THE TRE'R CEIRI CONSERVATION PROJECT – RE-EXAMINATION OF AN ICONIC HILLFORT

G2245

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GAT REPORT 1417

Pre-publication Report

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NOTE

The following report is a draft designed for publication. It requires re-editing but has been accessioned to the HER for information.

INTRODUCTION

Tre'r Ceiri (SH373446) is one of the best-preserved hillforts in the British Isles. It stands at a height of 485m O.D. on a slightly sloping plateau on the easternmost of the three peaks of Yr Eifl, on the Llŷn Peninsula in north Wales. The natural plateau on the top of the mountain is bounded by a massive, 2.3 to 3.0m thick, dry-stone rampart enclosing an area of 1.8ha. The remains of a parapet are preserved in several places demonstrating that the rampart survives close to its original height of between 1.0m and 3.5m. A second, equally massive, outer rampart stands to the north-west of the fort overlooking the saddle between Tre'r Ceiri and the middle peak of Yr Eifl, Garn Ganol. The main entrance into the fort is on the north-west side where a path runs through a gate in the outer rampart before running between flanking walls to a sunken opening through the inner rampart. A second, somewhat steeper, path climbs to a second entrance at the south-west. There are three other simple openings, often described as 'posterns', on the north, west and south-east sides of the fort. The northern postern is a distinctive narrow covered passage through the rampart. The fort contains the remains of about 160 dry-stone huts and enclosures exhibiting a great variation in size and shape, ranging from simple round huts to irregular and rectangular structures (Fig. 1). The less precipitous land around the fort contains a series of terraced enclosures and low walls.

The local geology consists of an intrusion of microgranite that naturally shatters into large slabs with large conchoidal fractures. Most of the peak down to an elevation of 330m is covered with a fairly stable blockfield. This is a product of perigacial frost shattering and weathering, resulting in an accumulation of angular slabs and blocks of stone. The size of the individual stones ranges from a few centimetres to a metre or more across. Most surface stones are large but movable by one or two persons. The microgranite slabs are hard and durable and abundant and are well suited to the construction of stable of dry-stone walls. The great abundance of stone is of particular importance to the remarkable condition of the monument. The usual fate of disused masonry structures throughout history is demolition and the reuse of stone on other buildings. Tre'r Ceiri stands on a fairly inaccessible peak and it has been easier for people in the local area to collect stone from the scree for the construction of walls and buildings than to remove it from the fort. There has therefore been very little dismantling of the huts and ramparts for reuse elsewhere and deterioration of the site has been limited to that caused by natural weathering and in more recent times, the actions of visitors, treasure hunters and to some extent archaeologists.

This paper summarises the findings of the Tre'r Ceiri Conservation Project. This was carried out between 1989 and 1999 in response to increasing levels of erosion, mostly caused by visitors to the site. The project was designed to stabilise the ramparts and huts that were deteriorating at an increasing rate across much of the fort. The principal aim of the project was conservation but a significant amount of new information about the site was produced as works progressed.

PREVIOUS WORK ON THE TRE'R CEIRI

This spectacular site has, unsurprisingly, attracted a lot of attention over the years. The site was visited by Thomas Pennant who described it as "the most perfect and magnificent, as well as the most artful, of any British post I ever beheld. It is called Tre'r Caeri, or, the Town of the Fortresses" (Pennant 1781, 206-7). It should be noted that there has been a tendency for a more romantic translation, "Town of the Giants", to be used in popular literature. This appears to be a mistranslation from *cewri* the plural of the Welsh word for giant as opposed to *ceiri* the plural of *caer* meaning fort.

The site has a long history of excavation; this is discussed below in more detail in the context of individual features of the site. A summary of significant work on the site is as follows:

The first official excavation was in 1903 by S. Baring-Gould and R. Burnard who excavated 32 huts (Baring-Gould and Burnard, 1904). In 1906 H. Hughes produced the first accurate plan of the fort, excavated 32 huts and examined the south-west entrance (Hughes, 1907). Further excavations were carried out in 1939 by G. Bersu, C. A. Gresham and W. J. Hemp, who examined five huts and a portion of the inner face of the rampart (Anon, *ca.* 1939). The south-eastern postern and an additional 10 huts were excavated by A. H. A. Hogg in 1956. The excavations produced finds from later in the fort's history, demonstrating that the huts were used up to the 4th Century AD. The excavations in the earlier part of the century were not carried out to modern standards and no stratigraphic information was recorded. The subsequent excavations in 1939 and 1956 uncovered no further dating evidence.

Descriptive surveys of Tre'r Ceiri were carried out in 1946 by W. E. Griffiths and in 1978 by K. Dallimore. Plans of the site were produced by RCAHMW in 1960 and Plowman Craven and Associates in 1980.

THE CONSERVATION PROJECT

Tre'r Ceiri currently attracts in excess of 7,000 visitors per year. Given that the site has been a popular destination for over 100 years it is unsurprising that the cumulative effects of erosion were reaching critical levels by the 1980s, particularly considering the amount of fragile dry-stone structures on the

site. The first report of damage to the site was by the Cambrian Archaeological Association after their excursion of 18 July1894:

> It would hardly be thought that in a civilized community it was possible that such a splendid specimen of a prehistoric city would be allowed to perish miserably, partly by neglect and partly by wanton injury. Yet stone by stone Treceiri (sic) is gradually being destroyed……Tourists and others now amuse themselves by tearing down portions of the ramparts in order to erect small cairns of stones which utterly disfigure the sky-line as seen from below. If the monument were scheduled it would be possible to reward these Goths and Vandals with the two months hard labour they most richly deserve (Cambrian Archaeological Association 1895, 147).

Tre'r Ceiri was scheduled as an ancient monument in 1923, but this had little effect on the causes of erosion. No concerted effort was made to combat the problem until 1978, when a survey and report on the condition of the site was produced by K. Dallimore for the Ancient Monuments Branch of the Welsh Office (Dallimore, 1978). This revealed that about 20% of the length of the rampart was in a state of collapse and that many of the huts had been badly damaged. He recommended a programme of consolidation and conservation to prevent further damage. A photogrammetric survey of the site was also commissioned by the Welsh Office (Plowman Craven & Associates, 1980). This was undoubtedly accurate but was not really approached from an archaeological perspective and added little to the existing plan (Hogg, 1960).

In 1989 Dwyfor District Council with grant-aid from Cadw embarked on a conservation programme designed to stabilise the monument. The project was taken over by Gwynedd County council after government reorganisation. Gwynedd Archaeological Trust was commissioned to supervise the archaeological aspects of the project, record all works as they progressed and produce annual reports on the work. The project was supervised from 1980 to 1991 by Steve Boyle and from 1992 to 1998 by the writer. A team of three stone masons with experience of dry-stone construction were commissioned to carry out the stabilisation works. Regular site meetings were held with Cadw and the Council in order to monitor the project and develop a suitable conservation and recording methodology.

The site was monitored during the initial phases of the project and several areas of masonry were found to be eroding very swiftly. The most serious erosion was on several substantial collapses in the ramparts that were being used for access into the fort. The original entrances had deteriorated to a point where they were not easily identifiable and were impassable because they were choked with unstable rubble.

Partly-collapsed dry-stone masonry is inherently unstable. This has been a particular problem on Tre'r Ceiri because of a weakness in the construction of the Iron Age masonry. Modern walls incorporate stones with their greatest length at right angles to the face the wall, called headers, and stones laid parallel to the face of the wall, called stretchers. The latter have an important function in binding the

stones face together and increasing longitudinal stability. On Tre'r Ceiri the rampart is faced on both sides with large stones, all laid as headers (i.e. long-ways into the wall) with a rubble core. The cumulative weight of the large facing stones, many of which run into the wall core, bind the masonry together very effectively. This structural integrity is, however, lost as soon as there is a collapse. Because the masonry is not bound together with stretchers it has little strength if not supported at the side. Collapses in the walls are therefore very vulnerable to erosion. The worst affected areas were losing several metres of rampart per year.

The walls were built directly on the broken stone and scree that covers the majority of the peak. The most common cause of the original collapses appears to have been a result of settling or movement of the stones beneath the wall. This caused the basal courses to tilt and the facing above this to slip forward and collapse. This in turn caused erosion of the wall core thus removing support behind the facing on the opposite side of the rampart.

It was decided that the only way to stabilise the ramparts was to reinstate the collapsed facing. It was also necessary to clear the entrances into the fort to maintain access. The sole aim of the project was to stabilise the existing masonry. No attempt was made to reconstruct the ramparts for any other purpose.

All masonry was surveyed and then photographed using an architectural shift lens both before and after conservation. Drawn, written and photographic records were made as works progressed. Some lengths of masonry, particularly where adjacent facing had been lost or basal courses had failed, were inherently unstable and on the point of collapse. These could not be stabilised *in situ*. The individual stones were numbered and the wall was carefully dismantled. It was then reconstructed using the numbered stones on the photographs taken before conservation as a reference. All reinstated masonry was marked with unobtrusive drill holes, one in each stone around the edge of the former collapse.

The reinstated masonry was built using the same style as the Iron Age stonework. It was found that careful stone selection tended to produce a somewhat regular masonry style that was markedly different to the original. A less-deliberate approach, achieved by adding quickly-selected, long headers, to produce a somewhat uneven face and then packing smaller stones in the wall core reproduced the original style.

Conservation of the huts presented additional problems. The masonry was generally more fragile, having been constructed from smaller stones, and often being little more than a single face revetting the natural scree. Collapses in the facing were, as in the ramparts, the principal cause of erosion and instability. A similar approach was therefore adopted and collapses were reinstated where possible. In some cases the collapses were so serious that the original line of the wall could not be determined. In these cases it was decided that the wall should not be reinstated because the construction of the masonry along a projected or estimated line would essentially involve the creation of a new feature and could be misleading to people examining the site in the future. In these cases the collapses were

stabilised by the addition of a few strategically placed larger stones or the insertion of stones lengthways into the rubble to act as pins. Also, any collapses or huts that had decayed to a point of stability were not disturbed. No unexcavated archaeological deposits were disturbed unless absolutely necessary; almost all of the huts with significant amounts of exposed masonry had previously been excavated so this was rarely a problem.

The collapses seemed to have caused by several different processes. The hut walls had been built, without foundations, on natural deposits of shattered stone. In some cases settling of the underlying stones had caused the basal course to tip or shift leading to collapses. The original building style was occasionally a contributory factor. Many of the hut walls incorporate large upright slabs in the inner face. This unusual building style, perhaps unsurprisingly, was less stable than the conventional masonry. The most common cause of serious collapses was, however, a result of excavations in the hut floors. The most serious were by metal detectorists and treasure hunters but some problems appeared to have been caused by the 1903 and 1905 excavations. Holes had been dug into the floors to a level below the base of the wall facing. This destabilised the natural deposits of stone beneath the wall causing it to collapse. The worst examples resulted in the total loss of the wall including the basal course with a result that the line of the facing could not be determined and masonry could not be reinstated.

One of the principal precepts of project was that there would be no intrusive work on previously undisturbed masonry or deposits. Despite this, the works uncovered many previously unrecorded features beneath the rubble. A detailed account of the conservation work is recorded in the ten annual volumes of conservation project reports that are archived at Gwynedd Archaeological Trust and RCAHMW (Boyle 1990-92 and Hopewell 1993-99). The following part of this paper summarises these detailed records.

RESULTS OF THE PROJECT

1. THE INNER RAMPART AND ENTRANCES

Dallimore identified 31 major collapses in the ramparts and entrances. A summary of the works carried out and details of discoveries made are described in the following section of the report starting at the south-west entrance and proceeding in a clockwise direction around the circuit of the ramparts.

The south-west entrance (Fig. 2)

Tre'r Ceiri is most commonly approached from the south-west where several paths converge and climb the steep slope to the fort. The conservation of this area began in 1992. The entrance had deteriorated to a state where it was poorly defined and partly blocked. Two additional footpaths had subsequently become established, leading to slightly easier access points over collapses in the rampart. There was

significant ongoing erosion at these points; Dallimore recorded one collapse as being 2m wide in 1978; by 1992 it was 5m wide. The provision of useable and stable entrances into the fort was a key objective of the project because this would deter visitors from climbing over the rampart and thus remove one of the main causes of erosion. It was therefore decided to clear the rubble and conserve as much of the entrance and rampart in this area as possible.

Much of the entrance passage was choked with collapsed stone. The north-western side of the passage was still standing up to a height of 0.8m to 1.0m but the inner end on the south-eastern side had collapsed and could no longer be traced. Both the RCAHMW and Ploughman Craven plans showed the inner end of the entrance as being about 2m wide. Hughes cleared the passage in 1906 "sufficiently to ascertain its plan" and uncovered "some stones low down, which in all probability, indicate the outline of the wall; though on the other hand, they may form portions of a rough paved way." Hughes estimated the entrance to be 2ft (0.6m) wide at its inner end.

When the rubble was cleared from the entrance passage, three large, apparently *in situ,* facing stones were identified. Two large slabs, set one on top of the other, marked the probable inner corner. Hughes presumably recorded the tops of these stones in 1906. The inner end of the passage was 0.8m wide. The passage floor, which consisted of a series of small worn slabs, was covered by a thin layer of peat much of which appeared to have washed in recently as it contained fragments of aluminium foil and plastic. New masonry was added above the newly revealed foundations to a height of 0.8m in order to support the eroding core of the wall.

The entrance passage runs through thickenings in the ends of the rampart, principally on the outer face, termed "bastions" by Hogg. They were built onto a scree slope, which was not particularly stable, and movements in the stones beneath the wall had caused substantial collapses although most of the lower courses had survived. A length of rough facing built into the scree in front of the rampart appeared to be an attempt to stabilise the slope suggesting that instability had been a problem when the walls were originally being built. The wall core also appeared to have been carefully laid here, as opposed to being mostly random stone seen elsewhere in the ramparts, again hinting at problems of stability when the bastions were originally constructed.

The line of outer face of the rampart, to the north of the entrance, was found to run behind the bastion. This facing was uniformly weathered, indicating that it had been open to the air and had been colonised by the crustose lichens that cover most of the exposed stone on the mountain. The lichens increase the weathering rate of the stones by breaking down their surface and therefore round off their sharp edges. They are also very slow growing; stone exposed by the 1956 excavations and in most of the areas uncovered by the work at the turn of the century were still not completely colonised by 1992. This indicates that the buried wall represents an earlier phase of the entrance and that the bastions were a secondary addition and were built at last several decades after the original wall. The path leading up to

the entrance is flanked by rough stone walls that abut the bastions, suggesting that these walls are also later additions.

The rampart: south-west entrance to the western postern

The rampart between the south-west entrance and the western postern survived, in places, to a height of 1.0m to 1.2m on the outer face and 0.8 on the inner. One of the recent pathways ran across it and there were several smaller areas of instability. The collapses were cleared of rubble and new masonry added to the height of the surrounding *in situ* wall. The remains of facing on the wall-top close to the south-west entrance appeared to be the remains of a length of parapet possibly indicating that the rampart survives close to its original height in this area.

The western postern was first recorded on Hughes' unpublished plan of 1906. Griffiths (1946) noted that it had been deliberately blocked with large stones. This area was quite eroded as it was adjacent to the collapse that had been adopted as a route over the ramparts. The loose rubble was cleared from the area revealing the outer face curving into a 0.8m-wide rubble-filled passage through the rampart. The inner face also curved into the entrance on the south side; the north side had suffered a major collapse apparently as a result of a shift in the underlying scree that had opened up a large void. The outer end of the passage had been deliberately blocked in antiquity with a one metre-high wall of roughly piled stone, the inner by two courses of uncharacteristically rectangular large stone blocks. The postern appears to have been roughly blocked after the passage had begun to collapse.

The rampart from the western postern to the north-west entrance

The rampart in this area is particularly well-preserved. The outer face survives to a maximum height of up to 3.3m and retains several well-preserved lengths of parapet demonstrating that the rampart survives close to its original height. There were four major collapses and several smaller instabilities all of which were conserved.

Several constructional details were recorded in the outer face. A 10m length of the rampart contains two different styles of masonry separated by a rough course of large stones running horizontally along the wall at a height of about 1.25m. The lower masonry consists of small stones, fairly regularly laid; the upper part is more irregular with larger stones. This suggests that there were two stages of building with a levelling course between them. In addition two pairs of straight joints were recorded in the outer face along with a marked kink in the wall where a different alignment of facing could be traced running into the body of the rampart for over 1.0m. These were initially interpreted as evidence of blocked entrances but, in all but one case, no facing could be traced running into the rampart. There are also no corresponding features on the inner face; the underlying ground slopes very steeply making an entrance unlikely in this area. It is more likely that these features are a reflection of the way that the rampart was built. The change in character of the wall with height could be an indication that the outer face was

built from outside the fort until it became too high to add stones to the top of the wall. Stones would then have to be carried to the top of the rampart and added to the wall built from above. This may well have been built by a different team of workers hence the change in masonry style. The straight joints in this length of rampart may have been temporary breaks in the facing allowing access to the wall top during construction. The facing running into the body of the rampart is most likely to be a result of a revision in the line of the facing, either after a collapse or during the initial construction.

The north-west entrance (Fig. 3)

The north-west entrance is approached by a terraced trackway, cutting across the slope and leading from the gateway in the outer rampart. It then turns to run between walls revetting the scree for 8m which abut the end of a 6.5m-long, sunken, entrance passage through the rampart. The inner end of the passage extends into the fort by 1.5m. The passage floor, near its inner end, runs about 1.5m below the natural ground level. When the site was visited by Pennant in 1781 he described this as 'The Grand Entrance'. In recent years the south-west entrance has been used as the main access to the fort and the north-west has largely been ignored. At the beginning of the 1993 season the outer end of the passage was barely discernible, being choked with rubble from a major collapse in the south-western flanking wall. The line of the inner end of the passage on the north-eastern side had also been lost, a major collapse having deposited yet more rubble in the passage. Much of the standing masonry was unstable and the collapse in the outer passage was being severely eroded by a footpath that had become established over the rubble, thus threatening masonry to either side. In view of the above and the desirability of having an accessible entrance on the north-west side of the fort it was decided to conserve and stabilise this area

There are discrepancies in the previous descriptions of the entrance. Hughes seems to have made a basic error 'The passage through the north-western entrance, in the inner encompassing wall, has been lengthened by extending the masonry *inwards* for about 20 ft [6.1m]'. His description and stand-alone plan of the passage itself correspond closely to the plan of the remains as surveyed in 1993 (i.e. with an extended passage on the outside) except for this transposition "The south-eastern wall slopes in sharply towards the north-western; it is irregularly concave, and has a slight bulge in the middle; the gateway narrows from a width of 12 ft [3.7m] at the entrance to 2 ft. [0.6m] at the inner end" (Hughes 1907, 58-9). It appears that the masonry was in much better condition at this time and this is the best record we have. It is possible that there was a simple transcription error when Hughes' plans were being compiled. Hogg described the area in 1956. The entrance was "much ruined" with the track ascending "between rough revetment walls about 20ft [6.1m] long, not bonded into the rampart" (Hogg 1960, 12).

The rubble in the entrance passage was carefully excavated aiming, at least initially, to remove only recently collapsed stone. The upper layers had been fairly recently disturbed. This was demonstrated

by the recovery of several large fragments of a Whitbread beer bottle and sherds of a china cup from underneath slabs within the passageway, in a position that indicated that they had not merely fallen into the gaps between the stones but that stones had been deposited on top of them. It was found that much of the rubble from the collapses had fallen like a deck of cards with the ends of the headers resting on the surface in front of the collapse. This was taken as a guide to the correct level of clearance. At this level the character of the stones changed from being jumbled and irregular to horizontal slabs interspersed with small stones suggesting a rough paved surface.

There were several serious instabilities in the surviving facing necessitating the numbering of individual stones and the careful dismantling and reconstruction of the affected masonry. The most serious collapse was half way along the south-western wall of the outer passage where masonry had failed at the base and about 2m of the foundation course was missing. It was necessary to replace the missing facing in order to stabilise the surrounding masonry. The remaining wall core was therefore cleared. This revealed a second, previously buried face, set back 1.0m from the line of the passage wall. Part of a mid second- to third-century Severn Valley ware jar was found in the core about 20cm above the level of the passage floor and 50cm in front of the buried face. This area of core appeared to have been relatively undisturbed. One large rim sherd and 24 smaller fragments, representing about 70% of the rim of the vessel, were recovered in a scatter of about 25cm. The south-western wall of the passage could now be seen to consist of several elements. The outer face of the rampart curves around to form the inner end of the passage. The facing of the outer passage abuts this but then steps back after 2.2m and runs parallel to the track from the outer gateway for a further 2.5m before turning to the south-west. The final phase, dated to sometime after the mid-second century by the pottery, consists of the wall alongside the track approaching the entrance. No comparable phasing could be seen in the north-eastern wall. It should be noted that the rampart runs on a slightly different alignment on either site of the entrance. This presumably indicates that the entrance was part of the original design of the ramparts as opposed to a later insertion.

The rampart between the south-west entrance and the north postern

The rampart here was generally well-preserved and retained short lengths of low parapet. Two substantial collapses were conserved along with other less serious areas of instability.

A discontinuity in the inner facing was interpreted as a possible ramp, providing access to the top of the ramparts, by Bersu, Gresham and Hemp in (1939, 4). This area had been suffering from erosion and was conserved in 1991. Loose stone was cleared from the area and it could be seen that there was a clear overlap in the facing. The facing running from the south-west had been built 1.4m in front of that to the north-east and there was an overlap of 1.6m. This confirms that this was a deliberately built feature and Boyle notes in the project report that “one may speculate that the provision of easy access to the wall-top would have been desirable at this point, as for some 35m to the south-west and for 50m to the north-east, access would have been impossible due to the huts ranged against the face of the wall” (Boyle 1991, 23).

The North Postern

The north postern is one of the most distinctive features of Tre'r Ceiri. It is a narrow passage through the rampart and the wall had once been carried over it on a series of massive stone lintels. The outer lintel, a distinctive stone with the characteristic curving conchoidal fractures that can be seen on most of the natural stone on the mountain, was still in place in 1989. The inner end of the passage had collapsed many years previously. Pennant described it in 1781 "there was in one place a cell in the thickness of the wall, or perhaps a sally-port, in part stopped by the falling-in of stones" (Pennant 1781, 207). A low secondary wall or "lower banquette" built against the inner face was recorded by Pritchard in 1887 (257); he interpreted it as a buttress, Griffiths (1946, 3) and RCAHMW (1960, fig 83) interpreted it as another access ramp. There was however no evidence that the feature ran up to the wall-walk and its presence on both sides of the entrance and length of over 20m on the eastern side, much longer than necessary for a ramp, suggest that it primary function was indeed a buttress. It should also be noted that the inner face is unusually high in this area and this could have led to some instability and the necessity for supporting masonry.

The postern was unstable and continuing to deteriorate. Comparison between photographs taken by the Royal Commission in 1956 (RCAHM 890451/6) and similar views taken at the beginning of the conservation project in 1989 showed that there had been serious deterioration. The outer end of the passage was on the point of collapse and it was felt that it might not survive for another winter. Conservation of this area was therefore seen as a priority and it was also decided to attempt to open the entrance as part of this process. Due to an unfortunate accident, the lintel was damaged during the works and broken into three pieces. Almost all previous records of the fort show this distinctive stone so it was decided to repair it. The broken stone was taken to Cadw's workshop in Caernarfon where it was resin bonded and pinned together with two stainless steel rods.

Much of the entrance passage had survived beneath the rubble and a second lintel, immediately behind the outer lintel was also in place. One other stone long enough to bridge the gap was recovered from the passage. The other lintels were presumed to have failed or have broken when the inner end of the passage collapsed. Several instabilities in the walls of the passage were conserved, most notably the outer corners which had deteriorated to a point where they could not be reconstructed using all of the original stones in their original positions because the masonry had partly collapsed and was inherently unstable. The original style of masonry was replicated, but some parts of the original masonry were lost in this case. The passage was re-roofed using the original lintels with the addition of three additional stones selected from the natural scree, one of which was used to reduce the loading on the repaired stone.

It was noted that, in contrast to the rest of the entrance, there was only a small amount of collapsed stone in the passage through the secondary buttressing wall on the inner face suggesting that the

rampart had not been carried over it. The roofing was therefore only extended across the width of the original rampart. A small amount of masonry was added above the lintels but no attempt was made to build the rampart to its full height.

The rampart to the east of the North Postern

The rampart climbs up a fairly steep slope to the top of the mountain and survives close to its original height and retains a substantial parapet for 25m. The walkway behind the parapet retained a surface of large slabs, presumably laid to prevent erosion to the top of the sloping masonry. This is one of the best-preserved stretches of undisturbed rampart on the fort. There was one serious collapse in the outer facing just to the east of the north postern but elsewhere only minor stabilisation was necessary.

The rampart around the upper part of the mountain

The rampart here was quite badly eroded. It had been built at the top of an extensive scree slope and in several places the base of the wall had slipped forward resulting in either the complete loss of the rampart, bulges in the facing or in displaced semi-collapsed facing that was a long way off line. Additional lengths of facing had also been built in the scree in front of the rampart presumably in an attempt to stabilise the slope. Repairs in antiquity resulted in several conjoining alignments of facing that resembled the discontinuity in the north-western wall (see above). Some areas had deteriorated to a point of stability and were not conserved, others were stabilised using the established methods.

The rampart from the outcrops to the south-eastern postern

The rampart in this area incorporates two large rock outcrops. The north-eastern end comprises low facing initially built onto bedrock and then onto scree. The scree in this area had moved and carried the rampart *en masse* 2m down the slope. The facing was still recognisable although it was leaning back at an acute angle, and was reasonably stable. This shows that the masonry on Tre'r Ceiri can survive quite significant movements and partial collapses without entirely losing its structure.

An 11.2m length of rampart runs between the large rock outcrops. This was generally well-preserved, standing to a maximum height of 2.5m on the outer face and up to 1.0m on the inner. Remains of a parapet could be traced in several places indicating that the wall again survives close to its original height. A narrowing of the rampart from 2.5m to 1.7m produced by a marked in-turning of the outer face could indicate the remains of a previously unrecognised, narrow, postern gate. This was in an area of collapse, although the lower courses of the rampart had survived. There were some fairly small

stones laid as headers running through the rampart that could have been the north-eastern side of an entrance passage but in general the masonry was in a poor state and no other evidence survived.

The remaining 27m of rampart between the outcrops and the postern, was in places, well-preserved, standing up to a height of 2.7m on the outer face. The inner face was, as in many places on the site, lower and its survival and interpretation were complicated by huts dug into the scree in front of the wall. There were some marked variations in the style of masonry in the outer rampart. One area of facing had been constructed from fairly regular natural blocks and slabs producing a semi-coursed style of masonry. This abruptly changes in a diagonal line across the rampart to wholly irregular facing. Elsewhere a course of slabs had been laid in a horizontal line part way up the wall in a fashion similar to that recorded at the north-western end of the fort. There was nothing to indicate multiple phases of construction and it seems likely that the changes reflect the work of different teams of builders using individual building styles.

The south-eastern postern was excavated by Hogg and found to be a simple gap in the rampart. The passage walls were formed by edge-set, upright slabs with laid masonry above them. It was blocked with random rubble as opposed to deliberately built masonry.

The rampart from the south-eastern postern to the south-western entrance

The rampart to the south-west of the postern is particularly well-preserved with the outer face surviving to a height of around 2.0m for around 60m. The inner face is generally less than 1.0m high and the rampart seems to have been built against a sharp break of slope and incorporates bedrock in places. The low remains of a parapet can be seen for much of this. The natural ground level falls steeply along the length of the wall. A length of facing running across the upper part of the rampart, forming a step, was probably designed to prevent erosion on the wall-walk. There were several fairly serious collapses, all a result of movement of the underlying scree. These were again conserved by rebuilding the collapsed masonry to the same height as the adjacent original.

The height of the outer face drops to an average of around 1.0m as it turns to the west and approaches the south-west entrance. The inner face cannot be traced in this area.

The inner rampart - discussion

The inner rampart is a fairly simple construction comprising an inner and outer face built from large stones, set into the wall as headers, with a rubble core. The facing is uncoursed, irregular and close to vertical. The rough style of construction and a ready supply of building materials would have allowed a relatively fast rate of construction. The total time to build the defences can be roughly estimated. The team of three stonemasons who worked on the conservation project could build at least one metre of full-height wall per day. There are roughly 400 metres of full-height wall and 130 metres of half-height

indicating an approximate build time of 1395 person days. Estimation of the actual time taken to build the fort is somewhat meaningless due to lack of information about population and the extent of involvement of the surrounding community. The resources needed can, however, be illustrated by noting that this translates to a build time of 139.5 days or 20 weeks for 100 people. Hogg carried out a similar calculation and estimated 78 days for 95 people based on the estimated population of the phase 1 roundhouses (Hogg 1960, 23). There are a great many unknowns in any calculation of this type but either estimate demonstrates that given a reasonably large pool of labour the ramparts could have been built relatively quickly with a major but not unrealistic use of resources or alternatively over several years with a lesser impact. Variations in the masonry style recorded during the project almost certainly indicate that several different gangs of workers were involved.

THE OUTER RAMPART

A second rampart runs around the outside of the north and north-western sides of the fort. The central part, around the north-west entrance is around two metres high and is built from massive boulders. Its construction is somewhat different to the inner rampart; the space behind the outer facing was simply in-filled to produce a terrace with no attempt to build an inner face or parapet. It also incorporates much larger stones possibly because it was easier to roll boulders down from the scree slope and onto the wall than it was to lift them up to the inner rampart. The rampart continues around much of the north and north-western side of the fort but becomes less monumental away from the entrance. It simply grades down to the ground at both ends and there is a wide gap at its north-westernmost point where the wall appears to have never been built.

The majority of the outer rampart is stable and it is rarely visited. The only area that required conservation was where the path leading to the north-west entrance passes through the rampart via a gateway. The south-western side is formed by an in-turning of the outer face producing a 2.2m wide passage wall. The opposite side consists of an out-turning length of massive wall, 3.5m thick and up to 2.2m high on both faces. The face turns sharply inwards near the outer end of the entrance passageway, a feature interpreted by Hogg as a jamb for an in-turning gate. This also overlies an earlier trackway running to the entrance through the inner rampart (Hogg 1960, 30).

There were two areas of collapse here. The north-eastern side had collapsed down to a height of 0.5m and was unstable. This was cleared of rubble revealing two lines of facing. It appeared that the inner had begun to fail with stones slipping out at the base and the outer had been built 0.5m in front of it to act as a buttress to the unstable masonry. Stone was added to this face to a maximum height of 1.1m in order to stabilise the masonry. A slightly more contentious intervention was made on the south-western side where there was a large 0.3 m diameter void in the facing that was showing some signs of instability Hughes and Hogg had both recorded a hole here “intended to receive the end of a timber baulk” (Hogg 13). The hole showed no sign of having been intentionally constructed as part of the wall

facing, there was not a stable lintel and the sides and base were all of irregular stone. It seemed more likely that several stones had simply fallen from the wall facing. This piece of wall stands alongside one of the two main paths into the fort and several tons of boulders lie on top of the rampart. It was therefore felt that it would be safest to pack the void with stones. No original masonry was affected and all of the stones were marked with drill holes. The packing stones were subsequently removed by persons unknown.

The remainder of the outer rampart was found to be stable to an acceptable extent, mostly as a result of the massive stones used in its construction.

THE HUTS

The interior of Tre'r Ceiri contains at least 158 huts and other structures, many of which required some level of stabilisation works. It is clearly beyond the scope of this paper to describe every hut in detail. The huts are clustered together in four main groups and the salient details of each group will be described.

Most of the larger, better-preserved huts have been excavated although few to modern archaeological standards. The first excavations may, however, have been of a distinctly non-archaeological nature. It appears that that the people of the neighbourhood had been treasure hunting in the huts in the mid-18th century "An old woman of Llithfain dreamt that a copper cauldron full of gold was buried in Tre'r Ceiri. This unfortunate dream did more harm to the cytiau of Tre'r Ceiri than many centuries of natural causes of decay" (Baring Gould and Burnard 1903, 5)

Two main phases of excavation were carried out. In the first 32 huts were excavated over a 10-day period 1903 under the supervision of Rev. S Baring Gould and Robert Burnard. In the second a further 32 huts and two of the entrances through the rampart were excavated over a 12-day period in 1906 under the supervision of Harold Hughes. In both cases the contents of the huts were emptied out and the finds recorded but with no record of stratification and only minimal description of the huts themselves. The excavation was carried out by teams of labourers from Bethesda and Four Crosses. It is clear that there were deposits within some of the structures and probably surviving floor levels. Baring-Gould and Burnard recorded that hut floors were covered by a thin layer of peaty earth which was covered by the debris from the walls. They noted that the roughly paved floors and underlying rubble "were uncommonly poor retainers of ill-considered or broken domestic objects" (1904, 4). General observations of the soils and substrate on the mountain during the conservation work suggest that the clayey subsoil is not very deep and overlies the natural blockfield in most places. Exposed deposits that are not consolidated by vegetation are vulnerable to erosion and there is a tendency for peat, clay and finds to be washed between the stones to accumulate on the first solid horizon which may be well below any archaeological horizons. Safely stratified deposits are therefore rare. Hughes produced a detailed plan of the site during the course of both the 1903 and 1906 of excavations, but

stated that “many details require correction” and that “corrected measurements have not yet been taken”. No further plan was forthcoming although a larger- scale hand-drawn version which includes more detail than the published version survives (Hughes 1906). Further excavations examining 10 huts, were carried out using more modern archaeological methodology by G. Bersu C. A. Gresham and W. J. Hemp (anon. c. 1939.)

The most recent excavation was by A. H. A. Hogg during the 1950s on behalf of RCAHMW (Hogg 1960). An updated and expanded site plan was also made at this time. It is significant that he attributes the good preservation of the site to the clearing out of the interiors and the building up of stones onto the top of the walls by the previous excavators. He also states that the “walls onto which the stones were built were sometimes the creation of the workmen, and the present plans do not necessarily represent their original form. Further, straight joints were usually masked, though sometimes they were made where they did not exist and doorways were often built up and concealed” (ibid, 17). Careful examination of the huts and masonry styles during the conservation project partly supports these observations. Several huts have clear changes in building style with the upper parts of the wall being little more than piled stones. This is almost certainly a result of clearing out the interiors by the early excavators. Many other huts, however, show no such evidence and the walls appear to be entirely original. It should be remembered that the site was sufficiently well-preserved to allow Pennant to produce an impressionistic drawing of the huts and Hughes a more detailed plan that included many unexcavated huts. This suggests that Hogg may have somewhat overstated the amount of rebuilding that had occurred.

The huts seem to share many constructional features. Almost all were formed by digging into the natural scree slopes. This method has the advantage of providing plenty of building material. The entrance is usually on the lowest side of the slope and level with the exterior, and the body of the hut terraced into the slope and below ground level. The lower courses often contain slabs set upright to form part of the wall facing. The slabs are locked in place by the surrounding conventional masonry but are points of weakness, being particularly vulnerable to undermining. A surprising amount of these uprights have, however, survived.

The shape and size of the huts exhibits a large amount of variation, ranging from a series of large traditional roundhouses that are usually interpreted as belonging to the earliest phase of activity to a large number of small irregular cells. There is also a range of rectangular and sub-rectangular buildings, many of which are built against the ramparts.

The southern group (Figs 4 and 5)

This group of 37 huts contains six roundhouses, 5 pairs of oval or sub-rectangular huts, a group of three huts formed by the subdivision of a large roundhouse, one large rectangular hut and a variety of irregular structures. Many of the huts in this area were suffering from serious erosion, mostly as a

result of being next to the main pathway through the fort. In particular, hut 5 described by Griffiths in 1946 as being “a fine hut” had been reduced to a rubble-filled hollow by treasure-hunters undermining the walls and visitors climbing over the subsequent collapses. Others such as hut 7 were still superbly preserved. All could however be seen to be deteriorating due to visitor erosion.

The clearance of rubble from the huts allowed many details of their construction to be recorded. This was of particular interest in this group of diverse and fairly well-preserved huts. The group is built around a series of six roundhouses all between 6.0 and 7.2m in diameter that appear to be the earliest structures. All of these have been subdivided, usually following a similar pattern. Pairs of oval to sub-rectangular huts are a distinctive feature of the occupation of Tre’r Ceiri, and Hogg had interpreted some of these as subdivided roundhouses and others as being single-phase constructions. All but one of the pairs of huts examined here could be shown to have been derived from earlier roundhouses. This is best illustrated by the pair of huts 17 and 18. Here a roundhouse, 6.0m in diameter, had been subdivided into two unequal compartments by a straight wall that included an entrance at one end. The ends of the dividing wall abut the roundhouse wall demonstrating that it was later addition. The narrow end of each compartment was truncated by a short length of facing, built in front of the junction between the division and the roundhouse wall, and infilled behind with small stones. This appears to have been designed to produce a pair of sub-rectangular huts as opposed to being a simple division of the original house. It was noticed that there was a collapse in the roundhouse wall behind the later masonry which must have occurred before the secondary features were added.

A similar arrangement was recorded in pairs of rectangular huts 15 and 16 and also 11 and 12 with the original round house wall clearly visible behind the division and infilling walls. The second phase truncating face in hut 11 appears to have, again, been built in front of a collapse in the roundhouse wall. There are slight differences, in this case. The dividing wall in hut 16 appears to have been built after the truncating wall and hut 12 seems to have been retained as a simple D shape perhaps with a modified entrance at the west.

The outline of huts 13 and 14 initially seemed to indicate that they were a product of a modified 7.2m diameter roundhouse. The masonry was rather fragmentary but the north-western corner of hut 14 was found to abut the outer face of 13 suggesting that hut 14 was simply built against a previous oval hut to form a D shaped hut that was subsequently modified by truncating the narrow end of the hut.

Hut 74 had been planned as a sub-rectangular structure by both Hughes and RCAHMW. This is however another example of a subdivided roundhouse with the division abutting the house wall and a possible infilling wall in the northern compartment. There is no record of this hut being excavated so conservation work and disturbance was kept to a minimum. This may be one of the few huts left on the site that has the potential for producing stratified dating evidence.

The most obvious subdivided roundhouse is represented by huts 53, 89 and 90. This was planned by Hughes and compartments 89 and 90 are depicted as being foreshortened compared to Hogg's plan. Hogg was the first to recognise that this was a subdivided roundhouse. He traced almost all of the circuit of the outer face, demonstrating that the cluster of small irregular cells was added to the roundhouse. He uncovered evidence showing that original roundhouse wall had begun to collapse prior to the construction of huts 88 and 39. The Y shaped partition and the stub wall forming the door jamb between compartments 53 and 89 were both shown to abut the roundhouse wall. The jamb of the doorway to 90 was "apparently of one build with the outer wall"(Hogg 1960, 32). He also recorded that the shape of compartment 89 had been "falsified by erecting a wall across the middle of it and filling the space N. of it with rubble from the excavations"(ibid, 34). A photograph from 1956 (RCAHM 890464/8) shows a rough face at the north-east end of the hut. Boyle, during the 1989 season, uncovered two possible facing stones set in the hut floor, slightly below the level of the base of the hut walls. He suggested they were original and speculated that they may have formed part of a partition. This would follow the pattern of truncating the ends of the compartments found in most of the other sub-divided roundhouses. It is therefore possible that Hogg mistook the wall for rebuilding that had occurred in 1903. This hut was in poor condition at the beginning of the conservation project having eroded significantly since 1956. It is the first feature that visitors come to in the interior and is therefore prone to damage, both accidental and deliberate. The walls were reinstated to a point of stability.

Interpretation of hut 53/89/90 and its adjacent structures will always be problematic. There is surviving original masonry but the hut has now been cleared of rubble or excavated three times and at each stage there has been some rebuilding. There is sufficient original masonry to show that it almost certainly originated as a stand-alone roundhouse with an internal diameter of 8.0m. This was subsequently subdivided and a cluster of smaller irregular structures were built against its outer face. Some of these secondary structures were further modified; hut 36 is almost certainly an addition to hut 87 and huts 51 and 72 show signs of alteration.

Most of the additions to the original roundhouse are defined by clear straight-joints in the masonry. There are, however, exceptions. The stub of internal division on the south (between 53 and 90) appears to be tied in to the roundhouse wall and the outer face of the roundhouse does not appear to continue between huts 86 and 92. These discrepancies could indicate that the wall of the original roundhouse had begun to collapse and was rebuilt to accommodate the new features. Hogg recorded semi-collapsed masonry on the outer face behind the cells to the north. Alternatively the builders of the secondary structures could have removed parts of the original facing in order to tie the two phases together. In either case it seems likely that the original roundhouse had fallen out of use or was in a very poor condition, before the secondary structures were added.

During the conservation work some unstable piled stone was removed from the wall top. This contained a large piece of a coarse-gritstone, saddle-quern. This was examined by Dr D. Jenkins from

Bangor University who identified the stone as Anglesey gritstone, a common source for quern-stones and probably originating from an area around Ty'n y Gongl. The stone on the wall top was most probably placed on top of the wall during the clearance of the hut in 1903.

The southern group of huts also contains three smaller undivided roundhouses (5, 6 and 7) and two unexcavated and only partially-defined probable roundhouses 79 and 95. Roundhouse 5 is 5.0m in diameter and has a 4.1m long entrance passage on the north-western side. The adjacent roundhouse 6 is slightly smaller at 4.4m and also appears to have included a long entrance passage. A line of masonry in the entrance floor shows that the passage was modified by the addition of a wall at an angle to the original. Hut 7 is also 4.4m in diameter; the floor is over a metre below the surrounding ground level and original facing survives up to a height of 1.5m. This includes several edge-set slabs, two of which are over a metre high.

A group of irregular huts 8, 9 and 10 show some evidence of phasing; hut 8 was built against the wall of hut 10. It could be argued that the obviously semi-circular hut 9 and hut 10 are modified roundhouses with hut 8 a more recent insert. There are, however, no other visible joints in the masonry and the current arrangement of huts could only have been achieved by extensive rebuilding of any earlier structures. The evidence is inconclusive and it is possible that these three huts are single-phase unmodified structures. Hut 100 near the south-eastern postern had been badly damaged but was clearly rectangular and built against the rampart.

The central north-western group (Fig. 6)

This group contains one definite roundhouse (hut 21) 6.5m in diameter. A hollow to the east of this may be the remains of a second roundhouse, about 6m in diameter. To the north-west of this is a group of oval to sub-rectangular huts all terraced into the natural scree slope. A rough meandering wall of piled stone runs along the north eastern edge of the huts. Huts 22 and 23 are both roughly regular rectangular buildings and 24, 25 and 19 are all roughly D-shaped. Hut 82 is a small cell or even a terrace that incorporates particularly large edge-set stones in the wall including one slab that is 1.5m tall. Examination of a collapse in hut 26 revealed a possible reason for the variations in the shape of the huts. In this case the hut is almost rectangular apart from the southern wall which runs at 45 degree angle to the side-walls. Clearance of stone from a collapse here showed that the shape of the corner was dictated by the presence of bedrock protruding from the scree. This cluster also includes a series of huts built against the rampart. Hut 77 is rectangular with dimensions of 9.6m x 3.1m with the rampart forming its north-western wall and is the largest rectangular hut on the site. Two adjoining huts built against the rampart are small and sub-rectangular.

The north-eastern group (Figs 7 and 8)

A band of huts run across the fort on a slightly sloping natural terrace below the cairn. These huts had been particularly badly affected by a spate of treasure hunting and metal-detectorist activity, much of it recorded by Dallimore's survey in 1978 although some was more recent. This consisted of the excavation of deep holes in the hut floors causing serious and often unconservable collapses in the hut walls. There was also evidence of problems caused by the early excavators. Hut 67 appears to be particularly well-preserved with inner facing surviving to a height of 1.4m. It is however a perfect example of Hogg's observation that the early excavators added to the original masonry. The hut floor had been excavated to below the level of the base of the wall. An abrupt change in the style of the masonry at a height of 0.8m indicates the extent of the original wall. This consists of stones laid to a fairly neat face. In contrast, the upper parts of the wall are nothing but roughly-piled small stones. Voids beneath the base of the walls had begun to form and the entire structure was in danger of collapse. It was, however, possible to pack the voids and stabilise the hut.

There are a wide range of shapes and sizes of huts in this area. Hut 56 is the only definite undivided roundhouse in this group. It has a diameter of 5.0m and has a cluster of small sub-rectangular huts around it. The distinctive paired huts indicating sub-divided roundhouses are again present. In several cases structural evidence showing the different phases of masonry was uncovered. The roundhouse wall could be traced behind the division and a truncating wall in hut 59, and a similar arrangement was almost certainly present in hut-pairs 47/48, 76/143 and 48a/48b. Paired, small, sub-rectangular huts 45/46, 105/106, 45a/45b and perhaps hut 41 also appear to follow this pattern but were not investigated in detail being ruinous but stable. The only subdivision that appeared to be integrated into the roundhouse wall was that recorded in hut 61 by Hogg. This may simply have been a result of the end of the dividing wall being built against already collapsed masonry in the hut wall.

The majority of the remaining huts are oval and built in interconnecting clusters, with adjoining huts built against the walls of their neighbours. They are of a fairly uniform size typically 4m x 2.5m. Most of the huts in the group built against the rampart at the south (102 to 108 etc) follow this pattern as do those along the eastern and northern margins of the group i.e. around huts 50, and 67-9. The cluster around hut 50 is, unlike most of the huts on Tre'r Ceiri, built on level ground and not terraced into the scree; both the inner and outer faces of huts 49 and 50 survive to a height of over 1m. The structures to the north of this (129-132) are more irregular and appear to be pens or small enclosures as opposed to dwellings.

The huts at the north of the north-east group include oval, sub-rectangular and D-shaped huts with a cluster of small interconnecting cells and rectangular huts built against the rampart. Some additional details were uncovered during the conservation work. Hut 64 was portrayed as being circular by RCAHMW although Hughes showed it as being oval with an irregularity in the southern wall. The irregularity appears to be a later addition, perhaps buttressing a weakness in the wall. The hut is in too poor condition to allow its original form to be determined although it could have been a 4.5m diameter roundhouse. Hut 63 appears to have been built against its eastern wall. A two-phase entrance was

uncovered in the eastern wall of hut 56, probably indicating that it had been reduced in size. An entrance was discovered in the south-western side of hut 38, a small roundhouse close to the rampart. The previously planned entrance (Hughes 1906 and RCAHMW 1956) appeared to have been a collapsed section of facing. Hut 121 had been depicted by both Hughes and RCAHMW as a roundhouse with a diameter of around 6 m. The outer face supported this observation. Minor stabilisation works, however, revealed straight lengths of facing on all sides of the interior suggesting that it had been modified to form a roughly rectangular structure with dimensions of 5m x 3m.

The eastern group (Fig. 9)

A row of distinctively rectangular huts are terraced into the bottom of a steep scree slope to the west of the cairn. In common with many of the huts, these had been disturbed by treasure hunter hacks. There had been some serious collapses. Conservation and some clearance of rubble was therefore necessary. This allowed accurate plans of the huts to be made, and uncovered some additional details.
Hut 138 was found to be roughly trapezoidal with a slightly offset entrance in the western wall. Hut 137 was sub-rectangular with outer facing on the north-eastern side that defined one side of "hut" 139. Feature 139 is a large levelled enclosure bounded on three sides by a wall of piled boulders with a probable entrance on the north-west. There is nothing to suggest that it ever functioned as a building and it best interpreted as an animal pen. Huts 75, 144 and 145 were probably all rectangular. Hut 144 was badly ruined with much semi-collapsed and off-line facing but both Hughes and RCAHM depict it as being rectangular. Hut 145 was in poor condition and had not been correctly defined by either of the previous plans. The admittedly fragmentary remains of facing beneath the rubble showed that it was a rectangular hut with dimensions of 6.5 x 4.2m. There are a few small structures dug into the scree slope to the north-east of the main huts but these do not appear to be buildings and are best interpreted as animal pens.

The outlying huts (Figs 10 and 11)

There are several huts that are not part of the main clusters. A small group of huts built against the rampart to the east of the south-west entrance appear to be centred on two large roundhouses (Fig. 10). Adjacent huts 3 and 4 are quite different shapes and sizes but clearance of loose rubble from the line of the walls revealed what is almost certainly the line of the wall of a former roundhouse with a diameter of about 7.5m. This forms the southern wall of hut . Hut 3 and the rest of hut 4 consist almost entirely of secondary masonry built within the larger roundhouse. Hut 32 was found to be a simple undivided roundhouse with a diameter of 6.0m and an entrance on the south-west. Various stubs of facing can be seen adjacent to these huts. They appear to be part of a series of rectangular huts (30-31 and 33-35). These were all found to be stable and no clearance was undertaken. Several additional hollows and lengths of facing were recorded which probably indicate further huts (34a, 35a, 35b, 72a and 72b).

A large roundhouse (29) and 3 adjoining rectangular cells stand towards the south-western end of the fort. Hogg carried out some limited work on roundhouse 29 and adjacent hut 28 and suggested that the outer face of hut 29 had been modified in order to tie in the masonry of hut 28. A conclusive relationship between the two could not be demonstrated however. This group was basically stable and little consolidation was necessary.

Many of the larger rectangular huts were built against the rampart. Hut 2, close to the north-west entrance, was a somewhat isolated example. It was cleared of some recent disturbance showing that the north-west wall had been built against the rampart forming a shelf about 1.0 high. There appeared to be an entrance in the south-eastern wall.

The huts – Morphology and phasing

To date, 160 stone buildings have been identified at Tre'r Ceiri, all but two of them enclosed within the circuit of the inner rampart. These are usually described as houses, and often roundhouses, in both popular and academic literature, giving the impression of an interior densely packed with substantial dwellings. The site plan shows that this is not the case; larger buildings are present but there is a preponderance of small irregular structures.

Hogg proposed a typological series "suggesting development from a simple round hut, evolving through a round hut with a central partition into D shaped huts, and thus into small irregular or rectangular enclosures" (Hogg 15) He cites the subdivision of roundhouse 37 by a blocking wall as evidence of beginnings of the first development followed by the construction of subdivided roundhouses with the division as part of the original construction as demonstrated by hut 61 and somewhat less conclusively by the three-compartment subdivision of hut 89/90/53. The next phase of irregular huts was shown to have been built against the three-compartment roundhouse. This gradual evolution was argued to demonstrate that "the occupation of the fort was unbroken from its foundation until sometime in the 4th century at least" (ibid 16)

The additional structural details uncovered during the conservation project allow some refinement to be made to this typological series. There seems to be little doubt that the first phase of occupation of the site comprised a series of roundhouses (Fig 12). Many of these were subsequently modified following a process comprising the erection of a subdivision and the blocking off of the narrow ends of the resulting D-shapes to produce a pair of roughly rectangular huts. This process with minor variations can be seen to have occurred in 15 roundhouses. Hogg, unfortunately, excavated the only roundhouse (61) where this process cannot be conclusively demonstrated. He was correct in recognising that several of the houses seemed to have elements of the subdivision that were bonded into the original roundhouse wall. This is not necessarily an indication that the subdivided roundhouses were single-phase structures. Several instances of collapses in the original roundhouse walls, behind the second phase of masonry, were recorded both during the conservation project and by Hogg. It could be argued

that the rare instances of apparent single phase construction such as in the doorway between huts 53 and 90 (in the three-compartment roundhouse), are a result of adding new masonry at the same time as repairing a collapse and bonding the two elements together.

The frequent collapses in the first phase of roundhouses behind later masonry indicate that the roundhouses were in poor condition when the modifications were made. This makes Hogg's gradual morphological development less likely and therefore also casts doubt on an unbroken occupation of the site. It can be argued that the poor condition of the roundhouse walls indicates that there was a period of abandonment before the construction of the subdivisions and irregular huts. This would fit with known settlement patterns in the region; hillforts were generally abandoned in the late Iron Age and several were subsequently visited and reoccupied during the Romano-British period (Waddington 106-8). It can therefore be argued that the huts represent two phases of occupation on Tre'r Ceiri. The first comprised a hillfort containing at least 26 conventional Iron Age roundhouses that appears to be part of a series of large- to medium-sized stone built hillforts of the Caernarfonshire series dating from the 1st millennium BC (Harding 100-102 Waddington 97-102).

The interior of the fort as currently visible probably represents the second phase of occupation. As noted above, the huts are often referred to in popular literature and even in academic papers as being predominantly roundhouses with some mentions of rectangular or irregular structures. This is perhaps more of a reflection of the writers' expectation that a hillfort will contain roundhouses than of the evidence on the ground. A review of the plan shows that there are in fact only 11 undivided roundhouses. Most of the subdivided roundhouses have been modified to the extent that they are only recognisable as pairs of small rectangular huts and almost certainly functioned as such. The original roundhouses appear to have been treated as convenient, partially-revetted holes in the ground and used to build smaller structures as opposed to being large structures requiring subdivision. The predominant type of buildings are the 93 irregular huts. These are variable and generally conform to a somewhat asymmetrical sub-oval or sub-rectangular plan. Clearly roundhouses were not the predominant building type and it is only the smaller and less standardised examples such as huts 5 and 6 with their extended entrance passages that show evidence of later modification and use. This change in building style probably indicates a change in the function of the site.

An examination of the buildings on Tre'r Ceiri shows that 15 are lightly-built irregular enclosures best interpreted as animal pens. The remaining 145 could have been roofed buildings. One of the most obvious differences between the two phases is a change in scale of the buildings. The phase 1 roundhouses have a mean internal area of 26.2sq m, the phase 2 huts, excluding undivided roundhouses, a mean internal are of 10.4 sq. m. The huts derived from subdivision of the roundhouses are even smaller with a mean internal area of 7.9sq.m, with one as small as 3.5 sq. m (only slightly larger than a modern double bed). The only huts to approach the size of the roundhouses were the rectangular huts set against the walls and in a group at the east end of the site below the cairn. This radical shift in building style clearly indicates a change in roofing style. The remaining roundhouses

could have been built in a conventional; style, although this does not have to be the case. The rest could have been roofed in several ways. Corbelling would have been an obvious solution given the amount of good building material but the vertical hut-walls and relatively small amounts of tumble within the huts suggest that this method was not used. The trend towards rectangular building could indicate hipped roofs or a simple mono-pitched construction. These scenarios presuppose that the site was used as a permanent or semi-permanent settlement. Some or all of the buildings could have had intermittent and/or temporary use and utilised simple temporary covers such as animal skins with light wooden supports.

The huts - Artefactual evidence

The conservation project produced only two artefacts. The saddle quern from Hut 90 is a typical Iron Age type; new technology in the form of rotary querns had become dominant by the Romano-British period. This is most likely to date from the first phase of occupation and it is significant that it was found in a subdivided roundhouse. This adds further evidence showing that the distinctive three-compartment hut 89/90/53 originated as a large roundhouse as opposed to being a single build. The pottery from the north-west gateway dates part of the flanking wall alongside the entrance to the mid-second century or later. This demonstrates refurbishment or remodelling of the entrance during the Romano British period and could indicate that the secondary modifications to the ramparts and entrances date from this phase.

There is little to add to the previous accounts of the finds from the early excavations (Wheeler 1920-1921 46-55 and Hogg 15-16). None were stratified but a wide range of material was recovered including high-status metal-work in the form a gold plated brooch, fragments of a beaded torc and a triskele, Roman pottery, beads, a bone comb, part of a shale ring (in 1956), a few iron tools spindle whorls, ox, horse and sheep bones, pot boilers, charcoal and stone pounders. The brooch and the torc probably date from the mid-first century AD, the datable pottery from no earlier than the mid-second century. Waddington suggests an early medieval date for the bone comb (Waddington 110, 221). Hogg's analysis shows that only one of the undivided roundhouses produced Roman pottery suggesting that they are early. The rest of the Roman pottery was found in all styles of huts apart from the larger rectangular buildings. The high-status metal-work all came from sub-rectangular huts or subdivided roundhouses.

A small amount of further analysis shows some additional patterns in the distribution of finds. Most of the finds including 'potboilers' charcoal, bones, pottery and stone pounders indicate domestic activity and this was identified in 57% of the huts. The material was identified in all sizes of huts including some of the smallest. Significantly, finds indicating more settled domestic activity, 3 spindle whorls and a saddle quern all came from roundhouses or subdivided roundhouses. No material was recovered from 32% of the huts and again size was not significant. Morphology was significant with 41% of rectangular and irregular huts producing no material compared with16% of roundhouses and

subdivided roundhouses. This may be a result of accumulation of material over the longer period of occupation of the roundhouses including two phases of activity for the subdivided examples.

The finds distribution indicates two distinct phases of activity; phase 1 in the Iron Age associated with a series of roundhouses followed by occupation in the Romano British period centred on the irregular divided and sub-rectangular huts. The bone comb was the only find from the larger rectangular huts suggesting that early medieval activity is a possibility.

The extra-mural enclosures

All of the less-precipitous ground around the fort is covered with low meandering walls that either form small terraces or larger curvilinear fields. The RCAHMW plan is a good record of these but additional details have been added during surveys for the preparation of this paper. The enclosures extend beyond the outer rampart and appear to interrupt its line in the gap at the north-west suggesting that they predate it. Many of the enclosures are covered in heather and grass. Some, particularly on the scree to the south are devoid of vegetation. These contain few large stones compared to the surrounding blockfield and appear to have been made by the clearance of large stones which were then used to build walls at lower edge. This is a typical field clearance technique and these are best interpreted as small curvilinear fields or pens, perhaps similar to other contemporary upland fields in the area. Suggestions by Hogg and others that some of these may have been garden plots seems to be unlikely, the altitude and poor, acidic, peaty soils preclude the cultivation of any lowland crops. Analysis of the soils in the enclosures by Lang in 1983 was inconclusive but recorded deposits of peat between 10 and 30cm deep (Lang 1983, 21) The vegetation around the fort when unmanaged quickly reverts to tall heather and scrub, decreased grazing over the last 10 years has led to changes in the vegetation and rapid regrowth of trees. It seems likely that the enclosures were an attempt to provide improved grazing in the immediate environs of the fort; the bare enclosures to the south may simply be a result of erosion by stock trample or over grazing. It has been suggested that two rectangular settings of stones on the saddle to the south-west of the fort may be burials (Hughes 1907, 50-51 and Hogg 1960, 14) but neither are currently visible in the tall heather.

CONCLUSIONS

No discussion relating to hillforts can ignore the changes in the interpretation of hillforts by post-processual archaeological theory. Up until the 1980s hillfort function was seen primarily in terms of defence and warfare (Wheeler 1943, Avery 1986). Studies had been dominated by work in southern England on sites such as Danebury, leading to a model that perceived hillforts as central places in the landscape controlled by a warrior elite within a hierarchical society (Cunliffe 1995, 87-97). A series of papers by Hill (1995a, 1995b and 1996) Bowden and McOmish (1987) amongst others argued for a rethink of the military role of hillforts to the extent that they were seen to have a primarily symbolic

function. Emphasis was put on the role of boundaries in defining social groups and ritual motivations for the construction of hillforts or elements thereof. Some concluded that hillforts were purely symbolic structures with no accompanying defensive role. Somewhat more pragmatic approaches have since been proposed recognising that violence and conflict were almost certainly a factor in Iron Age society (e.g. James, 2007 and Armit 2007).

The debate has considerably broadened the scope of hillfort studies, emphasising the complex and varying role in of hillforts in Iron Age society. Avery's vision of 'terrified clans each huddled timorously into a massively defended hilltop refuge' (1986, 228) has been replaced with a more nuanced approach. Armit argues that a defensive role is complimentary with ritual and symbolic functions and that hillforts fulfilled multiple additional roles such as political centres, elite residences, sacred precincts, stock enclosures, crop stores, gathering places and the sites of fairs. Many hillfort ramparts incorporate elements of monumental display that do not perform a practical defensive role. There are wide regional variations in architecture that are more than a function of availabilities of different building materials. Driver's analysis of the hillforts of Ceredigion identifies complex regional architectural traditions relating to the settlement of the surrounding landscape (Driver 2013).

In its first phase of construction Tre'r Ceiri was one of several Iron Age hill forts in the region. It comprised a series of roundhouses enclosed by a single dry-stone rampart built from the abundantly available local stone. The main entrance was probably on the north-west with a secondary entrance on the south-west. In their earliest form these may have been simple gaps in the rampart. At least three narrow additional entrances seem to be original features providing access both to springs on the slopes below the fort and to a series of curvilinear enclosures and terraces that were almost certainly livestock enclosures. This indicates a commitment to upland agriculture and the importance of livestock to the activities in the fort. It seems likely that the landscape around the fort would have been actively managed to produce upland pasture. The area is currently dominated by heather although there is still some grassland to the north-west around hut 151 which itself appears to be a typical upland shepherd's shelter. The bwlch between the peaks and also the upland area extending to the south-west could almost certainly have been managed to produce grassland. It therefore seems likely that one function of the fort was a base for summer grazing.

The roundhouses contained spindle whorls and a quern indicating wool and food processing on site thus demonstrating at least semi-permanent habitation. There has been much debate about the seasonal versus permanent occupation of the site. Hogg suggests permanent occupation because "it is difficult to account for the disappearance of the presumably substantial winter houses" (1960, 24). This presupposes that most Iron Age settlements are visible in the modern landscape where in reality structures such as clay-walled roundhouses usually remain hidden until revealed by excavation or parch-marks. It is indeed difficult to envision a model for the occupation of Tre'r Ceiri without substantial links to lowland settlement. On purely practical grounds the uplands around the hillfort would not have been productive enough to sustain anything more than a very small population. There

would have been, as noted above, potential for summer pasture but the elevation (370 to 425m on the plateau below the fort), poor soils and exposed position would have made arable cultivation impossible and there are also large expanses of inaccessible boulder fields on the eastern approaches that would have been totally unproductive. Hillforts are no longer seen as isolated castles but more as the focus of a community most probably spread over an extended territory. When viewed in these terms it is less likely that Tre'r Ceiri would have been occupied in the winter months. It is, it must be remembered, one of the highest hillforts in Britain and sits on a very exposed 485m high mountain top. Weather conditions can be extreme in the winter months and any residents must have had very pressing reasons to live in such an environment. It can be argued that the hillfort tradition in the area could have developed from transhumance practices. Livestock would have represented a substantial part of the wealth and prestige of a community. It is also likely that this resource was under threat from raiding. The origin of these defended hilltop enclosures could well have been a response to this, with the ramparts keeping animals in as much as keeping raiders out. Hillfort design, often enclosing large areas with distinctly permeable defences, would be suited to this function as opposed to any activities resembling medieval and later warfare. This bringing together of people and their movable prestige objects in the form of livestock would inevitably lead to the development of ritual and display practices. The ramparts of Tre'r Ceiri appear to have a defensive function but became increasingly elaborate and monumental as the site developed. The ramparts were, from the beginning, most imposing along the north-western side i.e. to either side of the main entrance. It could be argued that this side of the fort is most easily accessible and thus harder to defend but the area around the south-west entrance is also fairly easily accessible and the rampart is low and distinctly unimpressive in this area. The fort in its earliest form appears to be designed for display as well as defence.

The secondary features in the form of the elaboration of the entrances and the construction of an outer rampart seem to be less overtly defensive. The outer rampart in particular is distinctly monumental both in terms of its sheer scale and its use of massive stones in the facing. These massive stones are only present on the approaches to the entrance and are best interpreted as displaying a message about the strength of the inhabitants. If examined in detail, the outer rampart is revealed as a poor defensive feature; it simply grades to the ground before reaching any other masonry and can be circumvented by simply walking round the ends. The extended passageway leading to the north-west entrance may have produced some defensive advantage but its main function seems to be in emphasising the main entrance to the fort. The secondary defences have not been conclusively dated; the entrance passageway can be demonstrated to have built or at least modified during the Romano-British use of the fort, and this may indicate a major refurbishment and remodelling of the fort including the construction of the outer rampart. This interpretation is quite likely to be correct but is not proven and some elements of the secondary defences may belong to the first phase of occupation.

The second phase of use, probably commencing during the second century AD and therefore during the Roman occupation, appears to have occurred after the first phase of roundhouses had become ruinous suggesting a period of abandonment. There is little uniformity in the design of the second-phase huts,

many being irregular but with tendencies towards a sub-oval or sub-rectangular plan. The dense clustering of these smaller cells is unusual. There are similar clusters in areas of the Garn Fadryn and in the Mynydd Graig Goch hutgroup. Both sites are within 15km of Tre'r Ceiri suggesting that it is a fairly localised building style.

The phase 2 huts are typically less than half the size of the previous phase of roundhouses and represent a complete change in building style as opposed to the occasional subdivisions of roundhouses noted by Waddington in other Romano- British settlements (Waddington 2013, 108). The phase 1 roundhouses had space for social interaction beyond simple family groupings and the finds suggest extended periods of occupation even though it may have been seasonal. The smaller cellular structures of the second phase would have been considerably less effective at providing either of these functions. Modern groups of structures comprising similar groups of small dwellings are commonly found in temporary settlements such as refugee camps and pop festivals. The analogy is perhaps contrived but many of the structures are too small to be practical long-term dwellings and the dense groups of buildings would have been difficult to roof without run-off into adjacent structures. There are a few more substantial structures that could have been more permanently occupied and it is likely that the buildings performed a wider range of functions than the phase 1 roundhouses and that some were temporary structures.

It seems that all or most of this activity took place during the Romano-British period, the finds suggest it was from the middle of the second century onwards, although this could be to some extent a reflection of variations in the availability of pottery and exchange goods. The first half-century of the imposition of Roman rule was quite clearly a brutal process and existing political and social and political networks would have been seriously disrupted (Burnham and Davies 2010, 145). The impact on agriculture would also have been great with increased yields of grain being demanded to supply the garrison. After two generations of Roman military rule the garrisons were withdrawn from all of the forts in north Wales apart from Segontium. By the mid-second century the overtly military aspects of Roman rule were being replaced administrative functions such as tax collection and local government (ibid). This shift in power may have led to both a resurgence of previous tribal and social groupings and a certain amount of political instability. The Romano-British re-modelling of Tre'r Ceiri can be seen as a response to this, with a return to a site conveying power on the local community. The apparent increase in temporary occupation could be interpreted as a straightforward need for temporary refuge for a population and their livestock in the face of increased threat, either locally or from raiders across the Irish Sea. It could alternatively be interpreted as an indication of a re-use of the site for short-term ritual practices and events promoting social cohesion. The two functions are not mutually exclusive but our current evidence is incomplete. This is, to a certain extent, the result of the bias of the excavators. It is notable that no areas of the hillfort apart from the huts and ramparts have been excavated; the rest of the interior must also have been used for a variety of functions.

The impressive hillfort would have been a symbol of the strength and power of the pre-Roman population to those who had lived under the yoke of military rule. It is therefore unsurprising that it became the focus for re-use as power began to shift. There have been several suggestions that the continued to be used in the early-medieval period which have mostly been dismissed due to the lack of post-Roman pottery (Hogg 1960, 16). Waddington's provisional dating of the bone comb from one of the rectangular huts to this period may be significant (Waddington 2013, 110). There are no particular reasons to suggest that the use of the site would have stopped with the Roman withdrawal. Roman influence had moved away from aggressive military occupation many generations before and the re-use of the site demonstrates that new social and political groupings had developed. Arguments based on the lack of post- Roman finds reflect the loss of the supply-chain of Roman goods, an easily observable event in the archaeological record. The resulting reduction in datable artefacts, however, made the activities of the remaining population much more difficult to detect.

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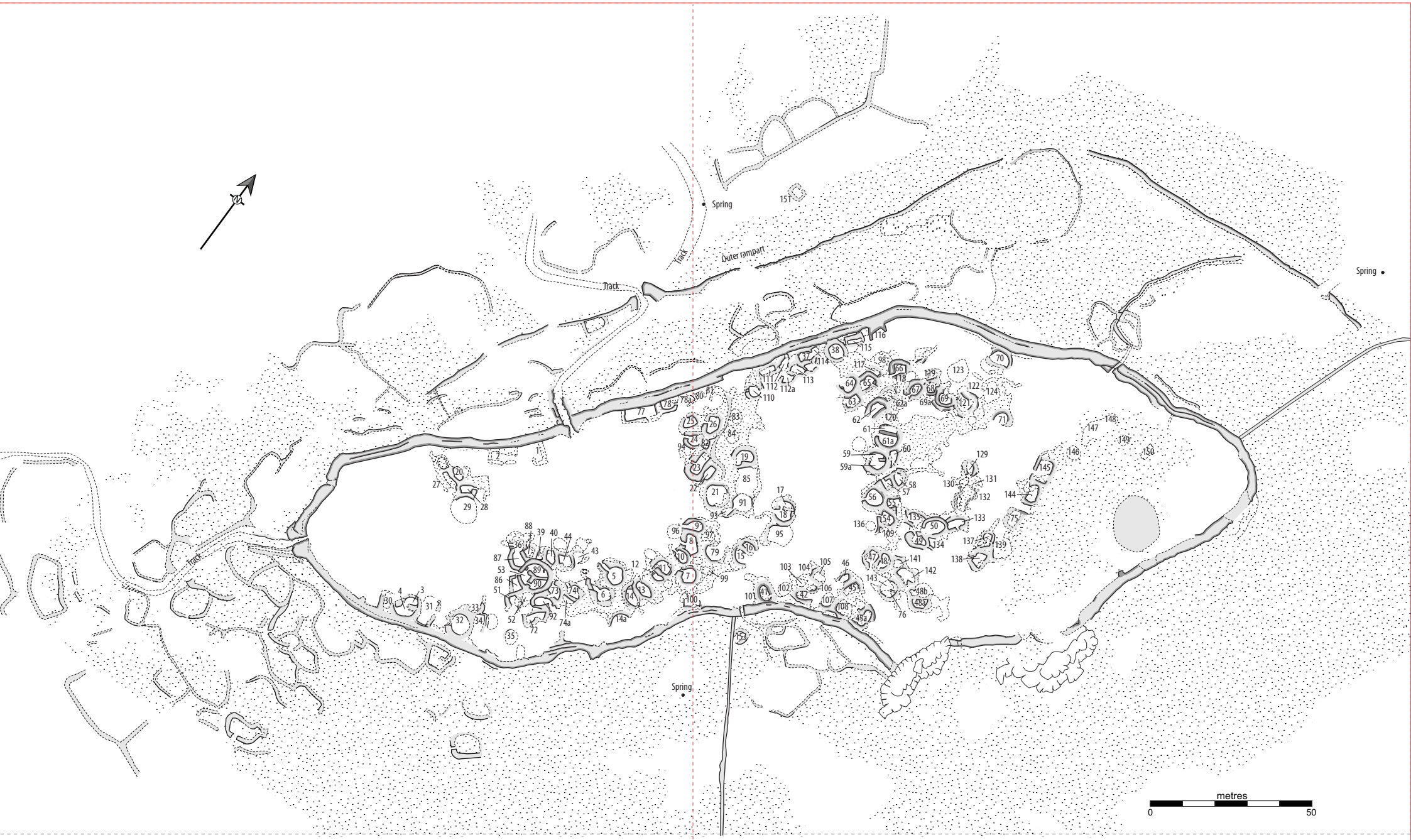
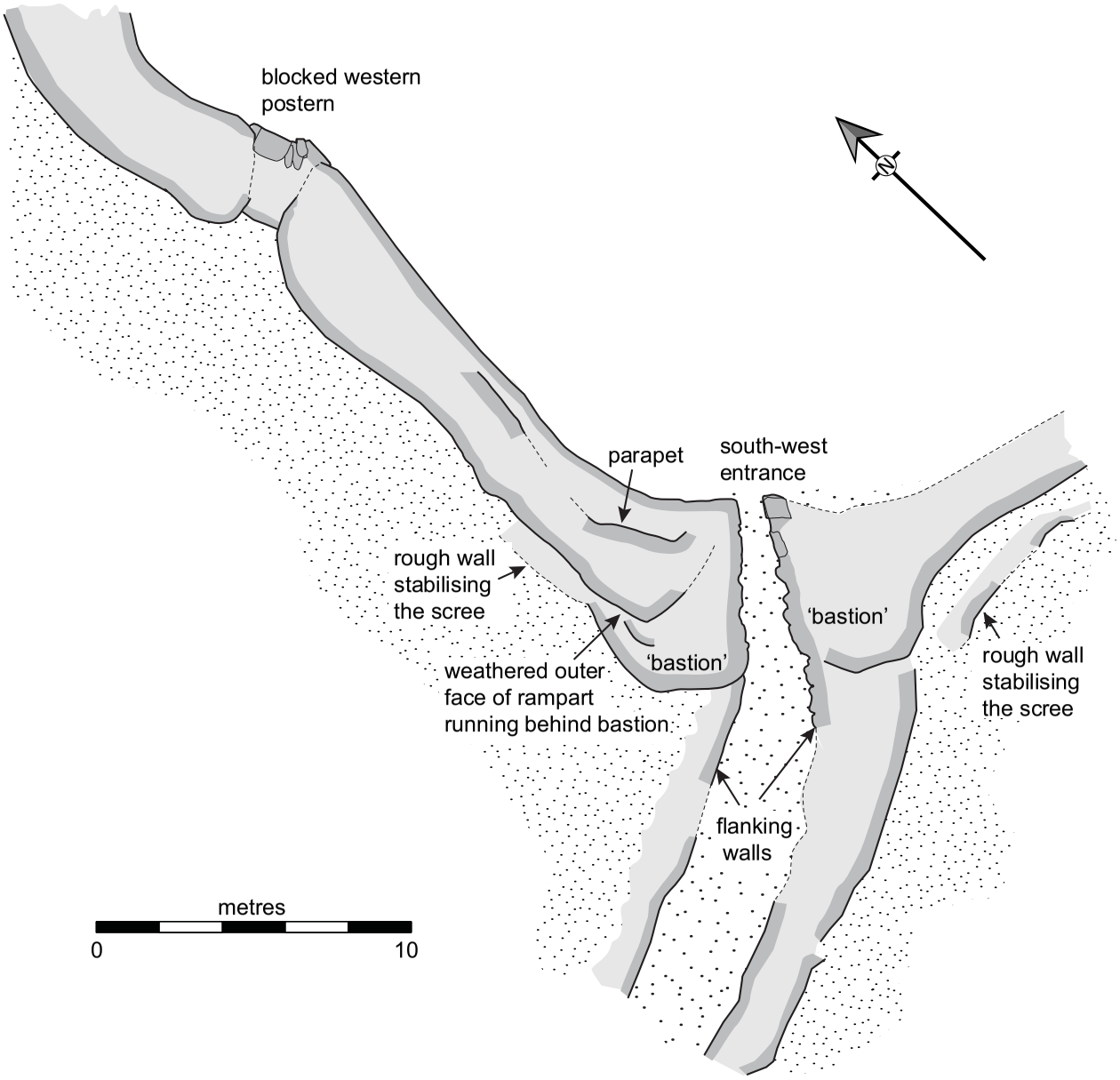


Fig 1

Double-page spread


blocked western postern
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parapet
south-west entrance
rough wall stabilising the scree
'bastion'
weathered outer face of rampart running behind bastion
'bastion'
rough wall stabilising the scree
flanking walls
metres
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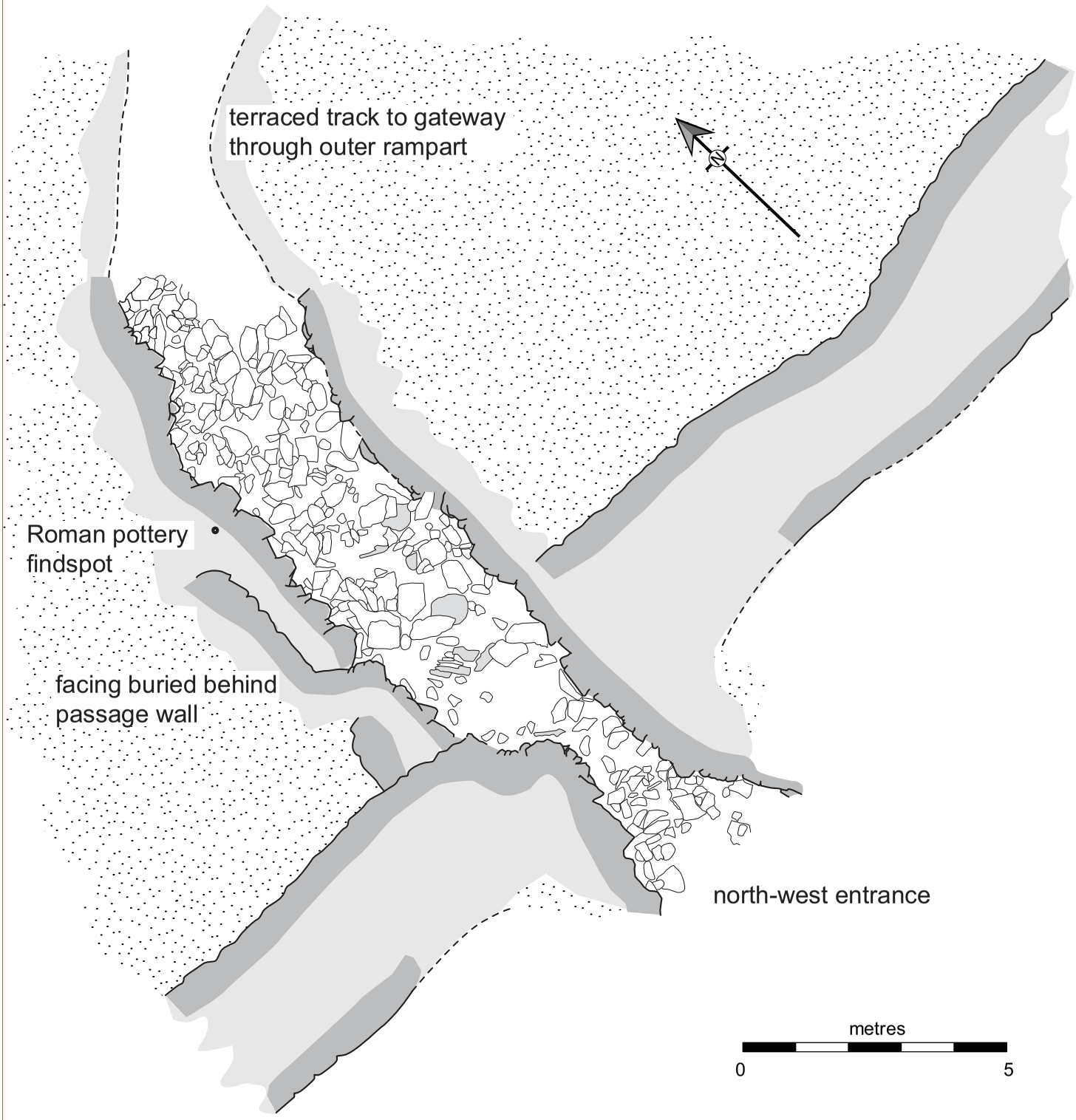
10

Fig 2


terraced track to gateway
through outer rampart
Roman pottery
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facing buried behind
passage wall
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Fig 3

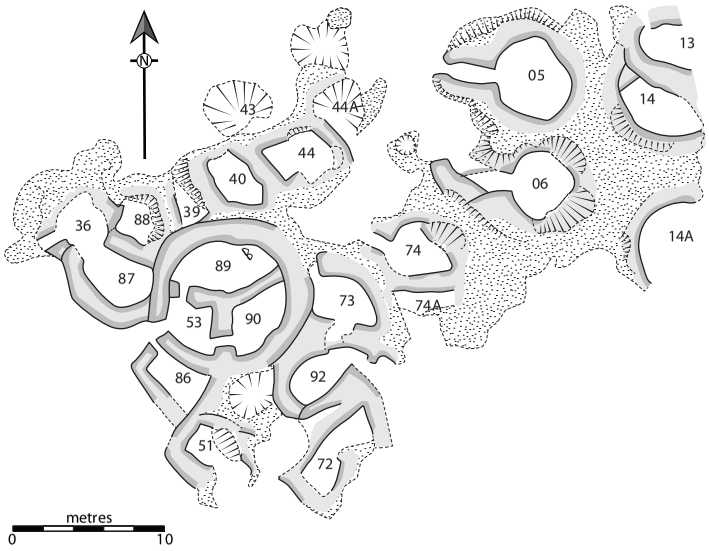
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Fig. 4

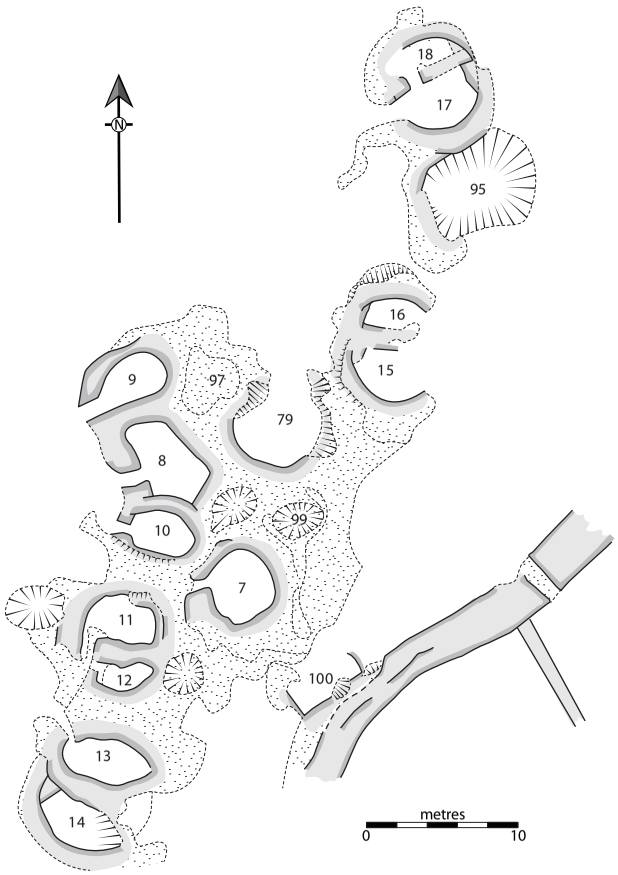
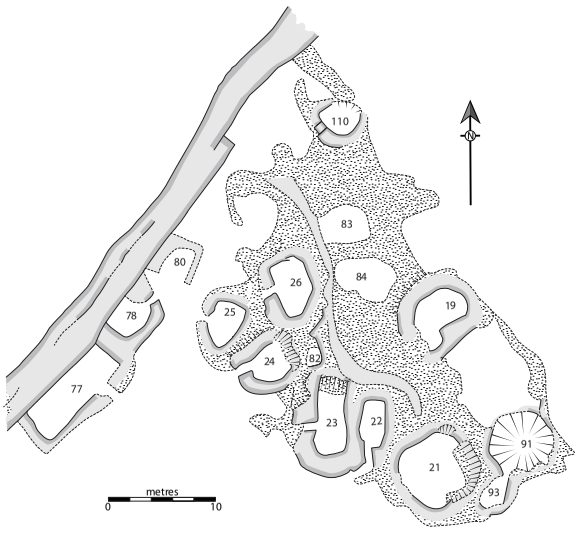


Fig. 5



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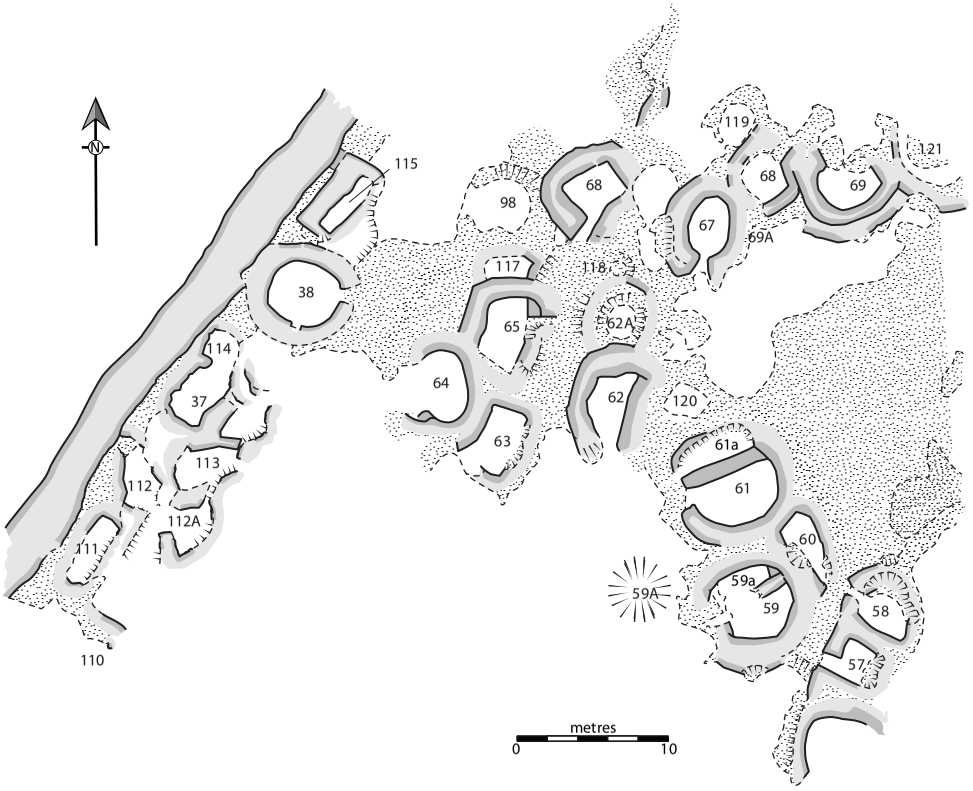
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Fig 7

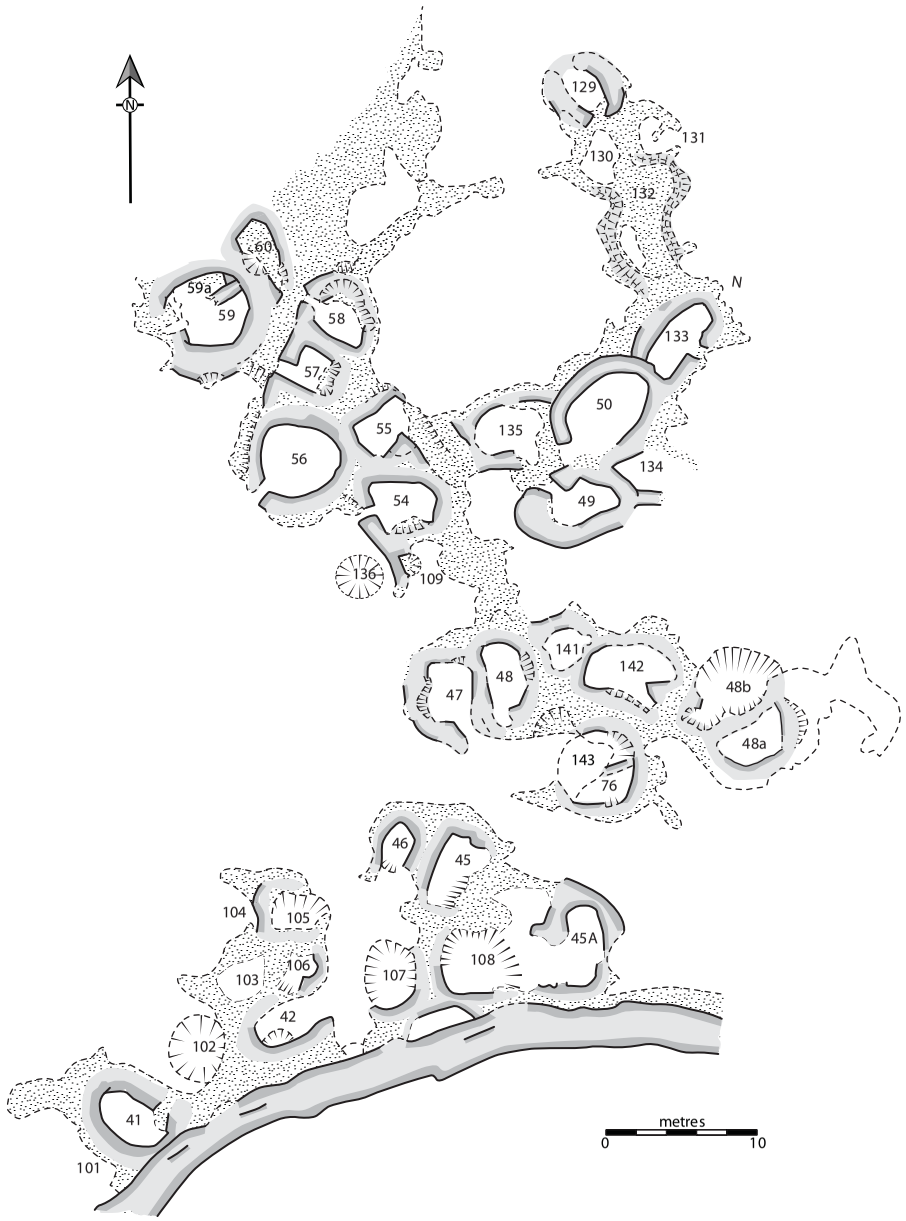
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Fig 8

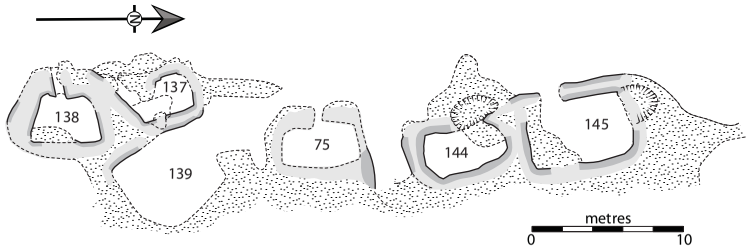

Fig 9

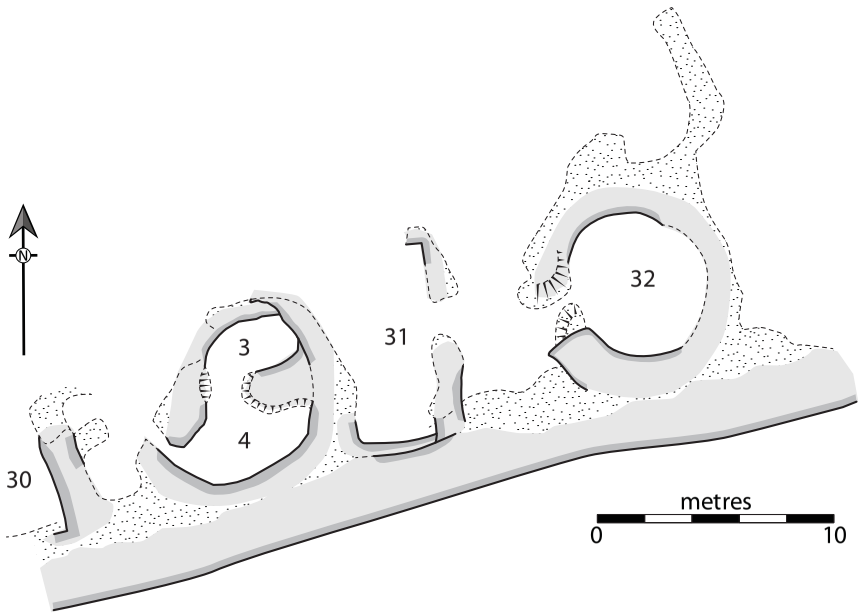

Fig 10

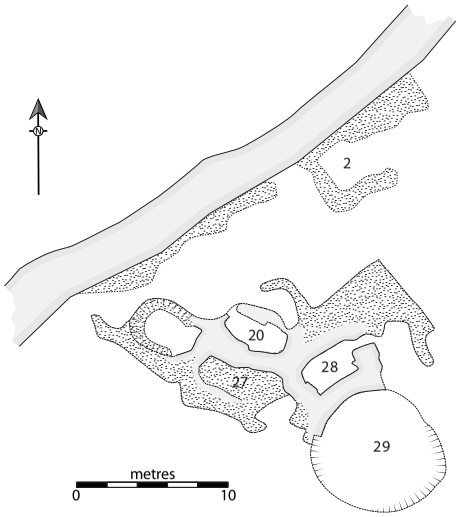

Fig 11

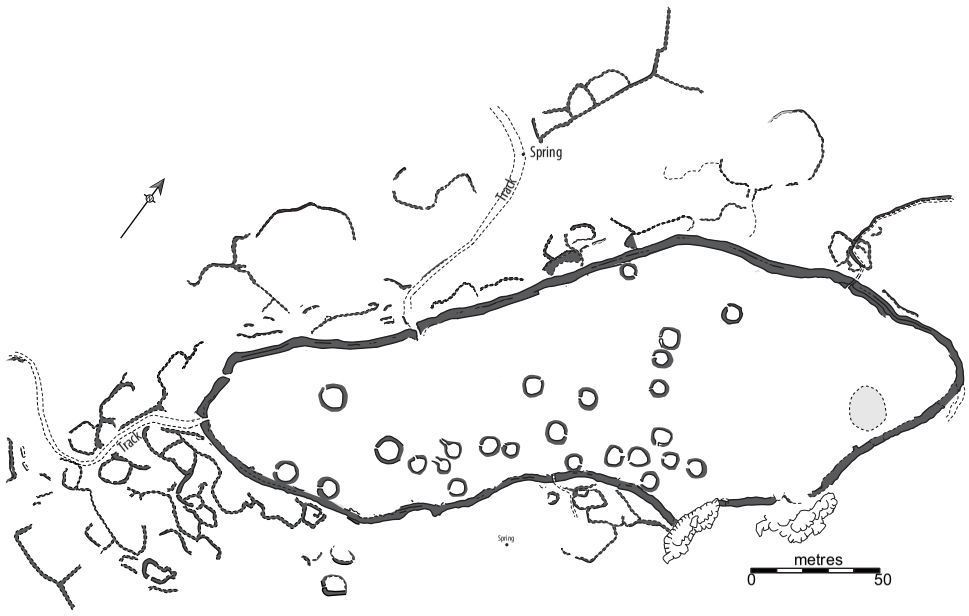

Fig 12