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CASTLE AN DINAS, ST COLUMB MAJOR, CORNWALL

ARCHAEOLOGICAL SURVEY REPORT

Sharon Bishop



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Research Report Series 110 - 2011

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ST COLUMB MAJOR
CORNWALL**

ARCHAEOLOGICAL SURVEY REPORT

Sharon Bishop

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SUMMARY

The analytical survey of Castle an Dinas shows that enclosure of the hilltop was of several phases. Two, perhaps three barrows were constructed on the hill in the early Bronze Age. In the later Bronze Age or early Iron Age the hilltop was enclosed by a small bank and ditch and later in the Iron Age, probably after 400BC, the massive ramparts of the hillfort were constructed and subsequently enhanced. The hillfort may have continued in use until the 1st century BC but occupation does not appear to have been intensive or prolonged. The abandoned earthworks lent themselves to tradition and tales of romance until the discovery of Wolframite in 1915, when they were modified as the hilltop became the hub of industrial activity. Castle an Dinas mine closed in 1957.

CONTRIBUTORS

Sharon Bishop and Elaine Jamieson (Archaeological Survey & Investigation) carried out the field survey with the assistance of Derwin Gregory and Robert Skinner (English Heritage Professional Placements in Conservation - EPPIC). Deborah Cunliffe (Imaging, Graphics & Survey team) penned the survey drawing for publication. This report was produced by Sharon Bishop, incorporating comments from Elaine Jamieson, Mark Bowden, David Field and Graeme Kirkham.

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The image on the front cover shows Derwin surveying rampart 3.

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INTRODUCTION

The Iron Age multivallate hillfort of Castle an Dinas, St Columb Major, Cornwall has a colourful history full of mythology and tradition, romance and passion. It features in Cornish folklore as one of the seats of the Duke of Cornwall (Padel 1981) and, as with many sites in Cornwall, is linked with the romantic legends of King Arthur (eg Jenner 1921). More recently it has been the scene of two notorious crimes of passion (Rabey 1979). The hillfort encloses two possible early Bronze Age barrows and in the early 20th century the ramparts were altered to accommodate Cornwall's premier tungsten mine (Brooks 2001).

Its specific history is somewhat of a mystery, however, as the site has received relatively little archaeological attention. Small scale excavation in the early 1960s (Wailes 1963; 1964; 1965) has led to the suggestion of a Neolithic date for the earliest enclosure on the hill (HER PRN: 21602) but this is not borne out by the earthworks. A detailed analytical survey was conducted in February and March 2011 at the invitation of The Cornwall Heritage Trust, through the Historic Environment Service at Cornwall Council. This report sets the hillfort in its landscape and historical context and the survey provides accurate information for on-site interpretation, the publication of excavations undertaken in the early 1960s and the conservation management plan (Bowden 2010, 2). Castle an Dinas is one of two hillforts by the same name in Cornwall, which can lead to some confusion in the literature; the other is situated further to the south-west, at Ludgvan near Penzance.

Location and topography

Castle an Dinas is located 3.5km east-south-east of the small town of St Columb Major, near the centre of Cornwall in south-western England (Fig 1). It is one of the largest and most impressive hillforts in Cornwall, sited in an imposing position with panoramic views. The St Breock Downs form the near horizon 5.5km to the north and the slightly larger granite knoll of Belowda Beacon is about 2.5km to the east. The massive mountains of waste material from the extensive china clay workings, known locally as the 'Cornish Alps', dominate the skyline on the Hensbarrow Downs 5km to the south, beyond Goss Moor. The landscape is more open to the west and on a clear day patches of brilliant blue sea off the north Cornwall coast can be seen.

Settlement is generally dispersed, comprising scattered farmsteads and hamlets, the small medieval market town of St Columb Major and the post-medieval industrial settlement of Indian Queens. The site occupies the watershed between four drainage areas: tributaries of the River Menalhyl rise to the west and northeast; of the River Porth to the south-west; the River Camel to the north and east, and the River Fal to the south, in Goss Moor. They flow along deeply incised valleys, connecting Castle an Dinas with the north Cornish coast and the much broader Fal estuary to the south.

The hillfort has a high amenity value, offering visitors an illusion of remote wilderness that contrasts with more clinical perfectly mown sites elsewhere (Thurley & Preston Jones 1990, 35). It is centrally placed close to the arterial A30 road with a car park and free entry. The walk to the hillfort is a steady gradient, with gates rather than stiles making it accessible. A public footpath passes through the eastern edge of the site, from north to south, although visitors are afforded open access of the ramparts. The hillfort hosts the annual midsummer bonfire lit by the St Columb Major branch of the Old Cornwall Society.

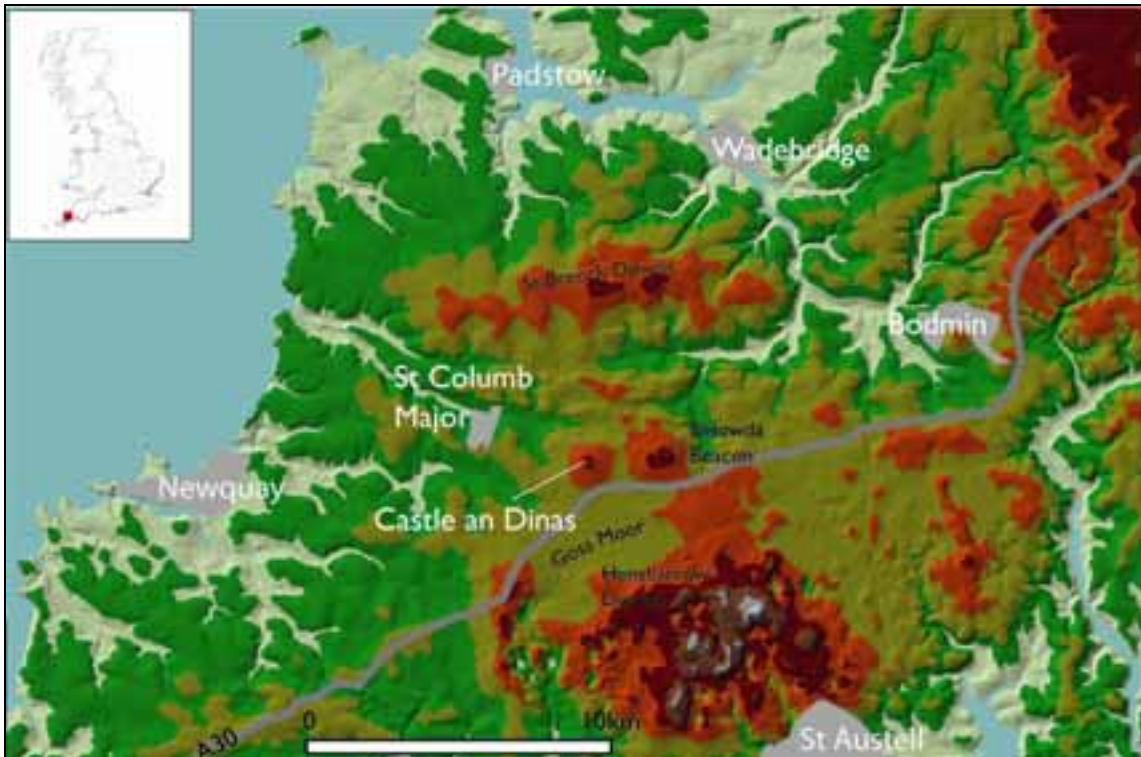


Fig 1: The location of Castle an Dinas, Cornwall. Relief shaded at 50m intervals; shown at 1:250,000. Height Data: Licensed to English Heritage for PGA, through Next Perspectives™.

Geology and vegetation

The hillfort crowns the summit of Castle Downs, a granite knoll that rises to nearly 215m within the rolling plateaux of the central Cornish 'Killas' (Countryside Agency 1999, 180). The ramparts occupy the area between the 205m and 210m contours. The bulk of the hill is composed of the grey slates of the Lower Devonian Meadfoot Beds overlain with slaty mudstone and siltstone soils of the Hafren soil association, with an outcrop of granite on the north-western side of the hill (Ordnance Survey 1982; SSEW 1983; Brooks 2001, 97). The intrusion and genesis of the granite, around 290 to 270 million years ago, was associated with complex metamorphic processes that have resulted in a variety of rich mineral deposits across south-west England (Webb 2006, 19). Erosion of the granite has

produced the mineral rich acidic soils that form the moorland basins and valley bottom gravels (Newman 2006, 126; Henderson 2007, 30).

Macroscopic observation has identified four phases of igneous activity at Castle an Dinas, resulting in the presence of a Wolframite lode that is almost unique in Cornwall for its strike [15° east of north] and the almost complete absence of other metallic minerals (Kear 1952; Goode & Hawkes 1982). Wolframite is the ore mineral for tungsten, known for its high melting point and strength and used in the production of hard materials - alloys and steels. The lode outcrops on the northern side of the hill and was first identified in 1915. It comprises an almost vertical fissure, up to 0.9m wide, which was mined between 1916 and 1957 (Davison 1920, 349; Brooks 2001).

Today the hilltop can be described as a pocket of rough ground comprising dry lowland heathland surrounded by recently enclosed land, which at the time of survey [early 2011] was used as pasture fields. The fields immediately around the monument were improved and enclosed during the Second World War and are characterised by their rigidly straight sides. Beyond are the morphologically different field patterns, on the lower slopes and valley bottoms, which appear to derive from medieval or perhaps earlier cultivation (Thurley & Preston Jones 1990, 19; CCC 1996).

Cornwall's remnant heathland is recognised as of international importance because of its association with well-preserved archaeological remains and the exclusive wildlife habitat that it provides. Bracken, gorse and brambles expanded over the site at the expense of heathers from the 1960s onwards, when regular summer grazing by cattle ceased (Thurley & Preston Jones 1990, 19). The Cornwall Heritage Trust is attempting to reinstate regular sheep grazing to keep the vegetation under control (Tony Blackman, pers comm).

LANDSCAPE HISTORY

The south-western peninsula has a distinctive archaeological character that undoubtedly owes much to its physical geography; its remoteness from the rest of southern Britain and the dominance of the sea, which both connects it with the wider world and acts as a very real physical and conceptual boundary (McOmish 2000; Henderson 2007, 24). Atlantic sea routes have provided means of exploration, communication, trade and exchange for over 6000 years and this is reflected in the morphology of some of the monuments, aspects of material culture and shared cultural characteristics. Contact was not at a static level or driven solely by developments elsewhere, but a more dynamic process involving the fluctuating movement of people, objects and ideas up and down the coastlines. The patterns observed in the archaeology reflect the development of regionally distinctive responses to engaging with and managing the landscape (Fox 1961, 55; Rippon 2007, 121; Kirkham 2011, 109).

The earliest archaeological evidence around St Columb comes in the form of a handful of isolated Mesolithic finds [a flint pick, a mace head and a flint scatter], which indicate some small-scale localised activity. The early Neolithic period in Cornwall is characterised by the presence of burial monuments and hilltop occupation sites known as tor enclosures. The Giant's or Devil's Quoit is located about 2km to the west of Castle Downs, making it the earliest known monument nearby. It was a simple rectangular dolmen which was converted to a pigsty by the early 19th century (Lysons and Lysons 1814) and finally collapsed after 1870 when the stones were broken up and re-used in walls and hedges or buried. The possible capstone survives partly buried beneath a hedge (Johnson 1978, 5). The monuments, along with the appearance of gabbroic pottery and ground stone axes, all point to the exploitation of a wider range of natural resources in the Neolithic. The landscape was also made more open, with areas of woodland cleared and maintained by domestic livestock, some cereal cultivation and the leaching effects of heavy rainfall (Cunliffe 2005, 52; Rippon 2006, 46).

The later Neolithic and early Bronze Age periods are closely linked by the nature of their monuments. Settlement evidence remains scarce but the number of standing stones, stone rows, round barrows and scatters of lithic material spread amongst them indicates an intensification of ceremonial activity across the landscape (Jones 2005, 140; Rippon 2006, 49). A cluster of monuments survive on the St Breock Downs nearby, where the barrows are silhouetted on the northern horizon from Castle Downs. They are accompanied by standing stones including the St Breock Down monolith, which is the largest in Cornwall, and the Nine Maidens stone row, also unique as the only confirmed stone row west of Bodmin (Jones 2005, 51; Rowe 2005, 83). Smaller groups of barrows sit on Belowda Beacon and on Castle Downs. Other barrows nearby are suggested by the name 'Barrow Close' on the Tithe Award map (CRO: St Columb Major Tithe Award) and the presence of several circular cropmarks mapped from aerial photographs (eg HER PRN: 75736). Two possible hengiform sites revealed by recent work on the A30 nearby can be added to this overall pattern (Clark & Foreman 2009).

As elsewhere in Southern Britain, a trend towards enclosure becomes evident in the late Bronze Age and early Iron Age (Brück 2007, 26; Rippon 2006, 54). In the south-west the hilltop enclosures from this period are on a modest scale involving only very simple single bank and ditch systems. For example, the middle to late Bronze Age large hilltop enclosure at Liskeard (Jones 1998-9, 67) and the early Iron Age palisaded enclosure at Raddon, Devon, which predates the hillfort (Gent & Quinnell 1999, 66). Other pre-hillfort activity on hilltops may have been unenclosed (Brück 2007, 30).

The Cornish Iron Age is characterised by what are usually referred to as 'defended' sites: hillforts, cliff castles and the enclosed farmsteads known as 'rounds'. Their distinctive character has been recognised for some time (Fox 1952; Johnson & Rose 1982). Comparatively little is known about unenclosed settlement from this period, although excavations at Higher Besore, Truro, highlight the potential for these to have formed part of the contemporary dynamic settlement pattern (Nowakowski 2011, 247). A regional style of burial can be distinguished dating from the 4th century BC to the mid-1st century AD. The usual form is for crouched inhumations with the head to the north buried in individual graves within cemeteries (Quinnell 1986, 118; Cunliffe 2005, 551).

Most excavated hillforts were apparently redundant by the mid-1st century AD (Johnson & Rose 1982, 156). The round continued as the most common settlement type, use apparently peaking in the 2nd and 3rd centuries AD alongside the courtyard houses of West Penwith which appear to date to the 2nd to 4th centuries AD. Square and rectangular rounds are often assumed to be Roman in date but definitive dating evidence is lacking (Quinnell 2004, 213; Rowe 2005, 117). There is little sign of Romanisation in the Cornish landscape generally, or for much Roman impact on basic life styles (Rippon 2006, 61). Some coastal sites, like Tintagel, appear to have flourished in the late Roman and early post-Roman periods, acting as significant ports of trade (Barrowman et al 2007).

Reconstruction of the early medieval settlement pattern across Cornwall relies heavily on place names and folk traditions (Rose & Preston Jones 1995, 52). Some rounds continue into the 5th and even the 7th centuries, perhaps alongside the open farmsteads and hamlets, often identified by the prefix *tre* from the 8th century onwards, that were to become the norm by the 10th century (ibid 66; Rippon 2006, 64). Seasonal settlement was widespread (Herring 2011b, 265). Strong folklore traditions locate early medieval assemblies at a range of earlier sites, including the St Breock Down monolith, and locate rulers in cliff castles and hillforts. Castle an Dinas sits near the southern boundary of the hundred of Pydar, the approximate course of which is now followed by the A30 but was already an *eald stræt* in 960 (Padel 2010, 213). The boundary route may reflect an earlier tribal division and incorporates stretches of ridgeway that may have been used since prehistory.

Castle an Dinas, the surrounding downs and several farms formed part of the medieval Manor of Reterth, in turn part of the Manor of Rialton (Henderson 1930, 66). The Manor of Rialton had been given by one of the Earls of Cornwall to the Priory and

Convent of Bodmin (Lysons & Lysons 1814, 66). All of this property passed to the Crown at the Dissolution and was annexed to the Duchy of Cornwall, who managed it from their administrative centre at Lostwithiel (Henderson 1930, 66; Preston Jones & Rose 1986, 163). Use of Castle an Denny's Down as common in the medieval period is confirmed by a sale document of 1593, which also mentions a turbary on Gosmore (RIC: HA/1/9).

The 19th century saw some changes on the hilltop. Potatoes and turnips may have been planted on the summit in 1801, by way of agricultural improvement (Barton 1972, 191), and a quarry was opened up in the interior before 1815 (Hitchins & Drew 1824a, 431; CRO: St Columb Major Tithe Award). Parts of the lower slopes of Castle Dennis Down were enclosed by a Bill of 1817 (RCG 1817; 1820) and parcels leased in 1826 (CRO: X62/24/1). Sporting rights across the common were granted in 1865 at a yearly rent of five shillings (CRO: W/37) and in 1870 there was still an annual custom of lighting the furze to keep back the growth for pasture (Barton 1972, 191). Growth of the China Clay industry and railway created the large industrial settlement of Indian Queens to the south-west (Henderson 1930, 67).

The 1907 (1:2,500) Ordnance Survey map shows a benchmark on the easternmost of the two stones at the northernmost barrow and a trigonometry station on the southernmost barrow, which has since been removed. The hillfort remained in open grassland until the surrounding hilltop was ploughed and improved during the Second World War (Thurley & Preston Jones 1990, 2). The earliest available aerial photographs were taken in 1946 and clearly show the hillfort surrounded by cultivated fields. The worn trackways associated with the tungsten mine are also clearly visible.

Mining

The south-western peninsula's mineral wealth is often cited as a major stimulus for contact in prehistory (eg Cunliffe 2005, 206) but physical evidence is limited. Tin from behind the eyes on the early 1st Millennium BC Gundestrup Cauldron has a distinctive metallurgical signature which links it with Cornwall (Nielsen *et al* 2005, 38-9) and other isolated finds such as ingots are known but extraction sites remain elusive. They almost certainly focused on the alluvial deposits worked by panning and surface collection and were probably destroyed by extensive later re-working (Newman 2006, 136; Rippon 2006, 50). The process of using water to separate the tin ore [cassiterite] from surrounding geology, known as 'tin-streaming', was probably used from prehistory through to the 19th century.

Streamworks on Tregonetha Downs, to the north-east, and numerous prospecting pits on the lower slopes of Castle Downs were mapped from aerial photographs and have been suggested as early medieval in date (HER PRN: 37433). The Lanherne valley has been streamed for alluvial tin for centuries and from the 13th century there were tinner's settlements at Trevarren and Ruthvoes (Rabey 1979, 67). A note from 1683/4 refers to a 'rytche myne of sylvere oore' on land to the north of Castle an Dinas (CRO: ME/2509)

and several mine shafts are marked in surrounding fields on the Tithe Map (CRO: St Columb Major Tithe Award).

The advent of the First World War made the supply of tungsten vitally important. A local tin streamer, suspecting the presence of Wolfram, obtained a mining lease from the Duchy of Cornwall and began searching for a lode on the northern side of the hill (Davison 1920, 348; Brooks 2001, 11). By July 1915 the lode had been proved in several places by costeaning; sinking pits about 3m apart down to the bedrock and holing from the bottom of one pit to another. A prospect shaft sunk on the north of the hill produced an encouraging assay and so levels were started. In 1916 Great Western Ores Ltd was formed to equip the mine and developed the levels over the next couple of years, until South Crofty bought it in 1918. By December 1920 the price of Wolfram had dropped significantly and all work was suspended. The price recovered in 1929 and mining restarted towards the end of the year. Despite the higher price ensured by the lack of other minerals in the lode work was suspended between January 1932 and July 1933. After which development and production continued until the mine finally closed in 1957 (Rabey 1979, 68; Brooks 2000, 32).

The mining operations extended through the hill, with up to eight levels either side of the granite. Adits provided access to the upper two levels to the north and shafts were sunk to both north and south. A ventilation shaft was sunk inside the hillfort, near the northern ramparts, and several others outside (CRO: MRO/15156). An aerial ropeway known as a blondin was installed in 1943 to transport ore from the south shaft to the mill on the northern side of the hill (Brooks 2001, 63). Buckets with a 4CWT capacity were carried overhead by a continuous ropeway held aloft by a series of pylons. The pylons used concrete footings on earthwork platforms cut from the ramparts. Other sections of the eastern ramparts were levelled to allow the buckets to travel unimpeded and allow miners access to either side of the mine (Preston Jones & Stanley 2011, 10). Creation of the surrounding fields in the Second World War has resulted in the realignment of public access through the mine's south-eastern entrance.

The Second World War

The Royal Observer Corps had a monitoring post on the high ground at Quoit, about 2km west of the hillfort, and one of the mine adits north of the hillfort was used as an operational base by the St Columb Major auxiliary unit. A large chamber was dug out for use as a bunker approximately 100 yards down the tunnel. It had natural rock walls with no linings and heavy wooden doors. The bunker was fitted out with bunks and used to store explosives such as gelignite and dynamite.

ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

Castle an Dinas is a prominent feature of the central Cornish landscape which has long caught the imagination of local inhabitants and visitors to the peninsula. It has been described as Cornwall's finest hillfort (eg Cornish 1906, 461) and understandably features in a range of county surveys (eg Hals 1750), parochial histories (eg Hitchins and Drew 1824) and the notebooks of several antiquarians (eg Borlase 1758). There was a small scale archaeological investigation in the early 1960s and the site has benefitted from conservation work undertaken since the Cornwall Heritage Trust took ownership.

Mythology and notoriety

Castle an Dinas is traditionally seen as the place of early medieval assembly for Pydar hundred (Preston Jones & Rose 1986, fig 2). This is probably largely due to its role in Cornish folklore and such mythic associations may reflect the continued perceived significance of the site, from its prehistoric beginnings into the post-Roman and medieval periods. In the 15th century William of Worcester wrote that 'Tador' Duke of Cornwall was killed there (Cornish 1906, 461) and the early 16th century Cornish miracle play 'Beunans Meriasek' [the life of St Meriasek] places one of the castles of the Duke of Cornwall at Castle an Dinas in Pydar Hundred, with the more important centre at Tintagel (Padel 1981, 71).

Although Castle an Dinas does not feature in continental versions of the Arthurian Romances its incorporation into local accounts suggests they may have some foundation on an authentic piece of Cornish folklore associated with the Tristan stories (ibid). Tristan was nephew to King Mark of Cornwall: he was a knight of Arthur's round table and his romance with Iseult, Mark's intended bride, has been told and retold (eg Quiller-Couch & du Maurier 2004). Castle an Dinas is usually seen as Arthur's hunting seat, with Goss Moor the fabled hunting ground extending to the south and marked by Arthur's Stone, a standing stone near Quoit said to bear the hoof marks of Arthur's horse but now lost (Halliday 1959, 91; Rabey 1979, 13). The hillfort was also suggested as Arthur's birthplace by Henry Jenner, founder of the Cornish Gorsedd, who hoped that he and King Arthur were born in the same parish (1921, 19).

During the English Civil War the remnant of Hopton's Royalist army spent two nights in the open moors near Castle an Dinas (Coate 1963, 208) although this is often interpreted as camping within the hillfort (eg Preston Jones & Stanley 2011, fig 15). Hopton's forces were undisciplined and demoralised: his position was hopeless and he was pushed back to Truro, where in March 1646 he consented to treat with Fairfax (Halliday 1959, 257; Gaunt 1987, 34).

In the late 19th and early 20th century two crimes of passion at Castle an Dinas brought notoriety to the area (Rabey 1979; 1984; 1986). Around 1889 the murderer of one woman was found in the old mine workings having become trapped and subsequently

starved to death. In 1904 the body of 17 year old Jessie Rickard was found in one of the hillfort ditches. She had been shot by her lover, who was found nearby a few days later having shot himself in the head with the same revolver.

Antiquarian and archaeological enquiry

Richard Carew's Survey of Cornwall, published in 1602, marks the spirit of creative enquiry associated with the Renaissance and Reformation (Halliday 1953, 49). It was only the second county volume to be printed, after Kent. Carew gives a simple description of Castle an Dinas' 'deep treble trenches' and notes a great causeway leading to it (ibid, 220). John Norden's perambulations took place between 1597 and 1601 but his descriptions and accompanying maps were not published until 1728 (ibid, 50; Norden & Ravenhill 1972, 19). Norden included features that Carew had overlooked and his maps provide the first illustration of the hillfort, which is shown as a walled ring crowning the hill. Castle an Dinas is the only site depicted with this symbol on any of Norden's maps of the nine Cornish Hundreds, which again suggests that the site was still thought of as significant, albeit perhaps because of its romantic mythology. This perceived significance may help explain John Leland's apparent confusion in 1538 at seeing no building, only 'an hille' bearing the name of 'castle' (Toulmin Smith 1964, 184).

Most of the antiquarians describe three circuits of ramparts and where accompanied by plans the ramparts are portrayed as perfect circles (eg Tonkin 1736; McLauchlan 1849; Borlase 1871). The first to accurately reflect the shape of the hillfort was Samuel Lysons, who surveyed the site in the 1790s at a scale of 450 feet to an inch (British Library: MS 9462 Folio 18b). The survey was published alongside Warbstow Burrows [Warbstow Bury] as examples of ancient earthworks in Cornwall (Lysons & Lysons 1814, plate between pages ccxlviii and cclix).

McLauchlan's references to 'excavations' probably relate to recent [early-19th century] quarrying rather than antiquarian excavation (1849, 26). Borlase excavated the northernmost barrow and found two pits, the southernmost barrow being already disturbed (1871, 19). A hand written note accompanies his plan but gives no details of any finds. The only other archaeological excavations were conducted by Bernard Wailes over three summers in the early 1960s (1963; 1964; 1965) and as part of the more recent conservation work in 1994 (Preston Jones 1994, 9).

Wailes' excavations were small in scale (Fig 2) but were accompanied by an earthwork survey, magnetometer survey and phosphate analysis. An interim report was published for the first season (1963) but only short progress notes were produced for the subsequent excavations (1964 & 1965). A recent reappraisal of Wailes' notes gives an indication of the total area excavated (Blick 2009, fig 5) but no more description of the artefacts. In the first season trenches dug across all four rampart circuits [Trenches 1 & 2] showed them to be of simple 'dump' construction of stone and earth, without retaining walls or revetting (Wailes 1963, 52). Wailes dismissed the northernmost barrow,

including the protruding stones, as spoil from the 'spring' hollow and appears to have confused the 'spring' with the post-medieval quarry (ibid, 54). An irregular area of cobbling was identified to its north-east [Area II], near the lowest point of the interior where differences in the vegetation suggest it is usually wet.

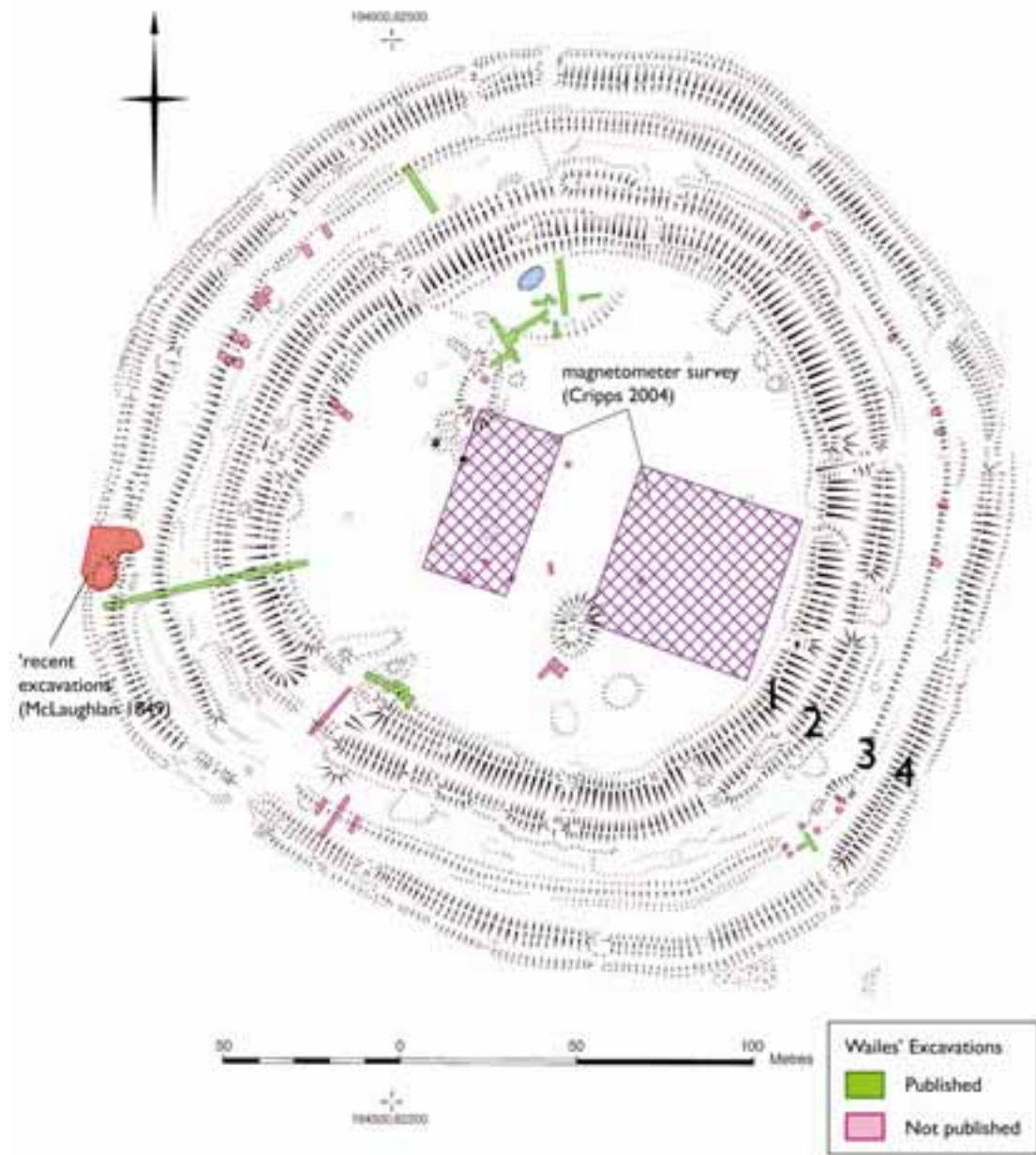


Fig 2: Archaeological interventions
 The survey is shown reduced to 1:2000 with the approximate locations of published excavation trenches after Wailes (1963, 1964 and 1965); unpublished trenches after Blick (2009).

Rampart 1 was interpreted as a two-phase construction: the first a dump of earth and rab [a sub-soil conglomeration of granite particles bound together with clay that is common in Cornwall] with a berm on the exterior; in the second phase this berm was covered with earth and granite material probably taken from a re-cutting of the V-shaped ditch, which was cut several feet into the solid granite bedrock. Rampart 2 had only a slight ditch and was considered to function more as a counterscarp to rampart 1 than as a defensive circuit in its own right.

Wailes interpreted Rampart 3 as a much smaller construction originally, which had eroded and silted naturally and did not appear to function as part of the probably later hillfort (ibid, 52). Other features identified included postholes of a possible timber hut, a two course stone facing to the in-turn and cobbling just inside the original entrance [Trench 41] plus a possible 'original' south-eastern entrance in rampart 3 [Trenches 61 & 62]. Finds were scarce; they comprised quantities of water-worn pebbles that were interpreted as possible slingstones, a scatter of chipped flint [Trench 61] and a few small sherds of pottery, probably South Western Decorated Wares (ibid, 55; Nowakowski & Quinnell 2011, 353). The general lack of material culture was taken to indicate a single short-term phase of occupation.

In August 1963 the interior of the hillfort was cleared to facilitate a proton magnetometer and phosphate survey. There were few magnetic anomalies, which excavation found to be mostly non-archaeological. The phosphate analysis showed slightly higher phosphate levels in a sporadic ring immediately inside rampart 1. Further excavation trenches were cut with the intention of defining rampart 3 more clearly [Area III] and appeared to show that rampart 4 was later. The trenches exposed several irregular hollows that were interpreted as terminals to sections of the rampart 3 ditch (Wailes 1964a & b).

The last season of Wailes' excavations, in June to July 1964, continued work on the interior and rampart 3 (1965). Magnetic anomalies were defined in greater detail and further trenches opened in the interior which revealed some gullies and small pits, again indicative of short-term occupation. A 'careful surface study' of rampart 3 was made which identified nine breaks in the circuit or possible entrances, in addition to the two identified the previous year by excavation. All nine were tested by excavation: four were 'proved' as entrances but continuity of the ditch could be demonstrated at the remaining five where the bank had eroded. Wailes concluded that there were six entrances in rampart 3: single entrances on the south-west and north-east and 'twin' entrances on the south-east and north-west (ibid). The ditch had silted up naturally and there was no evidence of posts, cobbling, or indeed any dateable artefact. Water worn pebbles were present high in the secondary silt and were suggested as associated with the appreciably later ramparts, 1, 2 and 4. There was no evidence for occupation of the hillfort after the Iron Age.

The hillfort was surveyed at 1:2500 for Ordnance Survey mapping revision in February 1972 when only two or three gaps in rampart 3 were noted. There has been little direct

archaeological investigation since: five way-marking postholes were excavated by hand in 1994 but nothing of archaeological significance was noted and there were no finds (Preston Jones 1994, 9). Two areas in the interior were subjected to magnetometry survey in 2004 as an exercise testing the technique on Cornwall's Igneous geology (Cripps 2004, 6). They suggested two groups of postholes, one perhaps indicating a circular structure (ibid, 9).

Two important projects providing a coherent body of contextual information have been completed for the whole county. The Historic Landscape Character [HLC] of Cornwall was assessed as a pilot project (CCC 1996; Herring 1999) and the National Mapping Programme [NMP] project for Cornwall and the Isles of Scilly [COMP] was the first to be published online (Young *et al* 2007). The latter appears to have made the link between the number of breaks in the circuit described by Wailes (1965) and early Neolithic causewayed enclosures, suggesting Castle an Dinas was a potential example (HER PRN: 21602).

The prehistory of Cornwall is better understood in the uplands of Bodmin (Johnson & Rose 1994) and the rough ground of West Penwith (Dudley 2011), where early monuments and settlements are better preserved and have received more intensive archaeological investigation. Elsewhere in Cornwall important new information is coming to light on a hitherto unsuspected range and density of sites through development (Jones 1998-1999; Jones & Taylor 2010) and along linear corridors such as pipelines (Lawson Jones 2001; 2003) and improvements to the A30 road (Clark & Foreman 2009). The acidic soils mean poor survival of faunal assemblages, other organic materials and iron objects. Even substantial sites like the middle Bronze Age settlement at Trethellan Farm, Newquay, gave no indication on the surface (Nowakowski 1991, 7). Farmsteads and other sites inhabited today may mask places chosen for settlement in earlier periods (Cunliffe 2005, 57).

Conservation

Castle an Dinas is a Scheduled Ancient Monument [CO 93] owned and managed by the Cornwall Heritage Trust, who acquired it from the Duchy of Cornwall in 1988 (Preston Jones 1994, 5). An initial management report recommended a phased programme of scrub removal and heather heathland restoration, earthwork repair, way marking and interpretation (Thurley & Preston Jones 1990). Vegetation management commenced in 1993 and earthwork restoration was carried out by the British Trust for Conservation Volunteers [BTCV] in July 1994.

This included the repair of visitor erosion on the inner rampart opposite the entrance from the car park, the scouring of the pond and repair to the inner rampart immediately to its north, and the erection of five low way marking posts directing visitors westwards to enter the inner hillfort by the original entrance (Fig 3; Preston Jones 1994, 9). Two information panels were erected by 1994: a Cornwall Wildlife Trust board beside the

gate and a panel on a stone pillar in the car park for the Cornwall Heritage Trust. A panoramic plate pointing out various landmarks was installed inside the hillfort by the Cornwall Heritage Trust in June 2002. It stands on a stone pillar erected over the easternmost stone of the northernmost barrow.

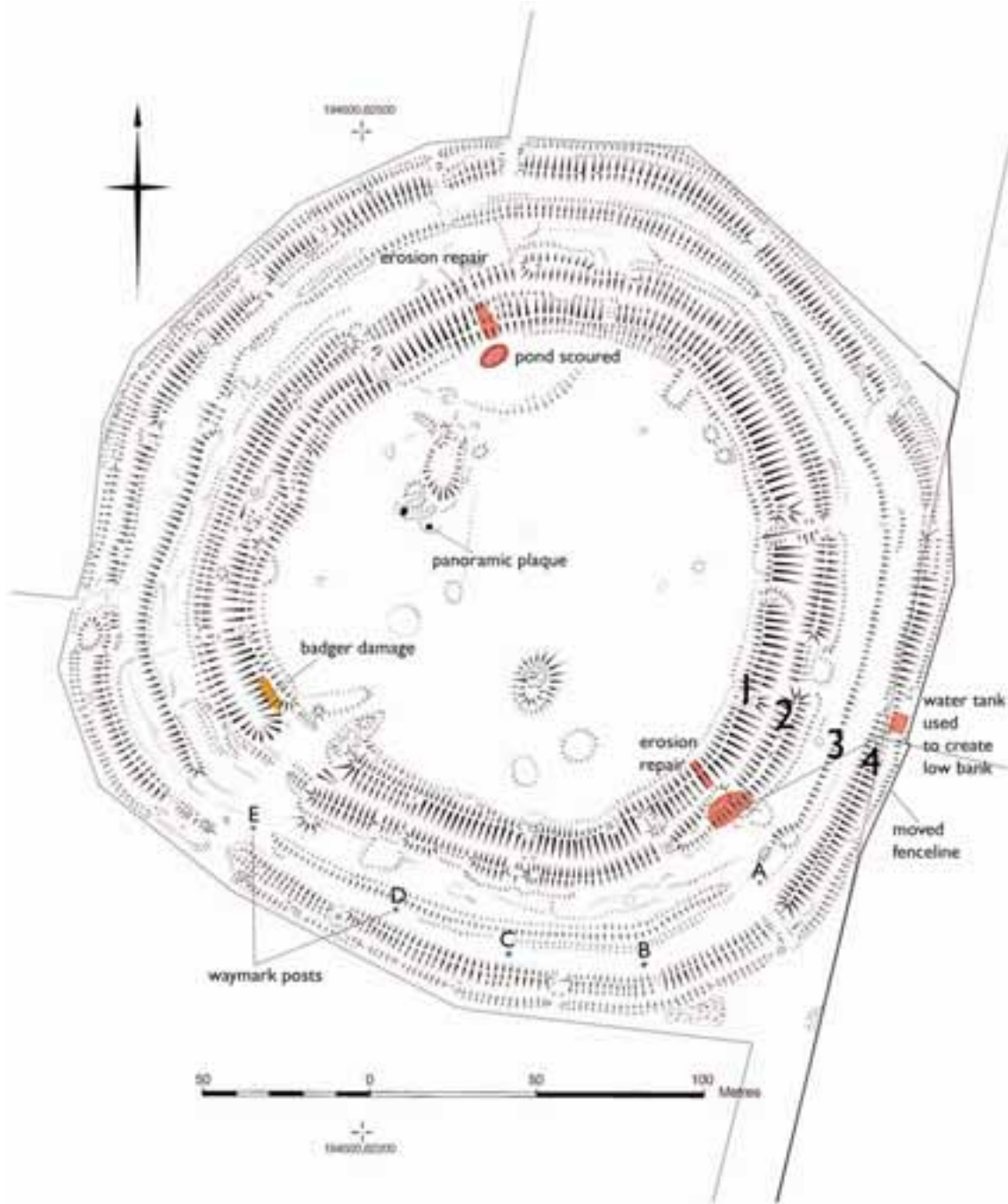


Fig 3: Conservation works.
 The approximate locations of conservation works (after Preston Jones 1994 and Preston Jones & Stanley 2011) are shown against the new earthwork survey reduced to 1:2000.

In 2009 further conservation work took place as part of the 'Conserving Cornwall's Past' project. This involved more scrub clearance and the partial demolition of a concrete water tank. The rubble was then used to create a short bank across a desire line that was suffering erosion (Preston Jones & Stanley 2011, 11). The project also commissioned educational work in partnership with the Royal Cornwall Museum and liaised with a local artist who produced a series of illustrations reflecting different periods in the hillfort's history. The recent acquisition of a narrow strip of land immediately east of the hillfort has allowed the fencing to be re-aligned beyond the edge of the monument (ibid, 10).

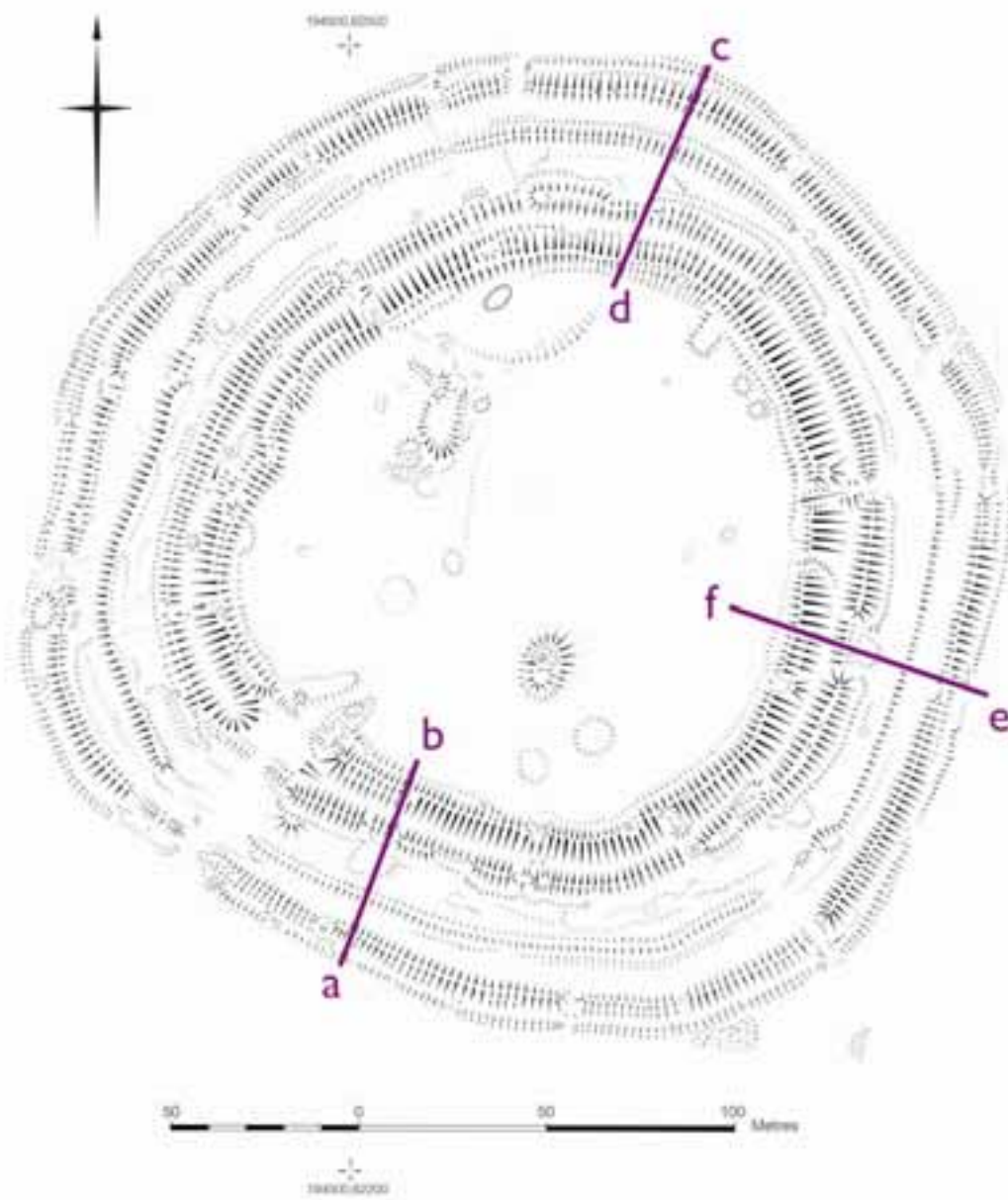
The grass was machine cut in February 2011, immediately prior to the survey, and between survey visits in February and March 2011 the fence and public gate to the south of the monument were moved closer to the car-park. Several of the surrounding fields are subject to Countryside, Entry Level and Higher Level Stewardship Agreements (MAGIC 2011) and it is hoped that the long-term well-being of Castle an Dinas will be ensured through a Higher Level Stewardship agreement (Preston Jones & Stanley 2011, 9). The mine buildings are sadly neglected at present, despite their national importance; they are overgrown with brambles and the concrete is crumbling, making access hazardous.



Fig 4: The miner's entrance, which now provides the main access to the hillfort. A waymark post and the recreated bank in rampart 2 can be seen through the gap.

THE EARTHWORKS

The earthworks comprise concentric circuits of ramparts that enclose a central roughly circular area of 1.65ha containing two heavily damaged probable Neolithic or Bronze Age barrows and a post-medieval quarry (Fig 5). The original entrance to the south-west has been supplemented by more recent cuts, mostly through the outer circuit, and other modifications associated with the early 20th-century Wolfram mine, agriculture and recent conservation work. The ramparts are numbered 1 to 4 after Wailes (1963, fig 18).



*Fig 5: The earthwork survey.
The survey reduced to 1:2000 showing the locations of the three profiles given in Fig 6.*

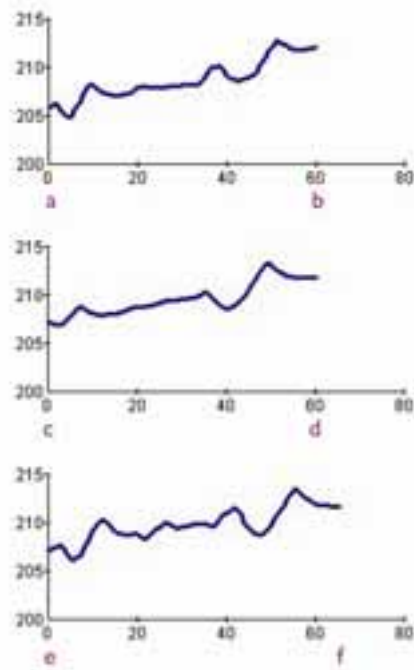


Fig 6: Three profiles across the ramparts.
The locations of the profiles are given in Fig 5.

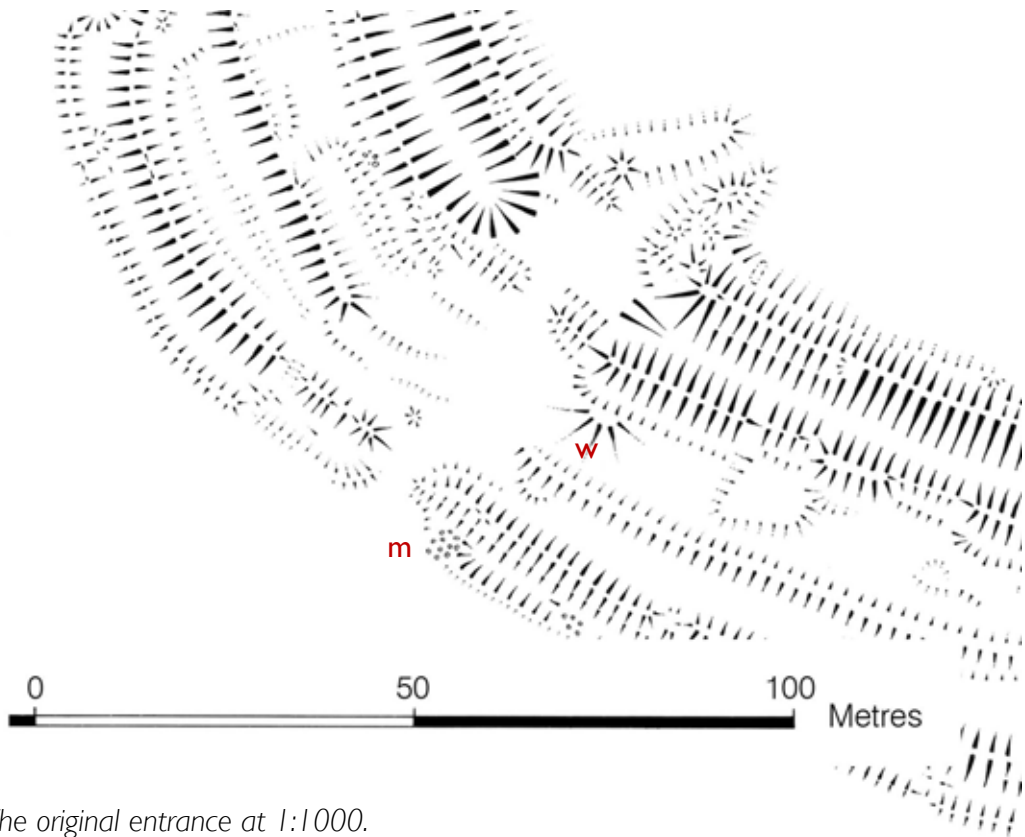


Fig 7: The original entrance at 1:1000.

The ramparts

Ramparts 1, 2 and 4 are colonised with heather and gorse whereas rampart 3 is part of the flatter, grass covered area between the more massive earthworks. Although concentric, the circuits do not define a perfect circle. They comprise relatively straight sections making up an irregular polygon (Fig 8).

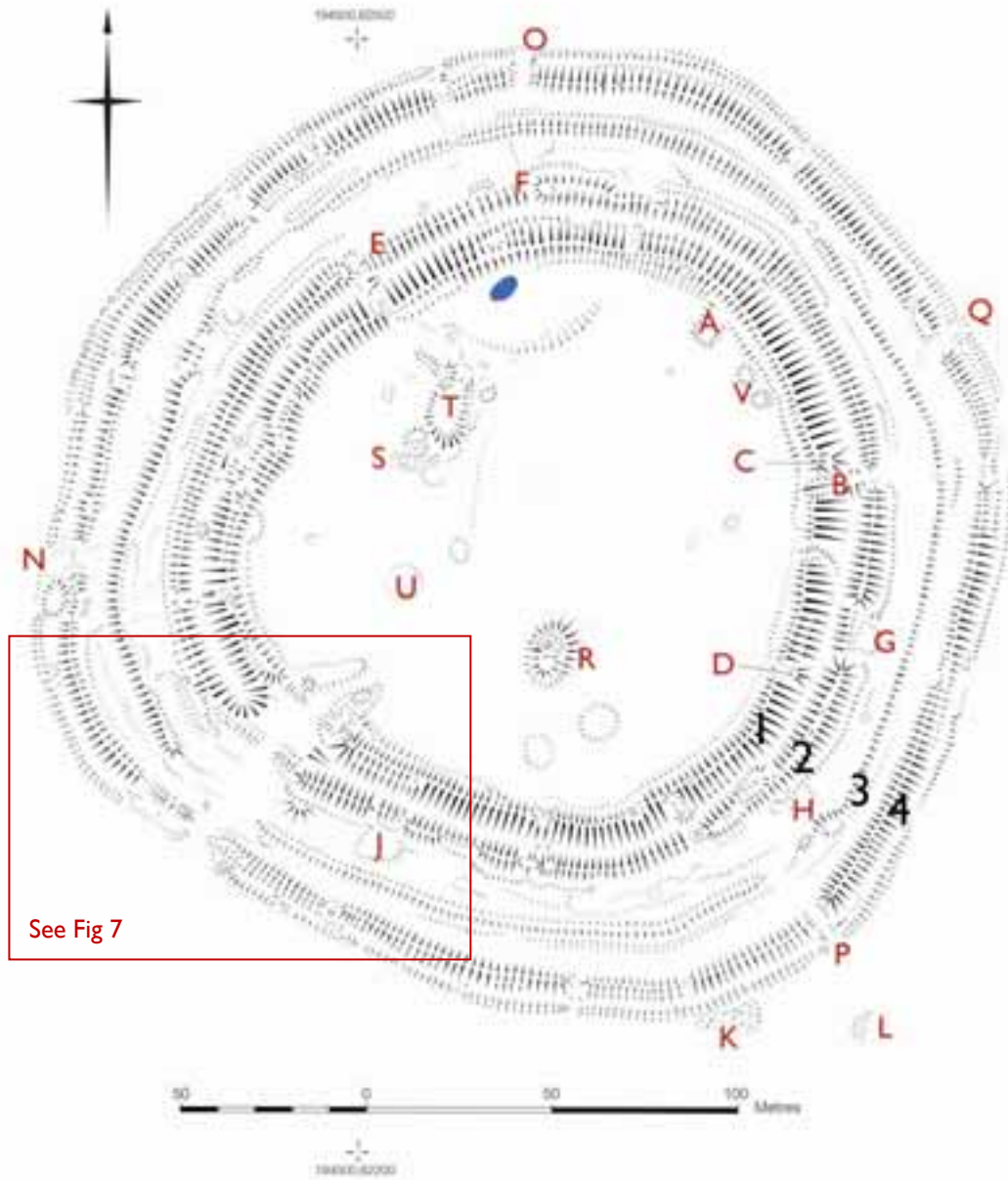


Fig 8: The survey labelled with features referred to in the text. Survey shown reduced to 1:2000.

Rampart I

Rampart I, the innermost circuit, comprises a bank and flanking outer ditch. The bank rises above the interior of the hillfort from between 0.5m in the north-west, where the gradient of the internal slope is shallower, to 1.5m in the south-east, reaching a maximum elevation of 213.8m (Fig 6). The summit of the bank is 1m wide and the base between 9m and 12m wide. The lack of quarry scoops immediately inside the circuit for material to construct the bank, as found in hillforts elsewhere, is perhaps due to the harder geology. Some slippage in the bank material has produced a shallow skirt along the interior but in places there is more of a step or low terrace, especially along the eastern side, perhaps suggesting an earlier phase of construction. In the north-east this skirts around a rectangular platform [A] that extends for 10.5m south-west from the rampart.

Changes in gradient on the exterior emphasise the junction between the dumped bank material and the cut of the ditch, especially through the granite along the western side. The base of the ditch is between 2m and 3m wide and the top about 8m across. Slight changes in depth are usually associated with corresponding changes in the bank, where various erosion scars cut through.



Fig 9: The concrete blocks left from the blondin pylon footings on platform D.

A gap of 19m defines the original entrance to the south-west, with low in-turned banks on either side extending for up to 19m to the east-north-east (Fig 7). Both in-turns are topped with small mounds, about 6m across and between 0.4m and 0.6m high, although the easternmost in-turn is much more disturbed. Two low narrow banks, about 3m wide and up to 0.7m high, reduce the entrance gap to 4.5m. Recent badger damage marks the bank immediately north-west of the entrance (Fig 3) and around the circuit a number of erosion scars cut through the top of the bank to different depths.

A more recent entrance has been cut completely through rampart I on the eastern side [B] and a corresponding causeway constructed across the ditch. Immediately to the north is a platform apparently constructed by pushing material from the top of the bank outwards [C]. A second identical platform is located 58m to the south [D] and is topped with broken concrete blocks (Fig 9).

Rampart 2

Rampart 2 is arguably the most altered of the earthwork circuits of bank and flanking outer ditch. Survival of the ditch is fragmentary; where it does survive the ditch only reaches about 0.3m deep, the base of the ditch is between 0.7m and 1.5m wide and the top about 3m wide. Two low narrow banks, about 0.5m high and remarkably similar to those in rampart I, reduce the width of the original south-western entrance from 19.5m to just 2.5m. They are flanked uphill by shallow ditches (Fig 7).

The bank rises to a maximum elevation of 212.4m in the south-east and comprises several distinct sections of different character. Much of the circuit is on a scale just below that of rampart I, rising between 1.7m and 2.6m above the inner ditch and between 0.9m and 2.2m above the outer ground surface. The summit is about 0.8m wide, with several stepped changes in height along the circuit. Changes in gradient on the inner side, facing rampart I, again emphasise where the ditch was cut into bedrock forming an almost vertical face, with some silting below at the side of the ditch.

One section of the bank was recreated in 2009 (see Fig 3) but several other sections are remarkably similar in morphology. They comprise uniform lower and narrower banks which are not quite aligned on the more massive earthworks of most of the circuit. This is particularly marked to the north-north-west, where a 50m stretch of lesser bank meets what looks like a bull-nosed terminal of the larger bank, apparently aligned slightly more to the north [E]. The junction of these two bank sections is also in line with a substantial cut through rampart I and visitor and animal erosion may be contributing to the lack of chronological clarity in the earthworks. The eastern end of the lesser bank also appears to abut a bull-nosed bank terminal, this time with a corresponding bull-nosed terminal to the outer ditch [F]. There is no sign of spread waste material immediately to the north of the lesser bank, as might be expected if material was quarried from it. Indeed, only to the east is there a small low mound of potential spoil adjacent to an example of these lesser banks [G], with possible further suggestions along the southern side [H & J]; the latter an amorphous spread to the south of up to 13m across.

Rampart 3

Rampart 3 is the slightest of the three circuits and defines an area about 220m across. It predominantly takes the form of a low bank which is most evident down-slope, where it reaches a maximum of up to 0.6m high. Up-slope the bank is little more than 0.1m high. The bank is flanked by a shallow outer ditch barely 0.2m deep and in places a very slight narrow counterscarp bank survives. Although heavily eroded where footpaths and trackways have cut across it the only real break or entrance is to the south-west, where a gap of 26m separates the two bank terminals (Fig 7).



*Fig 10: Rampart 4 as the footpath crosses it to the north-east.
The bank, ditch and counterscarp bank are highlighted by the sun and shadows.*

Rampart 4

Rampart 4 is the outermost circuit comprising bank, ditch and counterscarp bank (Fig 10). The rampart rises to between 0.9m and 1.6m high. Its summit is only 0.5m wide and in places along the outer side, especially to the south, the lower section is almost vertical and clearly cut into the rock. The ditch is between 0.3m and 0.7m deep and its bottom is between 1.2m and 2.3m wide. The counterscarp bank is between 0.5m and 1.2m high. It is artificially straightened by ploughing beyond the fence-line and the surface is much

stonier, perhaps also partly due to field clearance. Two piles of concrete and stone rubble, which are becoming overgrown, are located just outside the hillfort [K & L].

The eastern side of the original entrance in rampart 4 is quite disturbed, with a pile of rubble overlying the counterscarp bank [m] (Fig 7). There are several additional cuts. Taking them clockwise: a farm track utilises an area of post medieval quarrying immediately north of an oval quarry hollow dug into the ditch [N]; the farm track continues along rampart 3 to another cut [O]; cuts to the south-east [P] and north-east [Q] are now used by the footpath and provide access to the monument from the car-park. There are signs of later alteration at the south-western entrance similar to those observed in ramparts 1 and 2. A low narrow bank, about 0.4m high, extends for 15m from the north-western side, across the entrance, and is flanked by a shallow ditch to the south-west.

The interior

The most obvious earthworks within the interior are the two heavily disturbed probable barrows and the post-medieval quarry, to which can be added several very subtle roughly circular mounds and hollows and a more recent dump of material. The interior is also scarred by footpaths. A broad shallow hollow, about 50m east to west, occupies the lowest part of the interior, at the northern edge around the recently scoured pond. Differences in the vegetation imply that this hollow is much wetter than the surrounding hilltop and water probably collects naturally here.

The southernmost barrow is located at almost the highest point of the hill [R]. It has clearly been disturbed, causing two distinct halves to the uppermost of the surviving earthworks. It comprises a low oval platform on which the southernmost upper half is a heart-shaped mound and the northernmost half a similarly shaped depression, almost mirroring the mound. The barrow is orientated south-south-west to north-north-east. The platform stands between 0.3m and 0.5m high: its base measures 21.5m long by 16m wide and the top is 15.5m long by 10m wide. The heart-shaped mound rises a further 0.5m: its summit measures 4.7m across and the base up to 8.3m. The depression is about 0.3m deep; its bottom measures 1.5m across and the top is a maximum of 5m wide.

The northernmost barrow is even less distinct [S]. It comprises amorphous mounds and hollows which extend over an area about 17m in diameter, with two large stones 9m apart along the southern edge. The mounds are each about 0.4m high. The easternmost stone is now covered by a stone pillar for the panoramic plaque.

A hollow [T], 24m long by up to 12m wide, is 1.75m deep and open to the north. The sharp unweathered profile, patches of exposed stone and loose rubble scattered within all indicate that it is a quarry dug to exploit the granite outcrop at the north-western side of the hill. It is probably the quarry mentioned by Hitchins & Drew as 'recently opened'

(1824a, 431) and marked on the 1840 Tithe Award (CRO Tithe Award St Columb Major).

Several very slight, barely 0.15m high, circular mounds with broad flat tops are dispersed across the interior. The most obvious is the blackened site of the annual midsummer bonfire [U], which measures 11m in diameter. At the far north-eastern edge of the interior are two piles of spoil, the easternmost around a slight hollow [V].

Other features

The area between ramparts 2 and 3 is about 13m wide and relatively flat. The survey identified several very subtle scarps that are roughly parallel with the ramparts and emphasised by vehicle tracks but could perhaps indicate occupation of this area. Use of the eastern side as a route way by the miners and the subsequent footpath means this side may have suffered more from erosion, possibly eradicating already slight features. Just east of the entrance is a low, barely 0.3m high, semi-circular mound [w], which appears to be cut to the north by the outer ditch of rampart 2 (Fig 7).

The impact of mining

The discovery of Wolfram in the early 20th century (Brooks 2001) started a rapid series of changes to the hillfort. Shafts and adits were cut into the hilltop and the ramparts on the eastern side were adapted to allow access and transportation of the ore across the site. Cuts just wide enough for a single vehicle were made through ramparts 1, 2 [B] and 4 [P & Q] and the connecting trackway can be seen as white from use on aerial photographs taken by in 1946. Sections of the ramparts were levelled for the aerial ropeway (Preston Jones & Stanley 2011, 10) and two earthwork platforms created from rampart 1 to support its footings [C & D]. The mine's ventilation shaft came up near the hollow now occupied by the pond but appears to have been completely filled in as it is not evident as an earthwork. Two piles of spoil towards the north-east of the interior [V] are probably associated with modification of the hillfort for the mine.

The impact of archaeologists

A few of Wailes' excavation trenches can be traced as earthworks. Trench 2 is clearly identifiable and has left a substantial cut in rampart 1 which has since been used as a convenient footpath. The eastern end of Trench 41, across the eastern in-turn at the hillfort's original entrance, is also easily recognisable as a small rectangular hollow. Many of his other trenches were only about 1m square and are therefore difficult to trace accurately. A group of small rectangular hollows south-west of the easternmost barrow is probably from excavation and the northern end of Trench 1 is suggested by a gap in the bank of rampart 3.

The recently reconstructed bank in rampart 2, opposite the modern entrance (Fig 3), is easily recognisable. Unfortunately it does not appear to deter visitors from accessing the interior by climbing the ramparts. It is lower than the bank to either side and footpaths are clearly in use across it at either end. The site of the water tank can be traced as a flat rectangular platform now covered in grass, which otherwise blends in with the surrounding earthworks of rampart 4.



Fig 11: Castle an Dinas mine in production. The aerial photograph shows the adits to the north of the hill in the foreground and the alignment of blondin pylons extending over the hill towards the southern shaft. Extract from HV56 taken 24th June 1952: original photography held at Cambridge University Collection of Aerial Photography.

DISCUSSION

Castle an Dinas has been suggested as an early Neolithic causewayed enclosure (HER PRN: 21602) largely because of Wailes' published excavation notes (1963; 1964; 1965), the relative slightness of rampart **3** and its poor visibility on the available aerial photographs, none of which appear to have been taken in optimum conditions. The analytical survey of the earthworks shows that rampart **3** is almost continuous except for the one original entrance to the south-west. Whilst probably pre-dating the later Iron Age hillfort, the character of this circuit suggests that it is more probably late Bronze Age or early Iron Age in date. The hillfort itself is also more complex, with several phases of enhancement clearly evident in the ramparts and at the entrance.

Before the hillfort

The scatter of chipped flints found during Wailes' excavations (1963, 55) suggests some prehistoric activity on the hilltop of Castle Downs, but the earliest monumental activity appears to have been the construction of the barrows. The two large stones incorporated into the northernmost barrow and the siting of the southernmost, which occupies the highest point of the hill, are suggestive of places that had been significant for some time but that took their final barrow form in the early Bronze Age. Unassuming barrow exteriors have been shown to hide very complex structures of several phases, with evidence for elaborate rituals involving fires, wooden objects and pieces of pottery which took place over hundreds of years (Jones 2005, 38; Rowe 2005, 85). Others had a clear visual impact, incorporating bright yellow clay or startling white quartzite. The low incidence of burial may suggest that they were associated with activities which transcended the need to bury an individual as an act of central importance (Jones 2005, 38).

Interpretation of the northernmost barrow remains problematic, however, Wailes thought it was simply spoil from the adjacent hollow and Tonkin linked it with the ruins of old houses identified by Hals beside a small shallow pit (1736, 219). Borlase's excavation revealed that the mound covered two pits (1871, 19) but as there were no finds and the feature clearly much disturbed Wailes may have been correct. Tonkin referred to the southernmost as a barrow and it too has clearly been excavated, at some point before 1871 but without record. A third barrow was located to the south east of the hillfort: it was mapped by McLauchlan (1849) and excavated at some point before 1916 (Henderson 1916-1917, 13) but ploughed level in the later 20th century. A very slight circular mound [w], apparently truncated by the rampart **2** ditch, could possibly be another barrow, and the circular platforms in the interior could perhaps be low barrows.

The barrows were components in a cumulative landscape of ritual monuments of the late Neolithic and early Bronze Age that included standing stones, numerous round barrows and the newly identified hengiform monuments. The late Neolithic hengiform at Royalton, 1km to the south, has been suggested to reference the hilltop of Castle Downs

(Clark & Foreman 2009, 31) and this elevated natural place may have formed a focal point in the landscape on and around which monuments were deliberately located. Each site probably marks a significant place that was visited repeatedly and modified at different times, with barrows being constructed over some of the ceremonial monuments in the early Bronze Age (Jones 2005, 28).

The relative slightness of rampart **3** is usually taken to indicate that it represents the first enclosure of the hilltop (eg Forde-Johnston 1976, 160) although differential survival is a notoriously unreliable indicator of chronology (Johnson & Rose 1982, 167). It was first included in Lysons' survey plan although not described in the text (1814, ccxlix) and was noted as 'a kind of step' by Hitchins & Drew (1824a, 430) but apparently missed by McLauchlan (1849) and Borlase (1871). As the other circuits are roughly concentric the earthworks provide no stratigraphic insight.

Our only dating evidence is therefore from Wailes' limited excavations and by analogy with similar sites elsewhere. Erosion of the inner face of rampart **4** was found to overly the secondary silt of the rampart **3** ditch, indicating an appreciably earlier date for rampart **3**. Unfortunately, no datable artefacts were associated with rampart **3**, only a scatter of chipped flint [Trench 61]. Water worn pebbles were frequently found high in the secondary silt (Wailes 1965, 65). The assemblage recovered would undoubtedly benefit from modern analysis, perhaps dating the flints and suggesting alternative ideas for the pebbles, which Wailes interpreted as slingstones associated with the hillfort within an assumed military function.

Wailes' excavations suggest that rampart **3** was not a sizeable rampart that had been levelled during a construction phase, but a small earthwork that had eroded and silted naturally (1963, 52). It is clearly of a very different character to ramparts **1**, **2** and **4** and does not appear to have been refurbished or incorporated into the overall design of the hillfort, except that the more massive circuits are concentric, apparently respecting and perhaps even revering the earlier earthwork.

Wailes suggested six entrances in rampart **3** (1964b, 25; 1965, 65), however, his more detailed descriptions are less certain and coupled with the surviving earthworks cast doubt on this interpretation. Although survival of the shallow flanking ditch and counterscarp bank is very fragmentary the scarp clearly continues around the hilltop. Wailes noted that it was difficult to distinguish whether the ditch did actually continue across Trench 61 due to the irregularity of the slate bedrock and in Trench 62 found only what appeared to be the butt end of the ditch (1963, 55). Other ditch ends sketched in his field notebook (1964b) appear quite distinct but may also be due to the irregular geology or define the ends of construction episodes rather than definite breaks in the circuit. The in-turn Wailes observed to the south-east and entrance to the north-east are areas of erosion due to wear and tear from the miners' route and subsequent footpath. Similarly, his paired entrances to the west may correspond with areas of erosion from recent agricultural trackways.

Castle an Dinas is not the only site in Cornwall to have been suggested as an early Neolithic causewayed enclosure. Deliberate interruptions were recorded in the ditch of Bury Down Camp, Lanreath, and the suggestion was made that the site represented a local variant of the causewayed enclosure (Ray 2001, 60). This interpretation was subsequently considered unlikely due to the differences in the earthworks, which had little in common with confirmed sites elsewhere, and lack of Neolithic material in the ditch (Oswald *et al* 2001, 87).

Tor enclosures appear to provide the Cornish counterpart to causewayed enclosures, with both Carn Brea and Helman Tor producing early Neolithic radiocarbon dates (*ibid*, 89; Whittle *et al* 2011a, 514). Unlike these, Castle Downs is not topped by a massive bulk of weathered granite or strewn with large granite boulders. Nor is it the most spectacular and distinctive hill in the area, an honour which probably falls to the slightly larger granite knoll of Belowda Beacon to the east. The lack of massive enclosing walls around numerous building platforms and absence of Neolithic artefacts also points to the differences between rampart 3 and these sites.

At 220m in diameter rampart 3 encloses a much larger area than the four stony bank hilltop enclosures identified in West Penwith (Herring 2011a, 86). They each enclose cairns and have been suggested as late Neolithic or early Bronze Age in date, however, recent work highlights the possibility that monuments that appear to be Neolithic on morphological grounds may be much later, perhaps Iron Age in date (Jones 2010, 224).

The most likely scenario is therefore that rampart 3 belongs to the late Bronze Age and early Iron Age practice of hilltop enclosure, comprising single bank and ditch systems on a modest scale (Brück 2007, 26; Rippon 2006, 54). Pastoralism was an important element of the late Bronze Age economy and these sites may have played a major role in animal management (Brück 2007, 31). Many are located near natural route ways and may have been placed to facilitate passage through the wider landscape. Alternatively, the low height of the earthwork suggests that it may not have created a very effective physical barrier and it may have had more significance as a symbol of prestige and isolation (Bowden & McOmish 1987, 83). The natural silting of the ditch indicates that it was not maintained and the site was abandoned for a period of time before the hillfort was constructed.

The hillfort

Cornish hillforts are relatively small compared with those of central southern Britain, but their size is typical of the wider south-western peninsular and south-west Wales (Rowe 2005, 110; Brown 2009, 2). The wide spacing of the rampart circuits and addition of annexes is also common in these areas, creating multiple enclosure hillforts (Fox 1961, 51). Hillforts represent a significant communal effort and level of social organisation and can be interpreted as monumental expressions of attachment to a defined place (Cunliffe 2005, 347; Brück 2007, 30).

Rather than simply consider them as the fortified residences of the élite, however, they may have been places where different groups of people repeatedly came together for a fluid range of social, economic, political and ritual activities that changed over time (Rowe 2005, 111; Brown 2009, 7). In West Penwith the early Iron Age hillforts and cliff castles are thought to have been centres for discrete territories (Rowe 2005, 109) but this cannot be demonstrated for the rest of Cornwall. Most hillforts provide evidence for several phases of use; repeated visits involving the rebuilding of ramparts and re-digging of ditches (Brück 2007, 30). Some degree of interior planning is also evident, including the construction of circular houses and rectangular storage units (Quinnell 1986, 115).

The hillfort of Castle an Dinas clearly exploits the local topography, the ramparts making deliberate use of the contours to encircle the summit of the hill in a classic defensive position. The interior is not overlooked by higher ground nearby or from the slopes below. Analogy with hillforts elsewhere suggests Castle an Dinas had a wide range of functions, however, even if supporting evidence from the excavations is slight. It is located at the watershed of rivers linking it with both coastlines, close to the boggy moorland basin of Goss Moor and rich mineral deposits, the exploitation of which perhaps added to its mystique. Castle an Dinas may have occupied a no man's land between territories and provided a defined space for different groups to come together within a range of local and regional social, economic and political networks.

The wide spacing of the concentric ramparts is typical of hillforts in the south-west. The intervening area may offer depth in defensive terms (Forde-Johnston 1976, 285; Johnson & Rose 1982, 166), but these sites are generally accepted as designed for pastoral communities, perhaps on a seasonal basis: the inner enclosure forming the main inhabited area and the outer enclosures for corralling livestock (Cunliffe 2005, 283). Fox suggested they were mostly for cattle (1952, 18) but sheep are better suited to upland grazing (Quinnell 1986, 117).

The pastoral interpretation is supported by excavations at Killibury, which produced evidence of long-lived occupation in the interior but only slight occupation in the outer enclosure (Cunliffe 2005, 284) and small post holes excavated at Castle Dore have been interpreted as used for hurdle stock pens (Fox 1961, 46). Use of these areas probably differed from place to place, with some offering additional living space and others perhaps as ritual areas emphasising the isolation and prestige of the site (Bowden & McOmish 1987, 77; Brown 2009, 55). It is also possible that the spaces between the ramparts were intended to have ramparts built on them (Mark Bowden, pers comm).

The level of occupation at Cornish hillforts clearly varied. Killibury produced evidence of long-lived occupation in the interior between the 4th century BC and 1st century AD but only slight occupation in the outer enclosure (Quinnell 1986, 114; Cunliffe 2005, 284). Similarly, pottery and a series of radiocarbon dates from Gear indicate significant occupation between the 4th century BC and early 1st century AD (Edwards & Kirkham 2008, 97). Some of the houses appeared long-lived and there were indications of craft

activity, including metalworking. In contrast, Wailes' limited excavations of Castle an Dinas suggest only a single short-lived occupation phase (1963, 55). The few sherds of pottery from Castle an Dinas are generally accepted as South Western Decorated Wares, which were common in Cornwall from the 4th to 1st centuries BC (Cunliffe 2005, 201; Nowakowski & Quinnell 2011, 353).

The incorporation of the earlier barrow monuments within the hilltop enclosures made a physical link with the past, perhaps legitimising and reinforcing associations in the Iron Age present. The practice appears relatively widespread, with examples known from cliff castles (Nowakowski & Quinnell 2011, 373), hilltop enclosures (Herring 2011a, 86) and other hillforts. For example, round barrows are enclosed at Shoulsbury Castle, Exmoor (Riley & Wilson North 2001, 61) and Scratchbury and Whitesheet Hill in Wiltshire (Bowden & McOmish 1989, 15).

Ramparts

The ramparts are the clearest evidence of any substantial activity on the hilltop. They are not just a physical boundary defining an occupied or defended space, but probably had a range of other more symbolic meanings and significance (Bowden & McOmish 1987; Nowakowski & Quinnell 2011, 386). The concentric layout of Castle an Dinas means that there is no clear stratigraphic relationship, except perhaps in rampart 2. Rampart 3 is markedly more polygonal than the other circuits, which also suggests an earlier date; the apparently later circuits smoothing out the sharpest changes of direction (Graeme Kirkham, pers comm). In plan the hillfort can be seen to comprise a number of short straight sections of bank and ditch, some poorly aligned, that may indicate gang or episodic working (Fox 1952, 4). The hillfort is clearly of more than one phase of construction: the different episodes of construction and rebuilding would have brought people together in events that strengthened their community by enhancing the physical and symbolic efficacy of these boundaries.

Hillforts begin to occur with some frequency in Cornwall from the 8th century BC onwards but tend to consist of ramparts with a vertical front of stone or timber (Nowakowski & Quinnell 2011, 333). There appears to have been some reorganisation of settlement in the middle Iron Age, with some hillforts remodelled and more elaborate ramparts constructed. Wailes recorded that the ramparts at Castle an Dinas were constructed as simple dumps of stone and earth (1963, 52); a technique widespread in the south-west from the 4th century BC onwards (Cunliffe 2005, 364; Rowe 2005, 109). Although some sections are sheer in profile this is where the ditch is cut into the bedrock and not from any attempt at walling (Fig 13). The excavations revealed no sign of any retaining walls, revetting or timber structures, except at the entrance (Wailes 1963, 54). The similar scale and character of ramparts 1, 2 and 4 imply that they are broadly contemporary.



Fig 12: Rob surveying rampart 1.



Fig 13: Stone rubble exposed in rampart 2.

Castle an Dinas is variously described as bivallate or multivallate and it could be argued that both are correct. The bivallate hillfort comprising ramparts 1 and 4, each with ditches and counterscarp banks, was enhanced on more than one occasion. This included the enlargement of the counterscarp bank of rampart 1 to create a third rampart [rampart 2], which was never completed (Fox 1961, 49). Wailes suggested that the second phase in the construction of rampart 1 probably represented a clearing out or re-cutting of its ditch, perhaps cutting into the granite for the first time (1963, 52). As rampart 1 appears complete work to create rampart 2 may be a separate, later phase. Enhanced sections of rampart 2 clearly correspond with the cutting of an outer flanking ditch, but its intermittent pattern suggests episodic or gang working. Although parts along the eastern side were reduced in height to allow the blondin to operate in the mid-20th century, other lesser bank sections of rampart 2 on the northern side, which appear very similar in character, may be original.

Entrance

The original hillfort entrance appears to respect that of the earlier hilltop enclosure in that it was to the south-west, perhaps indicating some memory or continued association of use, or simply that the earlier entrance was clearly visible. The entrance is typical of hillforts in Cornwall in that it is aligned co-axially with stone kerbed in-turns on the inner circuit, although the entrance gap is relatively broad (Fig 7; Threipland 1956, fig 4; Fox, 1961, 40). The in-turns are now very mutilated piles of stone and earth on the surface. Although all entrances to a site need not look the same their presence does point to its being the only original entrance, as they are absent from the cut in rampart 1 on the eastern side of the hillfort. The post holes in Trench 41, across the eastern in-turn, suggested the presence of a timber hut, apparently constructed at the same time as rampart 1 (Wailes 1963, 54).

Such features are traditionally considered an unfinished attempt to reinforce the defences of the inner enclosure: entrances are seen as the weakest defensive point and are therefore subjected to more rebuilding and modification (eg Forde-Johnston 1976, 284; Cunliffe 2005, 365). More recent interpretive work explores a wider range of potential functions for entrances, which inherently focused the attention of the people using and visiting the site, acting as the interface between the hillfort and the wider world. They offered the potential for the display of clear statements about the inhabitants and activities taking place inside and staged impressive designs and structures may have been used to reinforce the ritual or ceremonial aspects of the entrance (Bowden 2006, 434; Nowakowski & Quinnell 2011, 341). In this context it is interesting that the in-turns at Castle an Dinas are slightly skewed: they direct entrants towards the southernmost barrow on the highest point of the hill, perhaps reinforcing the significance of this particular part of the interior.

Very low, straight and narrow banks were subsequently inserted into the circuits of ramparts 1, 2 and 4, apparently as a deliberate attempt to narrow the entrance. Their

remarkably similar character suggests that they are broadly contemporary but their date of construction is unknown. Rampart 4 differs in that it has an outer ditch flanking the low bank across the western side of the entrance. The lack of a similar feature on the eastern side may indicate it was constructed later, perhaps to narrow the gap further. As no corresponding bank reduces the gap in rampart 3 they may be the last phase of later Iron Age activity associated with the hillfort or a much later date, perhaps associated with medieval use of the hilltop as common and the seasonal corralling of animals. They are only just visible on aerial photographs taken in July 1946 when they are covered with the same vegetation as most of the hillfort, indicating that they are not recent features somehow associated with the mine.



Fig 14: The view south across the entrance.

Elaine stands behind the small bank narrowing the entrance in line with rampart 2.

Several of the antiquarian descriptions mention a stone causeway, already overgrown with grass by 1602, leading south-west from the entrance down the hill to where it connected with a lane (Tonkin 1736, 212; Halliday 1953, 220). The 1907 (1:2500) Ordnance Survey map shows a trackway extending to the south-west that may preserve its approximate alignment although it was probably ploughed out in the mid-20th century. Beyond a standing stone the course may be preserved as a slightly sinuous field boundary.

The Iron Age landscape

The surrounding Iron Age landscape is poorly understood. There are two smaller hillforts nearby: at Demelza 3.5km to the east-north-east which has not been excavated and at St Dennis 5km to the south where a single trench cut in 1962 revealed the bank of the outer rampart but no ditch or finds to provide dating evidence (Thomas 1965, 34). Castle an Dinas sits just within an area of lower density for rounds that extends between Goss Moor and the St Breock Downs, around St Wenn (Quinnell 2004, 211). Most of the nearest rounds are found to the west: at Tresaddern, Tregatillian and the Roman period metalworking site of Little Quoit Farm (Lawson-Jones 2003, forthcoming), although there are also isolated examples known to the south-east at Pendine at the northern edge of Goss Moor and to the north-east at Kerpit Farm.



Fig 15: The settlement pattern.

Castle an Dinas is the green ring at the centre. The rounds are shown in purple and red [Little Quoit Farm], the early medieval settlement sites in orange and the medieval settlements in blue. The settlement pattern is shown against anciently enclosed land [green] and rough ground [light brown]. HER data © Cornwall Council; other data © English Heritage. Relief shaded at 25m intervals, shown at 1:45,000. Height Data: Licensed to English Heritage for PGA, through Next Perspectives™.

The known settlement pattern implies that this area may not have been as densely settled as much of Cornwall in the Iron Age and Roman periods. It is probably at least partly due

to the extensive area of rough ground comprising Castle Downs, the St Breock Downs, Belowda Beacon and the Tregonetha Downs (Fig 15), and the likely presence of substantial woodland in many of the stream valleys in later prehistory (ibid, Herring 2011b, 263; Graeme Kirkham, pers comm). Perhaps what we see is more the result of archaeological visibility than the actual distribution of Iron Age sites, which may be hidden by the later farms and hamlets that essentially continued to occupy much the same sites.

CONCLUSION

The analytical survey of Castle an Dinas shows that enclosure of the hilltop was undertaken in several phases. Rampart 3 defines a pre-hillfort enclosure probably dating to the late Bronze Age or early Iron Age. It had one entrance to the south west, not six as identified by Wailes (1965, 65). Although excavation suggests this was abandoned, the subsequent massive ramparts of the hillfort appear to have respected it. The hillfort was constructed in at least two phases, probably after 400BC. Occupation does not appear to have been intensive or prolonged. The hillfort probably fulfilled a variety of roles to differing degrees within local and regional social, economic and political networks between the 4th and 1st centuries BC. At some point the entrance was narrowed. After the Iron Age this enigmatic windswept site lent itself to tradition and romance until the discovery of Wolfram in 1915, when the hilltop became the hub of industrial activity.

METHODOLOGY

A Level 3 detailed analytical survey (Ainsworth *et al* 2007) of Castle an Dinas, St Columb Major, was carried out in February and March 2011. Detail was surveyed using a Trimble R8 survey grade GNSS receiver working in Real Time Kinematic (RTK) mode, with points related to an R8 receiver configured as an on-site base station. The position of the base station had previously been adjusted to the National Grid Transformation OSTN02 via the Trimble VRS Now Network RTK delivery service. This uses the Ordnance Survey's GNSS correction network (OSNet) and gives a stated accuracy of 0.01-0.015m per point.

The survey data was downloaded into Korec's Geosite Office software to process the field codes. The data was then transferred to AutoCad 2011 Map software for plotting out at a scale of 1:1000 on polyester drawing film, ready for graphical completion in the field. Additional detail of the more subtle earthworks was then added using standard graphical techniques of tape and offset from control points captured with the GNSS rover.

The survey data was also loaded into a project GIS to aid analysis and illustration. Wailes' plan was georeferenced with a best fit error of 2m, however, this meant an overall rotation of the plan through about five degrees anti-clockwise. Earthwork features interpreted as representing Wailes' excavations were found to be between 5m and 10m from their position on his plan. As the subsequent conservation works (Preston Jones 1994; Preston Jones & Stanley 2011) and magnetometry survey (Cripps 2004) have used Wailes' plan to define their location, their spatial depiction is also flawed. The position of the waymark posts, more accurately captured during the Level 3 survey, also suggests an error of about 5-10m for the posts on earlier plans.

Table 1: A concordance for the monuments surveyed.

<i>Monument Type</i>	<i>NMR's Archaeological Database</i>		<i>Cornwall HER</i>	<i>NHLE</i>	<i>RSM - OCN</i>
	<i>Monument Number</i>	<i>Index Number</i>			
MULTIVALLATE HILLFORT	430680	SW 96 SW 2	21602	1006713	CO93
BARROW	430713	SW 96 SW 13	21604		CO93
BARROW	1546208	SW 96 SW 51	21605		CO93
SPOIL HEAP / BARROW	430744	SW 96 SW 24	21606		
QUARRY	1542612	SW 96 SW 52	21663		
TUNGSTEN MINE	1461839	SW 96 SW 48	21686		
FINDSPOT: FLINTS			21603		

Monument records for each site surveyed have been added to English Heritage’s archaeological database (AMIE) and existing records enhanced. The main elements of the monument record comprise location, indexed interpretation, textual description and main sources.

Table 2: AMIE records.

Event:	1535358	English Heritage: Castle an Dinas – Level 3 survey
Archive Collection:	AF00368	

AMIE Monument Records			
Existing	Amended	New	Revised total
4	4	2	6

In compliance with English Heritage guidelines (Dickinson 2008), the project archive has been deposited in English Heritage’s public archive at: The Engine House, Firefly Avenue, Swindon SN2 2EH, where it can be consulted.

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Documents

at the Royal Institution of Cornwall:

HA/1/9 1593 Final concord. Lady St Aubyn's Lands in St Columb etc.

at the Cornwall Record Office:

Tithe Award St Columb Major

X62/24/1 Lease; Mr J Harwood to J Buller Esq, 19th Jan 1826

W/37 Grant of shooting rights, Castle an Dinas downs, Rialton manor, St Columb Minor, 16 May 1865

ME/2509 Report on mines in Cornwall, by John Lawrye, 6 Feb 1684

MRO/15156 Mine plans, Castle-an-Dinas mine, St Columb Major

Abbreviations used in this report

CCC	Cornwall County Council [now Cornwall Council]
COMP	Cornwall & Isles of Scilly Mapping Project
CRO	Cornwall Record Office
CWT	Hundredweight
ft	Feet
ha	Hectare [10,000 square metres]
HER	Historic Environment Record
HLC	Historic Landscape Characterisation
MAGIC	Multi Agency Geographic Information Centre http://magic.defra.gov.uk/
MSS	Manuscript
NHLE	National Heritage List for England http://www.englishheritage.org.uk/professional/protection/process/national-heritage-list-for-england/
NMP	National Mapping Programme
PGA	Pan Government Agreement
PRN	Primary Record Number
RCG	Royal Cornwall Gazette
RIC	Royal Institution of Cornwall, Truro Museum.
RSM - OCN	Register of Scheduled Monuments – Old County Number



ENGLISH HERITAGE RESEARCH AND THE HISTORIC ENVIRONMENT

English Heritage undertakes and commissions research into the historic environment, and the issues that affect its condition and survival, in order to provide the understanding necessary for informed policy and decision making, for the protection and sustainable management of the resource, and to promote the widest access, appreciation and enjoyment of our heritage. Much of this work is conceived and implemented in the context of the National Heritage Protection Plan. For more information on the NHPP please go to <http://www.english-heritage.org.uk/professional/protection/national-heritage-protection-plan/>.

The Heritage Protection Department provides English Heritage with this capacity in the fields of building history, archaeology, archaeological science, imaging and visualisation, landscape history, and remote sensing. It brings together four teams with complementary investigative, analytical and technical skills to provide integrated applied research expertise across the range of the historic environment. These are:

- * Intervention and Analysis (including Archaeology Projects, Archives, Environmental Studies, Archaeological Conservation and Technology, and Scientific Dating)
- * Assessment (including Archaeological and Architectural Investigation, the Blue Plaques Team and the Survey of London)
- * Imaging and Visualisation (including Technical Survey, Graphics and Photography)
- * Remote Sensing (including Mapping, Photogrammetry and Geophysics)

The Heritage Protection Department undertakes a wide range of investigative and analytical projects, and provides quality assurance and management support for externally-commissioned research. We aim for innovative work of the highest quality which will set agendas and standards for the historic environment sector. In support of this, and to build capacity and promote best practice in the sector, we also publish guidance and provide advice and training. We support community engagement and build this in to our projects and programmes wherever possible.

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