, and on the south side where it broke at the entrance. Three short slots (351, 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 Candlestane 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.

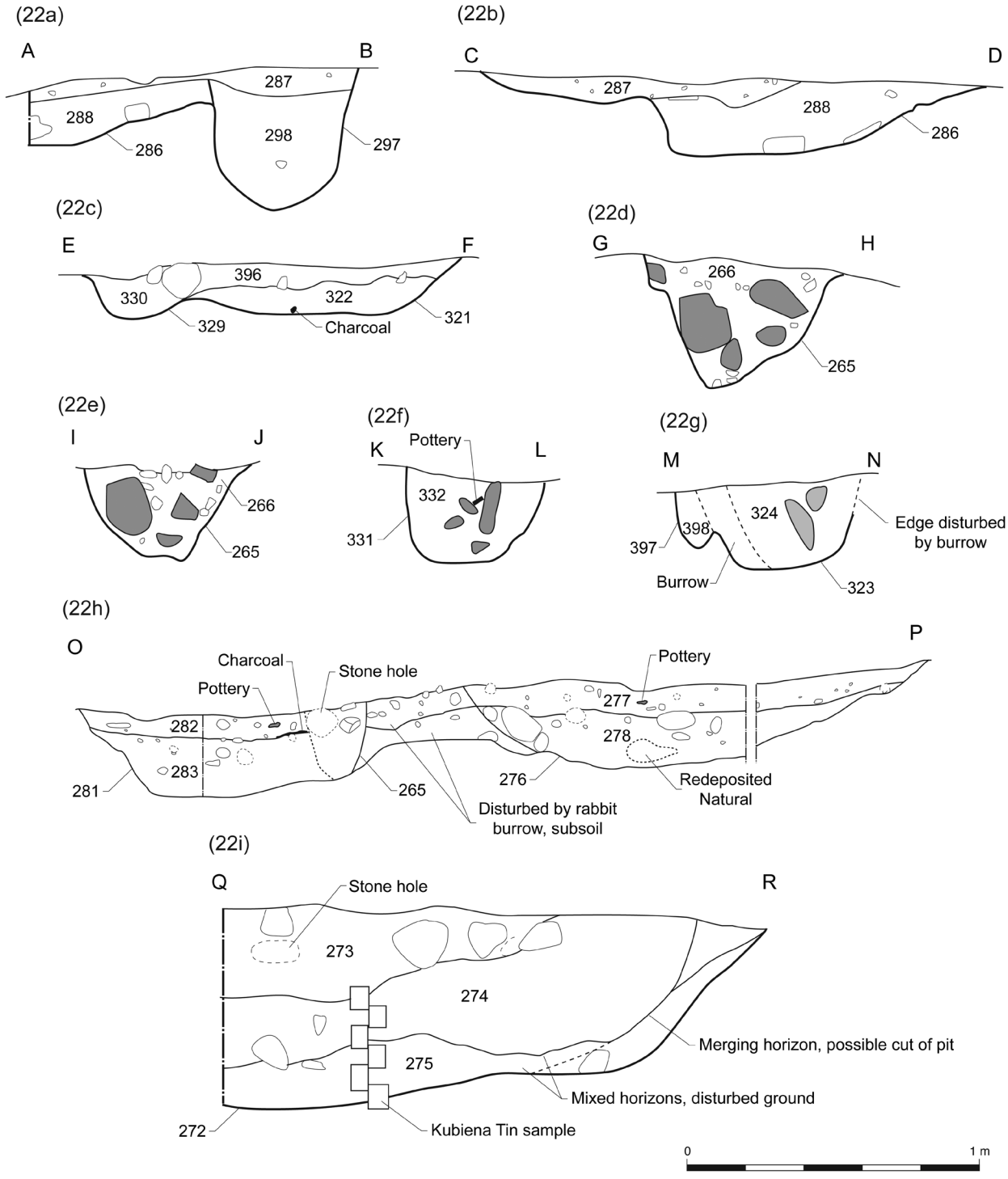
A ring of 12 post holes (393, 416, 325, 385, 329, 477, 442, 387, 297, 440, 303, 371) ranged in size from 0.3m diameter by 0.1m deep to 0.86m diameter by 0.15m deep. The diameter of this post ring was *c* 8m. Four of these post holes (477, 329, 385 and 325) were cut into the outer edge of Ring Ditch 321,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

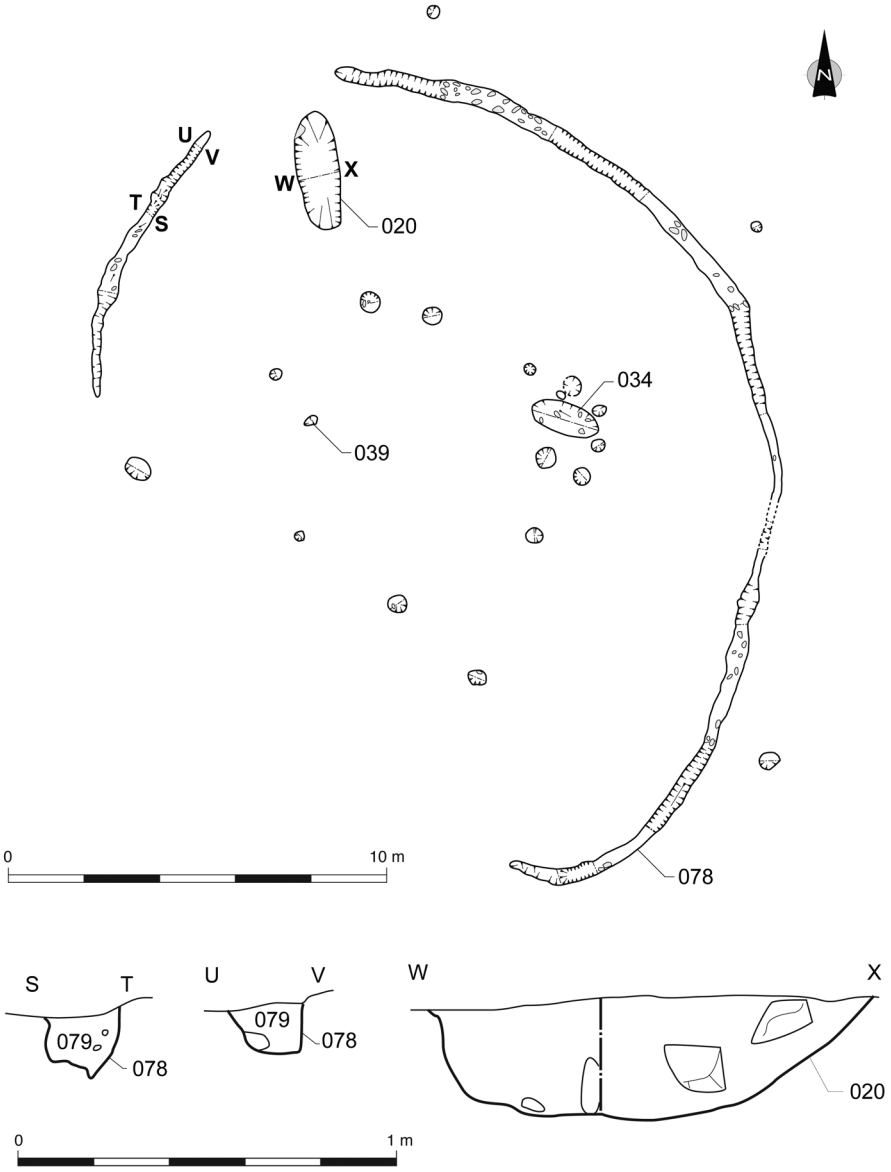
5.2 Structure 2E

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.

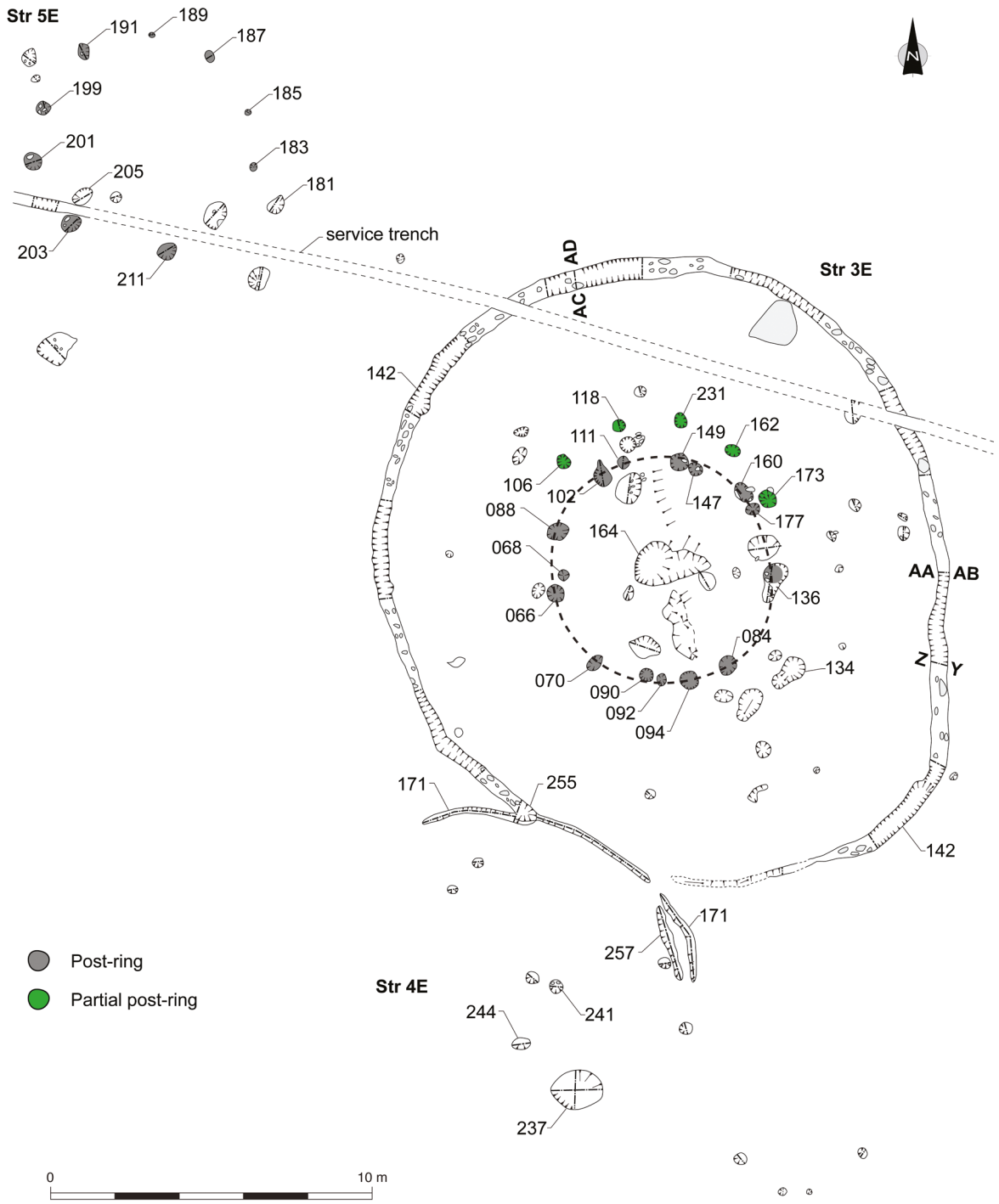
5.2.3 Interpretation and phasing

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.

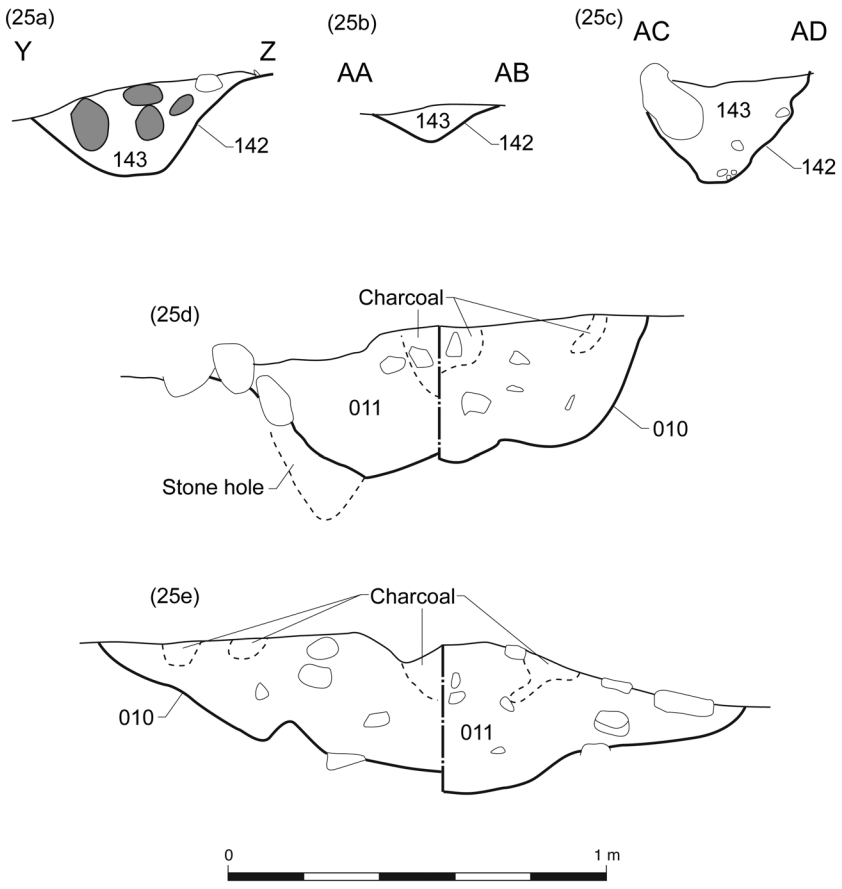
The 17 internal features within the structure ranged in size from 0.2m by 0.35m by 0.11m deep to 0.6m by 2.2m by 0.34m deep. The large central pit (164) contained evidence of in-situ burning, with a charcoal and ash-rich fill (165) and burnt natural subsoil in its base, and as such was interpreted as 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

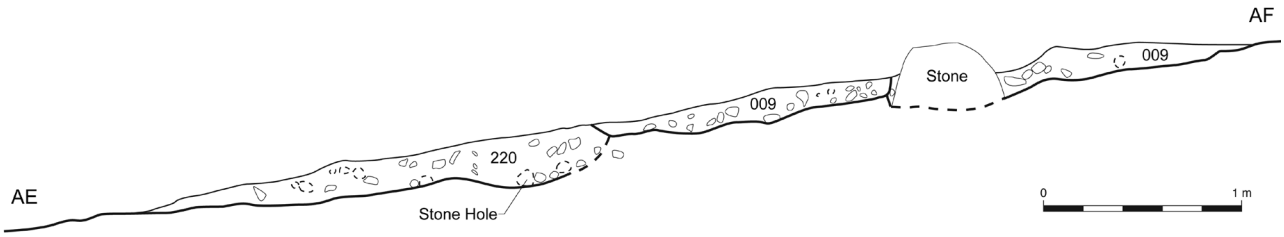
5.6.1 General summary

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 and15mm, 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.

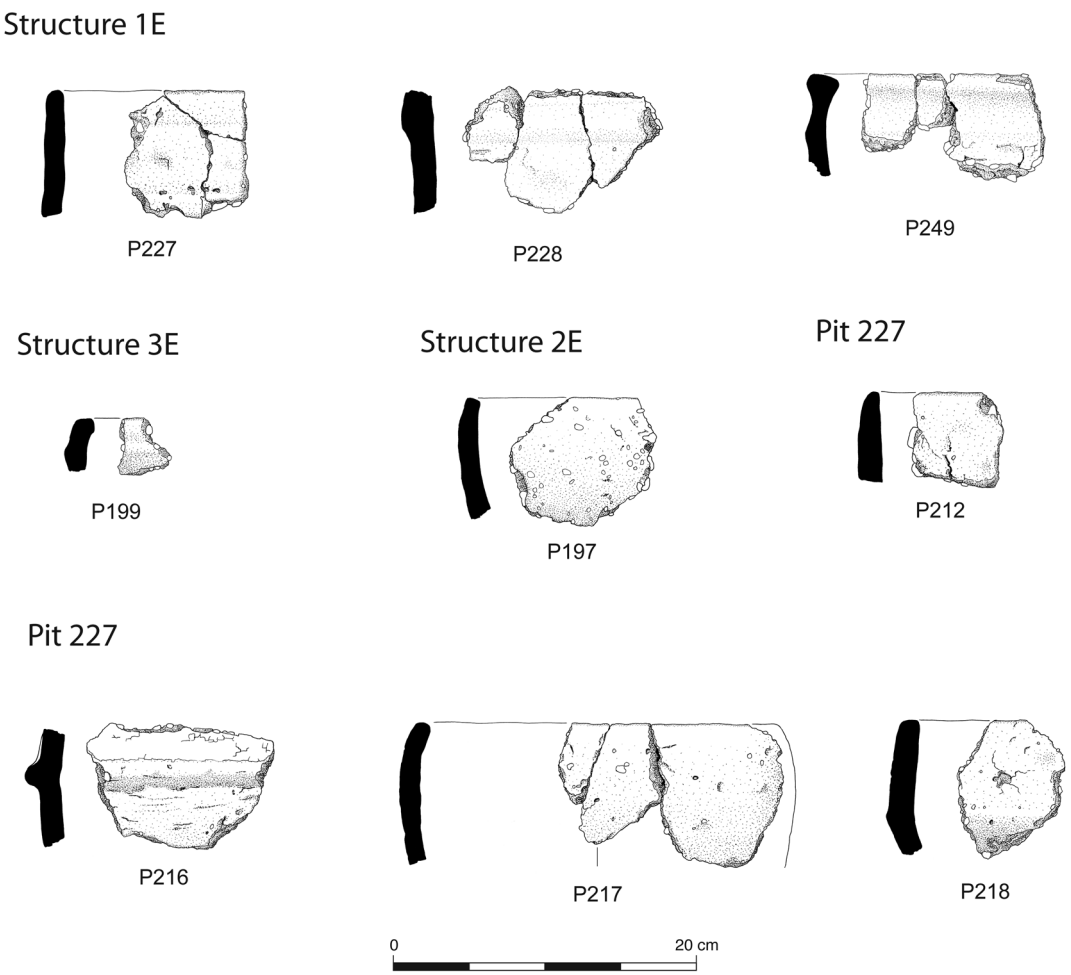
The diagnostic sherds from the outer palisade included flat and rounded rims (P227 Illus 27; P226), flat and footed bases (P239, P240), and body sherds with external bulges (P228 Illus 27; P225); it is unclear if these latter are thick cordons. Also within the western ring ditch (321) and a post hole (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



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.

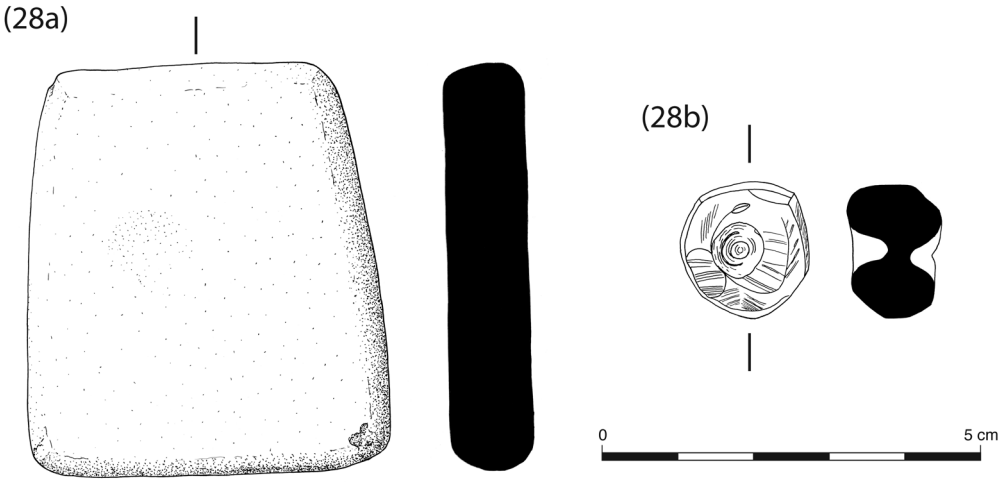
Where recognisable, the rims were flat-topped from plain vessels with straight sides (P212 Illus 27), rounded slightly inturning rims from barrel-shaped vessels with slight necks (P217 Illus 27), shouldered bowls with upright flat-topped rims (P218 Illus 27), and flat-topped and slightly necked (P219, 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

	Str 1E		Str 2E		Str 3E		Str 5E		Totals		
Species	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	%
Alnus					1	0.2			1	0.2	0.2
Betula	7	1.3	1	1	1	1			9	3.3	3.3
Corylus	39	17.7	21	3.6	3	4.1	13	1.7	76	27.1	27.3
Quercus	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 (*Arrhenatheum 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

		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
Weed seeds															
Polygonum persicaria/ lapithifolium L.	Nutlet	Persicaria/pale persicaria		1	10							1		2	2
Polygonum sp.	Nutlet	Knotgrass			1										
Rumex sp.	Nutlet	Dock			1										
Chenopodium album L.	Seed	Fat hen		1											
cf *Attriplex* sp.	Seed	Orache			1										
Galeopsis sp.	Nutlets	Hemp-nettle			1							2			
Plantago lanceolata L.	Seed	Ribwort		1											
Gramineae indet. (medium)	Caryopsis	Medium-grained grass													
cf Gramineae (medium)	Caryopsis	Medium-grained grass													1
cf *Bromus/Lolium* sp.	Caryopsis	Brome/rye grass			1		1								
cf *Danthonia* sp.	Caryopsis	Heath grass			1										
Scripus spp.	Nutlet	Club rush			3										
Carex spp.	Nutlet	Sedge			1										
Indeterminate	Seed	Seed indet.		1	4										
Potential economic species															
Linum usitatissmum	Seed	Cultivated flax			5							2			1
Corylus avellana L.	Shell	Hazel	3	1	7		1		4			3			4
Malus/Pyrus sp.	Pip	Apple/pear								1					

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
Other plant remains															
Monocotyledon	Fragment	Rhizome					1								1
Indeterminate	Bud/fruit	Indeterminate	1			1									
Cereal remains															
Triticum dicoccum	Caryopsis	Emmer wheat	2	3											
Triticum cf *dicoccum*	Caryopsis	Emmer wheat											1		2
Triticum sp.	Caryopsis	Wheat	4	2		15					1		10		17
Triticum cf *dicoccum*	Spikelet forklet	Emmer wheat	1												4
Triticum cf *dicoccum*	Glume base	Emmer wheat	1												2
Triticum cf *spelta*	Caryopsis	Spelt wheat				1									
Triticum aestivum/ compactum	Caryopsis	Bread/club wheat													3
Triticum cf *aestivum/ compactum*	Caryopsis	Bread/club wheat											4		
Triticum/Hordeum sp.	Caryopsis	Wheat/barley	2		8	8	1				1				
Hordeum var. *nudum* (TW)	Caryopsis	Naked barley					4			2	1	119		2	2
Hordeum var. *nudum* (ST)	Caryopsis	Naked barley	1				59		20 (e)	6	4	598		7	3
Hordeum var. *nudum*	Caryopsis	Naked barley	2		9		45		184 (e)	2	6	686		7	9
Hordeum sp.	Caryopsis	Barley	275	183	223	46	219		1636 (e)	80	73	1353	55	47	159
cf *Hordeum* 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				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
Carex spp.	Nutlet	Sedge	2	
Cereal remains				
Hordeum var. *nudum*	Caryopsis	Naked barley	9 (1 attached internode)	
Hordeum sp.	Caryopsis	Barley	134 (5 attached internodes, 1 germ)	76
cf *Hordeum* 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 *Brassica* sp.	Seed	Mustard family		
Artemisia sp.	Achene	Mugwort	1	
Galium aparine L.	Seed	Goosegrass/cleavers	1	
Cereal remains				
Hordeum var. *nudum*	Caryopsis	Naked barley	25	
Hordeum sp.	Caryopsis	Barley	50	53
cf *Hordeum* 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	$\delta^{13}C$ ‰
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	$\delta^{13}C$ ‰
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.

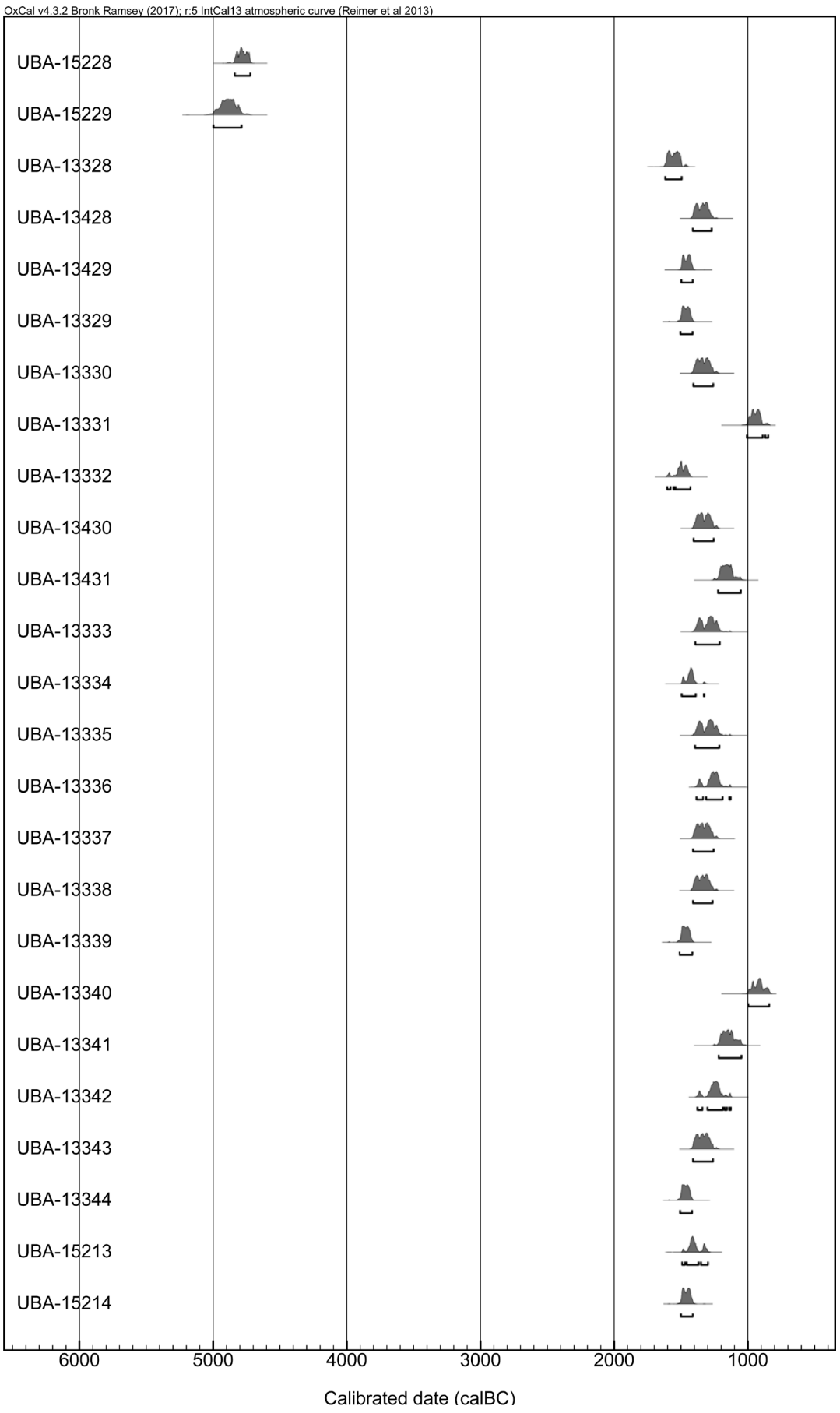
5.11.3 Structure use

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.

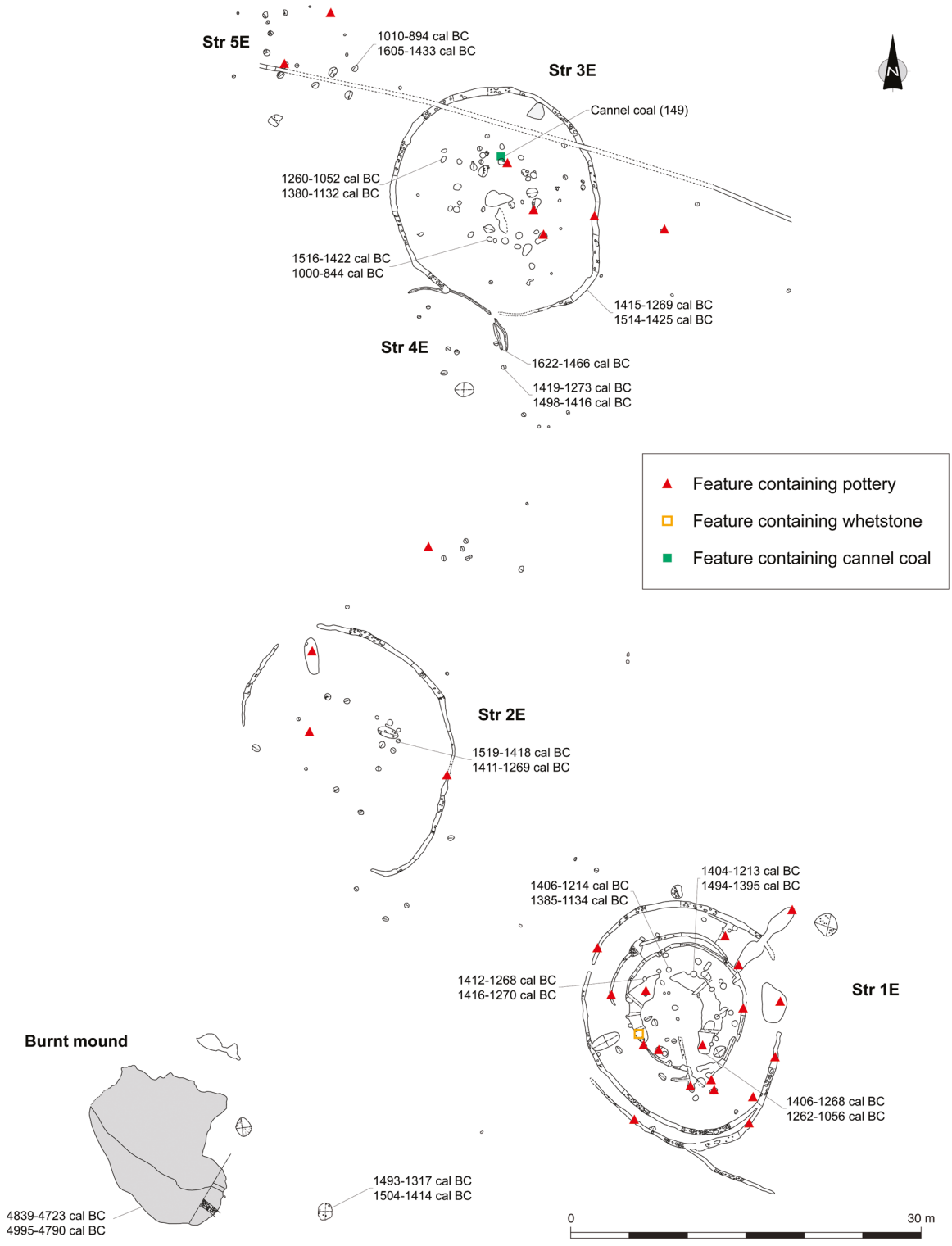
The ring ditches within Structure 1E, although shallow due to truncation, appeared to have been deliberately excavated rather than resulting from wear patterning. Their edges were defined and the sides reasonably steep-sided, when compared to other ring ditches at Blackford, such as those from Structures 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.

6. MID TO LATE BRONZE AGE STRUCTURES (AREA G)

Two adjacent circular structures (Structures 1G and 2G) and one other possible earlier structure (Structure 3G) were identified in this area, along with three isolated features (Illus 32). Located to the north-east of the development area, these structures occupied a relatively flat piece of ground, with commanding views of the rest of the development site. The underlying geology was stony and sandy and this was generally reflected in the fills of features, which ranged from loosely compacted to firmly compacted sandy silts of light to dark brown.

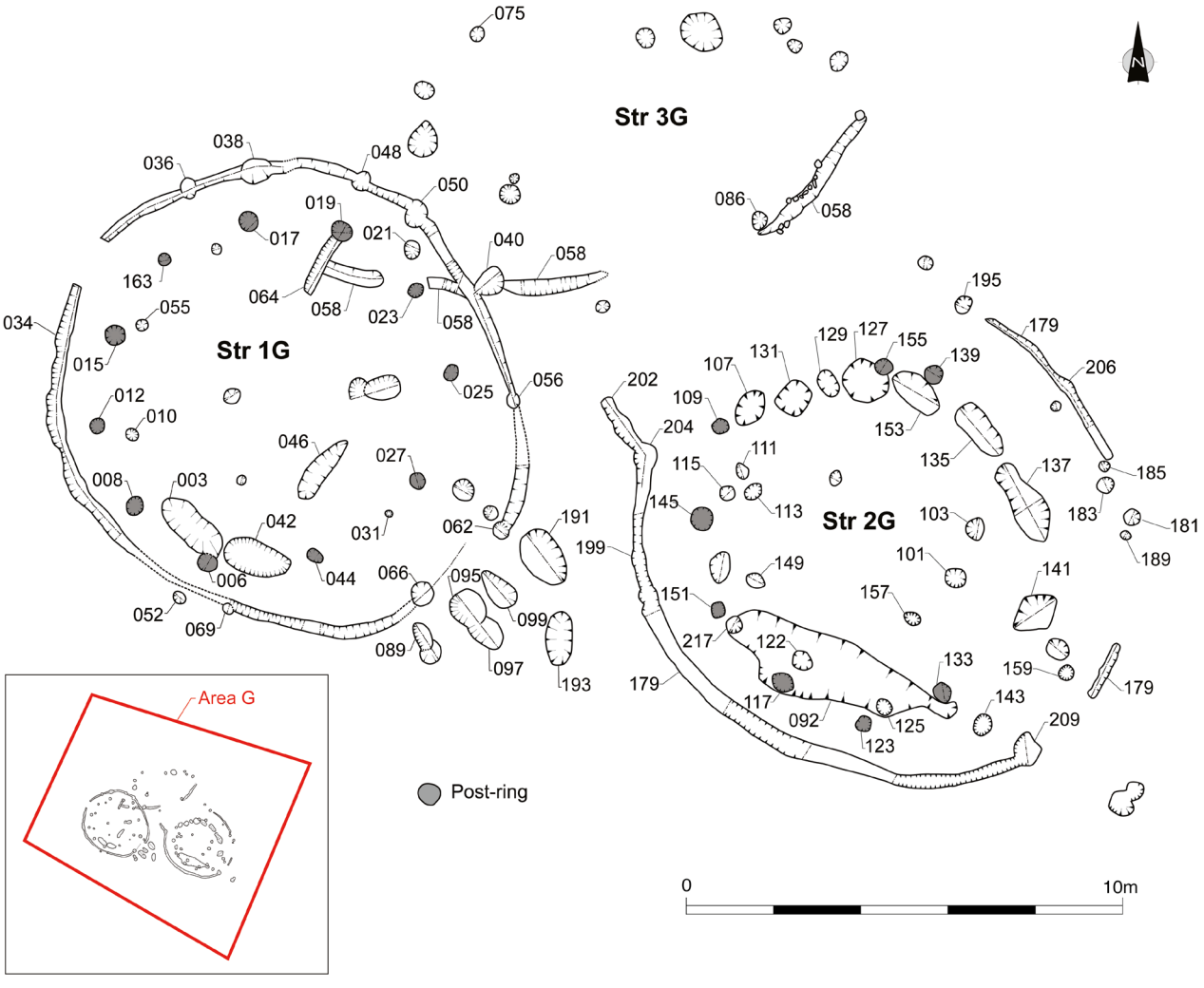
Roundhouse Structures 1G and 2G were both post-built and bounded by an external ring groove. There was no evidence of an internal hearth in either structure but internal features were present. Structure 3G comprised a group of features. Although an architectural form cannot be seen in plan, these features were all bounded to the south by a curvilinear gully suggestive of an enclosed area of activity. Three isolated features were also excavated, but their functions could not be determined.

The archaeological features represent at least two phases in the site history. The earlier phase is represented by the curvilinear gully and the later phase by Structure 1G.

6.1 Structure 1G

6.1.1 General summary

This was a post-built structure with a diameter of *c* 11m. The structure was defined by a ring groove (034). It had an array of internal features and an entrance orientated to the south-east.



Illus 32 Area G site plan

6.1.2 Description

The structure had a possible post ring of 11 post holes (044, 006, 008, 012, 015, 163, 017, 019, 023, 025 and 027). All the post holes were filled with single deposits of sandy silts. Their dimensions ranged from 0.57m by 0.6m by 0.27m deep to 0.32m diameter by 0.06m deep. Some of the other post holes close to this line, such as 010, 055, 021 and 031, may represent a second post ring.

The ring groove (034) was a near-continuous cut filled with dark brown sandy silt (035). There were eight post holes within the ring groove, 036, 038, 048, 050, 056, 062, 066 and 069, each containing single fills of similar composition to the fill of the ring groove itself and suggestive of a single depositional event filling all of these features. Feature 052 may also have been a post hole within the ring groove, which now appears as an outlier because of the reduction in width of the ring groove due to horizontal truncation.

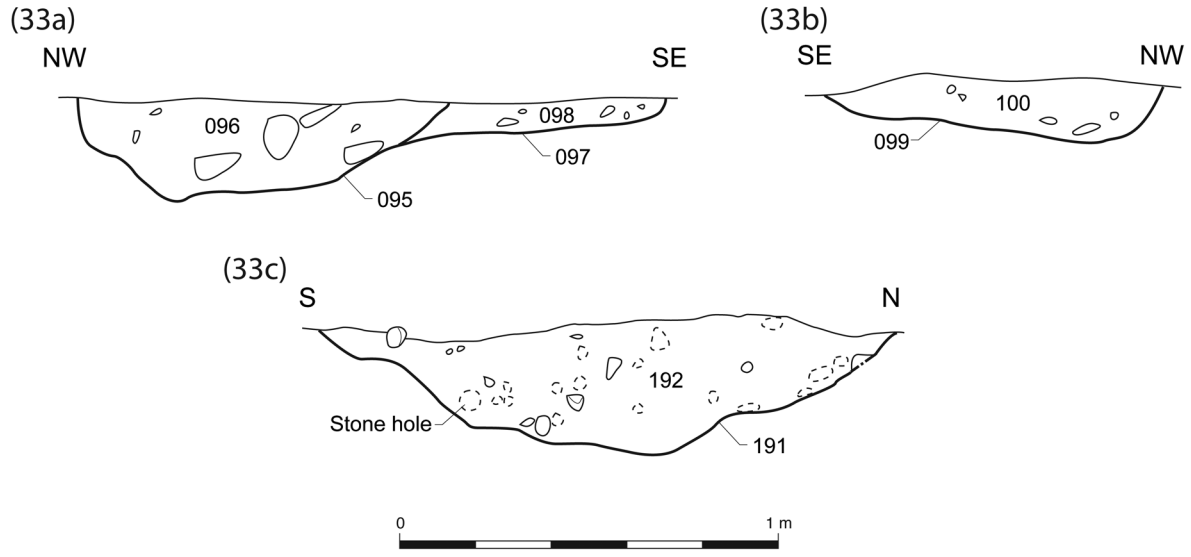
The ring groove had two breaks in it. The one to the north-west is interpreted as having been caused by truncation rather than being an entrance, because of the shallowness of the feature at this point and because a faint stain of fill material could be seen in the gap when the structure was exposed. The other break to the south-east was interpreted as the point of access, as Post Holes 066 and 062 appear to define the terminal ends of the ring groove, and the gap, which measured 2m, was thought to be an entrance. External to the entrance was a group of features (089, 095, 097, 099 (Illus 33b), 191 (Illus 33c) and 193). One of these, 097, had been cut by a later feature (095 Illus 33a). These features may be the supporting post holes for a porched entrance to the structure. The number of features and their alignments may be as a result of several phases of porch structure associated with more than one phase of structure.

Several internal features within the house could not be assigned to the post rings. These features ranged in size from 0.15m diameter by 0.1m deep to 1.6m by 0.8m by 0.13m deep. Two truncated pits, 003 and 042, may be the vestigial remains of a larger ring ditch feature and they mirror a similar feature in Structure 2G. The remains of a short slot (064) cut an earlier feature (058, part of Structure 3G) and was cut by Post Hole 019.

Prehistoric pottery was recovered from within the fills of three features (012, 034 and 036) and burnt bone from within the fills of Features 017, 019, 042 and 064.

6.1.3 Interpretation and phasing

This appeared to be a multi-phase roundhouse represented by at least two post rings and a ring groove, none of which were necessarily contemporary with each other as there is no direct



Illus 33 Selected sections within Structure 1G, Area G

link between them. The features to the south-west of the structure, outside the entrance, probably represent a multi-phase porch structure associated with more than one construction phase.

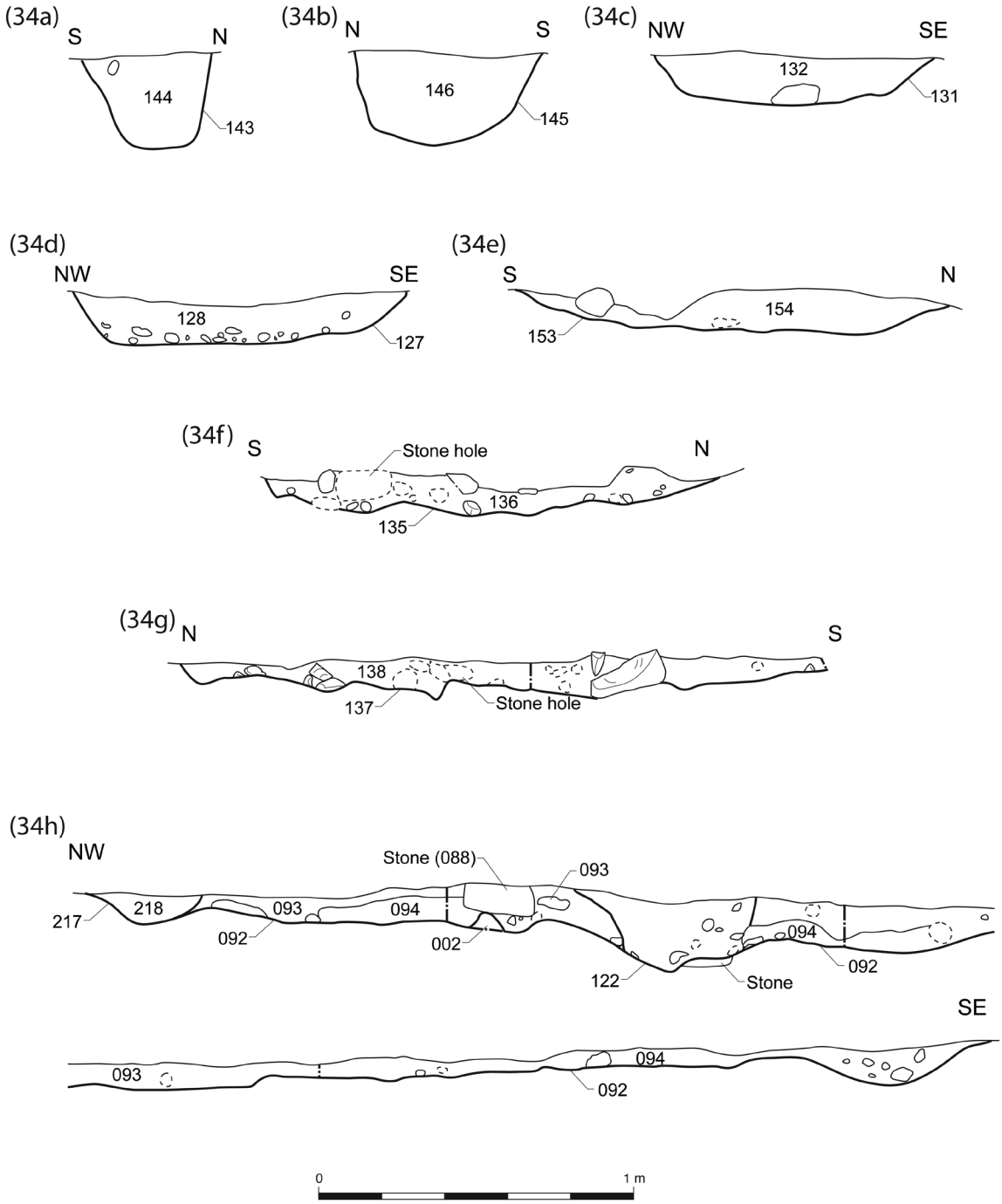
6.2 Structure 2G

6.2.1 General summary

This was a post-built structure with a diameter of *c* 11m, the limits of which were defined by an outer ring groove. As with Structure 1G, there were internal features present and an entrance to the south-east.

6.2.2 Description

The post ring had eight surviving post holes (133, 123, 117, 151, 145 (Illus 34b), 109, 155 and 139), and adjacent post holes which may represent replacements (125, 122, 149, 217, 115, 111 and



Illus 34 Selected sections within Structure 2G, Area G

possibly 113). The main post holes were filled with single deposits of dark brown to black silt with charcoal inclusions, and the presumed secondary post holes were generally filled with dark to mid-brown silt with fewer charcoal inclusions.

The ring groove, 179, had a diameter of 11m and was heavily truncated, not being present on the north side of the house. The ring groove terminated at the south-east with Post Hole 209. To the north-west, a short section of trench, hinged on Post Hole 204, was orientated south-east/north-west and terminated in Post Hole 202. There were two post holes cut into the base of the ring groove, 199 and 206, and five other probable post holes which lay on the extrapolated line of the ring groove (195, 185, 183, 181 and 189).

Illus 35 Excavating Pit 092 in 2G, Area G

The 2m-wide entrance was orientated to the south-east, where there was a break in the ring groove. The entrance was defined by the terminal end of Ring Groove 209 and a corresponding break in the outer post ring between Post Hole 133 and Feature 141, as well as the positions of Post Holes 143 (Illus 34a) and 159.

An arc of eight pits (107, 131, 129, 127, 153, 135, 137 and 141 Illus 34c–g) ran concentric with the post ring on the north and east. Although they correspond with the outer post ring at a point where it is missing, it is difficult to assign these pits to the post ring because of their difference in size and form; they may represent a truncated ring ditch, corresponding with 092 on the south-west side. This would suggest that there are at least two phases to this structure, superimposed one on top of the other. Given that Post Holes 117 and 155 cut Ring Ditch 092 and Pit 127 respectively, it would appear that the post ring is later than the ring of pits.

Ring Ditch 092 (Illus 35) was also cut by 125, 122 and 217 of the arc of another possible post ring (Illus 34h), making the remains of putative Ring Ditch 092 earlier than this phase of occupation.

Three internal features (103, 101 and 157) formed a line and possibly represent an internal division, perhaps a windbreak across the porch.

Prehistoric pottery was recovered from within the fills of Features 125, 107 and 135, and burnt bone from within the fills of Features 092 and 141.

6.2.3 Interpretation and phasing

The main architectural features are at least two post rings, a ring groove and a ring ditch which possibly represents an earlier phase of occupation. There is evidence of a truncated and segmented ring ditch occupying the north and north-east, represented by an arc of pits, and the south and south-west represented by Pit 092. Although almost identical, the radiocarbon dates (see below) indicate that this was a later building than Structure 1G.

6.3 Structure 3G

6.3.1 General summary

Structure 3G is represented by a grouping of 12 features to the north of the site which were bounded on their south by the intermittent remains of a curvilinear gully (058). The gully had two post holes cut into its base, 040 and 086. If the curvature of Gully 058 is projected, and assumed to be a closed ring, then the feature would have an overall diameter of *c* 15m. The curvilinear gully (058) was cut by the ring groove (038) of Structure 1G, making the former stratigraphically the earlier feature.

6.3.2 Interpretation and phasing

Stratigraphically this structure is earlier than Structure 1G, and therefore by inference earlier than Structure 2G. The structure consisted of a probable palisade, based on its size, and there was little evidence to suggest that there was a structure within this palisade. The palisade may therefore have formed a corral, or a windbreak to protect other kinds of activities from the elements.

6.4 Artefacts

6.4.1 Pottery

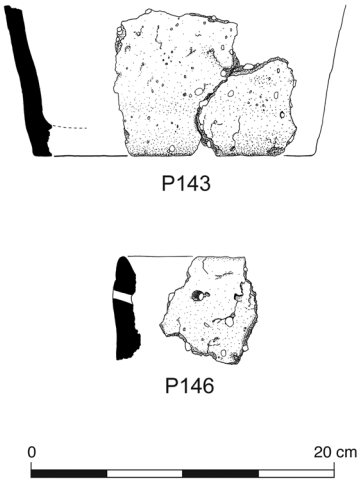
Melanie Johnson

A small MBA/LBA assemblage was recovered from this area, comprising 36 sherds from seven different vessels (P143–149). These were divided between Structure 1G and Structure 2G as follows: Structure 1G: nine sherds (377g, four vessels), Structure 2G: 27 sherds (271g, three vessels).

Eight of the sherds were recovered from contexts associated with Structure 1G (Post Holes 012 and 036, Ring Groove 034), while a further single body sherd was collected during cleaning over it. A small post hole forming part of the outer post ring of the structure (012) produced five flat base sherds weighing 330g (P143 Illus 36). The fabric was coarse, sandy and heavily gritted, up to 13mm thick and the base had a diameter of 150mm. The sherds are possibly burnt and are abraded.

The other two features, the ring groove and Post Hole 036, which had been cut through the ring groove on the north side, contained three plain, very abraded body sherds with gritty fabrics. These are likely to be sherds relating to the occupation of the structure.

The remaining 27 sherds came from a post hole and pits within Structure 2G (107, 125 and 135). Pits 107 and 135 contained just four small plain body sherds between them. Post Hole 125 contained



Illus 36 Pottery from Area G

23 rim and body sherds and a possible base (total weight 226g) from a vessel with a tapered rounded rim and thick body (P146 Illus 36), though little of the profile of the vessel survived. The walls were up to 14mm thick, with finger-marking visible on both surfaces. The fabric was sandy and contained stones up to 10mm in size.

It seems more likely that the larger deposits of sherd material recovered from Post Hole 012 in Structure 1G and Post Hole 125 in Structure 2G are the result of deliberate deposition rather than a process whereby residual small sherds worked their way into features during the occupation of the buildings. These deposits would have to have been made following the removal of any structural timbers from the post holes. Both of these post holes fall within the south-west quadrant of the roundhouse and form part of the post ring. Neither of these vessels had signs of surface deposits, unlike some of the other sherds from each structure.

6.5 Environmental evidence

6.5.1 Calcined bone

Sue Anderson

Thirty-three contexts contained 15.05g of bone. Of this, 9.05g was collected from Structure 1G, 5.85g from Structure 2G and 0.15g from Structure 3G. The largest group from Structure 1G was in Pit 042 (5.1g), and in Structure 2G there was a small concentration in Ring Ditch 092 (3.5g). One fragment from Linear Feature 064 in Structure 1G may be antler, and there was a fragment of a small petrous temporal (probably animal) in Structure 3G Post Hole 075.

6.5.2 Charcoal

Michael Cressey

Area G is low in charcoal overall and is represented by three individual fragments of hazel (0.7g), with 80 fragments of oak (8.6g) representing 92% of the assemblage.

6.5.3 Charred cereal remains

Mhairi Hastie

Composition of plant remains

The vast majority of the 93 samples from this area did not contain any carbonised material. Where plant remains were identified they consisted of very small amounts of poorly preserved cereal grain with occasional seeds of wild taxa, small abraded fragments of hazelnut shell and occasional charred rhizome fragments. No more than five identifiable items were recovered from any one sample. The majority of grains were identified as barley. Only one barley grain, recovered from a post hole (010, Structure 1G), was sufficiently preserved to identify the naked variety. Weed seeds were lacking, with only one seed of sedge being recovered from Post Hole 017.

Distribution of plant remains

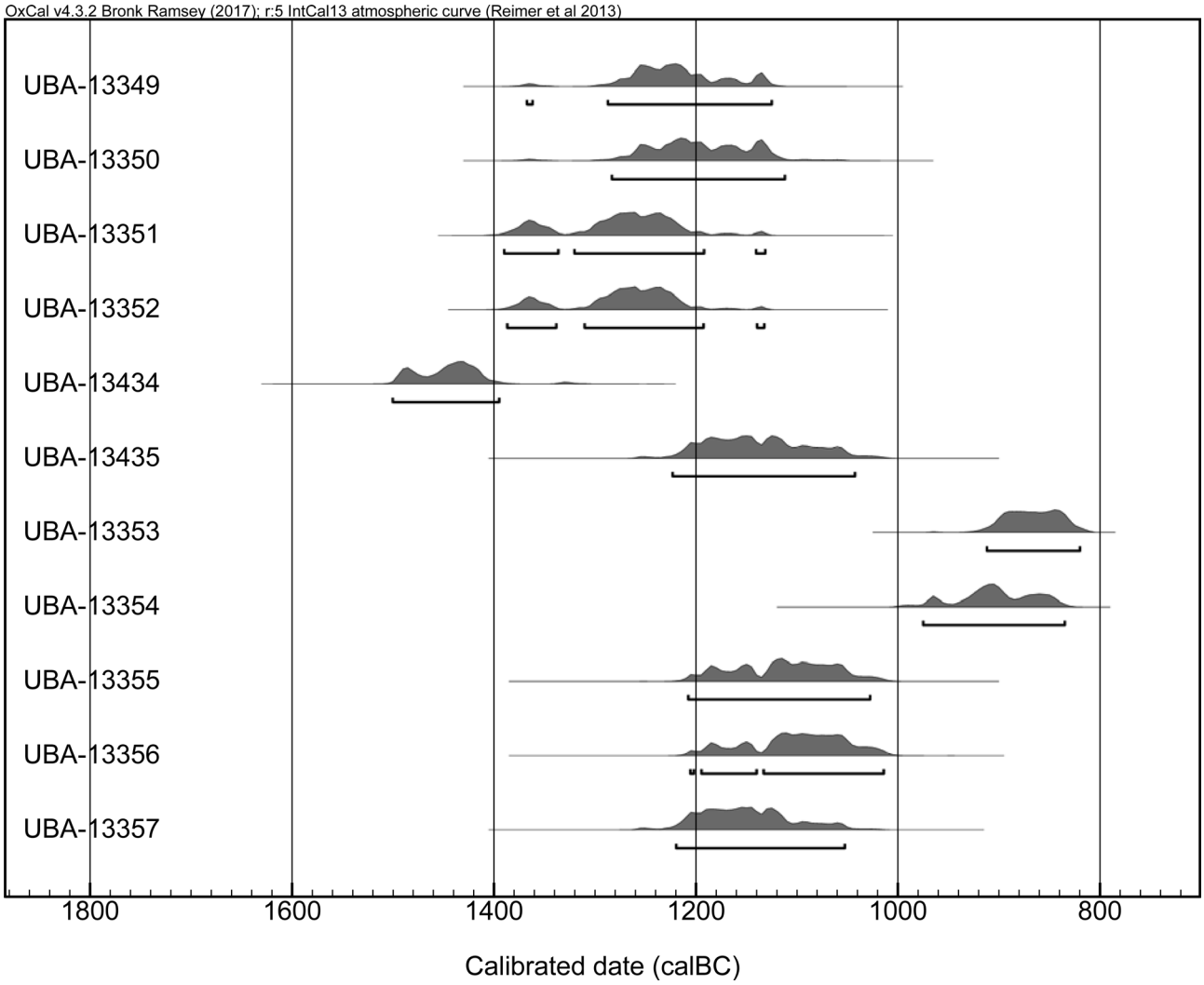
Carbonised plant remains, including cereal grains and hazelnut shell, were recovered from features associated with Structure 1G and Structure 2G. The charred plant remains were found to be preserved in negative features, principally internal post holes and pits; only one external feature, Post Hole 089 to the south of Structure 1G, contained any carbonised remains. There was no general spread of plant remains throughout the different features and across the whole of the excavated area as seen elsewhere at Blackford. It would seem likely that in this case the plant material recovered from Structure 1G and Structure 2G is directly associated with occupation activities carried out inside the structures, particularly through food preparation and corn-drying, possibly at a central hearth.

No plant remains were present in samples taken from Structure 3G. This lack of carbonised plant remains may indicate that food preparation was not being carried out in this structure. Nonetheless, this does not discount such crop-processing activities as winnowing, threshing or pounding being carried out in the structure, as the by-products of these activities would not be preserved in the archaeological record unless they came into contact with fire.

Looking at the spread of cereal grain and nutshell within the structures themselves, there is a distinct bias of plant material within internal pits and post holes which lie either against the wall of the structure, or form part of the house wall. Similar distributions of plant and other domestic remains are noted by Rothschild (1991) and Joyce & Johannessen (1993). These ethnohistorical parallels record that domestic rubbish tended to accumulate around the edges of house structures, as central preparation areas were swept clean, and it is possible that the distribution of plant remains seen within Structures 1G and 2G may have resulted from similar processes, the internal space of each roundhouse being kept clean of debris, with burnt food remains being swept, along with other rubbish, to the side of the structure and producing an accumulation of material against the wall.

6.6 Radiocarbon dates

Eleven radiocarbon dates were obtained from charred cereal grains and nuts, six dates from Structure 1G and five from Structure 2G (Table 12; Illus 37). The dates reflect the period of transition from the MBA to the LBA. The dated material derived from the



Illus 37 Radiocarbon dates, Area G

single fills within post holes may have been caught within the post holes during the occupation of the site, or following rotting of the bases of the posts. Whether it entered the post holes in this way, or was incorporated following abandonment of the structures, the material is likely to have derived from the period of occupation, and therefore the occupation of the site would fall within the overall date range.

The two paired dates returned from Context 012 passed the chi-squared test and therefore could be legitimately combined giving an average age range of 1387–1135 cal BC (95% probability; UBA-13351, UBA-13352).

The dates returned from Structure 1G are earlier than those returned from Structure 2G; from this it can be inferred that Structure 1G was built and occupied before Structure 2G. However, the very wide range of dates recovered from both structures suggests that there was some residual or intrusive material in both feature groups.

6.7 Discussion

6.7.1 Phasing

There are two recognisable phases across the site, the earliest represented by the curvilinear feature (058) of Structure 3G, the second by Structure 1G. Within the two more complete structures, other sets of intercutting features were identified which may represent episodes of repair and replacement or separate phases of construction.

Feature 058 was cut by the ring groove (034) of Structure 1G, but neither 058 nor 034 could be directly dated. However, radiocarbon dates returned from the post holes which formed the post ring of Structure 1G returned an overall date range between

Table 12 Radiocarbon dates, Area G. Calibration was conducted using OxCal v4.1.7, using the IntCal09 calibration curve

Lab no.	Material	Context description	Date BP	95% probability	$\delta^{13}C$ ‰
Str 1G					
UBA-13349	Hazelnut shell	Fill of Post Hole 017 in post ring	2992±24	1367–1128 BC	–23.5
UBA-13350	Hazelnut shell	Fill of Post Hole 015 in post ring	2978±27	1312–1119 BC	–24.7
UBA-13351	Hazelnut shell	Lower fill of Post Hole 012 in post ring	3022±27	1389–1134 BC	–23.6
UBA-13352	Hazelnut shell	Upper fill of Post Hole 012 in post ring	3020±25	1386–1135 BC	–25.5
UBA-13434	Barley indet.	Fill of Post Hole 031	3165±28	1498–1401 BC	–22.1
UBA-13435	Barley indet.	Fill of Pit 046	2936±27	1260–1047 BC	–24.7
Str 2G					
UBA-13353	Barley indet.	Fill of Pit 107 in poss ring ditch	2726±22	913–821 BC	–30.1
UBA-13354	Barley indet.	Fill of Post Hole 143 in entrance	2764±23	976–836 BC	–30.7
UBA-13355	Hazelnut shell	Fill of Pit 147 in poss ring ditch	2919±23	1212–1019 BC	–31.6
UBA-13356	Hazelnut shell	Fill of Pit 141 in poss ring ditch	2911±24	1208–1014 BC	–28.0
UBA-13357	Hazelnut shell	Fill of Pit 153	2943±24	1259–1054 BC	–30.9

1498 BC and 1047 BC (95% probability: Table 12); the curvilinear Feature 058 therefore would either pre-date or fall within this date range.

The date ranges obtained from the two structures overlap considerably. However, Structure 2G returned the latest dates from cereal grains (976–836 cal BC: 95% probability, UBA-13354; 913–821 cal BC: 95% probability, UBA-13353). Whether these dates truly reflect the last occupation/abandonment phase of the site cannot be determined. The size, density and weight of a cereal grain means that they can be transported very easily, but also that they can sift through the fills of features, especially where the fills are loosely compacted, like those in Area G. Therefore the cereal may be intrusive and is not necessarily associated with immediate post-abandonment infilling of these features.

It is possible that phases of both structures were occupied at the same time, depending on how the roofs are reconstructed. If the eaves are envisioned as extending to the ground then the structures could not have been contemporaneous, but if the eaves were cut short at the top of the wall then there would be enough room for both structures to have stood simultaneously. There was no evidence for outer ring grooves into which the eaves could have been secured, nor for drip-gullies associated with water run-off from the eaves of the roof. Alternatively, the structures may represent multi-phase use of the site, with each structure containing evidence for at least two phases of construction.

6.7.2 Architectural features of the structures

Both Structure 1G and Structure 2G indicate at least two phases of activity: a post-built structure and a ring groove structure with entrances on the south-east. Internally there were the remains of probable ring ditches which may or may not have been contemporary with one or other phase of occupation. The charcoal evidence indicates the use of oak and hazel. Oak was likely used for the structural components and hazel for hurdle panels.

The post ring in Structure 1G was relatively easy to define because of its completeness and the similarity in form and size of the post holes. The post ring in Structure 2G was more difficult to define, principally because of the arc of pits in the northern and eastern sides of the structure. These seven pits were inconsistent in size and form with the circular post holes identified as part of the post rings of both Structure 1G and Structure 2G. The pits contained no packing stones or post-pipes and did not display the expected profile of a post hole whose post was removed by dragging it out. It is unlikely that differential truncation across the site has resulted in such a disparity between these larger, shallower pits, and the smaller, deeper post holes. It is suggested then that these pits were not foundations for structural posts, even though they appear to follow and continue the arc of the outer post ring. More likely, these pits represent a truncated ring ditch with an undulating base. One of the pits, 127, appeared in plan to be cut by 155, but during excavation the relationship was not clear. If, however, Post Hole 155 cut 127 then the post hole, and by extension the post ring, was later than the pit (127).

The distance between the ring groove and the post ring on the western side of Structure 2G was 1m between 151 and 179. Structure 1G was similar. The distance between Pit 135 and Ring Groove 179 on the east of Structure 2G was 1.5m, thus leaving enough space for the outer post ring to have continued between the pits and the ring groove.

Pit 092 in Structure 2G is best described as a shallow scoop ranging in depth from *c* 0.08m to 0.2m deep, and was 2.1m long. There were four features cut into its base, two of which (117 and 125) were sealed by 094, the lower fill of 092. Features 122 and 217 cut through both fills of 092, therefore indicating that they are later in date than Pit 092 as it would have to have been infilled by the time they were cut. Post Holes 125 and 117 were sealed by deposits infilling Pit 092, indicating that they are either contemporary with or pre-date that pit, and form part of an earlier post ring.

The cut of Pit 092 was irregular and shallow and could easily be described as a wear pattern that post-dated the post ring, particularly as the subsoil was loosely compacted with a high proportion of sands and gravels. It is possible that these wear patterns/ring ditches are the product of livestock trampling, indicating that the building was at least partly used to stall livestock.

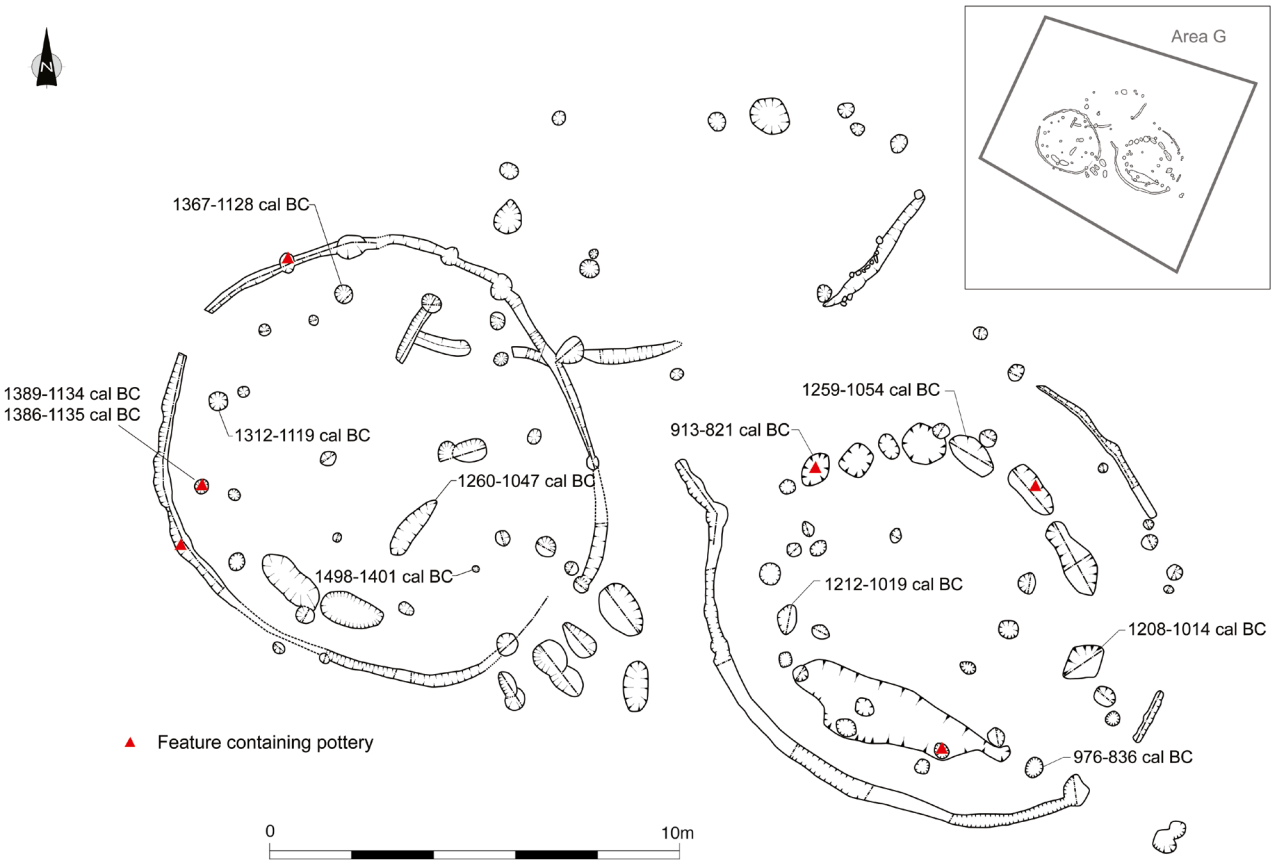
A similar situation can be seen with Pits 003 and 042 in Structure 1G, both shallow features. A post hole (006) appears to have cut the edge of 003, but

it could also be argued that 003 had worn away and abutted the post hole, with the base of the posts still surviving as 003 became infilled post-abandonment. The adjacent pit (042) was deeper than 003 at 0.2m and contained a higher percentage of stone within its fill than 003. The sides of 042 were also steeper and appear to be the result of deliberate digging rather than wear. However, because of their proximity, and the irregularity in the ground surface making the edges of features indistinct, it may be argued that 003 and 042 were once conjoined, forming a pit similar in size and position to 092 in Structure 2G. Both pits contained tiny fragments of burnt animal bone, which was likely derived from food processing.

Both structures had comparable ring grooves defining their extents. The ring groove of Structure 2G had a small slot on the north-west side that was orientated at an angle away from the rest of the feature, yet it appears to have been integral to the ring groove as it hinged on Post Hole 204. It is possible that the feature is the remains of foundations for an outbuilding, probably constructed from wattle hurdles, like the rest of the curtain wall that encompassed the structure.

The entrances to the two structures were orientated to the south-east. The function of the grouping of large pits outside the entrance of Structure 1G was not determined but the teardrop shape of Pit 099 may represent the collapsed sides of a post hole, as the post was either pulled out or collapsed to the north-west. It is possible that these pits represent different phases of porch structure which are not entirely superimposed.

Structure 3G is defined by the curvilinear feature (058) and represents the earliest phase within Area G. The feature was truncated to the south-east, making it impossible to determine whether there was an entrance in that sector. Projecting the alignment of the feature indicates that it would be sub-circular, measuring *c* 15m in diameter. At this size it is more likely to represent an enclosure boundary rather than a roundhouse wall. Potentially comparable MBA examples of circular structures enclosed by palisades at Blackford are Structures 3C, 1E and 3E.



Illus 38 Finds and dating distribution plan, Area G

6.7.3 Finds distribution and taphonomy (Illus 38)

Johnson has suggested that the larger sherds of pottery found within structural Post Holes 012 and 125 may be the result of deliberate deposition after the posts were removed. Alternatively the sherds, possibly from an unused and broken pot, may have been used as packing material to secure the post in position. This is of course a pragmatic solution to the problem of securing posts; it does not rule out that there may have been a ritual component involved.

While the distribution of the cereal grains within the peripheral features of Structure 1G and Structure 2G could reflect house-sweeping episodes, the skewed distribution of the cereals may also be an artefact of the lack of internal features into which they could be transported. A similar taphonomic argument could be made for the calcined bone, the majority of which was retrieved from peripheral Pits 042 and 092.

6.7.4 Structure use

Structure 1G and Structure 2G both display structural elements associated with roofed buildings, ie the post rings. These rings of post holes are the likely foundations for upright posts, the function of which may have been to support a ring-beam. A ring-beam helps distribute the weight of a roof. Roofed structures potentially could have been used for a variety of purposes, including storage, animal byres, workshops and homes. There is no direct evidence that favours either of these alternatives. If hearths are taken as an indication of human occupation then there was no surviving evidence for one within either structure. Although Pit 046 in Structure 1G occupies a position where hearths are often found, there was no in-situ burning, and no deposits associated with activities in and around a hearth.

Indirect evidence of human occupation (and the presence of fire) within the structures comes from the distribution of the charred plant remains which, found in peripheral features, is argued by Hastie (see Section 6.5.3 above) to be a product of sweeping clean the central floor space of the house. The presence and distribution of prehistoric domestic pottery may also argue for human habitation. There was no evidence from these structures for craft specialisation. On balance, it is probable that these structures were houses.

6.7.5 Economy

There was very little evidence upon which to reconstruct the economic activities of the inhabitants of this site. The use of both domesticated and wild flora and fauna are attested to by the recovery of hazelnut shells, barley grains and probable deer antler. All of these products derive from food sources that could have been collected, grown and hunted. The fragmentary condition of the antler precludes a reconstruction of its use, although it may have been collected for working or to use as a tool.

7. LATE BRONZE AGE STRUCTURE AND EARLIER FEATURES (AREA H)

Area H was located on the top of a knoll to the west of the development area. Discovered in this area (Illus 39) were the remains of an adult cremation burial, the remains of a probable post-built circular structure largely defined by a section of ring groove, and a scatter of 175 pits, some of which contained calcined bone and pottery, and one of which contained a fragment of a cannel coal bracelet.

There was also a discontinuous linear feature, orientated north-west/south-east, which bisected the site in its southern portion. To the south-west of this, two concentrations of features were noted (Areas 1 and 2), which are the probable remains of heavily truncated structures. The putative structures were defined by large pits interpreted as the remains of ring ditches, and sections of ring grooves. It is possible to discern other curving lines and small groups of post holes amongst the distributions across this area, but none is convincing enough to describe in detail.

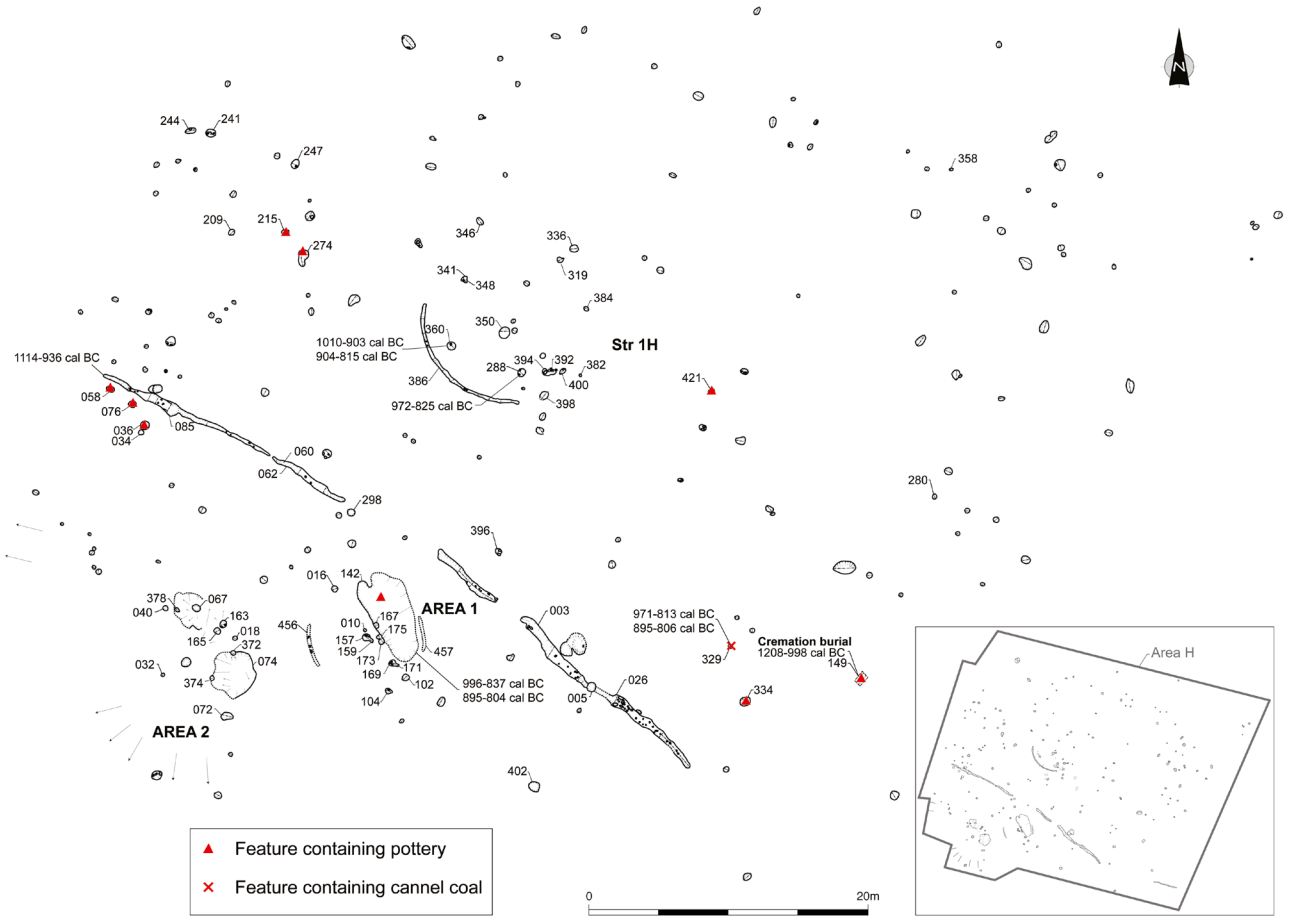
7.1 Structure 1H

7.1.1 General summary

A very truncated and ill-defined circular structure was identified in this area (Illus 39). It was initially recognised from the remnants of a ring groove on its south-west quadrant. It was post-built, with a diameter of *c* 11m. A number of internal features were also identified.

7.1.2 Description

The features defining this structure were largely sealed by a black to dark brown charcoal-rich deposit of silt (659) *c* 4m by 5m by 0.04m deep, possibly representing a destruction layer. The structure was



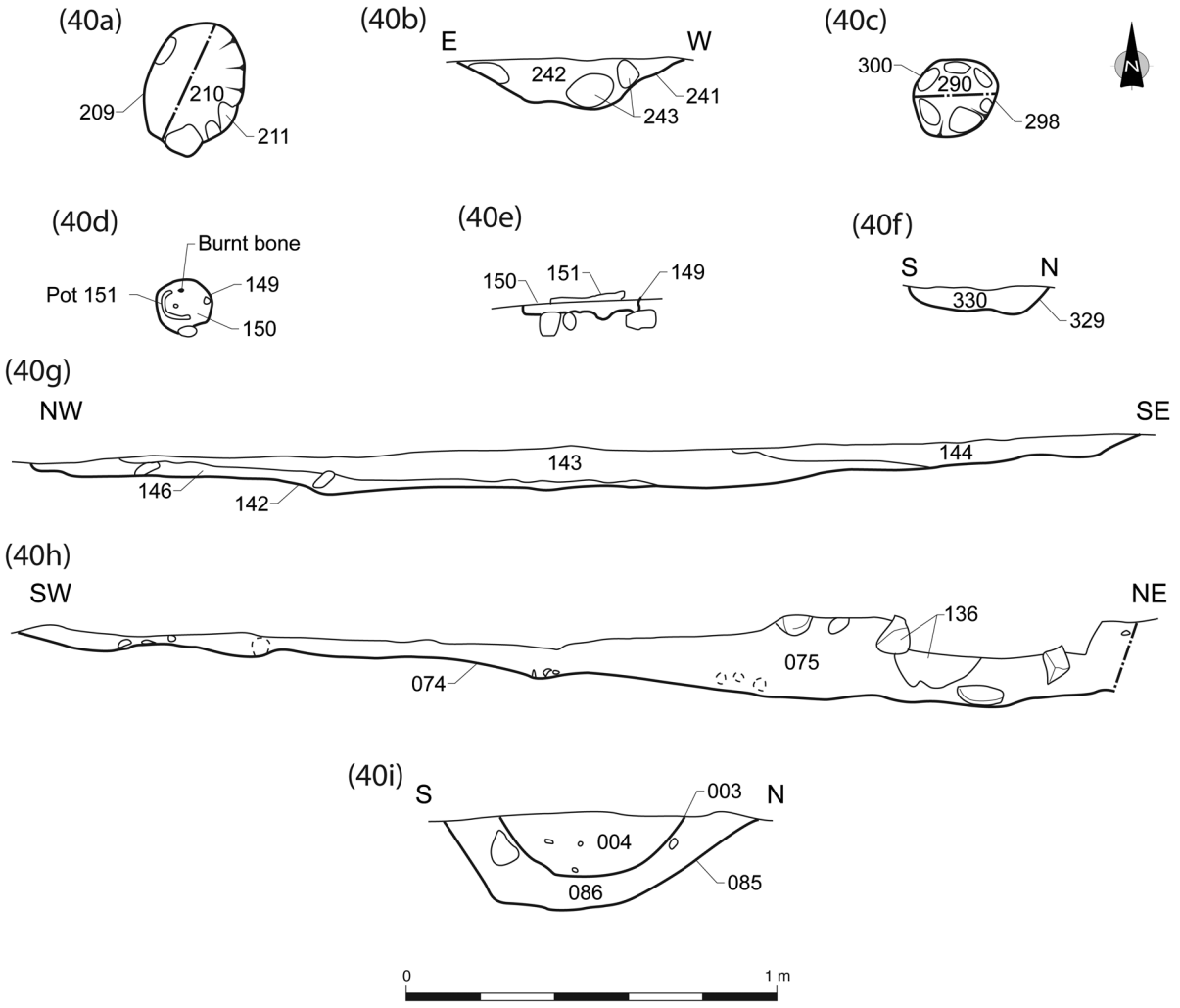
Illus 39 Plan of Area H

defined by the remnants of a ring groove to the south-west, 386, measuring 12m by 0.2–0.3m wide by 0.1m deep, and by pits that lay on the projected path of the ring groove, two to the south-east (398 and 382) and two to the north (346 and 336). There were 18 sub-circular pits recorded within the putative internal space of the structure. The pits were heavily truncated and ranged in size from 0.4m diameter by 0.19m deep to 0.65m by 0.6m by 0.28m deep.

What may be the partial remains of a post ring were defined by eight post holes (392/394, 288, 360, 341/348, 319, 384 and 400), one of which (360) contained packing stones. Charcoal from Features 288 and 360 returned LBA date ranges (Table 14). The proximity of Post Holes 392 and 394 is indicative of a replacement post, but unfortunately a large stone sat in the interface been the two cuts, blurring the stratigraphic relationship between them. The stone was probably packing material within the post holes. It is difficult to assign a function to the other six internal pits as there was no recognisable spatial patterning or architectural arrangement. The function of Pit 350 is difficult to determine but its profile suggests that it once contained a post that had been removed by pulling or pushing to the west. There was no obvious entrance into the structure.

7.1.3 Interpretation and phasing

The structure has architectural elements found in other structures at Blackford, including a ring groove and a single post ring, both only partially surviving. There is scant evidence to suggest anything other than a single-phase building, and although there is



Illus 40 Selected sections of isolated pits, Areas 1 and 2, and Gully 003, Area H

some evidence for a post replacement, this is likely to have happened during the building's occupation. The radiocarbon dates from Pit 360 are inconsistent, but the majority of samples from both 360 and 288 return LBA dates.

7.2 Scatter of pits

In total there were 175 pits, excluding those associated with Structure 1H. Ten of these pits were identified as possible post holes as they had stone packing material within them (examples shown in Illus 40a–c), four of which were grouped to the north-west of the site (209, 241, 247 and 244), five within the south-west quadrant of the site (036, 067, 298, 396 and 402) and one within the north-east quadrant of the site (358). The function of the remaining 165 pits could not be determined, but broad curving patterns can be seen, which may indicate heavily truncated post rings.

Pit 149 (Illus 40d & e) contained the heavily truncated remains of a cremation urn containing burnt bone fragments identified as an adult (Section 7.6 below) which returned a radiocarbon date range of 1209–998 cal BC (95% probability; UBA-13439). Pit 329 (Illus 40f), *c* 5m to the west of 149, contained a fragment of cannel coal bangle (see Section 7.5.2) and a small quantity of burnt bone of indeterminate species (see Section 7.7.1).

7.3 Areas 1 and 2

These two areas were of interest because of the concentration of small pits adjacent to two large pits (142 and 074), a possible occupation or destruction layer and the vestigial remains of a curvilinear gully.

Area 1 included a large curvilinear pit (142), reminiscent in size and form to a truncated ring ditch (Illus 40g), and 11 smaller pits clustered around its southern and western sides (010, 016, 102, 104, 157, 159, 167, 169, 171, 173 and 175). Two sections of curvilinear gullies (456 and 457) were recorded on the west and east sides of Pit 142.

The features of Area 2, which were sealed by a deposit of black to dark brown sandy silt (066), included a large pit (074 Illus 40h) and 10 smaller pits (018, 032, 038, 040, 072, 163, 165, 372, 374 and 378). There was some evidence that 074 was stone-lined.

7.4 Linear feature

A discontinuous linear feature (003) bisected the site on a north-west/south-east axis. The feature was irregular both in its dimensions and its profile. It was heavily truncated, surviving in places as little more than a stain. At its north-western extremity the feature could be seen to run down the slope for a short section before it became untraceable, while at its south-east extremity it also tapered out and was not seen in the evaluation trenches to the south and east. There were four breaks along its length, but it could not be established whether they were by design or as a result of truncation.

The feature cut Pit 085 (Illus 40j) on its north-east arm and was cut by 005 on its middle section. Three other pits were identified within the linear feature (060, 062 and 026), seen in section only.

The feature may have been part of a bigger enclosing feature such as a palisade, the rest of which has been truncated. It may equally have been a linear boundary, possibly fabricated from timber, based on the evidence of the three probable post holes within the feature. Alternatively it may have been a hedge line, which could explain its irregularity and undulating base, interpreted in the field as possible root boles. No field boundaries are depicted in this area on the early Ordnance Survey maps, suggesting that if it is a field boundary it was not identifiable as such when these maps were drawn up.

7.5 Artefacts

7.5.1 Pottery

Melanie Johnson

An assemblage of 92 sherds was recovered from this area, comprising a scatter of sherds from some of the many pits spread across this area, and a single urned cremation deposit.

A cluster of four pits on the west side of the excavation area contained a small quantity of pottery (10 sherds). Pits 034 and 076 each contained a rim sherd (P162 and P166 respectively, Illus 41). Both of these were rounded rims from neutral-mouthed bowls. The former has a diameter of 180mm. Plain body sherds were found in the adjacent Pits 036 and 058.

Further plain body sherds were also found in adjacent Pits 215 and 274, in Pit 334 and during

general site cleaning. A rim (P174) was also found in Pit 421, slightly to the east of Structure 1H. This small sherd was a tapered rim, bevelled to each side; little of the profile survived (Illus 41).

The possible structure referred to as Area 1 includes a large pit (142) which contained three plain body sherds.

There were no significant differences between the fabrics recorded across the site, with generally coarse, sometimes sandy fabrics containing varying quantities of grit and small stones, and probably of MBA/LBA date.

The majority of the pottery was from Pit 149, a small oval pit in the south-east of the area, where the vessel (P176 Illus 41) comprised in-situ base and body sherds weighing 1,270g. The vessel was removed in a block of soil for excavation in the laboratory due to the presence of cremated human bone. Plough damage had removed the upper portion of the vessel, to such an extent that the overall morphology of the vessel is unknown. Almost the whole of the base is present, with about three-fifths of the circumference of the wall to a height of 10mm. The base diameter is 140mm with a wall thickness of 15mm. The fabric is coarse and heavily gritted, with a pink to orange interior, grey core and orange exterior. The surfaces are smoothed and there is sooting on the interior. This vessel is the remains of an upright urned cremation, containing the cremated remains of an adult (see Section 7.6).

Fragments of potentially two other vessels were recorded in the fill of Pit 149. Five small plain body sherds which differed in colour and fabric to the urn P176 were found, and two rim sherds from a vessel with a rounded rim and slight internal bevel (P170 Illus 41). This rim had a diameter of 220mm and again differed in colour and fabric from urn P176. However, given that only the base of P176 survived intact, and it is not uncommon for the base of a vessel to be thicker and more heavily gritted than the rim portion, it remains a possibility that these additional sherds belonged to the upper portion of the cremation urn and it is due to construction techniques and firing conditions that they appear superficially to be from different vessels.

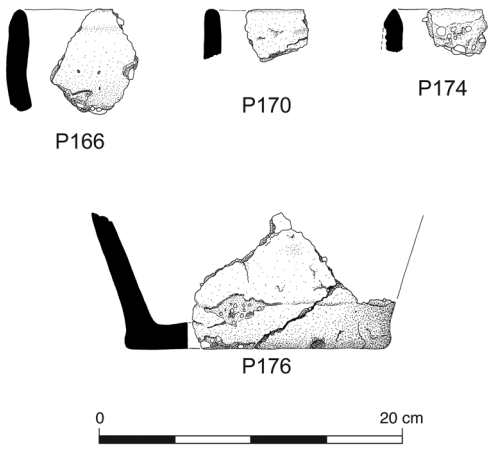
7.5.2 Cannel coal bangle

Fraser Hunter

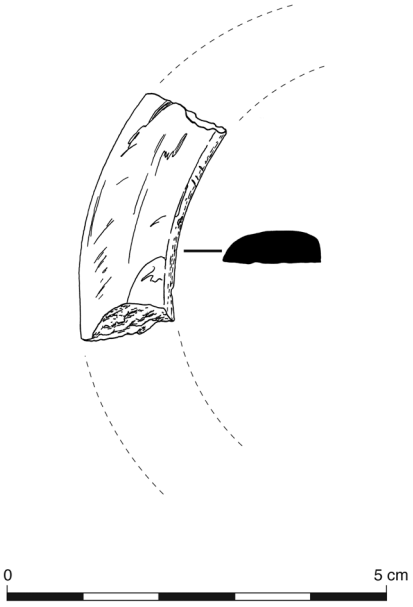
A bangle fragment was recovered from Pit 329, to the west of the cremation burial. Bangles are common later prehistoric finds, and are not chronologically diagnostic; evidence of use-wear shows this one had an extended life.

Catalogue (Illus 42)

▸ Bangle fragment, split horizontally and broken at ends. The surviving fragment comes from the top of a fairly broad D-sectioned bangle, rounded internally. There are near-vertical abrasion scars on the inner face, polished from wear; the exterior is well-finished but has considerable use-wear



Illus 41 Pottery from Area H



Illus 42 Cannel coal bangle from Area H

scratching, and a small spall has worn smooth from use. The conchoidal fracture suggests it is probably cannel coal. L 34, W 12.5, T 6.5 mm; internal D 75–80 mm (12% survives). Pit 329.

7.6 Cremated human remains

Sue Anderson

Pit 149 was the heavily truncated remains of an urned cremation burial. Some of the fill was recovered as a sample on site (<714>), and the remainder was lifted as a block containing the base of the pot and some of the pit fill. This was excavated in the laboratory, providing Samples <1134> (Pit Fill 150) and <1135> (Pit Fill 151). These were sieved for the recovery of bone and other organic material. The shallow nature of the pot base meant that excavation of the urn in spits was not feasible. The residues from wet-sieving were dried, sieved into three fractions (<2mm, >2mm, >4mm) and were then sorted into areas of the skeleton. The results for each sample are shown in Table 13 (the quantification by fraction is included in the archive). The total bone weight was 45.1g, and in addition ten fragments (1g) of bone from the urn were identified as possibly animal.

Fragments recovered both from the inside of the urn and the soil surrounding it were small, and abraded pieces occurred in both. There was no reason to suppose the fragments from the outside of the urn were from a different individual to those contained within, and it is likely that plough damage had resulted in some displacement of the urn's contents. The largest fragment sizes of skull and long bone were 16mm and 28mm respectively from within the urn, and 7mm and 10mm from the pit fill.

The individual was an adult, based on the size of the long bones and the completeness of the few surviving tooth roots. No elements diagnostic for sexing or closer ageing were present. The remains were too fragmentary to provide any further information about the individual buried here.

7.7 Environmental evidence

7.7.1 Calcined bone

Sue Anderson

Calcined animal and uncertain bone was recovered from Structure 1H (10.35g), Area 1 (4.4g), Area 2 (0.1g) and 25 other features (32.35g) on this site. The largest single quantities were from Pits 076 (5.2g), 215 (4.3g) and 329 (7.2g). Fragments from 076 included pieces of tooth root and mandible which could possibly be human, although there were certainly animal fragments present in the context too; a small quantity of pottery was also recovered from this feature (see Section 7.5.1).

7.7.2 Charcoal

Michael Cressey

Eight samples of charcoal were analysed from this area. Both hazel (25 identifications, 14g) and oak (165 identifications, 38.1g) are present, with oak dominating at 73% of the assemblage.

7.7.3 Charred plant remains

Mhairi Hastie

Composition of plant remains

A mixture of naked barley, emmer and spelt wheat was recovered from this area. Cereal grains were present, along with small amounts of wild taxa such as sedge, buttercup and hemp nettle. Fragments of hazelnut shell were present in the fill of only one

Table 13 Cremation burial quantification

Sample	Skull		Axial		Upper limb		Lower limb		Unident. limb		Unident.
	No.	Wt (g)	No.	Wt (g)	No.	Wt (g)	No.	Wt (g)	No.	Wt (g)	Wt (g)
714											1.4
1134	2	0.1							5	0.8	1.9
1135	35	3.6			7	2.4	20	4.9	27	5.8	24.2
Totals	37	3.7	0	0	7	2.4	20	4.9	32	6.6	26.1

pit (280); fragments of rhizome were also recovered from a small number of the samples. Of note is the recovery of two apple pips from the fill of Pit 400 in Structure 1H; no other fruit pips or any pericarp remains have been recovered from the other excavated areas, and their presence probably indicates the exploitation of wild fruit resources.

Distribution of plant remains

There is a general low-level spread of cereal grain and weed seeds throughout a variety of features spread across the area, although it does appear that there is a slight increase in the quantity of plant remains recovered from Structure 1H. No large concentrations of plant remains were uncovered to indicate any large-scale burning events. As with Areas B and C this sparse, almost uniform, spread of abraded material is probably the reworked and diluted remains of food burnt during daily activities and spread throughout many different deposits.

7.8 Radiocarbon dates

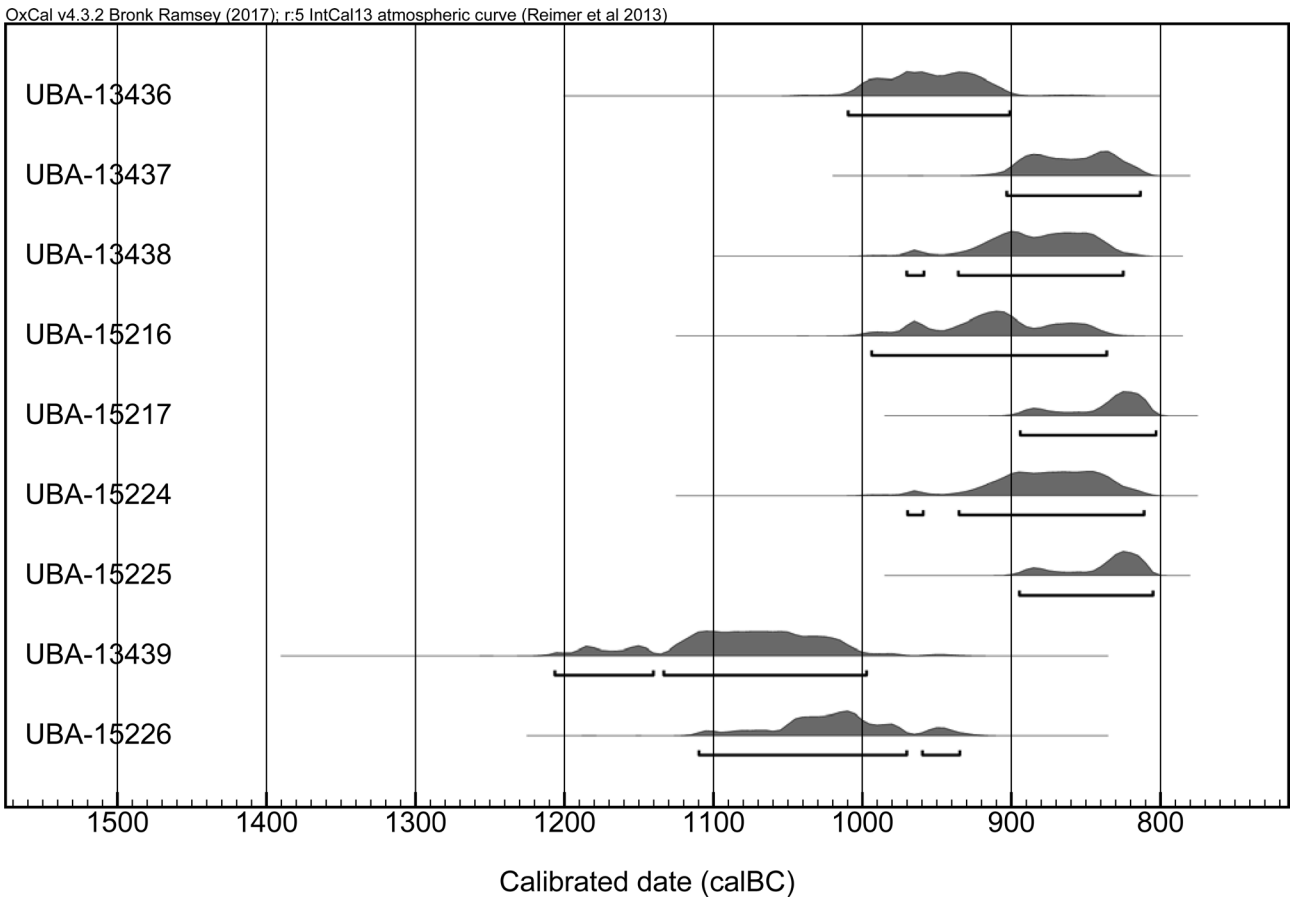
Nine radiocarbon date ranges were returned from this area and reflect MBA–LBA activity (Table 14; Illus 43). The only set of paired dates, those from Pit 360, were shown to be significantly different in a chi-squared test.

7.9 Discussion

7.9.1 Phasing

There was little evidence on which the phasing of the site could be based. There were no stratigraphic relations within the features with the exception of Linear Feature 003, which cut through an earlier pit (085), and which was itself cut by a later pit (005).

The radiocarbon dates suggest a period of activity from the MBA, with the cremation burial recovered from 149 (1208–998 cal BC; 95% probability; UBA-13439), through to the LBA, with burnt cereal grains from Pit 142 dated to 895–804 cal BC. The



Illus 43 Radiocarbon dates, Area H

Table 14 Radiocarbon dates, Area H. Calibration was conducted using OxCal v4.1.7, using the IntCal09 calibration curve

Lab no.	Material	Context description	Date BP	95% probability	$\delta^{13}C$ ‰
Structure 1H					
UBA-13436	Hazel charcoal	Fill of internal Pit 360	2803±22	1010–903 BC	–29.1
UBA-13437	Alder charcoal	Fill of internal Pit 360	2713±22	904–815 BC	–31.9
UBA-13438	Hazel charcoal	Fill of internal Pit 288	2746±26	972–825 BC	–27.0
Area 1					
UBA-15216	Hazel charcoal	Pit 142	2768±26	996–837 BC	–27.2
UBA-15217	Hazel charcoal	Pit 142	2685±21	895–804 BC	–27.3
Isolated pits					
UBA-15224	Barley indet.	Fill of Pit 329	2735±32	971–813 BC	–24.8
UBA-15225	Barley indet.	Fill of Pit 329	2688±19	895–806 BC	–27.8
UBA-13439	Human bone	Cremated Bone 149	2895±29	1208–998 BC	–18.0
Linear feature					
UBA-15226	Hazel charcoal	Fill of Linear Feature 003	2856±21	1114–936 BC	–26.8

cannel coal bangle fragment recovered from Pit 329, although not chronologically diagnostic, was found in association with cereal grains which returned dates of 971–813 cal BC (95% probability; UBA-15224) and 895–806 cal BC (95% probability; UBA-15225), suggesting the bangle was LBA in its origin.

7.9.2 The cremation burials

The remains of an adult cremation burial were recovered from Pit 149 just north of the linear feature (003). To the south of Linear Feature 003 burnt bone, possibly human, was recovered from Pit 076. There was no evidence of pyre debris marking the pyre site. For more detailed discussion see Section 11.4.

7.9.3 Architectural features of the structures

Very little can be said about Structure 1H except that it consisted of a partially surviving ring groove and a collection of pits thought to represent post holes, one of which (360) contained packing stones. The ring groove may have functioned as a foundation slot for the outer wall and the absence of ring ditches was in keeping with other LBA structures at Blackford such as Structure 1D.

The large pit (142) in Area 1 may have been the remains of a ring ditch. However, the dates returned were consistently of the LBA, and there were no other LBA structures at Blackford that had evidence of a ring ditch. It is possible that the feature was not a ring ditch, was an anomaly, or the dated material had become incorporated into an earlier feature. However, if it is a ring ditch it may represent a different use of the structure from the other LBA structures seen at Blackford.

7.9.4 Finds distribution and taphonomy

There is some evidence of a skewed deposition within the finds assemblage, with the majority coming from contexts with a proximal association with 003 (Illus 39). Both Pits 076 and 149 contained burnt bone and were close to the probable field boundary (003, 076 to the south and 149 to the north), and may represent acts of structured deposition. There is increasing evidence that critical points along field and enclosure boundaries are marked with special depositions such as concentrations of pottery or 'token cremations' (Brück 2001: 151), these token cremations usually being less than 50g, as were the human remains recovered in this area. The need

for bulk sampling in order to retrieve these small amounts has been advocated by Guttman & Last (2000: 155) and was the methodology employed during the excavations at Blackford. However, as a result of truncation much of the bone may have been lost and in actual fact the weight of the calcined bone making up the original cremation burial probably exceeded 50g.

Pottery was also collected from Pits 076 and 149, as well as from other adjacent contexts on the south side of the boundary (034, 036 and 058). To the north of the boundary, as well as the cremation (149), there was a shale bangle from Pit 329 and pottery from an adjacent pit (334). The rest of the retrieved pottery was from contexts that were some distance from 003: adjacent Pits 215 and 274 to the north-west of Structure 1H, and isolated Pit 421 to the south-east of the structure.

7.9.5 Economy

Naked barley, emmer wheat and spelt are all represented within the area. Its diffuse distribution across the site, coupled with its abraded nature, indicates that this material derives from the daily processing and cooking activities involved with cereal grain. The recovery of apple pips suggests a degree of wild harvesting. Fragments of burnt animal bone were recovered. The recovery of an ovicaprid faecal pellet from the Late Bronze Age/ Early Iron Age (LBA/EIA) house Structure 1F is supporting evidence that domesticated sheep/goat were being exploited.

It is not known whether the cannel coal bangle was manufactured at Blackford or not, but evidence of both the procurement of raw materials and the manufacture of jewellery was found in Areas B and E.

Prehistoric field boundaries are relatively common features of the Bronze Age in England (Yates 2007) and in north and west Europe generally (Harding 2000: 151), although they are not characteristic of Scotland. However, it appears that at Blackford one such boundary was recorded, Linear Feature 003.

If the area was divided by a fence then the fence was certainly not straight. Five pits that cut the feature may qualify as post holes, the sequence of construction being the same as that of the palisade in Area A, where a foundation slot was excavated, posts set within the cut, and then the cut backfilled. However, the irregularity in plan and section of Linear Feature 003, and its shallowness, does not offer support for a fence line. Alternatively, the land division may have been a hedge, with Pits 026, 060 and 062 having been formed by root boles. The hedge could have been formed from any thorny wild species, such as brambles (Harding 2000: 151). The putative hedge line was later cut by Post Hole 005, either because the hedge line had gone out of use and the post hole was entirely unrelated, or because it represents some form of augmentation to the hedge. Alternatively, the feature functioned as a drain, draining water downslope to the west and east. The pit then was latterly and coincidentally cut into the drain.

8. LATE BRONZE AGE/EARLY IRON AGE STRUCTURE (AREA F)

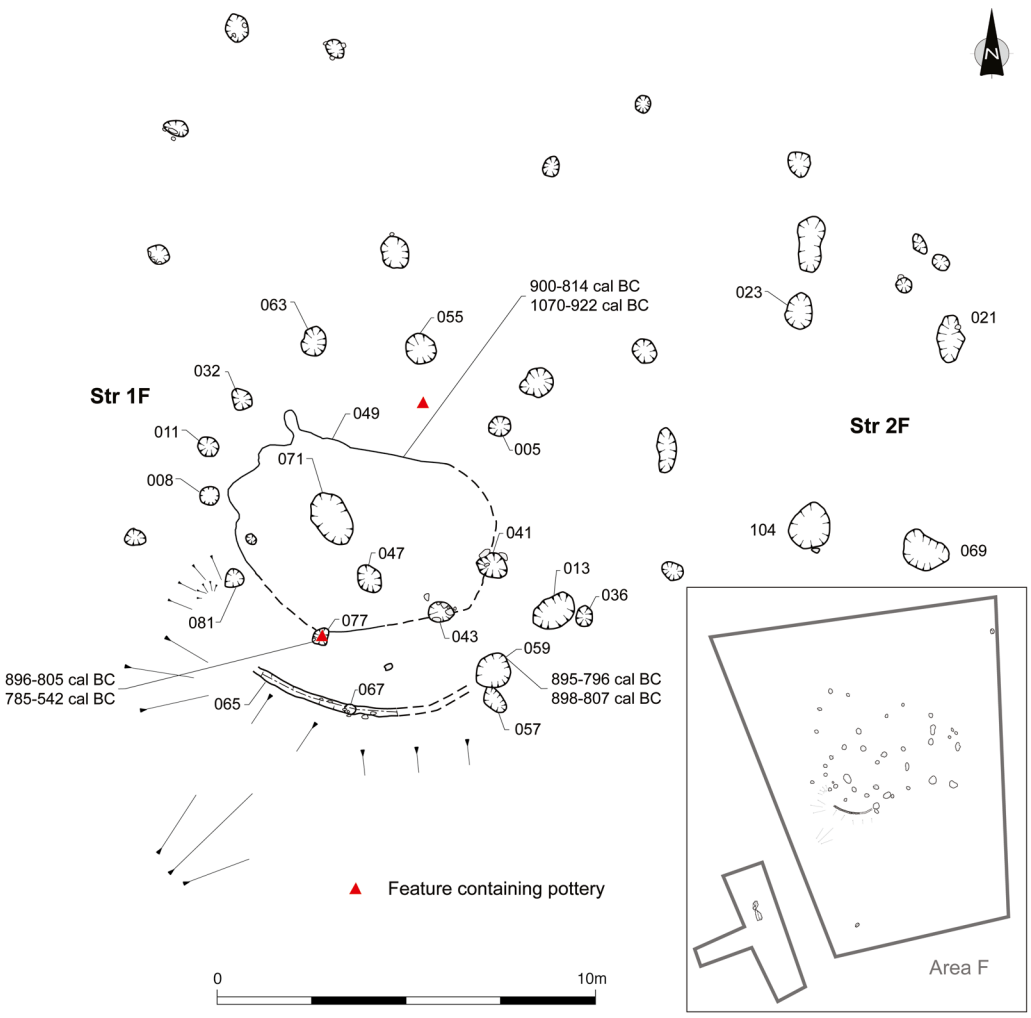
Discovered in this flat area with a sandy and stony subsoil were the remains of a LBA/EIA post-built circular structure, 1F, with a diameter of *c* 10m (Illus 44). It had a post ring and an entrance and porch orientated to the south-east. There were few internal features, one of which was interpreted as a hearth. The house features were cut into the subsoil and sealed by a charcoal-rich deposit. To the east of the house were the foundation post holes for a four-post structure, 2F. Other pits were scattered across the site.

8.1 Structure 1F

A post ring of *c* 8m diameter can be identified in this area. It comprised ten post holes (043, 077, 081, 008, 011, 032, 063, 055, 005 and 041). Post Hole 077 contained sherds of pottery from six vessels (see Section 8.4.1 below).

On the south side of Structure 1F were the partial remains of a ring groove (065), with a post hole (067) cut into its base. Extrapolating this around the post ring suggests a diameter of *c* 11.5m for the structure. Although heavily truncated, the ring groove could be seen to link with Post Hole 059. The point of entry was defined by two pairs of opposing post holes, 013/036 and 059/057, which may represent the remains of a framed doorway. Post Holes 059 and 013 were also opposed to two post holes in the post ring, Post Holes 043 and 041 respectively.

There were two internal features not assigned to the post ring: Pit 071, 1.6m by 0.8m by 0.35m deep (Illus 45) was probably a firepit due to the



Illus 44 Plan of Area F

nature of its charcoal-rich deposits and burnt soils. The soil micromorphology analysis also supports this, demonstrating that the upper fill, 072, was consistent with a fire of dung-based fuels (see Section 8.5.4). The function of the smaller pit, 047, with a diameter of 0.6m and 0.12m deep with its single fill of mid-brown to orange sandy silt, could not be determined.

Sealing the features of Structure 1F and continuing slightly beyond the outer ring groove was a deposit of firmly compacted black silt (049) containing charcoal fragments and a number of artefacts (see Sections 8.4–8.5). The soil micromorphology analysis suggests that this material also derived from a dung-based fire.

8.1.1 Interpretation and phasing

The most likely reconstruction of this group of features would appear to be based on the 8m-diameter post ring and an external ring groove which was largely truncated, representing a single-phase structure.

8.2 Structure 2F

A rectangular structure, 2F, was defined by four post holes and had overall dimensions of *c* 7m by 4.4m. The interpretation that these post holes were related was based on their similar size, form and spatial arrangement: 104, 0.55m by 1.07m by 0.25m deep; 069, 0.85m by 1.27m by 0.22m deep; 021, 0.6m by 1.26m by 0.16m deep; 023, 0.6m by 0.85m by 0.21m deep. The features contained single fills of sandy silts of dark brown or grey to black in colour, and there was no dating evidence.

8.3 Other features

There were 20 isolated features across the excavation area, ranging in size from 0.3m by 0.27m by 0.15m deep to 1.37m by 0.65m by 0.27m deep and filled with brown sandy silts, reflecting the characteristics of the subsoil and the probable ancient topsoil. There was no spatial patterning within these features indicative of structural remains, nor physical relationships to discern diachronic phasing, although most of the features were clustered around the structures and probably related to the occupation of Structure 1F. However, their function remains unknown.

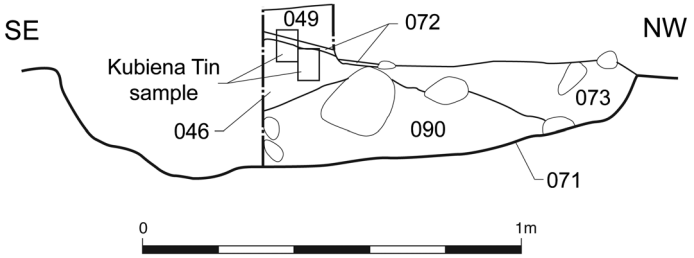
8.4 Artefacts

8.4.1 Pottery

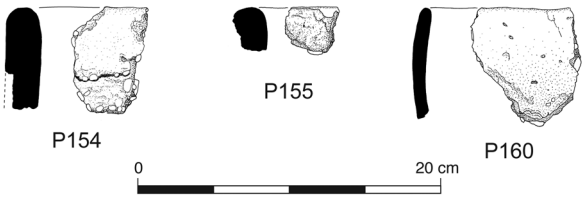
Melanie Johnson

A small assemblage of 19 sherds of MBA/LBA pottery was recovered from this area. More than half of the assemblage was recovered from Post Hole 077, forming part of the post ring within Structure 1F. However, eight sherds were all plain body sherds with no diagnostic traits and represent five different vessels. Three sherds were from a rim with a rounded top (P160 Illus 46). The fabrics were generally fairly heavily gritted. It is tempting to interpret this deposition as a deliberate one, similar to those in Area G (Section 6), as it is hard to understand how such a group of pottery could have come together in one post hole unless placed deliberately.

A charcoal-rich deposit (049), interpreted as material derived from a dung-based fire, sealed the cut features of Structure 1F and contained the rest of the assemblage, comprising small abraded body sherds and two rim sherds (P154–155 Illus 46).



Illus 45 Section of Pit 071, Area F



Illus 46 Pottery from Area F

Each of these rims is very thick (14–17mm) and has a rounded or sub-rounded top. These rims are unusually thick when compared to the rest of the assemblage.

8.4.2 Vitrified material

Dawn McLaren

Four small fragments of very dark brown, highly-vesicular, slightly glassy, non-magnetic vitrified material (1.6g) derived from a spread within Structure 1F (C049). The fill of Post Hole 032 produced multiple small amorphous nodules of lightly vitrified, bubbly, porous material comprising fused lumps of earth, stone, silica, ash and organics (51.8g), likely to be fuel ash slag or cramp. This material can form during any high-temperature pyrotechnic process, such as within a hearth, and is not necessarily the result of a deliberate industrial activity.

8.5 Environmental evidence

8.5.1 Calcined bone

Sue Anderson

Thirteen contexts in Structure 1F together contained 14.2g of bone. The largest quantities were collected from C049 (7.95g), Pit 071 (2.1g) and Post Hole 032 (2.3g). A fragment of large mammal tibia from 049 was submitted for radiocarbon dating (see Section 8.6 below).

8.5.2 Charcoal

Michael Cressey

Two species of wood are represented, with hazel (31 identifications, 19.2g) at 69% of the assemblage and oak (64 identifications, 8.3g) attaining 30%. The largest concentration was from C049 (15.4g hazel). Of the features, the two entrance post holes, 059 and 013, produced the greatest quantities, both containing oak and hazel. Other post holes within Structure 1F (005, 008 and 077) contained small quantities, and 25 blocky fragments (3g) of oak were identified in Post Hole 069 of Structure 2F, but it was not possible to determine whether this was part of the original post.

8.5.3 Plant remains

Mhairi Hastie

Only a small assemblage of very poorly preserved barley grains, a nutlet of persicaria and one or two rhizome fragments were recovered from this area. The quantity of plant remains present is very small and does not allow detailed discussion. Barley grains from Post Holes 059 and 077 in Structure 1F were submitted for radiocarbon dating (see Section 8.6 below).

8.5.4 Soil micromorphology

Clare Ellis

Two Kubiena samples (<1038> 1–2) were taken through the upper fills of Pit 071 (Illus 45). The lower sampled fill, 046, comprises a poorly to moderately sorted coarse sandy silt loam with few rock fragments. It has a high amorphous organic content with a few coarse and very few silt-sized charcoal fragments occurring throughout the organo-mineral matrix. There are very few fragmentary biogenic silica and very few rounded fragments of bone. The upper fills, 072 and 049, were not distinguishable in thin-section; these comprise a poorly sorted coarse sand dominated by silt-sized and coarse cellular charcoal. All three contexts have been extensively reworked by soil fauna, resulting in crumb and granular microstructures.

Bioturbation has largely destroyed the original fabrics; however, the boundary between 046 and 072/049 survives as an undulating, sharp and distinct boundary despite considerable reworking of the matrices by soil fauna. This boundary is indicative of a hiatus in accumulation, ie a break in dumping, as well as a marked change in the nature of the material being dumped. The amorphous organic content of 046 has been largely replaced by iron oxides; this probably occurred during heating and burning resulting in the segregation of iron

oxides (Simpson et al 2003), or it could be due to the presence of high amounts of acid organic matter in which the iron is finely integrated with organic molecules forming organo-mineral complexes (Courty et al 1989). However, the abundance of convoluted charcoal of organic matter (not wood) at the top of 072/049 is indicative of an organic, perhaps dung-based fuel residue and a fire in which combustion was not complete, possibly due to the use of damp fuel or the deliberate dampening of the fire to create an environment suitable for the smoking of meats or fish. The presence of small rounded fragments of bone fits with a domestic hearth ash source of the deposits.

8.6 Radiocarbon dates

Four dates were obtained from internal features within Structure 1F and two from a context sealing the structure (Table 15; Illus 47). Chronologically the dates fall within the LBA to EIA periods.

A hazelnut shell from the possible destruction C049 returned the earliest date, but it is possible that it was residual and subsequently became deposited within this context.

The two radiocarbon dates returned from post hole Fill 060 (UBA-13346 and UBA-13345) passed the chi-squared test and therefore can be legitimately combined, giving an average age range of 896–801 cal BC. Paired dates from 049 and 078 did not pass the chi-squared test, and one date, from Post Hole 077, is later than the rest (Illus 47). Overall, however, four of the dates were not significantly different and suggest a 9th-century BC date for the structure.

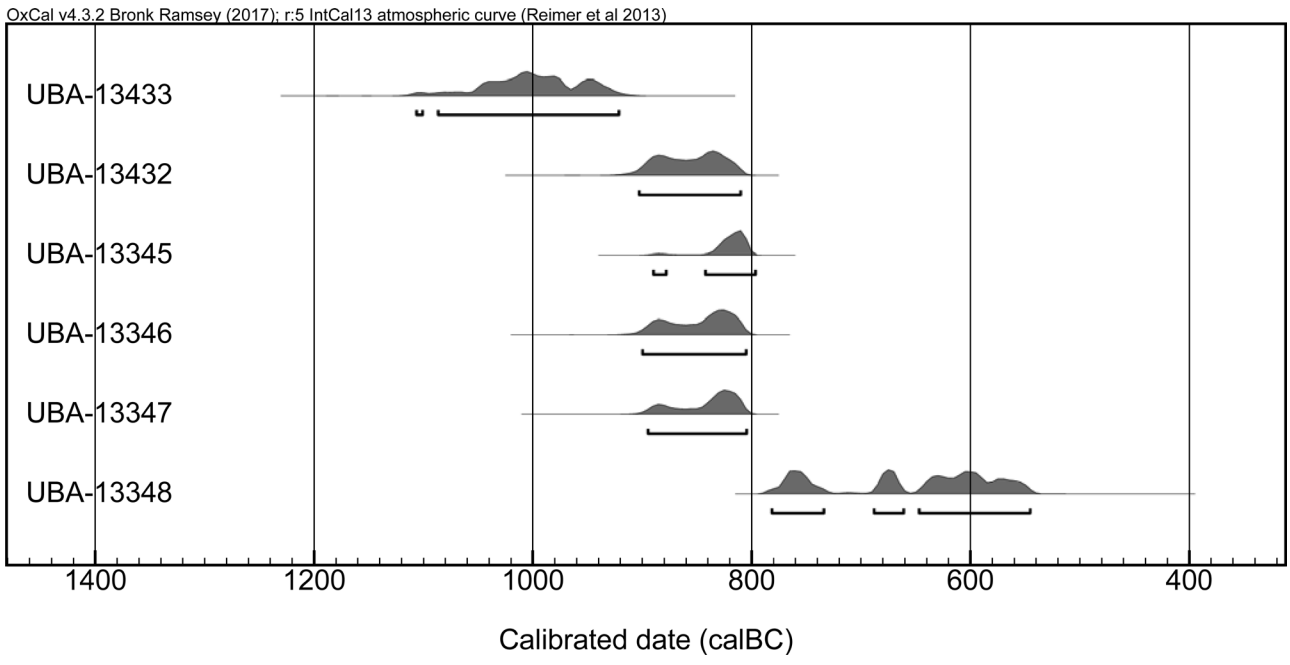
8.7 Discussion

8.7.1 Phasing

The site appears to represent a single phase of activity, since there were no intercutting features or stratigraphic relationships apart from all the features being cut into the natural subsoil.

8.7.2 Architectural features of the structures

Structure 1F probably had an 8m-diameter post ring separated from an outer ring groove by a *c* 1.4–1.8m gap. A similar, but more complete, example of this form of structure was identified in Area D (Section 9). The entrance was orientated to the south-east and was framed by a small external 'porch' (really an extended door frame) which used Post Holes 013 and 059, with short extensions comprising 057 and 036. Pit 071 contained deposits which indicated burning and the use of animal dung as a fuel. This, together with the presence of small rounded fragments of burnt bone within the upper deposit



Illus 47 Radiocarbon dates, Area F

Table 15 Radiocarbon dates, Structure 1F. Calibration was conducted using OxCal v4.1.7, using the IntCal09 calibration curve

Lab no.	Material	Context	Date BP	95% probability	$\delta^{13}C$ ‰
UBA-13433	Hazel charcoal	Layer 049	2844 ± 25	1070–922	–29.5
UBA-13432	Bone	Layer 049	2708 ± 25	900–814	–23.1
UBA-13345	Naked barley	Fill of Post Hole 059	2665 ± 20	895–796	–27.0
UBA-13346	Naked barley	Fill of Post Hole 059	2695 ± 26	898–807	–23.1
UBA-13347	Barley indet.	Fill of Post Hole 077	2688 ± 23	896–805	–25.6
UBA-13348	Barley indet.	Fill of Post Hole 077	2512 ± 19	785–542	–28.5

and the position of the pit within the house, suggests that this pit was a hearth.

Structure 2F was a simple rectangular structure based on four large posts.

8.7.3 Structure use

Structure 1F is assumed to have been a roofed building based on the fact that it was defined by a post ring. These structural posts are thought to be used to support the ring-beam, which aids in the distribution of the weight of the roof. The structure had a well-defined entrance on the south-east side, and the presence of a partially surviving ring groove on the south side of the structure demonstrates that the structure had an outer wall.

Pit 071 was interpreted as a hearth due to the burnt deposits. The presence of a hearth is a further indication that this structure was inhabited and is therefore likely to have been a house.

The four post holes that were thought to define Structure 2F were of similar size and form, and were coherent in plan, forming a rectangle. Comparable structures have been recorded, for example, at Little Woodbury (Ellison & Drewett 1971: 85) and at Dryburn Bridge (Dunwell 2007), as well as elsewhere in Britain. Early interpretation by Bersu (1940) suggested they were raised granary stores. None of the four post holes contained charred grain and only one post hole, 069, contained a small amount of charcoal.

8.7.4 Finds distribution and taphonomy

The finds assemblage was concentrated in two contexts, pottery from Post Hole 077 and pottery and burnt material from C049. The fact that pottery was only recovered from a single feature is intriguing and probably represents the deliberate deposition of the material within the post hole, but whether this had ritualistic meaning or whether the pot was used as packing material cannot be determined.

There are a number of taphonomic factors that may result in the low levels of pottery from features within Structure 1F. It may be the result of a house that was kept very clean, with refuse being dumped outside and away from the structure. Alternatively, it may be that the occupants owned or used very little pottery. Perhaps the house was occupied for a very short time, before detritus could accumulate. The lack of intercutting features suggestive of post replacements or other repairs is supporting evidence for a brief occupancy of the house, although exactly how long this lasted cannot be determined, as the radiocarbon dates span approximately a century.

8.7.5 Economy

There was very little evidence from which to reconstruct economic activities. Although small amounts of barley grains were recovered they could either have come from domesticated or wild species. Calcined bone was also recovered, some of which was from a large mammal, but again whether it represents a domesticated or a wild species could not be ascertained. If the four-post structure is interpreted as a grain silo, then the implication is that the occupants would have had access to enough grain to warrant such a structure.

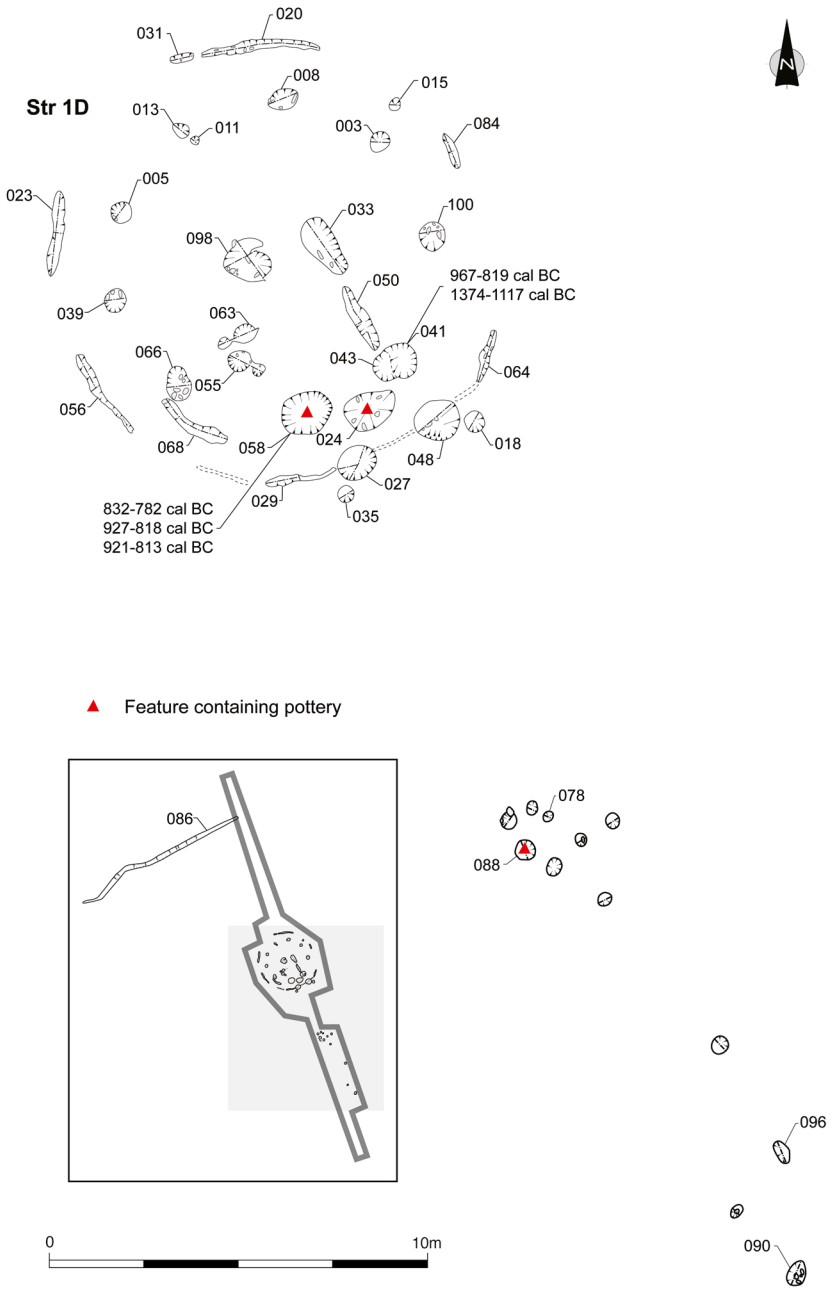
The vitrified material recovered from C049 can form during any high-temperature pyrotechnic process and may therefore have resulted from the putative house fire rather than from metalworking.

9. LATE BRONZE AGE STRUCTURE (AREA D)

This area, similar to Area F, did not command a vantage point on top of a hill like the other areas, but occupied a position on a gentle slope. The subsoil generally comprised sandy silt with medium-sized stones throughout. The northern area of excavation had a higher clay content and was less well drained. The excavation returned radiocarbon dates indicating a LBA date. There was a single unenclosed post-built structure, 1D, with an entrance framed by a porch that faced the south-east (Illus 48). There were a few internal pits within the structure. Other features external to the structure included the possible remnants of a land boundary to the north-west and a group of small pits to the south-east.

9.1 Structure 1D

Structure 1D was defined by a ring groove with a diameter of 11.5m which was truncated into seven segments (020, 084, 064, 029, 056, 023 and 031), and which ranged in size from 0.25m by 0.3m by



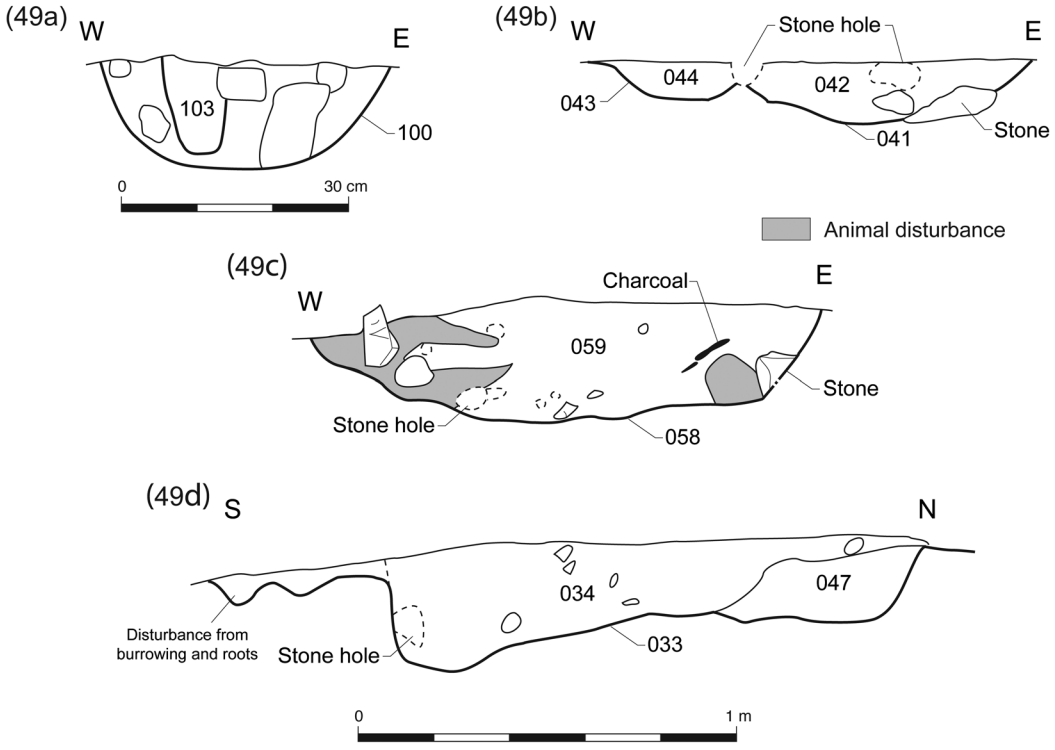
Illus 48 Plan of Area D

0.1m deep, to 0.2m by 2.35m by 0.14m deep. The segments of the ring groove were filled with sandy silts. No post holes were identified within the feature although Post Hole 015 fell within its projected north-eastern arc. The truncated remains of another curvilinear feature (068) were recorded in the south-west quadrant of the house. Either of these features may have been the remains of the foundation for an outer wall.

Structure 1D had a post ring of *c* 8.5m diameter made up of nine sub-circular post holes, spaced fairly regularly at *c* 2m apart, running internally concentric with the ring groove (008, 003, 100, 041/043, 058, 066, 039, 005 and 013) at a distance of *c* 1.8m from it. Three contained packing stones (005, 039 and 100 Illus 49a). These post holes ranged in size from 0.34m diameter by 0.05m deep to 1.1m by 1.35m and 0.37m deep. With the exception of Post Hole 008, which had two fills, they each contained single fills of sandy gravels and silt, black-grey and brown in colour. A possible post-pipe impression was recorded in Post Hole 100 (Illus 49a). Given their small size, proximity and similar fills, Post Holes 011 and 013 may have been the irregular base of a single truncated post hole or evidence of replacement.

The entrance faced the south-east, and was defined by four large post holes, 048, 027, 058 (Illus 49c) and 041 (Illus 49b), with 043 possibly acting as a replacement or shoring for 041. Two further post holes, 018 and 035, defined the outer entrance in a similar way to those seen in Structure 1F (Section 8). Within the entrance was a paving stone, 024, which had been laid over a depression in the subsoil. This depression had become filled with a charcoal-rich grey silty deposit which may relate to material accumulated during the occupation of the house. Three small sherds of pottery were recovered from this feature, and a further six came from Post Hole 058 (see Section 8.4.1).

There were a few internal features varying in size from 0.2m diameter by 0.15m deep to 0.9m by 1.2m by 0.27m deep. Although 098 and 033 (Illus 49d) occupied near-central positions in the structure and one or both could represent the remains of a hearth, there was no evidence of in-situ burning within either of their fills. A small linear cut, 050, aligned between the porch post hole (041) and the pit (033), may have been a foundation for an internal division.



Illus 49 Selected sections, Area D

9.1.1 Interpretation and phasing

There appears to be at least one phase to this post ring structure, although Curvilinear Feature 068 may represent another. However, with the exception of a probable replacement Post Hole 043, replacing 041, which was likely a running repair, there was no other stratigraphic or artefactual evidence to suggest more than one phase of building. Its size and appearance in plan are very similar to Structure 1F.

9.2 Other features

9.2.1 Pits to the south-east of Structure 1D

There was a group of eight small pits to the south-east of Structure 1D which varied in size from 0.2m by 0.3m by 0.04m deep to 0.43m by 0.5m by 0.23m deep. Pottery, representing two vessels, was recovered from Pit 088 (see Section 9.3.1 below), and there were tiny fragments of burnt bone in three of the features.

Further to the south-east there were another four isolated features, of which 090 and 096 aligned with a modern fence which is still standing to the north-west of the site. With the exception of 090 and 096, the function of these features is unknown.

9.2.2 Linear feature

An irregular linear feature, 086, aligned north-east/south-west, was excavated some 20m to the north of Structure 1D, with its north-east end extending into Area D (Illus 48); this was found within Evaluation Trenches 198 and 199. The cut of the feature could be seen in plan and its depth determined by evaluation slots. It measured 15m by 0.5m by 0.3m deep and was filled with two silt deposits. The linear feature is associated with Structure 1D by proximity only. No post holes were seen in plan or in the excavated sections, although the possibility that post holes were present in unexcavated sections cannot be ruled out. The feature followed the undulations in the subsoil, precluding it from being a drainage channel where a constant negative gradient would be required. The function and date of this feature have not been established, however, possibilities could include some form of boundary, either the foundations for a fence or, given its sinuous nature, the remnants of a hedge line.

Table 16 Pottery from Area D

ID	Cut	Feature	No.	Wt (g)
P137	024	Str 1D	3	5
P138	058	Str 1D	1	7
P139	058	Str 1D	3	7
P140	058	Str 1D	2	16
P141	088	External	9	52
P142	088	External	7	44
P193		Unstrat.	1	7
P194		Unstrat.	2	12
P195		Unstrat.	2	21
Total			30	171

9.3 Artefacts

9.3.1 Pottery

Melanie Johnson

A very small assemblage (30 sherds) was recovered from this area, with very little diagnostic material (Table 16).

Nine sherds from five different vessels came from contexts associated with Structure 1D. These came from just two pits, 024 and 058, both lying at the surmised entrance porch in the south-east of the structure. Only one of the vessels (P139) had any diagnostic traits, comprising two very small rim sherds; these have a rounded tip, but very little of the profile of the vessel survives. They were 7mm thick, brown in colour and with a lightly gritted fabric. The other vessels were all represented by plain body sherds, tending to be very abraded with gritty fabrics.

A further 16 sherds were recovered from Pit 088, one of a small cluster of pits lying to the south-east of the structure. These were from two different vessels and comprised plain body sherds, with a single curved sherd from P142 suggesting part of a base. The sherds from both vessels were abraded and small in size, with sandy fabrics, smoothed surfaces and sooting present on the interior.

Five sherds were recovered during general cleaning of the site and so are unstratified. These are all plain body sherds with gritty fabrics.

9.4 Environmental evidence

9.4.1 Calcined bone

Sue Anderson

With the exception of 0.2g recovered from three features in the pit group to the south-east of Structure 1D and 0.4g from Pit 033 inside the structure, all fragments were associated with structural features of Structure 1D (9.2g). The majority of pieces were recovered from the porch area, perhaps indicating that they were deposited during floor sweeping or other cleaning activities. Identifiable fragments were all non-human.

9.4.2 Charcoal

Michael Cressey

With only two species represented, Area D is extremely poor, with only 14 identifiable fragments, weighing 1.9g in total, of which oak formed the majority (10 identifications, 1.8g), the remainder being hazel. The fragments were recovered from Pit 063 within Structure 1D, and Pit 078 in the group to the south-east. This assemblage was dominated by very small fragments well below the level of identification.

9.4.3 Charred grain

Mhairi Hastie

Thirty-five samples were assessed from features in this area, of which 27 were associated with Structure 1D, the remainder being from pits to the south. Samples from five post holes were sterile, and most of the rest produced only small quantities of grain. The largest group was recovered from Pit 033 (Table 17).

Both barley and wheat were identified. Some of the grains of barley still had apparent hulls attached, indicating that the hulled variety was present. Hulled barley was not identified in any other excavated area. Although preservation of the wheat grains was generally poor, both spelt and emmer wheat were identified (in Post Holes 055 and 039 respectively). Chaff remains, which would allow a definite identification of the wheat species, were not present. One small indeterminate culm node (straw fragment) and a few fragments of hazelnut shell were also present. Only one sample from this area contained any weed seeds, Pit 033. Weed seeds present include brome/rye grass (*Bromus*/*Lolium* sp.) and ribwort. In addition, it is thought that the small quantity of possible rye grains recovered from this sample are also weed seeds of the barley crop (see Section 11.5.2).

The presence of hulled barley fits in well with the LBA/EIA dates for the features in this area. The hulled variety of barley was the most common cereal in Scotland during the Iron Age after it widely replaced the naked variety. It is thought that this may be a response by farmers to climatic decline during this period. The hulled barley grains

Table 17 Composition of plant remains from Pit 033

Latin name	Plant part	Common name	Quantity
Weed seeds			
Plantago lanceolata L.	Seed	Ribwort	1
Bromus/Lolium sp.	Caryopsis	Brome/rye grass	2
Cereals			
Triticum sp.	Caryopsis	Wheat	1
cf *Triticum* sp.	Caryopsis	Wheat	1
Hordeum var. *vulgare* (TW)	Caryopsis	Hulled barley	6
Hordeum var. *vulgare* (ST)	Caryopsis	Hulled barley	4
Hordeum var. *vulgare*	Caryopsis	Hulled barley	11
Hordeum sp.	Caryopsis	Barley	9
cf *Secale cereale*	Caryopsis	Rye	10
Cereal indet.	Caryopsis	Indeterminate	18

are enclosed in fused grains that would have given better protection from damp and fungal attack compared to the naked, free-threshing variety (Ramsay 2009).

9.5 Radiocarbon dating

Five radiocarbon dates were obtained from material retrieved from the fills of the entrance Post Holes 058 and 041 (Table 18; Illus 50). It is possible that the material became entrapped by the porch posts as the house was being swept out, and thus the dates reflect the structure's period of occupation.

The three dates returned from Post Hole 058 were statistically different, but two dates (UBA-13326 and UBA-13327) passed the chi-squared test and therefore can be combined giving an average age range of 924–815 cal BC. The two dates returned from Post Hole 041 were also statistically different. However, three dates from the two contexts (UBA-13323, UBA-13326 and UBA-13327) were not statistically different and suggest that the structure probably belonged in the 9th or later 10th centuries BC. The presence of hulled barley also supports a probable LBA date of activity (see Section 9.4.3, Hastie, above).

The date returned from Sample <UBA-13324> probably reflects residuality of the hazelnut shell, and the wheat from Post Hole 058 was potentially later than the main period of structure use.

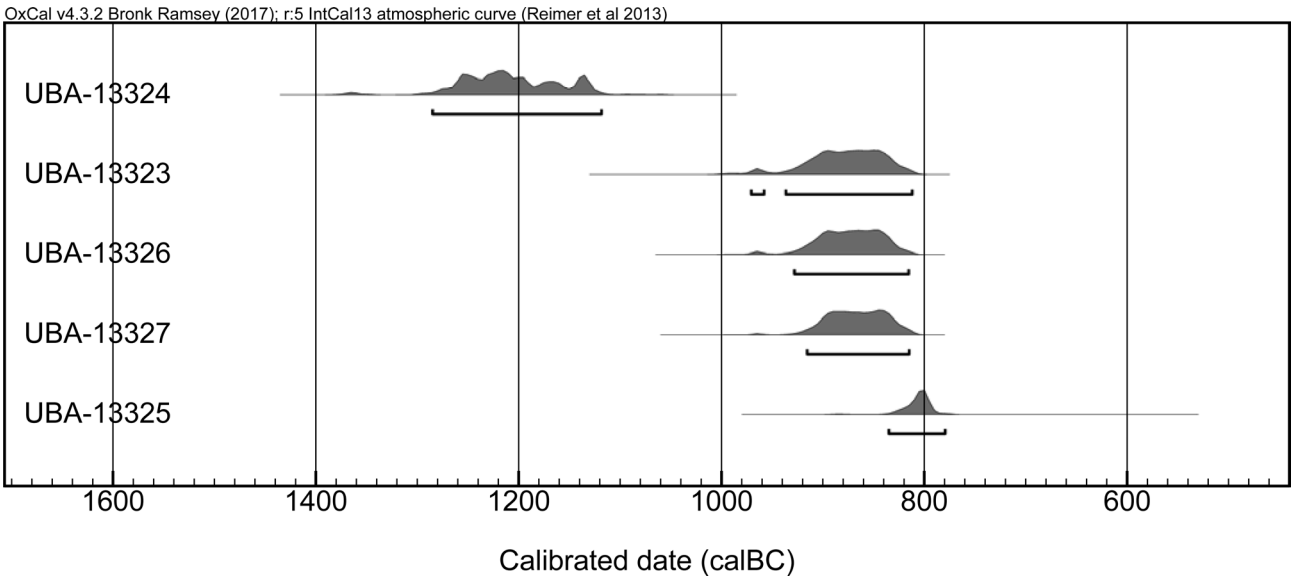
9.6 Discussion

9.6.1 Phasing

There were no stratigraphic relationships and little artefactual evidence to aid in phasing of the main features. Therefore it cannot be ascertained whether

Table 18 Radiocarbon dates, Area D. Calibration was conducted using OxCal v4.1.7, using the IntCal09 calibration curve

Lab no.	Material	Context	Date BP	95% probability	$\delta^{13}C$ ‰
UBA-13324	Hazelnut shell	Fill of Post Hole 041	2985±26	1374–1117 BC	–25.7
UBA-13323	Naked barley	Fill of Post Hole 041	2737±33	967–819 BC	–24.0
UBA-13326	Hulled barley	Fill of Post Hole 058	2735±27	927–818 BC	–22.3
UBA-13327	Hazelnut shell	Fill of Post Hole 058	2725±26	921–813 BC	–29.2
UBA-13325	Wheat indet.	Fill of Post Hole 058	2630±29	832–782 BC	–22.2



Illus 50 Radiocarbon dates, Area D

Structure 1D, Linear Feature 086 and the group of pits to the south-east were all contemporary. However, Structure 1D appears to represent a single-phase structure.

9.6.2 Architectural features of the structure

The 11.5m diameter of the structure is comparable to the LBA/EIA Structure 1F (Section 8).

Either of the ring grooves could have been the foundation for the outer skin of the structure. If 068 represented the position of the outer wall, then its proximity to the post ring may have meant that it was attached both to the post ring and secured in a foundation. If the outer ring groove represented the line of the outer wall, then the wall would have had to have been supported in some other way, by both the foundation slot and by posts, of which 015 may be a candidate. It is also possible that these two ring grooves represent two phases of building, 068 representing an earlier and heavily truncated structure.

The entrance faced the south-east, as did the majority of the structure entrances at Blackford. The entrance may have been framed by a small 'porch' or large door frame represented by Post Holes 027, 048, 018 and 035.

The charcoal recovered from the features fits the overall pattern at Blackford of oak and hazel. The wood had been burnt but there was no evidence that the structure had burnt down, and the charcoal may then derive from other pyrotechnic processes such as a hearth.

9.6.3 Structure use

The post ring is thought to have been the foundations for a ring of upright posts for supporting a ring-beam and roof, and the entrance was framed. These architectural elements are suggestive of a structure designed for human use, rather than an animal stall, for example. The paucity of artefacts recovered from the structure did not allow conclusions to be drawn about what activities may have taken place within the structure. There was no evidence for a hearth, although Pits 098 and 033 occupied a position that made them likely candidates, and there was no evidence of crafted objects other than pottery for probable domestic use. The fact that domestic pottery was recovered from the contexts relating to the entrance, possibly derived from sweeping out the structure, is also supporting evidence for human use of the structure. On balance it is suggested that the structure was a house.

9.6.4 Finds distribution and taphonomy

Twenty-four sherds of pottery (131g) were recovered from three features, 024, 058 and 088. A total of 9.8g of calcined bone was recovered from 13 features.

The bulk of the pottery, 96g, was recovered from the external pit, 088. A smaller quantity, 32g, was recovered from Features 024 and 058 in Structure 1D, which were components of the entrance and may have acted as a refuse trap if the refuse was being swept from the structure.

9.6.5 Economy

This structure provided evidence for the first use of the hulled variety of barley on this site, which became the dominant species grown during the Iron Age in Scotland. The presence of wheat also suggests that this species was being grown. The calcined animal bone could theoretically have derived from either wild or domesticated species, and is likely to have been the waste product from a component of the house occupants' diet, as it was recovered from contexts that suggest the material had been caught up in the sweepings from the floor of the house.

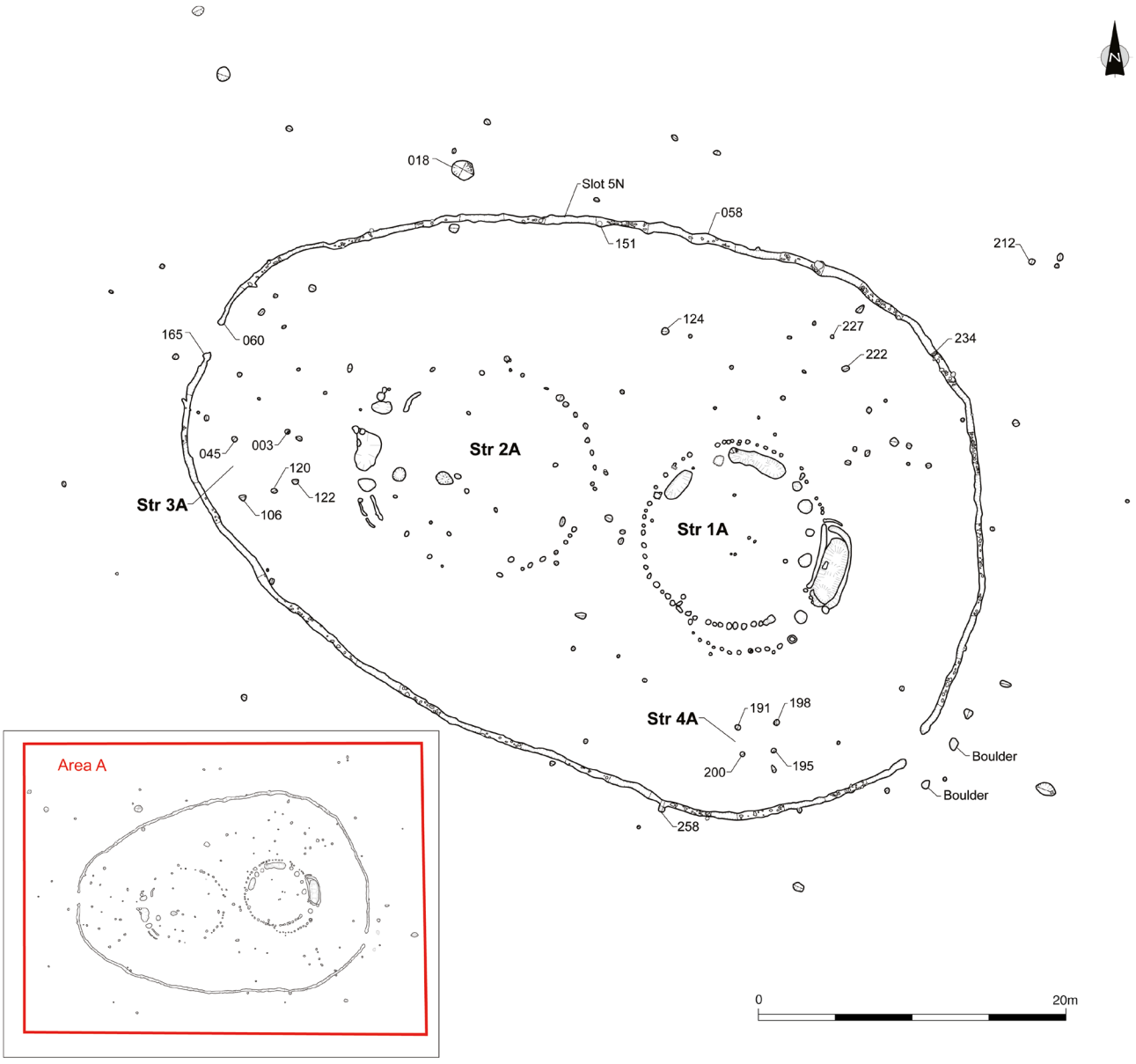
The linear feature, although undated, is not thought to relate to modern agricultural drainage, as at its western arm it ran counter to the prevailing downslope landform. The feature was roughly aligned with a modern field boundary to the north, and may be a former land boundary. Its sinuous nature was reminiscent of the linear feature within Area H (Section 7), and the possibility that it was an old hedge line demarcating land divisions or fields should be considered.

10. THE PALISADED ENCLOSURE (AREA A)

This area represents the final prehistoric period at Blackford with radiocarbon dates generally indicating an Early Iron Age (EIA) period of occupation, although a Middle Bronze Age (MBA) date was returned from a pit within Structure 1A and a pit outside the Iron Age palisaded enclosure. The excavation area covered 3,803m^2, within which were an elliptical palisaded settlement containing two large post-built circular structures; two four-post structures; and numerous pits both within and outside the palisade (Illus 51). The settlement occupied the top of a drumlin and commanded uninterrupted views of the surrounding landscape as well as the other Blackford sites. All the features were cut into the subsoil of yellow-orange sand and gravel.

10.1 The palisade

The palisade trench was examined by the excavation of a series of slots through it (Illus 52), alternately excavated in plan and via longitudinal sections, with the aim of identifying post holes within its fill. Post holes were, however, only identified in the longitudinal sections (eg Slot 5N Illus 51).



Illus 51 Plan of Area A

Illus 52 Aerial view of Area A

The cut of the palisade (058) defined an elliptical enclosure of maximum dimensions of *c* 52m along its north-west/south-east major axis and 36m along its north-east/south-west minor axis. The palisade trench was *c* 0.45m wide by 0.3m deep, with a circumference of *c* 140m. The trench was filled with firmly compacted reddish sand and gravel (059) and packed with angular stones (157) set edgewise. The upper fill of the palisade trench (156) was a discontinuous layer of loosely compacted dark brown to black silt, also containing sub-rounded cobbles and similar to the overlying topsoil (001), possibly suggesting that the palisade had rotted in situ.

Seven pits interpreted as post holes were recorded within the cut of the palisade (Table 19), the majority being found on its northern side and mostly identified in section. The depth of the palisade cut was shallower on its southern side, probably resulting from differential erosion, as the southern half of the palisade occupied a position nearer the break of slope than did the northern half, and consequently had suffered greater attrition. The post holes were seen to be neither evenly spaced nor contiguous.

The evidence of the surviving post holes within the trench suggests that round wooden posts were used in the construction of the palisade, and the presence of angular stones, set edgewise, suggests the use of packing stones. One interpretation is that the palisade was formed from a contiguous series of planks supported by intermittent upright posts.

Table 19 Post-hole dimensions within palisade

PH/Cut	Width	Length	Depth
060	0.28	0.30	0.24
073	0.20	0.20	0.25
074	0.20	0.26	0.40
138	0.25	0.20	0.40
140	0.15	0.20	0.40
151	0.25	0.30	0.50
153	0.20	0.20	0.30
165	0.22	0.36	0.16
234	0.35	0.39	0.17
Average	0.23	0.26	0.31

With the exception of Post Hole 074, no surviving wood or charcoal was recovered from the putative post holes. If these pits functioned as post holes then the wooden posts appear not to have burnt in situ; they may either have decayed or were removed. Post Hole 074 contained fragments of oak charcoal, as did the palisade foundation trench, however it cannot be said for certain where this burnt material originally derived from.

The dimensions of the post holes are given in Table 19. The average diameter of the holes, and by extension the posts themselves, was 0.24m. The post holes were steep-sided and tapered towards their concave bases, suggesting that the post had a similar profile. Five other posts (eg 258 Illus 53b) were cut into the side of the palisade (not visible in plan). One possible explanation for this is that they represent repairs to the palisade after its construction.

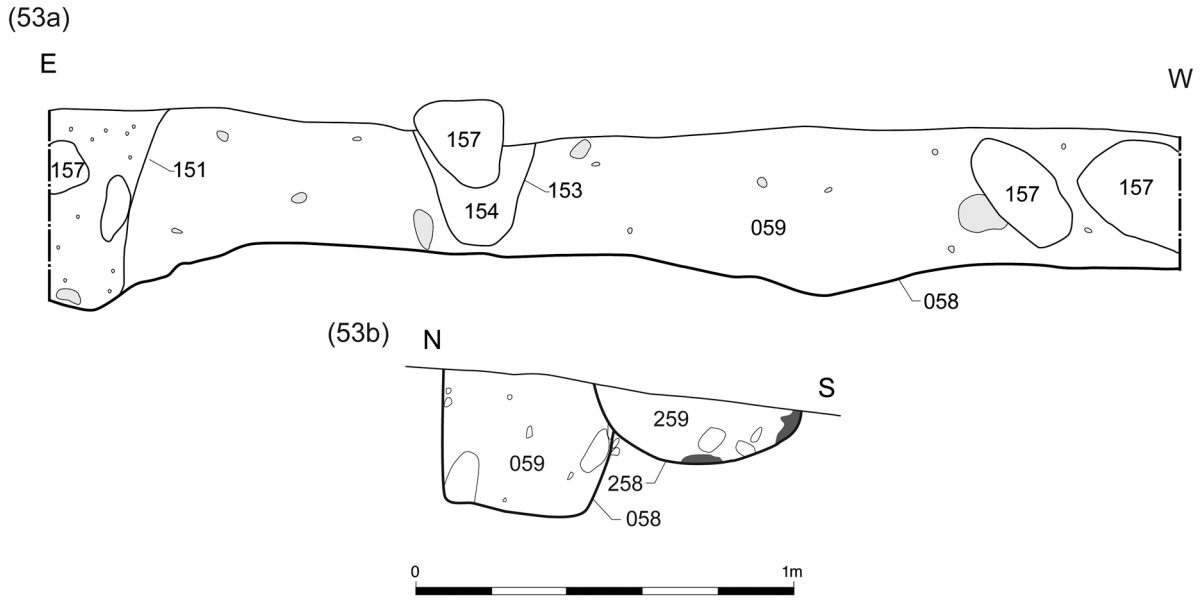
The palisade had two points of access, both *c* 2m wide, and defined by opposing terminals, one to the north-west where the cut of post holes could be seen in section and plan (060 and 165), and the other to the south-east, where no post holes were recorded in section, although the terminals of the palisade show a bulge typical of post holes in plan. Two large sub-angular boulders of length 0.6–0.8m framed the south-east entrance externally, although whether these were placed there deliberately is a matter for conjecture.

10.2 Structure 1A

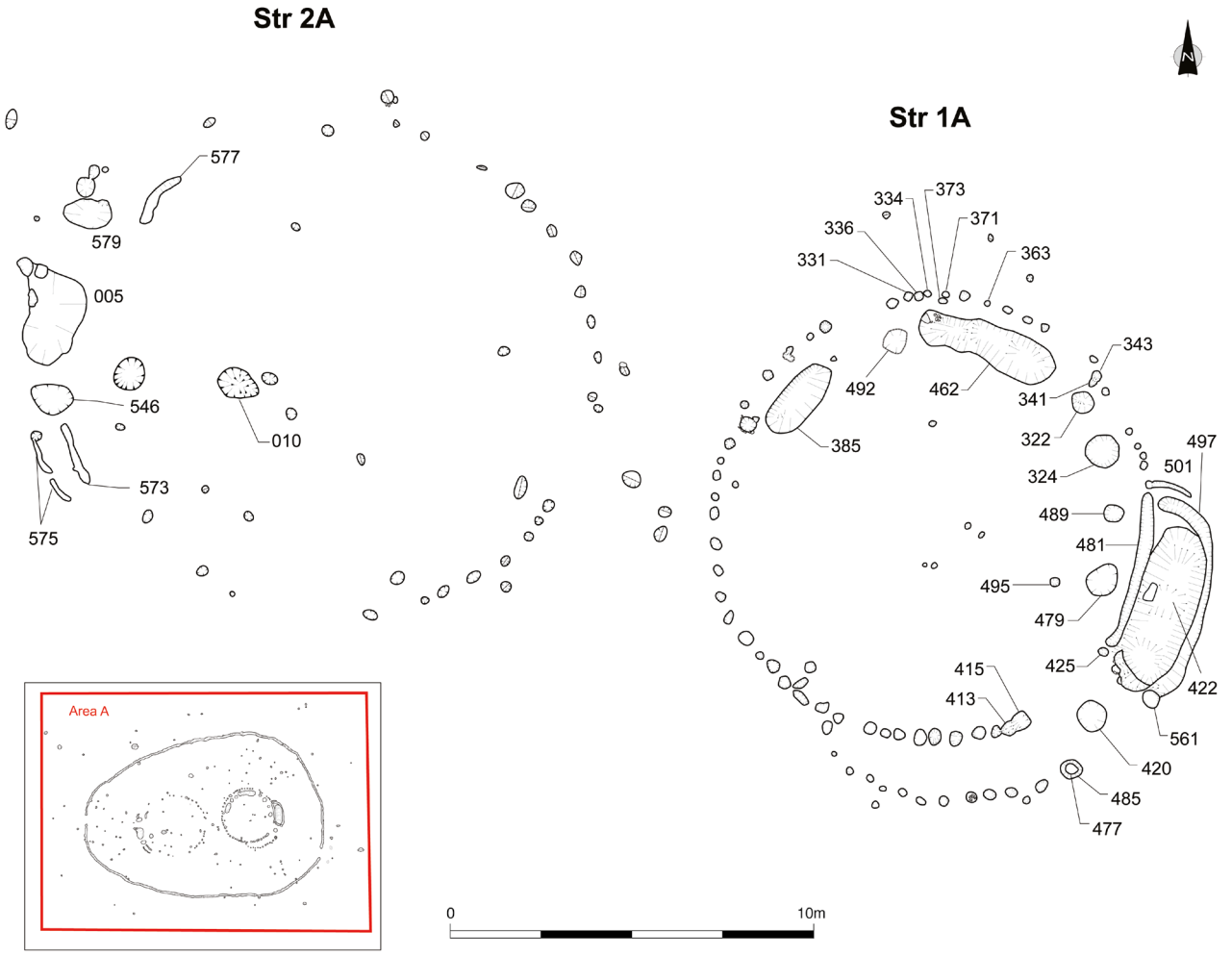
The eastern of the two circular structures was a post-built roundhouse with a pair of annexes on its south and south-east sides (Illus 54). Its diameter was 12m N–S excluding the southern annex and 14m including it. The south-east-facing entrance was defined by a break in the post hole ring. The interior of the house was flat and contained several features. There was an external pit (422) adjacent to the south-east quadrant of the house, bounded on two sides by Gullies 481 and 497, with a further section of truncated gully on its northern side (501).

The ring of 52 post holes, marking the wall of the structure, ranged in size from 0.14m by 0.17m by 0.07m deep to 0.4m by 0.4m by 0.1m. They were circular or oval in form and generally had concave bases and were filled with loosely compacted sandy silt. There was evidence of paired post holes, interpreted as replacements, with Post Holes 413/415, 485/477 and 343/341, and possibly, because of their proximity, 373/371 and 331/336/334. On the south-east side of the house and running along the inner edge of the external pit (422), the gully, 481, was interpreted as a foundation slot for a short section of wall replacing the post hole ring.

The entrance to the main building was defined by four opposing post holes (425, 415, 561 and 477), and a central pit (420) ranging in size from 0.28m



Illus 53 Selected sections of the palisade



Illus 54 Plan of Area A, Structures 1A and 2A

by 0.28m by 0.16m deep to 0.75m by 0.75m by 0.15m deep. The function of Pit 420 could not be determined. The entrance was 3m wide and faced south-east, and was aligned with the south-east entrance of the palisade.

The two annexes were accessed from the porch. The 15 post holes forming the annex to the south-west of the entrance were similar in form to those of the main post ring and ranged in size from 0.15m by 0.15m by 0.05m deep to 0.4m by 0.6m by 0.12m deep and were filled with loosely compacted sandy silt similar in nature to the fills of the post holes forming the outer wall of the structure. The annex to the north-east of the entrance was made up of several features, notably a large pit (422) (4.6m by 1.6m by 0.9m deep; Illus 55a). The pit was filled with three deposits: the upper deposit (423) was a loosely compacted dark brown sandy silt containing sub-rounded cobbles (424), the secondary fill was also a loosely compacted sandy silt but was more orange in colour, as was the primary fill (488). Both appeared to derive from burnt material, an observation supported by the soil micromorphology analysis (see Section 10.7.4). Pit 422 was bounded on three sides by two shallow gullies, both filled with loose mid-brown to grey sandy silt. The inner gully, 481, measured 3.5m by 0.32m by 0.2m deep, and appeared to be a continuation of the main post ring. The outer gully, 497, measured 6.15m by 0.4m by 0.14m. This gully has been interpreted as a trench for a timber wall bounding the exterior of Pit 422, of which the sub-angular to sub-rounded cobbles (424) found within Pit 422 may represent packing. A further gully, 501, was present to the north of Gully 497 and measured 1.4m by 0.12m by 0.05m deep, the function of which could not be

determined. No evidence for a roof was identified on the annex to the south-west of the entrance, but as it formed an extension to the porch it seems likely that both annexes would have been covered.

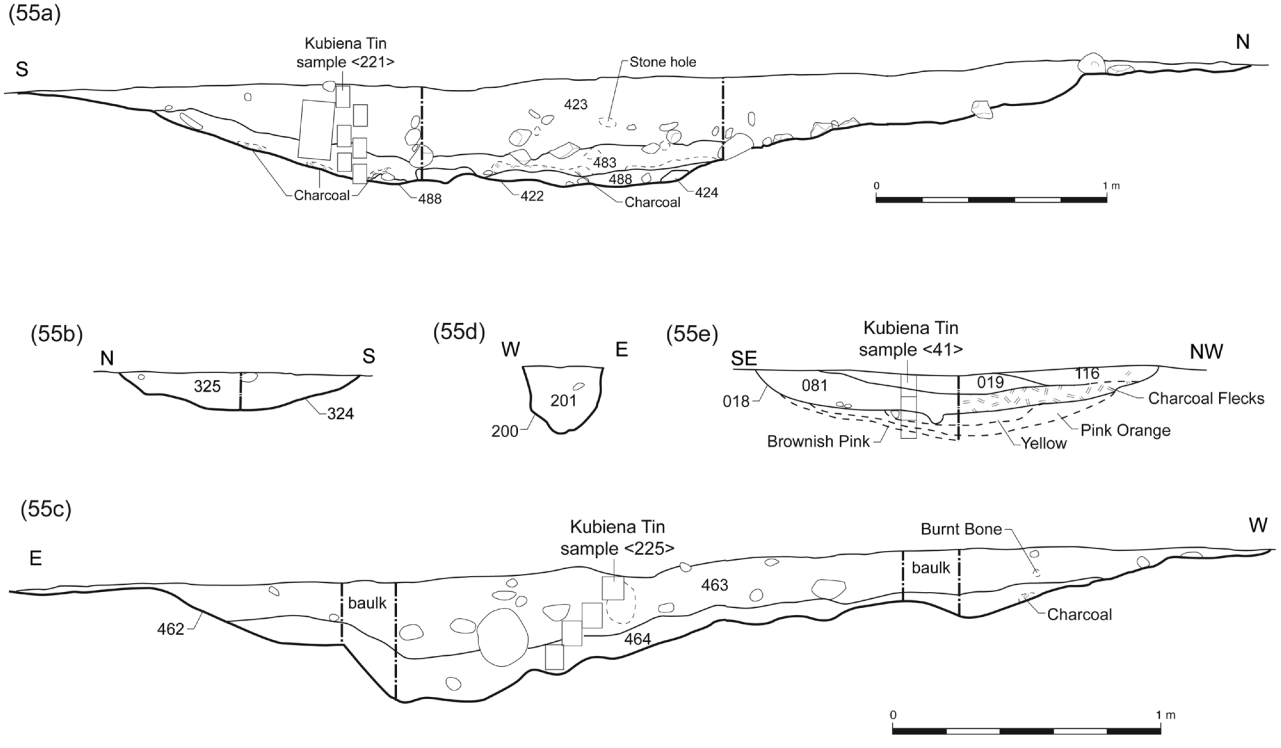
Fourteen internal house features were present. With the exception of 462, all were filled with single deposits of loose sandy silt varying in colour from light grey to brown, none of which contained burnt material suggestive of a hearth. There was an arc of four sub-rounded pits on the north-east side of the house (322, 324 (Illus 55b), 489 and 479) with dimensions ranging in size from 0.5m by 0.68m by 0.12m deep to 1m by 1m by 0.11m deep. Two other large pits were found, one on the north-west side of the house (385) measuring 2.2m by 1m by 0.21m deep, and one on the north side of the house (462 Illus 55c) measuring 3.8m by 1.2m by 0.45m deep. Pit 462 contained two fills, 463 and 464, both containing burnt animal faeces, possibly derived from burnt animal bedding, or from dried fuel (see soil micromorphology at Section 10.7.4 below). A hollow in the north-west part of the house, 492, contained the remains of a possible post-pad (491) fabricated from large flat stones. The other nine internal features were scattered throughout the house and ranged in size from 0.12m by 0.12m by 0.05m, to 0.3m by 0.5m by 0.1m.

10.3 Structure 2A

The western circular structure was post-built, 14m in diameter, and considerably more truncated than Structure 1A (Illus 54). It was principally defined by an arc of post holes on its eastern side, forming the wall of the structure, with a large pit on its north-west side. There were 14 internal features. Due to truncation, the position of the entrance could not be determined with certainty. However, a gap between Features 005 and 579 could represent an entrance that was aligned with the north-west entrance of the palisade.

There were 24 circular and oval post holes in a ring defining the house, with dimensions that ranged from 0.1m by 0.1m by 0.12m deep to 0.45m by 0.50m by 0.25m. Two linear features, 573 and 577, may represent the truncated remains of foundation slots associated with this post ring.

There was an arc of pits, 546, 005 and 579, on the western side of the structure; the largest (005) measured 5.6m by 2m by 0.45m deep. There were 16 other internal features ranging in size



Illus 55 Selected sections of Structures 1A, 4A and external Pit 018, Area A

from 0.18m by 0.21m by 0.05m deep to 1.4m by 1.3m by 6.4m. Three of these features were linear (577, 573 and 575), the rest were sub-circular pits. Although the size and location of Pit 010 suggested a hearth, on excavation it produced no evidence of burnt in-situ deposits or discoloration of the soil indicative of repeated burning, rather the fill contained sub-angular stones possibly used as a packing material. It is possible that Pits 579, 005, 546 and Linear Features 575, 573 and 577 represent an annex similar to that seen in Structure 1A, effectively showing that Structure 2A is a mirror image of Structure 1A; both accompanied by four-post structures (see below) and associated with a respective entrance to the palisade.

10.4 Structures 3A and 4A

These two groups of features were thought to be rectangular structures based on the similarities in their respective post holes in size, form and fills. A similar example (2F) has been recorded elsewhere (see Section 8.2).

The five post holes of Structure 3A (045, 003, 106, 120, 122 Illus 51) were each sub-circular in plan and were approximately 0.3–0.35m in diameter and 0.27–0.34m deep. They each contained a single fill of loosely compacted dark brown silt. The four post holes of Structure 4A (191, 198, 200 (Illus 55d), 195) were circular in plan and varied between 0.3–0.4m in diameter and 0.2–0.28m deep. They were all filled with a single deposit of dark greyish-brown sandy silt. Overall, the structures measured a maximum of 4.25m by 4m and 2.85m by 2.15m respectively.

10.5 Features within and outside the palisade

There were 54 pit features within the palisade enclosure that were not associated with any of the structures. They varied in their form and dimensions but all had fills with sand and silt components reflecting the composition of the natural subsoil. Pit scatters are a common occurrence on prehistoric sites and may have had a myriad of functions, including pits that had a structural component such as post holes, pits that were used for refuse or food processing, and pits that were excavated for ritual and symbolic reasons.

There was no obvious spatial patterning amongst these features that described the foundations of structures in plan. However, the features are undated and further features may have been lost through truncation; both of these effects confound the interpretation of the surviving features. However, it is possible that some of these were foundation pits for the posts in internal fences perhaps associated with stock handling, or they may have served as tethering posts for livestock, totems or even flagpoles.

One pit, 018 (Illus 55e), contained a large cache of cereal grain, and may have been used as a cooking pit in the MBA. Another pit to the east, 212, contained a small piece of vitrified material which was probably intrusive. Other than these two, there was no artefactual evidence relating to any of these pits.

10.6 Artefacts

10.6.1 Pottery

Melanie Johnson

Just three small body sherds were recovered during the excavation in this area. All of the sherds were very abraded.

A single plain body sherd was found in Pit 385 within Structure 1A. A further plain body sherd was recovered from Pit 212 to the exterior of the palisade to the north-east. This feature lies within a small group of three pits, none of which are dated. The fabrics of both of these sherds are fine and lightly gritted, orange in colour, and 5–10mm thick. The sherds are too few in number and are not sufficiently diagnostic to provide independent dating of the features and are likely to be background noise from domestic activities taking place on or near the site.

The third sherd was found during site cleaning and so is unstratified; this sherd is part of a concave neck and is decorated with parallel horizontal incised lines. The fabric is fine and sandy, and orange-brown in colour. This sherd is likely to be a fragment of EBA Beaker or Late Neolithic Impressed Ware. While unstratified, it does suggest some earlier prehistoric activity was taking place somewhere in the vicinity of the site and perhaps plough action has brought sherds into the topsoil from the fills of features.

10.6.2 Vitrified material

Dawn McLaren

A small quantity of vitrified material (NMVR, 26.2g) was recovered from Area A features. Of this, 1.6g was non-magnetic vitrified residue from Post Hole 495 in Structure 1A.

Three small fragments of magnetic, molten iron-rich vitrified material (UIS, 24.6g) were recovered from the fill of an isolated pit (227). No stratigraphic relationship between this pit and the palisade or internal structures could be detected and it is likely to be intrusive. Despite the small amount involved and its recovery from residual contexts, the presence of a small quantity of unclassified iron-rich slag does indicate that ironworking was taking place in the area but is unlikely to be contemporary with the date of the settlement due to the small quantities involved.

10.7 Environmental evidence

10.7.1 Calcined bone

Sue Anderson

This area produced a total of 45.2g of bone distributed across 25 contexts. The majority was recovered from Structure 1A and its annex (30.15g) with the largest single deposit coming from the northern pit (462; 26.2g). One fragment from the upper fill of the latter was submitted for radiocarbon dating (see Section 10.8 below). Where material was identifiable, all fragments were non-human and there was one possible antler fragment.

Fragments from Structure 2A totalled 14.05g, most of which came from Pit 005; none of this material was identifiable. The remaining pieces were recovered from one feature outside the palisade (018), five features inside the palisade (003, 124, 195, 222, 227) and the palisade slot (058, 153). All fragments were tiny and abraded.

10.7.2 Charcoal

Michael Cressey

Four species are represented in Area A (Table 20). Hazel is the most abundant (67%), followed by oak (22%). Both birch and willow are present in low amounts (5%).

Eighteen fragments of oak (7.7g) were recovered from the palisade, along with three fragments of hazel (2.0g). Structure 1A samples from post holes contained oak (1.1g), hazel (0.5g) and beech (3.6g), and samples from the ring ditch fill (483) produced oak (1.8g) and hazel (50.7g). Post holes in Structure 2A contained oak (1.7g) and hazel (1.5g), and oak was also recovered from a charcoal layer (0.5g). Other charcoal was collected from scattered post holes inside and outwith the palisaded area.

10.7.3 Charred plant remains

Mhairi Hastie

Out of 144 samples assessed from this area, only nine contained any grains, and in all but one case, a pit (018), the quantity of grain present in each sample was extremely low, with only one or two very poorly preserved and abraded grains of barley (*Hordeum* sp.) being recovered.

The largest concentration of cereal grain was recovered from Pit 018 outside and to the north of the palisaded enclosure. No other large concentrations of grain were recovered. Small assemblages of cereal grain, seeds of hemp nettle (*Galeopsis* sp.) and hazelnut shell were present in the fills of post holes and pits concentrated primarily at the northern end of Structure 1A. All but two weed seeds were recovered from the fill of Pit 018.

Table 20 Charcoal from Area A

Species	No. of IDs	Weight (g)	% Frequency
Betula sp.	15	9.5	5.6
Corylus avellana	63	113.9	67.0
Quercus sp.	99	37.8	22.2
Salix sp.	6	8.7	5.1
Total	183	169.9	100

The presence of charred plant remains, albeit in very small quantities, may feasibly indicate that some small-scale food processing was being carried out in the structure. Nevertheless, the very small quantity of plant remains recovered does not allow detailed discussion.

Pit 018

The fill of Pit 018 was found to contain a very large volume of burnt cereal grain, over 10,000 grains. The cereal assemblage consisted of almost pure grain which varied in preservation, although most grains were much abraded and this is reflected in the large quantity of small unidentifiable fragments of cereal grain that were present (Table 21). The bulk of the grain could only be identified as barley, yet where preservation was sufficient occasional grains of possible naked barley were identified. Fragments of barley rachis were also recovered, these being identified as the six-row variety. Weed seeds were present, along with the cereal grains, including persicaria, grasses, nipplewort, sedge and club-rush, the majority of which are typical weeds of cultivation. Large quantities of persicaria seeds were recovered from the sample; these are especially found in areas of moist arable soils and their presence along with other wet-loving seeds, such as sedge and club-rush, could indicate a lack of sufficient drainage in the arable fields.

Initial field results suggested that the fill of the pit had been burnt in situ so the pit was interpreted as a firepit, and it was suggested that the large quantity of grain had been accidentally burnt during corn-drying activities. However, soil morphological analysis of sediments from this feature (see Section 10.7.4, Ellis below) suggest that any in-situ burning, if it occurred, may have been masked by the process of rubefaction.

Considering the poor condition of the cereals it is suggested that the assemblage had probably been dumped into the pit. The extremely large quantity

Table 21 Composition of plant remains from Pit 018

Latin name	Plant part	Common name	Quantity
Weed seeds			
Polygonum persicaria/lapithifolium L.	Nutlet	Persicaria/pale persicaria	78 (e)
Lapsana communis L.	Achene	Nipplewort	6 (e)
cf Gramineae indet. (small)	Caryopsis	Small-grained grass	6 (e)
Scripus spp.	Nutlet	Club-rush	12 (e)
Carex spp.	Nutlet	Sedge	18 (e)
Indeterminate	Seed	Indeterminate	12 (e)
Potentially economic species			
Corylus avellana L.	Nutshell	Hazel	12 (e)
Cereal remains			
Triticum sp.	Caryopsis	Wheat	1
Triticum/Hordeum sp.	Caryopsis	Wheat/barley	60 (e)
Hordeum var. *nudum*	Caryopsis	Naked barley	76 (e)
Hordeum sp.	Caryopsis	Barley	11220 (e)
cf *Hordeum* sp.	Caryopsis	Barley	3472 (e)
Hordeum sp.(6-row)	Internode	Six-row barley	6
cf *Avena* sp.	Caryopsis	Oat	12 (e)
Cereal indet.	Caryopsis	Indeterminate	9876 (e)
Cereal indet. (small fragmentary bits)	Caryopsis	Indeterminate	++++

of burnt grain recovered from the pit is unusual. The two main sources of burnt grain on prehistoric sites are: 1) grain stores destroyed by fire; and 2) grain burnt during food preparation or corn-drying. In this case it would seem most likely that the very high concentration of grain is more in keeping with the accidental burning of a grain store, rather than grain simply burnt during small-scale food preparation.

10.7.4 Soil micromorphology

Clare Ellis

Structure 1A, Pit 462

Four Kubiena samples (<225> 1–4) were taken through the fill of Pit 462 (Illus 55c). The lowermost fill (464) comprises poorly sorted silty fine sand with few grit-sized mineral grains and rock fragments. Much of the burnt amorphous organic content has been replaced by iron oxide; there are very few silt-sized and coarse charcoal fragments. Phosphate occurs throughout the organo-mineral material but is particularly concentrated around charcoal fragments and where concentrations of biogenic silica occur. There are a few rounded clasts rich in biogenic silica as well as very few rounded bone fragments. It is possible that some of the dark brown (in OIL) rounded clasts of fragmentary organic matter are the remnants of herbivore coprolites. The context has been disturbed by post-depositional bioturbation. There is a sharp and distinct boundary into the overlying poorly sorted silt, with few fine sand-sized grains and few grit-sized rock fragments (463). The basic composition varies slightly from granule to granule; some granules are dominated by reddish-brown burnt amorphous organic matter, others by pale yellowish-brown, phosphatic amorphous organic matter and others by silt-sized charcoal. Fine sand depleted in organic matter infills a large passage. Fragmentary phytoliths are relatively common but burnt, and unburnt fungal spores are rare. There are a very few minute fragments of bone.

At the base of the lowermost fill (464) are what appear to be redeposited clasts of natural sand turf (with internal graded bedding) that have been burnt. Clasts of more organic-rich turf with fragments of grass ash occur slightly higher up the profile, although bioturbation has resulted in the mixing of the ashy deposit. This deposit, with a relatively high phosphate, charcoal and phytolith content, as well as clasts composed of charcoal, iron oxide and mineral grains, is interpreted as coarse grass/straw that has been mixed with animal faecal matter. One possible explanation is that this deposit is the semi-burnt residue of animal bedding and/or the faecal residues of herbivores such as cattle or horses. This material may have been accidentally burnt, or alternatively it may have been collected, dried and specifically utilised as a fuel. The presence of unburnt fungal spores is indicative of post-depositional decomposition.

The sharp boundary between Fills 464 and 463 demonstrates that there was relatively little mixing of the two contexts by soil fauna; this is perhaps due to a significant break between dumping episodes and/or the dumping of a considerable depth of 463, curtailing soil fauna activity below it in 464. The overlying context, 463, is dominated by burnt amorphous organic matter (presumably fuel residue) that has been juxtaposed with clasts of decomposed charred grasses (possible remnants of animal bedding). The original fabric of this deposit has been destroyed by post-depositional bioturbation.

Structure 1A, south-east annex, Pit 422

Six Kubiena samples (<221> 1–6) were taken through a sequence of fills within Pit 422 (Illus 55a). The lowermost context (483) comprises a poorly to moderately sorted sandy silt with frequent grit-sized rock fragments. The fine material is dominated by dark reddish-brown organo-mineral silt (dark brown in OIL) with common silt-sized charcoal, with approximately 20% granules of charcoal and occasional yellow (phosphate) matter with frequent phytoliths and very few diatoms. There are frequent coarse sand-sized charcoal fragments and very few larger fragments. There is limited mixing of the two sediment types, although there are occasional granules which comprise both sediment types. There is a sharp, prominent wavy boundary between Fills 483 and 423. The overlying context (423) is moderately sorted fine sandy silt with very few grit-sized rock fragments. This is characterised by dominant silt-sized charcoal set within an organo-mineral matrix in which the organic matter is extremely well decomposed. There are very few burnt fungal spores.

The dark reddish-brown fine organo-mineral material within Fill 483 is interpreted as a well-decomposed organic ash residue, probably originally

derived from the burning of turf. The yellow microaggregates and granules with charcoal and frequent phytoliths are construed as residues of a grass-rich fuel, the high quantities of phosphate indicating that this material is likely to be the remnants of burnt animal dung. The presence of diatoms implies that the animals producing the dung were grazed-upon vegetation that was growing in reasonably damp conditions; the incorporation of mineral grains is likely to have occurred as the animals drank from muddy puddles (Courty et al 1989). The survival of a few larger fragments of charcoal may be due to the presence of the occasional root within the turf, although wood may have been used as an initial igniter, if turf was used as a fuel for a domestic fire. The occasional survival of the original fabric, visible in the juxtaposition of the two types of ash within a granule, is evidence of the sequential dumping of probable hearth waste prior to post-depositional bioturbation. The overlying context (423) is interpreted as an ashy deposit (also thought to be mostly derived from turf); the context has been subject to considerable post-depositional bioturbation. However, the presence of frequent mineral grains with orange (in OIL) coatings in the uppermost sample is indicative of the burning of turfs that either had a lower organic content (ie soil that was not so well developed or had been previously stripped) or to which more subsoil/natural was attached than those turfs which produced the ash lower in the deposit.

External Pit 018

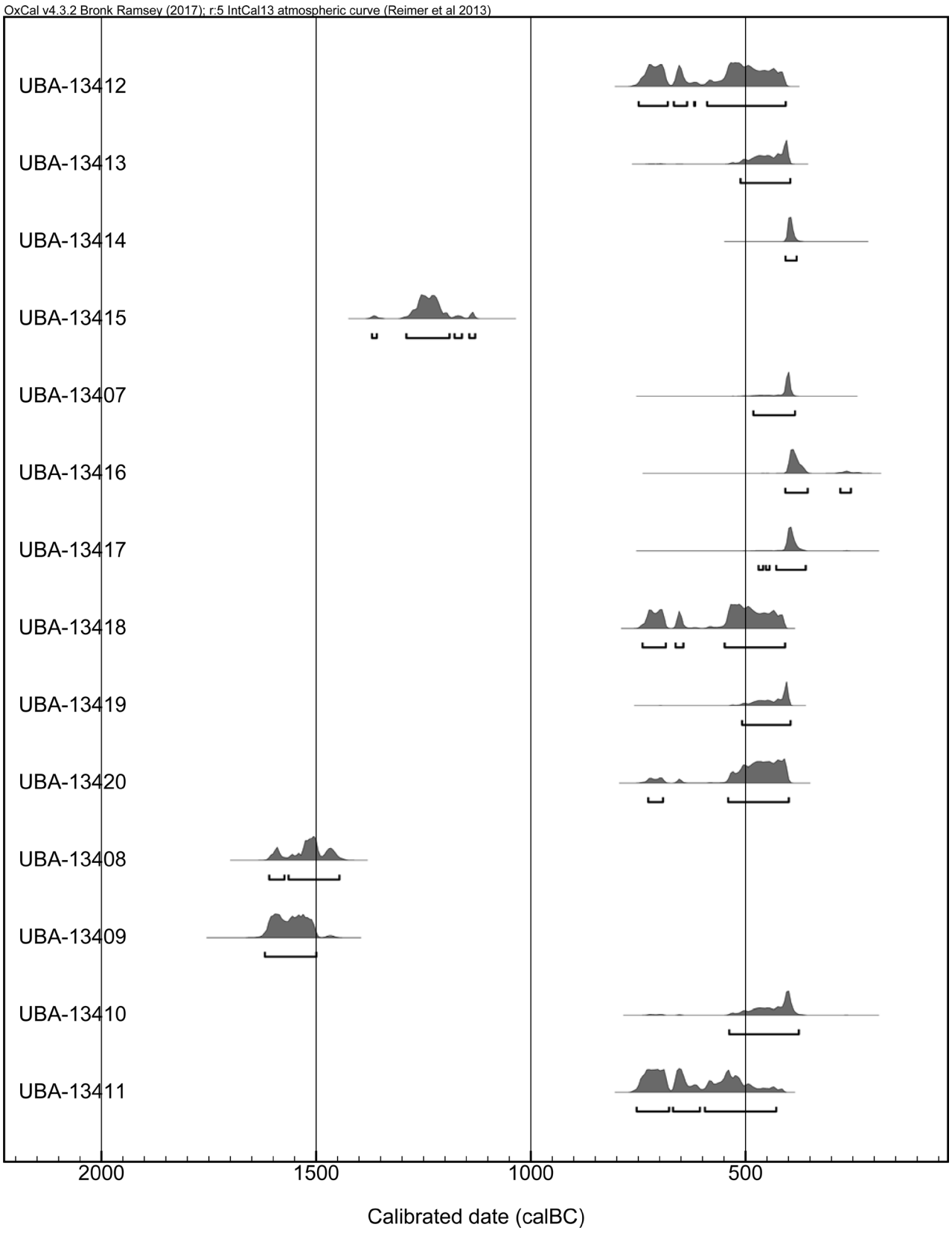
Three Kubiena samples (<41> 1–3) were taken through the fills of Pit 018 (Illus 55e). The lowermost sampled context is the natural (002), moderately sorted fine sand with a few grit-sized rock fragments. The fine organo-mineral component occurs as thin coatings to the mineral grains and rock fragments; this fine material is dark yellow-brown in PPL (plane polarised light) and orange in OIL. There are very few coarse charcoal fragments and very few phytoliths. The natural has been disturbed by post-depositional bioturbation. The basal fill (081) of the pit comprised a poorly to moderately sorted silt with a few fine sand grains with an increasing charcoal content from the base upwards. The boundary between 081 and 019 is diffuse and faint. Context 019 is poorly sorted silty fine sand dominated by burnt amorphous organic matter, with very few silt-sized and coarse charcoal fragments. It contains very few burnt fungal spores, phytoliths and rounded bone fragments. Intensive bioturbation has resulted in both of the pit contexts exhibiting crumb microstructures.

The natural fine sand (002) shows segregation of iron oxides within thin coatings to many of the iron-rich rock fragments and mineral grains; the same is observed in 002 <897>. The former deposit was interpreted in the field as being heat-affected, but given the intensity of iron segregation, the segregation is more likely to be a result of natural rubefaction rather than heat induced; any effects from an in-situ fire would be masked by this natural phenomenon. The overlying deposit (081) is dominated by weathered charcoal, with a few mineral clasts incorporated by soil fauna. The context has been extensively disturbed by soil fauna, but comprises partially combusted organic matter including woody species. The amorphous organic content of C019 appears to have been largely replaced by iron oxides. Together with low quantities of charcoal and minimal biogenic silica this context is thought to include the remnants of a dirty natural and/or mineral-based turf mixed with smaller quantities of wood and/or herbaceous ash.

10.8 Radiocarbon dating

The environmental assemblage, in terms of radiocarbon dating, from this area was very poor in quantity, condition and range of taxa, with much of the material derived from oak, and because of that species' longevity it was excluded from further analysis. Many of the deposits within features were sterile, limiting the choice of what could be targeted for dating. Fourteen dates were obtained from charred barley grains, charcoal from hazel, alder and birch and one date from a large mammal bone (Table 22; Illus 56). Nine dates were returned from Structure 1A, one from Structure 2A, one from Structure 4A, one from the palisade trench and two from an external pit. The majority of dates suggest an occupation period in the EIA, although MBA activity is indicated from the date range 1624–1495 cal BC (95% probability; UBA-13409).

Pit 018 appears to pre-date the palisade, having two MBA dates which are not statistically



Illus 56 Radiocarbon dates, Area A

Table 22 Radiocarbon dates, Area A. Calibration was conducted using OxCal v4.1.7, using the IntCal09 calibration curve

Lab no.	Material	Context description	Date BP	95% probability	$\delta^{13}C$ ‰
Str 1A					
UBA-13412	Hazel charcoal	Primary fill of Pit 324	2441±25	749–408 BC	–26.1
UBA-13413	Hazel charcoal	Fill of Pit 385	2382±20	512–397 BC	–28.8
UBA-13414	Hazel charcoal	Fill of Pit 385	2331±19	406–385 BC	–30.3
UBA-13415	Alder charcoal	Fill of Pit 385	3001±19	1370–1132 BC	–26.9
UBA-13407	Large mammal	Upper fill of Pit 462	2355±20	505–387 BC	–28.0
UBA-13416	Naked barley	Upper fill of Pit 462	2307±27	407–236 BC	–23.8
UBA-13417	Naked barley	Upper fill of Pit 462	2330±26	483–263 BC	–26.6
UBA-13418	Hazel charcoal	Upper fill of Pit 462	2437±18	742–409 BC	–26.5
UBA-13419	Hazel charcoal	Upper fill of Pit 462	2378±18	511–396 BC	–25.5
Str 2A					
UBA-13420	Hazel charcoal	Upper fill of Pit 005	2402±26	726–399 BC	–24.3
External feature					
UBA-13408	Barley indet.	Primary fill of Pit 018	3244±25	1607–1446 BC	–27.7
UBA-13409	Barley indet.	Primary fill of Pit 018	3277±27	1624–1495 BC	–29.8
Str 4A					
UBA-13410	Hazel charcoal	Fill of Post Hole 200	2359±33	701–381 BC	–30.9
Palisade post hole					
UBA-13411	Birch charcoal	Fill of Post Hole 258	2459±19	753–414 BC	–25.6

significantly different. These can be combined to provide an average date range of 1615–1470 cal BC.

No dateable material was retrieved from the palisade deposits. Therefore material from Pit 258 that cut the palisade was used, which returned a date of 753–414 cal BC (95% probability; UBA-13411). However, there are a number of caveats associated with this date. The pit may have been the remains of a post hole that cut the palisade, and therefore is stratigraphically later than the palisade. Alternatively, the feature may have been a foundation for a palisade post or a later replacement post during the construction or use of the palisade, or the position of Post Hole 258 may be entirely coincidental and unrelated to the palisade construction and would therefore post-date the palisade. The charcoal could have become incorporated within the fill of the post hole either when the packing deposit was shovelled into the post hole to secure the post, thus dating the construction event of the post hole, or anytime afterwards through the action of bioturbation or other physical means such as modern ploughing.

Of the five dates from the lower deposit of Pit 462 in Structure 1A, two were returned from naked barley grains (UBA-13416 and UBA-13417). Cereal grains will generally deteriorate more quickly when exposed to the elements than wood or bone, so those which become incorporated into feature fills are unlikely to have been lying on the ground surface for very long. However, as the dated material is light and relatively small it is possible that it became incorporated into the fill through taphonomic processes after the pit was filled with deposits.

Three dates were obtained from charcoal retrieved from Pit 385 in Structure 1A, one of which (UBA-13415) was an outlier. The other two were consistent to 95% confidence level returned from a chi-squared test, and the outlier is assumed to be

residual given that the dates from the palisade and houses are consistent within a reasonably narrow date range. But, as with the dates returned from Post Holes 200 and 005, there was no evidence of in-situ burning, thus suggesting the charcoal was intrusive, and it could have become incorporated into the post holes during the emplacement of the post within the hole, or during the structure's lifetime as the material sifted its way down through the loosened earth, or even after the post had rotted away or was robbed out. Generally, however, the dates are consistent with a settlement occupied in the middle of the first millennium BC, although the evidence is mixed and the taphonomic security of dated samples must be taken into consideration.

The earliest date from the site indicates MBA activity (Pit 018), but the majority of the dates indicate an EIA phase of occupation. With the exception of Pit 018, the pits both within and outside the palisade have not been dated and may relate to activities spanning the period from the MBA to the EIA, but equally could fall outside this date range.

10.9 Discussion

10.9.1 Phasing

The only stratigraphically related features on site were the intercutting post holes in Structure 1A: 413/415, 485/477 and 343/341, the post holes that cut the palisade (eg 258) and possibly, because of their proximity, 373/371, 331/336 and 334. These are likely to represent running repairs to degraded posts within that structure's lifetime. Aside from these repairs, the fact that all the features physically respect each other suggests a planned layout and the probability that the entire site was contemporaneous. The planned nature of the site is also reflected in the orientation of the entrances to the houses and their alignment to and equal distances from the corresponding entrances in the palisade.

Whether Structures 1A and 2A were in use at the same time largely depends on the interpretation of the form of their roofs, as the radiocarbon date ranges for both structures overlap. If the eaves from the roofs projected out and down to ground level then the structures could not be contemporary as the space between them would have been too narrow to accommodate the projecting eaves. There was no evidence, in the form of drip-gullies or foundation slots for the eaves, to intimate that the roofs projected to ground level. If, however, the eaves of the structures were cut short at the height of the external curtain wall, then the two structures could have stood at the same time, separated by a sheltered corridor.

The radiocarbon dates returned from this site indicate an EIA period of occupation. However, dates returned from Pit 018 indicate MBA activity. Pottery recovered from unstratified contexts was identified as EBA Beaker or Late Neolithic Impressed Ware and also attests to earlier phases of activity within the area.

10.9.2 Architectural features of the structures

There are both differences and similarities in the architecture of Structures 1A and 2A when compared with the MBA/LBA structures at Blackford. The necessity for ring grooves for the foundation of the outer walls has been overcome here by constructing a contiguous post-built wall, as indicated by the proximity of the post holes of the post hole ring in Structure 1A. Given the close spacing of the post holes it is probable that the walls were formed as a continuous woven basket, broken only at the entrance directly utilising the posts within the post ring. The post holes on the eastern side of Structure 1A had been replaced by a small section of a foundation slot (481), presumably into which a wall had been secured. A similar argument could be made for Structure 2A, with linear features 573 and 577 representing the remains of a wall foundation. There was no evidence for post holes within its cut, nor chocking stones for securing either posts or planks. It may be that the four pits (322, 324, 489 and 498) offered extra load-bearing potential at this juncture.

The evidence for ring ditches and their function has been discussed above (Section 4). However, where internal pits survived in the Area A structures, they were shallow and did not occupy proportionately as much of the internal floor space as those found in the MBA structures. Indeed, in Structure 1A a pit was excavated within an annex to the building, and if it is accepted that Grooves 497 and 481 were foundations for a wall then this pit may also have been covered by an extension of the

structure's roof. Finally, the size of the structures of upwards of 14m in diameter made these the biggest structures identified during the entire excavation. The possible post pad (492/491) and the arc of pits on the eastern quadrant of the house (322, 324, 489 and 479) may also have contained posts to increase roof support for this large building.

No parallels have been found for these structures at other Scottish sites. Perhaps the closest parallels are the stake-wall roundhouses found in some parts of south-west England and Wales, particularly an example at Frilford, Oxfordshire (Harding 2009: fig 12.5). However, all of these structures are less than 10m in diameter, and it has been suggested that this type of structure could not have supported a roof if it was more than 7.5m in diameter (Coles 1973: 59). Whether this applies to the stronger posts which must have been employed at Blackford is uncertain. However, it seems unlikely that Structure 1A, at least, was simply a stock enclosure, as Harding proposes for Frilford (Harding 2009: 70), since a corral would not require annexes and is unlikely to have had concentric ring ditches.

As well as differences, Structures 1A and 2A show similarities with the earlier MBA structures. Their general plan is circular and they were post-built. The entrance of Structure 1A was orientated to the south-east, the same orientation adopted by the builders of the MBA structures, where determined. However, the orientation of the entrance to Structure 2A, as defined by opposing Features 005 and 579, appears to be to the north-west. Although almost all of the other structures at Blackford have entrances to the south-east, the entrance for Structure 2A is orientated towards the entrance through the palisade enclosure, suggesting that this was a more important factor than those driving a south-east entrance bias.

Structures 3A and 4A were interpreted as structures based on the spatial arrangement of the post holes and their similarity in size and form. Comparable structures have been recorded at Little Woodbury (Ellison & Drewett 1971: 85) and at Dryburn Bridge (Dunwell 2007). Early interpretation by Bersu (1940) suggested they were raised granary stores. The post holes that were analysed for charred grain (50% in total) did not contain any cereal grain, further only one post hole of Structure 2A (200) contained a small amount of charcoal. During excavation there was no indication of a destruction layer sealing the structures. There is no evidence therefore that these structures burnt down, and the possibility exists that they were emptied of grain on abandonment of the site. Other explanations for the function of these rectangular structures have included small buildings, animal pens, watchtowers, exposure platforms for the excarnation of the dead, and porches relating to circular structures the rest of which have not survived (Ellison & Drewett 1971; Guilbert 1975; Guilbert 1981; Kendrick 1995: 64). The possibility that these are remnants of earlier structures, although not completely dismissible, is thought in this case to be unlikely. Had they been porch structures, they were not orientated to the south-east as are those of the majority of structures across the entire excavation. There was no evidence of the rest of such putative circular structures or which direction they may have been orientated. The possibility that they were watchtowers associated with a defended settlement in a time of internecine strife is supported by their proximity to the two points of egress through the palisade. However, the rectangular structures are also proximally close to Structures 1A and 2A, and may in some way be related to activities associated with those houses, such as storage or animal pens.

The palisade may have filled a single or multiple purposes. Depending on its height, which cannot be estimated from its foundation trench because the original depth of the trench cannot be ascertained due to truncation, the palisade may have served as a defensive structure against marauders or against the elements, for stock control purposes, as well as having symbolic and status elements, particularly if it was designed to be an imposing structure set atop a hill.

There was no evidence to explain why an elliptical palisade was constructed, rather than a circular or rectangular one. There were no obstacles to the west such as boulders, protruding bedrock or indications of dense tree cover, surviving as tree boles that could account for the tapering of the palisade at this point. Whether there were physical obstacles at the time of construction which have subsequently been removed or have eroded away is unknown. If it were oval in form, such as the enclosures at Dryburn Bridge (Dunwell 2007) and at Braehead (Ellis 2007), then its enclosed space would be greater, as would the ergonomics of building it and the requirement for raw materials. One possibility is that the shape

was dictated by the activity within the enclosure: a cluster of pits to the north-east of Structure 1A was physically respected by the palisade, and although there is a lesser cluster of pits to the north-west of Structure 2A, they are closer to the structure, therefore less space needed to be enclosed.

The exact height of the palisade cannot be predicted from the depth of its foundation trench as this feature has undergone horizontal truncation. However, one would expect that if the purpose of the palisade was defensive then its height would need to be substantial. If its purpose was defensive and its height restricted viewing over the top of the structure, then a raised parapet running along the inside of the palisade would have been necessary. The width and depth of the foundation trench, even after truncation, was big enough for it to have held sturdy posts of *c* 0.4m diameter, larger than modern telegraph poles, and planks rather than a thin wall of wattle construction. If the construction of the palisade was a direct response to offensive action then the two four-post structures, Structures 3A and 4A, may be interpreted as guard towers, as both are placed adjacent to entrances.

The palisade appeared to have incorporated both round and tapered posts and probably planks in its construction. Although there was no direct evidence of the material used, eg waterlogged wood remains within post holes, there is indirect evidence of the extensive use of oak as compared to other species of wood represented across the site. A palisade of plank- and post-built construction has been suggested for the later prehistoric enclosure at Braehead (Ellis 2007). Material from one of the post holes of the palisade (258) returned a radiocarbon date range of 753–414 cal BC, similar to that returned from the remnants of an oak plank from the Braehead enclosure, 800–480 cal BC.

There were two breaks representing the palisade's entrances; one to the south-east the other to the north-west, which were defined by the palisade's terminal ends and associated post holes. There was no direct evidence for a gated structure at either of the two proposed egresses; the post holes (165 and 060) could equally have functioned as straining posts for the palisade. Assuming that the egresses were gated, they were not elaborate like those at Braehead (Ellis 2007: 247). The apparent strategic placement of the two boulders outside the south-east entrance may have had a function to do with access through the entrance, or they may have been markers or ritual statements related to the enclosure and its occupants.

The palisade foundation slot would have been excavated first: the reason for a continuous trench rather than a series of contiguous post holes was that the ground-breaking only had to be done once (Hansen 1959; Harding 1974) and a continuous foundation trench allows more leeway for the subsequent placing of posts. On completion of the excavation, or part thereof, the upright posts and planks were secured into the bottom of the trench and the trench backfilled with the excavated material, including the stones, some of which appear to have been used as edge-set chocking stones. The use of stone packing material has been noted at Braehead (Ellis 2007), Dryburn Bridge (Dunwell 2007) and at many other similar sites.

There were a number of pit features across the site. They broadly fall into three groupings, those to the north-east of Structure 1A, north-west of Structure 2A and those outside the palisade. With the exception of Feature 018, which is much earlier in date, they remain undated. Similarly, other than the obvious proximity of pits to Structures 1A and 2A, there was nothing in their spatial arrangement indicative of structures or functions. The functions of these pits, ubiquitous on prehistoric sites, have been interpreted in many ways, including as post holes for fences and internal divisions, tethering posts for animals, flag or totem poles and refuse and latrine pits. Storage pits are another explanation and Pit 018 with its cache of grain may be such an example.

10.9.3 Finds distribution and taphonomy (Illus 57)

The artefact assemblage was extremely poor and does not allow for a detailed analysis. The unstratified possible EBA Beaker or Late Neolithic Impressed Ware testifies to earlier prehistoric activity within the vicinity of the excavation.

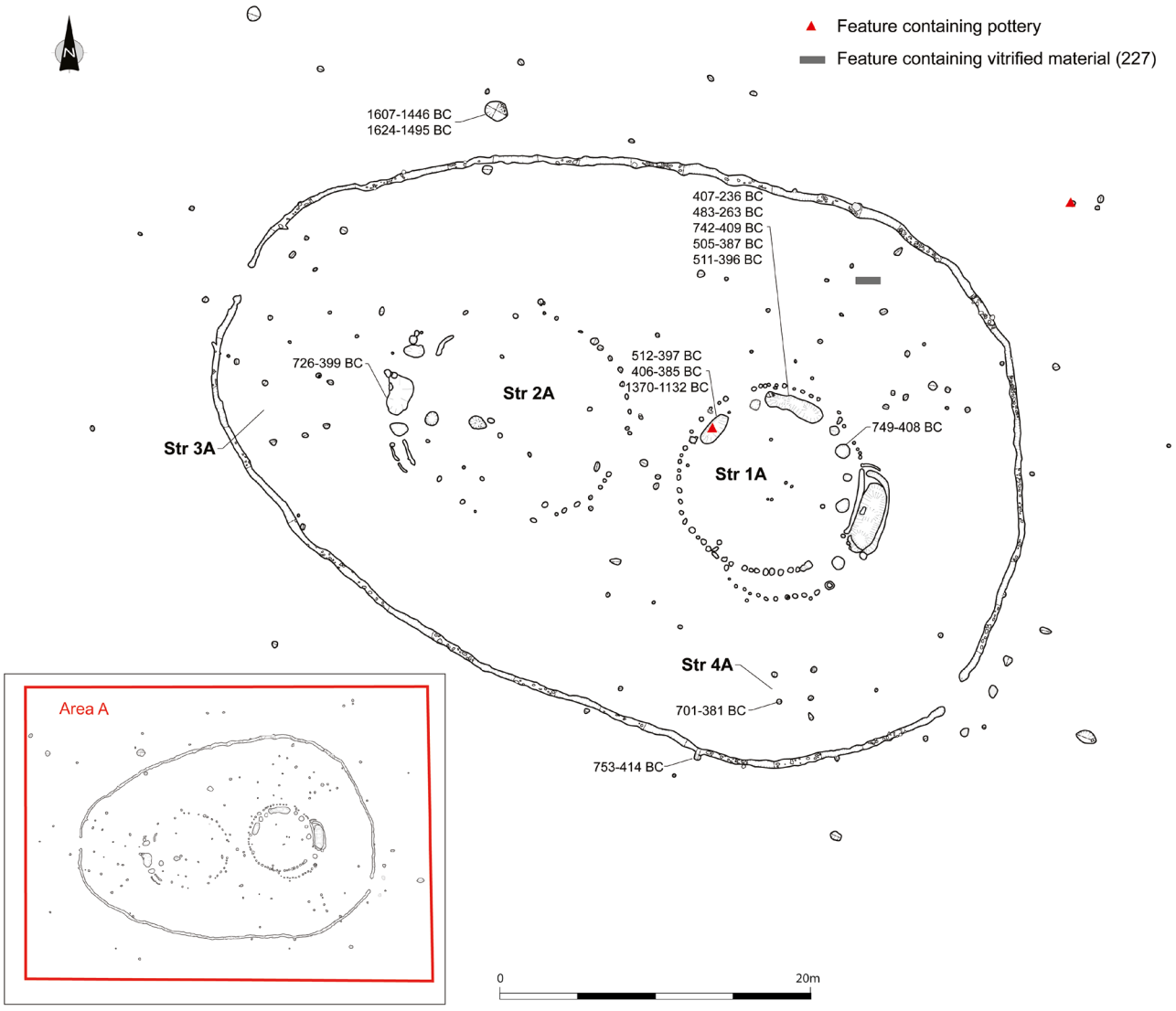
Pottery was recovered from the fill of Pit 385, and it is perhaps not a surprise in a domestic setting that some pottery was caught in what might be considered an artefact trap. What is perhaps more surprising is the lack of pottery across the structures within Area A. There are a number of explanations for this phenomenon. First, the occupants were not using much pottery, either out of preference or for

economic reasons, ie lack of available raw material or limited access to finished products. Although pottery is ideally suited for use as cooking vessels, it is not needed for eating or serving, where wooden, leather or basketry vessels are adequate. The lack of pottery may then just be a reflection of the original artefact assemblage and/or differential survival rates within the assemblage. Pottery sherds may have been present within other internal features of the circular structures, which have now been entirely removed, along with any pottery sherds, by subsequent ploughing. Or the sources of clay had over the thousand years of occupation at Blackford become depleted, which seems unlikely given the landscape.

The three small amorphous fragments of unclassified iron-rich slag that were recovered from Pit 227 may be intrusive material, as there was no other evidence of metalworking on site; Feature 227 was extremely truncated, only measuring 0.2m in diameter by 0.02m deep.

10.9.4 Economy and production

There is little evidence relating to economy and production. The charred cereal and artefact assemblage is poor. Pit 018 contained the highest concentration of charred grain and weed seeds. The combined paired dates from this pit returned a MBA radiocarbon age range of 1615–1470 cal BC. Analysis of the soil micromorphology suggests that if there had been any in-situ burning within the pit, it had been masked by the process of rubefaction. The upper deposit of Pit 018 contained partially combusted organic matter and charcoal, and coupled



Illus 57 Finds and dating distribution plan, Area A

with the presence of charred grain suggests that the cereal was being processed through heat, probably cooking, and became burnt and subsequently dumped into the pit during the process.

The pit contained weed seeds that are associated with crop husbandry and that thrived in moist conditions (see Hastie, Section 10.7.3 above). Of particular interest was the presence of nipplewort (*Lapsana communis*). It has been suggested that this plant is indicative of long fallow cultivation because of its shade tolerance and ability to grow in shaded cultivation plots within woodland (Whittle 1997), while others have suggested that the shade was provided by hedgerows enclosing the cultivation plots (Bogaard 2004), and yet others that the shade may have been cast by stands of trees or single trees left standing within small cultivation plots (Bakels 1978, cited in Milisauskas & Kruk 1989). The degree of deforestation during the MBA at Blackford is not known, and either scenario, of cultivation within woodland clearings or cultivation in plots bounded by shade-producing hedges, is possible. Although there was no evidence of field boundaries that might represent hedgerows within Area A, in Areas D and H there were linear features that, because of their sinuous and irregular nature, may qualify as the remains of such boundaries. The other weed seeds were indicative of poorly drained soils. Hastie (10.7.3 above) suggests that this may be due to poorly drained arable fields, however, field observation suggests that the subsoil across the site with its high concentration of gravels was largely free draining. Only in some low-lying areas such as Area D were modern field drains in use. It is possible that the crops were either grown in the small valleys between the drumlins, or possibly in woodland clearances, both qualifying as wetter areas. Both naked and hulled barley were also present. Naked barley was a staple cultivar in Scotland from the Neolithic to the Iron Age, and its presence within a MBA context is no surprise; however, hulled barley was a later introduction within the Scottish context more usually associated with the LBA and the IA (Iron Age) rather than the MBA (Dickson & Dickson 2000).

Naked barley was still being cultivated during the EIA period at 407–263 BC (UBA-13416 and UBA-13417). The small quantity of cereal grains recovered from structural features were all from Structure 1A, and were concentrated in the northern sector of the structure, in Features 363, 385, 462, along with a summer-flowering European annual weed, hemp nettle (*Galeopsis* sp.). The latter, while a typical weed plant in cereal crops, may also have been deliberately collected, as the seeds have some medicinal properties and the stem is useful for the manufacture of rope and textile. The skewed northerly distribution of cereal grains may have derived from the putative animal bedding that was burnt in situ (see soil micromorphology, Section 10.7.4 above).

The lack of chaff in either the MBA or EIA assemblages suggests that the processing of the harvested ears of grain was not undertaken within the structures, although the lack of chaff is a common feature of archaeobotanical assemblages across Scotland in these periods, and the distribution within the pits in Structure 1A is likely to be the result of grains that became charred during the food processing stage and were swept in or otherwise incorporated within these features. The presence of such a small amount of grain within these pits is more likely related to accidental rather than deliberate deposition.

The poor artefact assemblage does not allow detailed interpretation of either the manufacturing process or the distribution of the finds. Pottery was recovered from only two contexts: Pit 385 in Structure 1A and a small external pit, 212, both deposits likely to be the result of accidental rather than structured deposition. The material in Pit 385 may have become deposited during floor-sweeping episodes.

Evidence for ironworking was found in the form of three small amorphous fragments of unclassified iron-rich slag which were recovered from Pit 227. The low quantity and insecure context within a very truncated feature, coupled with the lack of evidence of iron industry, could mean the material is simply intrusive and may not be contemporary with the site.

10.9.5 Structure use

As with other areas, when addressing the function of Structures 1A and 2A it cannot be assumed that the presence of a ring of post holes means that the posts supported a ring-beam and other elements of a

roof. If the structures were unroofed then a plausible explanation of function could be as animal corrals. However, it seems unlikely that an animal corral would need further protection from an extensive palisade, or external pits, or a post-built annex like Structure 1A. It is argued that these elements are indicative of a structure designed primarily for human use, and by extension, although the features are considerably more truncated, so was Structure 2A. The lack of artefactual evidence from the structures precludes analysis as to whether the structures were used as houses, workshops or both. The opposing, seemingly planned, orientations of the house entrances to the south-east and north-west, which also align with the south-east and north-west entrances of the palisade, raises questions as to whether the houses had ritualistic or other meaningful uses.

The form and depth of the internal pits within Structure 1A are suggestive of wear caused by animals and/or the repeated cleaning-out of used animal bedding and excrement. The external pit (422) of Structure 1A also displayed three distinctive wear patterns at the base of its cut that could also have resulted from stalling animals. The soil micromorphology analysis offers some clues regarding the function of these pits. The lower fill (464) of Pit 462 has been interpreted by Ellis as burnt material composed of coarse grass/straw mixed with faecal residues of herbivores such as cattle and horses. Ellis offers two possible explanations: either the material was animal bedding that had burnt in situ in the bottom of the pit, or the material was collected, dried and used as fuel, the burnt end-product of which was deposited within the pit.

If the material was burnt in situ it would likely have been associated with a hearth. The pit was not interpreted as a hearth because of its proximity to the wall of the structure, its position at the back of the house and the fact that there was no evidence of burnt subsoil. Ellis notes a sharp boundary between the lower fill, 464, and the upper fill, 463, suggesting a two-stage depositional event rather than a period of sequential dumping as one may expect if these fills derived from regularly cleaning out a hearth.

The lower fill (483) of Pit 422 contained ash residue derived from the burning of turfs and a high concentration of phosphate. Furthermore, this material appears to have been sequentially dumped, something that Ellis interprets as the dumping of hearth material. This deposit may represent the build-up of animal dung and bedding which was periodically covered with ash from the fire for sanitary reasons.

The balance of evidence suggests that both the external and internal pits in Structure 1A could have been used as animal stalls.

10.9.6 Site abandonment

There were few intercutting features or other evidence for major re-structuring or rebuilding within the area suggestive of a single phase of occupation followed by abandonment. The soil micromorphology analysis indicates that turfs were burnt and incorporated into the upper fill of Pit 422. It seems unlikely that these turfs were used as fuel, the waste of which was used to fill a pit. An alternative explanation would be that this material derived from the roof when the building burnt down. However, there was no extensive layer that was interpreted in the field as a destruction layer, although both the upper fills of Pits 462 and 385 appeared to be the same as a charcoal-rich deposit that masked both these features and the intervening post holes pre-excavation. It may be that this deposit was the vestigial remains of a destruction layer, some of which had been truncated away.

The general lack of evidence for in-situ burning across the whole of the site lends support to the hypothesis that the site was abandoned but not burnt down.

11. DISCUSSION

The Blackford excavations have provided an insight into prehistoric settlement, architecture, ritual and socio-economic patterns produced over a millennium of occupation, principally from the MBA to the EIA. The most striking component of this prehistoric evidence is the range of circular structures. Fifteen such structures were recognised, with the possibility of up to four others that were too truncated to be securely assigned. Structures such as these are usually assumed to be houses, although their function may not be immediately obvious from the material remains. It is probable that a multitude of domestic and industrial activities took place within these houses, including cooking, weaving and other crafts. It is also possible that the structures housed the family's animals.

11.1 Chronology and overview

11.1.1 Mesolithic and Neolithic

The earliest radiocarbon dates returned from the excavations were Late Mesolithic, derived from hazelnut shells found within a spread of burnt material in Area E, which is interpreted as a burnt mound. Burnt mounds are usually associated with the Bronze Age although a putative Mesolithic example was excavated on the route of the M74 at Kirkhill Farm (NRHE No. NY19SW 59), Dumfries and Galloway (Pollard 1993), where Mesolithic flint tools were found within its matrix: however, it should be kept in mind that there are many mechanisms by which flint, and indeed burnt hazelnut shells, could become incorporated into the matrix of a later burnt mound.

The spread of burnt material may have derived from food processing and cooking. It is possible that the hazelnut shells may have been burnt elsewhere and are a residual element not directly associated with this feature. However, there is no record of Mesolithic activity within the environs of Blackford in the RCAHMS database, HER or literature, and with the exception of these dates no evidence of Mesolithic activity within the Blackford excavations. The parsimonious interpretation is that the nutshells were burnt during food processing activities in the Late Mesolithic and discarded along with the other burnt material within the burnt spread.

Early prehistoric activity appears again in Area X with Early Neolithic pottery deposited in a partially filled pit, either by natural means or deliberately.

11.1.2 Early Bronze Age (EBA)

There is a break in evidence for human activity until the EBA, when the deposition of Beaker pottery occurred in a pit in Area X. The pottery was found in association with cereal grains dated to 2466–2236 cal BC. No structures were found within this area; circular structures make their first appearance at Blackford during the MBA. The first evidence of cremation burials, dated to the EBA, was also discovered in Area X. Unstratified EBA pottery was also found during the site preparation phases in Areas A and C.

11.1.3 Middle Bronze Age (MBA)

The MBA is the most represented period at Blackford, with more of the radiocarbon dates falling within this period than any other. The period is characterised by the construction of groups of circular structures with internal ring ditches, some of which, such as those in Areas C and E, were enclosed within a palisade. The enclosing of the houses may have been a response to threats of violence, the weather, separation of livestock from the houses, or an exhibition of status. Another notable feature is the south-east orientation of the entrances. Naked barley was being processed, a crop found on other prehistoric sites because of its suitability to the Scottish climate. We also see the introduction of emmer wheat. Craft specialisation is represented by the manufacture of cannel coal jewellery.

11.1.4 Late Bronze Age (LBA)

Material from two circular structures (Areas F and D) was dated to the LBA. These structures in the main differ from the MBA structures with the loss of the ring ditch, although Structures 2B and 6B in Area B had putative ring ditches. The tradition of a south-east-facing entrance continued and the appearance of the first four-post structure was seen in Area F. A cremation in an urn burial and another

possible cremation deposit were discovered (see Section 11.4 for further discussion).

11.1.5 Early Iron Age (EIA)

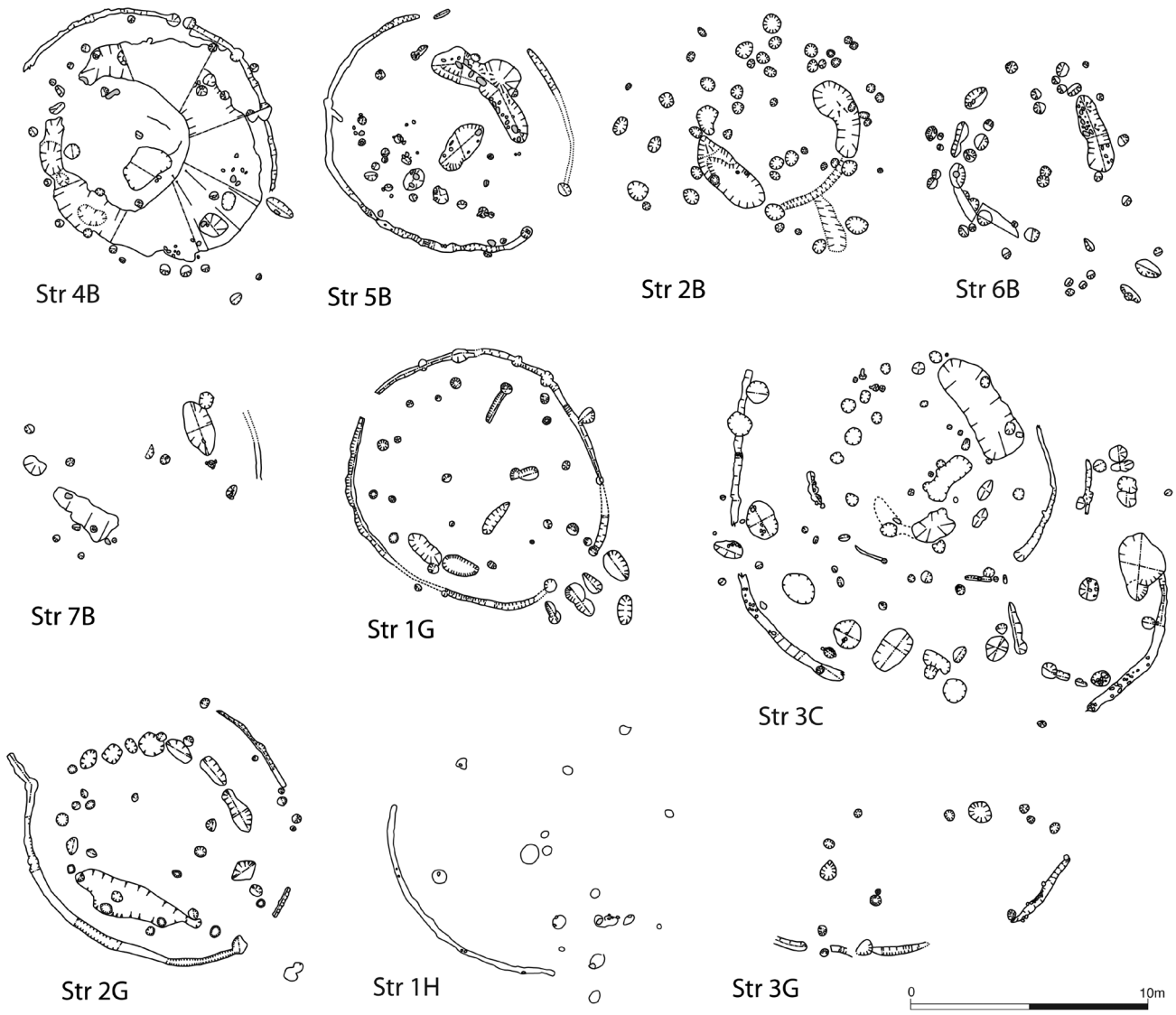
The EIA (defined in this report as the period 700–100 BC, the 'Long Iron Age' model of Parker Pearson & Sharples 1999) is represented by a large palisaded enclosure (Area A) within which were two large (13–14m diameter) post-built structures. There was evidence of the reappearance of the ring ditch as a component within the structures, and the introduction of a large pit constructed concentric to and outside the post ring of one of the houses. The presence of burnt animal faeces mixed in with other organic material was interpreted as being derived from animal bedding or possibly cakes of dried fuel. The internal pits were thought to be the result of animal wear, which was also apparent in the large external pit of Structure 1A.

11.2 The structures

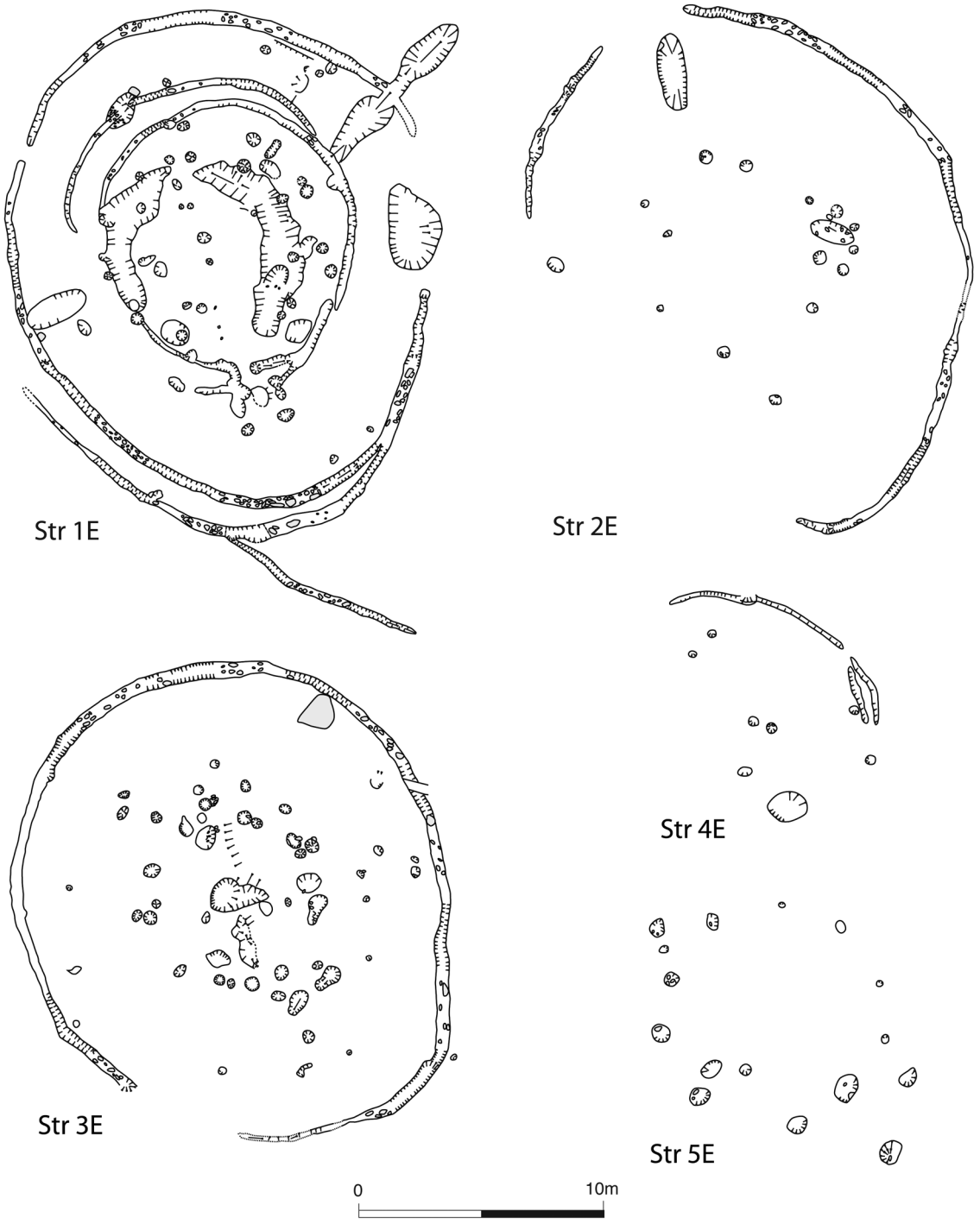
There are a number of architectural components of the structures, the presence of which appear to show both diachronic and spatial changes (Illus 58–60).

11.2.1 Structural elements of the houses: ring grooves, post rings and porches

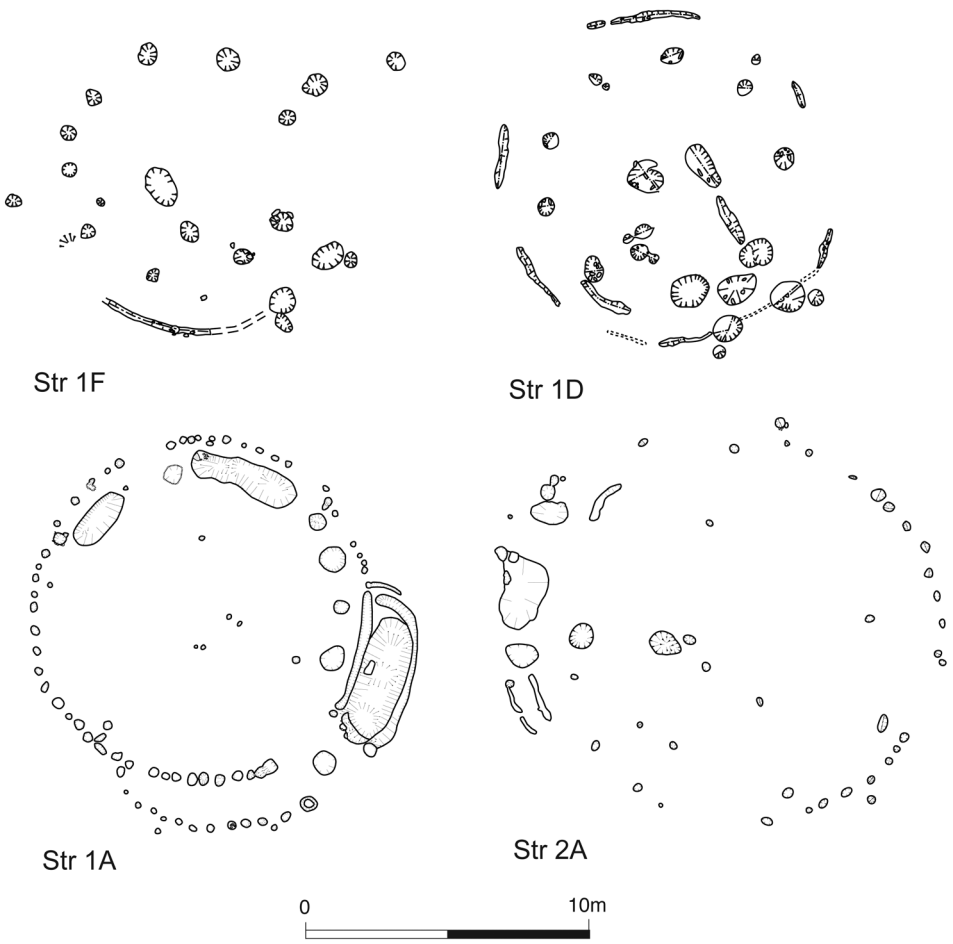
The first ring grooves occurred in the MBA, but they were not found or had not survived within



Illus 58 Plan of houses in Areas B, C, G and H



Illus 59 Plan of houses in Area E



Illus 60 Plan of houses in Areas F, D and A

all the structures of this period, being absent from Structures 2B, 6B, 3E and 5E. The ring groove continued in use until the construction of the EIA structures in Area A. The outer walls in these houses may have been fixed directly to the posts of the post ring, or the wall may have been earth-fastened using small stakes, the stake holes of which have been truncated. Alternatively, the houses had turf walls, requiring no foundations. The contiguous posts in the post ring of Structure 1A may even have served as the outer skin of the building.

Post rings within houses were present as either single or multiple rings, but the array of pits within some structures confused the interpretation. The house diameters, ranging from 6.6m to 11m, with the exception of those in Area A which measured 12m and 14m, were small enough for a single ring of upright posts to support the roof, and therefore the double post rings are more likely to have represented phases of rebuilding.

It could be argued that the houses in Area A with their *c* 14m diameters may have needed a double post ring to support the roof, however, there was no evidence of this in Structure 1A and little in Structure 2A, with the exception of an arc of pits in the north-east quadrant of the house and a possible post-pad in the north. The closely spaced nature of the posts may have provided enough support for the roof without the need for an extra ring of posts.

Likely porch structures were identified in only two of the houses, the MBA Structure 1E and, more tentatively, the EIA Structure 1A. The two porches were different in their composition. Structure 1E, the most likely candidate for a porch on the whole site, consisted of terminal posts within the outer ring groove, with three sets of opposing posts external to the ring groove; it was 'square' in shape. There

was also a central pit, which may have been the foundation for a central support, but this would have considerably restricted movement through the entrance. Alternatively, the pit may have had symbolic meaning as it was situated at the threshold of the structure, assuming the pit was contemporary with the porch. The posts forming the porch were similar in size to the other posts in the structure's post ring, suggesting that they could have held posts of equivalent height/girth to the rest of the post ring, resulting in a porch of significant proportions.

The entrance in the EIA Structure 1A appears to have been defined by four opposing posts, two of which were incorporated into the post ring with an external corresponding pair, one within the posts of the south annex and the other similarly aligned and adjacent to the external pit. If the annex and pit were roofed, as is the interpretation here, then the 'porch', annex and pit should be considered as a single entity, an extension to the structure. It remains possible, however, that these posts were not supporting a porch but were instead the posts marking the ends of a passage through a turf/earth wall which no longer survives, with the outer 'porch' posts defining the position of the now lost external wall line, as the posts are not substantially different in size from the remaining small post holes in the post ring.

Although not full porches in the traditional sense, the LBA Structures 1F and 1D had double offset post holes which might potentially represent an external frame around their doorways, offering some additional strength to the break in the circle, but may again simply mark the location of the passage through the wall, especially as the outer posts of the porches are aligned with the outer ring grooves.

It has been suggested that the porch is not a structural feature of roundhouses (Avery & Close-Brooks 1969; Hill 1984) and it has been shown that porches may be later additions, as was demonstrated at Bannockburn Fort CS1 (Rideout 1996). An alternative explanation may be that the entrance and porch were used as statements of status (eg Chadwick Hawkes 1994: 66). Pope, however, offers a pragmatic solution, suggesting that the large posts forming porches were used during construction to compensate for the gap created by the entrance, the larger posts providing a dead-weight counterthrust to the live thrust of the roof; that they compensate for stress and damage as people or animals move through the entrance, and that to increase headroom of the doorway, taller and hence wider posts were needed (Pope 2003: 186).

11.2.2 Ring ditches

Ring ditches predominantly occur in the MBA structures, early examples being Structures 5B and 1E, although in the latter the ring ditch belonged to the last phase of reconstruction of the building. Ring ditches within the MBA structures predominantly survived on one or both sides of the structures, with the exception of Structure 4B, where the surviving feature formed a penannular ring. The incomplete nature of the other ring ditches may be due to truncation, but potentially it suggests that the areas of ring ditch opposite the entrances were less deep and therefore (where these can be considered erosion features) less well-worn.

Ring ditches are not apparent in the LBA structures, represented by circular Structures 1D, 1F and 1H. However, by the EIA, and with the construction of Structure 1A, features which might be considered comparable with ring ditches recur. This time the pits interpreted as vestigial ring ditches occur on the north and north-west of the structure and in Structure 2A similar pits survived on the west side of the structure. A further change can be seen with the large external pit on the east side of Structure 1A, which may have served a similar function to the internal ring ditches of the earlier structures. As these features lower the floor height on the peripheries of their associated structures, Kendrick (1982) has suggested that they were deliberately excavated in order to increase the headroom at the wall and may be seen as an early version of the souterrain, and as such may best be considered as storage facilities (Kendrick 1995). The only structure at Blackford where it could be argued that the ring ditch may have effectively increased headroom was in Structure 4B, where the ring ditch survived to a depth of *c* 0.4m, although the depth of truncation is unknown.

Seven of the possible ring ditches at Blackford (Structures 2B, 3C, 5B, 6B, 2G, 1A and 2A) were little more than shallow scoops, but even given the likelihood of truncation, it seems unlikely they were deliberately excavated features. Apart from being

shallow, their edges were ill-defined. The pits on the northern and western floorspace of Structure 1A were also conjoined, pre-excavation, by a thin deposit of material that formed the upper surviving fill of both. A similar observation was made for the pits on the western side of Structure 2A, and again within Structure 1G where the two pits on the southern perimeter of the floorspace appeared, pre-excavation, to be a single feature (Illus 35). These features stood in stark contrast to the ring ditch features within Structures 4B and 1E. The ring ditches of Structures 4B and 1E were more substantial and had clearly defined boundaries, and were thought to have been the result of excavation rather than wear.

It has been suggested that shallower ring ditches may be the result of heavy wear created by cattle that were overwintered within houses (Jobey & Tait 1966; Reynolds 1982), although as Harding (2001: 38) has suggested, ring ditches may have had multiple functions.

The cattle byre argument is based on the functional imperative that cattle need to be overwintered (Andersen 1999 cited in Webley 2008: 62). Soil micromorphology from the fill of internal Pit 462 in Structure 1A demonstrated the presence of animal faecal matter possibly derived from animal bedding, which would support the argument for stalling animals within houses. However, Zimmerman has questioned the functional necessity of overwintering cattle within houses, pointing out that there are alternative methods (Zimmerman 1999, cited in Webley 2008).

The circular structures at Blackford appear to have had one entrance only, meaning that if animals were stalled within houses they would have been brought into the house via the same entrance as the human occupants, suggestive of a close relationship between the humans and their animal charges. However, a degree of separation between livestock and humans is still evident in the roundhouses: the ring ditch and the internal floor space occupy different levels, and it is possible that partition walls may have been used to fence off the ring ditches. The difference in height from the base of the ring ditch and the floorspace within Structure 4B was *c* 0.4m, but likely to have been deeper before horizontal truncation. Undoubtedly, if the ring ditches were designed for (or simply the result of) stalling animals, then the depth of the ditch would increase with time as the ditch was constantly mucked out. It has also been suggested that stalling the animals at a lower floor level would have helped with drainage by preventing the animal waste from seeping into the domestic floorspace (Hedeager 1992, cited in Webley 2008: 63).

In the western ring ditch in Structure 1E a large cache of grain was identified, which appears to have been burnt in situ (see Section 4.9), lending support to the storage interpretation. Recovered from the fill of this ring ditch was a charred piece of probable timber planking. Although this timber may have derived from a number of sources, it is plausible that it derived from a putative floor laid over the ring ditch, effectively utilising the ring ditch as a cellar-like structure.

It would appear that there is no decisive answer to the function of ring ditches at Blackford but the stalling of animals and the storage of materials, eg grain, are two possible uses, while more simply some of them may derive from the wear patterns of the building's occupiers over time.

11.2.3 Other internal features

Every structure contained a number of pits or post holes which were not integral to the superstructure. In some cases, large pits which followed the line of the wall or the post ring have been interpreted as truncated elements of the ring ditch. Other features such as post holes might represent the remains of internal partitions, although none shows any distinctive patterning which might indicate how these structures were divided up. A few might be the remains of a windbreak across the entrance, for example in Structure 2G and possibly 2B.

Large pits which were approximately central to the structures were present in MBA Structures 4B, 5B, 3C, 3E and LBA Structures 1D and 1F. These have been interpreted as hearths or cooking pits. All contained some form of burnt material, although generally not in large quantities, and only the pits in Structures 3E and 1F showed evidence for in-situ burning. It is possible that at least some cooking activities took place outside or within other structures, for example roasting or smoking meat or using water-filled troughs and heated stones.

11.2.4 Entrance orientation

Where entrances can be reconstructed, with the exception of Structure 2A, they face south-east. In the case of Structure 2A the north-west entrance appears to correspond with the entrance through the palisade.

This south-east orientation has been considered by many to reflect a cosmological concern with the sun (eg Fitzpatrick 1994; Oswald 1997; Giles & Parker Pearson 1999; Parker Pearson 1999; Parker Pearson & Sharples 1999), principally the opposition between night and day, leading to a structured use of the internal space with dichotomies of day/activity–night/sleeping. Indeed, the very act of orientating the entrance specifically towards the sunrise is by definition cosmological. However, as Pope has argued, the south-east orientation could be based on pragmatic considerations such as protection from the westerly prevailing winds in Britain, and the need for light and warmth from the rising sun (Pope 2007: 173). Whether the orientation is best explained in terms of a belief system, or is best described as a practical solution to a windowless or dimly lit structure, to avoid shadow cast by the surrounding palisade fence, or orientated towards other structures or topographical features in the landscape, is perhaps more a reflection of our own choice of interpretation.

The entrances in the palisades were not in every case orientated the same as the entrances into houses. In the case of Structure 1E, breaks in the palisade occurred to the west and east, although the one to the west may have been the result of truncation, and in Structure 3E the palisade entrance was orientated to the south-west. The palisade in Area A had two entrances, one to the south-east mirroring the south-east entrance of Structure 1A, and one to the north-west mirroring the orientation of the Structure 2A entrance. The entrances appear to occupy positions orientated from the north-west through to the east and south-west and it seems unlikely that they were necessarily orientated towards the sunrise. The orientations of palisade entrances appear to have been based on different considerations from those of house entrances. It was not possible to test the sunwise model of artefact deposition at Blackford, as the artefact assemblage was small and firm conclusions therefore could not be drawn.

It is possible that pragmatism can be imbued with ritual, and that reflections on cosmology are innate

Illus 61 View from Area A towards the SE and the SM Cecilmont Fort

within humans, such as the treatment of the dead and a belief in the afterlife. There is no reason to suppose that these were not considerations that the prehistoric inhabitants at Blackford also made.

11.2.5 Palisades

Enclosed structures are an early feature at Blackford, first appearing in the MBA. However, palisades were not universal MBA features, with the structures in Areas B and G being unenclosed. The palisade recurs in the EIA, with the structures in Area A being enclosed by a single large elliptical palisade.

Palisades or enclosures could have been multi-purpose. They offered protection from the elements and intruders, and may have been a statement of prestige. The MBA enclosed structures were Structures 3C, 1E, 2E, 3E, 4E and possibly 3G. If any of these homesteads were contemporaneous then it could be argued that enclosing them represented an uneasy dialectic between the households. Structures 5E, 3E, 1E, 3C, 6B and 1H all have dates that fall within the range of 1605–825 BC, and three of these (3E, 1E, 3C) were enclosed (see Table 23).

The EIA saw a return to enclosures, but this time two structures were enclosed in Area A, and the enclosure size and restricted access suggest that the purpose of this palisade had a defensive element. It may also have signified wealth and status; its size and position atop a knoll would have commanded views across the landscape (Illus 61).

11.2.6 Chronological sequence, typology and longevity

The chronological sequence of ring ditch structures in Scotland has recently been extended, with the excavations at Kintore (Cook & Dunbar 2008) returning MBA dates and those at Ironshill (Pollock 1997) and Culhawk Hill (Rees 1998), both in Angus, dated to the later first millennium BC. The ring ditch structures at Blackford fit well with this chronology.

The MBA structures at Blackford are characterised by roundhouses with ring ditches, some with elements of ring grooves, similar to those found at Kintore (Cook & Dunbar 2008: 321). The general classification is a ring ditch structure with posts or ring grooves around the exterior of the ring ditch, with or without a four-post entrance, although the presence of ring grooves appears to be a more common feature at Blackford. One exception is Structure 3E, which was a post ring house without ring ditches or ring grooves. However, the dating of Structure 3E was problematic as there was little consistency within the dates with the overall range, suggesting periods of activity from the MBA to LBA (1514–844 BC). Alternatively, given the generally shallow nature of the Area E ring grooves (0.15m or less), it is possible that any ring groove in Structure 3E could have been lost through truncation. Entrance orientation at Blackford is fairly consistent, where it can be discerned, with all but one of the MBA entrances facing the south-east.

The LBA structures at Blackford, Structures 1D and 1F, are similar to Cook & Dunbar's Type 4 classification: post ring with four-post entrance structures springing from the post ring (2008: 89); however, the four-post entrances of Structures 1D and 1F were reduced in size compared to those at Kintore, and at Blackford these structures have evidence of a ring groove.

The EIA circular structures within the Area A palisaded enclosure at Blackford are defined by close-set post-built walls, with evidence of possible ring ditches. In Structure 1A Pits 462 and 385 were interpreted as the truncated remains of a ring ditch on the north-west side of the structure. The Structure 1A entrance is based on a four-post arrangement: two on the alignment of the post ring and two aligned and incorporated into the annex, with the addition of a central support. However, the presence of an external pit and the annex, probably roofed, make Structure 1A an idiosyncratic structure within the Blackford houses, and the house is as yet unparalleled in Scottish archaeology.

A notable architectural element at Blackford was the presence of enclosed structures, the earliest being Structure 3C and possibly Structure 3E. Evidence of other probable MBA enclosures can be seen in Area E, Structures 2E and 4E, and in Area G, Structure 1G. Structures within enclosures disappeared during the LBA and re-emerged with the construction of the large palisade in Area A.

Whether the circular structures in Areas B and C were contemporaneous is difficult to ascertain as there were very few instances of stratigraphical relationships between features. In one instance it

can be seen that the ring groove of Structure 2B truncated a curvilinear feature associated with a possible earlier structure, Structure 7B. Otherwise the structures spatially respected each other.

It is generally agreed that the lifespan of a house is partly dependent upon the durability of the material from which it is constructed, the maintenance regime employed, and episodes of total rebuilding on the same plot. In the case of Blackford, the material used in construction was wood, probably oak and hazel (see Section 11.5.3). Experimental evidence has shown that reconstructed wooden-built longhouses will last no more than one or two generations, such as the Viking Age house at Trelleborg, Denmark, which showed severe decay after 30 years (Webley 2008: 39). Experimental work conducted on the lifetime of a post buried in the ground demonstrated that this was proportional to the diameter of the post, with a post of oak heartwood taking 15–25 years to decay for every 5.1cm of diameter (Webley 2008: 39). However, this is subject to variations in the soil, and the material used, such as the less durable sapwood (Purslow 1962). The post holes of the circular structures were generally very truncated, making it difficult to determine their original diameters. The post holes within the palisade survived to a greater depth. The average diameter of these features was 0.24m. Based on these calculations, these palisade posts would have lasted between 67 and 112 years, although the structures would have lost structural integrity before this.

There was evidence of what might be termed 'maintenance' being undertaken on the Blackford houses, expressed as paired post holes presumed to represent post replacements, eg within Structure 1F. There was also evidence of houses being rebuilt, such as Structure 1E, which would have necessitated the dismantling of the previous house if it was still fully or partially upstanding, in order for the new house to be built on the same spot. It cannot be determined whether these new-builds represent a new house built by the same family, or by new occupants.

The 19 structures at Blackford represent activity over a maximum radiocarbon-dated period of 1,609 years (UBA-13311 Area C to UBA-13416 Area A), thus if each structure represents a direct replacement of an earlier one, they lasted on average 84.5 years each. However, the upper date range obtained from Area C was from a non-structural pit and was probably intrusive. The upper end of the date range may therefore lie closer to *c* 1400 cal BC, based on the majority of the MBA dates, thus each structure would represent 61 years, assuming continuity without any overlap. This indicates that it was possible to have had near-constant occupation on the site represented by one or two homesteads only. As there is much overlap in the radiocarbon dates returned from the structures, particularly within the MBA, it cannot simply be assumed that each structure represents a single family lineage rebuilding a new structure with each passing generation.

However, Halliday (2007) suggests that in fact many roundhouse structures are single-phase and are only occupied for a generation, or even as little as 10 years or less, as our definition of sedentary farming may not be applicable to what could have been a much more mobile population in later prehistory, and this pattern of dynamic short-lived settlement can be seen in the better dated wetland environment (Barber et al 2007). It remains possible that what has been interpreted as maintenance and replacement of individual posts may in fact be superimposition of new structures onto old, either concentrically or eccentrically, making some of the more complex-looking floor plans interpreted as long-lasting structures perhaps instead be a sequence of simple roundhouses superimposed over one another and occupied for relatively short periods of time.

11.2.7 Summary

The MBA circular structures are characterised by segmented ring ditches running internally concentric with an outer post ring, and inner post rings have also been identified in all but two of the MBA circular structures (Structures 3C and possibly 5B). Ring grooves are also present in all but two of the circular structures, Structures 2B and 6B. The ring ditches generally occurred on the east and west sides of the structures, with the exception of those in Area G, which occurred on the south side. The ring groove and post ring continued in use through the LBA but the ring ditch was dropped, as was the enclosing palisade. The ring groove was lost during the EIA but we see the re-emergence of the ring ditch, albeit on a different orientation: to the north and

Table 23 Summary of structural features of houses and dating

Str.	Ring ditch	Ring groove	Post ring	Palisade	Porch	Max. diam.	Entrance orientation	^{14}C date ranges BC
5E			Single			7	SE?	1605–894
3E			Multi-phase	Present	Poss	7	SE?	1516–844
5B	Present	Present	Single			11	SE	1503–1313
1E	Present	Present	Multi-phase	Present	Present	12	SE	1494–1056
3C	Present	Present	Single	Present		10		1426–1133
6B	Present		Multi-phase?			8		1428–1308
4B	Present	Present	Multi-phase?			12	NW	1394–1210
1G		Present	Multi-phase			11	SE	1389–1128
1D		Present	Single		Frame	11.5	SE	1374–782
2B	Present		Multi-phase			9	SE	1370–1269
1H		Present	Single?			*c* 11		1010–825
2G	Present	Present	Single	Present		11	SE	1259–821
1F		Present	Single		Frame	11.5	SE	898–542
1A	Possible		Single	Present	Present	14	SE	742–397
2A	Possible		Single?	Present		13	NW & SE?	726–399

west. Elsewhere ring ditches have also been reported continuing late into the first millennium BC (Pollock 1997; Rees 1998; Cook & Dunbar 2008). There is very little demonstrable variation in orientation of the house entrances, which were predominantly to the south-east, the exception being Structure 2A with a north-west entrance. The alignment of house entrance orientations and enclosure orientations shows variability. In Structure 1E the entrance was orientated to the south-east but the entrance through the palisade was orientated to the east, while in Area A the house entrances were both orientated to their respective and opposed entrances in the palisade, to the north-west and south-east. Therefore it cannot be assumed that house entrances were consistently orientated towards enclosure entrances. Table 23 provides a summary of structural features and dates.

11.3 Finds summaries, distribution and taphonomy

11.3.1 Pottery

Melanie Johnson

Handmade prehistoric pottery amounting to 1,091 sherds, weighing 21.650kg in total, from a minimum of 267 individual vessels, was recovered from across the excavation areas. The assemblage is quantified in Table 24 and a full catalogue has been prepared for the site archive.

The assemblage is made up of heavily gritted coarse pottery, quite thick-walled, and the vessels are generally either barrel- or bucket-shaped, with upright or inturning rims, sometimes with an internal bevel or expanded to either side, or more often with a flat or round top. This type of pottery has for many years been referred to as Flat-rimmed Ware (Coles & Taylor 1970) and is a rather ill-defined ware present throughout Scotland during the second and first millennia. Little typological work has been undertaken on assemblages from this period across the country, so it is still unclear whether there are regional or chronological distinctions to be made, and the skewed distribution of sherds, so obvious at Blackford, is a puzzle that still requires some explanation.

Distribution

Areas B and C contained the largest amount of pottery of all the areas, with just under half of the overall assemblage by weight from here. Even

Table 24 Summary of pottery assemblage distribution

Area	No. sherds	Wt (g)	No. vessels	Ave. sherd Wt (g)	Sherd thickness		% with Sooting
					Mode (mm)	Range (mm)	
A	3	11	3	3.7	–	5–10	33
B and C	509	10,604	133	20.8	10	5–21	56
D	30	171	9	5.7	8	7–10	22
E	299	7,670	79	25.7	12	6–20	47
F	19	171	12	9	10	4–17	33
G	36	648	7	18	10	10–14	18
H	92	1,627	15	17.7	8	7–15	47
X	99	584	6	5.9	8	6–9	33
Unstratified	4	164	3				
Total	1,091	21,650	267				

within this area, though, the assemblage is unevenly distributed, with 90% of this area's pottery coming from just two of the buildings, with a particularly high proportion coming from a few contexts associated with Structure 2B. While a lot of pottery was found in the eastern ring ditch in Structure 2B, this was not the case in Structure 3C, where only a single sherd was found in the ring ditch and pottery was otherwise recovered from pits and post holes. Although a much smaller assemblage, most pottery from Structure 4B also came from the ring ditch. Only a few sherds were recovered from Structures 5B and 6B; there is no obvious distinction in the form or function of these buildings to explain why they are so artefact-poor in comparison.

Within Area D, the sherds from Structure 1D came from the entrance area, possibly suggesting that sherds became caught up in the fills of these pits/post holes during the sweeping out of the building through the door. The only other sherds from this area came from a pit to the south-east, possibly suggesting that this cluster of features were rubbish pits used by the occupants of the building, placed conveniently to the outside of the building's entrance but at sufficient distance to avoid any problems with hygiene.

Area G, although a small assemblage, had some interesting patterns, such as the deposition of base sherds from a single vessel in Post Hole 012 of Structure 1G and rim and body sherds from a single vessel in Post Hole 125 of Structure 2G, both of which fell within the south-west quadrant of the building and formed part of the post ring. The remaining sherds from these buildings can be considered to be residual sherds which had worked their way into post holes and other structural elements of the buildings during their occupation.

The assemblages from Areas A and D are too small to add much meaning to overall discussions of differences between areas, but are intrinsically interesting in posing the question of why some areas were practically aceramic in comparison with others. Area A was later in date than the other groups of structures excavated, being EIA, and there is perhaps a tendency identifiable in the material culture of the late second and first millennia BC in the north-east towards a reduction in the quantities of pottery and other artefacts recovered from domestic sites; for example, at Ironshill (Pollock 1997) and Douglasmuir (Kendrick 1995), both in Angus, and Wardend of Durris in Aberdeenshire (Russell-White 1995).

Forms and dating

Areas B and C included, apart from the usual rounded, bevelled and flat-topped rims from upright and slightly necked vessels, some very thick rims, vessels with external ridges and some more unusual

forms such as rims expanded to either side. The ridges along the exterior were produced either by running a finger along the exterior to form a groove, or pinching up the wet clay to form a ridge.

Excavations at Kintore revealed two MBA roundhouses (RH25, RH26) which had pottery associated with them (MacSween 2008). Unfortunately, none of the vessels are illustrated but the descriptions indicate that the pottery from this period was dominated by internally bevelled rims. Decoration is scarce, with only two examples of possible decoration. The Kintore assemblage has examples of ridges, grooves or cordons below the rim on the exterior, a trait that is absent from Blackford. RH26 contained three vessels which were considered to have been near-complete in-situ pots.

Other ring ditch houses at Deer's Den, Kintore, Aberdeenshire (Alexander 2000) have been dated to the Middle and Late Bronze Age (spanning 1600–700 BC). Later prehistoric pottery was found associated with two of the ring ditch houses and comprised bucket- and barrel-shaped vessels with flat bases and closed mouths, the rims including plain flat rims and short everted rims with internal bevels. One of the vessels was substantially complete and had a ridge/pronounced shoulder; it was recovered from a pit within the ring ditch of Structure 3. This house has a spread of radiocarbon dates, ranging from 1890–1030 BC.

The ridged ornamentation on the exterior of some vessels is a small component of the assemblage. It has parallels with other assemblages from this period, for example at Lairg (MacSween & Dixon 1998). External ridging was present on some vessels, with incision sometimes present between the ridges; another vessel had fingernail impressions between the ridges and another had impressed twisted cord. Vessels had internally bevelled, flat, rounded and expanded rims. This assemblage is dated to 1800–1200 BC.

A small quantity of earlier material has been recognised within the assemblages from Area A and the Watching Brief Area X. This material is Neolithic and Early Bronze Age in date and includes probable Early Neolithic Carinated Bowl, possible later Neolithic Impressed Ware, Beaker and Food Vessel. The pits containing Beaker and Early Neolithic pottery in the Watching Brief Area appear to be earlier features.

11.3.2 Other finds

Sue Anderson

Very few manufactured objects other than pottery were recovered during the excavations. The small quantities of artefacts recovered from the site could reflect the paucity of artefacts used/deposited during the structure's occupation; the poor survival of the occupation assemblage, particularly if wooden and other organic materials were used extensively; a very clean house which was regularly swept; or a combination of all of the above.

Twenty-one lithic artefacts were collected from three areas of the site, of which 14 were flint, although fragments of sandstone and chert with signs of working were also identified. The only tools identified within this small assemblage were a burnt scraper and two utilised flakes from Area B, and a blade from Area E.

The seven coarse stone objects included three perforated weights from Area B/C, two of which were found in Structure 3C and may be related to textile working. Two tools – a hammerstone and an anvil – were recovered from Structures 5B and 2B respectively, and a third – a whetstone – from Area E, Structure 1E. A sandstone block with natural grooves from Structure 3C was thought to be related to metalworking activity (see Clarke, Section 4.8.3 above). Unusually for a prehistoric site in Scotland, no quernstones were recovered.

Three objects of probable cannel coal were found, all items of dress or personal adornment. They were recovered from three separate areas of the site. A bangle fragment came from a pit close to the cremation burial in Area H, but is intrinsically undateable. An unfinished bead came from a post hole within Structure 3E, potentially dropped during the manufacturing process and rolling into the space created by a partially eroded post base. The 'napkin ring' fastener fragment from Structure 2B was only a small part of the original object and could have been broken off a more complete piece which was retained for use. Fragments of shale also recovered from this house have been noted as evidence for the exploitation and trade of this raw material (see Hunter, Section 4.8.4 above).

Very small quantities of vitrified material were recovered from four areas, but only the fragments from an isolated pit in the Area A palisaded enclosure

were thought to be related to ferrous metalworking. The largest single quantity of material from the site was just over 50g of fuel ash slag from a post hole within Structure 1F.

11.4 Treatment of the dead

During the EBA in Britain both inhumation and cremation burials were practised, although inhumation was the more common form of mortuary practice (Brück 2009: 1). After 2000 BC cremation began to be the most popular form of burial practice (Needham 1996: 131) and by the beginning of the MBA cremation burial had become the norm (Ellison 1980). This difference in the treatment of the dead is thought by some authors to reflect differences in social status of those being buried. Rowlands (1980: 51) has suggested that cremation was the act of destroying the body and the integrity of the individual, while inhumation preserves both the body and personal identity of the deceased. The overlap in these two mortuary patterns has allowed archaeologists to draw social distinctions between those that were interred and those that were cremated, with the cremation burials often taken to represent lower-status individuals (Bradley 1984: 84; Braithwaite 1984: 104–5; Mount 1995: 107–8). It has been noted that cremated individuals were often buried as satellite burials in the sides of barrows, whose central burial was an interment (Burgess 1980: 297–9; Bradley 1984: 84), and further that by the MBA the practice of furnishing graves with grave goods was diminishing, MBA cremations being buried with nothing except the funerary urn that the human remains were put in (Ellison 1980). At Blackford the burial practice appears to be dominated by the cremation rite.

The very truncated cremation burials at Blackford were identified in Trench 1 of the evaluation, in Area H and possibly in Watching Brief Area X. Two were certainly the remains of adult humans, the third being possibly human but too abraded for definitive identification. All three are likely to be broadly contemporary with occupation represented by the circular structures.

Over the whole of the Blackford prehistoric landscape there are only six burials: three probable cremations from these excavations of MBA/LBA date, two Bronze Age cinerary urns (NN90NW 14 and NN81SE 3) and one cist burial (NN81SE 4). There are at least three reasons that may account for the relative paucity of cremations: more exist but they have not been found; the remains have been truncated by modern agricultural practices; or the dead were treated in a manner that leaves no archaeological signature, such as inhumation in unmarked grave pits, since the acidic nature of Scottish soils does not favour the preservation of unburnt bone.

Although the prehistoric population is usually considered to be lower than today, the six prehistoric burials are clearly not representative of the Bronze and Iron Age populations, so where are the dead of these past communities? There are at least three reasons that may explain the paucity in the burial record at Blackford. First, many burials have probably been destroyed. Since the end of the Iron Age up to the Industrial Revolution, continued use of the land for farming, particularly ploughing, will have destroyed buried remains, including graves. During the 19th century, and likely as a result of new and more intensive agricultural practices and land improvement, more of the landscape at Blackford was being disturbed, resulting in the discovery of two buried cinerary urns and a cist burial under a cairn. It can only be speculated how many more were discovered and not reported, or simply unknowingly destroyed during agricultural developments. There was some limited evidence for modern farming activity across the excavation area, including two horseshoes, the size of which indicated they were used on heavy horses, and the remains of a partial flagstone floor with associated post-medieval artefacts, but no evidence for foundation trenches for walls suggestive of a building. This floor could be the remains of a threshing floor or cereal drying floor.

Second, there are likely to be burials that have not been found. Cremation burials can occur either singly or as a group in a cemetery or 'urnfield'. It is possible that more single burials lie undetected, particularly as most of the known burials were found away from the main areas of settlement. Third, it is possible that many of the isolated pits at Blackford originally contained cremation burials with or without cinerary urns, the contents of which have been destroyed through truncation by ploughing and weathering, and by the acidic soils, which is

one of the major reasons why inhumation burials are not a common feature in the Scottish archaeological record generally.

If, as has been suggested by some authors (see above), cremation reflects the 'lower' social status of the individual then presumably we have not found the chiefs or leaders, and those that have been found are from the lower caste members of the community, buried simply without grave goods in possibly unmarked graves. Certainly, no evidence of cairns or other grave markers was found during these excavations.

11.5 Environment and economy

11.5.1 Calcined bone

Sue Anderson

In general the animal bone recovered was calcined and very fragmented. Most of it was not identifiable to species. This level of preservation of butchered and cooked animal bone is not unexpected for prehistoric sites based on acidic soils, but unfortunately reveals little about the nature of animal, bird and fish exploitation practised by the prehistoric inhabitants of this landscape. Much of the bone from structures was recovered from features where swept rubbish might be expected to be deposited, and in this it is similar to the deposition of other finds within these roundhouses.

11.5.2 Charred plant remains

Mhairi Hastie

Out of 746 samples analysed, 277 samples contained carbonised plant remains. The concentration varied considerably across the excavated areas. Much of the plant material was in a poor condition and very abraded. This indicates that much of the material had undergone some movement prior to being buried. In most cases the plant debris is unlikely to relate to the function, or use, of the features from which they were recovered. Nevertheless, several high concentrations of cereal grain potentially associated with in-situ burning were noted, particularly from Structure 4E.

The most abundant element recovered was carbonised cereal grains. Cereal chaff was present only in samples from Area E. Occasional weed seeds (wild taxa) were recovered from samples spread across the excavated areas, but never in increased numbers. Other potential economic species, including flax seeds, hazelnut shell, and fruit pips were also recovered, although these were never present in large quantities.

The general lack of cereal chaff and other crop-processing by-products, such as straw fragments (culm nodes) and large quantities of weed seeds, indicates that relatively clean grain has become charred throughout the occupation of the site. However, evidence from Area E, where small quantities of chaff were recovered and a small proportion of fused grain was noted still with rachis fragments attached, may indicate that some of the grain was still in spikelets or ears of corn when burnt. Similar plant assemblages have been noted at other Scottish prehistoric roundhouse sites, most notably from recent excavations at Kintore, Aberdeenshire (Cook & Dunbar 2008).

In all but one area of the site the most common cereal recovered was naked barley (*Hordeum* var. *nudum*). Naked barley was a main cultivar in Scotland from the Neolithic period until the Late Bronze Age when it was replaced by the hulled variety (*Hordeum* var. *vulgare*). Its presence here would be in keeping with the Bronze Age date for the site. Where preservation allowed, both straight (symmetrical) and twisted (asymmetrical) grains were recovered with a ratio of 1:4, suggesting that both the 2-row and 6-row varieties were being grown. Naked barley would have been easy to process as the grain, having no husk, may be eaten with no preparation other than boiling (Johnson 1844).

The grains and occasional chaff fragments of wheat were also recovered, the bulk of which were consistent with emmer wheat. Both spelt and bread/club wheat were also present, although not in large quantities, and this suggests that only small amounts of both were grown, possibly for specific purposes. For instance, bread wheat has better rising properties than spelt or emmer and may have been grown specifically for use in bread making, while spelt is more frost resistant than the other wheat species and more tolerant of poor soil conditions, thus it may have been grown in more marginal or poor ground areas. Both emmer and spelt would have been suitable for cultivation in the upland areas in which the settlement is situated. The emergence of

spelt as the main wheat cultivar during the Iron Age period is thought to be a consequence of its short growing season and its ability to grow in cold, damp weather, making it better adapted to the wetter climates of later prehistory (Baker 1985).

It is interesting that one area, Area D, produced a small assemblage of hulled barley. This variety of barley has been a major staple in Scotland since the Late Bronze Age, when it replaced the naked variety. Although not present in very large quantities, the recovery of hulled barley from this area fits with the Late Bronze Age or Iron Age date for these features.

Grains of both oat (*Avena* sp.) and possible rye (*Secale cereale*) were also identified from the samples, but neither was found in high concentrations. Both have been recovered from early prehistoric Scottish sites and are thought to be remnants of weed seeds, for instance wild oat (*Avena fatua*) growing in the barley crops. None of the oat grain recovered from the site was sufficiently preserved to allow identification between the wild and cultivated species, although the identified grains were small, suggesting the wild species. Given the very small numbers of grains present it would seem most likely that these were also remnants of arable weeds.

Small amounts of the barley grain were noted to have elongated embryo ends, indicating that the grains had started to germinate. There was no specific concentration of these; instead they were mixed with other non-germinating grains.

Cereal chaff was rarely recovered, only being identified from samples taken from Area E. Both barley rachis fragments and wheat glume bases and spikelet forks were present. The presence of chaff in some samples may be a sign of the charring of a partially cleaned crop that was being stored or processed, although increased numbers of chaff in one sample (<945>) from Area E could potentially suggest that the grain recovered from this structure was on the ear when charred.

Weed seeds were relatively sparse. The weed seeds present are typically found on Scottish prehistoric sites, and can be split into two distinct groups: seeds of arable fields and disturbed ground, and seeds more distinctive of wet or waterlogged areas. Many of the weed seeds would have found their way to the site along with harvested crops, typical weeds of cultivation including corn cockle (*Agrostemma githago*), fat hen (*Chenopodium album*) and heath grass (*Dathonia* sp.), while others such as dock (*Rumex* sp.) and nipplewort (*Lapsana communis*), which can grow in areas of disturbed ground, may have been growing around the site. More wet-loving species, such sedge (*Carex* sp.) and club-rush (*Scripus* sp.) could have been present in damp areas of the cultivated fields, or transported to the site via turfs for building or use as fuel, in bedding/flooring material, or even with animal fodder.

Although most commonly interpreted as seeds of cultivation, certain species of wild taxa, such as fat hen and chickweed for instance, could have also been collected as an additional source of food, and may have been harvested as specific vegetable crops, along with the cereals. The leaves of fat hen can be cooked and eaten like spinach (Langer & Hill 1991). Unfortunately, the quantity of weed seeds recovered from this site is not sufficient to distinguish between arable weed seeds or wild taxa collected as food; in most cases this distinction can only be gleaned from information provided from human faecal material or stomach contents.

Three other species recovered from the site are likely to have had a significant economic function: flax (*Linum usitatissum*), hazel (*Corylus avellana*) and apple (*Malus* sp.). Hazelnut shell was recovered from most of the excavated areas. Hazel wood was a common component of the charcoal assemblages recovered from the site (see Cressey, Section 11.5.3 below), and the nuts would have been a readily available local source of food. The presence, albeit of only two, apple pips from Area H also indicates that other fruits were available in local woods. The presence of both hazelnut shell and apple pips indicates that wild food resources were being exploited.

Flax seeds were recovered from three samples taken from Structure 1E. Flax is known in Scotland from the Neolithic onwards, and was probably exploited for both oil and the production of linen.

Small quantities of charred rhizomes were present with the cereal grains and other plant material. These underground stems are commonly recovered from prehistoric sites and are typically interpreted as the remnants of turfs used for fuel or use as roofing material. Soil micromorphology analysis of sediments from across the site (Section 4.9.4) indicated that many of the soils recovered from pit and ring ditch fills consisted of mineral-based

turf ash, mixed with smaller quantities of wood. Whether this is a result of burnt roofing material or turf used as fuel is not clear, but turf could have been collected for specific purposes. For instance Miller et al (2000) suggested that the presence of rhizomes along with cereal grain indicates the use of turfs to dampen down hearths prior to their being used for corn-drying purposes.

Although not of plant origin, it is interesting to note that the burnt remains of a small animal dropping, probably of goat or sheep, were recovered from the fill of Post Hole 005 in Structure 1F.

11.5.3 Charcoal

Michael Cressey

Charcoal condition

The bulk of the hazel charcoal is represented by both pristine and amorphous fragments, and most was originally derived from roundwood. The oak charcoal could have been derived from both branchwood and mature trunks. Oak wood when burnt tends to split along its multi-seriate rays forming plate-like fragments. These were numerous within the oak assemblage and strongly suggest that mature oak, possibly split from mature branchwood, was used in construction. This appears to be the case in Area G, where oak dominates the assemblage (92%), which strongly suggests that the bulk of this species is derived from structural timber rather than fuel wood.

Seventy-two individual fragments, representing 7% of the total assemblage analysed, were BLOI. Ten individual fragments were found to be vitrified due to excessive amounts of heat caused by deliberate firing (common in furnace fuels) or accidental burning. Much of the >4mm charcoal is fairly amorphous, suggesting a greater proportion has been affected by the free-draining nature of the site. Constant saturation invariably makes charcoal more friable and susceptible to taphonomic decay. The author has found this to be the case in sand- and pebble-rich soils elsewhere in Scottish charcoal assemblages.

Species composition

The results allow a better understanding of the nature and distribution of woodland cover near Blackford in the Bronze and Iron Ages.

The five individual species that are recorded within the charcoal assemblage are all native to north-east Scotland throughout the prehistoric period. Hazel, oak and birch thrive on base-poor soils that are relatively well drained. Soil types might include brown earths and podsols which are formed over sandy gravels and upland soils typical of the study area. Willow prefers periodically saturated soils, typical of flood plains and riverbank environments. Alder is a tree that thrives with its roots in water and is a typical river or streamside tree.

All five species would have been exploited for a variety of uses and all would be useful as a fuel, providing they were gathered as deadwood. Due to its stronger structural integrity, oak would have been favoured in house construction. Hazel is well known for its use in hurdle manufacture (Rackham 1977; Brunning 2000) and would also have been widely exploited for wattle work. Hazel, if left to grow uninfluenced, can achieve fairly well statured trunk-wood (Wilkinson 1975) and it will self-coppice, providing an abundance of irregular-sized branches.

Table 25 shows the relative abundance of charcoal from specific archaeological features within Areas A–H. These results confirm that collectively the post

Table 25 Frequency, combined weight and distribution of the >4mm fraction charcoal from different types of feature

Genus/Species	Pits	Post holes	Ring ditches	Palisade	Miscellaneous features
Alnus glutinosa		1 (0.2)			
Betula sp.	44 (62.2)	23 (8.6)	1 (0.5)		
Corylus avellana	231 (134.6)	52 (1.1)	28 (8.9)	1 (1.7)	16 (16.8)
Quercus sp.	262 (170)	298 (93.1)	27 (14.4)	43 (8.7)	
Salix		6 (8.7)			

holes have an inherently larger volume of charcoal derived from oak wood than any other species. Other species present within these features are likely to be derived from 'background' charcoal that would have been present around the sites as a result of burning fuel and discarded refuse.

The data in Table 25 also confirm that pits contained a slightly higher burden of oak charcoal. Some of the pits, although ideal repositories for domestic waste, may have had a structural role and it is not surprising that this species attains higher frequencies and weight.

Based on the limitations of the data, charcoal derived from oak appears more abundant in pits and post holes. In her study on roundhouse morphologies, Pope (2003) mentions that oak is the most popular wood type in prehistoric construction, representing one in three identifications. A strong wood with durable heartwood, oak was the main structural timber in Scotland until the 17th century, when it was replaced by Scandinavian imports to make up the shortfall (Crone & Mills 2002; Crone & Watson 2002). This wood would have also been favoured for its resistance to decay. Anecdotal evidence suggests that this resistance may have been further enhanced by charring the points of the timber uprights prior to insertion into the ground, to prolong the life of the upright timber for a much longer period, but little reliable research has been conducted on this matter. If the buildings were demolished at ground level this action might lead to a larger frequency of oak charcoal within the post hole assemblage.

Hazel and birch are the next most popular woods, followed by alder and willow, although the latter two are normally low in frequency. Although absent in this assemblage, Scots pine (*Pinus sylvestris*) would have been present within the local upland landscape but is normally very low in frequency due to the high combustibility caused by its highly flammable resin content (Gale & Cutler 2000: 91). It is likely that this species was sought for its qualities as a starter fuel rather than its structural quality.

Hazel charcoal is generally well represented within Scottish prehistory and accounts for a large proportion of the charcoal within the sampled assemblage. Although there is no direct evidence within this assemblage to suggest woodland management, this species is synonymous with hurdle manufacture, used in house construction and pit linings, etc. Although it is poor for providing timber (*sensu stricto*), its fast-growing qualities allow it to produce regular stems of uniform diameter after only a few years following clear-felling of the parent tree. Of the roundhouse structures with central post wood identifications, examined by Pope (2003) from Highland Scotland, six included birch and five contained alder.

The upland soils within the study area are acidic by nature and towards the later prehistoric period these certainly supported oak, birch and hazel woodland (Tipping 1994). There is no evidence within the charcoal assemblage to suggest that the local hazel wood was managed, but in any case this species would have supplied material for a number of uses, including hurdle panels in house-building and, importantly, fuel wood. The charcoal assemblage that has been analysed from the excavations represents only a small volume of wood that would have been burnt over the lifespan of the site. It is difficult to quantify such amounts but it must have been in the order of tons per year. The precise quantity of wood procured for structural use alone must certainly have accounted for large amounts of mature wood. The impact that this had on the local woodland composition can only be a matter for conjecture, but it is likely to have been huge unless some form of formal woodland management was carried out. The presence of willow and alder shows that both dryland and wetland woodland has been exploited, but the charcoal recovered from these species accounts for only a fraction of the assemblage.

Conclusion

A spatial approach has been used in an attempt to establish the distribution of charcoal wood recovered from the individual areas of the site. The assemblage has provided an insight into the types of wood exploited at the site over its lifetime. Although taphonomic processes (weathering) have acted on the charcoal, sufficient good non-amorphous charcoal was recovered to assess the relative size and stature of the material exploited. Oak and hazel charcoal dominate the assemblage, with much lower amounts of willow and alder. Area G is dominated by oak (92%) and the bulk of this has to be attributed to structural post wood which, judging by the anatomy

of this particular species, was mature and probably originated from trunk or maiden wood in contrast to the smaller diameter branchwood commonly observed in the hazel assemblage. The quantity of charcoal present within the assemblage represents only a fraction that would have been exploited for fuel. All the species present within the assemblage are native and commonly recorded in later prehistoric charcoal assemblages.

11.5.4 Discussion of the environmental evidence
Chris O'Connell

The palaeoenvironmental evidence suggests that during the MBA a mixed subsistence economy was practised. Cereal grains were recovered from contexts across all areas of excavation and the phalanx of a sheep recovered from Area H. Although animal bone was recovered from EIA contexts, it could not be identified by species, however it is likely that at least some of it represents domesticates, and hence a mixed farming economy is also proposed for the EIA.

There are three models of cultivation regimes that can be applied to early prehistoric Scotland: shifting cultivation, where plots of land are temporarily and intensively cultivated until the land loses its fertility and a new plot is cleared of forest and shrub cover and cultivated; permanent cultivation, where an extensive plot of land is repeatedly cultivated over generations, and manuring to replace lost nutrients in the soil is often employed; and garden cultivation, an intensive regime whereby farmers undertake small-scale crop and animal husbandry, which require higher inputs of human labour per unit area. Garden cultivation can be made more efficient by row-sowing rather than broadcasting seeds, as it produces higher seed-yield ratios (Bogaard 2004: 41), but it is hard to determine the difference in the archaeology.

These three models have implications for the organisation of prehistoric communities and the archaeological signatures they leave behind. One possible aspect of permanent, as opposed to shifting, cultivation may have been investment in constructing land boundaries. Land boundaries may offer some protection to both crops and animals from the elements, but their presence may also indicate land ownership or land rights, indicative of permanent systems of cultivation by more than one homestead in a single area. Although there was little evidence for enclosed field systems at Blackford, two linear features – one in Area H and one in Area D – may, however, qualify as relict boundaries. The one in Area H was interpreted as a possible hedge line because of its sinuous and irregular nature. The use of hedges as a means of stock control has been suggested by Barber & Brown (1984: 186). The MBA weed seed assemblage recovered from Pit 018 Area A contained nipplewort, a shade-loving plant that grows under trees or hedgerows. Its presence, however, can be taken as evidence for either a system of permanent cultivation in fields enclosed by hedges, or a shifting cultivation when a few stands of trees have been left post woodland clearance. Similarly, the lack of field boundaries or enclosed spaces at Blackford could be taken as evidence of either a shifting pattern of cultivation, small but intensively cultivated garden plots, or a low population level where land rights were not an issue. However, as always, truncation will have played its part and any putative field systems may have been eroded or ploughed away.

Seeds of domesticated flax were recovered from Area E, and this species requires intensive cultivation with high labour input, and was likely to have been grown in small garden plots.

11.6 Site abandonment

Site abandonment may be a planned or unplanned event and there are a number of reasons why sites become abandoned. Natural catastrophes such as storms, fires accidental or otherwise, disease or failing land productivity are just some of the possibilities. Warfare or feuds may also play a part in the abandonment process, although evidence for these at Blackford is lacking and would be difficult to identify with certainty. However, there is no evidence that the houses were abandoned due to detectable catastrophic events such as destruction by fire, as a result of warfare, crop failure or disease.

Cook & Dunbar (2008) applied LaMotta & Schiffer's model of house abandonment processes based on ethnoarchaeological studies (1999: 19–29) to the prehistoric structures at Kintore, and this can be used at Blackford, albeit on a much reduced scale due to the paucity of the artefact assemblage.

During a planned abandonment, bulky or broken artefacts are left behind, while an unplanned abandonment will be characterised by the presence of prestige goods within the structure. At Blackford what may be considered prestige goods, the cannel coal napkin ring and the shale raw material, were found in Structure 2B. Similarly, in Structure 1G the burnt cache of grain may also be seen as a high-value commodity. A tentative case for unplanned abandonment could be made for these two structures, but the context of abandonment could not be established. The artefact assemblages from the other houses were too limited to apply the model, but as a general point the almost complete absence of an Iron Age assemblage mirrors the findings of Cook & Dunbar (2008: 344).

However, abandonment implies a permanent leaving-behind of the structures and land and a moving-out and away by the inhabitants, where the reality may be rooted more in shifting patterns of settlement over time across a defined landscape (Barber et al 2007; Halliday 2007), where individual structures are occupied then abandoned, perhaps once the structure falls into a state of disrepair and can no longer be maintained, or land returns to pasture over a long cycle, or the location becomes unsanitary or the inhabitants die with no heirs to take over, with new houses then springing up nearby and the old locations potentially eventually being reoccupied. In this way, settlements shift around the landscape over time as populations grow and contract.

11.7 Conclusions

The excavations at Blackford have given us an insight into the lives of the inhabitants of the Blackford area during the first and second millennia BC. The excavations have revealed evidence for building techniques, architectural preferences, economy and the treatment of the dead. More problematic for archaeologists is the understanding of life on a generational timescale.

A view of prehistoric home life, largely based on 20th-century ideals of domesticity, was that there existed a dichotomy of women/domestic and men/industrial and further that the household unit equates with the 'family' who engage in or with domestic activities that include food preparation and consumption and child rearing. Ethnographic studies have demonstrated that those that engage in domestic activities do not necessarily equate with the residence unit of the household (Brück & Goodman 1999; Yanagisako 1979). Moore (1988) has highlighted the fact that in many societies, cooperation between women of different households in undertaking domestic activities is not unusual. Further, the composition of the household unit may include individuals who simultaneously belong to other residence units (Yanagisako 1979) and that this arrangement can be fluid rather than static and changes through the 'domestic cycle' (Goody 1958). The domestic sphere is hence historically and culturally contingent (Brück & Goodman 1999) and the household is not an undifferentiated unit of production and consumption, but rather the intra-household relationships are dynamic and fluctuating (Allison 1999; Hendon 1996; Tringham 1991). This dynamic between the resident unit and domestic activities has implications for archaeologists in the way they address the material remains. It cannot be assumed that domestic activities within prehistoric houses were undertaken only by the immediate family unit and that the archaeological signatures left by these activities are reflections of familial activities. It also cannot be assumed that there were prescribed domestic activities that were undertaken by a specific gender. The large palisade in Area A may qualify as a communally built structure, because of its size and the resources needed to build it. However, whether this commune was willing, perhaps as part of an exchange of labour for provisions, or had an unwilling component such as slaves, cannot be ascertained from the physical remains. Nor can it be assumed that the material remains within a house were a product of that household. For instance, although pottery was recovered from many of the houses there was no direct evidence for pottery production anywhere across the excavations, nor was there evidence of the raw material, clay, needed for its production. Conversely, evidence for both the raw materials and manufacture of shale jewellery was recovered from Structure 2B, but whether this structure was solely a craft workshop could not be ascertained from the evidence. Structure 2B showed no structural elements that differed considerably from the other MBA structures or which might be suggestive of a specialised building.

With this social fluidity in mind, how should the structures at Blackford be viewed? Were each of the houses inhabited by a nuclear family? The answer to that may largely depend on how many structures stood and were occupied at one time. Extended families and the social fluidity of households as seen in the ethnographic record would necessarily need more than one structure/house to realise this fluidity. A single house standing alone could be a candidate for a self-contained nuclear family, depending of course on how far away the neighbours were. The two LBA houses in Areas D and F appear to be stand-alone structures and are separated by *c* 1km. Although this distance does not prohibit inter-household relations, it may have limited the ease of access and transport of materials and goods between the houses, thus the kind of fluidity described in the ethnographic literature presented above may have been curtailed. In the MBA at Blackford the structures in Area B are candidates for communal living, as the radiocarbon dates are broadly contemporary, the architecture similarly so, and the structures on the whole do not stratigraphically intersect. A similar argument could be made for the EIA structures in Area A. The close proximity of these structures would be ergonomically more efficient in moving goods, material, food and people between the structures, and could facilitate the day-to-day social fluidity as described above.

Although we cannot know for certain the relationships of those that occupied these structures, it is probable that the houses at Blackford were visual foci in the landscape, in much the same way as houses in the landscape are today, and because they were dwelling places, or homesteads, they were probably also foci of social and political relations, at least on a familial level. There was both diversity and conformity expressed in the material remains at Blackford. Although the architecture and chronology of the structures is broadly similar to trends in the Bronze and Iron Ages at other excavated sites (eg Kintore, see Cook & Dunbar 2008), there were new variations in style and possibly use within those at Blackford. There are differences in building styles, such as the use of ring grooves, orientation of entrances, size of buildings, and in the number, type and distribution of artefacts within the structures.

The excavations at Blackford revealed a prehistoric landscape that was largely discontinuous from the Mesolithic to Iron Age, but reached its zenith of occupation during the MBA. The Neolithic pottery found during the course of the excavations probably belonged to the earliest farming communities who tried to make a living at Blackford, although no traces of any settlement of this date were identified in the excavations. As the population of Scotland grew, so did the farming communities. New technological innovations, notably metallurgy, and expanding communities were the hallmark of the second millennium BC. Although the community may have been small, it was viable and lasted for a millennium. Old and established interactions with other communities at a regional scale would have continued and new ones formed, through marriage alliances, trade and procurement (as exemplified by the oil shale from this site), and warfare. Many of these aspects would have directly impinged upon the members of the community, requiring labour perhaps to build the defences we see in the Iron Age community in Area A, enclosing themselves within a palisade, the construction of forts, and the necessity for weaponry. Others, such as long-term political trajectories and climatic change, may have gone unnoticed within a generation, but nevertheless required communities to adapt to survive.

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APPENDIX 1: PALAEOENVIRONMENTAL METHODOLOGIES

A1.1 Plant remains

Mhairi Hastie

A1.1.1 Introduction

The analysis of the plant remains concentrates on the carbonised cereal grain and chaff, and other plant remains (including weed seeds, nutshell, fruit remains, etc) that were recovered from the samples retained during the excavation.

A1.1.2 Methodology

For the analysis of palaeoenvironmental remains, 1,040 bulk soil samples were retained during the excavation. All of the soil samples were processed through a system of flotation: the floating debris (flot) was collected in a 250µm sieve and material remaining in the tank (retent) was washed through a 1mm mesh.

In order to gain a quick characterisation of the samples a random selection, over 60% of the total samples (including both the flot and retent fractions) from each excavated area (Areas A–H), were scanned using a low-powered binocular microscope to assess the quantity and quality of plant remains present in each sample.

A database was compiled recording the quantity and diversity of the plant remains present. The aim was to characterise the deposits, highlighting any samples that were distinctive, and any trends in the data. The plant material recovered was split into six main groups: cereal grains, chaff remains, straw fragments, weed seeds, rhizomes and hazelnut shell. The quantity of wood charcoal present in each flot fraction was also recorded, although these are not further discussed.

Table 26 Four-point scale for abundance of plant remains

Scale	Abundance	Approx. quantity
+	Rare	1–10 items
++	Occasional	11–50 items
+++	Common	51–100 items
++++	Abundant	101 + items

The quantity of the plant remains was recorded using a four-point scale (see Table 26).

A1.1.3 Detailed identifications

Twenty-eight samples found to contain high concentrations of cereal grains ('+++' or '++++') were fully sorted, and the plant remains identified and counted. All identifications were made with reference to the modern collection of CFA Archaeology Ltd, and standard seed atlases.

Where very large quantities of carbonised plant remains were present, the sample was subdivided using a riffle box, and a proportion of the plant remains sorted and identified. The quantity of grain and other plant remains in these samples was then multiplied to give an estimate of the total in the full sample; estimates are identified by a number followed by an (e).

A1.2 Charcoal analysis

Michael Cressey

A1.2.1 Introduction

The objective of the charcoal analysis was to obtain an insight into the local woodland composition using a spatial approach to determine the relative frequency of the species of wood exploited for fuel and construction (eg roundwood and timber) across the site. This is a very generalised approach which accepts there is a range of biases affecting the charcoal assemblage, including differential use of wood at the time it was exploited, preservation within the buried environment (taphonomic agencies), size selection during identification and importantly the lack of radiocarbon-dated local pollen diagrams close to the study area.

A preliminary charcoal assessment was undertaken on the retent fraction to establish the quantity and quality of the assemblage. Follow-up analysis was then carried out to determine the overall species composition on samples recovered from the variety of pits, post holes and other negative features within Areas A–H. Species were selected for radiocarbon dating on the basis of these results. The assemblage was also examined to assess the quality and degree of abrasion and vitrification of the charcoal assemblage. Taphonomic processes, in particular remobilisation within the buried environment can, depending on

the nature of the soil surrounding it (sand/gravel or both), lead to abrasion. This causes rounding-off of the edges of the charcoal fragment resulting in amorphous fragments. Vitrification leads to a glass-like appearance within the vascular structure of charcoal and is attributed to intense heating as a result of secondary burning.

A1.2.2 Methods

Charcoal was collected by hand during the excavation and in bulk samples, which were processed using a flotation tank (see above, Section A1.1). Large samples of charcoal (over 100g) were split in a riffle box to produce sub-samples in order to speed up the sampling process. Smaller samples were processed using routine methods. In all cases, counts were limited to 25 identifications per sub-sample using a binocular microscope at magnifications ranging between ×10 and ×200. Generally, identifications were carried out on transverse cross-sections. Anatomical keys listed in Schweingruber (1992) and in-house reference charcoal was used to aid identifications. Asymmetry and morphological characteristics were recorded. Vitrified charcoal fragments, possibly a result of secondary burning, were recorded but in general this material is usually not identifiable owing to increased fusion of the vascular structure. In this report 'roundwood' is used as a term of reference for branch wood that has not been modified. Where applicable, woodworking evidence such as squaring and trimming has been noted. Samples <4mm are considered to be below the level of identification (BLOI).

A1.2.3 Charcoal identifications

Seventy-four samples were below <2mm and could not be identified. The bulk of the assemblage is represented by fragments where the morphology of the individual fragments have no coherent shape (ie non-cylindrical typical of branchwood). *Quercus* (oak) fragments into small plate-like fragments as a result of splitting along its multiseriate rays. Larger-diameter charcoal was more common in the grab-samples and is typical of branchwood.

The complete sub-sampled 4mm charcoal assemblage is represented by 1,114 individual identifications and five individual species of tree. *Alnus glutinosa* (alder) is the least abundant, represented by only two fragments. *Salix* sp. (willow) is low in frequency, with only six fragments present. *Betula* sp. (birch) is also low in frequency, with 37 fragments weighing 14g in total. The understorey shrub *Corylus avellana* (hazel) is represented by 433 samples (260g) while *Quercus* sp. (oak) is the most abundant species, attaining 329g represented by 636 individual fragments.

A1.3 Soil micromorphology

Clare Ellis

Thirty Kubiena tin samples were taken from a variety of representative features, including pits, ditches/gullies and occupation deposits. The summary results are presented in the relevant sections, and full descriptions are available in the archive.

A1.3.1 Strategy

Chris O'Connell

Where possible, Kubiena tin samples were taken in order to understand and/or confirm the depositional sequence of fills within features as interpreted in the field by means of archaeological excavation. Ring ditches were targeted where possible with the aim of testing the animal byre hypothesis. However, practical considerations limited sampling by Kubiena tins; the majority of the features were filled with a single fill, thus limiting the evidence for an understanding of depositional sequences; similarly, the shallow depths of the fills of many of the features prohibited the use of a Kubiena tin; the often stony and gravelly nature of some of the feature fills also precluded the use of this kind of sampling.

A1.3.2 Thin-section manufacture and description

The samples were prepared for thin-section analysis at the Micromorphology Laboratory following the methods of Murphy (1986). The samples were assessed using a MEIJI ML9200 polarising microscope following the principals of Bullock et al (1985), Fitzpatrick (1993) and Stoops (2003). A range of magnifications (×40 to ×400) and constant light sources (plane polarised light – PPL, cross-polars – XPL, circular polarised light and oblique incident light – OIL) were used in the analysis.

A1.3.3 Objectives

The specific objectives of the analysis were:

- to determine the character and nature of the various deposits
- to explore and identify modes of formation and accumulation.

A1.3.4 Summary descriptions

The sampled deposits range from coarse sand to silt and are either poorly sorted or moderately sorted. The dominant mineral is quartz, with minimal amounts of feldspar. The rock fragments are derived from a number of igneous, volcanic, sedimentary and metamorphic lithologies; most are weathered. The vast majority of the sampled contexts have been extensively reworked by soil fauna, evidenced in the prevalence of faecal pellets in the form of microaggregates. Consequently, the dominant microstructures are granular or crumb, with many showing elements of both (complex). These types of microstructure are reflected in the relative abundance of pores and voids. Most of the contexts contain fragments of root. Fungal spores occur in the majority of the contexts; some are clearly burnt and other are not.

The majority of the sampled contexts have a significant amorphous organic content that is burnt or charred; a few contexts contain limited quantities of amorphous organic matter that has not been burnt. Most contexts are reddish-brown to brown when observed in PPL; this is due to the presence of ferrihydrite as well as the colloidal organic matter. In XPL the contexts are isotropic (undifferentiated b-fabric) because of finely crystalline iron and amorphous organic matter.

Post-depositional alteration features that occur in the majority of the contexts include limited impregnation of the matrix material by sequioxides; evidence of probable partial waterlogging. A significant number of samples also contain clasts of sequioxides, broken and redeposited coatings of iron oxide; this breaking-up of the iron oxide would have been caused by bioturbation. Calcium oxalate replacement of roots is very rare and was observed in a minority of contexts.