CPAT Report No 959

Womaston Causewayed Enclosure

SURVEY AND EXCAVATION 2008

THE CLWYD-POWYS ARCHAEOLOGICAL TRUST

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N W Jones
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Report for Cadw

The Clwyd-Powys Archaeological Trust
7a Church Street, Welshpool, Powys, SY21 7DL
tel (01938) 553670, fax (01938) 552179

cover photo: cropmarks visible during July 2006. Photo RCAHMW 2006-2198

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SUMMARY

The causewayed enclosure at Womaston in the Walton Basin was identified as a cropmark in 2006, adding yet another major monument to what was already an area of obvious importance during the Neolithic. The significance and potential of the site was readily apparent and a programme of survey and excavation was undertaken in 2008 to determine the date, condition and vulnerability of the site. The results have added significant detail to the known plan of the double-ditched enclosure, and around 80% of the circuit has now been identified. A single section was excavated across the ditches, which included a terminal on the inner ditch circuit. Although cultural material was generally sparse, several sherds of Early Neolithic pottery were recovered from the ditches.

Both cuts were substantial, between 2.3m and 2.8m wide and around 1.8m deep, with U-shaped profiles. Their form suggests that they may have been excavated as a series of intercutting pits, rather than homogeneous ditch segments. The inner ditch had clear evidence for a later recut and charcoal samples have been submitted for radiocarbon dates have been obtained from charcoal samples from the base of this and one of the primary ditch silts, together with a date from a sample from a feature cut into the upper fill of the outer ditch. The nature of the silting suggests that both ditches had internal banks, with that on the inner circuit respecting the ditch terminal.

1 INTRODUCTION

1.1 The causewayed enclosure at Womaston near Old Radnor was first photographed from the air by JSK St Joseph in 1970 (CUCAP BEH 52), although the exact nature of what he had recorded was not appreciated until 2006 as a result of aerial reconnaissance by Chris Musson. Photography taken in July of that year clearly showed a circuit of two roughly concentric interrupted ditches, visible as cropmarks in a field of ripening cereal. Further photography (Fig. 1) in the same year was later taken by Toby Driver, of the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW).

1.2 The cropmarks define around 35% of the circuit, the site lying within three fields, two of which were under pasture in 2006. Although the enclosure itself was previously unrecorded, a number of flint artefacts have been recovered from the plough soil over the site itself and the general area around it.

1.3 The significance and potential of the site was obvious and a programme of survey and excavation was undertaken by the Clwyd-Powys Archaeological Trust (CPAT) with funding from Cadw in 2008 to determine the date, condition and vulnerability of the site.

1.4 This report presents an interim summary of the project which will be reported on in further detail in an article to be submitted to an appropriate journal in due course. The landowner has given permission for the finds to be deposited with the Llandrindod Wells Museum, and the site archive will be deposited with the regional Historic Environment Record, maintained by the Clwyd-Powys Archaeological Trust in Welshpool. Context numbers as they appear in the site archive and the illustrations accompanying this report are given in brackets in the following text.

Fig. 1 Cropmarks visible in July 2006. Photo RCAHMW (Photo 2006-2198)

2 SETTING AND LOCATION

2.1 The Walton Basin (Fig. 2) has long been recognised as an area of considerable significance in its concentration and variety of prehistoric monuments, and our appreciation of this area is due in no small part to the work of Alex Gibson during the late 1990s (Gibson 1999).

2.2 The earliest evidence of activity is provided by Mesolithic flint scatters, which are recorded at some 16 locations in the basin, concentrating in the central area, mostly along a low ridge. A similar distribution is presented by flints from the Neolithic period, a time when we see the construction of the first, and most spectacular of the monuments.

2.3 The Walton Cursus lies in the south-east corner of the basin, south of the Summergil Brook. The cursus is 660m long and 60m wide, with square terminals at either end. There is too a second cursus further to the west which has been the subject of a recent evaluation**.** The Hindwell Cursus, as this has become known, consists of two ditches between 55m and 75m apart which, on the basis of cropmark evidence, could extend for as much as 1.5km. Although the function of cursus monuments is unclear, there are generally assumed to have been ceremonial avenues.

2.4 At the time of its construction the most impressive monument in the Walton Basin would have been the very large palisaded enclosure at Hindwell. Defined by closely set posts, the palisade enclosed an area of around 34ha, some 1400 mature oak trees having been used in its construction. To date, this is the largest Neolithic enclosure in Britain. A similar, although smaller enclosure lies further to the south, and is possibly associated with an avenue of pits. In the same area there is also a very large ring ditch, around 100m in diameter, which may bear some relationship to the henge monuments of the Neolithic.

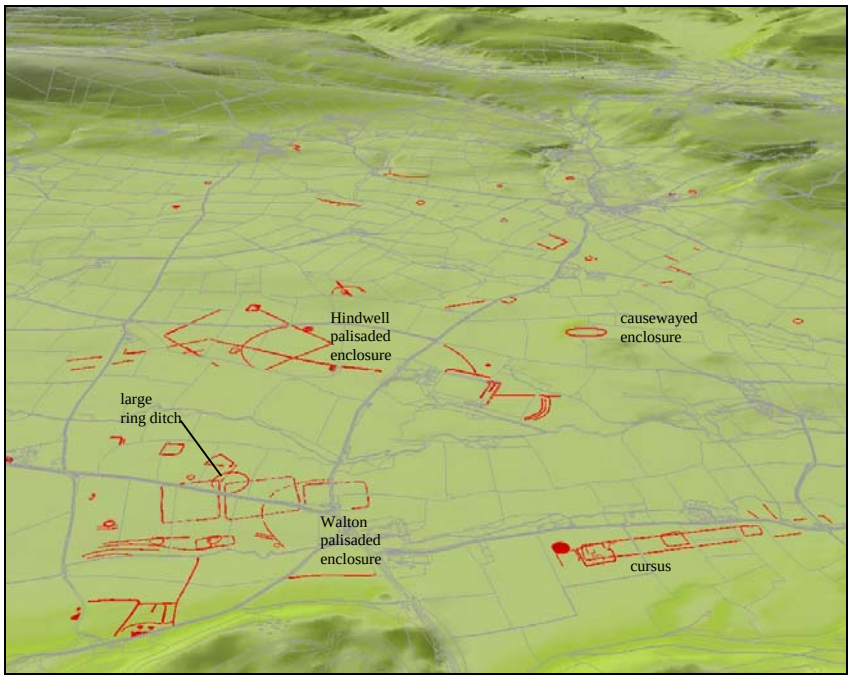

Fig. 2 Digital terrain model of the Walton Basin showing cropmarks.

2.5 A significant number of flints (PRN 2210) have been found which appear to have come from the causewayed enclosure, or at least from the same fields in which it lies. Reports by Noble (1953, 17-18; 1954, 80) record a total of 70 pieces of flint, including seven convex scrapers, a hollow scraper and the broken tip of an arrowhead, all of which once formed part of a collection at Knighton Secondary School. The Walton Basin in general has produced significant quantities

of flintwork of Mesolithic to Bronze Age date, and the collection is dominated by scrapers (28%), retouched and serrated flakes (23%), and other retouched pieces (25%), all types which are good indicators of domestic assemblages (Bradley 1999, 65). Excavations at Upper Ninepence, to the north of Hindwell, provided clear evidence for Neolithic occupation in the form of pits containing Peterborough Ware, while a later phase of activity associated with Grooved Ware also included two circular structures (Gibson 1999b).

2.6 Bronze Age activity is represented by monuments on a much smaller scale, and largely consists of numerous round barrows, or their ploughed-down remains in the form of ring ditches. A number of barrows appear to have been deliberately placed along the sky-line on the north-western rim of the basin. There is a single stone circle, the aptly named 'Four Stones', as well as several individual standing stones.

2.7 The Womaston causewayed enclosure lies on a modest but prominent hill, 500m to the north-west of Womaston in the Walton Basin of eastern Radnorshire (SO 26226094), at an altitude of 210m.

Fig. 3 View of the Walton Basin from the north-east showing the setting of the causewayed enclosure

Fig. 4 The low but prominent hill occupied by the causewayed enclosure, showing the position of the excavation trench.

2.8 Although the hill rises no more than 25m above the surrounding area this is sufficient to give the site a panoramic view around the Walton Basin (see Fig. 5). To the west the Basin narrows, following the valley of the Summergil Brook into the Radnorshire Hills, overlooked by the prominent rise of Whimble, flanked to the north by Bache Hill, which has five Bronze Age barrows on the skyline. To the north there is a dip in the skyline beyond Evenjobb and eastwards lies Burfa Camp with its Iron Age hillfort overlooking the narrow gap created by the Hindwell Brook as it flows eastwards into Herefordshire. The view southwards is dominated by Herrock Hill, Stanner Rocks and Old Radnor Hill, now marked by the prominent stone quarry (Fig. 4).

Fig. 5 Views of the Walton Basin from the Womaston Causewayed Enclosure

3 GEOPHYSICAL SURVEY by Richard Hankinson

3.1 A programme of geophysical survey was undertaken with the objective of defining those sections of the ditch circuit that were not known from cropmark evidence, together with a limited investigation of the interior.

3.2 The survey used a fluxgate gradiometer and the methodology employed is detailed in Appendix 1. Fluxgate gradiometer survey provides a rapid, non-invasive, method of examining large areas for magnetic anomalies. It has proved to be particularly effective in the context of this study, having added new detail and resolved some issues regarding the relationship between the enclosure and other features visible on aerial photographs.

Geophysical Survey Results

3.3 The survey was conducted in the two pasture fields which contain the western side and north-eastern quadrant of the enclosure. Unfortunately, the arable field which contains the majority of the site was not available for surveying in the time available. The results are present as a greyscale plot in Fig. 6.

3.4 The western part of the survey consisted of a single area totalling 0.52ha, comprising fourteen whole or partial grids. The survey successfully identified the two ditches, although the magnetic response was fairly poor. The northern part of the survey revealed both ditch circuits continuing the alignments identified as cropmarks in the adjacent field. They exhibited a slight curve and continued for approximately 30m before fading out. This may be due to either a lack of response or the terminals of the ditches having been reached. Both ditches seemed to reappear around 25m further south, and continued the gentle overall curve of the previous section for about 20m until they were cut by the line of a metal pipe running downhill from a water tank which lay next to the field boundary. The inner ditch could not be conclusively identified from the results on the south side of the water pipe, probably as it coincided with metal fences, which mask the response of any sub-surface features, although the outer ditch was identified. The results suggested that both ditches were between 1.5m and 3m wide, although this was more probably a result of the level of response from the soils rather than an accurate reflection of their actual size.

3.5 The north-eastern part of the survey consisted of two areas comprising eighteen whole or partial grids across the area of the enclosure, with a further 15 grids investigating a level, natural terrace at the base of the hill. The soils in this part of the enclosure provided a markedly improved response to those on the west, and the visibility of the ditches were more pronounced as a result.

3.6 Although apparently disturbed by later activity, the outer ditch was more continuous in this section. On the north side of the enclosure the ditch was identified around 20m east of the field boundary, continuing for 28m to a point where a gap of 7.5m signified the presence of a later feature. Beyond this, the ditch continued for a further 22m until it met a later ditch running obliquely through the enclosure; a short section of possible enclosure ditch, about 6m long, reappeared to the south-east of the oblique ditch.

3.7 Three or perhaps four sections of the inner ditch were identified in the north-east, commencing on the north side about 6m from the field boundary and continuing for 22m, with a gap of 14m at its south-east end, beyond which the ditch continued for 15m to a further gap of 3.5m. The next segment of ditch was about 13.5m long, with a gap of 12.5m at its south-east end. A possible section of ditch, 2m long, was apparent at the end of the last gap, although this extended beyond the survey area and could be the result of other factors.

3.8 Apart from the enclosure ditches, the survey also identified two later, linear features, both of which cut across the ditches. The more northerly feature may be related to field drainage, while

the other is likely to be the ditch of a former field boundary. Comparison with 19th-century map sources suggested that it represented part of a fossilised system of open-field agriculture, originating in the medieval period. A pair of features which were more difficult to assess lay within the bounds of the enclosure, consisting of a short gully 11m north-east/south-west by 2.5m wide, with a smaller, possibly oval pit, 3.5m north-east/south-west by 2m, just to its east.

3.9 The geophysical survey successfully revealed a significant portion of the enclosure which was not clear from cropmark evidence. It is difficult to be specific about the nature of the ditches, but the results seem to support the suggestion of the cropmarks on the aerial photographs that the inner ditch is interrupted at regular intervals, although perhaps the outer ditch is more continuous. Understanding the reasons why the results were so faint in the west field is problematic, but one possibility is that the ditches were backfilled with similar material soon after they were excavated, in which case the instrument would find it difficult to differentiate between the natural subsoil and the backfill of the ditches.

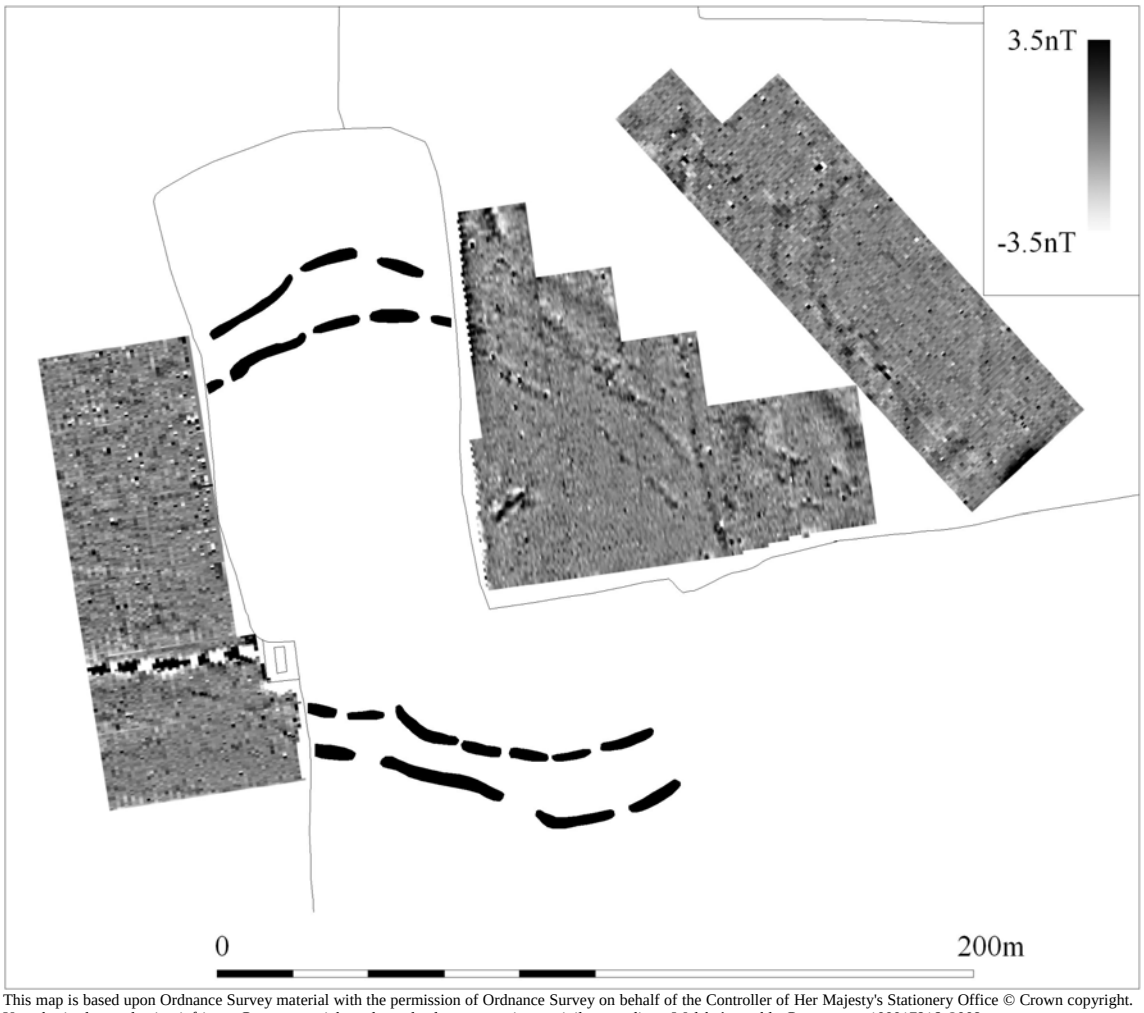

Fig. 6 Geophysical Survey results and cropmarks

4 TRIAL EXCAVATION

4.1 The excavation comprised a single trench that initially measured 29.4m by 3m aligned south-west to north-east (Fig. 7), extending across both ditch circuits and into the interior of the enclosure. A hand-excavated extension was later added to investigate a ditch terminal on the inner circuit. The ploughsoil was removed mechanically, immediately revealing the upper fill of both ditches, with natural glacial gravels elsewhere. The depth of modern ploughsoil was extremely shallow (0.15m to 0.2m) and it was evident that over the centuries ploughing had removed any prehistoric ground surface and truncated the upper fills of the ditches.

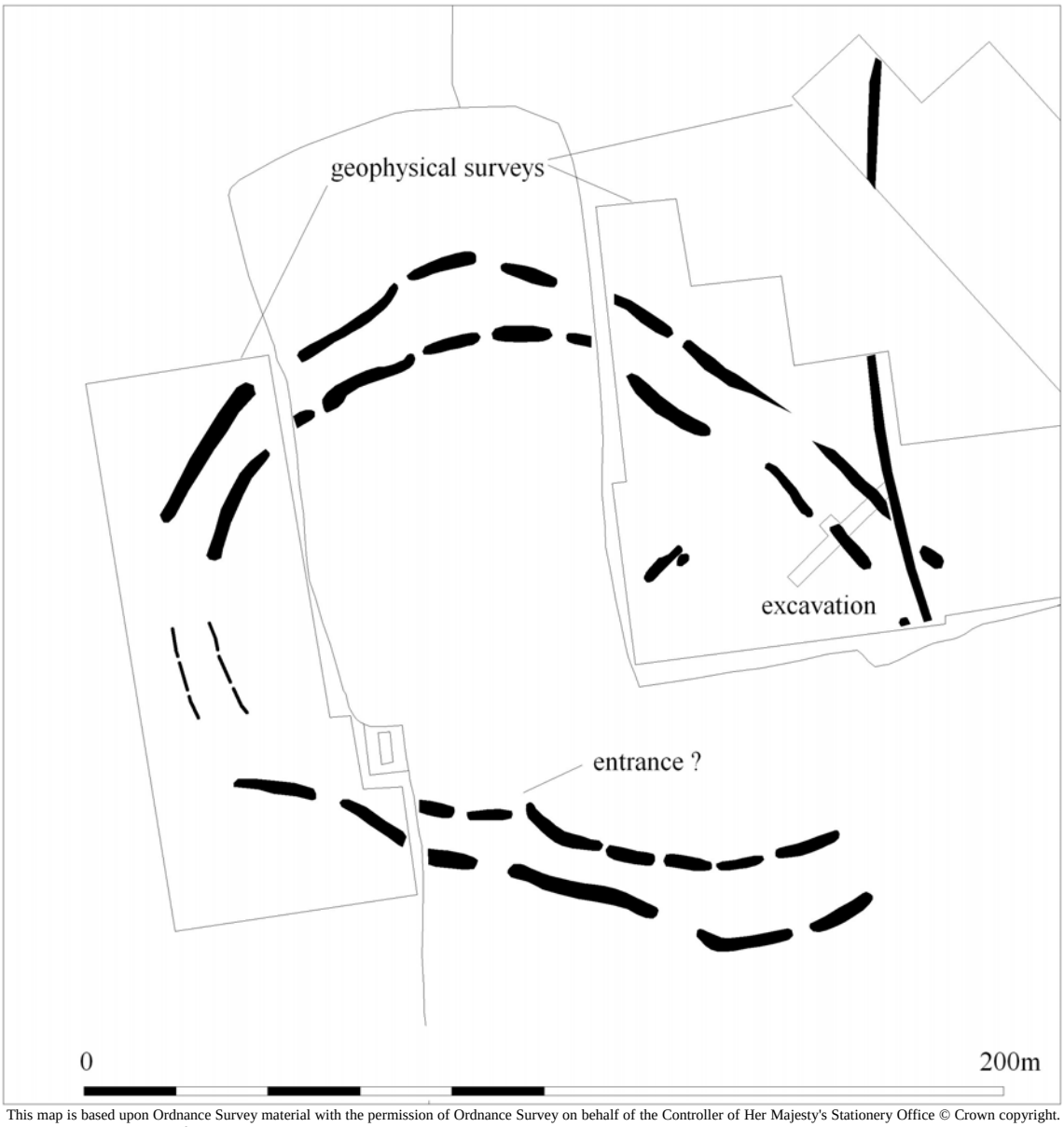

Fig. 7 Womaston causewayed enclosure plotted from cropmarks and geophysical survey, showing trench location

4.2 The ditches were separated by a berm 8.5m wide, within which no archaeological features were identified in the coarse, glacial gravel. Two features were identified in the interior of the enclosure, both shallow scoops or pits (38 and 40), although neither produced any dating evidence and may not necessarily be associated with the enclosure. The terminal of the inner

ditch had been cut through a shallow scoop (53), filled by a deposit of silty loam, from which no dating evidence was recovered.

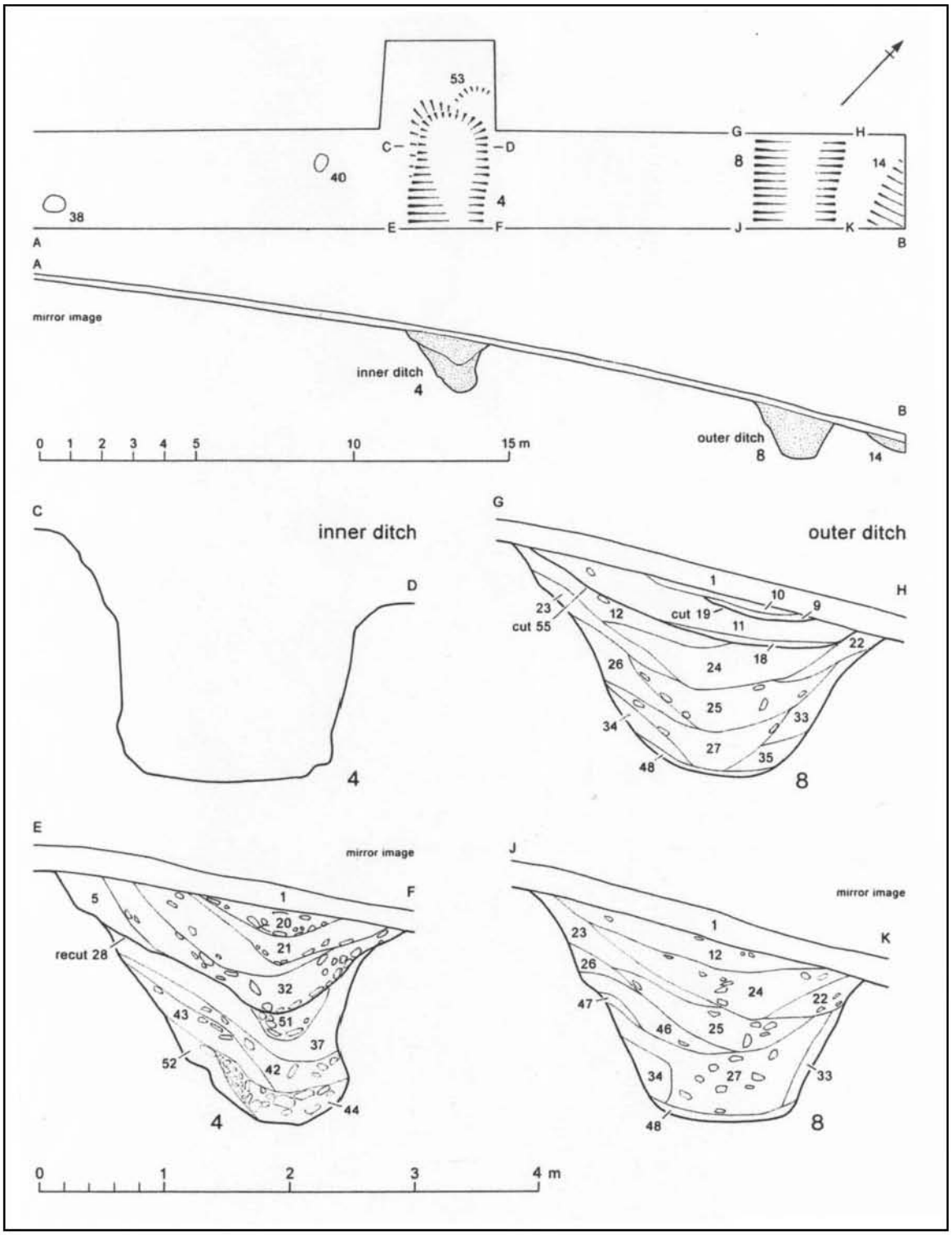

Fig. 8 Excavation plan and sections.

Fig. 9 View of the excavated ditches with the outer ditch in the foreground.
Photo CPAT 2627.103

The Inner Ditch

4.3 The inner ditch (4), which was 2.3m across and up to 1.8m deep, was clearly identified in its upper levels, although the sides became increasingly difficult to determine with depth. Eventually it became apparent that this was due to the sides having collapsed while the ditch was still open, undermining the upper edges on both sides, but more noticeably along the inner edge. The excavation included a terminal, which had been identified by the geophysical survey, forming the south-eastern side of a gap perhaps 3.5m wide. Although the excavation only investigated a 4m-long section of the inner ditch its form suggested that the feature may have originally been excavated as a series of intercutting pits, rather than a continuous ditch. This is suggested by a distinct narrowing of the lower section of the ditch around 3.5m from the terminal, although the width at the top remained fairly constant. Consequently, the published section gives a rather unrepresentative view of the ditch compared to the profile surveyed closer to the terminal (see Fig. 11).

4.4 The collapse of the ditch sides is likely to have occurred not long after it was excavated and is represented by two main deposits, a slumped layer of natural silts and gravels (52), and a basal deposit of loose glacial gravel (44). The tip lines within the ditch suggest that the majority of the infilling, which consisted of layers of silty clay with varying stone and gravel content, occurred from the inner side of the ditch, indicating that excavated spoil must have been placed on this side to form a bank. The distribution of the fills also implied that the bank may not have extended as far as the ditch terminal. The only direct dating evidence came from the upper fill, context 5, which produced several sherds and smaller fragments of pottery (Find nos 1000,

1009 and 1012). However, samples of hazel charcoal were recovered from a gritty clay layer near the base of the ditch (context 45, find no 1021), which were submitted for radiocarbon dating. Samples from this context were also taken for possible palaeoenvironmental analysis.

Fig. 10 Excavation of the inner ditch terminal. Photo CPAT 2627.126

4.5 At some time after the ditch had become largely infilled, a fairly shallow recut (28) was excavated to a depth of around 0.8m, respecting the original terminal and stopping just inside it. A thin layer of clean clay (36) was noted in the base and around part of the sides of the recut, on top of which were a number of flat stones (31) which appeared to have been deliberately placed. These were sealed beneath a layer of firm silty clay (context 32) from which samples of hazel charcoal were recovered (Find no. 1017), which have been submitted for radiocarbon dating. A total of ten sherds of Neolithic pottery were recovered from the fills of the recut (Find nos 1013, 1014 and 1019), although none was particularly diagnostic.

The Outer Ditch

4.6 The excavated section of the outer ditch (8) was 2.8m across and a maximum of 1.8m deep on the inner, upslope side. Unlike the inner ditch there were no signs of significant collapse, although the inner edge was difficult to ascertain in the upper section where it cut through a band of glacial silt and clay (13). Again the ditch fills appeared to have been derived more from the inside than the outer edge. The ditch appeared to have been infilled by natural silting, although the pattern of silting, with deposits of loose gravel (25, 27, and 46) interspersed with layers of silty clay (26, 34 and 47), signalled periods of stabilisation. Unfortunately, no dating evidence was recovered from the lower ditch fills, although layer 24, against the outer edge of the ditch, produced four sherds of Early Neolithic pottery (Find nos 1005, 1006, 1008 and 1010), including a rim, as well as a flint flake (Find no. 1007).

4.7 There was evidence for later features cut into the ditch in two stages once the ditch had been largely infilled. The upper ditch fill (12) had been cut by a shallow feature (55), 2.6m wide and up to 0.55m deep, which had a butt end and extended beyond the excavation to the north-west. Against the north-western baulk the base of the scoop contained a spread of charcoally soil (18), sealed beneath the main fill (11), which produced a single sherd of Neolithic pottery (Find

no. 1002) and a flint flake (Find no. 1003). Charcoal from context 18, identified as hazel, has been submitted for radiocarbon dating. The scoop in turn had been cut by a smaller scoop (19), 0.9m wide and up to 60mm deep, which also contained a significant amount of charcoal (9).

5 Neolithic Pottery by Alex Gibson

Introduction

5.1 The pottery was in a friable state and some sherds, owing to their small size and friability had not been cleaned. The pottery was laid out in well-lit conditions and examined macroscopically using a x10 hand lens. No microscopic or biochemical analyses have been undertaken and, indeed, the assemblage is so small that no destructive analytical techniques can be recommended.

Description

5.2 Two main fabrics are represented. Fabric 1 is hard and well-fired and contains abundant, coarsely crushed quartz, opening agents which often erupt on both surfaces. The surface colouration tends to be black though some oxidised red patches are also notable (see Nos 3 and 4 below – probably sherds from the same vessel). Fabric 2 is much finer and thinner and contains much more finely crushed stone and/or sand. It is slightly softer in texture than Fabric 1 and has a slightly laminated appearance. The surfaces are smooth and well-finished.

5.3 Sherds are generally small and lack diagnostic features on which to base positive identification. The exception to this is No. 3 below, from the fill of the outer ditch (context 24), which is an everted and slightly thinned rounded rim. This is totally in keeping with earlier Neolithic rim forms from open or Carinated Bowls. No carinations, however, are present to allow the positive identification of the latter class.

Dating

5.4 Dating of the assemblage is difficult owing to the largely undiagnostic character of the sherds. However, in the absence of truly carinated sherds or burnished fabrics, the open bowl (No. 3) and the fabric finish generally suggests a date in the earlier (but not primary) Neolithic, *c*.3800-3600 Cal BC.

Discussion

5.5 This is the first earlier Neolithic pottery known to the writer to have been found in the Walton Basin/Radnor Valley, or indeed in Radnorshire generally. Extensive flint scatters in the area with both Mesolithic and Neolithic elements, however, clearly demonstrate that the valley was not unoccupied in the earlier Neolithic (Gibson 1999b, Fig. 4 and 48-73). The closest parallels for the assemblage come from Brecnock with finds of Carinated Bowl and plain bowl at Gwernvale (Britnell & Savory 1984), Penywyrlod (ibid), Gwernyfed Park (Lloyd & Savory 1958), Ty Isaf (Grimes 1939), Mynydd Troed (Crampton & Webley 1966) and Ffostyll (Vulliamy 1923). Once again, from these sites, simple, everted rim forms predominate and shoulders may or may not be present in the assemblages.

5.6 Earlier Neolithic pottery is also rare across the border in the West Midlands though small amounts have been recovered from Baginton, Warwickshire (Hobley 1971), Brook Street, Warwick (Cracknell & Bishop 1992) and Kings Newnham, Warwicks (Gibson 1990). Further south and west, small assemblages were recovered from the excavations at the Cotswold-Severn tombs of Hazelton, Gloucestershire (Saville 1990) and the Rollright Stones (Whispering Knights), Oxfordshire (Lambrick 1988). A substantial assemblage of carinated, S-profiled and baggy plain bowl pottery has also been found at Wellington Quarry, Hereford also in a quartz-rich fabric (Gibson 2003). Whilst earlier Neolithic pottery is clearly not unknown in the West Midlands and south-east Wales, the present assemblage is nevertheless a small but important assemblage amongst a sparse local scatter.

Catalogue

1 Find no. 1005, context 24 (fill of outer ditch). Four sherds (24g) in a moderately hard fabric with slightly laminated texture. The outer surface is grey while the inner surface and core are black. The surfaces are smooth and well-finished. Well-crushed stone inclusions up to 4mm across but generally less than 1mm. Fabric averages 7mm thick. Early Neolithic.
2 Find no. 1006, context 24 (fill of outer ditch). Unwashed crumbs (3g), probably Neolithic.
3 Find no. 1010, context 24 (fill of outer ditch). Rim sherd (8g) in a hard, well-fired fabric, with smooth, black outer surface and pink-brown inner surface. The fabric contains crushed quartz inclusions up to 6mm across. The rim is rounded, slightly thinned and everted, but the sherd is too small to estimate the rim diameter. Fabric averages 10mm thick. Early Neolithic.
4 Find no. 1008, context 24 (fill of outer ditch). Single sherd (7g) in a hard, well-fired fabric similar to No. 3 and possibly the same vessel. Black on both surfaces. Fabric averages 10mm thick. Early Neolithic.
5 Find no. 1014, context 31 (fill of outer ditch). A small sherd (2g) in a hard, smooth and well fired fabric similar to No. 1. Fabric averages 5mm thick. Early Neolithic.
6 Find no. 1019, context 36 (fill of outer ditch). Two abraded body sherds (26g) in a similar fabric to Nos 3 & 4. 7mm thick. Early Neolithic.
7 Find no. 1002, context 18 (upper fill of outer ditch). Unwashed crumbs (4g). Probably Neolithic.
8 Find no. 1013, context 30 (fill of inner ditch). Single sherd plus seven unwashed crumbs (8g). Fabric similar to No. 1. Fabric averages 6mm thick. Early Neolithic.
9 Find no. 1000, context 5 (upper fill of inner ditch). Single sherd (4g) as Nos 3 & 4 above. Early Neolithic.
10 Find no. 1009, context 5 (upper fill of inner ditch). Three unwashed crumbs (3g). Probably Neolithic.
11 Find no. 1012, context 5 (upper fill of inner ditch). Unwashed crumbs (14g). Probably Neolithic.

6 FLINT

6.1 The excavation produced a single worked flint (Find no. 1007), a utilized flake from the fill of the outer ditch (context 24), together with a small flint chunk (Find no. 1003) from context 18, the charcoal deposit in the base of a feature cut into the outer ditch.

6.2 The collection of around 70 flints which were recovered from the site during field walking by Frank Noble during the 1950s clearly forms an important archive, although at the time of writing the whereabouts of the collection have yet to be ascertained. However, assuming that it is possible to locate the flints, the intention is to have them reported on by a specialist for inclusion in the final excavation report.

7 RADIOCARBON DATING

7.1 Three samples were submitted to Beta Analytic in Miami, Florida, for AMS dating. The results were calibrated by Beta using INTCAL04 radiocarbon age calibration.

Beta Sample No: 254592
Material: Charcoal, *Corylus*
Context: Basal fill (32) of recut of inner ditch
Conventional radiocarbon age: 4800 ± 40 BP
2-sigma calibration: Cal BC 3650 to 3510 and Cal BC 3410 to 3390

Beta Sample No: 254593
Material: Charcoal, *Corylus*
Context: Lower fill (45) of inner ditch
Conventional radiocarbon age: 4660 ± 40 BP
2-sigma calibration: Cal BC 3610 to 3610 and Cal BC 3520 to 3360

Beta Sample No: 254594
Material: Charcoal, *Corylus*
Context: Fill (18) of feature cut into upper fill of outer ditch
Conventional radiocarbon age: 4630 ± 40 BP
2-sigma calibration: Cal BC 3610 to 3610 and Cal BC 3520 to 3360

8 DISCUSSION

8.1 The programme of survey and excavation at Womaston, combined with the plotting of cropmarks on available aerial photographs, has added significant detail to the known plan of the enclosure, and around 80% of the circuit has now been identified. The enclosure measures 180m east to west by 130m, enclosing an area of 1.2ha, with a possible entrance on the southern site where the inner ditch circuit appears to be inturned. The ditches are both substantial, between 2.3m and 2.8m wide and around 1.8m deep, with U-shaped profiles common to most causewayed enclosures. The ditch excavations revealed clear evidence for several phases of activity, the inner ditch terminal having been cut through an earlier, undated feature, and had itself been the subject of a later, shallow, recut. The radiocarbon dates suggest a period of activity somewhere between 3610-3360 BC, although there is no statistical difference between the dates for the main ditch and the later recut. While there was no evidence for a recut in the outer ditch, the upper fills had been disturbed by later activity, including a shallow feature which produced a calibrated date of 3610-3610 BC and 3520-3360 BC. The silting profiles in both ditches suggest the presence of an internal bank which, in the case of the inner ditch may have stopped slightly short of the ditch terminal.

8.2 The excavations only produced a small collection of pottery, none of which was particularly diagnostic, although the form of the single rim sherd, and the nature of the fabric generally, suggest an Early Neolithic date of around 3800-3600 BC. To date, this is the only pottery from that period to have been found in the Walton Basin, and together with the radiocarbon dates, indicates that the causewayed enclosure is likely to be the earliest monument in the area.

8.3 In Britain, the earliest causewayed enclosures belong to the Early Neolithic, in the first half of the 4th millennium BC, although they appear in continental Europe as early as the 6th millennium BC. The form of these monuments varies considerably, with single or multiple concentric circuits of ditches, and continuous or discontinuous banks formed from material quarried from the ditches. Their common distinguishing feature is the frequent but irregularly-spaced causeways which punctuate the ditch circuits. Although some sites survive as upstanding earthwork monuments, many are only known from cropmark evidence. In parts of Britain, notably south-west England, and possibly also Cumbria and Pembrokeshire, there are a number of stone-walled enclosures with discontinuous ramparts which might also be considered as contemporary counterparts.

8.4 The classic causewayed enclosure is perhaps best represented by Windmill Hill in Wiltshire, which has a triple circuit of ditches and is one of the best preserved examples in the country. Excavations on a number of sites have demonstrated that the ditch segments were not necessarily all dug at the same time and the recutting of the ditches appears to be a common feature, often associated with ritual deposits. This rather episodic construction process has more recently been taken to suggest that causewayed enclosures may never have been regarded as finished monuments, but rather as projects requiring continual endeavour as a communal effort

by a dispersed or fragmentary society. Indeed, one current theory argues that the layout of causewayed enclosures in Britain may be derived from an idealised 'folk memory' of the form of very early enclosed settlements in continental Europe, providing a focus for communities which still remained relatively mobile. Other theories regarding their function include enclosed settlements, cattle enclosures, religious sites and trading centres. These sites represent the earliest form of non-funerary monument and, along with long barrows, may represent the first detectable evidence for the interaction of larger communities (Oswald et al. 2001, 35-7, 122 and 133).

8.5 Until relatively recently these monuments were unknown in Wales, although nine potential sites have now been identified, not all of which are necessarily Neolithic, and a further two potential sites exist in Shropshire and Herefordshire. As well as Womaston, cropmark evidence has revealed three enclosures in the Vale of Glamorgan, at Corntown, Flemingston and Norton (see Fig. 11). The Womaston enclosure is markedly similar to those at Flemingston and Norton, both of which are bivallate, while the enclosure at Corntown has three sets of ditches (Burrow et al. 2001). Although known from cropmark evidence, both Norton and Corntown have produced considerable quantities of flintwork, some of which belongs to the Early Neolithic, while Flemingston has been shown to preserve slight earthwork traces of the ditches (*Arch. in Wales* 46, 2006, 151-2).

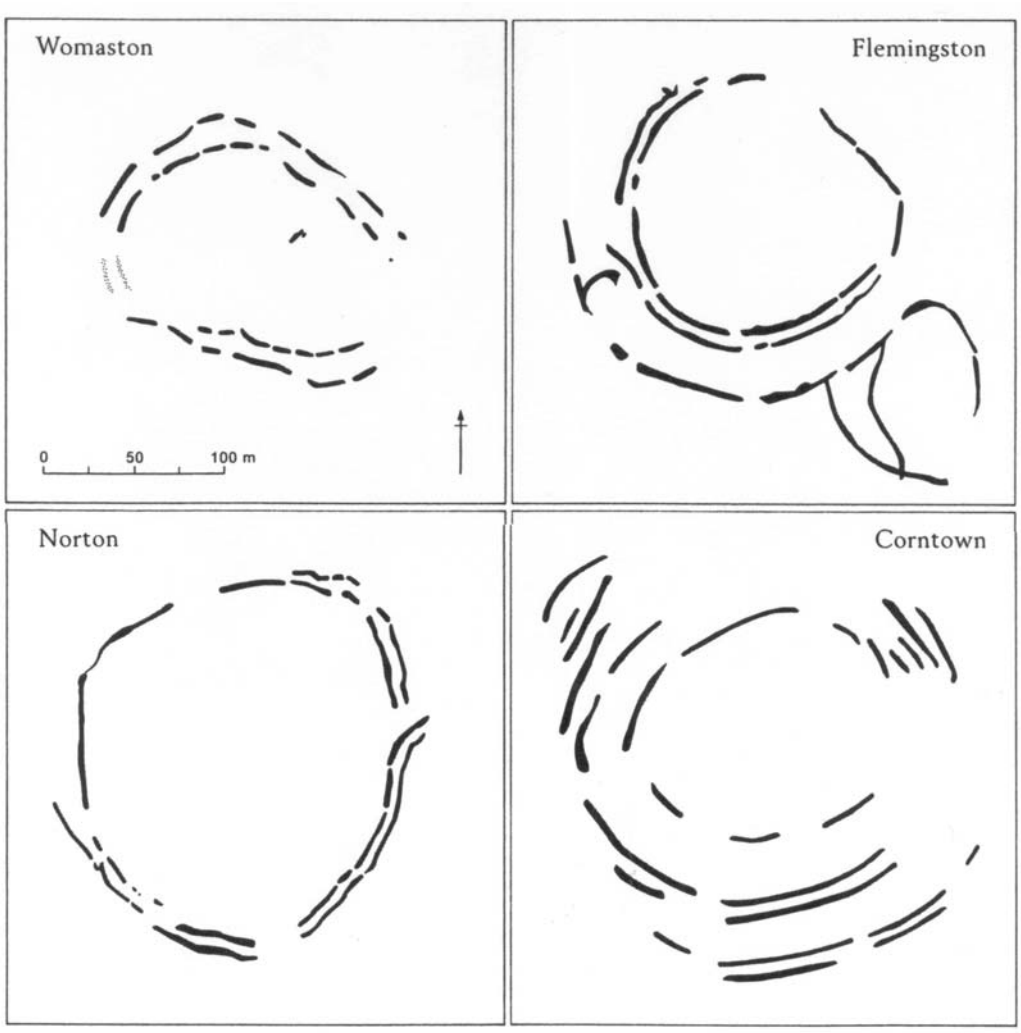

Fig. 11 Comparative plans of four cropmark causewayed enclosures in Wales (based, with the exception of Womaston, on original plots by RCAHMW, © Crown Copyright).

8.6 Recent excavations in advance of quarrying at Beech Court Farm, Ewenny, have confirmed another causewayed enclosure in the same area, with several phases of rock-cut ditches and other activity. However a date of 1940–1610 Cal BC has been produced for a post-hole associated with a Collared Urn, and a roughly comparable date of 1880-1660 Cal BC from a hearth, while the only dating for the ditches places them in the Iron Age, with dates of 790-450 Cal BC and 190-40 Cal BC from two ditch terminals (Lewis & Huckfield, 2008).

8.7 A possible causewayed enclosure on the outskirts of Caersws, in the upper Severn Valley, may also belong to the Iron Age, with charcoal from the base of the ditch providing a date of 520-190 Cal BC (CAR-1313). The enclosure, which measures 300m by 110m, survives as a partial earthwork with a single ditch and internal bank; other sections of the ditch have been confirmed through geophysical survey (Jones 1993). Although perhaps four causeways are visible in the earthworks, the nature of the majority of the circuit remains uncertain and this, together with the Iron Age date, may argue against this being a true causewayed enclosure.

8.8 Excavations on Anglesey, at Bryn Celli Wen, have revealed several ditch segments forming an oval enclosure measuring 150m by 100m, which occupies the end of a spur. In this instance the ditches were relatively slight and were replaced by a stone bank associated with Peterborough Ware (Edmunds & Johnson 1991).

8.9 In Pembrokeshire, recent excavations on the site of an earthwork enclosure at Banc Du have produced a date of around 3650 BC from the base of the ditch (Darvill et al. 2007). The ramparts, which were built with a stone outer face and timber posts behind, appear to be rather irregular and partly interrupted. To date this is the only confirmed Neolithic enclosure in Wales which is upstanding, although it has been suggested that another earthwork enclosure with a discontinuous bank, at Marian Ffrith in Flintshire, may also belong to this group of monuments.

8.10 The relatively recent identification of the causewayed enclosure at Womaston has added another major monument to what was already an area of obvious significance during the Neolithic. Sited on a low hilltop, the enclosure overlooks the palisaded enclosure at Hindwell, less than 500m to the west, and the Walton Green cursus, around 1km to the south-south-east. Causewayed enclosures are often found in close proximity to burial and ritual monuments, including long barrows, although at the moment this is the one major monument type which is apparently absent from the Walton Basin, but an example could yet be revealed through further aerial reconnaissance.

8.11 Mesolithic activity is well attested in the surrounding area, mostly in the form of flint scatters, but more significantly a pit at Rough Close which, although devoid of artefacts, contained charcoal which produced a date of 4940-4540 Cal BC. Similarly, Neolithic settlement is clearly indicated by a wealth of flint, although it is a series of pits which were revealed beneath the later round barrow at Upper Ninepence which provide direct evidence for occupation. Nine small pits were associated with Peterborough Ware, as well as waste flint and charred materials. The nature of the deposited material suggested that it was derived from a domestic context, although the deposition may have been more ritualistic than the simple burying of rubbish. Radiocarbon dates from five of the pits placed this activity in the Middle Neolithic, from around 3500 BC to 2900 BC. A later phase of activity, centred around *c*. 2700 BC, was associated with Grooved Ware and flintwork and comprised a series of pits and probably two circular, stake-built structures (Gibson 1999b, 38 and 160-4). The combined radiocarbon dates for the Hindwell palisaded enclosure suggest that its was constructed between *c*. 2800-2500 Cal BC (Table 1), around the same time as the Grooved Ware phase at Upper Ninepence.

Table 1 Radiocarbon dates from excavations in the Walton Basin (after Gibson 1999b)

Site	Context	Lab No.	C14 Date BP	Cal BC 95%
Rough Close	Pit	SWAN-114	5860±70	4940-4540
Upper Ninepence	Peterborough Ware pit	BM-2967	4400±50	3310-3230 or 3180-3160 or 3140-2910
	Peterborough Ware pit	BM-2966	4410±35	330-3240 or 3110-2920
	Peterborough Ware pit	SWAN-23	4470±80	3360-2920
	Peterborough Ware pit	BM-3071	4590±60	3520-3090
	Peterborough Ware pit	BM-3070	4490±60	3360-3030 or 2980-2930
	Groove Ware pit	SWAN-24	4240±70	3040-2850 or 2830-2610
	Groove Ware pit	BM-2968	4160±35	2890-2850 or 2830-2610
	Groove Ware pit	BM-2969	4050±35	2870-2810 or 2740-2720 or 2700-2490
	Groove Ware pit	BM-3069	4060±40	2870-2810 or 2780-2720 or 2700-2490
Hindwell Palisaded Enclosure	Charred oak post	SWAN-116	3960±70	2900-2800 or 2700-2200
	Charred oak post	SWAN-117	4070±70	2880-2800 or 2780-2460
	Charred oak post	SWAN-230	4040±80	2900-2350
	Charred oak post	SWAN-231	4130±80	2910-2500
	Combined dates		4045±37	2870-2810 or 2740-2720 or 2700-2470
Hindwell Ash	Pre-barrow posthole	CAR-1480	3730±70	2500-1900
Upper Ninepence Enclosure	Basal ditch silts	SWAN-21	3390±70	1880-1520
	Upper ditch silts	SWAN-22	2010±70	200-AD130

8.12 There are a number of other potentially Neolithic monuments in the area which have yet to be dated. These include a second palisaded enclosure with pit avenue and a 100m-diameter ring ditch, both at Walton, and a large mound at Knapp Farm which is usually considered to be a small motte, although it has been argued that there are similarities with large prehistoric mounds such as Silbury Hill and Duggleby Howe (Gibson 1999b, 9). The recent excavation of the proposed Hindwell Cursus produced charcoal from significant contexts within one of the ditches which it is hoped may be suitable for radiocarbon dating.

8.13 One of the project aims was to assess the condition and vulnerability of the site, which extends across three fields, each in a different ownership. The majority of the enclosure falls within an intensively farmed arable field, and it is this field which has produced the most clearly defined cropmarks, as well as the flint scatter recorded during the 1950s. The results from the excavation have demonstrated that even where the site lies beneath pasture the topsoil is thin, at no more than 0.2m, and centuries of ploughing have removed any contemporary ground surface. The arable field has been subject to more intensive cultivation, such that there is a negative lynchet of around 0.5m along the field boundaries separating this from the two pasture fields. The monument is, therefore, clearly at risk from further plough damage.

9 ACKNOWLEDGEMENTS

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APPENDIX 1
GEOPHYSICAL SURVEY METHODOLOGY
By Richard Hankinson

The survey used a fluxgate gradiometer and the methodology employed was that used in the 2006 and 2007 surveys of defended enclosures in Montgomeryshire (see Hankinson and Silvester 2006, Hankinson 2007) which in turn was developed from that used by the Gwynedd Archaeological Trust for their survey of Roman fort environs (Silvester, Hopewell and Grant 2005).

Instrumentation and background

The geophysical work was carried out using a Geoscan FM36 fluxgate gradiometer, which detects variations in the earth's magnetic field resulting from the presence of iron minerals in the soil. These minerals are generally the weakly magnetised iron oxides that are normally found in topsoil. Features cut into the subsoil can be detected by the instrument when topsoil has formed part of their fill, whether directly or by silting.

There are a variety of other processes which may result in detectable anomalies, such as the presence of iron objects in the soil, which yield high readings. The potential to detect areas of burning is possibly of more interest, as it can identify hearths and kilns where the fired clay has acquired a thermo-remnant magnetic field upon cooling.

Unfortunately, not all soils are conducive to the use of this method, particularly in cases where the topsoil and subsoil have similar magnetic properties. Occasionally, high or random levels of magnetic material within the soil can effectively mask the results and prevent detection of artificial features. The lack of detectable anomalies cannot be taken to mean conclusively that there is no surviving archaeology in a locality.

The Geoscan FM36 is a hand-held instrument which allows readings to be taken automatically as the operator walks at a constant speed along a series of fixed length traverses. The sensor consists of two vertically-aligned fluxgates, set 500mm apart, whose Mumetal cores are driven in and out of magnetic saturation by a 1,000Hz AC current passing through two opposing driver coils. As the cores come out of saturation, the external magnetic field can enter them, producing an electrical pulse proportional to the field strength in a sensor coil (Clark 1990, referred to in Hopewell 2004).

Magnetic fields and variations are measured in nanoTeslas (nT). The earth's magnetic field is approximately 48,000nT, but archaeological features generally produce instrument readings of less than 15nT. Areas of burning and iron objects produce higher readings, perhaps up to several hundred nT. The gradiometer can detect changes as low as 0.1nT.

Data collection

The gradiometer has an on-board data logging device which enables readings to be taken at specific time intervals. These readings are taken along parallel traverses within a grid of known size, which allows them to be correlated with geographical locations.

In the case of the surveys described here the grids measured 20m by 20m, with intervals between the traverses of one metre. The speed of each traverse was controlled such that readings were taken every 0.5m, thereby giving a total number of 800 readings per $400m^2$ grid.

Data processing and presentation

The data was transferred from the data logger to a computer, where it was compiled and processed using Geoplot 3.0 software. A minimum of processing was carried out, although compensations were made for instrument drift caused by gradual changes in the earth's magnetic field, and inconsistencies in data collection. Typical processing functions utilised for these ends were *Zero Mean Grid, Zero Mean Traverse, and Destagger.* The *Clip* function allowed smaller

variations in the readings to become visible by reducing the impact of very low and very high readings on the plot.

The results are presented in greyscale format, along with an interpretation drawing. The greyscale plot produces a plan view of the survey and allows subtle changes in the data to be displayed. Trace plots of the type produced in earlier reports (see for example those for Forden Gaer in Silvester and Hankinson 2006, figs 2-3) have been eschewed because they appeared to add little to the overall impression and understanding of the sites surveyed. It would, however, still be possible to produce such plots from the archived data if these were required at any stage in the future.

Grid location and the plotting of the geophysical survey results

Prior to the commencement of each geophysical survey, the survey grids were laid out and then located in relation to nearby field boundaries by total station surveying. The survey was subsequently geo-registered, which enabled the National Grid co-ordinates of fixed points on each survey grid to be determined.

The greyscale plot of the geophysical survey results for each area was produced using Geoplot 3.0 software and the plot was exported as a Windows Bitmap. This was then cleaned up and rotated to match grid north using Paint Shop Pro software, before being imported as a raster layer into GIS using Mapinfo. It was registered in relation to the Ordnance Survey grid using the co-ordinates derived from the topographical survey. This then enabled the individual surveys to be accurately placed in relation to each other.

The GIS layer of the greyscale plot could then be contrasted with a variety of other sources, such as aerial photography, and this enabled a more analytical assessment of the results to be made. It also allows the results of the geophysical survey to be more easily archived and to be readily available in digital format for any future work at the site in question.

APPENDIX 2

PROJECT ARCHIVE

1 A1 site drawing
9 A4 site drawings
55 context record forms
135 digital photographs, film no. 2627
photographic catalogue
context register
drawings register
finds register
levels record forms
Correspondence

Digital data
Topographical survey – hindwell.pmw (Penmap survey software)
Geophysical survey data
Aerial photographic plot

Contexts Register

Context	Type	Comment
1	Deposit	Modern plough soil
2	Deposit	Gravel sub subsoil
3	Deposit	Yellow-brown silty subsoil
4	Cut	Inner enclosure ditch cut
5	Deposit	Upper fill of inner ditch cut
6	Cut	Post hole
7	Deposit	Fill of [6]
8	Cut	Outer enclosure ditch
9	Deposit	Charcoal patch in outer ditch? Fill of [19]
10	Deposit	Upper fill of outer ditch
11	Deposit	Fill of outer ditch
12	Deposit	Fill of outer ditch
13	Deposit	Fill of outer ditch
14	Cut	Former field boundary ditch
15	Deposit	Fill of [14]
16	Cut	Plough scar in inner ditch [4]
17	Deposit	Fill of [16]
18	Deposit	Charcoal deposit
19	Deposit	Possible scoop, filled by (9)
20	Deposit	Fill of inner ditch recut [28]
21	Deposit	Fill of inner ditch recut [28]
22	Deposit	Fill of outer ditch [8] – against outer edge
23	Deposit	Fill of outer ditch [8] – stony silt
24	Deposit	Fill of outer ditch [8] – loose gravel / stone
25	Deposit	Fill of outer ditch [8] – v. loose gravel
26	Deposit	Stony silt on inner edge ditch [8]
27	Deposit	Loose gravel, below (26)
28	Cut	Possible re-cut of ditch terminal
29	Deposit	Fill of re-cut [28]
30	Deposit	Narrow stony deposit (large cobbles at base)
31	Deposit	Dump of stones at base of (30)
32	Deposit	Primary fill of re-cut [28], below (31). Yellow silty clay and stones

33	Deposit	Fill of ditch [8] – gritty silt against outer edge
34	Deposit	Fill of ditch [8] – yellow-brown clay silt against inner edge
35	Deposit	Fill of ditch [8] – Loose gravel below (27), (33)
36	Deposit	Fill of ditch [4] – firm pale yellow silty clay below (32)
37	Deposit	Fill below (36) – loose stony gravel
38	Cut	Pit towards SW end
39	Deposit	Fill of [38]
40	Cut	Scoop SW of inner ditch
41	Deposit	Fill of [40]
42	Deposit	Fill within inner ditch [4], below (37)
43	Deposit	Loose gravel
44	Deposit	Stony clay deposit below (43)
45	Deposit	Compacted clay deposit
46	Deposit	Fill of ditch [8]
47	Deposit	Fill of ditch [8]
48	Deposit	Fill of ditch [8]
49	Deposit	Fill of ditch [4] – soft grey silty-clay above (45)
50	Deposit	Primary fill of [4] – firm clay with charcoal below (45)
51	Deposit	Stoney fill in ditch 4
52	Deposit	Primary fill of ditch 4
53	Pit	Shallow pit cut by terminal of ditch 4
54	Deposit	Fill of pit 53
55	Recut	Shallow recut in top of outer ditch 8

Drawings Register

No	Scale	Contexts	Sheet No.	Comment
1	1:20		A1	Initial plan
2	1:20	18	A4	Outer ditch [8], after removal of (11)
3	1:20		A4	Pre-ex of inner ditch, outer extension
4	1:20		A4	Longitudinal section of possible feature
5	1:20	4 and 28	A4	Re-cut [28] of [4,] inner ditch
6	1:20	31	A4	Dump of stones (31) below (30), inner ditch
7	1:20	36	A4	Possible remains of clay lining
8	1:20	8	A4	SE facing section of ditch [8]
9	1:20	8	A4	NW facing section of ditch [8]
10	1:20	4	A4	NW facing section of ditch [4]

Small Finds Register

Find No	Context	Material	Number	Weight	Comment
1000	5	Pottery	1	4g	Single sherd of Early Neolithic pottery
1002	18	Pottery	1	4g	Very fragmentary pottery, probably Neolithic
1003	18	Flint	1	1g	Flint
1005	24	Pottery	4	24g	Early Neolithic pottery
1006	24	Pottery	1	3g	Prehistoric pottery, probably Neolithic
1007	24	Flint	1	5g	Utilized flake
1008	24	Pottery	1	7g	Early Neolithic pottery
1009	5	Pottery	3	3g	Prehistoric pottery
1010	24	Pottery	1	8g	Early Neolithic rim sherd
1012	5	Pottery	17	14g	Prehistoric pottery, probably Neolithic
1013	30	Pottery	8	8g	Early Neolithic pottery
1014	31	Pottery	1	2g	Early Neolithic pottery
1019	36	Pottery	1	26g	Early Neolithic pottery
1020	15	Pottery	1	9g	Medieval pottery – cooking pot rim

Samples catalogue

Find No	Context	Material	Number	Comment
1001	9	Charcoal	1 bag	Sample of charcoal, outer ditch
1004	18	Charcoal	1 bag	Sample of charcoal deposit (18)
1011	26	Soil	3 x 10 lt	Sample of stony silt, outer ditch
1015	33	Soil	3 x 10 lt	Sample of gritty silt, inner edge outer ditch
1016	34	Soil	3 x 10 lt	Sample of stony clay silt, inner edge outer ditch
1017	32	Charcoal	1 bag	Fragment of wood charcoal
1018	39	Soil	1 bag	Sample of fill of (38)
1021	45	Charcoal	1 bag	Fragment of wood charcoal
1022	18	Charcoal	1 bag	Sample of charcoal deposit (18)
1023	45	Soil	1 x 10 lt	Sample of compacted clay deposit
1024	50	Soil	1 x 10 lt	Sample of firm clay, containing charcoal
1025	45	Soil	1 x 10 lt	Sample of compacted clay deposit
1026	49	Soil	1 x 10 lt	Sample of fill from ditch [4]