Archaeologia Cambrensis 167 (2018), 113–141

A Late Bronze Age ring-fort at Bayvil Farm, Pembrokeshire

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A 70m-diameter circular ditched enclosure identified as a cropmark in 1996 at Bayvil Farm, Eglwyswrw, north Pembrokeshire, was initially thought to be a segmented-ditched enclosure, an early type of Neolithic henge. Geophysical survey in 2012–13 and partial excavation in 2014 has shown it to be Late Bronze Age ring-fort dating to the eleventh-tenth centuries BC and subsequently occupied during the Early Iron Age. Late Bronze Age circular enclosures of this kind are well known in eastern England but this is the first such ring-fort to be discovered in Wales. A medieval corn-dryer identified by geophysical survey was also excavated which is probably to be associated with the probable traces of the medieval settlement of Bayvil, associated with the redundant St Andrew's Church which has possible medieval origins.

INTRODUCTION

This prehistoric site, first recognised as a cropmark in 1996, photographed from the air by Chris Musson in 1996. It lies on bedrock of silty mudstones of the Nantmel Mudstones Formation with superficial deposits of clayey gravel on relatively level ground at 130m above Ordnance Datum (SN 1024 4056) to the south-west of Bayvil Farm and to the just to south-east of the redundant church of St Andrew's Church, Bayvil. An assessment in 2006 by Dyfed Archaeological Trust concluded that this 70m-diameter circular ditched enclosure is probably of Iron Age date but it has also been suggested that it might be a segmented-ditched enclosure — an early type of Neolithic henge (Driver 2007, fig. 18). After geophysical survey in 2012–13, the site was excavated with four trenches in September 2014. The ploughsoil was stripped by mechanical excavator and features cut into the subsoil were excavated by hand.

GEOPHYSICAL SURVEY

Geophysical survey of the enclosure and its environs was carried out in 2013 and 2014, confirming the potentially segmented nature of the otherwise continuous ditch and identifying a single entrance in the south-east.

Geophysical survey grids were laid out using Leica GS15 Smart Rover GNSS. Magnetic survey was carried out using a Bartington Grad601 Single Axis Magnetic Field Gradiometer System (fluxgate gradiometer) with dual 1m Grad-001-1000L sensors over 20m by 20m grids with readings taken at 0.125m intervals along traverses spaced one metre apart, at a resolution of 0.1nT. Data were output to ArcheoSurveyor v2.5 for minimal processing.

The south-western part of the enclosure was surveyed in 2013, revealing a high level of background 'noise'. Survey of the north-eastern part of the enclosure in 2014 revealed very different conditions, with a much less noisy background. The ditch of the enclosure was clearly visible as a circle of strong positive

Fig. 1. Aerial photograph of the Bayvil Farm enclosure in 1996, viewed from the south. *Photograph: © Crown copyright: Royal Commission on the Ancient and Historical Monuments of Wales.*

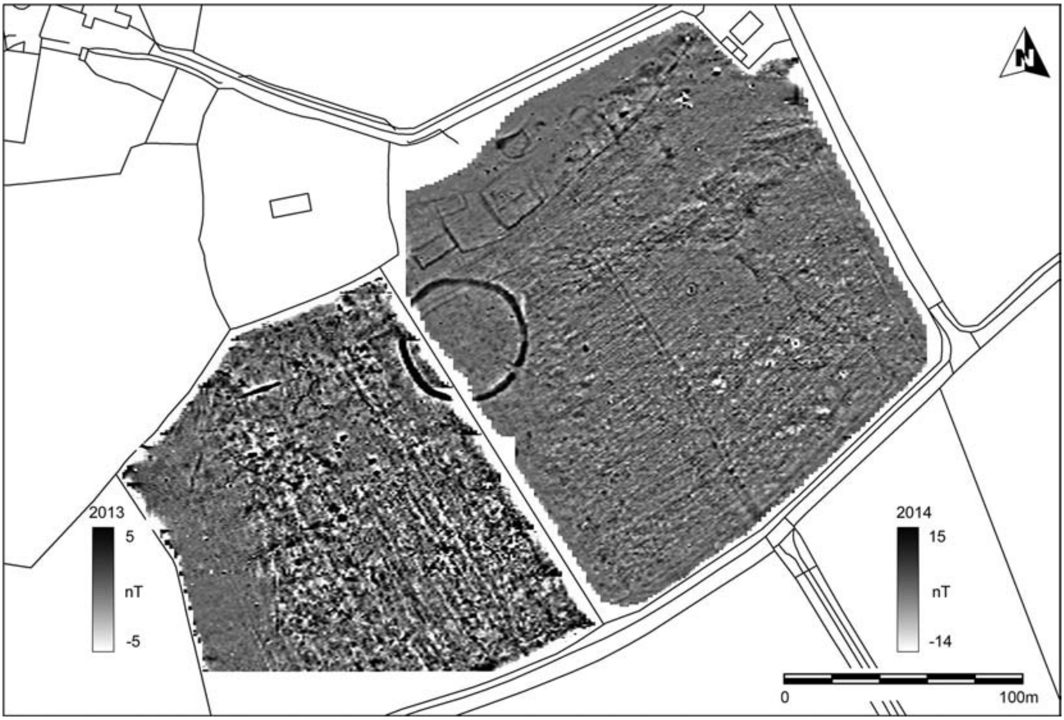

Fig. 2. Fluxgate gradiometer plot of the enclosure. Above it and to the right are rectilinear anomalies likely to be the remains of the medieval settlement of Bayvil. At the top left is St Andrew's Church.

magnetic response. There is no evidence of gaps or causeways in the ditch, as is shown in the east of the circuit in the aerial photograph (Fig. 1). Numerous magnetic anomalies are, on the basis of selective excavation in 2014, likely to be large pits, some of them indicative of activities associated with the enclosure. Others, as in Trench 3 (see below), were geological features. The anomaly examined in Trench 4 proved to be a medieval corn-dryer, probably associated with what appears to be part of a previously unrecorded medieval settlement of Bayvil along the north-east side of the survey area. This is represented by a linear arrangement of contiguous small enclosures and possible drainage gullies, 10–25m across, lying in a zone about 160 long and 50m wide to the south of the lane between St Andrew's Church and Bayvil Farm. The pattern is not dissimilar to that of the late twelfth- and thirteenth-century burgage plots and building drainage trenches in Newport (Pembs.), about 5 kilometres to the west (Murphy 1994).

EXCAVATIONS

Trench 1 – enclosure ditch and entrance

Trench 1 (14m × 7m) was located through the south-east-facing entrance so as to include a 6m-stretch of the ditch's eastern terminal. It also included a 9m-wide area within the enclosure's interior. The enclosure's now-vanished bank is assumed to have been on the inside of the ditch and to have been *c*. 5m wide and

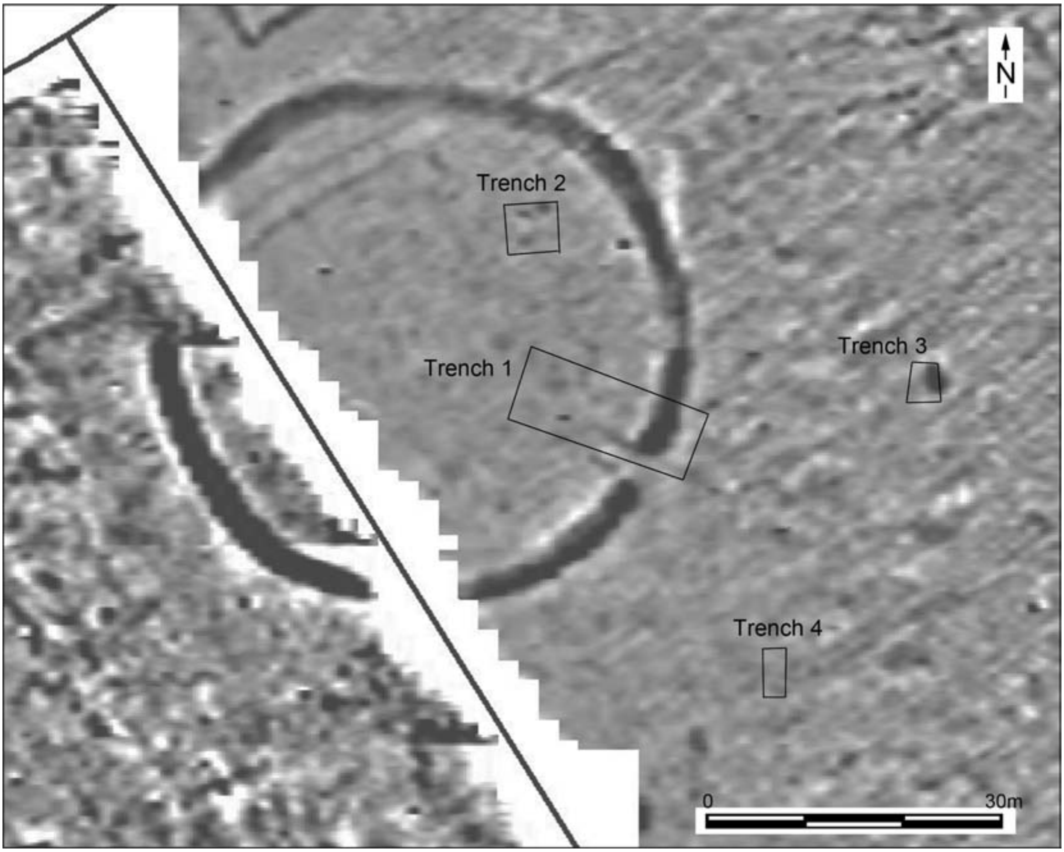

Fig. 3. Locations of Trenches 1–4 at Bayvil Farm in relation to geophysical survey.

separated from the entrance by a line of postholes set in a post trench. Within the interior beyond the bank were eight postholes of various dimensions, none forming any apparent spatial pattern (although the excavated area was limited in extent). There was no evidence of any postholes or other features within the area of the bank, the outer limits of which were marked by a line of cobbles at the base of the ploughsoil.

Enclosure ditch

The ditch (101) was 3.5m wide × 1.5m deep with a V-shaped cross-section and was cut into loose mudstone which was formed of small platelet-shaped stones. The ditch terminal bends slightly inwards towards the centre of the enclosure.

The ditch was filled with a sequence of layers, many of them containing shingle derived from the bank. The lowest three layers form a primary fill devoid of any finds other than carbonised wood fragments. The basal deposit (136) was a mid-dark brown silt with pea gravel. Above it, layer 135 was a mid-brown-yellow silt with small sub-angular stones. This was covered by a deposit of mid-dark brown clay silt with small to medium sub-rounded to sub-angular stones (134). Carbonised hazel (*Corylus avellana*) roundwood from this layer was radiocarbon-dated to 1260–1050 cal. BC at 95.4% probability (OxA-31813; 2948±27 BP), within the Late Bronze Age.

Fig. 4. Trench 1 in foreground and Trench 2 beyond, viewed from the south. The ditch terminal is at the lower right. *Photograph by Adam Stanford (Aerial-Cam Ltd)*.

The layers of secondary fill were largely stone-free, suggesting a period of stabilisation before bank material began eroding into the ditch. The lowest deposit within this secondary fill was friable light orange-brown sandy silt (113) with just a few sub-angular stones and fragments of carbonised wood. About 3m from the terminal, layer 113 contained a deposit of pottery (SF14 and SF15) probably from a single Late Bronze Age plain ware vessel (Fig. 8, vessel B). A broken hammer stone (Fig. 9, SF17) was also recovered from this layer. Two radiocarbon dates were obtained on carbonised roundwood from layer 113: one from hazel (*Corylus avellana*) is 1020–890 cal. BC at 95.4% probability (Beta-392849; 2800±30 BP) and the other on field maple (*Acer campestre*) is 1050–890 cal. BC at 95.4% probability (OxA-31814; 2807±28 BP).[1] Above this were a series of thin and spatially limited deposits. The earliest of these was a thin layer of soft light brown-yellow silt sand (112) within the area 1.5m from the terminal. Against the inside wall of the ditch, a loose mid-brown-grey silt (111) with medium-sized angular stones and rounded cobbles was evidence of a major slumping of bank material into the ditch. This was followed by a thin deposit of loose, very dark grey silt sand (110) with angular stones, about half of which were burnt. This appears to be the result of an episode of burning on the enclosure bank. Above this was a layer of soft mid-brown silt (109) containing angular and sub-angular stones and pottery sherds (SF7) probably from the same vessel found in layer 113; both layers appear to be the result of rapid, relatively stone-free infilling of the ditch. Layer 109 was covered by a layer of mid-brown sandy silt (115) with many small- to medium-sized sub-angular stones tumbling into the ditch from the side of the bank.

The subsequent deposits in the ditch can be defined as tertiary deposits. The first of these was a deep layer of soft yellow-brown sandy silt (107) with few stones. This was followed by a slump of compact

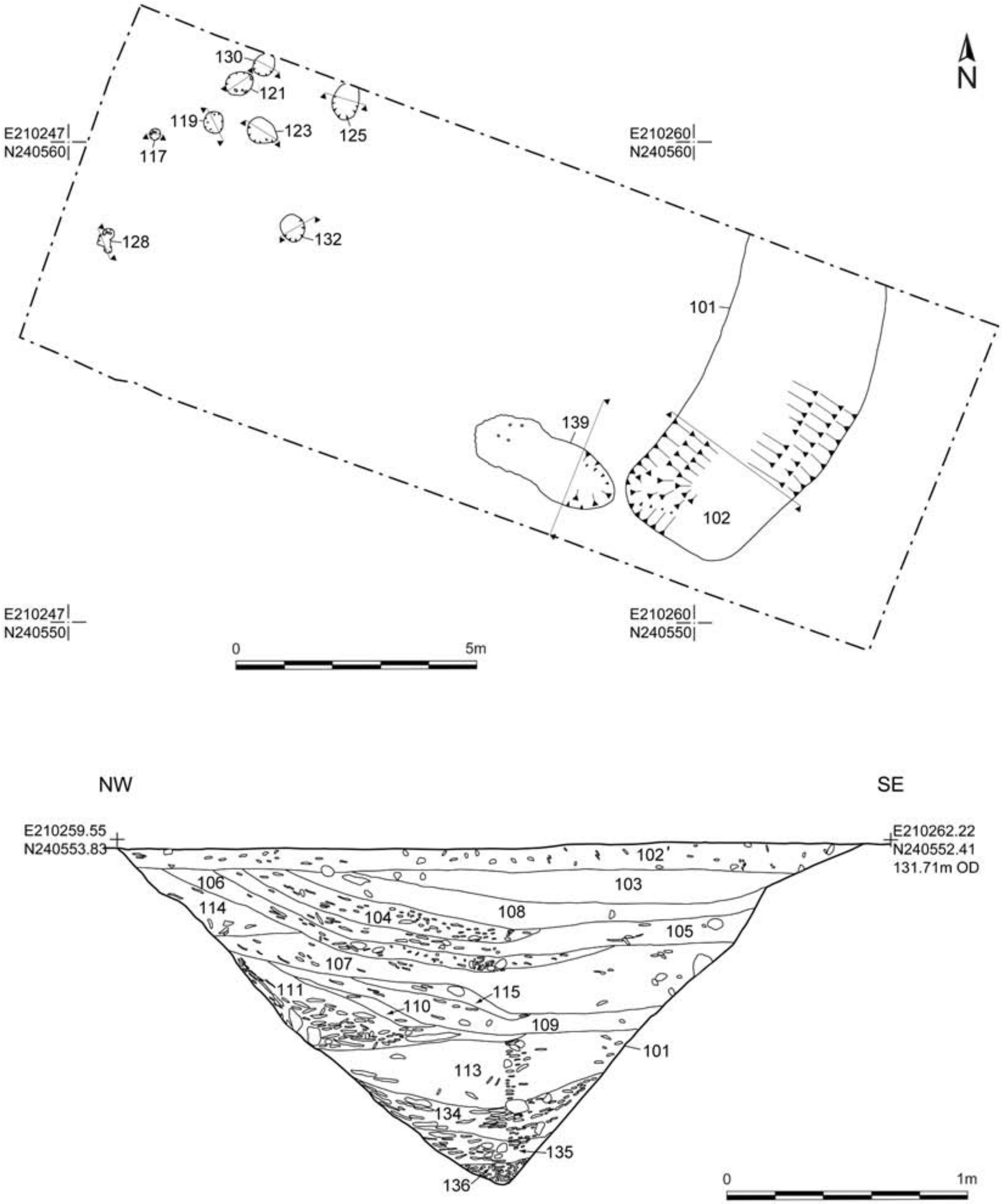

Fig. 5. Plan of Trench 1 and section across the north terminal of the enclosure ditch.

orange-brown clay and brown-grey clay silt (114) into the bank-side of the ditch. Layers 114 and 107 were covered by a deposit of loose mid-brown silt (106) with frequent stones of medium size. A deposit of pottery from a second, single Late Bronze Age vessel (Fig. 8, vessel A) lay within 2m of the ditch terminal. Layer 106 was covered by a friable mid-brown sandy silt (105), covered on its north (bank) side by yellow-brown sandy silt (104) with angular stones, the result of tumble from the bank.

The uppermost layers in the ditch were a series of ploughsoils most likely formed by cultivation in recent centuries, from the medieval period or later. The lowest of these was soft light brown-grey silt (108). This was covered by soft light brown-orange silt (103), below mid-brown-orange sandy silt (102).

Twenty-five irregular pieces of mudstone with artificial holes or notches came from the ditch and four from nearby posthole 128. Initially, the perforated stones were thought to be ornaments or weights (cf. Murphy and Mytum 2012, 294–7) but it soon became clear that these were created by the Bronze Age ditch diggers, presumably by driving a metal spike or antler pick into the bedrock in order to break it up. A similar observation was made for perforated stones in the backfill of rock-cut features at the nearby Early Iron Age hillfort of Castell Mawr (Parker Pearson *et al*. 2017).

Entrance gully

The magnetometer survey revealed a pair of linear features each side of the entrance and perpendicular to the line of the enclosure ditch. Excavation of the northern of the two gullies showed that they were the remains of a pair of post lines, designed to prevent the otherwise unsupported bank from slumping into the entranceway of the enclosure. The northern gully (139) commenced within 0.3m of the inside corner of the ditch terminal. It was 3m long, 0.5m wide and 0.4m deep, with sloping sides and a flat bottom of which only the southernmost part was excavated. It was filled with soft mid-brown silt with many loose sub-angular stones (138). It was cut by posthole 141, 0.3m wide and 0.3m deep; with a rounded bottom, filled with light brown clay (140). This posthole could have held a post 1.8m high and may have been the most southerly in a line of four or more serving to revet the bank.

During excavation of gully 139, its west side was found to be cut into a natural feature filled with extremely soft sand and mudstone platelets. The full dimensions of this natural feature could not be determined since it lay mostly outside the trench but it probably occupied a substantial part of the enclosure's entrance. It appears to be a small sinkhole but whether the positioning of the entrance on top of it was accidental or by design was not established.

Postholes within the enclosure

There were eight pits and postholes excavated in Trench 1 within the enclosure, all of them behind the position of the bank rather than in line with the entrance. No spatial patterning was evident in their distribution but this may have been partly a factor of the small size of the trench. *Posthole 117* was circular with vertical sides, 0.25m diameter and 0.34m deep, and was filled with stone packing (half of which were of quartz, one of them reddened by heat) and friable light brown sandy silt (116). It could thus have held a post about 0.2m in diameter and 2m high. *Posthole 119*, 0.6–0.4m across and 0.42m deep, was steep-sided and pear-shaped in plan. It was packed with medium-to-large sub-angular stones in a matrix of brown-red clay silt (133). Its post-pipe was composed of friable mid-brown sandy silt (118). Its post was possibly slightly thicker and higher than that in posthole 117. *Pit 121*, 0.55m in diameter and only 0.11m deep, was circular in plan with a flat base. In its base was a 0.02m-thick layer of blackened light brown sandy silt (126). Above this, it was filled with angular stones and friable light brown sandy silt (120). *Posthole 123* was 0.58–0.54m across and 0.34m deep with steep, slightly concave sides. It was filled with only occasional stones in a mid-grey-brown sandy silt (122). Although of appropriate dimensions for a posthole, the lack of packing stones suggests that it might have been a pit or even an incomplete posthole.

Posthole 125, 0.41–0.51m across and 0.4m deep, has vertical sides down to a V-profiled base. It contained a moderate quantity of stones (10% by volume) within a light brown sandy silt (124). *Posthole 128*, 0.5–0.3m across and 0.27m deep, was oval in plan with near-vertical sides and a flat bottom. It was filled with packing stones, one of them large, in light brown sandy silt (127). *Posthole 130*, 0.47–0.35m across and 0.26m deep, had steep sides and a flat base. It was filled with tightly packed stones, some of them burnt, in a dark brown clay silt (129). *Posthole 132*, 0.47–0.31m across and 0.3m deep, had with vertical sides and a rounded base. It was filled to a depth of 0.16m with light brown-yellow silt (137), followed by an upper layer of brown sandy silt (131) 0.14m thick. Neither fill contained any packing stones, casting doubt on its use as a posthole.

Trench 2 – enclosure interior

This 6m × 7m trench was excavated within the enclosure's interior to investigate three magnetic anomalies revealed by geophysics. There were, in fact, 11 features identified in this trench, of which seven were excavated. Four of these were double features — shallow pits that had been re-cut by later pits — and two formed a pair of adjacent pits. The seventh excavated feature was a 3.4m-long, 0.2m-wide arc-shaped gully which appears to be part of a 5m-diameter roundhouse wall-trench.

Pit 210 was 0.85–?0.9m across and 0.12m deep, with a slightly concave bottom. It was filled with light grey-brown silt (209). Cut into the top of 210 was a smaller bowl-shaped pit 210, 0.8–0.64m across and just 0.1m deep, which was filled with grey silt (201) containing burnt stones.

Pit 206 was 0.75–0.7m across and 0.25m deep with a V-shaped profile. Its lowest layer was mid-orange-brown silt (221) that filled the pit to a depth of 0.16m. Layer 221 contained an unworked beach pebble of flint (SF2). This layer was capped by two thin layers, the lowest (215) a very dark grey-brown silt with carbonised material, and the uppermost (214) light grey-brown with frequent small, angular stones. The pit was capped with a layer of mid-brown to orange silt with angular stones (205). Pit 206 was cut by a smaller bowl-shaped pit 204, 0.4–0.32m across and 0.09m deep, filled with very dark brown-grey silt (203) with frequent burnt stones and carbonised material.

Pit 213 was an irregularly shaped feature, 0.38m across and 0.09m deep, with a bowl-shaped profile, filled with light grey-brown silt (212). It was cut on its east side by a larger pit 208, 0.95–0.64m across and 0.4m deep, with near-vertical sides and a flat bottom. The bottom 0.2m of Pit 208 was filled with light grey-brown silt (230) containing frequent sub-angular and sub-rounded stones and carbonised material. Above this was a compacted, dark brown silt (224) with frequent carbonised material. This was covered by an orange-brown burnt deposit (223), above which was a further layer of dark brown silt (222) with frequent carbonised material. Above this was a layer of brown silt (211), also with burnt material. Pit 208 was capped with dark brown-grey silt (207). There was no indication that the sides of the pit had been heated so this feature was probably not a sunken oven but a repository for a series of hearth deposits, perhaps from an adjacent building.

Pit 219 was a circular or oval pit, 0.8m across and 0.14m deep, with a bowl-shaped profile, filled with dark brown silt (220) containing frequent sub-angular and sub-rounded stones. Pit 219 was cut on its north side by a similar-sized bowl-shaped pit (216), 0.8–0.85m across and 0.11m deep. Pit 216 was filled with two layers: light orange-brown silt (218) beneath black-brown silt (217). Layer 218 contained a flint scraper (Fig. 9, SF13). Carbonised hazel (*Corylus avellana*) roundwood from this deposit produced a radiocarbon date of 780–500 cal. BC (OxA-31816; 2483±27 BP), in the Earliest/Early Iron Age, some centuries after the enclosure ditch had been constructed and started to silt up.

Two pits do not cut each other as the other pairs do but they are located 0.25m apart. Pit 226 was oval and bowl-shaped, 0.65–0.35m across and 0.12m deep. Its primary fill was light yellow-brown silt (227) with small angular stones. This was covered by a similarly stony layer of mid-grey-brown silt (225). Pit

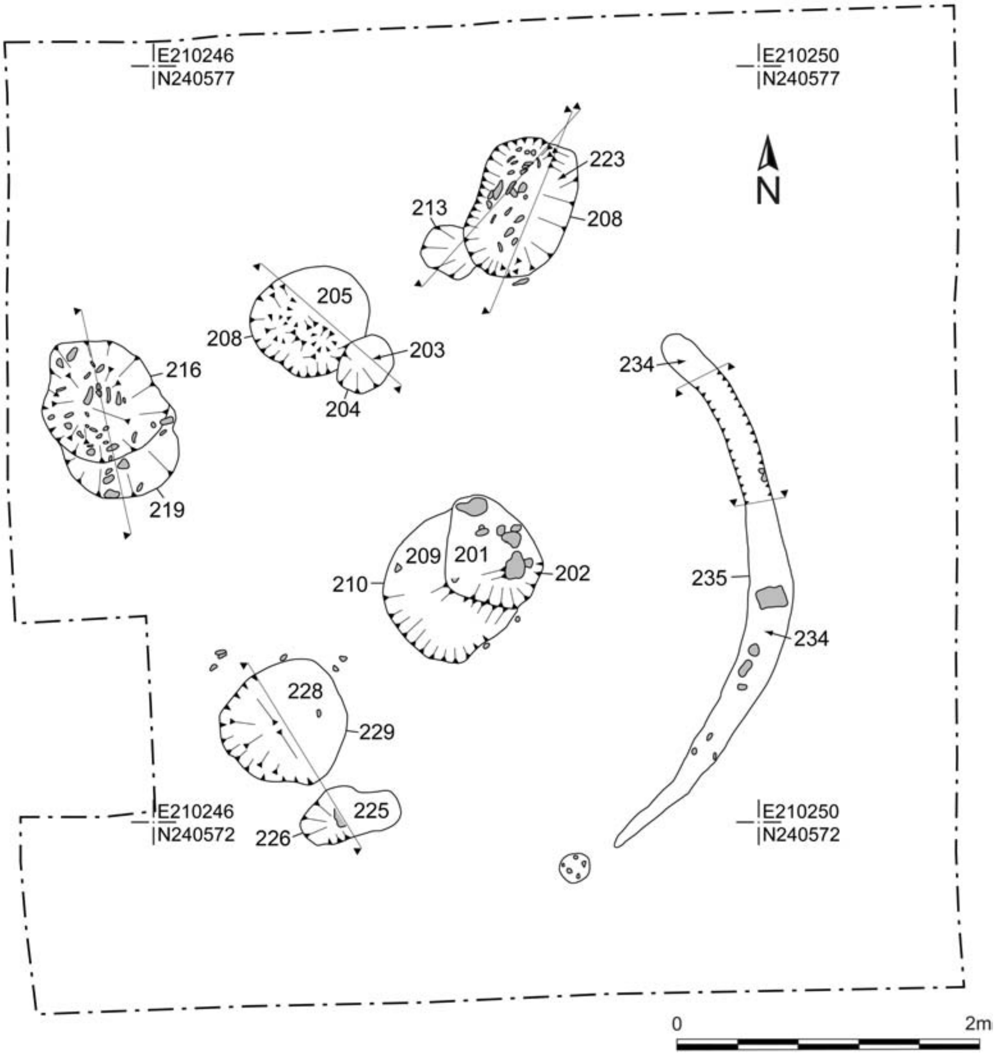

Fig. 6. Plan of Trench 2.

229 was almost circular, 0.8m in diameter and 0.3m deep, with near-vertical sides and a flat bottom. Pit 229 has three fills. The lowest was mid-orange-brown silt with frequent burnt stones (233). Above this was dark grey-brown silt (231), capped by more dark grey-brown silt with quantities of burnt stone (228).

The only feature in Trench 2 that was not a pit was structure 235, a 3.4m-long, 0.2m-wide and 0.07m deep arc-shaped, U-profiled gully, running north-south and bowing to the east. It was filled with a heterogenous deposit of dark brown silt and carbonised material (234) and contained a grinding stone (Fig. 9, SF16). It was interpreted as a wall-trench for a small roundhouse of 5m diameter, with a doorway possibly in the south or north-east. The central position of the four sets of pits (210 and 202, 206 and 204, 219 and 216, and 226 and 229) within this possible roundhouse raises the possibility that they formed a square setting of replaced postholes to support this building's roof. Carbonised hazel (*Corylus avellana*) roundwood from the wall-trench fill is radiocarbon dated to 770–430 cal. BC at 95.4% probability (OxA-31815; 2470±26 BP). This places the roundhouse's use in the Earliest/Early Iron Age, the same period as pit 216's fill and a century or more after the surrounding enclosure ditch was dug out.

Trench 3

Outside the enclosure, the substantial magnetic anomaly in Trench 3 turned out to be a corn-dryer (303), probably of medieval date and containing quantities of carbonised barley. It was excavated in half section along its long axis, with its south-west half left unexcavated. It was 2.85m long and 1.67m wide across its wider north-west half and cut into mudstone bedrock. Its south-east half was 1.3m wide and 0.22m deep, shallower than the depth (0.46m) of its larger north-west half.

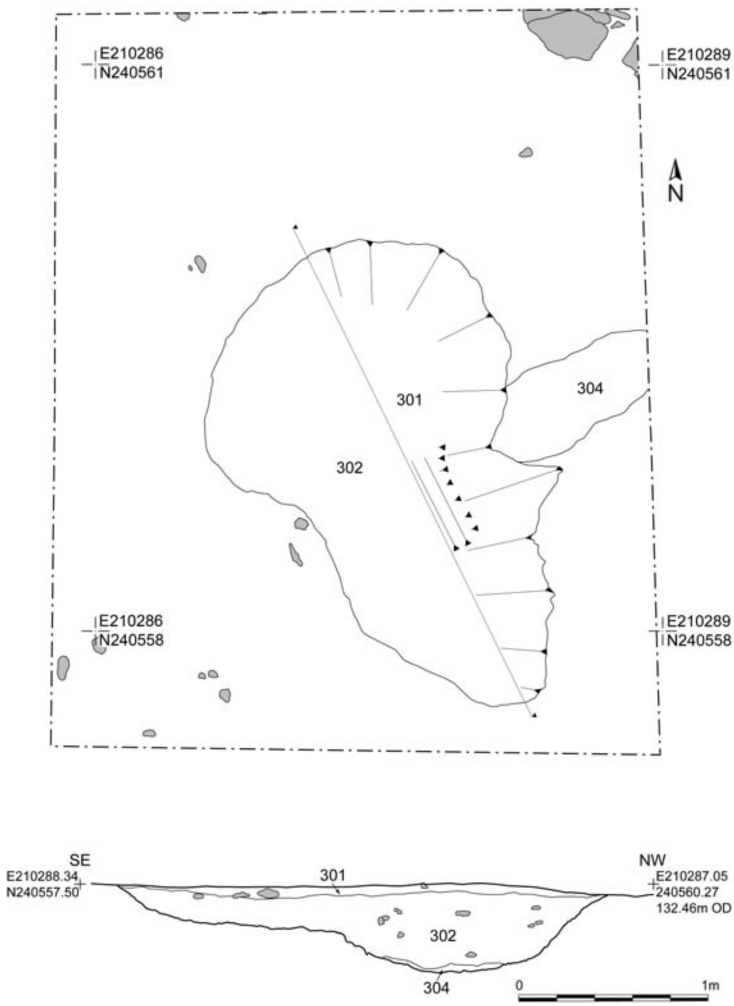

Fig. 7. Plan of Trench 3 and section through the corn-dryer.

The lowest layer in the north-west half of the corn-dryer was a thin brown-orange burnt deposit 0.04m thick (304). Most of the feature was filled with a deposit of loose mid-brown silt (302) packed with charred plant remains and wood charcoal. The uppermost layer, immediately below the ploughsoil was a 0.06m-thick deposit of mid-brown silt with carbonised material (301), in which a sherd of medieval pottery (SF3) was found.

The results of the magnetometer survey suggest that this corn-dryer stood in isolation from any associated buildings or other such structures, possibly because of the potential fire hazard. However, as noted above, the many rectilinear anomalies detected along the northern edge of the field, 60m to the north-west, are likely to be those of a medieval settlement associated with the now redundant St Andrews's Church to which the corn-dryer probably belonged. The church dates from at least the sixteenth century (Pritchard 1907, 96) though the late twelfth-century font inside the church suggests a medieval origin.

Trench 4

Within Trench 4, the geophysical anomalies of two apparent circles, one about 20m in diameter and the other 10m, turned out to be the result of geological and subsoil variation where areas of bedrock protruded into the base of the ploughsoil.

POTTERY

Sherds deriving from a minimum of two plain Late Bronze Age vessels of a kind dating to just after 1000 BC (cf. Morris 2013) were found in deposits within the enclosure ditch (Fig. 8). Later Bronze pottery is not well known from south-west Wales but general parallels for vessels with simple everted rims like vessel A and inturned rims and expanded bases like vessel B can be found in assemblages from Stackpole Warren, Pembrokeshire (Darvill 1990) and further afield from Brean Down, Somerset (Woodward 1990), Kemerton, Worcestershire (Woodward and Jackson 2015) and the Breiddin, Montgomeryshire (Musson 1991).

A single sherd of unglazed medieval pottery was found in the upper fill of the corn-dryer.

Vessel A

Twelve sherds and numerous crumbs (109g) derive from a single small jar (83mm tall), plain with a tapered vertical rim (120mm diameter) and a footed base (110mm diameter). Almost 25% of the pot is represented and it has an average wall thickness of 7mm. The greyish-orange exterior surface is wiped smooth and the pale yellowish brown interior surface is very slightly rough to the touch but is uniform with few visible non-plastics including black clasts up to 0.2mm in diameter. Both surfaces display occasional grass impressions. The vessel has a coarse, soft clay fabric with an orange-grey core, a beige exterior surface and a beige-orange surface on the interior. Filler is common (about 30%) and consists of medium to large angular inclusions up to 10mm across. There is no trace of sooting or burnt residues on the vessel's sherds.

From layer 106, SF001. Since only half of this ditch fill layer was excavated, it is possible that the sherds recovered represent part of a whole or almost whole vessel that was deposited in the ditch terminal. The position of layer 106, slightly above layers 113 and 109, makes it likely that this pot dates to the tenth century BC or slightly later.

Vessel B

Sherds probably representing about half of a single jar, plain with a slightly tapering round-topped rim 180mm diameter and a footed base 130mm diameter and an average wall thickness of 11mm. The moderate

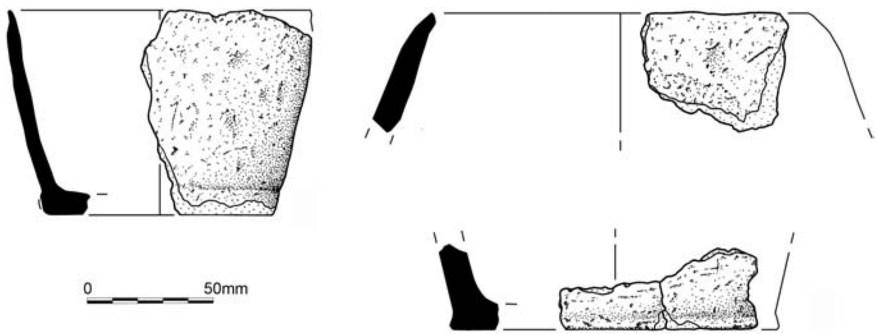

Fig. 8. Late Bronze Age vessels from the enclosure ditch.

brown exterior surface is wiped and slightly rough, and the dark grey interior surface is relatively smooth. The vessel is made of a moderate brown paste 2mm thick, overlying a 9mm-thick, dark grey paste. Black shiny clasts, 0.3–0.5mm in diameter, are about 10% by area. The interior surfaces of the base sherds are covered with a thin layer of black residue but there is no trace of sooting on the pot's exterior surfaces.

Twenty-three sherds and numerous crumbs SF007 (331g) from layer 109; rim sherd SF014 (12g) and 49 sherds and crumbs SF 15 (397g) from layer 113. It seems likely a whole vessel deposited in the ditch terminal. Two radiocarbon dates on carbonised roundwood from layer 113 date to 1044–897 cal. BC (OxA-31814; 2807±28 BP) and 1015–895 cal. BC (Beta-392849; 2800±30 BP).

Microscopical descriptions of the Late Bronze Age pottery. By Rob Ixer

Vessel A. A very clean brown clay carries small angular quartz, rare muscovite and trace amounts of epidote. Larger single grains are rare but include coarse-grained clinopyroxene, strained quartz, unaltered to altered feldspar/plagioclase and just possibly olivine. Rock clasts comprise ophitic dolerite with very pale green clinopyroxene ophitically enclosing thin plagioclase laths and small, rounded ?olivine/epidote. Enclosed plagioclase is totally altered to secondary minerals with very low interference colours, slightly larger non-enclosed plagioclase is less altered and has unaltered rims. Other clasts comprise stubby altered plagioclase-opaques-brown amphibole intergrowths with a little accessory apatite. Other rock types are rare but include polycrystalline quartz. The presence of unaltered olivine is suspect as the dolerites are heavily altered. The sherd is tempered with a Preseli dolerite or possibly two different dolerites. The dolerite is not Carn Meini-type dolerite. The local geology is meta-sediment rather than igneous, in contrast to the filler used in the pots.

Vessel B. A slightly silty brown clay carries small angular quartz and rare muscovite. Larger single grains are include coarse-grained quartz, clinopyroxene, brown amphibole and rare, cellular carbonised wood. Irregular shaped rock clasts with quits a wide size range are essentially monolithic comprising clinopyroxene ophitically enclosing plagioclase that alters extensively to fine-grained clinozoisite and minor muscovite and both primary minerals are locally intergrown with opaques and brown-green amphibole plus rare apatite and possible sphene. In some clasts later plagioclase is unaltered or epidote with high interference colours is present. Other rock types are uncommon but included fine-grained micaceous sandstone and siltstone and meta-sandstone with quartz grains within a muscovite matrix. The sherd is tempered with a Preseli dolerite but not of Carn Meini type.

STONE TOOLS

Flint scraper (Fig. 9).
Flint scraper of black translucent flint with a portion of cortex indicating that this very fine artefact is made of nodule flint and not a beach cobble. From Trench 2, pit 216, layer 218, SF13.

Grinding stone (Fig. 9).
A waterworn near-spherical dolerite cobble (75mm × 73mm × 60mm thick) with a grinding facet on its underside. Peck marks on its upper side may be the result of use as a hammer stone. This grinding stone may have been the top stone for a saddle quern. 527g. From Trench 2, gully 235, layer 234, SF16.

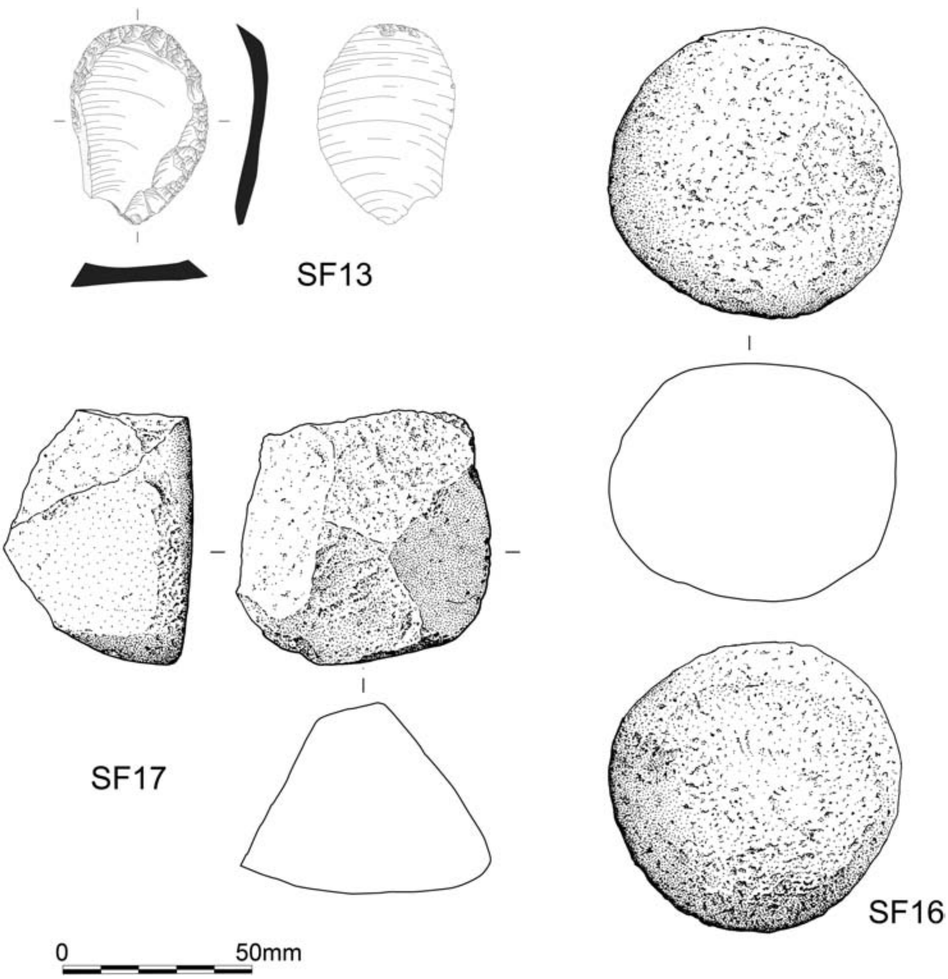

Fig. 9. Flint scraper and stone tools from the enclosure.

Broken hammerstone (Fig. 9).
Broken hammer stone (62mm × 68mm × 45mm thick), made from a waterworn dolerite cobble. Two areas of pecking are visible, one on the largest flat face of the cobble and the other on the edge between this face and another. 266g. From Trench 1, enclosure ditch, layer 113, SF17.

Burnt stones
Some 104 fragments (9.475kg) of burnt stone were recovered from the excavations. Cut features in Trench 2, within the interior of the enclosure produced the highest quantities (72 fragments weighing 5.27kg). Within Trench 1, 36 fragments (2.144kg) were recovered from the enclosure ditch fills and 18 fragments (1.818kg) from cut features. Medieval features produced only 24 fragments (177g).

CHARRED PLANT MACROFOSSILS AND CHARCOAL
By E. Simmons

Methods
Samples selected for analysis of charred plant macrofossils were sorted using a low-power binocular reflected light microscope (×10–65). The greater than 1mm fraction of sample 30 from corn-dryer fill (302) was fully sorted. The less than 1mm fraction was sub-sampled with the resulting counts of plant material multiplied to represent that present in the sample as a whole. All other samples were fully sorted. Identification of plant material was carried out using modern reference material in the Department of Archaeology, University of Sheffield and various reference works (e.g. Cappers *et al*. 2006). Cereal identifications follow Jacomet (2006). Other plant nomenclature follows Stace (2010). Information on the ecology of wild or weed plant taxa was taken from various reference works (e.g. Preston *et al.* 2002). Quantification of cereal grains was based on the presence of embryo ends, glume bases, rachis nodes and the nodes of straw (Jones 1990, 92).

Wood charcoal fragments were fractured manually and the resultant anatomical features observed in transverse, radial and tangential planes, using high-power binocular microscopy (×50, ×100 and ×400). Identification of each fragment was carried out to as high a taxonomic level as possible, by comparison with material in the reference collections at the Department of Archaeology, University of Sheffield and various reference works (e.g. Schweingruber 1990; Hather 2000). Nomenclature follows Stace (2010). A minimum charcoal fragment size of 2mm was chosen for identification, as smaller fragments are difficult to fracture in all three planes and therefore difficult to identify. This may, however, result in a bias against the representation of species such as lime (*Tilia* sp.) which tend to be fragile and fracture easily into small fragments. Where possible, 50 wood charcoal fragments greater than 4mm in size and 50 fragments 2–4mm in size were identified from each context with the aim of identifying a representative sample of wood taxa utilised for fuel, thereby reducing bias related to fragmentation. Where this was not possible, all of the fragments of wood charcoal greater than 4mm in size were identified, with the remaining fragments being 2–4mm in size.

Results from the Late Bronze Age ring-fort
Charred plant macrofossils
The predominant cereal type present in contexts associated with the Late Bronze Age ring-fort is hulled barley (*Hordeum* sp., Table 1). A single asymmetrical hulled barley grain, which is typical of the lateral spikelets of six-row barley (*Hordeum vulgare*), is present in ditch fill 113 and a naked asymmetrical barley grain (*Hordeum vulgare* var. *coeleste*), is present in ditch fill 110. It is therefore possible that both six-

Table 1. Charred plant macrofossils from contexts associated with the Late Bronze Age ring-fort

	enclosure ditch			gully	pit		pit	
Feature	101			139	208	208	229	229
Context	107	110	113	138	222	224	231	228
Sample	16/18/22	20	21/38/43	60	11/13	47	49	46
Volume of soil processed (litres)	72	9	108	51	17	1	18	27
Hordeum vulgare L. emend. Lam. (hulled six-row barley) asymmetrical grain (hulled)	–	–	1	–	–	–	–	–
Hordeum vulgare var. *coeleste* L. (naked six-row barley) asymmetrical grain (naked)	–	–	–	–	–	–	–	–
Hordeum sp. (hulled barley), symmetrical grain	1	–	–	–	–	–	1	–
indeterminate grain	13	–	5	–	–	–	24	9
Hordeum sp., (indeterminate barley), grain	8	–	2	1	–	–	32	4
rachis internode	2	–	–	–	–	–	–	–
cf. *Hordeum* sp., indeterminate grain	–	–	–	–	–	–	–	3
Triticum dicoccum Schübl. (emmer wheat), glume base	–	–	5	–	–	–	–	–
Triticum cf. *dicoccum* Schübl., grain	2	–	–	–	–	–	–	–
glume base	–	–	2	–	–	–	–	–
Triticum cf. *spelta* L. (spelt wheat), grain	–	–	–	–	–	–	1	–
glume base	–	–	–	–	1	–	–	–
Triticum dicoccum/spelta L. (emmer/spelt wheat), grain	–	–	–	–	1	–	1	–
glume base	1	–	2	–	–	3	–	1
Triticum indet. (indeterminate wheat), grain	5	–	–	–	–	–	5	–
Indeterminate cereal, grain	4	–	–	–	–	–	9	3
Non-seed charred plant material								
<2mm culm node/monocot. stem fragment	9	2	18	30	1	–	–	1
<2mm culm base/monocot. basal stem fragment	–	2	12	15	–	–	–	–
thorn	3	2	–	1	–	–	2	–
tuber/rhizome	6	1	10	1	–	–	2	1
Wild / weed plant seeds								
cf. *Ranunculus acris/repens/bulbosus* (meadow/ creeping/bulbous buttercup)	–	–	–	1	–	–	–	–
cf. *Ficaria verna* Huds. (lesser celandine), tuber	–	–	–	6	–	–	–	–
Fabaceae (pea family)	–	–	–	1	–	–	–	–
Vicia spp./*Lathyrus* spp. (vetches/wild peas)	2.5	–	–	–	–	–	–	0.5
Medicago spp. *Trifolium* spp. (medicks/clovers)	7	1	6	2	–	–	–	4
Prunus spinosa L. (blackthorn)	1	–	–	–	–	–	–	–
Rubus fruticosus L. agg. (bramble)	31	10	1	1	2	–	–	–
Rubus idaeus L. (raspberry)	7	1	–	1	–	–	–	–
Aphanes arvensis L. (parsley piert)	–	–	2	–	–	–	–	1
cf. *Aphanes arvensis* L.	1	–	–	–	–	–	–	–
Corylus avellana L. (hazel), nutshell	–	–	–	1	2	–	6	3
Persicaria maculosa/lapathifolia (redshank/pale persicaria)	1	–	–	–	4	6	4	–
Fallopia convolvulus (L.) Á. Löve (black bindweed)	2	–	1	1	–	–	–	1
cf. *Fallopia convolvulus* (L.) Á. Löve	–	–	–	1	–	–	–	1
Rumex spp. (docks)	1	2	–	–	1	1	–	–
Rumex acetosella L. (sheep's sorrel)	–	–	1	–	2	–	–	4
Rumex cf. *acetosella* L.	–	–	–	–	2	–	–	–
Spergula arvensis L. (corn spurrey)	3	–	2	–	6	–	–	–
Caryophyllaceae (pink family)	–	–	–	–	1	–	–	–
Stellaria spp. (stitchworts)	1	–	3	–	–	–	–	–
Stellaria media (L.) Vill. (common chickweed)	–	–	–	–	1	–	–	–
Chenopodium spp. (goosefoots)	–	–	–	–	1	–	–	1
Chenopodium album L. (fat hen)	–	–	–	–	1	–	–	–
Montia fontana ssp. *chondrosperma* (Fenzl) Walters (blinks)	–	–	3	–	–	–	–	–
Galium aparine L. (cleavers)	7	2	–	1	–	–	–	–
Galium spp. (bedstraws)	–	–	–	1	–	–	–	–
Plantago major L. (greater plantain)	–	1	–	–	–	–	–	–
Plantago lanceolata L. (ribwort plantain)	1	1	–	–	2	–	–	1
Veronica sp. (speedwell)	–	–	1	–	1	–	–	–
Ajuga reptans L. (bugle)	–	–	1	–	–	–	–	–
Prunella vulgaris L. (selfheal)	–	–	–	–	1	–	–	–
Carex spp. (sedges)	–	–	–	–	1	–	–	–
cf. *Carex* spp.	–	2	–	–	–	–	–	–
Phleum pratense L. (timothy)	8	3	12	–	–	–	–	–
>1mm Poaceae spp. (grass family), large seeded	–	–	–	–	–	–	–	–
<1mm Poaceae spp. (grass family), small seeded	8	2	14	–	13	–	4	6

row hulled barley and six-row naked barley is present, although the presence of two-row barley cannot be ruled out. It is likely, however, that due to the presence of only one naked barley grain, the naked barley is a minor contaminant of the hulled barley crop. A small number of grains and glume bases were identified as emmer wheat (*Triticum dicoccum*) or probable emmer wheat (*Triticum* cf. *dicoccum*) and a small number of grains and glume bases had morphological characteristics intermediate between emmer wheat and spelt wheat (*Triticum dicoccum*/*spelta*) although no spelt wheat grains or glume bases were positively identified.

The utilisation of wild plant food resources is also indicated by the presence of seeds of bramble (*Rubus fruticosus*) and raspberry (*Rubus idaeus*), a blackthorn fruit stone (*Prunus spinosa*) and hazel nutshell (*Corylus avellana*). Tubers of lesser celandine (*Ficaria verna*) which were present in entrance gully fill (138) have also been shown to have represented a potential source of wild food in prehistory (Mason and Hather 2000, 423).

The assemblage of wild or weed plant seeds included taxa commonly associated with fertile disturbed soils and cultivation such as parsley piert (*Aphanes arvensis*), redshank/pale persicaria (*Persicaria maculosa/lapathifolia*), black bindweed (*Fallopia convolvulus*), corn spurrey (*Spergula arvensis*), common chickweed (*Stellaria media*), fat hen (*Chenopodium album*) and cleavers (*Galium aparine*). Taxa which are commonly associated with both grassland and cultivated fields, but are frequently occurring taxa in archaeobotanical charred plant remains assemblages, included vetches/wild peas (*Vicia spp./Lathyrus* spp.), medicks/clovers (*Medicago* spp./*Trifolium* spp.), sheep's sorrel (*Rumex acetosella*), ribwort plantain (*Plantago lanceolata*), timothy (*Phleum pratense*) and grasses (Poaceae). A small proportion of the wild or weed seed assemblage also included taxa commonly associated with damp soils such as lesser celandine (*Ficaria verna*), blinks (*Montia fontana* ssp. *chondrosperma*) and sedges (*Carex* spp.)

The charred cereal grains present in contexts associated with the Late Bronze Age ringwork are likely to have been charred accidentally during parching or food preparation and redeposited as waste from domestic hearths. The wild or weed plant seeds may have been charred following removal from the harvested crops during crop processing, or may represent plant material collected for use as fodder, tinder or roofing and flooring material. The relatively low density of charred plant remains present in the contexts associated with the Late Bronze Age ringwork may indicate that cereal processing was carried out on a relatively small scale, with small quantities of cereals less likely to come into contact with fire. Corn-processing by-products may also have been utilised for other purposes however, such as fodder or temper for example, rather than being burnt.

Low-density assemblages of charred plant remains are typical for Late Bronze Age and Early Iron Age sites in the region. Palynological evidence indicates that the subsistence economy in many areas of west Wales was likely to have been based on pastoralism, particularly during the Iron Age. Agriculture was also practiced in favourable locations, however, but seems to have been carried out on a relatively small scale (Seymour 1985, 341–2; Caseldine and Griffiths 2010, 87).

The low density of charred crop material as well as the crop types and suite of wild or weed plant seed taxa present in contexts associated with the Late Bronze Age ringwork at Bayvil Farm are similar to those present at other Bronze and Iron Age sites in west Wales. A low-density assemblage of six-row hulled barley, oats and wheat along with wild or weed plant seeds including docks, orache and grasses was present in samples from a Bronze Age house excavated at Newton, Llanstadwell (Pembs.) (Caseldine and Griffths 2004a). A low-density assemblage of charred cereal grain and wild or weed plant seeds from Late Bronze Age/Iron Age contexts excavated at Brownslade (Pembs.) (Carruthers 2011) also included hulled six-row barley along with spelt wheat. Wild seeds included clover/medick, docks, fat hen, ribwort plantain and grasses. Sloe stones indicated the exploitation of wild food resources and lesser celandine tubers were also present. Both hulled and naked barley were present in Bronze Age pit fills from Pantymenyn in Carmarthenshire (Caseldine 2000). Naked six-row barley was present in posthole fills from an early Bronze Age roundhouse at Stackpole Warren (Pembs.), along with seeds of black bindweed, sheep's sorrel and fat hen (Caseldine 1990).

A low-density assemblage of charred plant macrofossils from Early-Mid Iron Age contexts at the hilltop enclosure site of Castell Mawr (Pembs.) (Simmons 2017) included hulled six-row barley along with spelt wheat. The assemblage of wild or weed plant seeds is again similar and included clover/medick, parsley piert, redshank/pale persicaria, sheep's sorrel, chickweed, corn spurrey and plantain. A low-density assemblage of predominantly wild or weed plant seeds from Early Iron Age contexts at the promontory fort site of Berry Hill (Pembs.) (Caseldine and Griffiths 2012) included clover, ribwort plantain, sheep's sorrel, docks and grasses. A low-density assemblage of charred plant remains from an Iron Age occupation site of Porth y Rhaw (Pembs.) (Caseldine and Griffiths 2010) was dominated by spelt wheat but also included emmer wheat and hulled barley. Wild or weed seeds were also sparse but included knotweeds (*Persicaria* spp.) and goosefoots (*Chenopodium* spp.). Spelt also predominated in archaeobotanical assemblages from an Iron Age promontory fort at Dale (Pembs.) (Caseldine 1999) and Llawhaden (Pembs.) (Caseldine and Holden 1998) although six-row barley was also present, along with oat. The suite of wild or weed plant taxa present at Dale was very similar to that at Bayvil Farm and included sheep's sorrel, redshank (*Persicaria maculosa*), fat hen, oraches, common chickweed, corn spurrey, ribwort plantain, black bindweed and parsley piert.

The presence of typical crop weeds such as parsley piert, redshank/pale persicaria, corn spurrey, and black bindweed in association with cereal grain in the charred plant macrofossil assemblage from Bayvil Farm, in common with other Bronze Age and Iron Age sites in west Wales, indicates that these taxa are likely to represent weeds of crops. Medicks/clovers, sheep's sorrel, ribwort plantain and grasses are also frequently occurring taxa in Bronze and Iron Age archaeobotanical assemblages from west Wales. Corn spurrey and sheep's sorrel are commonly associated with sandy acid soils. Clovers/medicks have an adaptive advantage where soil fertility is poor due to the ability of leguminous taxa to fix nitrogen from the air. Redshank/pale persicaria, black bindweed and fat hen are associated with spring sowing of crops although the presence of parsley piert and cleavers, which are associated with autumn sown crops, possibly indicates both autumn and spring sowing regimes. However, due to the low numbers of wild or weeds seeds present in the assemblage, no firm conclusions regarding sowing times can be drawn. Damp grassland is indicated by the frequent occurrence of timothy and the presence of blinks. The lesser celandine tubers present in entrance gully fill (138) may also indicate damp grassland which was utilised for the gathering of plant material for food or may have become charred in turf where fires had been set. A seed of bulbous meadow/creeping buttercup (*Ranunculus acris/repens/bulbosus*) is also present in gully fill (138) further indicating the presence of damp grassland.

The presence of taxa commonly associated with grassland and disturbed soils such as ribwort plantain and grasses is a common feature of later prehistoric assemblages of crop material and it has been suggested that this may be related to the crop husbandry techniques practiced at the time such as periods of fallow within a crop rotation regime (Carruthers 2011, 163). Grassland taxa may also indicate the cultivation of recently ploughed fields on land that had previously been established grassland or the presence of plants gathered for use as fodder, tinder, roofing or flooring material which then became charred and mixed with other hearth waste (Carruthers 2011, 163).

Charcoal

A relatively high diversity and similar range of taxa were evident in the ditch fill and other prehistoric features (Table 2). Oak, hazel, Pomoideae, wild/bird cherry and alder were consistently represented. Oak is particularly abundant in the ditch fill (113), the posthole fill (118) and the entrance gully fill (138). Pomoideae is particularly abundant in the pit fills (218 and 231). Probable blackthorn is also present in all features other than the ditch. A small proportion of ash is present in the ditch and pit fills 231 and 218. Poplar/willow is present in the ditch and the entrance gully. Birch is present in pit fill 218 and posthole fill 118. Fabaceae is present in pit fill 218 and entrance gully fill 138. Elm is present in pit fill 218.

Fungal hyphae were noted as present in the vessel cavities of two of the charcoal fragments from ditch fill 113, one of the fragments from posthole fill 118, one of the fragments from entrance gully fill 138, three of the fragments from pit fill 231, and none of the fragments from pit fill 218.

The charcoal assemblage present in contexts associated with the Late Bronze Age ring-fort is similar in terms of the taxa represented, indicating the local availability of oak woodland with a variety of underwood, woodland margin and scrub taxa as well as areas of damp soils with alder woodland. Woodland communities of base-poor soils in the west of Britain are dominated by oak and birch (Rodwell 1991, 22–3). Hawthorn, wild apple, wild pear and members of the rowan family (which are represented by Pomoideae), along with wild/bird cherry and hazel, are all common underwood taxa in deciduous woodland (Rackham 2003, 349–58). Alder is commonly associated with damp soils such as swampy ground transitioning from open water and rich alluvium in river valleys (Rodwell 1991, 30–3).

Charcoal assemblage composition is likely, however, to be influenced by a number of factors, including differences in availability and anthropogenic fuel wood selection strategies, as well as by

Table 2. Summary table of wood charcoal

Feature type	ditch	posthole	entrance gully	pit	pit	corn-dryer
Feature number	101	119	139	229	216	303
Context number	113	118	138	231	218	302
Sample number	43	24	60	49	9	30
Period	Late Bronze Age				Early Iron Age	Medieval
Taxon (common name)						
Fabaceae (legume family)	–	–	2	–	1	2
Prunus cf. *spinosa* L. (?blackthorn)	–	1	1	2	3	–
Prunus padus/avium (wild/bird cherry)	1	8	4	6	10	10
Pomoideae (hawthorn/wild apple/ wild pear/ rowan family)	7	12	1	36	24	3
Ulmus sp. (elm)	–	–	–	–	3	–
Quercus sp. (oak)	59	44	80	27	24	4
Betula sp. (birch)	–	3	–	–	3	10
Alnus glutinosa (L.) Gaertn. (alder)	10	3	2	7	8	2
Corylus avellana L. (hazel)	16	26	6	13	10	42
Populus/Salix (poplar/willow)	1	–	1	–	–	–
Fraxinus excelsior L. (ash)	4	–	–	1	5	25
Indeterminate	2	3	3	8	9	2

taphonomic factors such as differential charcoal preservation and recovery (Asouti and Austin 2005, 8; Théry-Parisot *et al.* 2010). It is therefore unlikely that the composition of the wood charcoal assemblage is directly representative of the nature and extent of woodland and scrub in the local environment. The frequent occurrence of oak charcoal, for example, is likely to be related to the availability of oak woodland as well as to the excellent properties of oak as a fuel wood and structural timber. Hawthorn/apple/pear/rowan family taxa, hazel and cherry are also good fuel woods, producing good heat and a long-lasting fire. Ash is a particularly useful fuel wood, as it does not require seasoning in order to burn well. Elm does not burn easily but does produce a long-lasting fire when well-seasoned. Birch produces good heat but burns quickly and alder is a poor fuel wood unless previously converted to charcoal (Webster 1919, 44; Porter 1990, 93). Gorse and broom also produce a hot but short-lived fire (Gale and Cutler 2000, 260).

Evidence of fungal hyphae is generally rare in the wood charcoal assemblage as a whole, indicating the use of primarily freshly collected wood which had been well seasoned and not allowed to decay while in storage but not collected as dead wood. Radial cracks were also occasionally present, but not with a frequency that would indicate the use of a significant proportion of green or damp wood. Oak, ash and elm provide excellent structural timbers and hazel was used for fencing and roofing (Rackham 2003). It is likely therefore that at least some of the taxa present in the charcoal assemblage are representative of offcuts from the use of wood for structural purposes. Hawthorn/apple/pear/rowan family taxa, hazel, wild/bird cherry and blackthorn also represent sources of wild food, as well as fuel, in the form of edible nuts, fruits and berries.

The high proportion of oak in Late Bronze Age ditch fill (113) in comparison to Early Iron Age pit fill (218) and greater proportions of Pomoideae in pit fill (218) in comparison to ditch fill (113) may indicate a reduction in the availability of oak and an increase in the availability of Pomoideae between the Late Bronze Age and the Early Iron Age. Tyloses were noted as present in the vessel cavities of a relatively high proportion of the oak charcoal fragments from the ditch, in comparison to pit fill 218, indicating the use of mature oak heartwood. The majority of the observable ring curvatures of charcoal fragments in the ditch were weak, indicating the use of larger branches or trunk material while the majority of the observable ring curvatures in pit fill 218 were strong, indicating the use of smaller branches or twigs. Any differences in the proportions of various taxa present in different contexts may, however, be related to differences in fuel wood selection strategies and taphonomic factors, as well as to availability, as discussed above.

A small assemblage of charcoal from a Bronze Age house excavated at Llanstadwell included oak, hazel, alder, birch and cherry/blackthorn (Caseldine and Griffiths 2004a, 10). Wood charcoal from Early–Middle Iron Age contexts at the hilltop enclosure site of Castell Mawr (Pembs.) (Simmons 2017) included blackthorn, Pomoideae, oak, birch, alder, hazel, poplar/willow and ash. A small assemblage of charcoal from Early Iron Age contexts at the promontory fort site of Berry Hill (Caseldine and Griffiths 2012) included oak, elm, hazel, alder, birch, blackthorn, cherry and Pomoideae. Pollen evidence from the Iron Age forts at Porth y Rhaw (Caseldine and Griffiths 2010) and Dale (Caseldine 1999) indicated a largely open landscape with some oak and hazel woodland along with alder carr. Palynological evidence from a number of sites in the Preseli region of north-west Pembrokeshire has indicated that substantial woodland clearance occurred during the Late Bronze Age with concurrent increases in grasses, bracken and other herbaceous plant taxa (Seymour 1985, 327). However, despite this woodland clearance activity, there is also evidence that woodland regeneration occurred after abandonment of cleared areas (Seymour 1985, 329). There is also evidence to indicate that a period of woodland regeneration occurred at the end of the Bronze Age in mid Wales, although woodland clearance intensified during the Iron Age in the Preseli region, accompanied by expansion of open ground and ruderal plant taxa (Seymour 1985, 337–8).

Results from the medieval corn-dryer

Charred plant macrofossils

The predominant cereal type present in the medieval corn-dryer's fill (302) is hulled barley (Table 3). The presence of a significant proportion of asymmetrical hulled barley grains indicates the presence of hulled six-row barley, although the presence of hulled two row barley cannot be ruled out. Many of the barley grains were small tail grains. A relatively significant proportion of oat grain (*Avena* sp.) is also present, although only two oat floret bases were recovered, both of which were of wild oat (*Avena fatua* L.). It is therefore likely that at least some of the oat grains are representative of wild oats growing as a weed in the crop of barley although the presence of cultivated common/bristle oat (*Avena sativa/strigosa*) cannot be ruled out. A small proportion of spelt wheat grains (*Triticum spelta*) were also present, along with grains exhibiting morphological characteristics intermediate between spelt wheat and free-threshing wheat (*Triticum spelta/nudum*) although no free-threshing wheat grains were positively identified.

The assemblage of wild or weed plant seeds included taxa commonly associated with fertile disturbed soils and cultivation such as wild radish (*Raphanus raphanistrum* ssp. *raphanistrum*) redshank/pale persicaria, black bindweed, fat hen, oraches (*Atriplex* spp.), cleavers, scentless mayweed (*Tripleurospermum inodorum*) and wild oat. Taxa which are commonly associated with both grassland and cultivated fields, but are frequently occurring taxa in archaeobotanical charred plant remains assemblages, included curled/clustered/broad-leaved dock (*Rumex crispus/conglomeratus obtusifolius*), ribwort plantain, nipplewort (*Lapsana communis* ssp. *communis*) and grasses (Poaceae).

The rich assemblage of cereal grain, consisting largely of hulled barley and oats present in the fill of the medieval corn-dryer is likely to have been charred following a parching accident. Hulled barley requires parching in order to remove the hulls (Hillman 1981, 153–4). Oats also require drying prior to storage as they are liable to shatter when harvested ripe and so are often harvested in a semi-ripe state (Straker 1997, 97; Carruthers 2010, 176). Oats also require parching to assist the removal of the lemmas prior to oatmeal or groats preparation (Monk 1987, 137). Charring accidents within corn-dryers are likely to have been common. Ethnographic examples of corn-dryers indicate that the crop material would have been spread on straw or similar flimsy material to dry, which could easily have been ignited by sparks from the flue (Scott 1951, 198; Fenton 1978, 377). The presence of weed seeds, including possible wild oat grains, and a significant proportion of barley tail grains, suggests that either partially processed crops were being dried or that accidentally charred grain had become mixed with by-products from the later stages of crop processing utilized as fuel. The presence of wood charcoal would support an interpretation of fully processed grain being mixed with corn-dryer fuel, although Hillman (1981; 1984) noted that kiln drying of barley can occur prior to the second sieving stage of crop processing, where tail grain and weeds seeds smaller than prime grain would still be present with the crop.

Archaeobotanical evidence from west Wales indicates a possible change in the principle crop types cultivated between the Roman and medieval periods, from glume wheats and bread wheat to barley and oat (Carruthers 2011, 181). The crops types present in the corn-dryer fill from Bayvil Farm would therefore be consistent with a medieval rather than a Roman date. Oats are frequently present in medieval archaeobotanical assemblages from Wales (Caseldine and Griffths 2004, 17) and are also common in south-west England and Scotland (Straker 1997). This may be due to the tolerance of oats to poor growing conditions such as high rainfall and acid soils. There is evidence that two types of oat were cultivated during the medieval period in Wales, common oat (*Avena sativa*) and bristle oat (*Avena strigosa*), which is particularly suited to cold wet climates and poor acidic soils (Carruthers 2010, 179). Barley is the other main crop of the medieval period in Wales (Caseldine 2015, 8) and was often grown alongside oats as a mixed crop known as dredge which was grown in order to ensure a good harvest (Caseldine and Griffiths 2004b, 15). It is possible therefore, that although some of the oat

Table 3. Charred plant macrofossils from the medieval corn-dryer (layer 302, sample 30)

Volume of soil processed (litres)	35
Cereals and other economic plants	
Avena sp., (oat), grain	400
cf. *Avena* sp., grain	368
Hordeum vulgare L. emend. Lam., (six-row hulled barley), asymmetrical grain	48
asymmetrical tail grain	32
Hordeum sp., (hulled barley), symmetrical grain	112
symmetrical tail grain	64
indeterminate grain	1,328
indeterminate tail grain	1,360
Hordeum sp., (barley) indeterminate grain	352
indeterminate tail grain	336
indeterminate rachis internode	16
cf. *Hordeum* sp. indeterminate, grain	112
Triticum spelta L., (spelt wheat), grain	16
Triticum cf. *spelta* L. grain	16
Triticum spelta/*Triticum aestivum* s.l. (spelt/free threshing wheat), grain	16
Indeterminate cereal grain	160
Non-seed charred plant material	
Awn fragments	16
thorn	1
Wild/weed plant seeds	
Raphanus raphanistrum ssp. *raphanistrum* L. (radish)	1
Persicaria maculosa/*lapathifolia* (redshank/pale persicaria)	864
Fallopia convolvulus (L.) Á. Löve (black bindweed)	14
cf. *Fallopia convolvulus* (L.) Á. Löve	8
Rumex crispus/*conglomeratus*/*obtusifolius* (curled/clustered/broad-leaved dock)	2
Amaranthaceae (goosefoot family)	42
Chenopodium spp. (goosefoots)	62
Chenopodium album L. (fat hen)	166
Atriplex spp. (oraches)	28
Galium aparine L. (cleavers)	2
Plantago lanceolata L. (ribwort plantain)	12
Asteraceae (daisy family)	8
Lapsana communis L. (nipplewort)	40
Tripleurospermum inodorum (L.) Sch. Bip. (scentless mayweed)	8
cf. *Tripleurospermum inodorum* (L.) Sch. Bip.	8
Avena fatua L. (wild oat)	2
>1mm Poaceae spp. (grass family), large seeded	64
<1mm Poaceae spp. (grass family), small seeded	16

grains present in the corn-dryer fill from Bayvil Farm are likely to be representative of weeds, some cultivated oat may also be present.

A small assemblage of oat and barley grain was present in late twelfth- and early thirteenth-century contexts in Newport (Pembs.), five kilometres to the west of Bayvil Farm. The assemblage of wild or weed plant seeds from Newport includes typical weeds of cultivation such as corn spurrey, parsley piert, scentless mayweed and fat hen, along with grassland and damp ground taxa (Caseldine 1994, 76). Charred plant macrofossil assemblages from corn-dryers in west Wales include an assemblage of charred grain largely consisting of oats, some of which is identified as common or bristle oat and barley, present in the fills of an early medieval corn-dryer at Newton (Caseldine and Griffiths 2004b). Weed seeds and wood charcoal fragments were present in low quantities, indicating the assemblage is representative of a processed crop accidentally burnt while being dried. The wild or weed seed assemblage included oraches, stinking chamomile and docks as well as wild radish. Oat is dominant in a sample of charred plant remains from an early medieval pit fill at Wiston (Pembs.), interpreted as material resulting from an accident during drying of oats prior to milling (Caseldine 1995). Both wild and cultivated oat were present, indicating that the oat crop is likely to have included wild oats as a weed. Other wild or weed seed taxa present included fat hen, orache, redshank/pale persicaria, black bindweed, sheep's sorrel, ribwort plantain, scentless mayweed and nipplewort. The presence of charcoal, chaff and wild or weed plant seeds indicated that either the oat crop was partially cleaned or that the accidentally charred oats had been mixed with waste used as tinder or fuel (Caseldine 1995). Charred plant remains from corn-dryer contexts excavated at the early medieval site of South Hook (Pembs.) indicated that hulled barley, common oats, bristle oats and possibly dredge were being dried at different times and in different ovens (Carruthers 2010). A lack of chaff and low proportions of weed seeds indicated that the charred cereal grain is representative of processed crops that were being dried prior to milling or storage. Taxa present in the wild or weed seed assemblage included stinking mayweed, fat hen and wild radish. Charred plant remains from an early medieval deposit interpreted as the remains of a corn-dryer excavated at Boulston (Pembs.) as part of the South Wales Gas Pipeline Project (Giorgi 2013) is dominated by oats with few wild or weed seeds except those of a similar size to grain, indicating a cleaned crop. The wild or weed seed taxa present included corn spurrey, knotgrass, knotweed, wild radish, ribwort plantain, stinking chamomile and grasses. Charred plant remains from early medieval deposits at the cemetery sites of West Angle Bay (Caseldine and Griffiths 2011) and Brownslade (Carruthers 2011) also consisted largely of hulled barley and oat. The assemblage of wild or weed plants seeds from West Angle Bay included leguminous taxa, docks, goosefoots, ribwort plantain, stinking chamomile and grasses.

The majority of the wild or weed plant taxa represented in corn-dryer fill context 302 are typical weeds of cultivation or disturbed ground. Two of the segetal plant taxa represented by relatively large numbers of seeds were redshank/pale persicaria and fat hen. These taxa, along with black bindweed and wild radish are characteristic of spring sown crops. The abundance of fat hen and oraches which are characteristic of nitrogen-enriched soils may also indicate that manuring was being carried out. The presence of scentless mayweed suggests the cultivation of somewhat heavy soils. The presence of wild or weed taxa associated with grassy habitats as well as cultivated soils such as ribwort plantain and nipplewort may also be representative of grassland plants collected as fodder, tinder, roofing or flooring material.

Wood charcoal

A similar diversity of taxa to those associated with the Late Bronze Age ring-fort is present in the charcoal assemblage from the corn-dryer's fill (302) (Table 2). Hazel is particularly abundant followed by ash, birch, wild/bird cherry, oak, Pomoideae, alder and Fabaceae.

The charcoal assemblage present in the medieval corn-dryer fill (302) included a similar range of taxa to that present in the contexts associated with the Late Bronze Age ringwork, although the assemblage is dominated by hazel, the proportion of oak is particularly low and a relatively large proportion of ash is present. It is therefore likely that some woodland, woodland margin and scrub environments were available locally for use as fuel during the medieval period, although it is possible that the availability of oak had declined. The high proportion of ash may also be related to a decline in oak woodland as ash is a coloniser of open ground and so would be expected to flourish in areas of woodland clearance. The high proportion of hazel may be representative of hazel from managed coppice woodland although no evidence for the use of coppice is discernible from the hazel charcoal fragments. It is likely, however, that many areas of woodland in the medieval period were managed as a relatively scarce and valuable resource (Rackham 1995, 85; 2003, 133). It is also likely that hazel was specifically selected for use in the corn-dryer due to the excellent properties of hazel as a fuel wood (Webster 1919, 44; Porter 1990, 93).

Charcoal from an early medieval corn-dryer excavated at Newton included oak, hazel and cherry/blackthorn (Caseldine and Griffiths 2004b, 17). Charcoal from an early medieval hollow at Wiston (Pembs.) (Channilor 2014, 51) included oak, hazel, cherry, Pomoideae and Fabaceae. Charcoal from the ditch fill of an early medieval cemetery site at West Angle Bay (Pembs.) also included oak, hazel, birch, cherry and blackthorn, interpreted as being representative of oak and scrub woodland or possibly hedges associated with the bank and ditch of the cemetery (Caseldine and Griffiths 2011).

DISCUSSION

The ceramic and radiocarbon-dating evidence indicates that this site is not a Middle-Late Neolithic enclosure of the type described as a segmented-ditched formative henge. Instead, the sequence of radiocarbon dates in the ditch and the Late Bronze Age plain-ware pottery within the secondary and tertiary layers of the ditch demonstrates that this enclosure ditch was dug probably in the late twelfth-eleventh century BC and then silted up probably within the tenth century BC. A probable roundhouse wall-trench and a pit with a flint scraper produced radiocarbon dates indicating activity within the enclosure probably in the late eighth-sixth centuries BC. This site’s use thus spans the Bronze Age/Iron Age transition though occupation and use may well not have been continuous. Similar Early Iron Age dates in the eighth-sixth centuries BC have been obtained for the concentric palisaded enclosures on the nearby hilltop of Castell Mawr (Parker Pearson *et al*. 2017), and from a small occupation site at Craig Rhos-y-felin (Parker Pearson *et al*. 2015).

The earliest enclosed settlements in Wales are generally found in the Late Bronze Age or Bronze Age/Iron Age transition (Murphy and Mytum 2012, 264–5). Within west Wales, early dates in the eighth to fifth centuries BC have been obtained from promontory forts at Dale (Benson and Williams 1987), Porth y Rhaw (Crane and Murphy 2010) and Berry Hill (Murphy and Mytum 2012). The Bayvil Farm enclosure is thus unusually early for a ditched enclosure in this region.

Pembrokeshire is not particularly well represented by finds or settlement remains of the Late Bronze Age, although a cluster of open settlements and enclosures of this period is claimed for the southern slopes of Carn Ingli, south of the river Nevern (Driver 2007, 122–3; Darvill and Wainwright 2016, fig. 2.49). The only reported finds of metalwork are a palstave and socketed spearhead found near Pentre Ifan, just 2.5 kilometres south of Bayvil, which might derive from a Late Bronze Age hoard (Darvill and Wainwright 2016, 187–8). A pennanular gold ‘lock-ring’ recorded by the Portable Antiquities Scheme from Nevern, 2 kilometres to the south-west (ibid. 195–7), also hints at a degree of wealth likely among the inhabitants of Late Bronze Age Bayvil.

Late Bronze Age defensive circular enclosures are known as 'ring-forts' or 'ringworks' (Manby 2007, 405–17). Over a dozen of them are known in south-east and eastern England but, until now, none have been identified with certainty in western Britain (Fig. 10). However, Manby has suggested that Castell Bryn Gwyn on Anglesey (Wainwright 1962) might be a Late Bronze Age ringwork covered by Iron Age ramparts (Manby 2007, 413). He also points to Late Bronze Age reuse of Henge A at Llandegai (Lynch and Musson 2004) in North Wales (Manby 2007, 418). (See also Gibson 2018, in this volume).

The nearest equivalent from Ireland is an irregular circular ditched enclosure at Tintore 2, Co. Laois, dating to the tenth to ninth centuries BC (Cotter 2009). This 40m-diameter ditch enclosed a *fulacht fiadh* (burnt mound) of eighth- to fifth-century BC date. Otherwise, Irish enclosed sites from this period are rather different to the largely British circular ringworks, consisting mostly of broadly circular or concentric hillforts such as Rathgall (Raftery 1976).

The greatest concentration of Late Bronze Age ringworks is in south-east England, with outliers in east Yorkshire at Thwing (Manby 2007) and Grimthorpe (Stead 1969), and in Normandy at Malleville-sur-le-Bec (Mare 2005). They include Mill Hill, Deal (Champion 1980, 233–7), Highstead (Bennett *et al*.

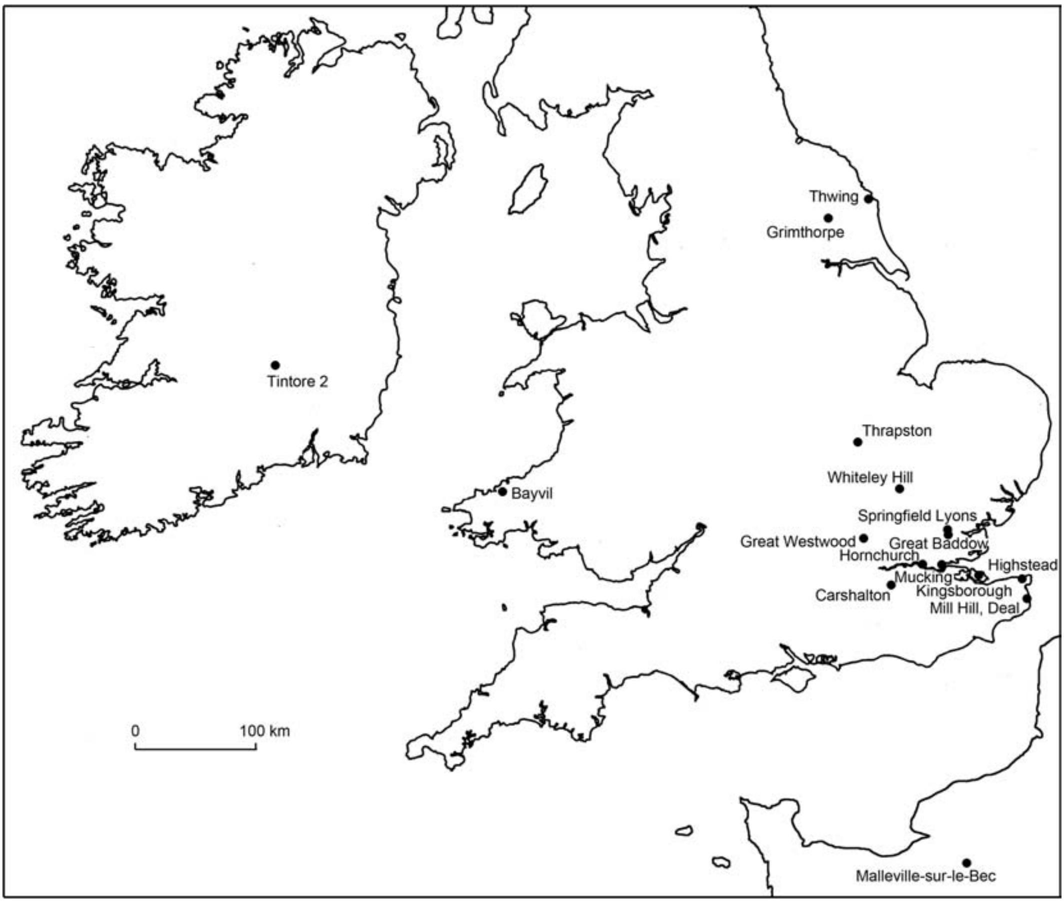

Fig. 10. Distribution of Late Bronze Age ringworks in Britain, Ireland and northern France.

2007), Carshalton (Adkins and Needham 1985; Grove and Lovell 2002), Mucking North and South Rings (Bond 1988; Evans *et al*. 2016, 125–218), South Hornchurch (Guttman and Last 2000), Great Baddow (Brown and Lavender 1994), Whiteley Hill (Bryant 2015, 50–2), Great Westwood (Bryant 2015, 52–3), Kingsborough, Isle of Sheppey (Allen *et al*. 2008, 284–308), Thrapston (Hull 2001) and Springfield Lyons (Brown and Medlycott 2013).

The largest examples (such as Thwing) are over 120m in diameter and the smallest (such as South Hornchurch) less than 40m (Brown and Medlycott 2013, fig. 5.4). Some are double-ditched concentric enclosures but most have a single ditch which may or may not be segmented. Like Neolithic henges, they tend to have either a single entrance or two opposed entrances. The closest comparison to Bayvil Farm, both in size and shape, and in orientation of its entrance, is Mill Hill, Deal.

The majority of these ringworks date to the tenth and ninth centuries BC (Needham 2007, 48–9) and several have produced evidence for metallurgy, craft-working and feasting (Parker Pearson 1996, 121–3; Brown and Medlycott 2013, 152–5; Bryant 2015, 50). Such activities are assumed to have been controlled by leaders whose residence lay within the enclosure (Brown and Medlycott 2013, 159–61). Since the middle of the Bayvil Farm enclosure remains unexcavated, there is no way of knowing yet whether it contained a central roundhouse contemporary with its enclosure, as is the case with so many of the other ringworks.

The radiocarbon dates from the Bayvil Farm enclosure ditch compare well with those from Springfield Lyons, the best dated example of a Late Bronze Age ringwork. This Essex site was occupied in *c*. 1210–980 cal. BC and abandoned in *c*. 840–690 cal. BC (both at 95.4% probability; Brown and Medlycott 2013, 147). Thus the Bayvil Farm enclosure sits well within this short-lived class of unusual prehistoric sites.

The morphological similarity of Late Bronze Age ringworks to Neolithic henges is striking (Parker Pearson 1996, 122; Manby 2007, 418; Brown and Medlycott 2013, 155). Brown and Medlycott suggest that, in the case of Springfield Lyons, its circular form connected its builders to a mythic history, transferring meanings embodied in a nearby Neolithic enclosure to enhance the authority of its Late Bronze Age residents (ibid. 155–9). On the Isle of Sheppey, Kingsborough enclosure A is sited between two Neolithic enclosures, 'paying reference to and respecting them' (Allen *et al*. 2008, 313). A similar link with the Neolithic past has been claimed for Llandygai Henge A, where a Neolithic henge was reoccupied in the Late Bronze Age, and for Thwing, with features consistent with those of a nearby Neolithic henge (Manby 2007, 418).

That said, the majority of other Late Bronze Age ringworks appear not to have had any local Neolithic monument to inspire their construction. Even so, the similarity of form between ringworks and henges is close enough to suppose that ringworks referenced an ancient Neolithic past. Given the location of Bayvil Farm just 5 kilometres north-west of Craig Rhos-y-felin, a bluestone source for Stonehenge, its construction could possibly have drawn on mythic histories relating to events of two millennia earlier. Similarly, the geometric plans of the Early Iron Age concentric palisades and enclosing ramparts at Castell Mawr, 3 kilometres south-east of Bayvil Farm, could have continued that revived link with a much more ancient past.

ACKNOWLEDGEMENTS

This work would not have been possible without the kind permission of the landowners, Mr Geraint Rees and Mrs Richards. We are also grateful to the late Phil Bennett, formerly of the Pembrokeshire National Park, and Louise Austin, formerly of Dyfed Archaeological Trust, for providing help and information. Investigations at Bayvil Farm were carried out as part of the Stones of Stonehenge project, researching the origins of Stonehenge's bluestones within the area of the Preseli hills in north Pembrokeshire. The research in 2014 was supported with a grant from the National Geographic Society. Our archaeological field team included 30 students and volunteers, too numerous to mention by name here. Illustrations were drawn by Irene Deluis.

NOTES

1. This and other radiocarbon dates were calibrated by OxCal v. 4.1 using the IntCal4 atmospheric calibration curve and quoted at 2 sigma.

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