CPAT Report No 981

Potential Cursus Monuments in Mid and North-east Wales

GEOPHYSICAL SURVEY AND EXCAVATION 2008-09

THE CLWYD-POWYS ARCHAEOLOGICAL TRUST

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Report for Cadw

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1 INTRODUCTION

1.1 Following the completion of the rapid survey of prehistoric funerary and ritual monuments in 2005 the enhanced Historic Environment Record (HER) included records for seven known and potential cursus monuments in mid and north-east Wales. Of these, only two sites, the Welshpool Cursus and the Walton Green Cursus, have so far been confirmed through excavation, and currently only the former is scheduled. Four of the remaining sites are known only from cropmark evidence, while one is an upstanding earthwork. An additional site is recorded in the National Monuments Record which, at the outset of the project, had yet to be appended to the regional HER.

1.2 The present project was therefore designed to examine the potential cursus monuments through a combination of geophysical survey and trial excavation, with the objective of determining their status and potentially providing some evidence for dating for these anomalous monuments.

1.3 Cursus monuments are characterised by roughly parallel banks and ditches, with the more complete examples having terminals at either end, forming elongated enclosures, some with central linear mounds. Excavations in England have dated them to the Neolithic, between 4,000 and 2,500 BC. They take their name from the Latin for 'racecourse', and are so named because early archaeologists believed them to have been used by the Ancient Britons for racing their chariots, a theory which has now been dismissed. Their true purpose, however, remains a mystery, although it is generally believed that they served as routeways for ceremonial processions. Although many cursuses extend over considerable distances, in some cases up to 10km, most are rather shorter, typically around 2km or less in length.

1.4 The cursus monuments of Wales were the subject of an article by Alex Gibson (1999a) which identified a further two possible sites, at Tyn-y-cefn near Corwen, and Sarn-y-bryn-caled near Welshpool. These were re-examined during the rapid survey and subsequently dismissed, the former being more likely to reflect patterns of field drains, and the latter a trackway. Recent excavations during the construction of a new gas pipeline affected the site of one of the potential cursus monuments, near Pipton, in Brecknock (PRN 5818; SO 16213800), revealing it to be a Roman road with flanking ditches, and no further investigation was therefore proposed.

1.5 Those sites examined during the project are as follows (see Fig. 1):

- Collfryn (PRN 38009; SJ 21891649)
- Gerwyn Fechan (PRN 54886; SJ 36884583)
- Hindwell (PRN 33109; SO 24926074 to SO 25096083)
- Holywell/Whitford Dyke (PRN PRNs 28097 and 28099; SJ 15317466)
- Meifod (PRN 7123; SJ 16201377)

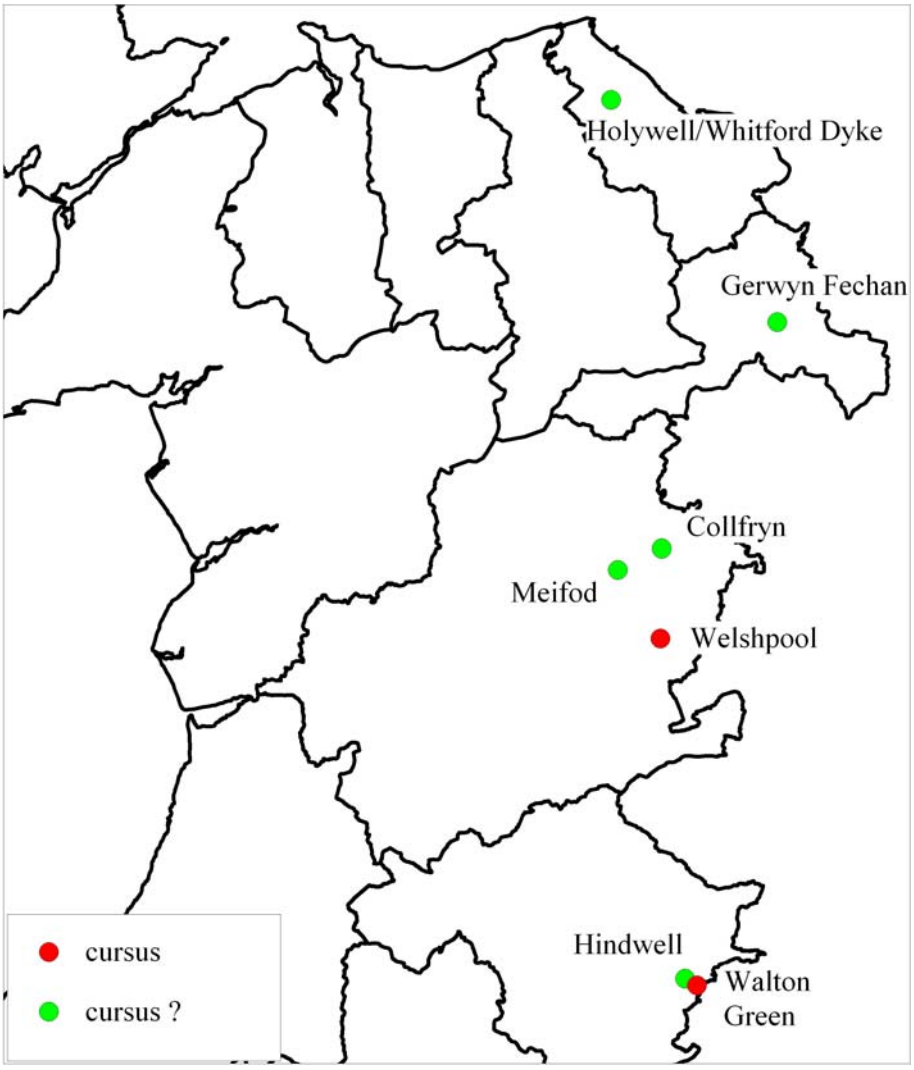

Fig. 1 Known and potential cursus monuments in mid and north-east Wales

2 CONFIRMED CURSUS MONUMENTS

Welshpool Cursus (PRN 3482; SJ 21720487)

2.1 The cursus is located at Sarn-y-bryn-caled to the south of Welshpool, and forms part of a ritual complex which also includes the well-known timber circle. The cursus is *c*. 380m in length, aligned north-west to south-east, and comprises roughly parallel ditches 8-10m apart. Trial excavations during the early 1990s provided a radiocarbon date of 3891-3889 cal BC or 3796-3662 cal BC (OxA-3997) for charcoal recovered from the base of one of the ditches (Gibson 1994).

Walton Green Cursus (PRN 5134; SO 26465988)

2.2 The cursus is of Loveday's (1985) Bi type, having well-spaced, parallel ditches and square terminals. As part of the Walton Basin project, three trenches were excavated through the ditches in order to confirm its identification and obtain dating material, two at the east terminal and the third across the northern ditch. The ditches were shallow and narrow, in keeping with other cursus monuments excavated in Wales, although unfortunately no dating evidence was revealed (Gibson 1999a, 11-14).

3 **COLLFRYN** (PRN 38009)

3.1 Cropmarks have revealed two narrow, parallel ditches 8m apart, oriented north-north-east to south-south-west, and extending for around 80m, lying in close proximity to a large ring ditch (PRN 5149; Fig. 2). The cropmarks are located around 5km north of Guilsfield in Powys (SJ 21891649), in the low hills to the south-east of the River Vyrnwy at an altitude of 130mOD.

Fig. 2 Cropmarks visible in 1987 define the ring ditch and two parallel ditches.
Photo CPAT 87-7-13

Geophysical Survey

3.2 A magnetometer survey (Figs 3-4) examined an area of 0.64ha, comprising 16 grids, each measuring 20m by 20m, encompassing the majority of the area where cropmarks had been identified.

3.3 The magnetic response was relatively even across the whole area, with the exception of a number of obvious spikes which are likely to be the result of metallic debris in the topsoil. The results suggest that there is little difference in the magnetic signature between the topsoil and subsoil, making any archaeological features rather difficult to detect using this form of geophysical survey.

3.4 The survey did however identify the large ring ditch known from cropmark evidence, although there was no evidence for the large internal pit which had been suggested by the cropmark. This, and a re-examination of the aerial photographs (Fig. 2), suggest that the presumed pit is perhaps more likely to be a result of the soils and geology, than an archaeological anomaly.

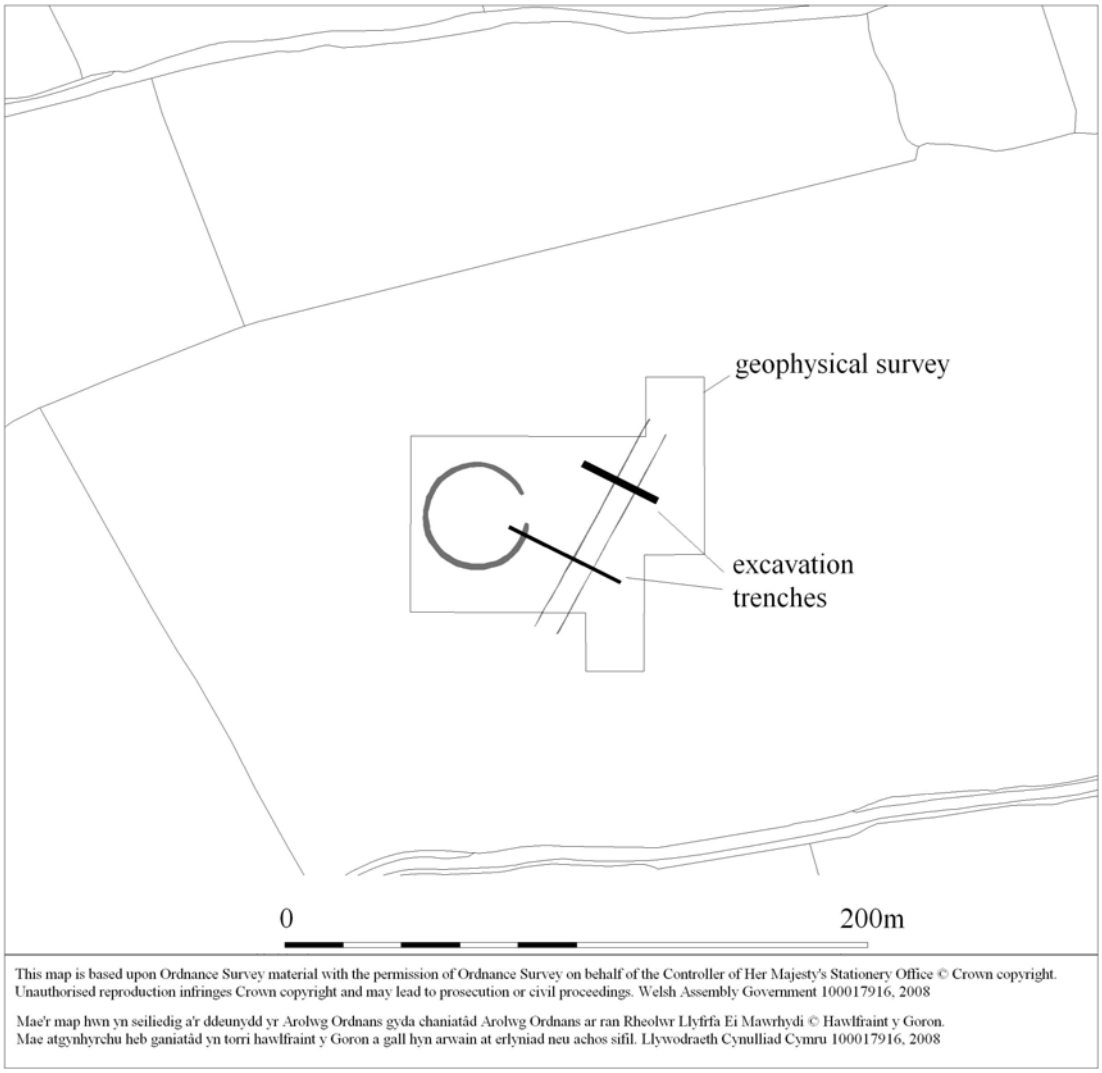

Fig. 3 Location of cropmarks, geophysical survey and excavation trenches

Trial Excavation

3.5 The excavations comprised two trenches aligned west-north-west to east-south-east, positioned to investigate the linear cropmarks and a small part of the ring ditch (Fig. 5). The topsoil, which was up to 0.30m thick, was removed mechanically to reveal the surface of the natural clay subsoil, although in some areas a disturbed layer at the interface of the topsoil and subsoil was subsequently removed by hand.

3.6 In both trenches a number of linear field drains became apparent, which were evidently associated with two phases of drainage. Each phase had drains which respected the same alignments, being either north-north-east to south-south-west, or north-north-west to south-south-east. The earlier drains, which were around 0.3m wide, were typified by a dark, humic fill containing flecks of lime. Later drainage was evidenced by a series of stone-filled drains, again around 0.3m wide, but of a more regular nature. It may be presumed that the earlier drains were hand-excavated, while the later drains were machine-cut.

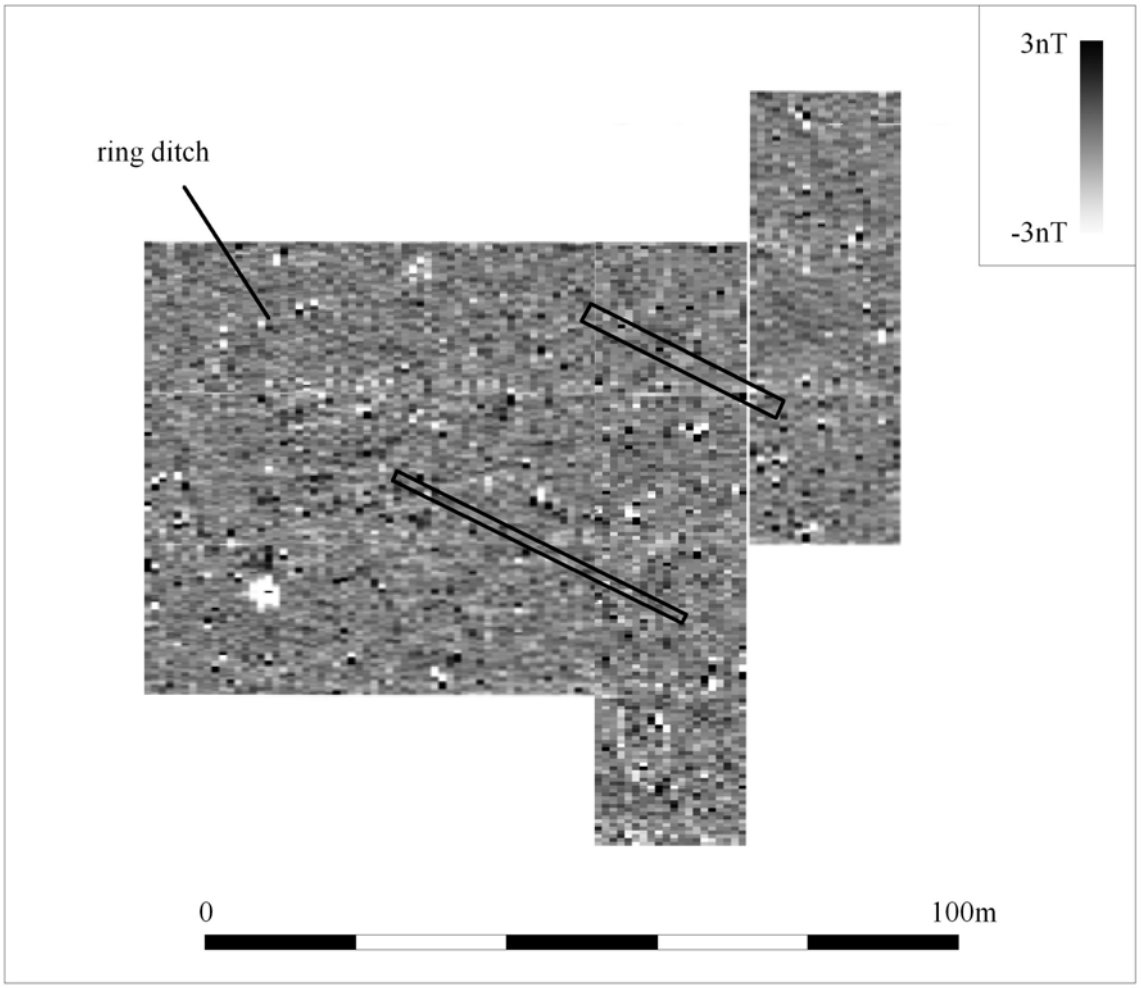

Fig. 4 Collfryn geophysical survey and trench location

3.7 At the southern end of Trench 1 the subsoil was cut by the curving course of the ring ditch. Although this remained unexcavated, the edges were well-defined, revealing a ditch 2.3m wide with an upper fill of brown clay loam, above a layer of yellow-grey clay silt containing flecks of charcoal which was visible against both edges of the ditch.

3.8 A broad, shallow ditch was identified in Trench 2, measuring 2.9m across and 0.3m deep, filled by a uniform deposit of grey-brown clay silt. There was no evidence to suggest the likely date or function of the ditch.

3.9 The trenches and individual features were all recorded by total station survey, the results from which clearly demonstrated that two of the drains in each trench corresponded precisely with the cropmarks of the proposed cursus.

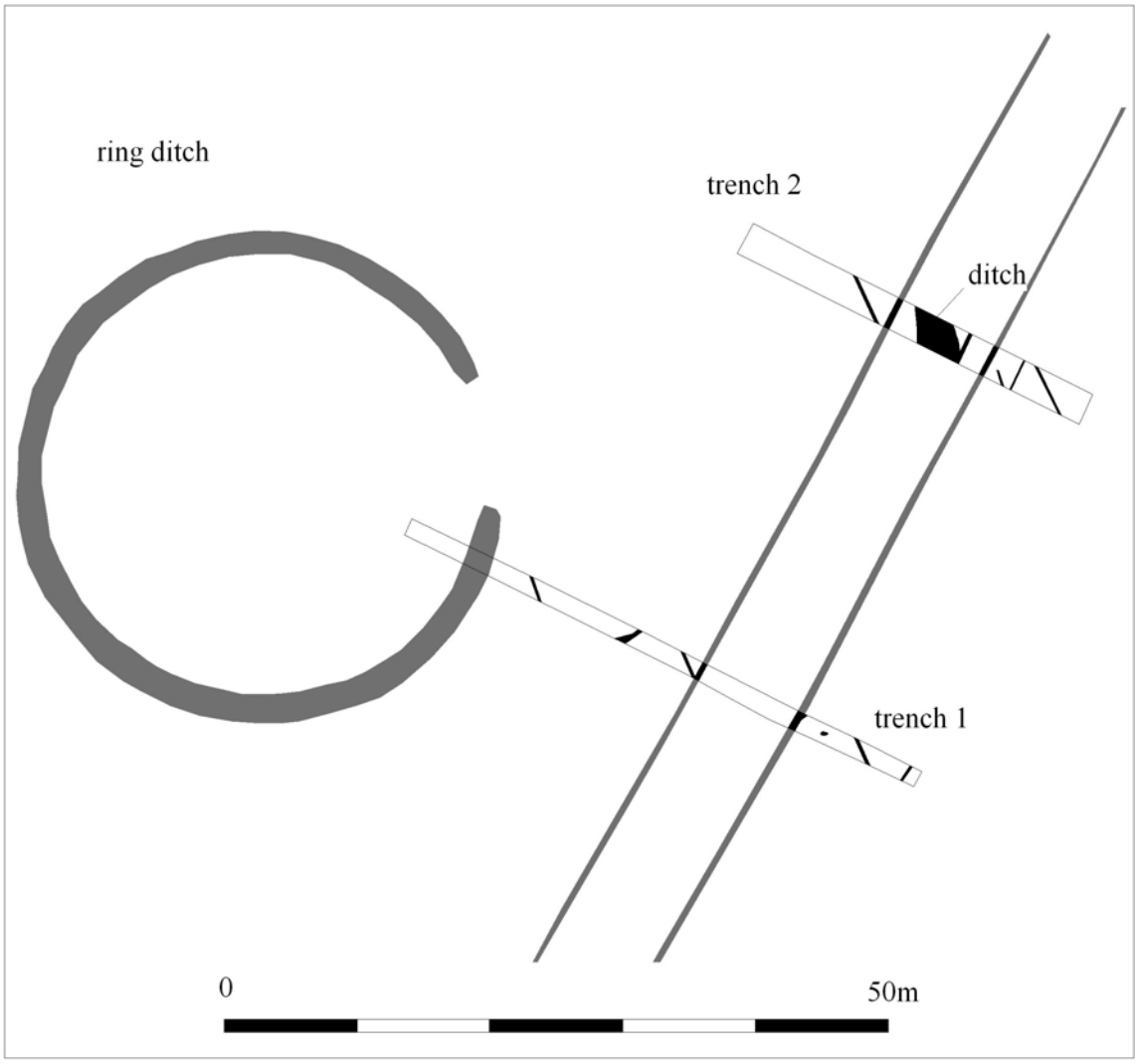

Fig. 5 Collfryn cropmarks, geophysical survey results and excavated features

Conclusions

3.10 The trial excavations have clearly demonstrated that the parallel cropmarks were formed in response to two field drains, although it is curious why the other drains did not create similar cropmarks.

3.11 The geophysical survey has provided more detail of the large ring ditch, which is around 37m in diameter, with a ditch 2.3m wide. Both the geophysics and the cropmarks have indicated a possible gap of perhaps 9m on the eastern side, although the results were not sufficiently detailed to be certain that this is a deliberate entrance rather than a response to ground conditions. The ring ditch is unusually large, however, although its ditch is not particularly wide, and it is possible that this may be a hengiform monument rather than a plough-levelled round barrow.

4 GERWYN FECHAN CURSUS (PRN 54886)

4.1 Vertical aerial photography in May 2006 (COWI VEXCEL) revealed two roughly parallel ditches, between 10m and 18m apart, extending for at least 200m (Fig. 6). The site is located in the Sesswick area, to the south of Wrexham (SJ 3688245834).

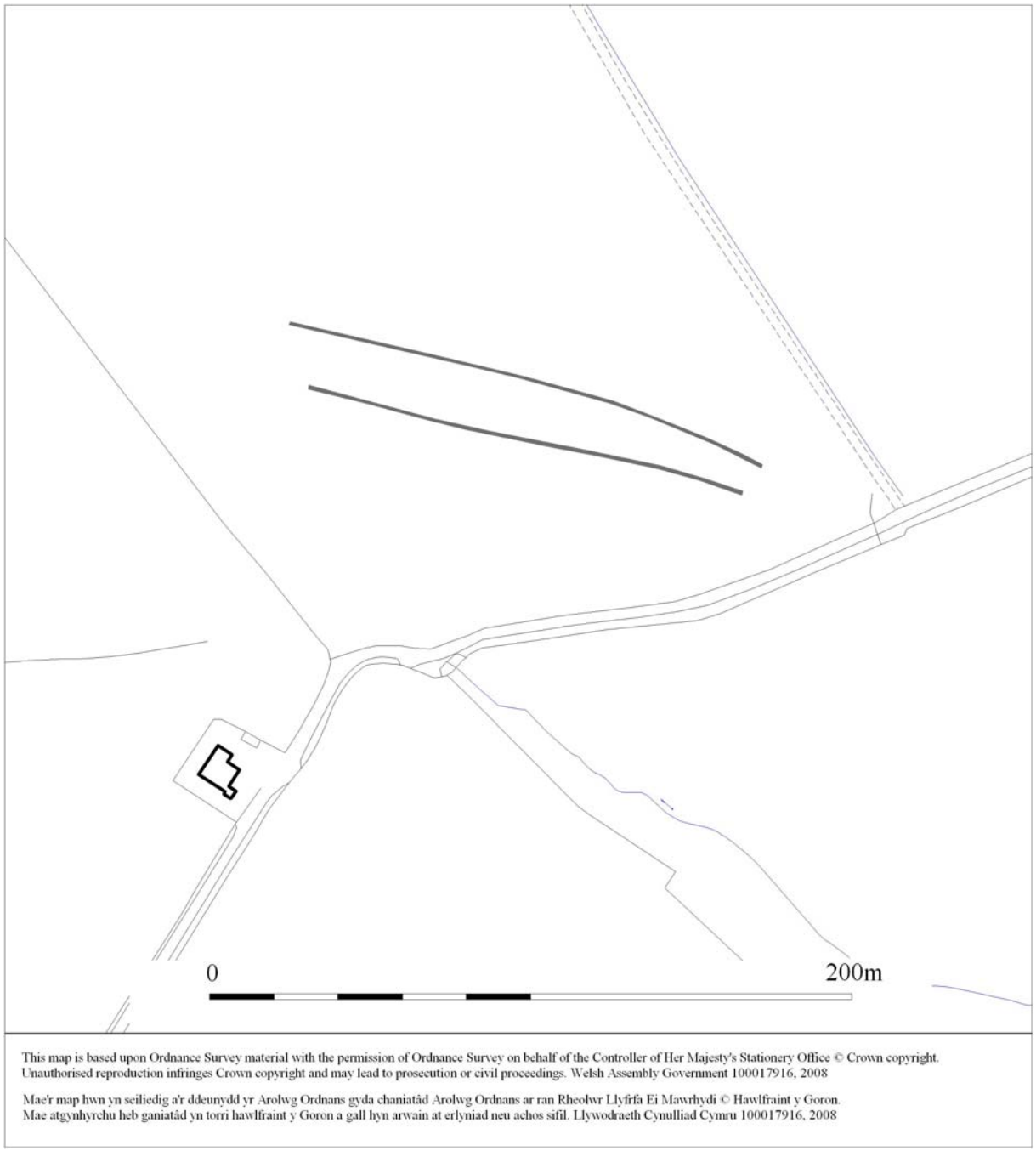

Fig. 6 Cropmarks at Gerwyn Fechan

4.2 Although trial excavations had been planned for 2008-9 it was not possible to gain access. However, it is hoped that the work can be undertaken in 2009-10.

5 **HINDWELL** (PRN 33109)

5.1 Cropmark evidence from several seasons of aerial reconnaissance has revealed a more or less continuous feature defined by two ditches between 54m and 70m apart, extending for at least 800m from SO 24366050 to SO 25086087. The most recently identified section, at the south-western end, was recognised on Google Earth. There are also two further lengths of linear cropmarks which may extend the northern ditch for another 1.6km as far as SO 26546155 (Fig. 7).

5.2 The site lies in the Walton Basin, 1.3km north-west of Walton village, in an area rich in prehistoric archaeology (Fig. 7). The Walton Green cursus lies 2km to the east-south-east, while the Four Stones stone circle is close to the south-western end, and the north-eastern end extends into the interior of the Hindwell palisaded enclosure (PRN 19376). A detailed geophysical survey undertaken in 1998 to investigate the palisaded enclosure also showed faint traces of the linear ditches, although there is no indication of their relationship with the enclosure (Gibson 1999b).

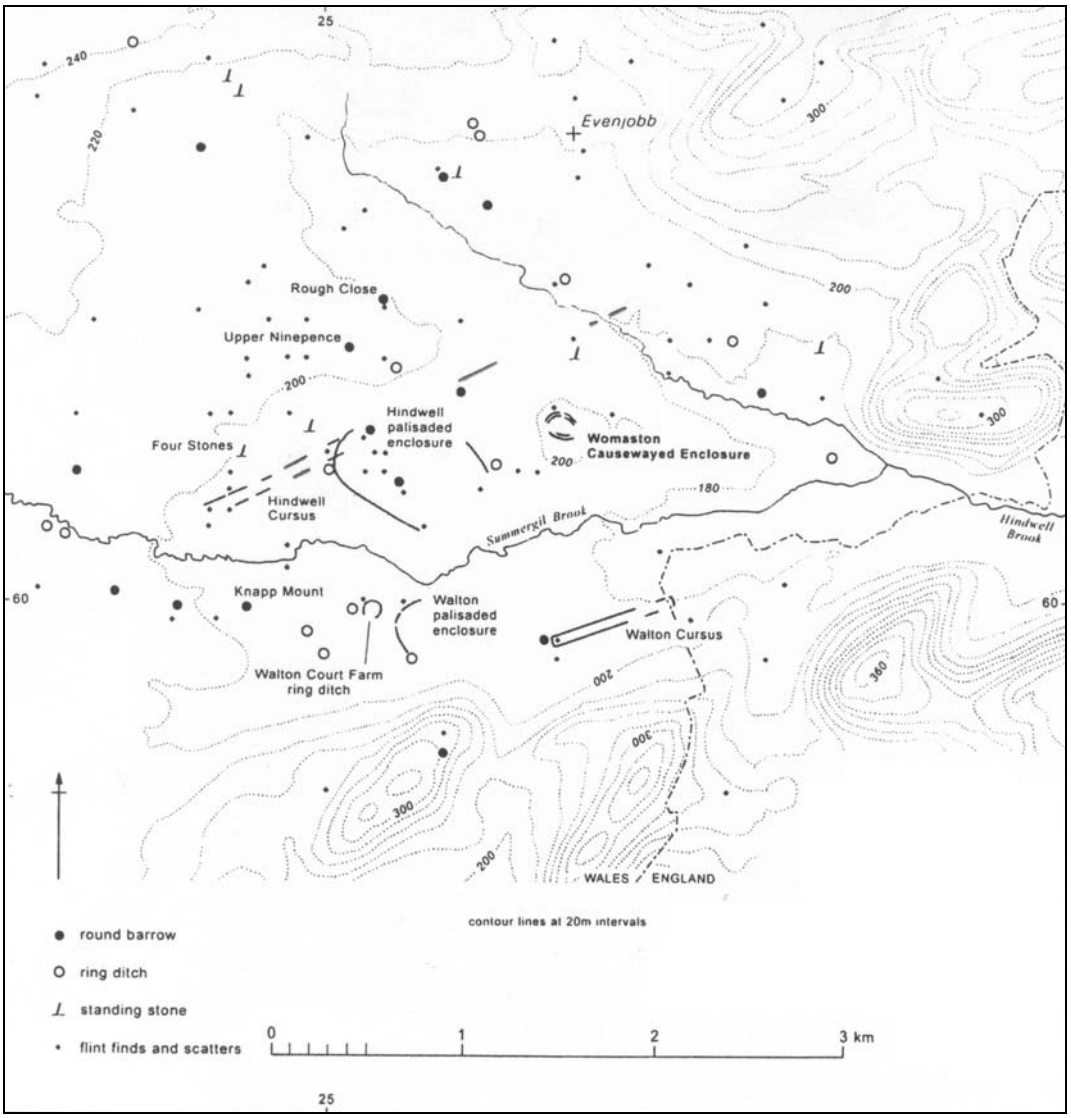

Fig. 7 Prehistoric monuments in the Walton Basin

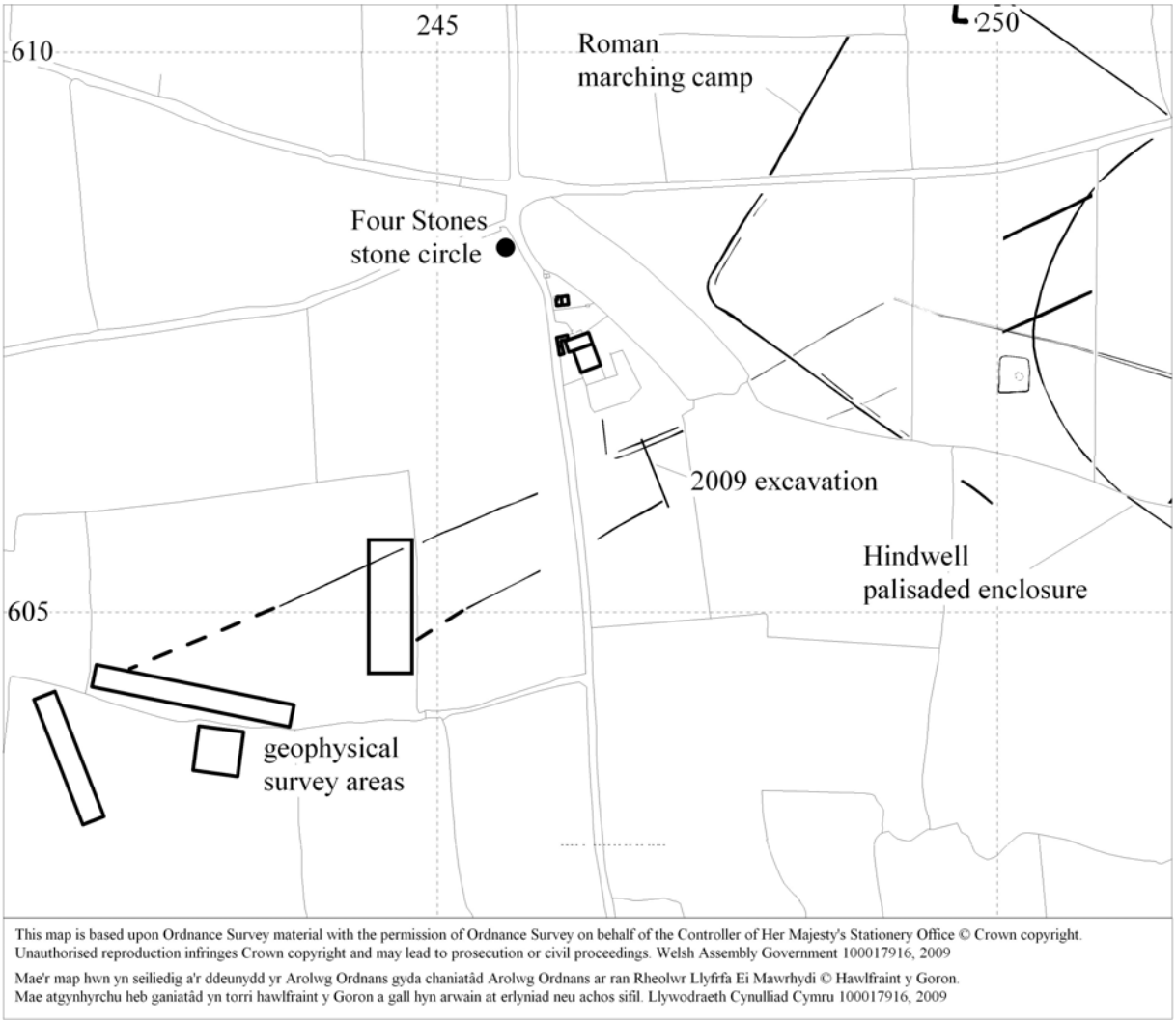

Fig. 8 Cropmarks at Hindwell showing the two linear ditches, together with the location of the excavation and geophysical surveys.

Geophysical Survey

5.3 A magnetometer survey was undertaken in September 2008 in four areas at the south-western end of the cropmarks in an attempt to clarify the extent of the ditches in that direction (Fig. 9). A total of 1.24ha was surveyed in four separate areas, across two adjacent fields. The northern field had recently been harvested, while the southern field was down to pasture.

5.4 The eastern area confirmed the presence of both ditches, approximately 80m apart, although the south-eastern ditch was rather less well defined than its northern counterpart. A 180m-long strip along the southern boundary of the field revealed evidence for the continuation of the north-western ditch, but no indication of the southern ditch. Two further areas were then examined in the adjoining field to the south, although in neither case was there any evidence for a continuation of the ditches.

Fig. 9 Hindwell geophysical survey results

Fig. 10 The western end of the potential cursus at Hindwell viewed from the west. Photo CPAT 95-17-17

Trial Excavation

5.5 Originally it had been intended to follow the geophysical survey with a programme of trial excavation in the same areas, but the late harvest left an insufficient window of opportunity for this to be undertaken, and the excavation was therefore conducted further to the east, at a point where the cropmark of the northern ditch follows the base of a post-glacial terrace (see Fig. 11). Other cropmarks in this area relate to former field boundaries depicted on late 19th-century Ordnance Survey mapping.

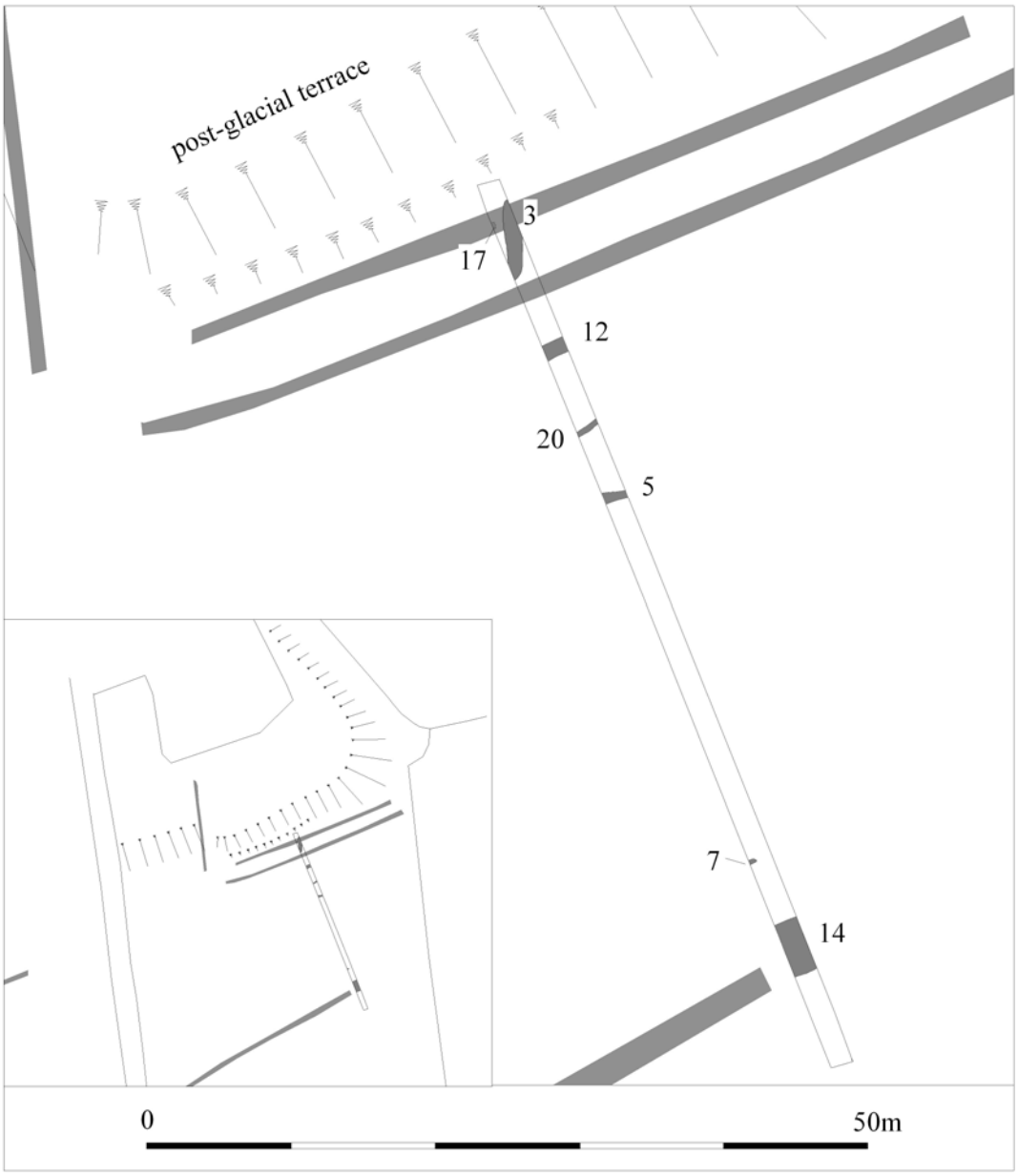

Fig. 11 Excavation location, plan and cropmarks

5.6 A single trench, 66.8m long and 1.5m wide, was excavated by machine across the line of the ditches, the position having been determined from existing plots of the cropmarks. The topsoil (1) was relatively thin, between 0.2m and 0.25m, mostly overlying a deposit of old ploughsoil (2) up to 0.32m thick. Removal of the overburden revealed the natural subsoil, which generally consisted of river gravels, although with some areas of fine silt and clay.

5.7 A substantial ditch (14) was identified towards the southern end of the trench, cutting into the river gravels, and measuring 3.9m across and 1.8m deep, with steeply sloping sides and a flat base (see Figs 12-13). The primary fill (29) consisted of fine gravel in a silt matrix, probably representing rapid weathering of the sides immediately after construction. A deposit of brown, stoney, clay-silt (28) against the southern edge partly sealed the primary silting and contained frequent charcoal flecks and small fragments, of which a sample was taken. Both deposits were sealed beneath a layer of stiff yellow clay (27) up to 0.08m thick, signalling a period of stabilisation. A series of gravely deposits (24-26) against the northern edge of the ditch suggest a later phase of erosion which is likely to have been derived from bank material on that side of the ditch. The upper ditch fill (16) consisted of a deposit of clay-silt, the thickness of which suggests deliberate infilling. Although no dateable artefacts were recovered from the ditch, it is anticipated that charcoal recovered from contexts 28 and 16 will prove suitable for radiocarbon dating.

Fig. 12 Ditch 14 from the south. Photo CPAT 2790-083

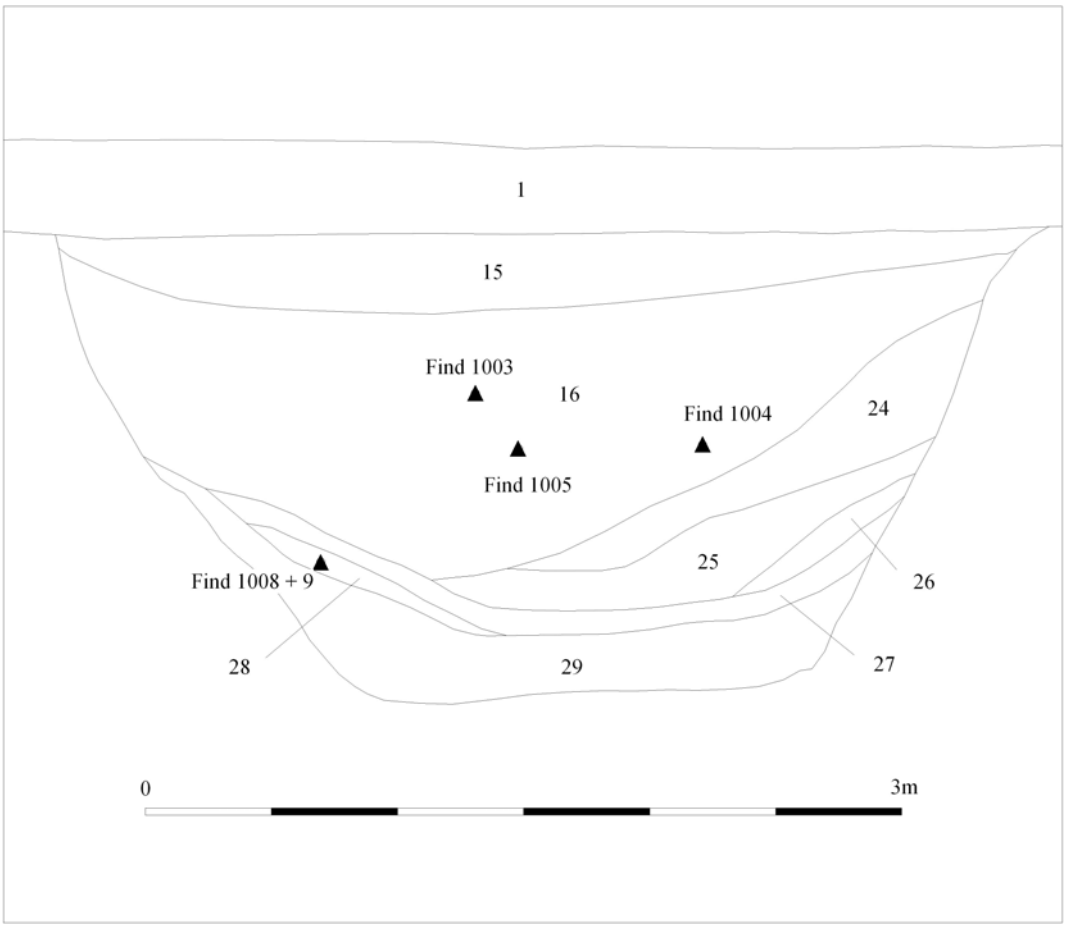

Fig. 13 Ditch 14 east-facing section.

5.8 Approximately 4.5m to the north of the large ditch a small hearth (7) was identified extending beyond the baulk to the west. The hearth consisted of a shallow scoop around 0.32m wide and 0.17m deep, cut into the natural gravels, which displayed evidence of in situ burning. A thin deposit of charcoal (8) lined the base of the scoop, which was largely filled by a deposit of firm silty loam (9).

5.9 Although the trench had been positioned to examine both of the ditches indicated by cropmarks, the trial excavation failed to identify the northern ditch, despite a thorough investigation of the area. It is possible, however, that the ditch had been disturbed by a short length of ditch which contained a significant quantity of Roman pottery dating to the late 3rd – 4th century, as well as a fragment of a rotary quern. The ditch (3), which was aligned north-south, was around 1.1m wide and up to 0.6m deep, and was butt-ended at its southern terminus (Fig. 14). The profile was generally V-shaped, with a noticeable slot 0.25m wide in its base, which became more pronounced further from the butt-end, and there was also a suggestion that the ditch may have turned to the east at the point at which it intersected with the eastern baulk of the excavation.

Fig. 14 Ditch 3 from the south. Photo CPAT 2790-059

5.10 Immediately adjacent to the ditch on the west side was what appeared to be a posthole (17), 0.6m across, containing packing stones, and extending beyond the excavation to the west. Although the feature was not excavated, its proximity to the Roman ditch suggests a possible association.

5.11 A second Roman ditch (5) was identified further to the south, which was V-shaped and around 0.9m wide and 0.35m deep. Pottery recovered from the fill included a Severn Valley Ware tankard and sherds of Black burnished ware.

5.12 Two further potential features were identified in the area of Roman activity, although neither was entirely convincing, producing no artefacts, and both may be the result of natural deposition. The southernmost was a shallow, slightly curving gully (20) measuring 0.5m wide and only 0.15m deep, filled by a yellow silty clay (21), while the second gully was slightly larger, measuring 1.1m in width and 0.2m deep, with a similar fill.

Finds

5.13 The following description provides a preliminary identification of the finds, which await specialist reporting, to be undertaken at a later date. A total of 277 sherds (4886g) of Roman pottery was recovered from the excavations, of which 248 sherds (4505g) came from the ditch 3 and 29 sherds (381g) from ditch 5. The majority of the sherds (55%) were from Severn Valley Ware vessels, representing at least six wide mouthed jars and two tankards, all of probable late 3rd – 4th century date. Black burnished ware accounted for 40% of the sherds, all of which were

from cooking pots, with the exception of a single plain rimmed dish. The cooking pots represented a minimum of two vessels with oversailing rims and obtuse-angle lattice decoration, suggesting a date in the late 3rd century. Other types of pottery were sparse, with only two mortaria (184g), one of which may be from Oxford, and seven small sherds of Samian ware. The other significant find was half of the upper stone from a rotary quern, which was recovered from ditch 3. The quern had a diameter of 560mm, with the upper stone being slightly concave internally, with bi-directional grooving, and convex externally. The central hole for the pivot is flanked by two smaller holes which could have been used for either the wooden turning handle, or as grain feeds.

Conclusions

5.14 The results from the trial excavation are somewhat mixed, in that it was only possible to identify the southern ditch of the potential cursus. Further investigation of the cropmark evidence may shed some light on the reason for the apparent absence of the northern ditch at this point, although it is possible that the ditch was simply not recognised as a result of later disturbance. The southern ditch was identified, however, and its size – 3.9m by 1.8m – would place it amongst the largest cursus ditches so far identified. By comparison, the Rudston A cursus has a maximum ditch width of 4m, while the Greater Stonehenge Cursus measures around 3.3m by 1.5m towards the western terminal, although elsewhere it is far more slight at around 2.5m by 0.45m, conforming to the generally accepted pattern of cursus ditches being more substantial closer to the terminals.

5.15 If the cropmark evidence is to be believed the Hindwell cursus may extend for more than 2.4km, with neither terminal having yet been identified. As with the scale of the ditch, the length would also place the monument amongst the larger examples in Britain. Morphologically, the Hindwell cursus is unusual in that the ditches are not parallel with each other, varying between 54m and 70m apart. This irregularity is not unknown, however, as the Greater Stonehenge Cursus varies between 100 and 150m in width (Thomas *et al* 2009, 42). It has been noted that many cursus monuments incorporate seasonally wet ground, or even watercourses, into their fabric (Brophy 2000), and at Hindwell the western end, as currently known, lies 300m to the east of the Summergil Brook, while the eastern end may extend as far as, or even beyond, the Knobley Brook.

5.16 Clearly further work is required to determine the status of this monument, although the anticipated radiocarbon dates from the excavation may go some way to answering the question of date. The northern ditch has yet to be investigated and the comparison with its southern counterpart may prove crucial in determining whether both are part of the same monument. In order to achieve this, however, both ditches would need to be sectioned at the same point along the monument to avoid any confusion which might arise as a result of the variation in dimensions noted on other sites, with the ditch size decreasing away from the terminals. The recent investigations have demonstrated that magnetometry has its limitations when trying to identify ditches cut into the river gravels of the Walton Basin, and although resistivity may be more successful, further sections of the monument are perhaps more likely to come to light as a result of continuing aerial reconnaissance.

5.17 The discovered of Roman activity was unexpected, although perhaps not surprising. The site lies around 1km to the west of Hindwell Roman fort, while one of several marching camps in the area is only 150m to the east and the projected line of the Roman road is around 170m to the north. What is interesting, however, is that all of the pottery indicates activity dating to the late 3rd – 4th century. It is probably also significant that much of the pottery was composed of relatively large sherds, suggesting that it had been deposited directly after breakage. This, together with the rotary quern, indicates an occupation site not too distant.

6 HOLYWELL/WHITFORD DYKE (PRNs 28097 and 28099)

6.1 A linear earthwork adjacent to a hengiform monument on the former Holywell Racecourse has been suggested as a possible cursus, although it has previously been regarded as part of Offa's Dyke, and more recently as a separate monument known as the Whitford Dyke. The earthwork can be traced intermittently for around 9km from a point south of the henge (SJ 15317466) to Trelawnyd (SJ 08347988), although the most northerly section is unproven (Fig. 15). The majority of the upstanding sections have been scheduled on the basis that they are part of Offa's Dyke. The proximity of Gop Cairn to the northern end may be significant.

6.2 The discontinuous earthwork appears to have been first recorded by the Ordnance Survey on the Surveyors' Drawing No. 343, surveyed in 1834-5, on which it was identified as Offa's Dyke. This identification was later adopted by Sir Cyril Fox, who commenced his fieldwork study of the Dyke as a whole with investigations in this area in 1924-5 (Fox 1955). Fox described the surviving earthwork sections in some detail, although comparison with the Surveyors' Drawing clearly indicates that significant sections had already been lost by the 1920s.

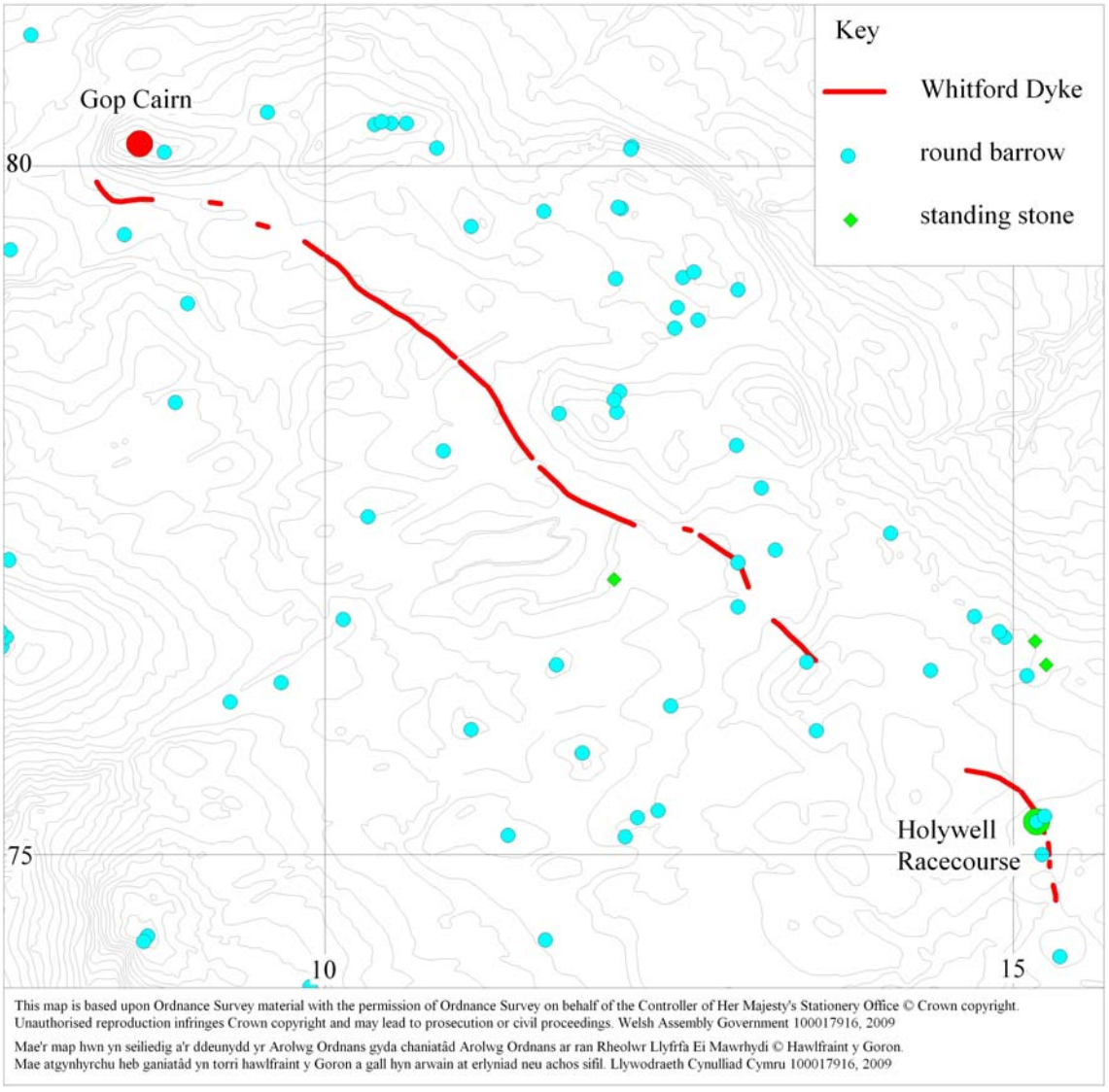

Fig. 15 The course of the Whitford Dyke in relation to prehistoric monuments

6.3 In particular, Fox's attention was drawn to two sections of the earthwork where a change in direction coincided with what appeared to be prehistoric monuments, and it was in these areas that he decided to excavate a number of sections. Near the south-eastern end of the earthwork, on the site of the former Holywell Racecourse, is the hengiform monument known as the Holywell Earth Circle, or Ysceifiog Circle, which is defined by a ditch with a slight internal bank forming an oval 108m across north-east to south-west by 95m (Fig. 16). Within the circle, but off-centre to the south, is a prominent round barrow 20m across. Fox noted that the 'dyke' respected the circle, rather than continuing across it, and excavated two sections across the 'dyke', one 39m to the south-east and the other 119m to the north-west. The excavations were unable to identify either the original ground surface or the profile of the ditches with any certainty, having over-cut both sections, although the conclusion was that the ditches were probably around 1m deep and 3.3m wide, and between 8.25 and 9.75m apart internally.

Fig. 16 The earth circle, barrow and Whitford Dyke at Holywell Racecourse viewed from the north-east. Photo CPAT 08-c-227.

6.4 Fox excavated four further trenches around Brynbella, 2.8km to the north-west (SJ 13007712), where a round barrow marked a change in direction. Here, the limestone bedrock had been cut into by both ditches, making their identification much more straightforward. The ditches proved to be 20m apart internally, around 3.7m wide and 1.4m to 1.8m deep.

6.5 The general acceptance of this earthwork as the northern section of Offa's Dyke has been challenged by Hill and Worthington (2003, 154-161) who drew attention to the slight nature of the ditches, and the fact that the form of the monument is completely anomalous with the size and profile of the earthworks which form Offa's Dyke further to the south. Indeed, the most northerly section still regarded as Offa's Dyke is at Treuddyn, 22.75km to the south-east. Instead, they have suggested that the earthworks are part of a mutually agreed boundary, which is now known as the Whitford Dyke.

Fig. 17 The Earth Circle and Whitford Dyke on and around Holywell Racecourse, showing the location of the excavation, geophysical surveys and augering (nos 1-17).

6.6 The status of the linear earthwork adjacent to the circle was also questioned by Alex Gibson (1999), who similarly argued that the two flanking ditches suggested that this was not part of Offa's Dyke. In addition, the fact that the 'dyke' appears to run up to, but not cross the circle and its central barrow, were seen as an indication that the features might be contemporary. However, Gibson only suggested that the section to the south-east of the circle, not the entire earthwork, might be a cursus.

6.7 A re-examination of the earthwork as a whole has shown that as far as can be determined its form remains consistent, with a central mound flanked by two ditches. Although the dimensions do vary, it is not unreasonable to assume that the visible earthworks were originally part of a single monument. The north-western end is rather uncertain as a length of bank to the south-east of Gop Farm has been identified as part of the dyke, although Fox suggested that it might be part of an old roadway (Fox 1955, 19). Neither this, or the adjacent section alongside the present road, are convincingly part of the linear earthwork and the last identifiable section is just west of Trelawnyd.

Geophysical survey

6.8 A programme of geophysical survey was conducted by ArchaeoPhysica to investigate the area of the henge, together with the section of linear earthwork to the north-west, with the principal intention of locating Fox's 1925 excavation trench (Roseveare & Roseveare 2008). The survey employed two prospecting techniques, with a caesium vapour magnetometer used for both areas, while an electromagnetic survey was conducted across a sample area of the henge as well as the linear earthwork.

6.9 The magnetometer survey (Fig. 18) identified the linear earthwork, although the generally low variation in the magnetic response meant that its components were less well-defined than might have been anticipated, and it was not possible to gauge the width of the ditches. A linear anomaly (Fig. 18, A) was identified crossing the earthwork which appeared to coincide with the location of Fox's trench, which he recorded in his field notes as being '226ft (68.88m) north of the well . . . measured along the eastern ditch'. However, the feature appeared to be longer than the recorded excavation section and a second linear anomaly 14m to the south-east (Fig. 18, B) was suggested by the geophysicists as an alternative, although this does not agree with Fox's location.

6.10 The low magnetic response was also a feature of the henge, with the result that very little detail was apparent in the geophysical data. The ditch could be identified, being more readily visible on the south and south-east, where the earthworks are more pronounced, and barely discernable on the western side. Three features were identified in the interior which may be related to the henge, including two pits (C-D) and a possible short gully (E).

6.11 The barrow, which was excavated by Fox and lies south-east of the centre, was more readily identified, including the surrounding ditch.

Fig. 18 Magnetometer survey of the Earth Circle and Whitford Dyke on Holywell Racecourse

Trial excavation

6.12 Although originally it had been intended to excavate a section across the linear earthwork immediately to the south-east of the earth circle, it was not possible to gain access to that area and attention therefore focused on the section to the north-west. The project proposal was to identify Fox's excavation in this area, re-excavate the trench and cut back one section to provide undisturbed material from the ditches and bank which it was hoped would contain some datable material. In the event it proved extremely difficult to locate the trench. Although the geophysical survey had identified an anomaly which it was thought corresponded to the position of the trench, this assumption was based on a measurement from a well depicted on Ordnance Survey mapping. However, a total station survey of the area demonstrated that this mapping was inaccurate in respect of the location of the well, and the anomaly could not be Fox's trench. A short trench, measuring 6.5m by 1.5m, was therefore excavated by machine along the eastern ditch, removing the topsoil in the hope of identifying the cut of the 1925 excavation. Careful cleaning failed to identify any obvious feature and the decision was taken to position the new trench according to Fox's measurements. The resulting trench measured 19m by 1.5m, extending east to west across the bank and flanking ditches (Fig. 19). At this point the bank was clearly visible as an upstanding earthwork around 10.5m across and 0.3m high, although neither ditch was readily apparent at ground level.

6.13 The removal of the topsoil (1), which varied in thickness from 0.16m on top of the bank to 0.36m above the ditches, revealed in situ bank material with the upper ditch fills on either side. It was evident that there had been considerable animal disturbance throughout the excavated area, with the bank material in particular being mixed with topsoil. Where it was less disturbed the bank consisted of a single deposit of mottled sandy clay (2) up to 0.15m thick and perhaps 5.4m wide, lying directly on top of the natural subsoil, with no indication of a buried ground surface beneath. It proved extremely difficult to differentiate between the bank material and the subsoil, which at this point also consisted of a red/yellow, mottled, sandy clay, the only detectable difference being that the subsoil had a firmer texture. Although the visible earthwork implied a bank perhaps 0.3m high, the excavated evidence indicates only 0.15m of bank material surviving beneath the topsoil, the difference being accounted for by the bank affording protection to the subsoil from the action of ploughing which had elsewhere denuded the subsoil.

6.14 As with the bank, difficulties were encountered in identifying the edges of both ditches, most notably the inner edge of the western ditch (6). This mirrored the problems encountered by Fox, and was due to the variable nature of the glacial till which overlies the limestone bedrock in this area. Although it was generally the case that the subsoil consisted of around 0.4m of firm sandy clay overlying a stiff, yellow, stoney clay, there were patches and lenses of more sandy material.

6.15 As excavated, the ditch appeared to be around 4.2m wide and up to 0.75m deep, with the upper fill (7) consisting of a reddish brown sandy clay-silt, up to 0.45m thick. This overlay a thin layer of yellow brown gritty clay (8) against the inner edge of the ditch, which sealed a primary fill composed of yellow brown stoney clay (16), up to 0.24m thick. It was notable that there appeared to be some disturbance within the ditch, close to the northern baulk, and although no clear edge could be determined it is possible that this was related to Fox's excavation. No dateable artefacts were recovered from the ditch, with the only find being a fragment of dressed stone from the upper fill.

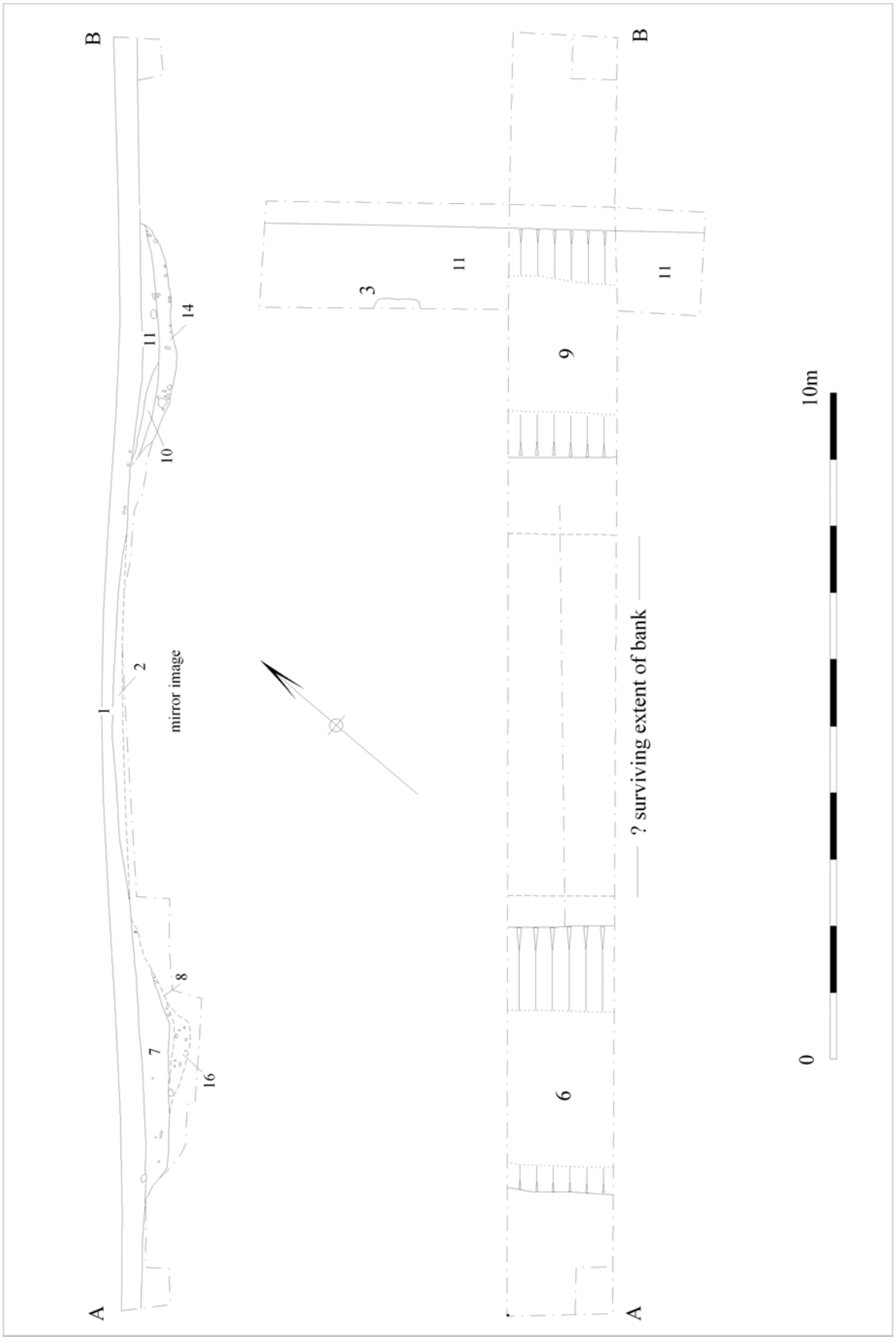

Fig. 19 Excavation plan and section

6.16 The eastern ditch was better defined, the natural subsoil being more consistent in this area. The ditch measured 3.7m in width and up to 0.55m deep, with a primary fill (14) 0.26m thick composed of yellow brown stoney clay. As with the western ditch, there was evidence of disturbance against the western baulk, although again with no clearly defined edges. The primary fill was sealed by a layer of reddish-brown clay silt (10) against the inner edge, presumably representing redeposited bank material, with an upper fill (11) 0.24m thick, similar in character to that of the western ditch.

Fig. 20 The excavation viewed from the west. Photo CPAT 2791.033

6.17 The only other feature to be identified was a modern pit (3) which had been cut into the upper fill of the eastern ditch.

Augering

6.18 A limited programme of hand augering was undertaken to examine the nature and depth of the archaeological deposits associated with the dyke and the ditch of the earth circle, primarily in the hope of identifying material with potential for dating and palaeoenvironmental analysis (Fig. 17, nos 1-17). In the event, however, no such deposits were identified. The results are presented in Appendix 2.

6.19 An examination of the earthwork 14m to the south-east of the excavation (nos 1-3) produced similar results, with the ditches between 0.47 and 0.52m deep beneath the topsoil, although there appeared to be rather more bank material surviving, perhaps as much as 0.42m. To the south-

east of the circle (nos 7-9) the bank and ditches are more pronounced and the augering indicated up to 0.25m of in situ bank material, with ditch deposits extending to 0.64 to 0.67m below the topsoil.

6.20 The ditch of the hengiform monument was examined at three locations on the south and south-east (nos 4-6), although it was difficult to determine the difference between ditch fills and the subsoil. Sample 4 gave the clearest results, suggesting 0.52m of ditch silts beneath the topsoil, while samples 5 and 6 indicated that the ditch could be as little as 0.34m or as much as 1.06m deep, depending on the interpretation of deposits of sand and sandy clay.

6.21 Further to the south-east the monument is clearly visible on the eastern side of the road, although the Ordnance Survey record only a short length of bank at the southern end of the field. The earthwork is not continuous, however, having been cut be a trackway. The depiction in Fig. 17 is based on a rapid survey as part of the present project. The northern section (nos 10-14) appears to be very similar to the excavated example, with up to 0.22m of surviving bank material and flanking ditches between 0.47m and 0.8m deep. Samples taken across the southern section of the earthwork revealed no obvious difference between the topsoil and the bank and neither was it clear which deposits represented ditch silts.

Conclusions

6.22 The recent investigations had rather mixed results, suffering in part from the same difficulties faced by Fox in 1925 in identifying the edges of the ditches and base of the bank. The principal aim of the study was to determine the date of the monument but unfortunately the excavation produced no artefactual evidence and, although bulk soils samples were recovered from the ditches, it seems unlikely that they will contain any material suitable for radiocarbon dating. Furthermore, the investigation of other sections by augering suggests that the nature of the subsoil is such that organic preservation is likely to be poor and charred material is evidently scarce.

6.23 It had been hoped that the geophysical survey might reveal more detail of the hengiform monument, particularly with regard to the interior. However, although some internal features were tentatively identified, the monument in general appears to be fairly unresponsive to magnetometry.

6.24 In general, the excavation confirmed Fox's findings, revealing a slight surviving bank around 5.4m wide and perhaps 0.15m high, with a western ditch 4.2m wide and 0.75m deep and an eastern ditch 3.7m wide and 0.55m deep.

6.25 The question therefore remains as to whether the linear earthwork is more likely to be prehistoric in date, or belongs to the earlier medieval period. On balance, the latter is perhaps more likely, with the incorporation of two prehistoric monuments along its route, and Gop Cairn possibly marking the north-western end. As a boundary feature the earthwork runs more or less along the spine of the Flintshire plateau, dividing the hinterland of the Dee Estuary from the Vale of Clwyd. This is not to say, however, that the entire monument is of the same period and, as Gibson suggested, the section immediately to the south-east of the hengiform site could be a cursus. An examination of Fig. 17 shows that this section does not readily match the alignment of those to the north and south and this could, therefore, be another earlier monument which was incorporated into a much later boundary.

7 **MEIFOD** (PRN 7123)

7.1 A pair of approximately parallel linear cropmarks were noted in a field to the south of Ceunant Farm (SJ 16201377) on an aerial photograph taken by CPAT in 1984 (CPAT 84-MB-624, Fig. 21). The site lies alongside the main A495 road, about 1km north-east of Meifod village, and is sited on the edge of the flood plain of the River Vyrnwy at about 80m OD (Fig. 2). The cropmarks appeared to represent two roughly parallel ditches around 14m apart, extending for approximately 85m from north-east to south-west. The south-eastern of the two ditches seemed to be markedly wider than that to the north-west.

Fig. 21 The potential cursus near Meifod. Photo CPAT 84-MB-624.

Geophysical Survey

7.2 The magnetometer survey examined an area of 0.4ha, comprising ten complete grids, each measuring 20m by 20m, encompassing the whole area where cropmarks had been recognised on the aerial photograph.

7.3 The survey results (Fig. 22) identified two slightly curving ditches extending south-westwards for almost 100m from the edge of a river terrace, and clearly extending into the next field, beyond the limits of the survey. It was not possible to determine the relationship between the ditches and the river channel. The north-western ditch is the most clearly defined, being some 2.5m in width, while the south-east ditch varies from 2.5m to 4.5m in width. The separation of the ditches increases from 5.5m at the north-east end up to a maximum of 8.5m some 50m to the south-west, before converging slightly to 7.5m separation at the edge of the field.

7.4 Additional features were revealed by the geophysics in the area between the main ditches, comprising a pair of approximately parallel linear ditches, approximately 3.5m apart, and each up to 1.5m in width. These features were apparent over a length of about 30m in the central portion of the site, but appeared to fade out to both the north-east and south-west. Less well-defined features on the geophysics results probably denote the presence of changes in the subsoil created by fluvio-glacial activity.

7.5 A programme of trial excavation had originally been proposed as part of the project, but following the results from the geophysical survey it was decided that no further field investigation was required.

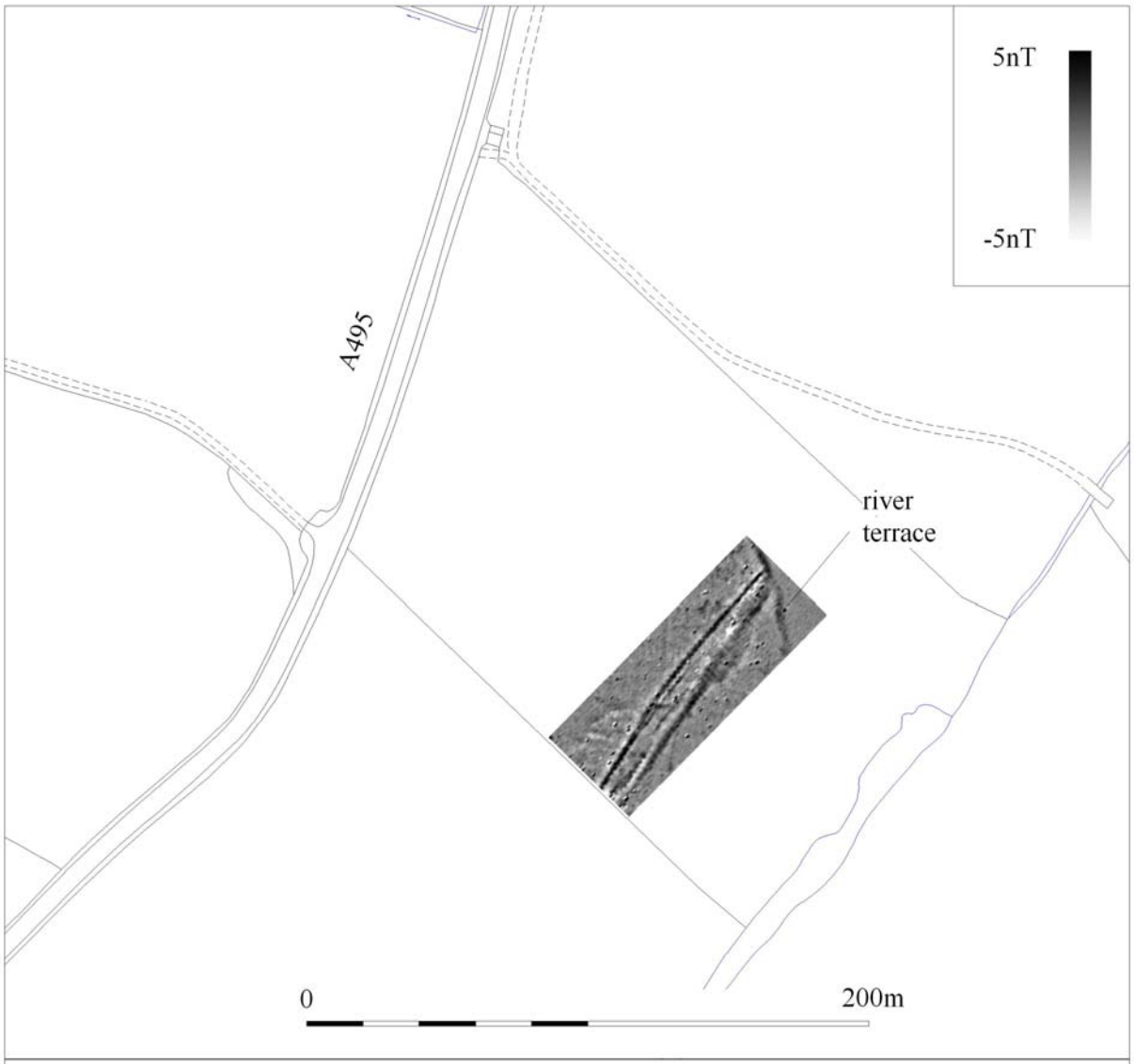

Fig. 22 Geophysical survey results on the site of the possible cursus near Meifod.

Conclusions

7.6 Although the survey confirmed the presence of the two ditches, their form suggests that they are most likely to be associated with former field boundaries, or a trackway, and the site has now been dismissed as a potential cursus.

8 CONCLUSIONS

8.1 To date the project has investigated four of the five potential cursus monuments in mid- and north-east Wales, with the result that two have now been discounted. Geophysical survey at Meifod revealed that the cropmark ditches were perhaps more likely to be associated with former field boundaries and possibly a trackway, while at Collfryn excavation demonstrated that two parallel field drains were responsible for the cropmarks.

8.2 The potential cursus at Hindwell, in the Walton Basin, has proved to be the most interesting of those investigated. A programme of geophysical survey successfully extended the western limit of two roughly parallel ditches, which can now be traced intermittently for perhaps as much as 2.4km. Trial excavations identified the southern ditch, which proved to be far more substantial than cropmarks had suggested, measuring 3.9m wide and 1.8m deep. Samples of charcoal were recovered from one of the lower ditch fills, as well as what appeared to be a deliberate infilling, and it is hoped that these will prove suitable for dating. Unfortunately, the excavation failed to reveal the northern ditch and further work is therefore still required before the status of the site can be confirmed.

8.3 In north-east Wales the study reinvestigated the linear earthwork now known as the Whitford Dyke, which runs south-east from near Gop Cairn in Flintshire, to the hengiform monument on the former Holywell Racecourse, and for several hundred metres beyond. A programme of geophysical survey, excavation and augering identified the surviving earthworks, but unfortunately did not recover any datable material. An examination of the plan and form of the monument suggests that it may not all be contemporary, and a short section south-east of the hengiform site could yet prove to be Neolithic in date, having been incorporated into a much later boundary feature. While it is tempting to associate the linear earthwork with Gop Cairn, the largest prehistoric cairn in Wales, its course bisects the Flintshire plateau in a manner which would not be out of place for a medieval boundary feature. Further work is clearly required on this extensive monument to finally determine its date and function.

8.4 It is hoped that the remaining site, at Gerwyn Fechan, near Wrexham, will be investigated during 2009-10, although at the time of writing access has still to be arranged for a small-scale trial excavation.

9 ACKNOWLEDGEMENTS

9.1 The writer would like to thank his colleagues, Richard Hankinson and Ian Grant, who undertook the geophysical surveys and also assisted with the excavations, and Wendy Owen, Eleri Farley, Rob Blackburn, and Jenny Britnell for their assistance with the excavations.

9.2 Thanks are also due to the following: the various landowners and tenants for allowing access to the sites; Gwynedd Archaeological Trust for the use of their geophysical survey equipment; Anne and Martin Roseveare, ArchaeoPhysica, for conducting the geophysical survey at Holywell Racecourse; Shanon Deal, National Museum Wales, for providing information from Sir Cyril Fox's notebooks.

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APPENDIX 1

CPAT Geophysical Survey Methodology

1.1 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 Silvester and Hankinson 2006; Hankinson 2007) which in turn was developed from that used by the Gwynedd Archaeological Trust for their survey of Roman fort environs (Silvester et al 2005).

1.2 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 similar studies, having added new detail to known sites and resolved some issues regarding the relationship between them and other features visible on aerial photographs.

Instrumentation and background

1.3 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.

1.4 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 also of interest, as it can locations where fires have created a thermo-remnant magnetic field in the soil upon cooling.

1.5 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.

1.6 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 1996, referred to in Hopewell 2004).

1.7 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

1.8 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.

1.9 In the case of the standard resolution survey used for this programme of work 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

1.10 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.

1.11 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

1.12 Prior to the commencement of each geophysical survey, the survey grids were laid out and then located in relation to nearby field boundaries by topographic survey using an EDM and Penmap software. These results were then related to the Ordnance Survey base mapping using the Mapinfo program, which enabled the National Grid co-ordinates of fixed points on the survey grid to be determined.

1.13 The greyscale plot of the geophysical survey results 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.

1.14 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

HOLYWELL EARTH CIRCLE AND WHITFORD DYKE
TABLE OF AUGER SAMPLES

Sample 1

Depth (cm)	Material	Colour	Munsell no.	Texture	Components	Comment
0-25	Silty loam	Dark greyish brown	10YR 4/2	Friable	Occ. stone	Topsoil
25-67	Sandy loam	Dark yellowish Brown	10YR 4/4	Friable		Bank material
67-77	Silty clay	Brown	7.5YR 5/4	Firm		Natural subsoil
77->90	Silty clay	Yellowish brown	10YR 5/4	Stiff		Natural subsoil

Sample 2

0-30	Silty loam	Dark greyish brown	10YR 4/2	Friable		Topsoil
30-51	Sandy silt	Brown	10YR 4/3	Friable		Ditch silt
51-77	Silty clay	Yellowish brown	10YR 5/6	Firm		Ditch silt ?
77-93	Silty clay	Yellowish brown	10YR 5/6	Firm		Natural subsoil
93>	Silty clay	Yellowish brown	10YR 5/4	Stiff		Natural subsoil

Sample 3

0-23	Silty loam	Dark greyish brown	10YR 4/2	Friable		Topsoil
23-46	Silty clay	Brown	10YR 4/3	Friable	Occ. Small stone	Ditch silt
46-75	Silty clay	Yellowish brown	10YR 5/6	Firm		Ditch silt
75->100	Silty clay		10YR 7/4	Stiff		Natural subsoil

Sample 4

0-28	Sandy loam	Dark greyish brown	10YR 4/2	Friable		Topsoil
28-58	Sandy silt	Dark brown	10YR 3/3	Friable	Occ. Small stone	Ditch silt
58-80	Silty sand	Dark yellowish brown	10YR 3/4	Friable	Occ. Small stone	Ditch silt
80-185	Sand	Dark yellowish brown	10YR 4/6	Friable		Natural subsoil
185-280	Sand	Dark yellowish brown	10YR 4/6	Friable		Wet subsoil
280->300	Clay	Dark yellowish brown	10YR 4/4	Stiff		Natural subsoil

Sample 5

0-31	Sandy loam	Dark greyish brown	10YR 4/2	Friable		Topsoil
31-79	Clay silt	Yellowish brown	10YR 5/4	Friable	Occ. Small stone	Ditch silt
79-118	Sand	Dark yellowish brown	10YR 4/6	Friable		Ditch silt ?
118-148	Clay silt	Yellowish brown	10YR 5/6	Friable		Natural subsoil
148-160	Sandy clay	Dark yellowish brown	10YR 4/4	Firm		Natural subsoil
160-180	Sandy clay	Yellowish brown	10YR 5/6	Firm		Natural subsoil
>180	Clay	Yellowish brown	10YR 5/8	Stiff		Natural subsoil

Sample 6

0-38	Sandy loam	Dark greyish brown	10YR 4/2	Friable		Topsoil
38-72	Sandy loam	Dark yellowish brown	10YR 3/4	Friable		Ditch silt
72-144	Sandy clay	Yellowish brown	10YR 5/6	Firm	Occ. Small stone	Ditch silt ?
>144	Silty clay	Brownish yellow	10YR 6/6	Firm		Natural subsoil

Sample 7

0-32	Sandy loam	Dark greyish brown	10YR 4/2	Friable		Topsoil
32-74	Sandy clay	Brown	10YR 4/3	Friable		Ditch silt
74-96	Sandy clay	Yellowish brown	10YR 5/6	Firm		Ditch silt ?
96->200	Clay	Brownish yellow	10YR 6/6	Firm	Stone	Natural subsoil

Sample 8

0-43	Sandy loam	Dark greyish brown	10YR 4/2	Friable		Topsoil
43-55	Sandy loam	Dark yellowish brown	10YR 3/4	Friable		Ditch silt
55-110	Sandy clay	Dark yellowish brown	10YR 4/6	Firm	Freq. Small stone	Ditch silt ?
110->150	Clay	Yellowish brown	10YR 5/4	Stiff		Natural subsoil

Sample 9

0-26	Sandy loam	Dark greyish brown	10YR 4/2	Friable		Topsoil
26-51	Sandy loam	Dark yellowish brown	10YR 4/4	Friable		Bank material
51-95	Sandy clay	Yellowish brown	10YR 5/6	Firm	Small stone	Natural subsoil
>95	Sandy clay	Yellowish brown	10YR 5/8	Stiff		Natural subsoil

Sample 10

0-68	Sandy loam	Very dark brown	10YR 2/2	Friable		Topsoil
68-115	Clay sand	Dark yellowish brown	10YR 4/4	Friable		Ditch silt
115-150	Sand	Yellowish brown	10YR 5/6	Firm	Small stone	Natural subsoil
150-162	Sandy clay	Brown	7.5YR 4/4	Firm		Natural subsoil
>162	Sandy clay	Yellowish brown	10YR 5/8	Firm	Stone	Natural subsoil

Sample 11

0-36	Sandy loam	Very dark brown	10YR 2/2	Friable		Topsoil
36-58	Sandy clay	Strong brown	7.5YR 4/6	Firm		Bank material
58-86	Clay sand	Strong brown	7.5YR 5/6	Friable	Small stone	Natural subsoil
>86	Sand	Brown	7.5YR 4/4	Friable	Stone	Natural subsoil

Sample 12

0-40	Sandy loam	Very dark brown	10YR 2/2	Friable		Topsoil
40-120	Sandy clay	Brown	7.5YR 4/4	Firm		Ditch silt
120->200	Sand	Dark yellowish brown	10YR 4/4	Friable		Natural subsoil water table @ 195cm

Sample 13

0-48	Sandy loam	Very dark brown	10YR 2/2	Friable		Topsoil
48-122	Sandy clay	Brown	7.5YR 4/4	Friable		Ditch silt
122->200	Sand	Dark yellowish brown	10YR 4/4	Friable		Natural subsoil

Sample 14

0-40	Sandy loam	Very dark brown	10YR 2/2	Friable		Topsoil
40-74	Clay sand	Strong brown	7.5YR 4/6	Friable	Occ. stone	Ditch silt
74-108	Clay sand	Brown	7.5YR 4/4	Firm		Ditch silt ?
108->200	Sand	Dark yellowish brown	10YR 4/4	Friable		Natural subsoil

Sample 15

0-32	Sandy loam	Very dark brown	10YR 2/2	Friable		Topsoil
32-70	Clay sand	Dark yellowish brown	10YR 3/4	Friable	Occ. stone	Ditch silt
70-88	Sandy clay	Dark yellowish brown	10YR 4/4	Firm		Ditch silt
88-148	Sandy clay	Yellowish brown	10YR 5/6	Stiff		Natural subsoil ?
148-188	Sand	Dark yellowish brown	10YR 4/4	Friable		Natural subsoil Natural subsoil
>188	Clay	Brown	7.5YR 4/4	Stiff		

Sample 16

0-61	Sandy loam	Very dark brown	10YR 2/2	Friable		Topsoil/bank material
61-89	Clay sand	Yellowish brown	10YR 5/4	Firm		Natural subsoil
>89	Clay	Strong brown	7.5YR 5/6	Stiff		Natural subsoil

Sample 17

0-38	Sandy loam	Very dark brown	10YR 2/2	Friable		Topsoil
38-80	Clay sand	Dark yellowish brown	10YR 4/4	Friable	Occ. stone	Ditch silt
80-108	Sandy clay	Yellowish brown	10YR 5/6	Firm		Ditch silt
108-153	Sandy clay	Pale brown	10YR 6/3	Firm		Natural subsoil
>153	Sandy clay	Yellowish brown	10YR 5/6	Firm		Natural subsoil