SURVEY AND EXCAVATION ON PEMBREY MOUNTAIN

By GEORGE WILLIAMS

INTRODUCTION

The project was carried out by the Dyfed Archaeological Trust in the Spring and Autumn of 1977. The area concerned occupies the west spur of Pembrey Mountain—a promontory overlooking the coastal fringe of south-east Carmarthenshire (Fig 1). This is an area of known archaeological interest but until the summer of 1976 it was obscured by a 12 year old Forestry Commission plantation. The destruction by fire and subsequent clearance of much of this plantation allowed the detailed investigation of the area. Initial fieldwork by N. Kerr, which formed part of the Trust's survey of forestry and archaeology in Dyfed (DAT 1977, 33-34) showed existing records to be inadequate and new sites and features were identified. Prior to replanting, a detailed survey was undertaken and selective excavation was carried out to determine the nature of certain of the sites.

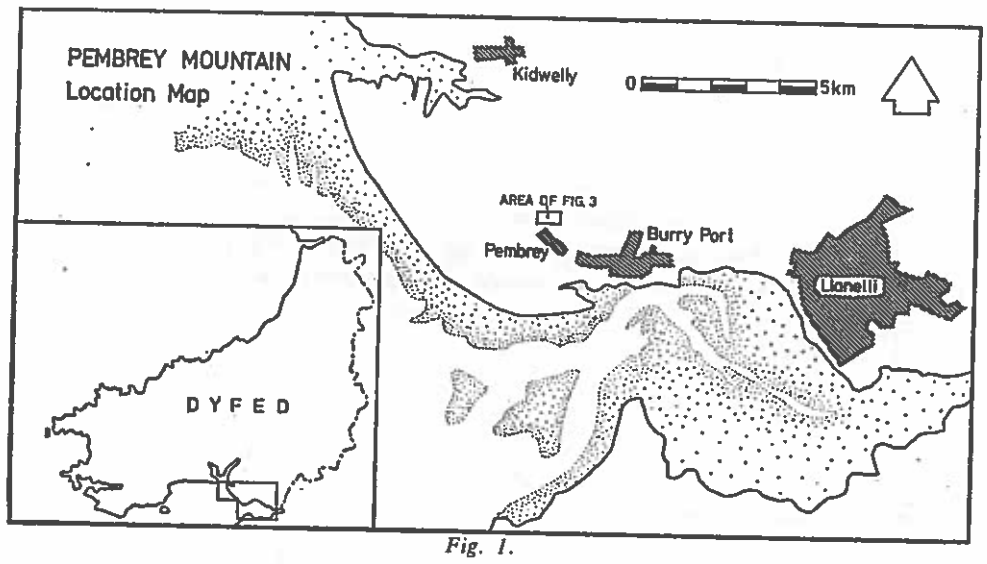

Fig. 1.

GEOGRAPHICAL AND ARCHAEOLOGICAL BACKGROUND

Topographically, south-east Carmarthenshire is characterised by blocks of higher ground which are separated by river valleys running north-east/south-west (the Towy, Gwendraeth Fawr and Gwendraeth Fach and the Loughour) and bounded by Carmarthen Bay on the south. The solid geology consists of Carboniferous coal measures and associated peripheral geology and is overlain by extensive glacial deposits.

There is abundant evidence for human activity in the area in the Neolithic and Early Bronze Age, this taking the form of burial and ceremonial monuments which survive in particular concentration in the upper Gwendraeth area (Ward 1976). By the Later Prehistoric Period, permanent settlement, manifested by defensive enclosures, had largely deserted the upper valleys and become concentrated in the coastal areas. The defended enclosures in the area, including the Pembrey examples, involve a spect-

rum of characteristics typical of south-west Wales as a whole. This Later Prehistoric landscape may also include field systems with a similar coastal distribution—to an extent incorporated into later Mediaeval field systems (see below). Mediaeval settlement and arable farming tended toward the low lying ground but included common pasturage on higher land and in post-Mediaeval times enclosure and cultivation of upland areas certainly occurred. Further evidence of human activity, in the form of shell mounds, is present on Pembrey Burrows and appears to represent activity of largely Mediaeval date.[1]

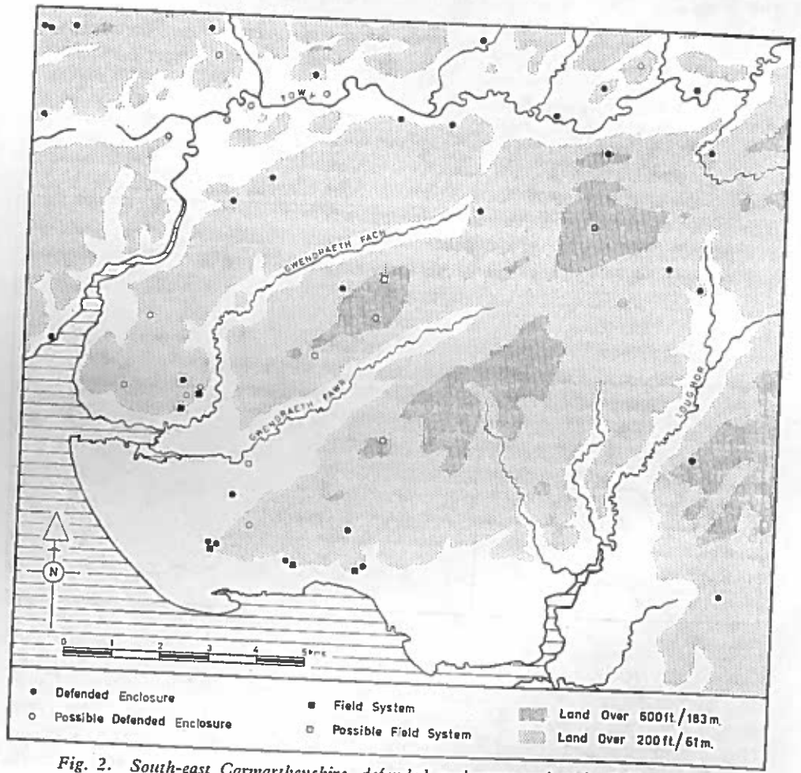

Fig. 2. South-east Carmarthenshire, defended enclosures and early field systems.

GEOLOGY, TOPOGRAPHY AND LAND USE OF PEMBREY MOUNTAIN

The geological solid of the area surveyed is Carboniferous sandstone (lower Pennant measures) with underlying coal measures and is geologically complex with north-west, south-east fault lines running diagonally across the east-west line of the promontory. The area rises to 110m O.D. and commands extensive views of Carmarthen Bay to the south and west although it is overlooked by higher ground which rises

to the east. The summit area falls toward the west in a series of terraces resulting from the diagonal fault lines. Two low knolls—Court Wood knoll and Knight's Wood knoll—are features of the eastern side of the area and overlook the southern edge of the promontory. The sides of the promontory fall precipitously to the north-west and less dramatically to the south. At the foot of the north-west slopes are the low lying Pinged Marshes; the southern slopes fall to better drained land where Pembrey village now stands. The sea lies some 4km west of the area—beyond the extensive wind-blown sand deposits of Pembrey Burrows. The present land use of the area surveyed includes not only the plantation to the west but a small adjacent area of enclosed rough grazing to the east. In this eastern area also, the Knight's Wood knoll supports deciduous woodland. The soils in the area excavated were largely typical brown podsolic and similar soils had been present since the Iron Age at least.

PREVIOUS REFERENCES/EARLY HISTORY/DOCUMENTATION

Preliminary research has revealed little documentary or map evidence to shed light on the history of the area in the Mediaeval period. The area stood within the Manor of Pembrey, a sub-lordship of Kidwelly. The site of the *caput* of Pembrey is unknown but it may have been on the site of Cwrt, a building dating to at least the early sixteenth century and belonging to the Vaughan family. Cwrt lies at the foot of the southern slope of the area investigated, some 500 m south-south-east of the Court Wood enclosure. The area surveyed is likely to have been part of the demesne lands associated with Cwrt. There is no historical or archaeological evidence that it came within the open fields of Pembrey, nor that it was common; the latter was apparently situated further to the east along Pembrey Mountain. Eighteenth century documents however, refer to *Coed Marchog* which was located on the western slopes of Carreg Lwyd. Curiously, the name "Knight's Wood" is now applied to the small piece of woodland immediately to the east of Court Wood enclosure. In the fourteenth century Pembrey was held from Kidwelly as a knight's fee. The name "Court Wood" itself appears to have been applied to the area including the enclosure and the area to the west. All this suggests that in Mediaeval times the whole upland area was woodland.

At the time of the nineteenth century Tithe award, part of the area had been enclosed. Most of the boundaries had gone out of use by 1914 (25" O.S. map), and of the boundaries within the area marked on the latter map, only that incorporating the eastern side of Court Wood enclosure survives as a modern boundary, though portions of one to the north of lynchet (M) still survives (see below).

Prior to 1964 the land use appears to have been unenclosed rough grazing. In 1964 the area, including the sites of both enclosures, was ploughed and planted by the Forestry Commission. It is unfortunate that although known, the Garreg Lwyd enclosure was then not protected. The effect of this plouging may be judged by comparing Plates 1 and 2. No doubt many minor features were obliterated at this time. Following the Trust's survey and excavation, both Garreg Lwyd and Court Wood enclosures have been scheduled as Ancient Monuments. These sites have not been replanted, though the rest of the area has been re-afforested.

The history of the recognition of archaeological features in the area is somewhat confused and is dealt with under individual sites below. Garreg Lwyd enclosure has

been reasonably well documented since its inclusion on the O.S. 1st Edition 1" map of 1830. Court Wood enclosure was rediscovered by W. H. Morris and A. H. Ward (Ward 1974) and some of the other features described below were first recognised by them. The remainder were identified as a result of the Trust's Survey.

THE SITES (FIG. 3)

The two major features of the early landscape are the defended enclosures Garreg Lwyd and Court Wood. The western, Garreg Lwyd, is the most complex and probably of at least two phases; in its later phase at least, being bivallate and having a complex entrance, intervallar space and perhaps an annexe. Court Wood is a simpler, univallate enclosure with an outwork on the east; both the main enclosure and outwork appear incomplete. Other features, perhaps belonging to an early phase of activity, include a series of cultivation terraces. Others, including ridge and furrow cultivation and building platforms, are largely attributable to post-Mediaeval and modern activity.

GARREG LWYD DEFENDED ENCLOSURE (SITE B)

The earliest reference to the enclosure is the 1st Edition 1" O.S. map (1830) where the site is shown as an enclosure and named as *Gareg Llwyd*. Subsequently H. N. Savory drew the attention of A. L. F. Rivet to the site and it was included in the O.S. map of Southern Britain in the Iron Age, but named Mynydd Pembrey (west) in the accompanying lists, whilst the name Graig Llwyd is given, presumably erroneously, to a doubtful hillslope enclosure *c* 1 km. to the north-east, near Biggin (SN 43780295). The site was first photographed from the air in 1959 by Dr. St. Joseph (Plate 1).

The site occupies rising ground at the end of an east-west ridge which forms the apex of the promontory. It is in a strong, naturally defensive position; a narrow summit platform is protected by precipitous slopes on the north and west and by steep slopes on the south which become less steep as they sweep round to front the approach along the ridge. The ground rises again eastward along the ridge. The defences basically consist of two ramparts, following the shallower southern and eastern slopes, their terminals resting on the precipitous northern and western ones and defining an area of approximately 0.4 ha..

The inner rampart survives as an outer scarp (maximum 3m high), a shallow rear slope being present on the east only. It was apparently of two phases. The earliest was located at the top of the gentler eastern slope, enclosing the summit platform only, with its terminals curving round to rest on the steep southern and precipitous northern slopes. No entrance for this first phase enclosure is traceable. The continuation of this rampart along the southern slope to the edge of the precipitous western slope, is apparently an addition as it butts the curved terminal of the first phase and runs at a level some distance down the southern slope. There is no trace of a ditch associated with either section of this rampart (a section of ditch to the east which is separated from the inner rampart by a berm and directly backs the outer, is probably a quarry ditch associated with the latter).

The outer rampart again survives only as a steep outer scarp, with a back slope

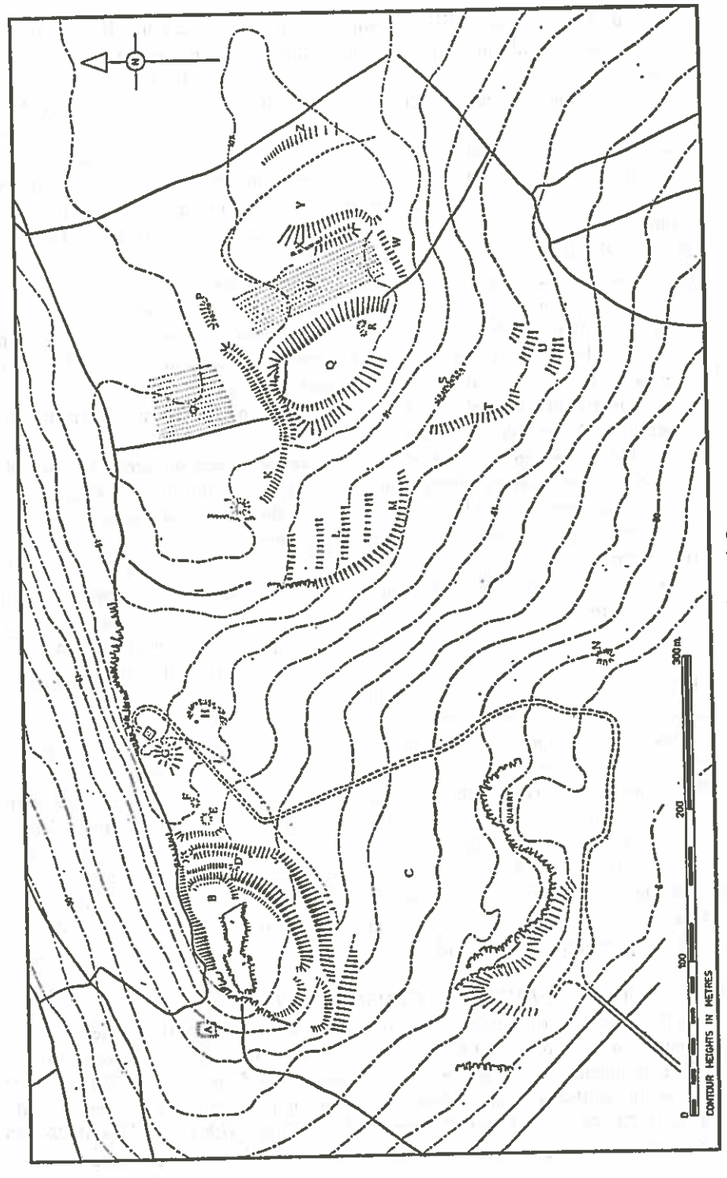

Fig. 3. Area of Survey.

present only on the east where it is accompanied by the rear ditch. It is located at the foot of the eastern and southern slopes, its terminals again resting on the precipitous northern and western slopes. There is a narrow interspace between two ramparts. The section at the base of the eastern slope is roughly concentric with the postulated first phase inner rampart. Again there is a discontinuity between it and the section at the foot of the southern slope—a kink accompanied by a lowering of the rampart. It is tempting to suggest that this lowering represents an entrance to a possible annexe (see below) but the existence of a modern track at this point makes it uncertain. A ditch fronting this outer rampart is traceable over much of its length but is only well defined where the defences cross the ridge to the east.

The entrance to the main enclosure is on the south-west. At present its details are unclear due to erosion and the presence of standing trees, but the arrangements are plainer on aerial photographs (Plate 2). A zig-zag approach through the outer rampart was created by the overlapping of the rampart terminals and the provision of an additional outer bank. This approach, at present, leads to a funnel-shaped entrance through the inner bank although this present form does not necessarily represent anything other than the erosion of a simple gap.

A possible annexe to the east of the site can be traced on aerial photographs (Plate 1)—its rampart curving round to include the rising ground to the east and terminating on the northern scarp edge at the top of the slope. It is not now apparent on the ground and must be considered a doubtful feature.

Apart from the summit platform and south-eastern intervallar space, most of the enclosed area is extremely steep. Erosion has been considerable—the upper southern slopes are bare rock and there is considerable corresponding accumulation at the rear of the rampart. No traces of internal structures are present. Only the summit platform and south-eastern intervallar space seem sufficiently flat to allow the construction of buildings, even with the provision of artificial platforms of which none are apparent. A number of platforms and hollows, in the foot of the inner rampart on the east and in the annexe, are undoubtedly quarries of comparatively recent date, as was proven by the excavation of the most likely "hut platform" amongst these.

While the site is very probably of more than one phase, the details of its development are not clear. The first phase may involve only the eastern section of inner rampart which encloses the summit platform although the concentric nature of both eastern ramparts and the discontinuity in the outer may indicate that the site was indeed bivallate at this stage. Later phases involve the extension of the inner rampart to include a larger area and the extension or construction of the outer, including the provision of the complex entrance and interspace.

COURT WOOD DEFENDED ENCLOSURE (SITE Q)

The defended enclosure now known as Court Wood enclosure is also clearly marked, though not named, on the O.S. 1st edition 1" map, but thereafter it seems to have escaped archaeological attention until its rediscovery and inclusion in Ward's 1974 field survey of south-east Carmarthenshire, although the published references to the site (Ward 1974, 24 nos. 24 and 25) seem to be confused with Garreg Lwyd (Ward's site 13). The enclosure and outwork can be seen in the bottom right hand corner of

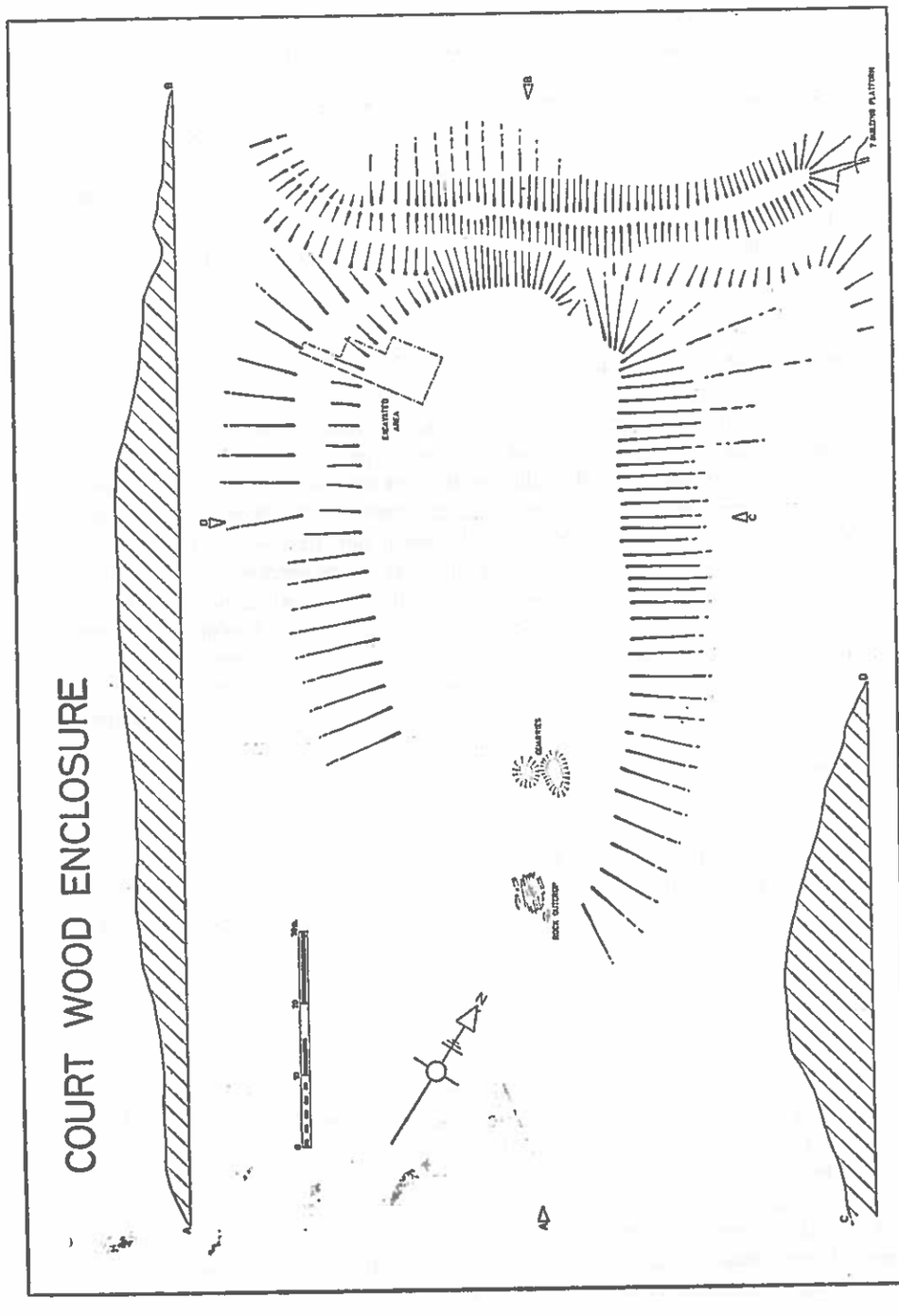

Fig. 4.

Dr. St. Joseph's 1959 photograph of Garreg Lwyd.

The site is located some 250m east of Garreg Lwyd (Fig. 3). It occupies a low knoll overlooking the steep slope of the mountain on the south-west. The knoll is approached by gently rising ground on the north but the defensibility of the site is reduced by the similar Knight's Wood knoll some 50m away to the south-east. The slopes of the knoll are steep on the north-east but more gentle on the north-west and south-east where they approach the steep south-western slope. The defences consist of a single rampart enclosing the knoll (an area of 0.25 ha.) with an additional length of bank and internal ditch running tangentially to the main body of the enclosure on the north-west.

The main rampart is manifest as an outer scarp only over most of its circuit; only on the north-west is there any trace of a rear scarp. It is best preserved in the north-west section where the natural approach is relatively gentle, rising 3m from the bottom of the ditch which it shares, at this point, with the outer rampart. There is a lowering of the rampart in this area. The defences continue round to the north-east as an apparently artificial enhancement of the steep slope of the knoll. On the south-west, above the steep slopes of the hill, the defences are preserved as a double terrace —the upper corresponding to the bank and the lower to the ditch. They appear, originally, to have been slighter than on the north but are also apparently heavily eroded. This bank is apparently continuous with that on the north-west but the slighter ditch runs out into the deeper north-western ditch. The continuation of the south-western defences to join with those on the north-east is not apparent. The former fade out as the natural slope becomes more formidable to the south, while the latter also fade out before crossing the gentle southern approach. There is no indication that this was ever an entrance. The most likely position for an entrance is the lowering of the north-west rampart, approached by a possible hollow way formed by the rear ditch of the outer bank. However, the approach up from the bottom of the ditch is, at present, not well marked and very steep.

The outer rampart and rear ditch curve in from the lynchetted edge of the south-western scarp, cross the gentle slope immediately north-west of the main rampart and, after turning slightly outward again to the north-east vanish abruptly on level ground.

The reasons for the apparent lack of defences on the south are unclear. While the excavation suggested a drastic truncation of the south-western rampart, the gentle southern approaches would have required massive defences which seem unlikely to have eroded away completely, and it is possible that the enclosure was never completed. The nature and function of the outer bank are also unclear. The bank may have been intended solely as an outwork covering the entrance and in this respect it makes strategic sense at its south-eastern end where it joins the scarp edge. However, it would be expected to curve round to the south-east, covering the vulnerable approach from the Knight's Wood side, and some additional or alternative explanation seems necessary. There is no reason to suppose that it was destroyed during the construction of the post-Mediaeval building which could well have been sited to its north or south, and indeed a subsidiary building platform may have been inserted into its decayed terminal (see below). Again, it may have been unfinished. If this was the case, it was perhaps contemporary with the main enclosure although the relationship of its

ditch to that of the main enclosure on the south-west suggests it is a secondary addition.

CULTIVATION TERRACES

These comprise a series of terraces—defined by positive lynchets—situated on the summit and upper slopes of the hill. Three large terraces (K, M and T) to the south and west of the Court Wood enclosure, follow the series of natural terraces falling west along the ridge of the mountain. Three strip lynchets (U) are traceable to the east of (T). A level area (C) immediately south of the Garreg Lwyd enclosure, was also probably cultivated but its southern boundary has been destroyed by a major landslip. A lynchet (W) also follows the edge of the natural scarp between the Court Wood and Knight's Wood knolls. In some cases they are overlain by later enclosure walls and, with the exception of (W), there is no trace of ridge and furrow cultivation in the area bounded by them. They seem, therefore, to pre-date post-Mediaeval enclosure patterns and cultivation on the summit of the hill (see below). A number of features exist within them which may be contemporary with this earlier use. (M) contains traces of widely spaced, shallow ridges (L), running across the slope and (T) has traces of a stone wall (S) bounding its area on the uphill side. The wall does not conform to any boundary recorded on nineteenth century or later maps.

SMALL ENCLOSURE, GARREG LWYD (SITE H)

The remains of a semi-circular stretch of crude drystone walling 25m in diameter, lie just outside the putative annexe to the Garreg Lwyd enclosure. The remains consist of a band of rubble some 2m wide with little elevation above ground level. Built on ground sloping relatively gently to the south, its terminals rest on a steeper slope to the east. Below this point recent disturbance has been considerable and any possible continuation or closing of the arc would have been destroyed. It appears to be of a respectable antiquity but limited excavation failed to produce any evidence relating to its date or purpose.

LATER FEATURES

A number of features are more or less attributable to post-Mediaeval and modern activity. These include the remains of stone buildings (P) located beyond the eastern terminal of the outer bank of the Court Wood enclosure. The most easterly remains consist of a rectangular platform, (15m x 6m) most clearly defined in the north- eastern corner. The platform is fronted on the north by a stony bank with a central entrance gap and there is an indication of a right-angled turn at the east end but no definite remains of other walls edging the platform can now be traced. A further, poorly defined platform to the west, set into the terminal of the enclosure bank, may be another building platform. The remains probably represent a cottage of post-Mediaeval date.

These buildings may well be associated with various traces of land use in the area which, while post-dating the lynchets,pre-date the immediate pre-plantation regime. In the saddle between Knight's Wood and Court Wood there are traces of narrow ridge and furrow cultivation (V) associated with the lynchet (W) and further traces of narrow ridge and furrow (O) exist to the north of Court Wood enclosure. In addition, a

series of boundaries is depicted on the Tithe map of 1838 and the 1914 O.S. map. In most cases there are no surviving indications of their former line although a stretch of drystone walling (I) still stands to the north of and continues the line of plough lynchet (M).

Large numbers of artificial hollows and platforms are a feature of the area. Some result from the use of the hill as a firing range in the Second World War—sites (J) and (N) being definitely of this origin. Others are undoubtedly modern quarry scoops (R and D to G and an extensive area of quarrying Y on the slopes of the Knight's Wood knoll. The last is indicated in Fig. 3 by a dotted line). Some of these latter in the area of the Court Wood enclosure (D to G) were, at first, tentatively identified as possible house sites of an early type but the excavation of the most likely proved it to be a quarry of apparently recent date. A rectangular platform (A), located below the western scarp of the Garreg Lwyd enclosure, is more likely to represent a building but again is probably of no great antiquity.

A number of features are associated with the Knight's Wood knoll although the surviving remains are considerably disturbed by quarrying and their interpretation is uncertain. A bank and ditch (X) runs north-west/south-east near the south-western foot of the knoll; the bank is on the downslope side and only clearly traceable over the south-east part. The remains of a stone wall embedded in the turf fronts the ditch on the north-west. The bank is breached at the south-east by the ditch which turns south, giving the impression of an entrance with the ditch looking distinctly like a hollow way. At the north-west there is some indication that the ditch turned north-east to cross the knoll. There is a further substantial, outward curving scarp (Z) below the north-east foot of the knoll. It is possible that both sections of earthwork originally formed a continuous enclosure around the knoll although there is, at present, no certain connection between them and the north-eastern stretch of scarp may well be a natural feature. The date and purpose of the features remain unclear but at least they seem unlikely to be associated with the Court Wood enclosure and are probably of no great antiquity.

THE EXCAVATIONS

COURT WOOD ENCLOSURE

Excavation here was initially intended to establish the nature of the site as some doubt had been expressed regarding its interpretation as a defended enclosure. To this end a trench (Figs. 4 and 5) was cut through the south-western rampart which appeared likely to be the simplest and most easily interpretable stretch of the defences. This was later extended to the north to provide further information on rampart structure, pre-rampart levels and paticularly the survival of internal deposits.

Summary of Results and Conclusions

A well preserved pre-rampart sequence included a buried soil, the A horizon of which had been incorporated into a thick occupation layer. This occupation layer included a succession of well-defined horizons and a number of structural features apparently representing a more or less extended period of occupation although its nature remained unclear in the limited area excavated. This occupation was succeeded

by defences consisting of a single-phase bank fronted by a scarped slope above a small, shallow ditch. Within the enclosed area horizons were severely eroded and no well-defined occupation deposits survived. The only definite structure located was a square setting of post holes, on balance attributable to the defended phases. The truncated remains of the rampart were overlain by a flimsy structure, of post holes and paving, which was probably relatively recent.

Finds attributable to a pre-rampart context included small scraps of possibly "Early Iron Age" pottery while a radio-carbon date of 335±45 b.c. was obtained from a superficial pre-rampart level. This came from one of a number of samples of carbonised grain which were recovered from both the pre-rampart levels and the four-post setting. A small amount of Romano-British pottery was recovered from a number of probably post-rampart contexts.

Geology

Information on the basic geology was derived mostly from the trial trench (see Fig. 7). The underlying Pennant sandstone was of complex structure, much affected by periglacial modifications and heavily frost-heaved and shattered. Overall it formed a profile rising gently from west to east, interrupted by a natural shelf in the area below the rampart. To the east of the ditch it was overlain by a solifluxion deposit (19) which filled the shelf below the rampart, becoming thinner and dying out upslope. To the west of the ditch a deposit (69) probably of till, lay deeply embedded in the cryoturbated bedrock. These deposits were modified by the development of later pre- and post-rampart soil formation.

Pre-occupation Soil (Fig. 7)

This was represented by the lower horizons of a typical brown podsolic soil. A brown, loamy C horizon, forming the matrix of the top of the sandstone bedrock, was overlain by a typical strong brown B horizon formed on the solifluxion debris. The upper horizon of this B horizon was a slightly eluviated layer (8), compacted by trampling during the phase of occupation. The A horizon had been completely incorporated into the occupation horizons.

Pre-rampart Occupation (Fig. 5)

Description

This was well-preserved beneath the whole area of the rampart (Fig. 7, layer 17). To the west it was truncated by the inner slope of the ditch; to the east it petered out below the first phase rampart spread. The occupation horizon was a sandy silt containing occupation debris, on average 12 cms thick. Within the horizon a number of discrete elements were identified and it was possible, in local areas, to arrange some of these in a stratigraphic sequence. Early features (Fig. 5a) comprised stone spreads (96), including a patch of cobbling. Part of the stone spread sealed a shallow, stone-filled gulley (85)—the earliest pre-rampart feature. An arrangement of stones (77), forming a right angle and set in a shallow gulley (88), was insecurely stratified although the gulley appeared to terminate in an oval post hole (87) overlain by the patch of cobbling. Also of uncertain stratigraphy were a shallow intrusion (93, noted in section)

and a post hole (80) with a well preserved stone packing. A portion of a flat-bottomed hollow (16) cut back into the hillslope, contained, at its base, dense quantities of charcoal and (in the trial trench) traces of burning and flat stones. The feature was not sealed by the early stone spreads but seems likely to belong to an early phase.

Much of the stone spread (96) was overlain by a thick occupation layer containing much charcoal and burnt stone and a little fired clay and burnt bone, with a particular concentration (68) in the area over and around the cobbled patch. This area also produced the largest deposit of carbonised grain. (This occupation layer is not illustrated on Fig. 5 but, stratigraphically, lies sandwiched between the features shown of Fig. 5a and those on 5b.)

The uppermost pre-rampart horizon (Fig. 5b) consisted of a fairly diffuse scatter of mostly horizontal slabs. These were embedded in the top of the occupation deposits and many were incorporated in the base of the overlying rampart. Clearly associated were a posthole (74) incorporating a rough box of packing stones, and a shallow drain (64) running downslope which preserved four *in situ* capping stones.[2]

Finds

Finds from the pre-rampart horizons included a flint flake (object 92) a whetstone (object 19), cinder and slag and one sherd of possible "Early Iron Age" pottery (object 91). A similar sherd (object 54) from the body of the rampart was probably also derived from the pre-rampart layers. Samples of carbonised grain (see appendix) were obtained from the basal fill of hollow (16) and the occupation deposits. The radiocarbon date was obtained from grain from the rich deposit (68).

Interpretation

In view of the limited area of excavation, there is little point in offering detailed interpretations for the individual elements described above. Clearly, more than one phase of pre-rampart activity is represented. The portion of hollow (16) is likely to represent a building platform and an early element in the occupation sequence. The stone spreads (96) and stone arrangements (77) may be part of a building structure with contemporary occupation debris accumulating on the stone surfaces. The uppermost stone spread and associated features must relate to a later structural phase, and may also reflect the decay or dismantling of some adjacent structure. Whatever the case, little, if any, time seems to have elapsed between the cessation of occupation and rampart construction. The mixing of the rampart material and the occupation deposits points to the absence of a stable turf line and, whilst this could be due to turf stripping, there is no evidence of secondary soil horizons within the layer.

The function of the area may have varied through time and the rubbish deposits may not necessarily all derive from the precise area excavated. The cinder and slag indicate metal working while the bone and charred grain indicate domestic activity (see appendix). There was no indication of the duration of this occupation.

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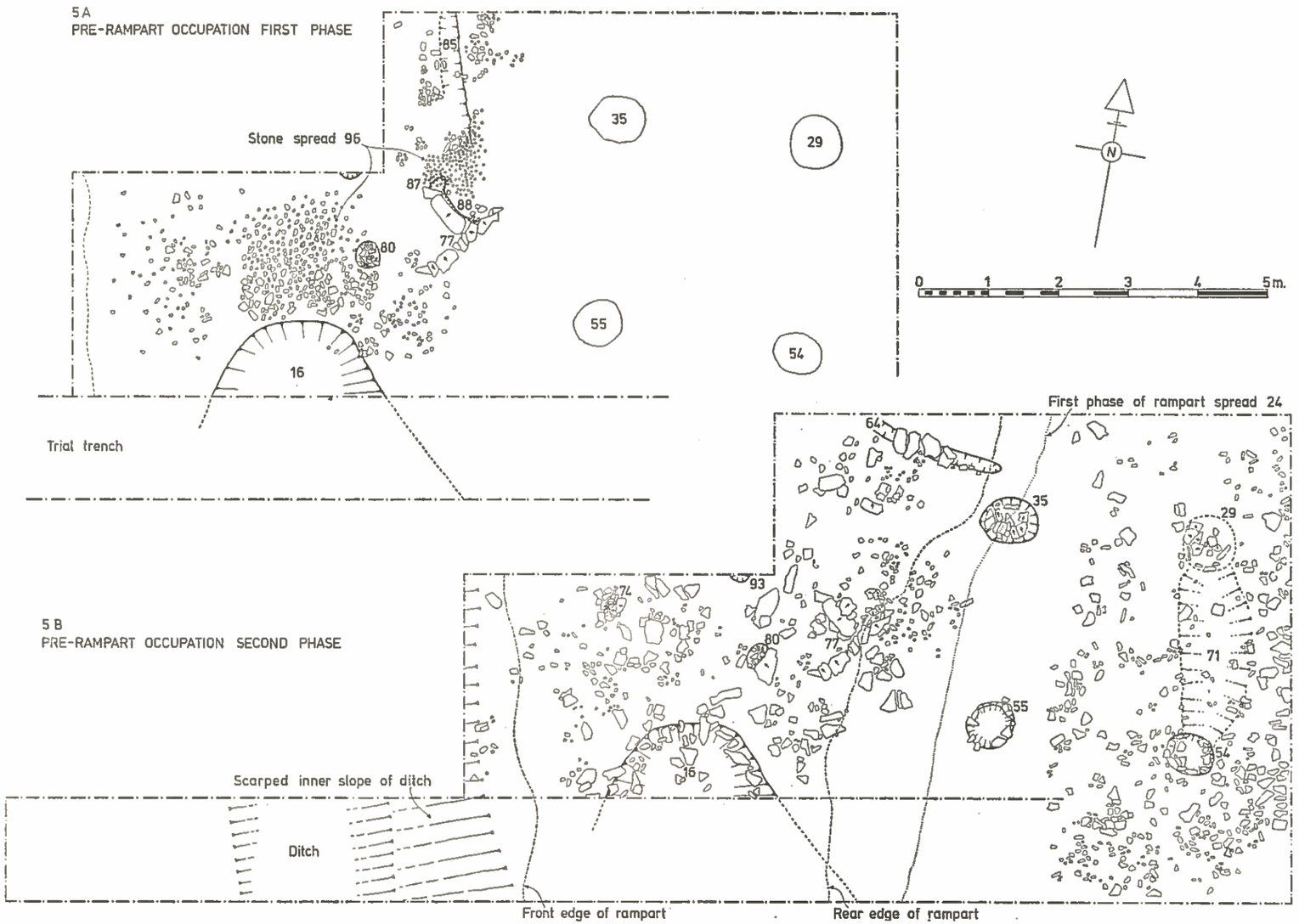

Fig. 5. Court Wood Enclosure, Pre-rampart occupation and internal area.

INTERNAL AREA (FIG. 5b)

Description

Beyond the protection of the rampart, erosion had been considerable; both the occupation horizon and the underlying eluviated horizon (8) died out leaving a layer (5), equivalent to the lower pre-rampart B horizon (see Fig. 7). To the west this was formed on the solifluxion debris and was relatively stone free but it became progressively stonier upslope as the solifluxion layer died out.

Archaeological features only clearly survived from the top of layer (5). The only convincing features were the four post structure and the possibly associated hollow (71). The setting was 3m square. The widths of the postholes were similar, between 80 x 65 cm (35) and 60 x 65 cm (50). Those on the downhill side were deepest (at least partly due to differential erosion); the deepest posthole (55) surviving to 55cm deep. The fill of post-hole (35) contained dense concentrations of occupation debris although the rest apparently contained very little of this material. Stone inclusions in the fill of the post-holes varied from few in (29) to dense in (35); but all had partially collapsed packing stones defining post pipes between 40 and 50 cm diameter. Post-holes (29) and (54) were joined by the aforementioned shallow, oval hollow (71), 1.0m wide maximum and with a similar fill to the post-holes. No trace of a similar feature was found between the other post-holes.

Finds

Charred grain was recovered from the fill of all the post-holes, demonstrating a ratio of inclusions which seemed to differ from the pre-rampart levels (see appendix).

Interpretation

It was clear that much evidence of occupation had been lost to the inside of the rampart, including pre-rampart occupation layers and any deposits contemporary with the rampart, and that only deeper features cut into the sub-soil survived. However, erosion is perhaps not the sole factor contributing to the absence of occupation horizons. The fact that the fill of the post-holes other than (35) is not marked by any quantity of occupation debris suggests that this was not present in quantity to the south-east of post-hole (35) at the time of the decay or removal of the four-post setting.

There was no stratigraphical relationship between the four-post structure and the sequence in the area under the rampart. However, the difference in ratio of grain inclusions between the pre-rampart levels and the four-post structure could perhaps suggest a later date for the latter (see appendix), while its position immediately inside the bank is a common one for a "four-poster". Although there remains the possibility of further post-holes extending the structure to south and east, this interpretation of the structure as a "four-poster" is the simplest. Its massiveness and the absence of terracing on the steep slope suggest a raised structure, comparable with those from Moel y Gaer discussed by Guilbert (1976, 311). The nature and direct association of hollow (71) is uncertain; it is not readily interpretable as a wall line.

DEFENCES (Figs. 5b and 7)

Description

The Rampart. The surviving bank was flat topped and apparently truncated, 80 cm high maximum and between 4 and 5.5m wide. As mentioned there was considerable mixing of its lower levels with the underlying occupation debris. It was constructed of a great variety of layers, relateable to the layers of soil and subsoil through which the ditch was dug. Toward the front, material tended to be stone free, with well defined tip lines falling consistently from front to rear from north-west to south-east diagonally to the line of the rampart. To the rear was a variable band of rubble.

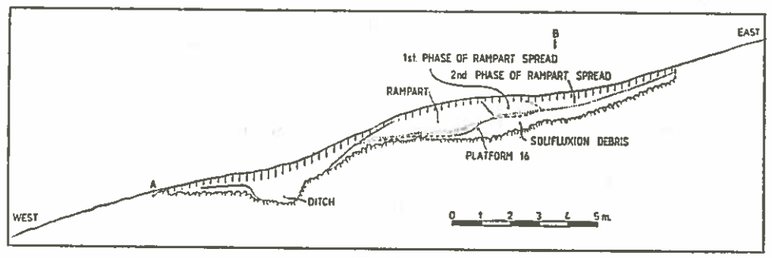

Fig. 6.

Immediately behind the rampart, deposits represented two stages of rampart decay. The first (24) was a relatively stone free sandy loam below which the pre-rampart layers petered out. To the inside of this was a layer (3), similar to layer (24) but with dense inclusions of small stones. It overlay the old B horizon layer (5) over most of the excavated area, becoming progressively thinner upslope and dying out by the eastern edge of the area.

The Ditch. This was only explored fully in the trial trench. The inner scarped slope extended for about 1.5m. The ditch proper was small, shallow and flat bottomed (2.3m wide and 90 cm to 1m deep) with a bell-shaped weathered profile. A very shallow extension was perhaps detectable beyond its western edge. Below an upper fill, incorporated into the horizon of the modern soil, the fill consisted of a silty loam with three zones of varying colour and consistency—the uppermost of these zones running up over the inner scarped slope. The fill contained stony inclusions which became denser towards the west but did not generally reach the western side.

Finds

The make up of the rampart included small quantities of occupation debris. Finds included one fragment of possibly "Early Iron Age" pottery (object 54) from the stone-free deposits, and two fragments of Romano-British pottery (objects 9 and 10) from the upper levels of the rearward rubble layer. A possible dressing stone (object 84) also came from the main body of the rampart. No finds came from the first stage rampart debris although they were more plentiful from the second stage. These included a flint flake (object 24), a flint scraper (object 17) and a whetstone (object 26).

Fig. 7. Court Wood Enclosure, north section of defences.

A further sherd of Romano-British pottery (object 20) came from the upper fill of the ditch.

Interpretation

Interpretation of the structure and phasing of the defences can again only be of very limited value, given the small area excavated. It seems likely that the construction of the rampart followed on immediately from the earlier activity and, therefore, need not be separated by any great period of time from the episode represented by the C^{14} date from the pre-rampart layer. Other than this there is no direct dating evidence for its construction, the pottery from its core probably deriving from pre-rampart levels. There is no evidence that it was of more than one phase of construction. The Romano-British material from the rubble band at the rear is very slim evidence on which to base a second phase; this area was probably disturbed during the destruction of the rampart, while the difference between the stone free and rubble deposits need reflect no more than a single phase of deposition; material derived from the upper fill of the ditch being dumped to the front, and material from the lower fill to the rear of the rampart.

The direction of the tip lines gives further indication of construction technique. The inclination of all tip lines toward the interior, diagonal to the rampart, indicates dumping starting from the north-west, proceeding from north to south. The inclination toward the interior may also suggest the rampart was built up against a front revetment, although no traces of a timber or *in situ* stone revetment were found and the concentration of stones throughout the fill of the ditch need be no more than stones eroded from the body of the rampart and scarped slope. An alternative is that a dump rampart was built up by back-tipping consistently from the front, and the scarp slope on the north at least was sufficiently steep to suggest that it continued the slope of a rampart *glacis*. (However, it can be emphasised in this respect that the shape of the ditch, as excavated, may represent no more than a localised version of a very irregular feature). Although the ditch itself is small, coupled with the scarped slope and rampart, it must be seen to represent a formidable defence.

The fill of the ditch indicates gradual silting and weathering of the rampart—the heavier inclusions deriving from the latter rolling furthest to the west down the sloping surface of the fill—an episode equivalent to the weathering of rearward layer (24) from the bank. The subsequent severe damage—the truncation of the rampart and the complete erosion of internal deposits—coupled with the deposition of the homogeneous and stony layer (3) points to a phase of ploughing.

POST-RAMPART STRUCTURE (Fig. 8)

A structure was set into the top of the bank and the rampart spread (24), immediately underlying the topsoil. It consisted of a setting of post-holes and an associated paved area. The setting of post-holes was roughly rectangular and evenly spaced, measuring 1.6 x 2.8m. The structural details of the southern pair were unclear although the northern four were well defined. The majority were roughly circular and varied considerably in diameter, from 65 cm to 40 cm, although depth was similar, about 30 cms. Post-holes (40), (41) and (42) had fills of largely upright or steeply

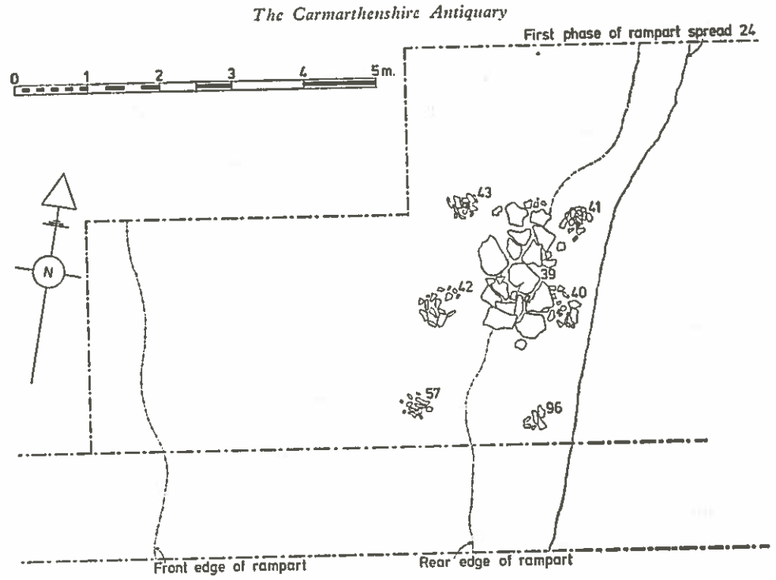

Fig. 8. Court Wood Enclosure, post-rampart structure.

pitched stones. Post pipes were preserved in (40), (42), (43) and perhaps (57) (in the last three being of stone box construction) which measured approx. 20 cm diameter.

The paving (39) was a roughly rectangular area of large flat slabs, measuring 1.9 x 1.1 m. It lay on or just set into the top of the rampart and rampart debris (24). It was set symmetrically to the northern bay of the rectangular setting and butting the upper fill of post-hole (40). A layer of two or three flat stones in a similar relationship to the rampart debris was noted in the trial trench.

Various hypotheses involving fences, palisades or even framing for a second phase rampart were suggested and ruled out; the remains seem to represent a small, flimsy and at least partially paved structure although the flat slabs recorded in the trial trench may indicate a continuation or the presence of a similar structure here. Its position, post dating the erosion of the rampart, suggests it is comparatively recent.

EXTERNAL AREA

Only a small area external to the ditch was excavated in the trial trench (Fig. 7). No archaeological horizons survived below the modern topsoil and lower soil matrixes were complex and variable. The most extensive layer (70) was of variable dark bluish clay or clay loams, and this partly overlay a reddish brown humic loam (90) at the western extremity of the ditch.

Whatever the significance of this sequence, the hand of man was not clearly evident. Layer (70), for instance, did not represent cleanings from the ditch, as it was too integrated with the bedrock and apparently cut by the ditch and apart from the ditch, no other apparently man-made features were noted.

THE FINDS

Prehistoric Pottery. Two sherds of possible Late Bronze Age/Early Iron Age pottery, object 91 from the 1st phase pre-rampart gully (85) and object 54 from the body of the rampart. Both of similar fabric, pinkish brown, sparsley gritted and well fired. The fabric is in some respects similar to VCP, but the form, if anything, represents the rounded shoulders of large, thick walled jars. While there are no apparent local parallels, and the material is very fragmentary, it would not seem out of place in an "Iron Age A" context.

Romano-British Pottery. Four sherds from a number of more or less secondary contexts. All body sherds and, with the exception of object 20, very small and abraded. Neither form nor fabric allowed more than a general Romano-British attribution.

Object 9 located superficially in rubble band at rear of rampart. Small, very abraded sherd, light buff, slightly powdery fabric.

Object 10 (same context as above). Very small and abraded but similar to object 20. Black exterior, orange/buff interior.

Object 20 from upper fill of ditch. Well preserved body sherd, black burnished type. Black, fairly smooth exterior, grey brown, rougher interior.

Object 28 from topsoil. Very abraded, fairly rough, sandy cream fabric with orange slip.

Utilised stones. Two sandstone pebbles used as whetstones. Object 19 from base of pre-rampart occupation layer. Object 26 from rampart debris (3). The latter burned and split, possibly by secondary use as a potboiler.

Two dressing stones. Object 30 from topsoil: end split from a large flat pebble of millstone grit (14 x 9 cm). Glossy surface worn along one edge opposite split. Stone presumably deliberately split to a convenient size for use as a dressing stone. Object 84 from body of rampart: sandstone pebble, traces of gloss indicating possible use as a dressing stone. Cracked and split, therefore again possibly used as a potboiler.

Miscellaneous pebbles including a few obvious, unreduced potboilers and a number of small pebbles of slingstone size, the latter from the ditch and rampart debris. These, however, very probably derived from the drift, as similar pebbles came from the B horizon of the buried soil.

Flint. Three flints. Object 17 from the rampart debris (3): scraper made from section of small pebble, retouched over half its circumference. Objects 24 and 29: two flakes from rampart debris (3) and top of B horizon (8) respectively.

RADIO-CARBON DATE

A date of 2285±45 b.p. (335 b.c.) (CAR-105) was obtained from a sample of carbonised grain from the rich pre-rampart occupation deposit (68).

SMALL ENCLOSURE, GARREG LWYD (Site H)

Two cuttings were made through the semi-circular stretch of walling. Cutting 1 which measured 2 x 4m, was sited to investigate a typical stretch of walling. The modern topsoil was found to overlie the full extent of wall collapse which extended up to 1.5 m wide. The collapsed rubble overlay a shallow buried soil which directly overlay the bedrock and the foundation courses of the wall, 50-60 cm wide, set on or into a slight lynchet in this buried soil. Cutting 2 was sited to investigate a possible entrance gap but the gap proved to be due to robbing. Neither cutting gave any indication of date or function.

HOLLOW (Site E)

A small excavation revealed the ragged ends of the natural strata split by quarrying. The only find was a china egg from the topsoil.

DISCUSSION

The results of the Pembrey project have already been included in a general discussion of Later Prehistoric and Roman Carmarthenshire (Williams 1978 and 1979) and only a few points need to be considered in more detail. A number of questions concerning the defended enclosures and cultivation terraces call for comment, although these are not answered by the limited excavation evidence. The evidence of greatest value provided by the project is that from the excavation of the Court Wood enclosure. Both the radio-carbon date from a specifically Later Prehistoric pre-rampart context and the sampling of the occupation deposits for charred plant remains are the first forthcoming from a defended enclosure in the area and augment the evidence from the closely comparable and extensively excavated Coygan Camp which lies some 15 km north-west of Pembrey across Carmarthen Bay.

The defended enclosures. Both Pembrey sites are of basically similar type. Both are examples of small hillforts which, throughout south-west Wales, constrast with the smaller hillslope ringworks which are also a feature of the area. More specifically they may be equated with the promontory forts which are also common along the coast of south-west Wales.[3] Both sites may also have characteristics which relate to the multiple enclosure sites of south-western Britain (although admittedly these features are not well defined), in particular the intervallar space and possible annexe at Garreg Lwyd, while the outer rampart at Court Wood which ends abruptly "in the air" is a relatively widespread feature on such sites (Fox 1961, 39ff. Hogg 1973, 58-9). Both sites seem to have had an extended period of occupation covering a broadly similar period; a late Iron Age date is suggested by the multivallation and entrance elaborations of the later phase of Garreg Lwyd, while relatively late Iron Age occupation is also indicated by the *terminus post quem* for the defended phase at Court Wood.

The close proximity of two such similar enclosures remains to be explained. Close groupings of defended enclosures, usually pairings, are reasonably common in West Wales and beyond. A grouping of sites in many respects comparable to Pembrey

exists on Hardings Down in West Gower, only 11 km south of Pembrey[4]. However, in the majority of cases these sites show marked differences in size, plan, position etc., which can be suggested as reflecting differences of date or function[5]. A residuum such as Pembrey shows no obvious fundamental differences. However, considering the little evidence we have at Pembrey it is pointless to speculate on the reasons for this juxtaposition.

Amongst "south-western" enclosures, incomplete ramparts are a widespread and puzzling phenomenon. Some are certainly the result of differential ploughing; the more recent boundaries responsible for this differential having been removed[6]. Others appear unfinished or at least apparently, originally incomplete. In discussing these, Hogg (1973, 58-59) has rejected the idea that these all represent the response to a short-lived threat although it is tempting to relate the Pembrey and Hardings Down sites (see note 4) to a localised single event. Hogg has suggested a strategic function in relation to the most vulnerable approach. Another explanation may involve the classic interpretation of multiple enclosure sites as stock enclosures, with varying needs for handling livestock within a constant framework being provided by moveable fences within a system of permanent earthworks.

The cultivation terraces. The evidence for the association of the cultivation terraces with the enclosure is circumstantial but considerable. They lie in close proximity. The lynchets apparently pre-date the later post-Mediaeval cultivation on the summit of the hill and, with the possible exception of strip lynchets (U), seem to owe nothing to Mediaeval cultivation but resemble the "terraced fields" of the Caernarvonshire systems (RCAHM 1964, XCViiff). Direct evidence of arable exploitation comes from the pre-rampart levels at Court Wood, with a mix of crops which possibly reflects a reaction to local Iron Age soil conditions (see Appendix).

As mentioned, Pembrey is one of a series of lynchetted systems located along the southern fringes of south-east Carmarthenshire (Fig. 2). These have been listed by Ward (1974, Nos. 5, 9, 24 and 31) and the system at Kidwelly has been studied in detail by Barnie and James (1979). Their occurrence on marginal land and/or as lynchetting of slopes suggests they may represent the remains of more extensive systems which once existed in the hinterland[7], and all may, in origin at least, be early. In all cases they lie close to defended enclosures, while the Pembrey system, as we have seen, seems likely to be independent of Mediaeval activity. However, the Kidwelly system at least flourished in the Middle Ages, although this too may well prove to have earlier origins[8].

The excavation. An early phase of activity is potentially, but not necessarily, represented by the flints which are undiagnostic and could belong to any period from the Mesolithic to the Romano-British. Other than this, the sequence appears to begin with the pre-rampart occupation.

The presence of pre-rampart occupation is common on excavated defended enclosures in West Wales. Indeed, the presence of defences as such is perhaps of limited significance in the history of the sites as settlements, while the pre-rampart sequences are potentially of great importance in documenting the origin and development of 1st millenium settlement which eventually becomes manifest as defended enclosures. However, the details of this development are obscure. A number of sites have evidence of Neolithic or Early Bronze Age activity which is presumably incidental to the later occupation[9]. The remainder, of assumed Later Prehistoric date, show both continuity and discontinuity with the defended phases but dating evidence is almost non-existent[10], with the notable exception of the well documented sequence at Coygan Camp (Wainwright 1967). Here pottery of a probably eighth to fifth century B.C. date was associated with the pre-rampart occupation. There seemed to be little separation in time between this occupation and the construction of the rampart and the latter was associated with pottery which could be as early as the fourth century B.C.[11].

This question of the date of construction of defences in the area has been well rehearsed. Dr. Savory (1976b, 255-257 and 271) has made a qualified suggestion that a relatively late, post "Halstatt" date for hillfort building, such as that suggested at Coygan, is general in western Wales, although the evidence is as yet partial and inconclusive and, indeed, two excavated early sites, Llanstephan Castle and perhaps Castell Cogan, lie within 15km. of Pembrey. Llanstephan Castle had a rampart with a timber spine, with suggested Urnfield parallels, and produced a series of C^{14} dates, centred on 510 b.c. (Guilbert and Schweiso 1972 and Guilbert 1974) which could calibrate to the seventh or eighth centuries B.C.C. However, existing published accounts of Castell Cogan (Grealey et. al. 1972, Little 1974, 13-14 and Savory 1980, 303) leave it uncertain whether the site is of Early Iron Age or Ultimate pre-Roman date.

The Pembrey sequence is similar to Coygan in that there seems to be continuity between pre-rampart and defended phases. Calibration of the pre-rampart Pembrey C^{14} date gives a 1 sigma range of 450-390 B.C.C., which is compatible with both the Coygan sequence and the general suggestion of a relatively late date for defences in the area. It also correlates well with the mixture of cereal crops from which the date was obtained (see appendix). However, the limitations of a single C^{14} date must be borne in mind and these may be particularly acute in the case of short-lived samples[12].

The history of the defended phase of the site is largely unillumined by excavation. Although the defences may never have been completed, the "four-poster" might indicate the continued occupation of the site. As regards the Romano-British material, while one must be wary of placing undue emphasis on a handful of sherds, the presence of a Romano-British settlement on a site of this type in the area is to be expected.

The most important evidence from Pembrey is provided by the carbonised grain which provides clear evidence for the use of such arable products in the economy of the period. As such, it augments the evidence from Coygan, where the excellent preservation of bone in alkaline soil conditions well documented the pastoral aspects of the economy, although evidence of arable farming, other than the presence of querns, was not recovered. While it has been suggested that the presence of querns on sites such as Coygan may reflect the use of imported grain, the Pembrey material emphasises the probability of local production; the possible fluctuations of growing conditions implied by the crop mixture possibly correlating with the podsolisation of the local soils (see Appendix). As we have seen, taken with other evidence, this also suggests the contemporaneity of the settlement and the nearby lynchets.

In these respects the Pembrey evidence forms part of a growing body relating to the distribution of arable farming in West Wales and beyond in the Iron Age. In south-west Wales early field systems are a feature of marginal land in coastal areas of Pembrokeshire. An Iron Age origin has been suggested at Skomer and St. Davids Head (Grimes 1950), and proved by C^{14} dating at Stackpole (Inf. Don Benson). The Pembrey grain, if not the lynchetted systems themselves, contribute to an extension of this evidence into coastal areas of Carmarthenshire (which includes also an iron bar share from Llanstephan). Within the intervening lowland and heavily cultivated inland areas, the absence of ancient field systems is likely to be an accident of survival as arable cultivation is well attested by excavation, including the well-known plough tips from Walesland Rath (Wainwright 1971) and a little pollen evidence[13]. The situation in upland north-east Dyfed apparently stands in contrast to this. Although excavation evidence is negligible, field systems are not present on marginal land, while in the Tregaron Bog sequence cereal pollen was virtually absent in the period (Turner 1964). A parallel situation is a well-known feature of North Wales—field systems being concentrated on marginal land in the north-west—and suggests a real dichotomy. On the other hand, an arable contribution has long been suggested in these upland areas on the grounds of settlement distribution and by reference to post Roman Wales, where the apparent absence of archaeological evidence for arable farming contrasts with the documentary (Alcock 1965a, 188 and 1965b, 191 and 208).

The role of pedological factors is seen as crucial in the economy and development of Later Prehistoric settlement and the podsolisation of the pre-rampart soil at Pembrey is classic, direct evidence of soil deterioration in the period, due to deteriorating climate or anthropogenic factors. Generally, in the highland zone, as elsewhere in Dyfed, this resulted in the abandonment of upland areas with their concentrations of Early Bronze Age sites and the eventual construction of defended enclosures on lower ground, between the 600 ft and 200 ft contours. This latter aspect does not occur in south-east Carmarthenshire where, although most land is between 600 ft and 200 ft defended enclosures are largely absent apart from the Towy Valley and the coastal fringe (see Fig. 2). This can be attributed to extensive deposits of till in the areas below 600 ft resulting in poor and intractable waterlogged soils which remain a feature of the area today. Better soils occur only above 600 ft and, to a limited extent, in peripheral areas. This deterioration of soils and the abandonment of upland areas form a classic context for developing economic and social pressures necessitating the construction of defences during the period.

The occupation of this coastal strip possibly also partly depends on the exploitation of marine and littoral resources. On a subsistence level this is documented by the considerable quantities of shellfish noted at Coygan, and here Iron Age activity on the littoral is demonstrated by pottery from shell mounds on Laugharne Burrows. Similar evidence would not have survived the acid Pembrey soils. The exploitation and control of marine resources may be hinted at by an increased size and the provision of stronger defences amongst sites in coastal areas of south-west Wales generally (see note 3).

Little can be said about the structures at Pembrey. Although there is no conclusive indication of the structure of the rampart, whether *glacis*-fronted or simple revetted, the latter is the most common amongst sites of the period in south-west Wales. The only well-defined structure is the four-post setting. Accepting this as a "four-poster" it can be added to Savory's distribution (180, Fig. 8.6). The small but growing number of these in West Wales probably reflects lack of excavation rather than other factors.

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The initial recognition of the importance of the area was by Nigel Kerr during the Trust's survey of forestry and archaeology in Dyfed. The sites were surveyed and the excavations directed by the author and Terry James. The site supervisor was Nick Taverner and excavation and survey staff included Gwilym Bere, Angus Clark, Jamie Hampton, Jessie Seaton and John Wright. Angus Clark was responsible for on site public relations.

Particular thanks are due to Don Benson and Terry James for their collaboration in every aspect of the project and to Mr. W. H. Morris for his help and encouragement and for information on the historical background. Thanks are also due to Dr. Sian Rees for useful comments on the text. Specialist reports are largely freely adapted and integrated into this report, but full acknowledgement can be made of the following contributions: most particularly Dr. G. Hillman for his work on the plant remains, and Mr. P. Wright for a study of the soils; also Dr. H. N. Savory for reporting on the prehistoric pottery; Heather James for comments on the Romano-British pottery and Dr. Q. Dresser for the radio-carbon date. The basic work on the finds and samples was by Sally Moss and Dorothy Williams. The publication drawings were by Steve Crummy and Ken Murphy. Typing was by Maureen Higginson and Dianne Hood. Thanks are again due to my wife, Dorothy Williams, for translating the text into English.

Grateful thanks are due to the Forestry Commission for their co-operation during both the survey and excavation project and during their re-planting programme. Also to Mr. John Davies of Penllwyn Uchaf Farm for his co-operation in allowing the access of equipment to the site and permitting the survey of sites on his land.

APPENDIX—
POSSIBLE EVIDENCE OF GRAIN-ROASTING AT IRON AGE PEMBREY

A Short Summary of Results From The Charred Remains of Plants[14]

BY GORDON HILLMAN[15]

THE SAMPLES

The excavator sampled a range of deposits from the Court Wood Enclosure for charred remains of plants which he recovered by large-scale floatation using an 'Ankara machine' of the modified 'Siraf' type (French 1971 and Williams 1973). Charred grains of cereals proved to be present in all 15 flots derived, in turn, from a range of pre-rampart deposits as well as from deposits associated with the four-post structure behind the ramparts. (See excavator's report above). However, it was only in the very dark deposit (68) in the pre-rampart levels (see p. 14 above) that charred grain

was present in high concentrations, namely at a mean frequency of 75 grains per kg of deposit; elsewhere, charred grain was sparse and frequencies ranged from 0.5 to 2 grains per kg. Remarkably, chaff remains were almost entirely absent and weed seeds were very rare.

THE CROPS PRESENT AND THEIR CHRONOLOGICAL IMPLICATIONS

(a) *Pre-rampart deposits*

Here, the predominant crops were Emmer wheat *(Triticum dicoccum)* and Spelt wheat *(T. spelta)*[16],and it is not unreasonable to assume that these crops were grown by the settlement itself—presumably in fields not far away. Charred grains of the two wheats were recovered always as a mixture and it is possible either (i) that they became mixed subsequent to being processed as clean grain (whether before or after deposition) or else (ii) that the two species were sown together in the same fields as mixed crops. Certainly, on the relatively poor, podsolic soils around the site, (see excavator's report above) such a mixture would quite possibly have offered a useful insurance policy against severely reduced yields in dry years[17]. Barley of the usual, six-rowed, hulled form was also present in these levels but, like the wheats, it was represented only by chaff-free grain. In free-threshing crops such as barley, however, absence of chaff remains is not unusual. A few grains of oats and a single grain of rye probably represent no more than stray weeds.

Present evidence suggests that, for most parts of Britain (Wales included), this combination of Emmer and Spelt (along with the usual six-rowed, hulled barley) is characteristic of the Late pre-Roman Iron Age in particular: spelt seems to have arrived in the Early Iron Age[18], and to have slowly ousted Emmer as the principal wheat until, by Roman times, Emmer was present generally only as a minor 'contaminant' of the Spelt[19]. It has come as no surprise, therefore, that charred grain from the rich, upper, pre-rampart deposit has now yielded a date of 335±45 b.c.

(b) *Four-post structure*

Samples from this part of the site included remains of the same suite of crops as those from pre-rampart deposits except that Emmer wheat seemed to be absent. If such negative evidence were to be taken at face value, then it could be interpreted as suggesting that these deposits are somewhat later than those pre-rampart deposits containing abundant remains of Emmer. However, negative evidence is especially suspect in a case such as this in which (i) only five samples were recovered from the (four-post) phase concerned, (ii) relatively few cereal remains were preserved in these particular deposits and (iii) the usual wide range of chance factors will necessarily have been involved in any vegetable matter being preserved by charring in the first place.

Within either set of deposits, no significant variation was observed in the composition of plant remains in samples from different layers or features.

IMPLICATIONS OF GRAIN ROASTING

The composition of cereal remains from Pembrey is remarkable. Unmixed hoards of clean, prime grain of cereals—the primary product of crop processing—are generally found only in destruction deposits where grain stores have been burned *in*

situ. Such charred hoards of clean, relatively chaff-free grain are, therefore, rare on British sites. This is especially true of sites where glume wheats were grown: in damp climates, glume wheats are generally stored as spikelets and, in the event of store-burning, they are generally preserved in association with much of their chaff. In general then, when floatation recovery is applied on sites where glume wheats were cultivated, typical habitation deposits yield charred cereal remains representing only those waste by-products of grain cleaning which were used as fuel. Of these, the items most commonly preserved in charred form are the denser bits of chaff, tail grain and weed seeds[20].

In stark contrast, the cereal and seed components of all 15 Pembrey flots consisted almost entirely of large, well-formed, 'prime' grain: in total almost 800 grains, there was only one tiny fragment of chaff (a glume base), just 34 weed seeds (26 of which were wild oats) and most importantly, only 7% of the grain was of the small 'tail grain' type. Such a distinctive composition could probably be dismissed as pure chance were it not for the fact that (i) essentially similar composition was recorded in all 15 flots and (ii) these flots were recovered from a wide range of seemingly disparate deposits which appear to represent a number of phases of occupation. The charred grain is unlikely, therefore, to derive from an isolated grain hoard accidentally charred by fire and, thereafter, scattered aound the occupation surface.

Clearly, primary food products are unlikely to be wasted deliberately—unless disease infested. How then did this prime grain come to be charred? As outlined elsewhere[21], there are generally only 4 points in the sequence of grain processing at which prime grain is exposed to fire (and thence to the possibility of being charred). At the first 2 of these points, the grain is still contained in spikelets and charring would, therefore, preserve the spikelet forks (heavy chaff) along with the grain. Of the two other points, one is the roasting of germinated grain for preparing malt, and not a single Pembrey grain shows any sign of having been germinated. The only remaining point of regular exposure of prime grain to the risk of charring occurs when it is prepared for consumption by roasting over the fire and, obviously enough, it is only the clean, chaff-free grain that is used, i.e. grain in exactly the state found at Pembrey.

Roasting over an open fire offers a quick and convenient means of preparing grain for consumption and was widely used until recent times. In the Shetlands and Orkneys, Fenton (1978) relates accounts of grain roasting in round-bottomed pots or on a *hellio*—a flat stone with a clay rim, while in present-day Anatolia a pot or an upturned metal *sac* is used[22]. However, the archaeological significance of this process is that, however roasted, some grains are commonly charred, so commonly, in fact, that the Scots (like the Turks) have given the resulting, black-clad grains a special name—'ministers' (Fenton, 1978). It is clearly not impossible that the charred, prime grain from Pembrey boasts a similar origin. Certainly, roasting would also have provided a means of drying the grain and, as Fenton indicates for the equally damp climates of Orkney and Shetland, grain-drying may have been a necessity for lodged or incompletely ripe crops where the grain is susceptible to mould. Eating the grain in roasted form would thus have offered a convenient and useful means of making good use of the 'tail end of the harvest' here in this damp corner of south-west Britain.

However, despite this possible explanation for the charred remains of our uncontaminated prime grains, one would nevertheless expect to find—somewhere on the site—some charred remains of chaff preserved as a result of chaff-waste and straw having been used as fuel—just as it is on most other British sites of this period where floatation recovery has been applied. The explanation may lie in the probable abundance of wood available for fuel here on the damp, mild coastline of Iron Age Dyfed; relative to, for example, central and eastern England. Chaff and straw would, therefore, have been needed only as tinder and, in hotly burning hardwood fires, the few bits of dense chaff from the tinder tend (as on coal fires) to be turned to ash rather than preserved in charred form.

IN CONCLUSION

The charred remains from Pembrey not only provide information on the types of crops grown in the vicinity but they also offer a means of tentatively assigning the site to the Late pre-Roman Iron Age and a brief glimpse of at least one aspect of day-to-day life and subsistence at the settlement.

NOTES

1 The sites probably represent seasonal exploitation of the cockle beds. Limited excavation in 1910 (TCASFC VII, 1911-12) and more extensive recent excavations (inf. W. H. Morris) have produced pottery of Late Mediaeval date. Prehistoric occupation may be expected by reference to examples elsewhere on the South Wales coast, but only a few undiagnostic flints were recovered.

2 It seems worth pointing out that this cannot readily be interpreted as a wall gulley of a building, the porch of which is represented by the four-post setting. The gulley is clearly capped by *in situ* stones, while the absence of terracing on the steep slope also does not suggest this interpretation.

3 While true coastal promontories are rare in Carmarthenshire, eminences such as Pembrey Mountain, rising above the immediately coastal lowland are occupied by equivalent sites. While it is often denied that coastal promontory forts form a specific grouping distinct from inland sites, differences can be detected which include a relative increase in size and strength, these differences involving immediately inland sites as well as strictly coastal examples. These differences are particularly well defined in the Milford Haven area, although less well marked in the area around Carmarthen Bay.

4 On Hardings Down there is a close grouping of three forts, one of which has been excavated. The group occupies a comparable position on a hill overlooking a valley opening onto the Gower coast. One of the sites is a small ringwork, while the other two are examples of the crossbank type of multiple enclosure site (Hogg 1973). Both are defensively sited, of a similar size (0.6 and 0.9 Ha.) and lie within 250m of each other. Hardings Down West, like the nearby site of Llanmadoc Bulward (RCAHM 1976, 52-55, Fig. 29) was considered to have an extended history—acquiring its outer banks by addition, these ending abruptly "in the air" as at Court Wood, apparently due to their being unfinished. Both main and additional enclosures at Hardings Down West were also unfinished.

5 Common pairings involve the "satellite forts" of Forde-Johnston (1962 and 1976, 212-6) although other types do occur. It is difficult to accept Forde-Johnston's interpretation of the satellite forts as having a strategic military function (Alcock 1965a, 185); chronological differences and a variety of social and economic functional differences can be suggested for these and other pairings.

6 Such a situation has recently been demonstrated by the Trust at Lewiston Hill (*Arch. in Wales* 19, 1979, 23).

7 There is a single possible outlying system on Mynydd Llangendeirne, although this is of a different character (Ward 1976).

8 Pers. Comm. Terry James. The system is not only close to the defended enclosures at Allt Cunedda and Penlan Uchaf, but the track known as the Summerway with which it is associated terminates at the Penlan Uchaf enclosure.

9 Well documented activity of an Early Neolithic date comes from Coygan Camp (Wainwright 1967, 14-20) and Clegyr Boia (Williams 1953) while Beaker material has come from Dale Fort (inf. Prof. W. F. Grimes). Two major hillforts—Moel Trigarn and Carn Goch—also include cairns of a presumably early date.

10 A series of palisades pre-dated the rampart at Gaer, Bayvil (James 1979). As yet undated pre-rampart occupation is known from Merryborough Camp (Crossley 1964), Woodbarn Camp (Vyner 1969), Pilcornswell Camp and Broadway Enclosure (unpublished DAT excavations). C^{14} determinations are awaited from the last three sites. Hut platforms may pre-date the rampart at Moel Trigarn (St. Joseph 1961) and the site has produced material of a potentially early date, while pre-rampart occupation of Pill Rath produced crucibles of an apparently Middle/Late Iron Age type (Williams 1946).

11 The first phase pottery included shouldered jars with fingertip decoration. The second phase pottery related to the saucepan pot styles of southern Britain. The excavator saw no apparent continuity in occupation and, depending largely on the dating of a pair of bronze bracelets from the second phase at Coygan and metalwork from related sites in south-east Wales, suggested a date between the eighth and second centuries B.C. for the first phase, and a second century B.C. date for the second. However the fact that first phase artefacts lay on the old ground surface below the rampart, does suggest that the construction of the rampart followed closely after the pre-rampart activity, while the earlier dates for the end of the first style pottery and the beginning of the second can now be suggested independently of the metalwork. The bronze bracelets from the site, which were in fact unstratified, can now also be attributed to the third or fourth centuries B.C. (Savory 1976a, 26).

12 The method used is the Clark calibration (Clark 1975). Ignoring the additional standard error, resulting from the use of a short-lived sample, gives a 1 sigma range of 450-390 B.C.C. and a 2 sigma range of 550-195 B.C.C. Introducing the additional standard error gives a 1 sigma range of 470-235 B.C.C. and a 2 sigma range of 735-135 B.C.C.

13 A little cereal pollen comes from Merryborough Camp (Crossley 1974) and Llanllwch Bog (Thomas 1965).

14 Primary score sheets and full tabulations of processed data are to appear elsewhere as part of a more detailed report.

15 Department of Plant Science, University College, Cardiff.

16 That grains of both species were present in this mixture could be deduced only from the presence of extreme morphological types that are unique to either species. However, the usual range of unassignable forms of intermediate morphology were also represented, of course.

17 Reaping, however, could well have posed a problem on account of differences in the ripening dates and height of ears of either species. On the other hand, the mixture poses only minor problems for processing as the relatively complex operations needed to free the grains of glume wheats are very similar in both wheat types. (For details of the processing of glume wheats, see Hillman 1981).

18 The only possible exception here is the contentious find of Spelt found in what appears to have been a Neolithic deposit at Hembury.

19 It must, however, be stressed that yawning gaps still exist in our crop chronologies for any one area and the present picture of temporal changes in British crop assemblages can only be a crude generalisation; areas are bound to have existed in which farmers continued cultivating outmoded crops—whether out of agricultural or culinary conservatism or because the first wave of newer crops yielded poorly under local climatic or edaphic conditions. Even as recently as 1969, crops such as Emmer and naked barley could still be found under cultivation in Czechoslovakia (Kühn 1970) despite the fact that for most parts of central Europe, both crops had ceased to be cultivated on a large scale two millenia before.

20 Details of the factors responsible for—and the products preserved by—charring are outlined in Hillman (1981).

21 The points at which crop products are exposed to fire are indicated by 'F' in the flow diagrams (Figs. 5, 6 and 7) in Hillman (1981).

22 In the Near East the toasted grain (Turkish *kavurmac* or Arabic *qualiye*) is commonly consumed as it is, while in Orkney and Shetland Fenton (1978) indicates that it was ground or crushed, mixed with buttermilk and eaten either as it was (i.e. as *louts*) or 'baked into thick cakes'.

ABBREVIATIONS

Acta. Univ. Agric. Brno	Acta Universitatis Agriculturae Brno
Arch. Camb.	Archaeologia Cambrensis
Arch. in Wales	Archaeology in Wales
Arch. J.	Archaeological Journal
BBCS	Bulletin of the Board of Celtic Studies
Carms. Ant.	Carmarthenshire Antiquary
TCASFC	Transactions of the Carmarthenshire Antiquarian Society and Field Club

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RCAHM, 1917. Royal Commission for Ancient Monuments Inventory for Carmarthenshire.

RCAHM, 1964. Royal Commission for Ancient Monuments Inventory for Caernarvonshire.

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The area surveyed from the air. The two defined enclosures and lynchet (M) are indicated.

Plate 1. From the south-east 1959, before planting (Cambridge University Collection. Copyright reserved).

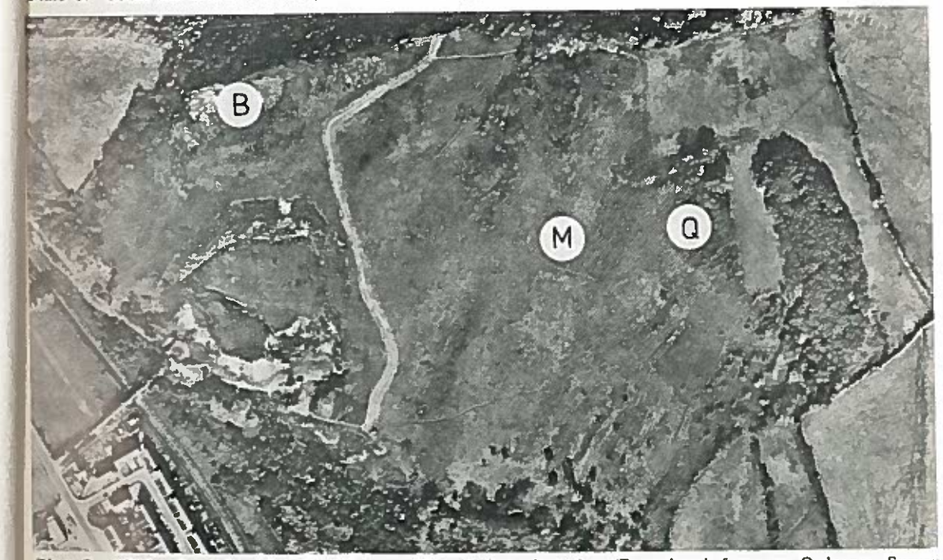

Plate 2. 1964, after ploughing for Forestry Commission plantation (Reproduced from an Ordnance Survey aerial photograph with permission from Her Majesty's Stationery Office, Crown Copyright reserved).