YMDDIRIEDOLAETH ARCHAEOLEGOL GWYNEDD

GWYNEDD ARCHAEOLOGICAL TRUST

REPORT ON THE NINTH SEASON OF THE TRE'R CEIRI CONSERVATION PROJECT MAY TO OCTOBER 1997

PART 1: TEXT

D. HOPEWELL

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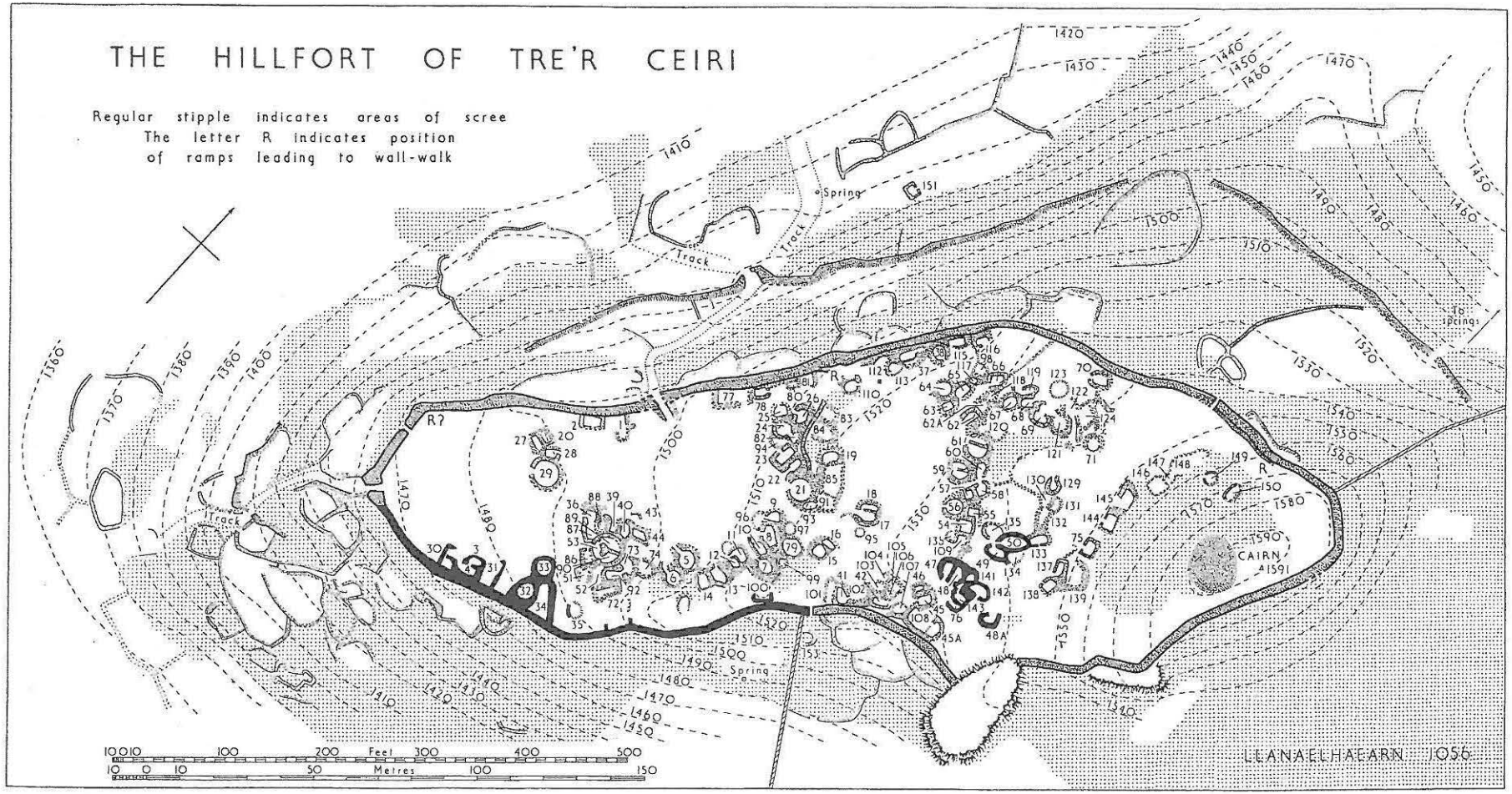

Fig. 1. General Plan (after RCAHMW, 1960), showing areas designated for conservation in the ninth season and location of detailed plans.

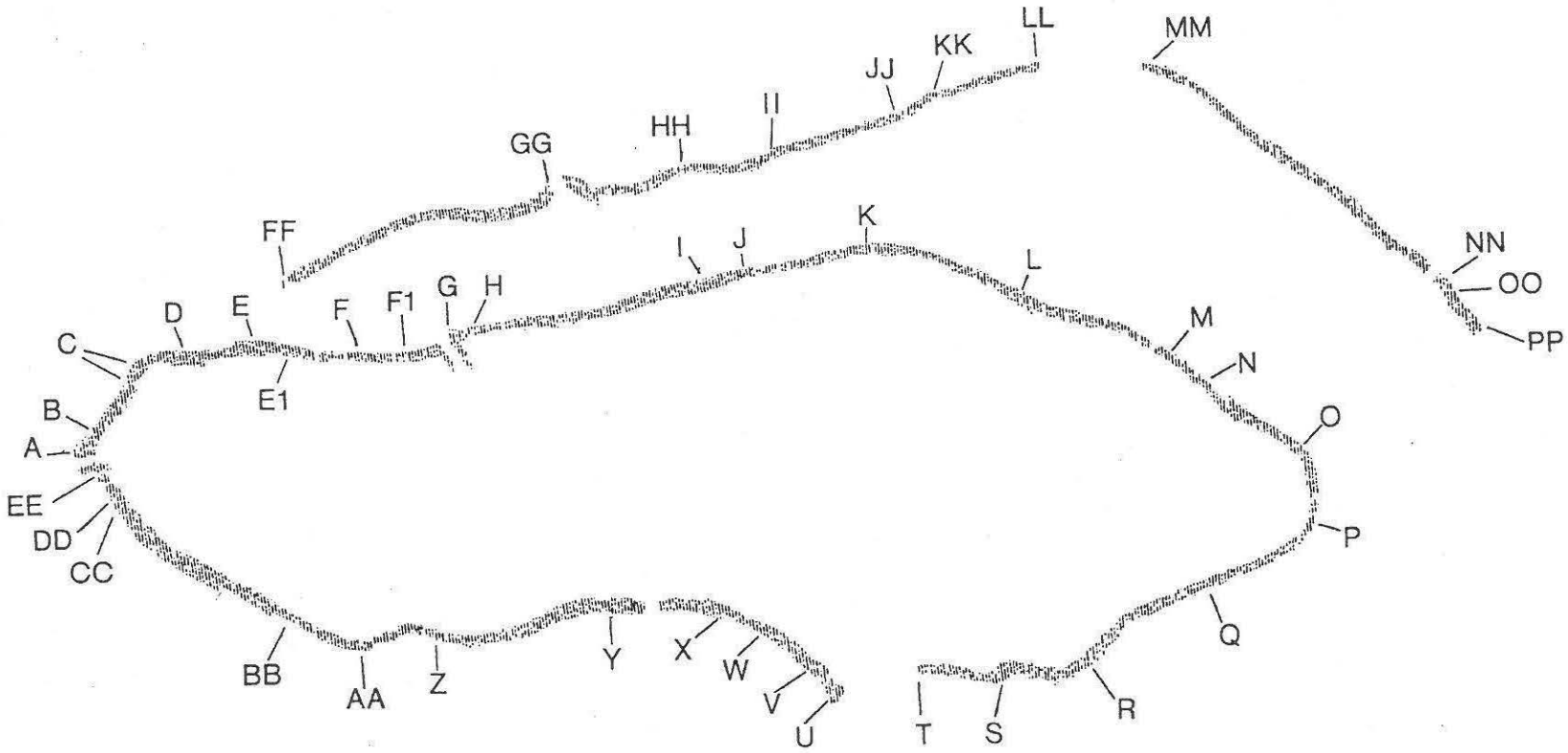

Fig. 2 The ramparts: points of collapse (Dallimore 1978).

Crynodeb o waith a gyflawnwyd yn y nawfed tymor.

Disgrifiwyd Tre'r Ceiri (SH373446) yn aml fel un o'r bryngaerydd sydd wedi cael ei chadw orau yn Ynysoedd Prydain. Saif 485m uwchlaw'r môr ar y mwyaf dwyreiniol o dri chopa'r Eifl, ym mhenryn Llyn. Mae'r gaer ddwy hectar (Ffig. 1) wedi'i hamgylchu â wal gerrig sych anferth, 2.3 i 3.0m o drwch. Yn anarferol, oherwydd fod y safle mor anhygyrch a bod digonedd o gerrig i gael ar y copa, ychydig iawn o'r gwaith maen sydd wedi'i glirio oddi ar y safle er mwyn ei ail-ddefnyddio. Mae'r gwrthglawdd wedi goroesi yn agos i'w uchder gwreiddiol o 3.5 metr mewn mannau, gyda'r rhannau gorrau yn cynnal gwrthglawdd wal gerrig sych. Saif wal amddiffynnol alanol arall i'r gogledd-orllewin i'r gaer. Ceir dwy brif fynedfa drwy'r gwrthglawdd yn y gogledd, y gorllewin a'r de-ddwyrain. Caiff y gwrthglawdd ei gario dros gilborth y gogledd gan nifer of gapanau drysau carreg. Ymddengys mai'r fynedfa yn y gogledd-orllewin yw'r brif fynedfa i'r gaer gyda thramwyfa 15m o hyd yn arwain at lwybr wedi'i derasu a phorth arall drwy'r wal amddiffynnol allanol. Mae tu mewn y gaer yn cynnwys olion tua 150 o gytiau cerrig sych a mannau caeedig sydd yn wahanol iawn o ran maint a siâp, o gytiau crwn syml i adeiladau afreolaidd a phetryal. Credir i'r gaer gael ei sefydlu rywbryd yn ystod y mil blynyddoedd 1af CC ac mae amryw o gloddiadau wedi dangos fod pobl yn byw yn y cytiau hyd at y 4edd ganrif OC.

Mae'r safle ar hyn o bryd yn denu oddeutu 7,000 o ymwelwyr y flwyddyn ac mae hyn wedi golygu bod rhai llecynnau o fewn y gaer wedi cael eu herydu'n ddrwg. Ym 1989, mewn ymateb i'r ffaith fod y safle yn dal i ddirywio, sefydlwyd project cadwraeth Tre'r Ceiri gan Gyngor Dosbarth Dwyfor, gyda chymorth ariannol oddi wrth Cadw a Chyngor Sir Gwynedd. Contractiwyd tîm o dri saer maen i gadarnhau'r waliau drwy drwsio rhai oedd wedi disgyn a sefydlogi gwaith maen simsan. Goruchwyliwyd a chofnodwyd eu gwaith yn fanwl gan Ymddiriedolaeth Archaeolegol Gwynedd. Ar ddiwedd tymor 1995 trosglwyddwyd gweinyddiad y project i'r awdurdod unedol, Cyngor Gwynedd. Rhoddwyd cymorth ariannol unwaith eto gan Cadw.

Gwnaethpwyd gwaith cadwraethol ar ran fawr o'r gwrthglawdd a thros wythdeg a phump o gytiau yn ystod wyth mlynedd cyntaf y project. Daeth llawer o wybodaeth i'r amlwg ynghylch strwythur ac dilyniant amser y safle yn ystod y broses gadwraethol.

Yn ystod y tymor 1997, cyflawnwyd y gwaith cadwraethol o'r 140m olaf o'r gwrthglawdd. Gwnaethpwyd gwaith sefydlogi ar gyfanswm o 60 a oedd wedi disgyn. Hefyd gwnaethpwyd gwaith cadarnhau ar 21 o gytiau ychwanegol. Unwaith eto gwelir dystiolaeth yn y cytiau hyn, o is-rannu a newidiadau, sy'n cadarnhau y dilyniant strwythurol a drafodwyd yn adroddiad y llynedd. Mae'r gwaith yn rhedeg ychydig ar y blaen, felly bydd amser ar gael i gyflawni gwaith cadwraethol ar y cytiau sydd ar ôl, yn ogystal ag adolygiad o sefydlogrwydd yr holl safle yn ystod y tymor olaf.

INTRODUCTION

Tre'r Ceiri (SH373446) has often been described as one of the best preserved hillforts in the British Isles. It stands at a height of 485m O.D. on the easternmost of the three peaks of Yr Eifl, on the Lly^n Peninsula. The two hectare fort (Fig. 1) is bounded by a massive, 2.3 to 3.0m thick, dry-stone wall. Unusually, due to the inaccessibility of the site and the abundance of stone on the peak very little masonry has been cleared from the site for re-use. The rampart has survived close to its original height of up to 3.5m in places, the best preserved portions retaining a dry-stone rampart. A further outer defensive wall stands to the north-west of the fort. There are two defended entrances through the inner rampart, at the south-west and north-west of the fort with additional simple gaps in the rampart at the north, west and south-east. The rampart is carried over the north 'postern' by several stone lintels. The north-west entrance appears have been the main entrance into the fort with a 15m longpassage leading to a terraced pathway and a further gateway through the outer defensive wall. The interior of the fort contains the remains of about 150 dry-stone huts and enclosures exhibiting a great variation in size and shape, ranging from simple round huts to irregular and rectangular structures.

A number of excavations have been carried out on the site; in 1903 S. Baring-Gould and R. Burnard 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, 1906). 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 A.D. Descriptive surveys of Tre'r Ceiri were carried out in 1946 by W. E. Griffiths and in 1978 by K. Dallimore. Dallimore also allocated codes to the more serious collapses in the outer face (Fig. 2). Further plans of the site were produced by RCAHMW in 1960 and Plowman Craven and Associates in 1980.

This spectacular site has been attracting large numbers of visitors for at least 100 years. Complaints about visitor damage were made by the Cambrian Archaeological Association as long ago as 1894 (Cambrian Archaeological Association, 1895) and erosion has become a major problem. Increasing concern about the deterioration of the remains prompted Cyngor Dosbarth Dwyfor, in conjunction with Cadw: Welsh Historic Monuments and Gwynedd County Council, to embark in 1989 on a conservation project to consolidate the site. The project ran for an initial five years. Gwynedd Archaeological Trust was commissioned to provide archaeological supervision and to record all works as they progressed. A management plan was produced at the end of the fifth season including a survey of all unconserved areas in the fort, recommendations for a further, concluding, five years' work and a long-term management strategy. Funding was subsequently agreed by Cyngor Dosbarth Dwyfor, Cadw and Gwynedd County Council for a further five yar programme which commenced in 1994. Local government reorganisation in 1996 led to the formation of a new unitary authority, Gwynedd Council, who took over the management of the project from C.D.D. again with financial help from Cadw. The ninth season of the project began in late May 1996, work continuing on site until October.

STAFF AND SUPERVISION

Works were conducted by Mr T. Edwards, Mr I. ap Llyfnwy and Mr D. Hughes of T.I.R. stonemasons, Penrhyndeudraeth, under the supervision of the writer. Monthly site meetings held in order to monitor the progress of the project and to arrange the work programmes were attended by the above stonemasons, the writer, Miss C. Vint of Gwynedd Council and Dr M. Yates of Cadw.

PROGRESS IN THE NINTH SEASON

Works in the ninth season were concentrated on the remaining 140m of unconserved ramparts and the 12 huts adjacent to this. A further 9 huts towards the south-east end of the large group of huts at the north-east end of the fort were also conserved. These were originally scheduled for conservation during year ten but work progressed significantly faster than expected during the present season. It is expected that this will leave some time in the final season for a review of the stability of the total conserved area and the carrying out of any associated remedial work. The weather during the working season was generally good although several days were lost due to severe conditions at the beginning of September.

RECORDING METHODS

The huts and ramparts destined for conservation were surveyed with a total station as the existing plans have been shown to be inaccurate. The plans were then printed out and fine detail was added by hand. All collapses were allocated a code based either on Dallimore's system or on the hut numbers on the RCAHMW plan. The ramparts were photographed in 2m segments with the film plane parallel to the wall, using a 28mm shift lens to correct the verticals. Each frame was taken from a distance of 4m thus producing an image using the 40% of the negative least affected by lens distortions, etc. A complete, overlapping, pre-conservation photographic sequence of the ramparts has now been produced. It was necessary to adopt a more flexible approach to the photographic recording of the huts as the limited space inside them placed

some constraints on the techniques that could be used. Where possible, photographs of standing masonry were taken using a levelled camera with the film plane parallel to the wall face using a normal 28mm lens. The 28mm shift lens was used to correct the verticals where a straight on shot could not be taken. A detailed written and photographic record was kept of the works as they progressed, supplemented with measured drawings where photographs could not shw enough detail or demonstrate relationships between features clearly. All photographic records were taken on monochrome and colour prints, supplemented with colour transparencies for lecture purposes. At the end of the season the negatives were catalogued and stored in standard archive conditions. The records were then added to the site database at the end of the season.

DETAILS OF WORKS COMPLETED

Details follow of all conservation works completed during the ninth season. These can be located by reference to Fig.1 and the detailed location plans, Figs. 3, 4, 5, 9, 11, 14, 16, 23 and 26. As the works were predominantly recorded photographically, it is recommended that the relevant Plates in Part 2 be consulted alongside the text.

At the end of the season, the edges of the collapses and any disturbed masonry was marked with discreet 10mm diameter drill holes. In addition to this, polypropylene cord was placed at the lowest point of disturbance in the wall core and at any other relevant points in order to indicate the extent of clearance undertaken.

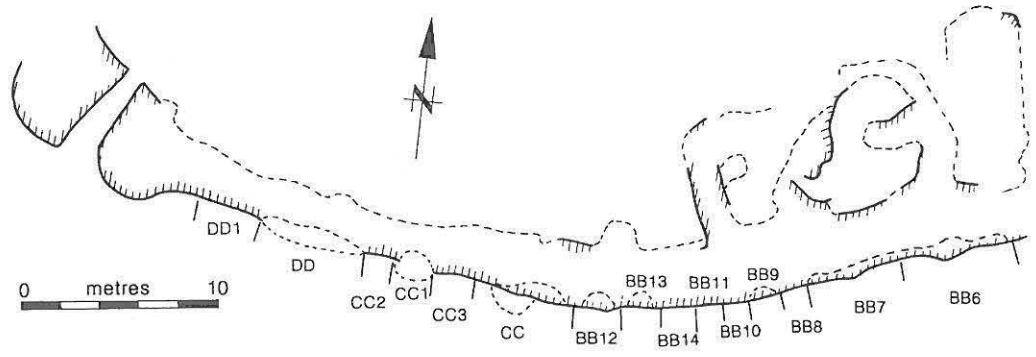

Fig. 3 Plan of ramparts DD to BB, showing location of collapses conserved during the ninth season.

THE RAMPARTS; OUTER FACE

Collapse DD1 (Fig. 3)

The facing to the west of DD1 had been conserved during the fifth season. DD1 was 3.0m wide and consisted of facing standing to a height of 0.5m (Plate 1). This was stable apart from some stones on the wall top which had been displaced and were overhanging the rest of the facing. These were pushed back into line (Plate 2).

Collapse DD (Fig. 3)

The outer face had been reduced to an unstable, 5.7m wide, rubble slope (Plates 3 to 5). Occasional poorly defined alignments of stone could be detected within the rubble but these did not appear to be *in situ* facing.

As this was an area that was still eroding, stabilisation work was required. The rubble was cleared from the collapse in order to locate any surviving masonry. Unfortunately no basal course had survived at any point across the collapse. Plate 6 shows DD after partial clearance. The collapsed stone along the line of the wall included numerous slabs all of which were sloping forwards, suggesting a failure at the base of the wall. There had obviously been a serious movement in the scree, the resulting landslide totally destroying the outer face. A considerable amount of stone was cleared from the collapse before stable scree was reached (Plate 7). The surviving wall at the eastern end of the collapse (CC2) clearly demonstrated that the wall had failed from the base (Plate 8). As this was a straight length of wall the surviving facing at either end could be used as a guide for the addition of new masonry. A stable base was produced using large stones and a new face was built up to the level of the interior of he site (Plates 9, 10 and 11).

Collapse CC2 (Fig. 3)

Collapse CC2 was on the point of collapse, so CC1 was conserved first in order to provide support for the weak masonry (see below). A 1.3m length of facing to the east of DD had survived to a height of 0.6m. This was however extremely unstable due to the displacement of the basal course (see Plate 8) and the large proportion of short headers that had been used in its construction. The stones had been numbered A to W before the clearance of DD (Plate 12) and stone had also been added to CC1. An attempt was made to pin the masonry as it was now supported by the rebuilt collapses DD and CC1. It soon became apparent that the facing was inherently unstable and that there was no solid masonry for the pinning to lock against. The facing was therefore dismantled in order to rebuild it in a stable fashion. A number of stones were replaced in the facing as the original stones were very short and could not be locked together. Stones A, B, H, L, I, K, M, S, R and U were replaced close to their original positions but te high proportion of new stones rendered this little more than a cosmetic exercise. Plate 13 shows CC2 after conservation.

Collapse CC1 (Fig. 3)

The outer face appeared to have collapsed down to ground level at the centre of this 1.9m wide collapse (Plates 12 and 14). Elsewhere occasional facing stones could be seen within the rubble. The collapse was cleared revealing surviving masonry across its whole length. The stones were however about 0.1m to 0.2m in front of the line of the face and many were tilted forwards (Plate 15). Some of these were stable and could be left in position but the majority were either pushed back into the wall or packed with core. At the west of the collapse the basal course was 0.2 m off line but well bedded into the scree. This could not be moved without disturbing the already fragile CC2 so it was left *in situ* and new masonry was added along the line of the rest of the rampart (Plate 16).

Collapse CC3 (Fig. 3)

The face was standing to a height of between 0.8 and 1.2m across this 2.0m wide section of wall (Plates 14 and 17). This was stable apart from the loss of a few stones from the wall top. Two heavy slabs were added in order to retain the core (Plate 18).

Collapse CC (Fig. 3)

The line of the wall could be traced across the whole of CC (5.3m) but in the central part the masonry had been reduced to the level of the rubble (Plates 19 to 21). Facing stood to a height of 1.0m at the east and 1.2m at the west. The masonry at the west was however very loose and seemed to be supported by a fallen slab (stone Z, Plate 19) which would need to be removed in order to conserve the rest of the collapse. There was a pile of large stones standing in front of the line of the wall that were acting as a buttress to the rubble adjacent to stone Z. This was carefully examined and appeared to be a chance collection of stones that had fallen from the wall as opposed to a man-made structure. The rubble was therefore cleared (Plate 22).

Stones O, P, Q, R and U were taken from the wall during the removal of stone Z. The rest of the numbered facing was unstable but this was mainly due to the lack of lateral support. The base of the wall that had previously been visible beneath the fallen stone was stable.This was used as a base for additional masonry which was built up to the level of the interior of the fort (Plates 23 to 25). The stones that had been removed from the facing were all replaced in their original positions. The weight of the new stonework supported and stabilised the rest of the fragile *in situ* facing.

Collapse BB12 (Fig. 3)

This 2.5m wide collapse had been caused by a movement in the base of the wall (Plate 26). The upper courses had fallen but the lower 0.5m of facing had bulged outwards by about 0.2m and had reached a point of stability. This masonry was left *in situ* and after clearance of a little displaced core new facing was added up to a height of 0.8m (Plate 27).

Collapse BB13 (Fig. 3)

There was a 2.0m wide dip in the top of the facing here, the wall falling from a height of 1.0m to 0.4m (Plate 28). The dip was filled with new masonry and no *in situ* stones were moved (Plate 29).

Collapse BB14 (Fig. 3)

Several stones had slipped forwards in the upper half of the facing (Plate 30). This had resulted in the destabilisation of the wall above. Stone X on Plate 30 was pushed back into the wall but the semi-collapsed facing above was jumbled and could not be saved. The stones were reset but not in their original positions (Plate 31). BB14 was 1.8m wide.

Collapse BB11 (Fig. 3)

This was a 1.6m wide unstable bulge in the outer face (Plates 30 and 32). The wall was on the point of collapse and could not be pinned. The loose stones were marked A to K (but not F). Stones A, B, C, D, E, G and K were removed from the wall (Plate 33). The stones above A and C were core material and were cleared.

The two upper stones (A and B) in the cleared area shown on Plate 33 were loose and were rebedded before any rebuilding was attempted. The marked stones were replaced close to their original positions, apart from stone A which appeared to have tipped forwards due to the loss of material from beneath it. Its front end was therefore lifted and supported by several additional stones. New facing was added above this bringing the height of the outer face up to the level of the inside of the fort (Plate 34).

Collapse BB10 (Fig. 3)

This 1.4m wide dip in the facing (Plate 32) had been caused by the loss of a few stones from the top of the wall. The loose core was cleared and 0.3m of new masonry added (Plate 34).

Collapse BB9 (Fig. 3)

This was a deep 1.6m wide dip in the height of the facing. The wall to either side was standing to a height of about 0.9m but at the centre of the collapse had fallen to 0.5m (Plate 35). All *in situ* masonry was stable so the loose stone was cleared and the dip filled with new facing (Plate 36).

Collapse BB8 (Fig. 3)

The outer face had survived to a stable height of 1.6m here (Plates 35 and 37). A few stones were reset on the wall top (Plates 36 and 38).

Collapse BB7 (Fig. 3)

The outer face of the rampart was 0.3m lower than the wall top across the entire 5.0m of this collapse (Plates 37, 39 and 40). There was no obvious reason for this and there had been no recent erosion apart from a little spillage of core. It is possible that this represents damage of the kind seen elsewhere on Tre'r Ceiri where stone has been deliberately thrown from the wall; if so it must have occurred in excess of 35 years ago as lichen regrowth had occurred.

Enough loose core was cleared from the wall top to allow the addition of new headers. About 0.3m of new facing was added across the whole of the collapse (Plates 38, 41 and 42).

Collapse BB6 (Fig. 3)

This was 5.9m wide shallow dip in the facing with a more serious area of collapse in the centre (Plates 43, 44 and 45). The initial impression was that the centre had bulged out and partially collapsed but closer examination showed that the upper part of the face had slipped off the base and had come to rest in a rather jumbled fashion in front of the *in situ* lower courses. The fallen masonry could not be reconstructed so it was removed, revealing stable facing standing to a height of between 0.6m and 0.8m (Plate 46). This dip was filled with new masonry and stone was added to the top of the wall across the complete collapse thus building the outer face up to the same height as the inner (Plates 47 to 49). There were two long stones protruding from the face towards the south-west end of BB6 (both marked with an X on plate 47) resembling the modern stepped stiles sometimes found in local drystone walls. This could be the result of a chance displacement of stones but could also represent an original point of access to the fort.

Collapse BB5 (Fig. 4)

The wall was stable for 5.3m and was standing to a height of between 0.8m and 1.7m (Plates 50 to 52). The variation in height was mainly due to undulations in the natural ground level. Minor dips and instabilities in the wall top were stabilised and the new or reset stones are indicated on Plates 53 to 55.

Collapse BB4 (Fig. 4)

This was an unusual collapse as there appeared to be an upright stone in the facing at the base of the wall (Plate 56). This was examined and it could be seen that the stone was not part of the original facing. It had fallen from above and had come to rest in this position. A large amount of unstable rubble was also held in place by the upright. The collapse was 1.5m wide.

The rubble and the upright stone were cleared leaving unstable masonry on either side. The base of the wall was intact and it was felt that the unstable facing could be left *in situ* as the addition of new masonry to the cleared area would provide support. New masonry was therefore added, the weight of which locked the facing on either side in place (Plate 57).

Collapse BB3 (Fig. 4)

This was a 2.5m wide shallow dip in the top of the wall (Plates 56 and 58). The *in situ* masonry was irregular but stable. Loose core and obviously displaced stone was cleared and new masonry was added up to the level of the wall top to either side (Plates 57 and 59).

Collapse BB2 (Fig. 4)

This 1.7m length of wall was stable up to a height of 1.0m (Plate 60). A few loose stones were reset on the wall top (Plate 61).

Collapse BB1 (Fig. 4)

The height of the face dropped from about 1.0m to 0.4m at the centre of this 1.2m wide collapse (Plate 62). A little loose core was removed and the dip was filled with new masonry (Plate 63).

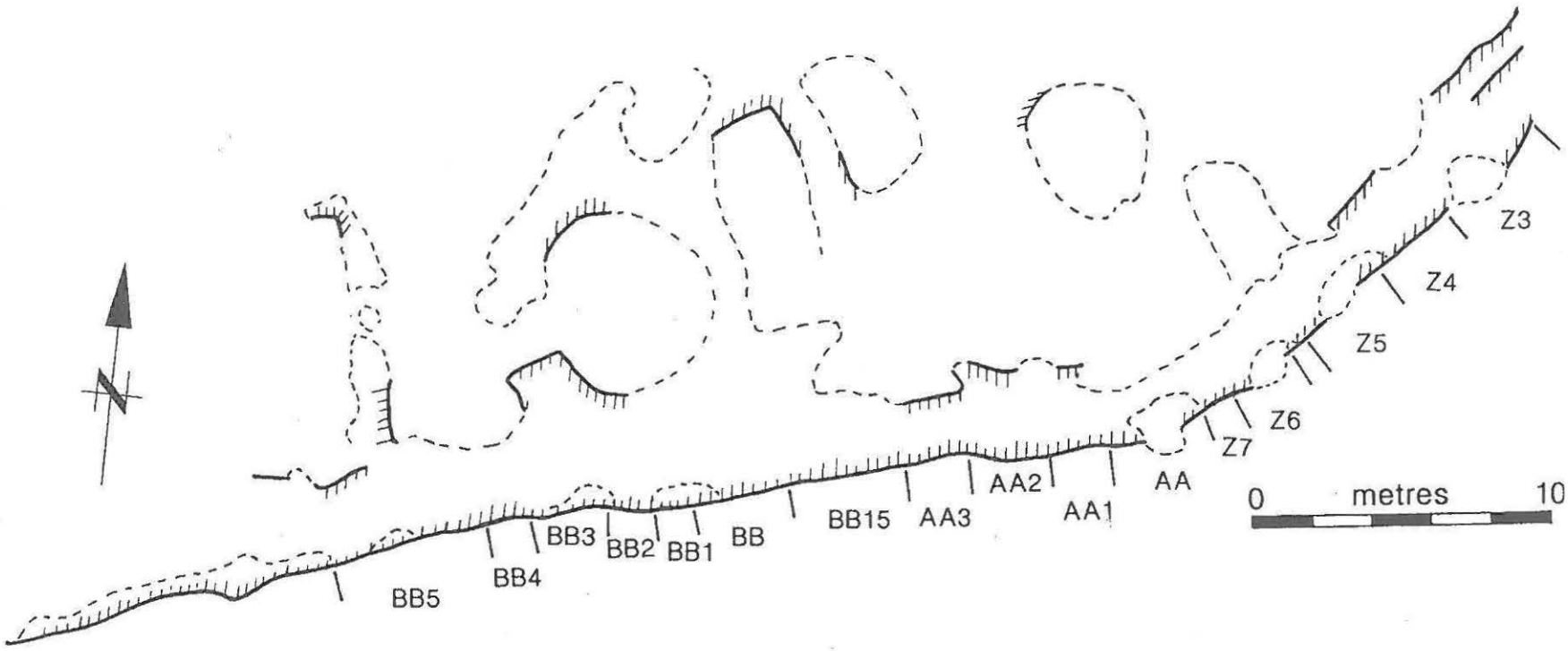

Fig. 4 Plan of ramparts BB to Z, showing location of collapses conserved during the ninth season.

Collapse BB (Fig. 4)

The upper 0.3 m of the outer face was somewhat loose and jumbled here (Plates 62 and 64). This was stabilised by the addition of the stones indicated on Plates 63 and 65. The collapse was 3.3m wide.

Collapse BB15 (Fig. 4)

This 4m length of wall was stable apart from a few loose stones in the upper course (Plates 66 and 67). A few stones were reset and stabilised with heavy headers. The new masonry is indicated on Plates 68 and 69.

Collapse AA3 (Fig. 4)

The height of the wall varied between 1.8 and 1.0m across this 2m wide collapse (Plate 70). The upper 0.2m of the facing consisted of small stones and was unstable in places. Four large heavy slabs were added to the wall top along with some smaller packing stones thus locking the *in situ* masonry into place (Plate 71).

Collapse AA2 (Fig. 4)

The base of the wall bulges out here. This was carefully examined and was found to be stable as the displaced headers were long and were held firmly in place by the weight of the rest of the wall (Plate 72). The collapse was 2.6m wide and the wall top was loose and unstable across most of this. A course of heavy slabs was added, the weight of which held the loose stones in place (Plate 73).

Collapse AA1 (Fig. 4)

This was a shallow 2.0m wide dip in the wall top (Plate 74). The core was standing to a height of about 0.2m above the top of the facing so a course of new masonry was added in order to retain it (Plate 75).

Collapse AA (Fig. 4)

This was a serious 2.2m wide collapse, the wall falling steeply from a height of 1.2 m at the north-east to approximately 0.3m at the centre (Plates 76 and 77). The facing in the centre was obscured by rubble and was sloping forwards at an angle of about 20°. The collapse had occurred at the apex of curve in the line of the rampart.

The rubble was cleared from the line of the wall revealing the surviving facing (Plate 78). This had slumped, was very unstable and could not be built upon. Further clearance was undertaken; unfortunately a small section of facing at the south-west end of AA collapsed unexpectedly. An attempt was made to recover the stones and reconstruct the facing but reference to Plate 76 shows that the facing had partially collapsed before the conservation process due to the loss of support at the north-east. A stable rebuild could not be achieved so the stones were used in a different order during the stabilisation of the rest of the collapse.

Clearance to the base of the wall in the centre of the collapse revealed the cause of the instability. Stone had been lost from beneath two large basal slabs that had tipped forewords. Stone was added beneath these stones in order to provide a level base for new facing. Plate 79 shows the stones (A and B) after they had been levelled (see Plate 78 for their original positions).

New masonry was added up to the level of the inside of the fort (Plates 80 and 81). This also supported the core and the masonry in AA1 which was becoming unstable.

Collapse Z7 (Fig. 4)

This 1.2 m length of facing was stable (Plate 82).

Collapse Z6 (Fig. 4)

Collapse Z6 was a 3.1m wide collapse, the wall falling from a height of 0.8m at either side to ground level in the centre (Plates 82 and 83). No facing could be seen in the 1.1m wide slope of eroding rubble in the centre of the collapse.

The unstable rubble was cleared from the collapse. Plate 84 shows Z6 after clearance; 0.9m of the basal course had been lost but elsewhere the *in situ* facing was stable. New masonry was added up to a height of 1.0m (Plates 85 and 86).

Collapse Z5 (Fig. 4)

The rampart had been reduced to a 1.6m wide rubble slope at the centre of a 3.4m wide dip in the height of the facing (Plates 87 and 88). The slope was unstable but had not suffered from much recent erosion. After clearance it became obvious that the wall had failed due to a movement in the scree. The displaced headers in the centre of the collapse can be seen on Plate 89. Also of note is the delicately balanced facing (at the top of the photograph) between Z5 and Z6. This superficially appeared to be original but clearance revealed that the lower courses of the wall had gone and the remaining three slabs were balanced on core material. This could not be supported and was lost when further core was cleared from the collapse. There was not enough surviving *in situ* masonry to allow a rebuild to be carried out here. A stable base was made in the scree and new masonry was added across the whole collapse (Plates 90 and 91).

Collapse Z4 (Fig. 4)

The outer face was standing to a height of 1.2m across this 2.8m wide collapse (Plate 92). The wall was stable apart from some loose stones in the upper course. These were reset and two heavy slabs were added (Plate 93).

Collapse Z3 (Fig. 4)

The outer face was standing to a height of 2.5m at the north-east of this collapse. This also coincided with a drop in the ground level of about 0.6m (from north-east to south-west). The collapse itself was 4.4m wide and had occurred, as is often the case, at a change in the line of the rampart. Much of Z3 had been reduced to a highly unstable rubble slope with displaced core and facing rolling down the slope from the rampart to the north-east (Plates 94 to 96). No facing was visible at the south-west but it had survived up to a height of 0.6m at the north-east where a large stone was protruding from the wall. A small amount of clearance was undertaken and the stone was pushed back into the face in order to help to retain the core. The rubble was then cleared from the collapse. This proved to be a difficult task as the core and surviving facing had to be pinned in order to prevent uncontrolled collapses of loose stone from above. Plate 97 shows Z3 after initial clearance. A large slab can be seen at the leel of the wall base. This had tipped forward indicating that there had been subsidence in the scree, several other similar stones had already been removed before the photograph was taken. This stone was reset and several others were added along the projected line of the wall thus forming both a stable base for the wall and a barrier against further loss of core material (Plate 98). Some further clearance of core was undertaken during the addition of facing to the new wall base allowing long headers to be used in the construction of the wall. New facing was added up to the height of the inner face but there was still a steep gradient in the wall top to the north-east (Plates 99 to 101). The core could not be stabilised by the usual packing and pinning techniques so large slabs were incorporated into the wall top in an irregular but stable fashion. This greatly improved the stability of the core and ensured that the wall could withstand a certain amount of the inevitable visitor foot traffic.

Collapses Z2 and Z1 (Fig. 4)

The 9.5m of wall between collapse Z3 and outcrop Z was one of the best preserved sections of masonry on Tre'r Ceiri (Plates 96 and 102 to 105). The outer face, standing to a height of between 2.1 and 2.9m, was a good example of the highly irregular masonry style found in the ramparts. There was also a good example of a pattern of deliberate damage often found on the site. In a number of places stones had recently been thrown from the otherwise stable wall top and could be seen smashed on the scree below.

The line of the outer face could be seen to meander particularly across Z1. As there was little instability in

this length of wall in was unlikely that this was a result of movement in the scree. The outer face of the wall was considerably higher than the inner and clearance of other collapses on this side of the fort suggested that the rampart had been built against bedrock and large scree, along the natural break of slope. The meandering wall could therefore be a reflection of the original topography of the hilltop.

The only conservation that was required here was the addition of a number of stones to the wall top in order to replace those that had been thrown off. The replacement stones are indicated on Plates 101 and 106 to 109).

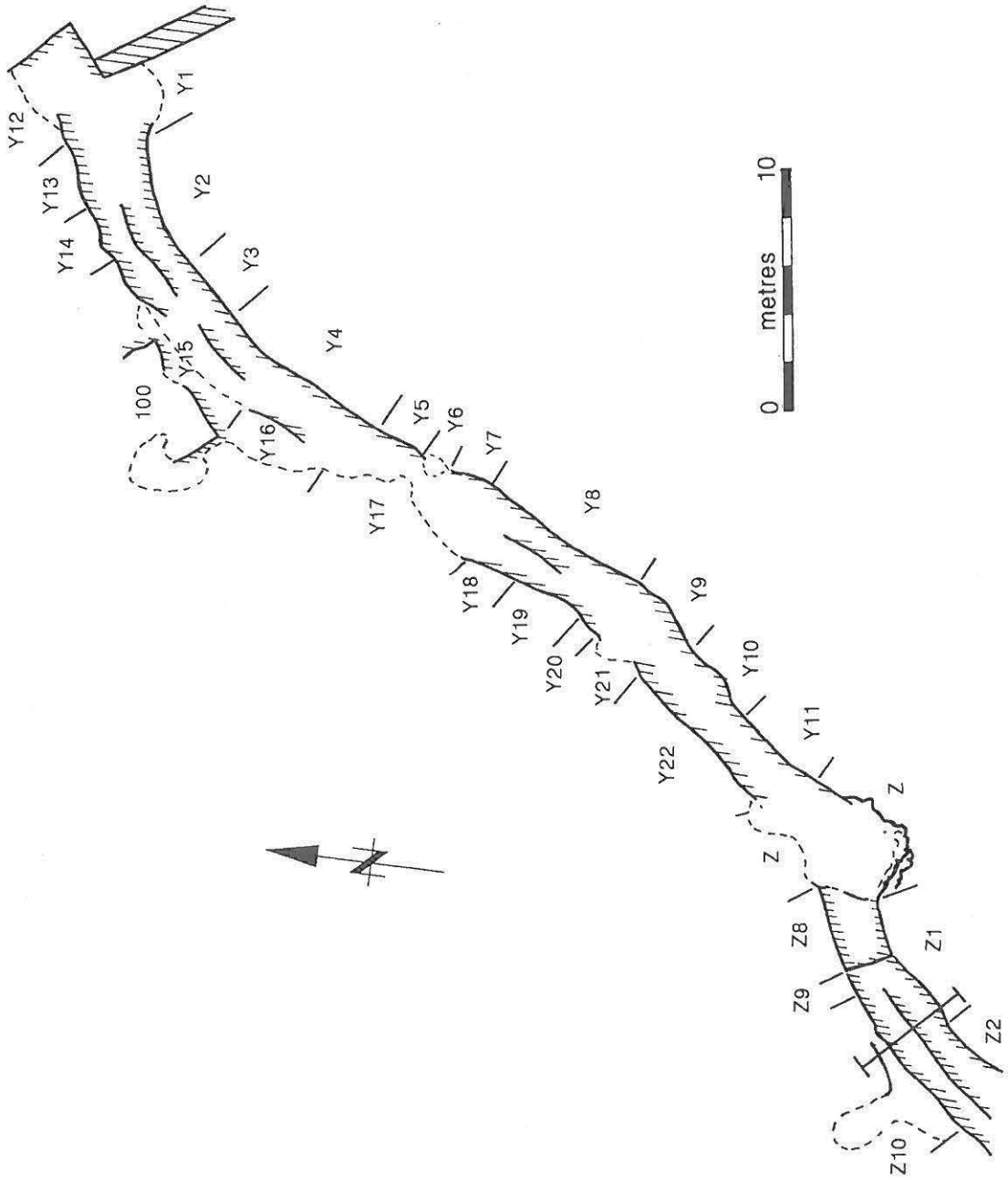

Fig. 5 Plan of ramparts Z to Y, showing location of collapses conserved during the ninth season.

Collapse Z (Fig.5)

The rampart abuts the south-west side of a large rock outcrop (Plate 105). It originally continued across the top of the outcrop but its line could not be accurately determined as all that remained was a jumbled mass of rock (Plate 110). The stone was not all weathered indicating that there had been some recent erosion. This outcrop has often been used a viewpoint by visitors and the recently broken stones on the scree below suggested that some of the rampart had also been thrown off. Hughes however did not record an outer face here so it seems that the recent damage has not been significant. The north-eastern side of the outcrop was less steep and the end of the surviving wall was built on this being largely supported by a large boulder in the face (Plate 111).

Four stones, indicated on Plate 112, were added to the end of the wall on the north-eastern end of the outcrop in order to provide additional support for the end of the wall.

Collapse Y11 (Fig.5)

This 4m length of wall was well preserved standing to a height of between 1.2m and 2.1m (Plates 113 and 114). Minor stabilisation of the wall top was carried out and the new stones are indicated on Plates 115 and 116).

Collapse Y10 (Fig.5)

This was a serious bulge in the wall (Plates 117 and 118) creating 3.5m wide area of instability. The facing was standing to a height of 1.7m at either side but in the centre had fallen to a height of 1.7m. The base of the wall was standing on a large flat slab that was tilted forwards at an angle of about 25°. More seriously, the facing appeared to be resting on one small stone which was in turn standing on the tilted slab. This was obviously very unstable and an uncontrolled collapse here could result in the loss of a considerable amount of masonry. It was therefore decided to dismantle the unstable facing with a view to providing a stable base to the wall.

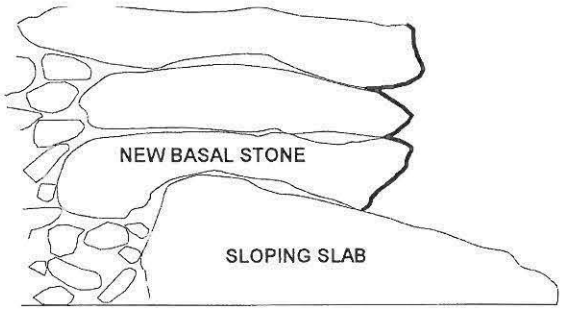

Fig. 6 Collapse Y10, method used to secure the base of the wall.

The *in situ* stones within the unstable area were numbered 1 to 97 (see Plate 117). Further stones (A to Z) were marked outside this area in case of unexpected collapse but as they were not affected they are not marked on the Plate. A V-shaped section of facing was carefully dismantled (Plate 119). It is usual, when dealing with large collapses where the rampart stands to over 2m in height, to have severe problems with the unstable core that was originally retained by the facing. In this case however the core consisted of large stones that were well locked together. It was confirmed during the clearance, that the wall was indeed resting on one small stone and was on the point of collapse. The tilted slab (Marked TS on Plate 120) was at the bottom of the cleared area and no further dismantling was possible without the loss of a lot more *in situ* masonry. The slab was very large and could not be reset. As the slab was sloping at an angle of about

25° it could not be used as a satisfactory base for the wall using conventional dry stone walling techniques. Fig 6 illustrates the method used to produce a stable wall base. Two wedge-shaped stones were selected from the scree that had a protrusion at the thinner end that could hook over the back of the slab. This compensated for the angle of the slab and stopped the basal stones from slipping forwards. Plate 121 shows the two new stones set in place. The small short stones that had been cleared from the base of the wall were probably not the original basal course as there had been considerable movement here and stones had obviously been lost. The stones that had originally been beneath 61, 62 and 63 were replaced with long headers in order to tie in the base of the wall. Stones 61 to 63 were reset in their original positions but at different angles in order to accommodate the new stones. The majority of the rest of the numbered stones were reset in their original positions although obviously slightly furtherback into the line of the wall as the bulge was now much less pronounced. Small packing stone 12 was discarded and one additional small stone was added beneath 28. Stone 60 was found to be shattered within the wall and was discarded. Stone 87 was also found to be broken, half of this was reused and the other half discarded. Stones 33, 34, and 39 were not moved in the original clearance but had settled somewhat during the building process. Stones 30 and 31 were both short stones and had obviously fallen from above so no attempt was made to reset them. The rebuilt facing was stable and almost indistinguishable from the original. Additional masonry was added above this up to the height of the inner face. Plate 122 is a preconservation photograph with the extent of the masonry that was subsequently cleared marked on it. Plates 123 and 124 show Y10 after conservation.

Collapse Y9 (Fig.5)

This collapse was 3.4m wide and marked the point where the line of rampart curved around somewhat to the north (Plates 118 and 125). The base of the wall had slipped forward by about 0.4m forming a noticeable bulge. This phenomenon is common in the masonry on Tre'r Ceiri as the almost total lack of stretchers in the facing results in the stones being pushed forward on the outside of curves and corners. The masonry was carefully examined and there had obviously been no recent movement. The base of the wall was reasonably well supported by stones running deep into the wall so no action was taken here. The wall top was a loose so the additional stones shown on Plates 124 and 126 were added.

Collapse Y8 (Fig.5)

This 7.3 m length of rampart was very well preserved, standing to a height of between 2.1 and 2.6m (Plates 127 to 130). There were some minor instabilities in the top of the facing where stones had been dislodged. There was also a 0.5m deep void about half way up the facing towards the south-west end of the collapse.

The wall top was stabilised by the addition of the stones shown on Plates 131 to 134. The void was examined and it was felt that the flat stone at the top was not supporting the facing adequately. Two supporting stones were therefore carefully wedged into the void.

Collapse Y7 (Fig.5)

The ground level rose steeply across this two metre length of rampart (Plate 135). The wall curved around to the south-south-west and at the apex of the curve was built upon a massive natural boulder protruding from the scree.

The masonry was stable apart from a few loose stones on the wall top. These were reset and are indicated on Plate 136.

Collapse Y6 (Fig.5)

A 1.0m wide section of facing had collapsed down to a height of 0.4m (Plate 137). The tumbled masonry was cleared. Plate 138 shows Y6 after clearance, the lower courses of the wall were intact and stable. New facing was therefore added up the level of the wall on either side (Plate 139).

Collapse Y5 (Fig.5)

The outer face was standing to a height of 1.6m at this point and it could be seen from the unweathered state of the wall top that some stone had recently been lost (Plates 137 and 140). The surviving facing had obviously slumped somewhat but had reached a state of stability. The width of Y5 was 2.0m.

A small amount of displaced core was cleared from the collapse and several stones, indicated on Plates 139 and 141, were added to the wall top.

Collapse Y4 (Fig.5)

This was a well preserved 7.8m length of rampart with facing standing to a height of between 1.8 and 2.6m (Plates 140 and 142 to 145). The only points of instability were a void about half way along the collapse and a few loose stones in the upper course of facing. The void was packed with three stones (Plate 147) and several stones were reset on the wall top (Plates 146 to 149).

Collapse Y3 (Fig.5)

There was a steep rise in the ground level along the line of the wall here. The wall top reflected this gradient and had become unstable with unseated stones tending to roll down the slope (Plates 145 and 150). The width of Y3 was 2.8m.

The wall top was stabilised by the addition of a number of stones from the scree, which were used to pin both the facing and the core. It was necessary to pin the core with large stones as its loss would have undermined the facing. The new facing is shown on Plates 149 and 151.

Collapse Y2 (Fig.5)

This was a well preserved 5.2 m length of wall standing to a maximum height of 2.4m (Plates 152, 153 and 154). The top of the facing contained several loose stones. These were reset and are indicated on Plates 155, 156 and 157.

Collapse Y1 (Fig.5)

The rampart immediately to the south-west of the modern field wall had collapsed down to ground level forming a 2.9m wide eroded slope (Plate 158). Surviving facing at the south-west end of the collapse had slipped forward by about 0.5m suggesting that there had been subsidence at the base of the wall.

The rubble was cleared from the collapse and it could be seen that the base of the wall had been completely lost for 2.3m (Plate 159). The stone marked with a red X is not original). The modern field wall overlapped the line of the rampart by 0.2m suggesting that the collapse was already established when it was built in the 19th century. The basal course had however been incorporated into the field wall (Stone A, Plate 159) and could be seen to run beneath it.

The line of the outer face could easily be extrapolated from the surviving masonry therefore new masonry was added up to a height of 1.0m (Plate 160). The modern field wall was dismantled where it overlapped the rampart and rebuilt to abut the new masonry thus producing an artificial structural sequence consistent with the original ages of the two walls. A slight bulge was left in the base of the wall at the south-west of the collapse as the removal of one of the off-line stones would have destabilised the *in situ* masonry.

INNER FACE

Collapse Y12 (Fig.5)

The inner face could not be traced with any certainty for 3.9m to the south-west of the blocked south-eastern entrance (Plate 161 south-west end only). The south-west end of the collapse consisted of

unstable piled stone which was not providing support to the adjacent wall. Several stones were therefore reset in a stable fashion (Plate 162).

Collapse Y13 (Fig.5)

The wall was well defined across this 2.7m wide collapse (Plate 163). The basal course consisted of large irregular boulders below about 0.4m of smaller stones. The uppermost course was loose and unstable so the stones indicated on Plate 164 were reset and core packed into the wall top.

Collapse Y14 (Fig.5)

The natural ground level fell sharply at this point and a 2.5m wide collapse had occurred (Plates 165 and 166). The line of the wall was obscured by fallen stone at the centre of the collapse and a short length of unstable parapet was standing above this. The collapse was cleared revealing the surviving base of the wall (Plate 167) which was seen to be stable. The rubble from the collapse was used to construct a new face thus retaining the core and preventing the parapet from being undermined (Plates 168 and 169).

The parapet was however still loose, so packing stones were added and several heavy slabs were set into the upper course. This locked the majority of the stones into place but could not produce a completely solid structure. Unfortunately the original masonry was so poorly preserved that only a total rebuild, and therefore the total destruction of the feature, could produce stable masonry. Therefore no further action was taken as the above work was seen to be a good compromise between stability and preservation.

Collapse Y15 (Fig.5)

The inner face was stable to the south-west of Y14 for 1.7m before deteriorating into a 6.4m wide rubble slope (Plates 170 to 173). The line of the wall could not be traced across the collapse. Hut 100 abuts the rampart at this point and its surviving south-eastern wall was retaining some of the rubble (see below). Limited clearance was undertaken along the projected line of the rampart but no *in situ* masonry was found.

The outer face and the wall to the north-east were standing up to 1.0m above the base of the collapse and were only supported by unstable rubble and core. It was therefore decided to reinstate the stone that had been cleared from the collapse in an irregular but stable fashion using the techniques used in several other areas of Tre'r Ceiri (eg hut 21. Hopewell 1996). The result can be seen on Plates 174 to 177.

The slight remains of the parapet can be seen above the north-eastern 5m of the collapse on the pre-conservation photographs. This was very fragile and in many cases could only be seen within the rubble. The *in situ* stones were pinned and heavy stones were added to the top of the feature. A reasonable degree of stability was achieved without disturbing a significant amount of masonry but, as in Y14, this was a compromise between stability and preservation of *in situ* masonry.

Collapse Y16 (Fig.5)

The inner face of the rampart emerged from the rubble above the south-west end of hut 100 and could be traced for 4.1m before being again lost in a jumble of large stones (Plates 173, 178 and 179). The surviving facing was very irregular and consisted of a high proportion of large stones. There was some instability in the upper course and one 1.2m long slab (Stone A, Plate 179) had fallen from the wall. The slab was lifted back onto the wall and a void in the facing beneath it was packed. Elsewhere the upper course was stabilised by the addition of stone to the face and wall core (Plates 177, 180 and 181).

Collapse Y17 (Fig.5)

The inner face could not be traced for the 7.0m between Y16 and Y18. This was in part due to a rise in the ground level; the outer face here was little more than facing separated by a little core from the bedrock and it is unlikely that the inner face ever stood to a great height. Plate 182 shows the central part of Y12 before conservation. This was infilled somewhat during the addition of new masonry to Y6 in the outer face (Plate 183).

Collapse Y18 (Fig.5)

This 2.1m wide collapse consisted of facing standing to a height of 0.4m to 0.6m which was partially obscured by fallen stone some of which was unweathered and had therefore recently been displaced (Plate 184). The parapet was standing to a height of 0.4m on top of loose core material above this. The fallen stone was added to the top of the existing inner face in order to retain the core and prevent undermining of the parapet (Plate 185).

Collapse Y19 (Fig.5)

The facing to the south-west of Y18 was stable, standing to a maximum height of 1.4m. A total length of 3.3m was examined and no further action was taken. The photographs have been retained in the archive.

Collapse Y20 (Fig.5)

This was a 0.9m wide dip in the inner face, the wall falling from a height of 1.1m to 0.8m (Plate 186). A few stones were lying in front of the wall and these were used to fill the dip with 0.3m of new masonry (Plate 187).

Collapse Y21 (Fig.5)

The height of the wall fell from of 1.2m to a rubble slope at the centre of the collapse (Plates 186 and 188). There were signs of recent erosion here. The rubble was cleared but a 1.2m length of facing could not easily be traced (Plate 189). A possible basal course could be seen just below the present ground level. One stone had tilted forwards and this had probably precipitated the collapse. There were however further, level stones between 0.2m and 0.5m behind the line of the wall that were not typical small random core. This area was carefully examined in case the line of the face turned inwards. The stones were not in a regular enough arrangement to be *in situ* facing and it was noted that the core in the corresponding outer face collapse had been regular and larger than usual. It was therefore decided to add new facing to the basal course. The tilted stone could not be reset without disturbing the surrounding masonry so a long stone with a protruding end was set above it. The protrusion hooked over the back of the tilted stone in a similar fashion to the basal stones in collapse Y10 (above). This provided a stable base for the addition of new masonry. Some of the core material was removed in order to make room for the new headers and the face was built up to a height of 0.6m (Plates 187 and 190).

Collapse Y22 (Fig.5)

The 7.4m of wall between Y21 and the top of outcrop Z was low but stable apart from occasional loose stones on the wall top (Plates 188 and 191 to 193). Loose stones were reset and one large unsupported block, stone A on Plate 192, was turned on its side and reset about 1m to the north-east (Plate 194). Other reset stones are indicated on Plates 190 and 194 to 196.

Collapse Z (inner face) (Fig.5)

The rampart originally continued across the top of outcrop Z (see Z outer face, above) but had been reduced to a spread of rubble. The inner face had been lost for 4.2m. No conservation was carried out here but the area was photographed in order to maintain the complete archive record of the ramparts.

Collapse Z8 (Fig. 4)

The displacement of stone from the outer face had resulted in a loss of a large amount of core material at the north-east end of this collapse. This had left the inner face poorly supported, lacking both the weight and the packing effect of the wall core. Stone was therefore imported from the scree and packed into the wall top. There was some instability in the upper part of the 3.5m length of inner face encompassed by Z8 (Plates 197 to 199) so several stones were reset in order to lock the top of the facing together. These stones are marked on Plates 200 to 202.

It was noticed, during the conservation of the wall tops, that there was a line of facing running across the wall at the south-west end of Z8. The 0.3m to 0.5m high facing formed a step in the top of the rampart (Plate 203). This type of feature has not been previously identified on Tre'r Ceiri. The facing did not continue down into the wall and it seems that the function of the step was to compensate for the steep change in ground level between the top of the outcrop and the wall below. If, as the presence of the parapet implies, the walls were designed to withstand foot traffic, this type of structure was necessary as a steep gradient on the wall top tends to result in erosion. The partial reconstruction drawing (Fig. 7) is one possible interpretation of the remains. It is not known however, if there was more than one step or if the parapet continued across the top of the outcrop but the drawing clearly demonstrates the method of compensation for the sudden change in ground level.

The step was stable apart from one stone that had obviously fallen from the inner corner. This was lifted back onto the wall.

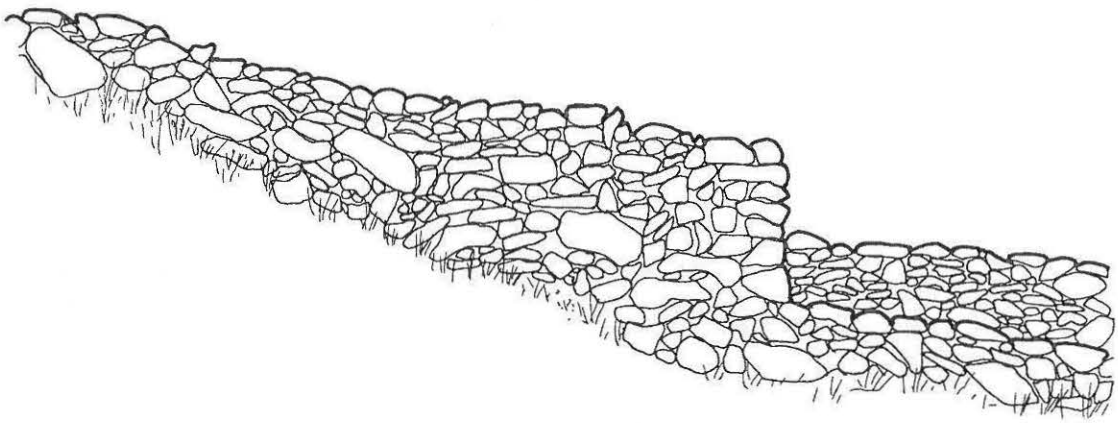

Fig. 7 Reconstruction of step in rampart at Z8.

Collapses Z9 and Z10 (Fig. 4)

The inner face to the south-west of the step at the end of Z9 was standing to a height of 0.8m. It fell to close to ground level 2.0m beyond this and could then only be traced as stones within the rubble and core where hut 72B was standing against the rampart. The parapet was however relatively well preserved standing to a height of 0.4m in places. It had been lost for 0.9m beyond the step (collapse Z9, Plate 204) but became well defined across the subsequent 6.8m (collapse Z10, Plates 204 to 206). The conservation of the outer face had considerably strengthened this feature. The area in front of the step was infilled with irregular rubble but no attempt was made to add new facing to the parapet across Y10 as its line could not be traced. The inner face of the rampart across Y9 and Y10 required no conservation. A profile across the wall of hut 72b, the rampart and the parapet was drawn (Fig. 8) in order to demonstrate the relationship between the various features.

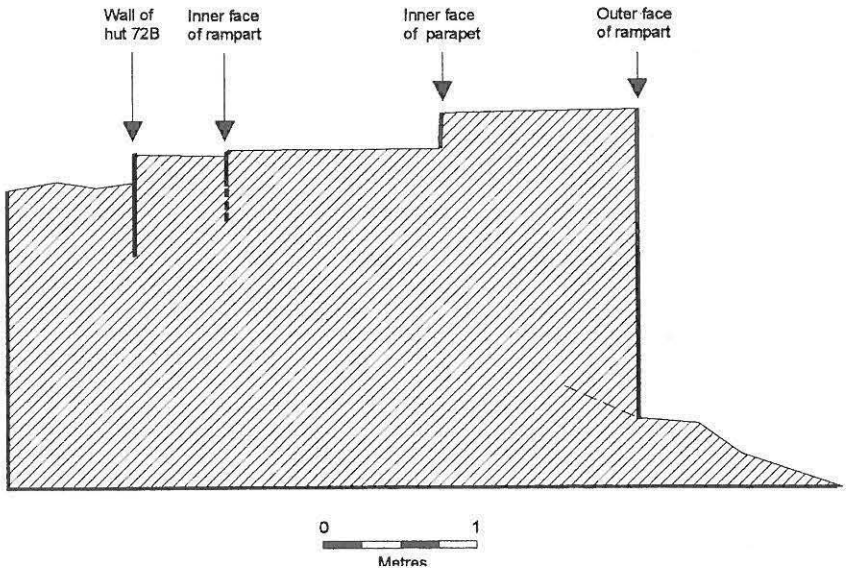

Fig. 8 Profile across Hut 72b and rampart.

The north-eastern end of parapet Y10 was unstable and somewhat jumbled for 3.6m. This was consolidated by the addition of several heavy stones to the top of the facing. Other obviously displaced stones were reset. All of the new and reset masonry is indicated on Plates 207 and 208.

The remaining parapet was reasonably sound and it was felt that any attempt to pin the occasional loose stone would, in view of the smaller stone size here, cause further instability. No further action was taken.

Inner face, Z10 to the south-west entrance (Figs. 3 and 4)

The inner face could not be traced for the 62m between Z9 and the south-west entrance apart from a short length revealed by a collapse in a hut wall that had been built against the rampart (see hut 31 below). Careful examination of the top of the rampart revealed slight remains of the parapet in many places along this length of wall. In most cases this amounted to nothing more than a preponderance of larger stones on the outer 1.3m of the wall top. It was however very noticeable in some places where the inner half of the rampart was visible only as a band of very small core material. The survival of the base of the parapet suggests that the wall stands close to its original height. The inner face must therefore never have been very high.

The presence of such slight remains also posed a problem for the conservation of the wall tops. It had become standard practice to pack the core in order to produce increased resistance to erosion. In this case however any such action would mask or destroy the remains of the parapet. It was therefore decided to take no further action on the wall tops; the consolidation of the outer face had produced a high degree of stability and there were no remaining areas of recent erosion.

THE HUTS

Hut 100 (Fig. 9)

This hut remains unexcavated but was examined by Griffiths in 1946:

> A small rectangular structure, 14 ft. [4.27m] long, set against the SE wall of the fort. The floor is 1 ft. [0.30m] below the general ground level. The inner face of the SW wall stands 1 ft. [0.30m] high. There is no sign of other walls, except traces of footings on the NW.

Dallimore (1978) describes the condition of the hut as poor. His remarks were as follows:

> Represented by small sections of walls against and at right angles to rampart. Maximum height of walls - 0.50m to 0.75m.

The hut was planned and examined at the beginning of the present season and there was found to be little change from the above descriptions. There was some obvious instability in the south-east wall and some erosion to the south west wall where a well-established minor footpath crossed the hut.

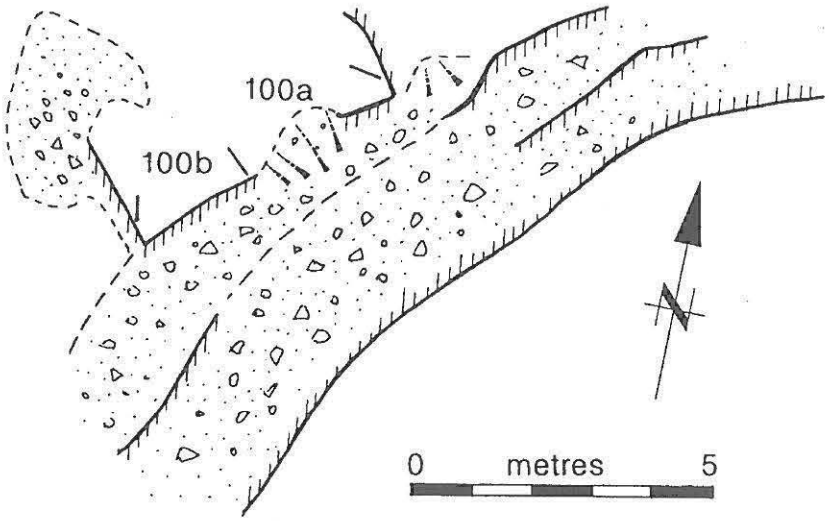

Fig. 9 Plan of hut 100.

Collapse 100a

The eastern corner of the hut was well defined but there had been a serious collapse in the south-eastern wall where 1.7m of facing could not be traced (Plate 209). This was a part of a larger area of collapse that also impinged on the inner face collapse Y15 (above). The collapsed masonry was cleared but there was no definite surviving basal course. Plate 210 shows the collapse after clearance. Stone A was a large upright, standing behind the expected line of the face. No definite line could be extrapolated from the jumbled stone but it appeared that the base of the wall had fallen forwards causing the masonry above to collapse. New masonry was needed in order to support the wall to either side. As the line of the wall had been lost, stone was added in an irregular fashion (Plate 211). Three additional stones were added to the top of the *in situ* facing in the corner of the hut.

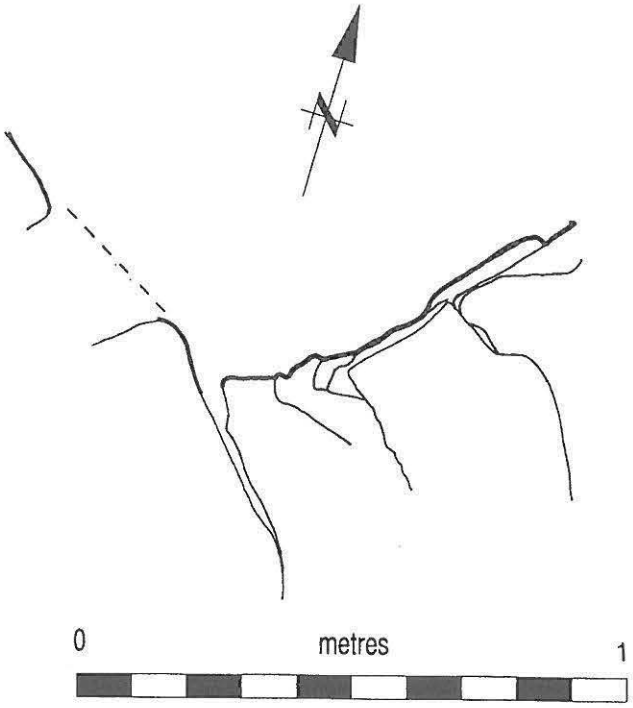

Fig. 10 Plan of collapse 100b, after clearance.

Collapse 100b

The south-western end of the hut was better preserved with facing standing up to a height of 0.8m (Plate 212). The corner of the hut was obscured by a fallen stone. The stone was cleared revealing a 0.6m long stone overlapping the end of the south-east wall. This marked the corner of the hut (Plate 213 and Fig. 9). Several stones were added above the end of the wall and the corner in order to provide support for the *in situ* masonry (Plate 214). Several heavy slabs, indicated on Plate 215, were added to the top of the south-eastern wall in order to retain the core. The top of the south-western wall was covered by a mat of vegetation which was protecting it from serious erosion although the presence of a footpath here could result in minor damage in the future if the vegetation is lost. No further action was taken.

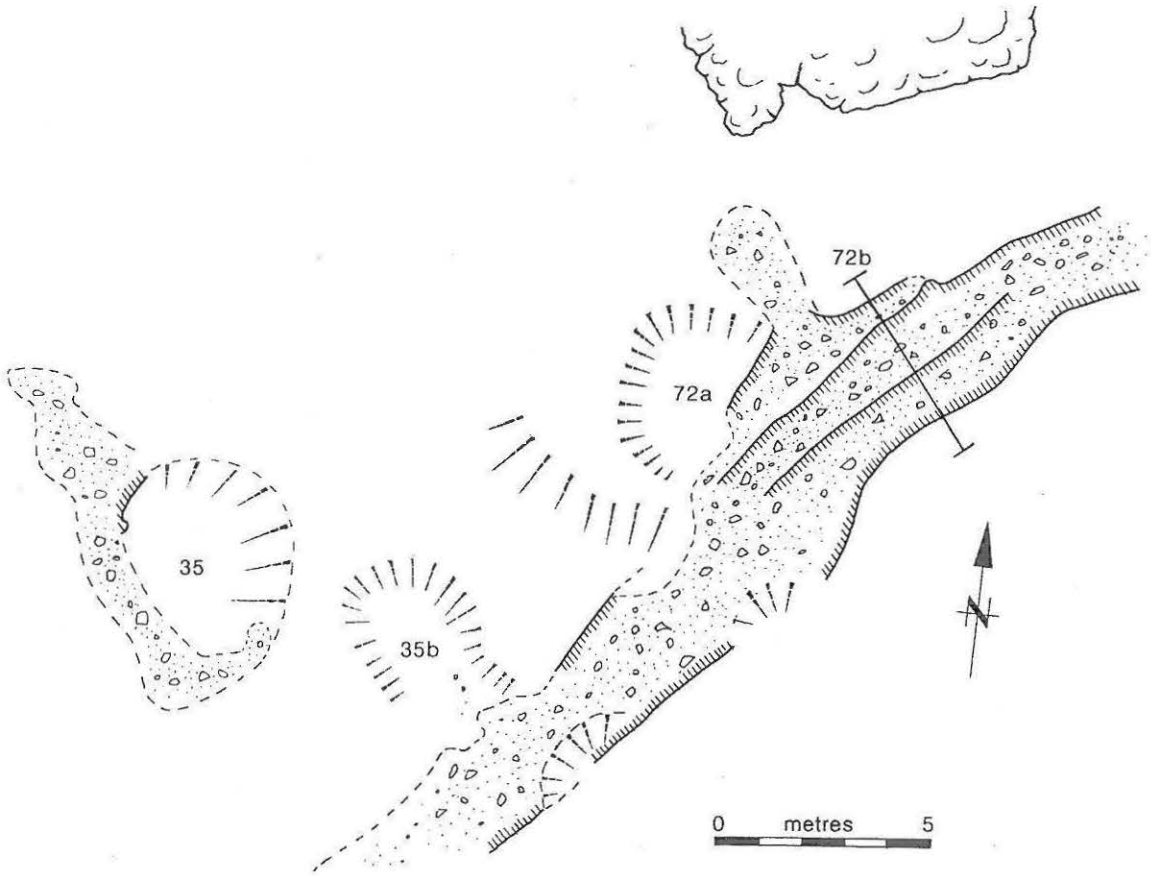

Fig. 11 Plan of huts 35, 35b, 72a and 72b.

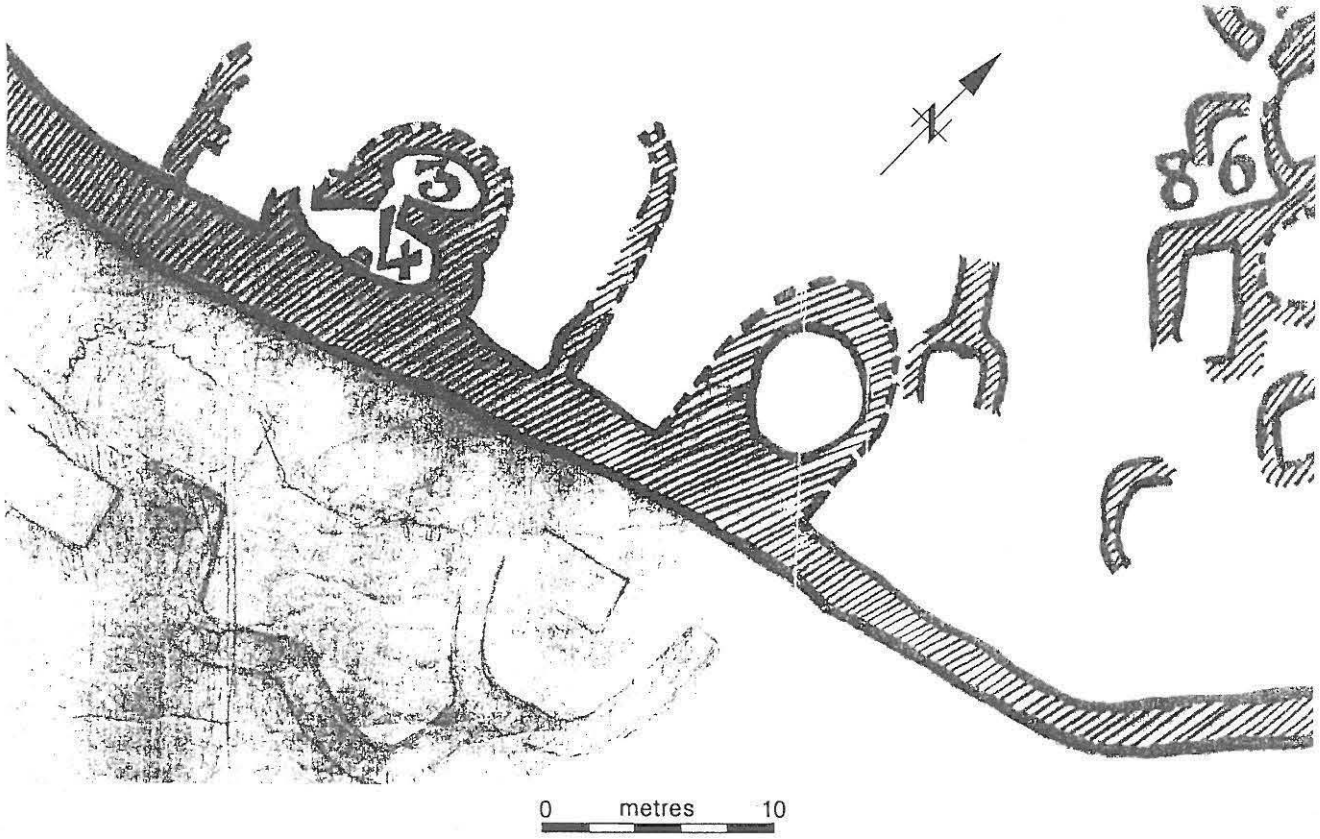

Fig. 12 Huts built against the western rampart (Hughes *ca.* 1906).

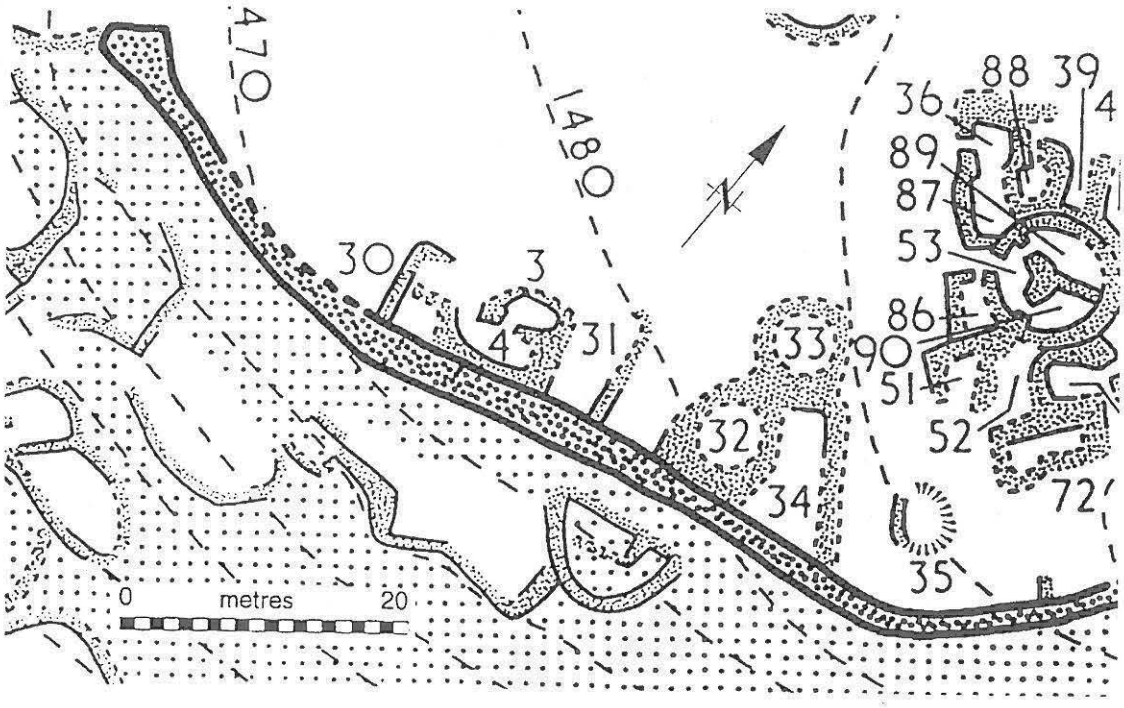

Fig. 13 Huts built against the western rampart (RCAHMW 1960).

Hut 72B (Fig. 11)

Hut 72B was previously unrecorded and was visible as a 2.0m length of low (O.2m in height or less) facing between 0.6m and 0.9m in front of the rampart (Plate 216). A concentration of stone was all that remained of the south-western wall of the hut. This suggested that the hut was originally rectangular. No further masonry was visible.

Collapse 72Ba

The surviving facing could be seen to extend to a minimum of 0.4m below and 0.2 m above ground level. The exposed facing was loose and unstable so several heavy stones were added in order to lock the *in situ* masonry in place (Plate 217).

Hut 72A (Fig. 11)

This hut was a previously unrecorded 4.0m x 2.5m sub-rectangular hollow. A single edge-set stone was visible in front of the line of the rampart (Indicated with an arrow on Plate 218). This had tipped forward but had reached a point of stability. The rest of the hut was overgrown so no consolidation was required.

Hut 35B (Fig. 11)

A 2.2m length of facing could be seen here (Plate 219). This was standing about 0.5m in front of the rampart. In front of this was a poorly defined rectangular hollow suggesting the presence of another unrecorded hut. The facing was stable and no action was taken.

Hut 35 (Fig. 11)

Recorded by Hughes (Fig. 12), RCAHMW (Fig. 13), Griffiths and Dallimore, this was a small (approximately 3m x 4.5m) poorly defined oval hut. There was some exposed stone, mainly on the

south-west side but this was jumbled and low. As there was no danger of erosion here no works were carried out in this hut.

Hut 35A (Fig. 11)

This was another previously unrecorded hut, visible only as a 4m length of gently curving facing set 1m in front of the rampart (Plate 220) standing behind a 6 x 2m overgrown hollow.

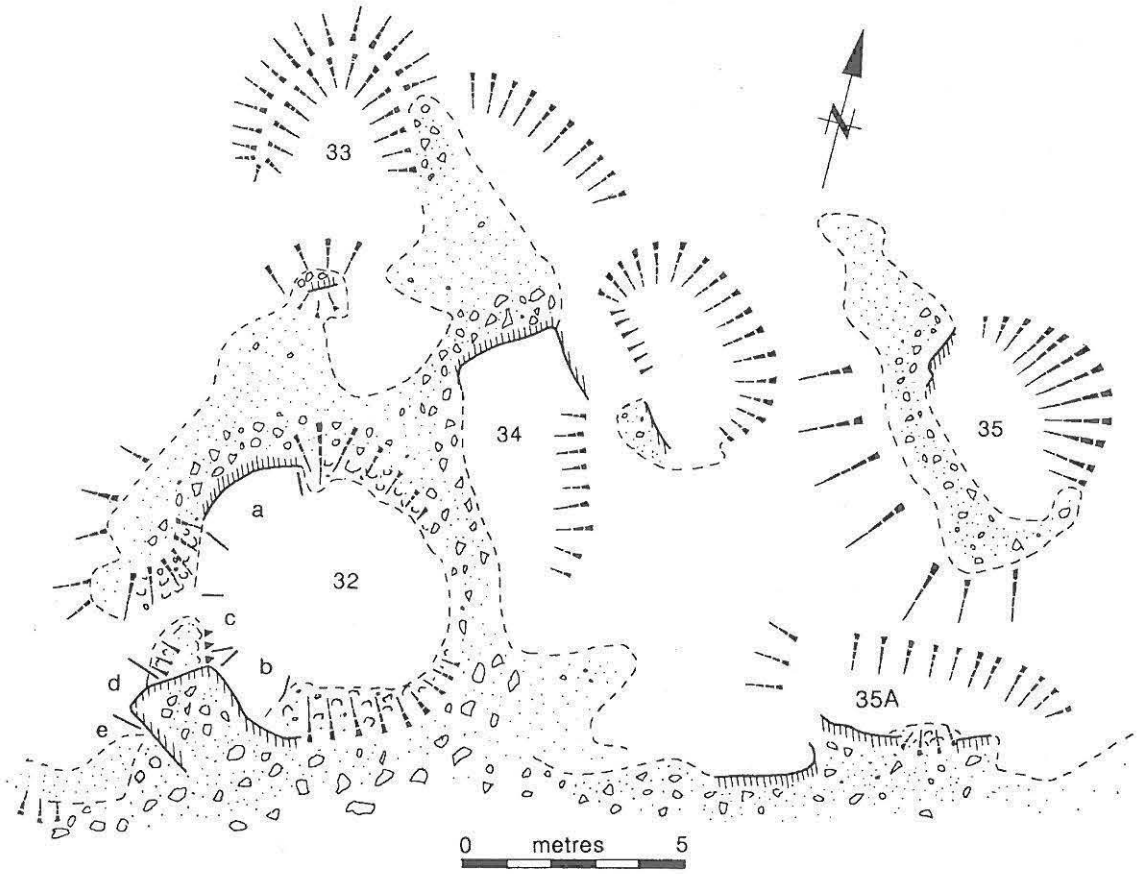

Fig. 14 Huts 32 to 35A, before conservation.

Hut 34 (Fig. 14)

This was a quite well defined but overgrown rectangular hut with internal dimensions of 7.0 x 2.5m. Exposed facing could be seen at the north end of the hut standing to a maximum height of 0.8m. This was stable and the wall tops were bound together by a dense mat of vegetation so no consolidation was required. The hut was recorded by Hughes RCAHMW, Griffiths and Dallimore.

Hut 33 (Fig. 14)

This was a sub-circular structure with an internal diameter of approximately 3.0m. This hut did not appear on Hughes's plan but was recorded by RCAHMW, Griffiths and Dallimore. The walls had been reduced to ground level and no conservation was required.

Hut 32 (Figs 14 and 15)

Hut 32 was portrayed on Hughes's plan (*ca.* 1906) as circular with no entrance. Griffiths's (1946) description was as follows:

> A large circular hut, with an internal diameter of 15 ft. [4.6m], set against the wall of the fort. Unlike most of the huts, its wall is built of small rounded stones and has no large facing stones. It stands 6 ins. [0.15m] - 1 ft. [0.3m] high. The S. wall, set against the fort wall, is very thick (7 ft. [2.1m]). The floor of the hut is 2 ft. [0.6m] below the general ground level.

Dallimore (1978) recorded the condition as good. His notes stated;

> Portions of north and south wall up to 1.75m. East and west walls tumbled but position is clear.

The hut remains unexcavated. Griffiths's description is very different to that of Dallimore. When the hut was examined and recorded at the beginning of the present season facing was still standing to a height of 1.6m suggesting that Dallimore was correct. In addition to this the facing consisted of stones that were of a typical size for the masonry found in huts in this area of the fort; there was no sign of Griffiths's small rounded stones. Either there had been some major changes in this hut over the previous 51 years or Griffiths was describing a different structure (see collapse 32b below for further discussion).

Before conservation the hut was visible as a circular structure with an internal diameter of about 6.0m. The south side of an entrance, blocked by large slabs, was visible in the western side of the hut. Facing was surviving across much of the western half of the hut. The eastern side had been reduced to an eroding rubble slope. The surviving internal facing was assigned two collapse numbers.

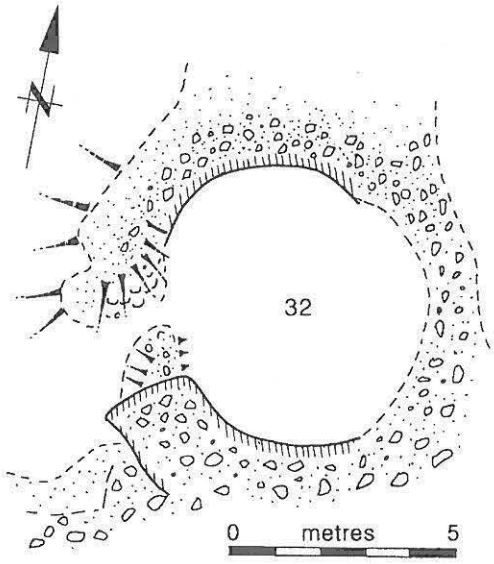

Fig. 15 Hut 32, after conservation

Collapse 32a

The facing in the north-western quadrant of the hut was poorly preserved (Plates 221 to 223). The line of the wall could be traced for 2.8m but to either side of this was recently fallen stone. The facing was standing up to a height of 0.7m in places but this was almost entirely the jumbled remnants of recently collapsed masonry. There was nothing that could be said to be in its original position and it was all extremely fragile. The high proportion of unweathered stone showed that much of this damage had occurred over the last few years. The semi-collapsed masonry could not be preserved so it was cleared along with the rest of the rubble. Plates 224 and 225 show 32a after clearance, stone A is indicated only as a reference point. The

basal course of the wall could be traced for 5.5m. The eastern end was marked by an edge set stone (B on Plate 225), no facing could be seen within the rubble beyond this and as the slope was reasonably stable no further clearance was undertaken.

A new 0.9m high face was constructed above the *in situ* masonry using, where possible, stone from the cleared collapse (Plates 226 to 228). Several facing stones were however imported from the scree as some of the tumble was not accessible being overgrown with heather, etc. The resulting wall retained the core, preventing further erosion and adding definition to the hut.

The Entrance (32c)

Plate 229 shows the blocked entrance to the hut. The dotted line indicates the southern side. To the north of this was a pile of large slabs which appeared to be a deliberate blocking wall. Closer examination however showed that all of the slabs were tilted to the southern side and that much of the stone was jumbled and irregular. This suggested that the northern side of the entrance had failed at its base and had fallen sideways against the wall on the opposite side of the passage. This hypothesis was supported by the fact that no *in situ* masonry was visible on the north side of the entrance; a blocking wall would probably have helped to preserve this. As no entrance was recorded by Hughes in 1906 it is presumed that the collapse occurred before this date effectively masking what must originally have been an obvious feature. As there was little instability here no consolidation work was undertaken.

Collapse 32b

The wall to the east of the entrance was standing to a height of between 1.0m and 1.6m.. The face could be traced for 2.6m before being obscured by unstable rubble. The upper 0.5m of the wall consisted of piled stone, some of which may have come from an old treasure hunter hack in front of the wall. This hole was beginning to cause some instability as it extended to below the basal course and a severe overhang had formed. The damage here could go some way to explaining the differences between Griffiths's and Dallimore's descriptions as the wall would originally have been lower and the ground level higher. The lichen regrowth shows that the hack was dug in excess of 35 years ago, i.e. before Dallimore and perhaps after Griffiths.

The rubble slope at the east end of the collapse was unstable so the loose stone was cleared revealing a further 1.6m of facing. Some of the rubble was used to pack the treasure hunter hack. The unstable portion of the piled stone and core on top of the wall was also cleared. Plate 232 shows the collapse at this stage of conservation. New facing was added to the top of the existing masonry in order to retain the rubble between the hut and the outer face of the rampart (Plates 233 and 234).

Collapse 32d

Plate 235 shows the outside of the entrance of hut 32. Stone A was sitting on the top of the outside corner of the south side. Several stones had obviously fallen off the wall here. These were replaced and no *in situ* masonry was disturbed (Plate 236).

Collapse 32e

The facing to the south-east of stone A (Plate 235) could be seen to run into the rubble in front of the rampart. A small amount of clearance was undertaken. The masonry could be traced for a total of 2.5m from the corner of the entrance (Plate 237). No further clearance was undertaken and the rubble was reinstated in a stable fashion (Plate 236).

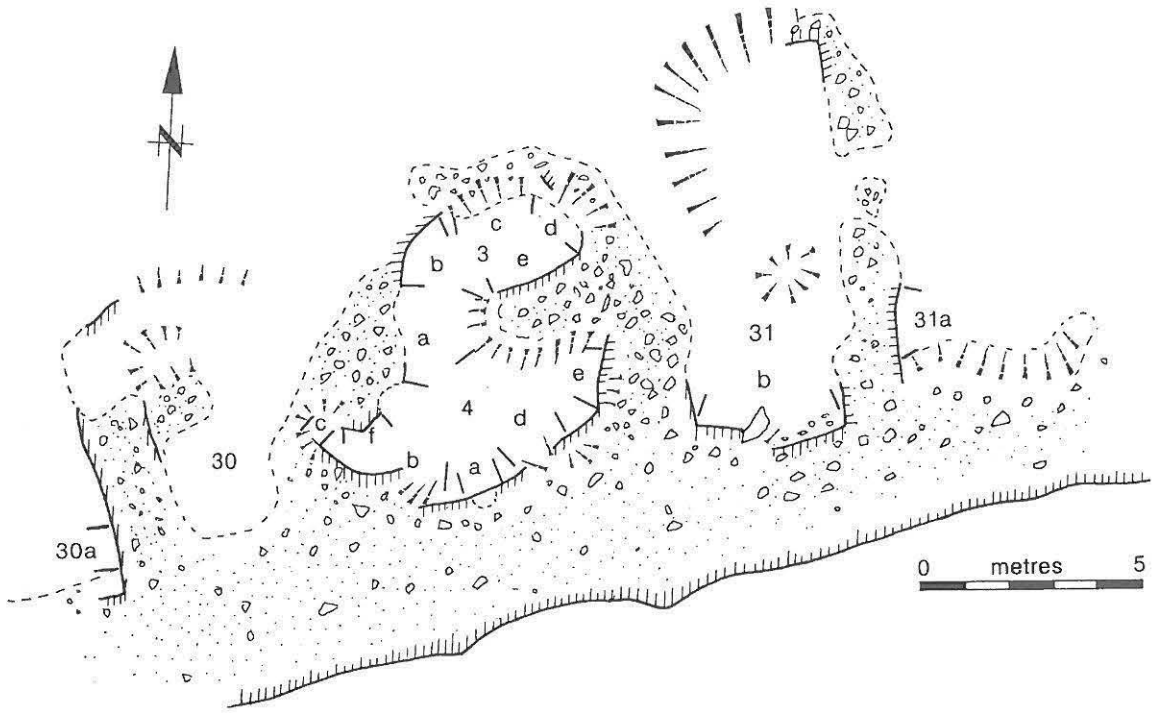

Fig. 16 Huts 3, 4, 30 and 31, before conservation.

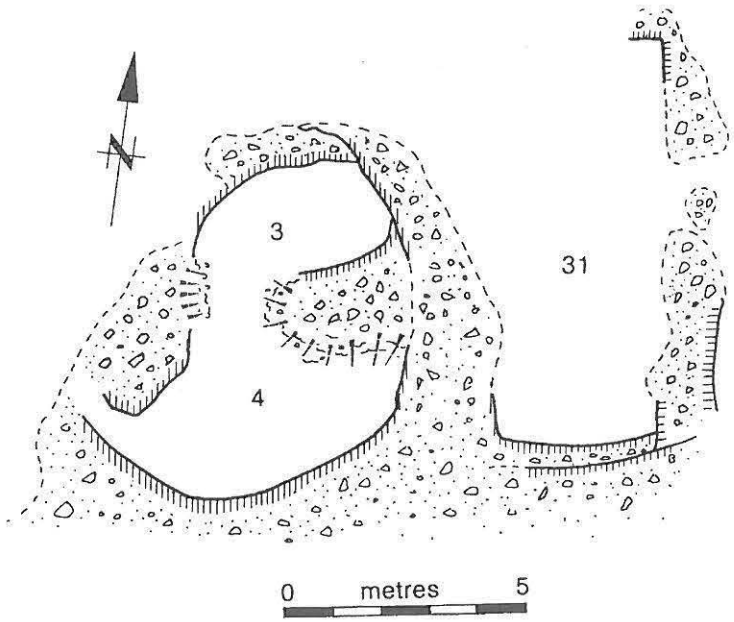

Fig. 17 Huts 3, 4, 30 and 31, after conservation.

Hut 31 (Figs 16 and 17)

Hut 31 remains unexcavated but was planned by Hughes and described by Griffiths in 1946;

> Apparently a large rectangular hut set against the S wall of the fort, with its longer axis N-S. Its S wall follows the curve of the fort wall and has an inner face 2 ft. [0.6m] high. The E wall is 4 ft. [1.2m] thick and 6 ins. [0.15m] high. The ground slopes up to the N, and the N end of the hut is buried; hence its length is undetermined. It is 12 ft. [3.7m] wide.

Dallimore noted the following;

> Only sections by rampart recognisable as walls. Has treasure hunter hack.

When the hut was surveyed at the beginning of the present season there was little change from the above. The treasure hunter hack was towards the centre of the hut and was overgrown. There was however a recent area of deliberate disturbance in the north-east corner of the hut. A small hole had been dug exposing the *in situ* corner of the hut. Several similar, unauthorised, excavations occurred during 1995, all of which exposed minor details of the site.

Collapse 31a

A 2.4m length of the outer face of the eastern wall hut was surviving (Plate 238). It was standing to a height of 0.2m and several stones had been displaced from the wall top. These were reset and locked into place with heavy slabs (Plate 239).

Collapse 31b

The southern wall was still standing to a height of between 0.6 and 1.0m (Plates 240 and 241). There was however a collapse in the centre, much of which was obscured by a single stone, close to a metre in length. The stone had come to rest with one end on the wall and the other on the ground. There appeared to be a discontinuity in the line of the wall at this point. There was also a small treasure hunter hack close to the south-east corner of the hut. This was infilled using loose stones that were lying in front of the southern wall. The reason for the discontinuity in the wall was revealed during this process. The loose stones had been hiding the basal course of a wall running parallel to the previously recorded wall (Plate 242). It was now obvious that the southern wall of the hut was in fact a skin wall standing between 0.4m and 0.45m in front of the inner face of the rampart. The collapse in the centre of the wall was cleared confirming that western half of 31b was the hut wall. This could be seen to ecome lower and more ruinous at the east thus exposing the inner face of the rampart.

The stone cleared from the collapse was used to consolidate the top of the surviving hut wall which was graded down to 0.2m at the east thus allowing the two phases of building to be visible without much compromising the stability of the wall. Stone was also added to the top of the inner face of the rampart as the upper courses were loose (Plate 243). The upper course of the eastern wall at the corner of the hut was stabilised by the addition of the stones indicated on Plate 244.

Collapse 31c

The recently uncovered north-eastern corner of the hut (Plate 245) was recorded but it was not conserved as it was felt to be reasonably stable.

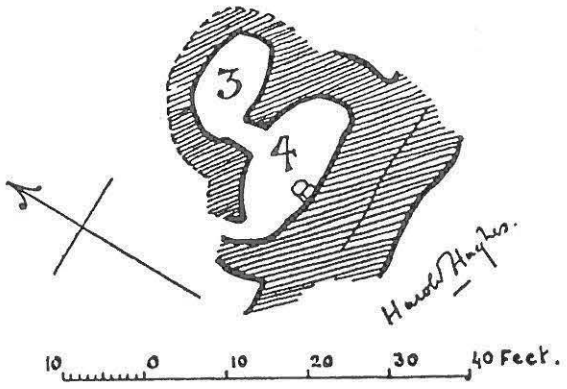

Fig. 18 Huts 3 and 4 (Hughes in Baring-Gould and Burnard 1904).

Huts 3 and 4 (Figs 16 and 17), general background

These huts followed the by now familiar pattern of two sub-rectangular huts formed by the subdivision and remodelling of an earlier roundhouse (Hopewell 96).

Both huts were excavated by Baring-Gould and Burnard in 1904:

> 3. Entrance from No.4 only 2 ft. [0.6m] wide. No hearth seen, nor any charcoal, but about a dozen pieces of dark pottery were found. Also, some pebbles and a small fragment of pointed iron. Height of wall, 4 ft. [1.2m].
>
> 4. A long hut against inner south-west wall, with a hearth composed of two flat stones. This hut yielded much charcoal, two spindle- whorls, one broken, and pebbles both large and small. Both these communicating huts are in a hollow, and the present walls are flush with surface level. Entrance faces north-west and is curved; 2 ft 2 ins. [0.66m] wide. Height of wall 6 ft. [1.8m].

A plan by Harold Hughes was also included in the report (Fig. 18)

Griffiths (1946) recorded hut 3 as being oval with internal dimensions of 4.0m x 1.6m. The floor was 1.5m below ground level and the entrance between the two huts was 0.8m wide.

He recorded hut 4 in some detail:

> A long, roughly oval hut, 18 ft. [5.5m] X 6 ft. [1.8m], set against the S wall of the fort. The walls are constructed of large stones. The hut is deeply sunk, the floor being 7 ft. [2.1m] below the general ground level. The E end of the hut is sub-rectangular in form; the E wall is set against Hut 31 and is thick (7 ft. [2.1m]) ; its outer face (i.e. the inner face of hut 31) is 6 ft. [1.8m] high. The south wall of the hut has a good inner face 7 ft. [2.1m] high. On the W there are traces of an entrance 1 ft. 6 ins. [0.5m] wide, with a sloping passageway.

Dallimore (1978) remarked that small portions of well preserved wall on the south and west of hut 3 were standing up to 1.25m, the north wall had collapsed. The south-west side of hut 4 was recorded as standing up to a height of 2m but the east wall had collapsed.

Hut 3 (Figs 16 and 17)

Hut 3 had further deteriorated by the beginning of the present season. The facing on the west was in a poor condition and only part of the dividing wall on the south was still standing. The entrance between the two

huts had been reduced to rubble and there had been severe erosion to both the northern and eastern quadrants.

Collapse 3a; the passage between huts 3 and 4.

Plate 246 is a general view of the huts and illustrates the seriousness of the damage that has occurred here over the last 40 years. The RCAHMW (1960) plan clearly shows an entrance at the point indicated by the arrow. This had been reduced to a spread of rubble (Plate 247). It was decided to undertake some limited clearance in order to see if any masonry had survived but it soon became obvious that the entrance had been completely lost. The scales on Plate 248 show the approximate line of the wall as planned by Hughes. The stone that had been cleared from the collapse was reinstated in a more stable arrangement so as to provide some support for the end of the dividing wall (Plate 249) and the slope opposite (Plate 250).

Collapse 3b

The 2.1m length of surviving facing on the west of the hut was standing to a height of 0.7m but was unstable apart from where it was held in place by vegetation (Plate 251). The upper course was reset and two large supporting stones were introduced in to the face close to the centre of the collapse (Plate 250).

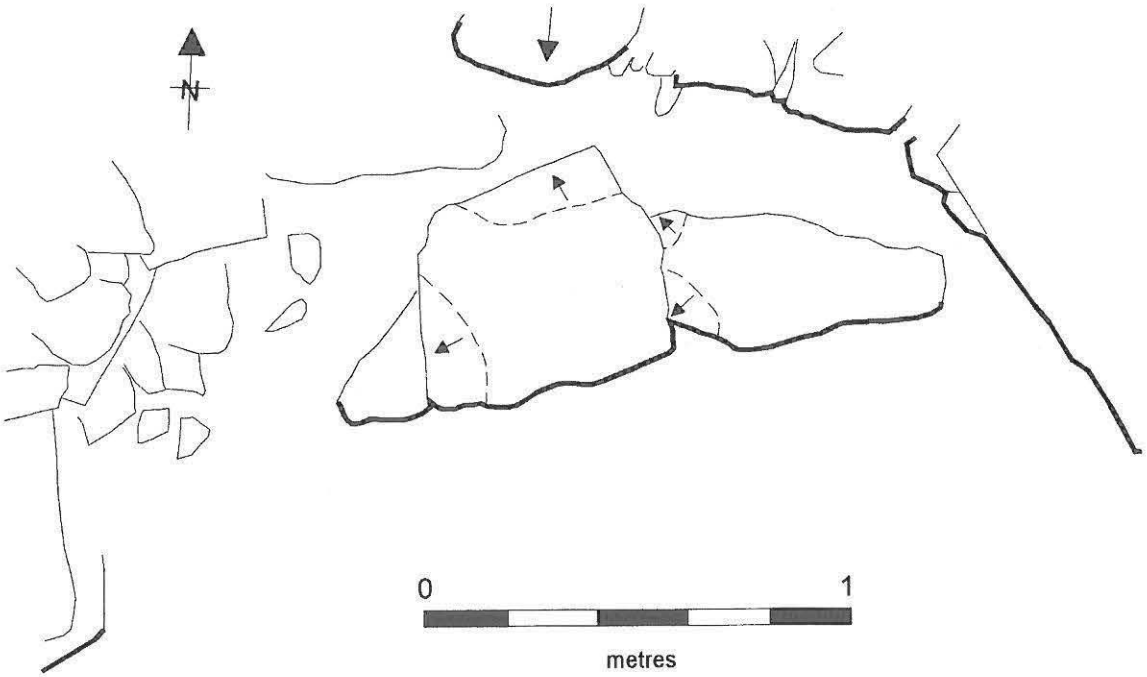

Fig. 19 Plan of collapse 3c, after clearance.

Collapse 3c

The north and east of the hut had been reduced to a rubble and earth slope with only two possible facing stones visible (stones A and B on Plate 252). There was an ongoing problem with erosion here as the main footpath running through the fort runs close to the north wall of the hut and stone and earth was eroding into the interior. It was decided to clear the eroded area in order to allow reinstatement either with facing or a built 'collapse'. The area was given two collapse numbers; 3c to the north-west of stones A and B (Plate 252) and 3d to the south of them (see below).

Collapse 3c was cleared of the fallen stone and redeposited peat revealing two lines of basal stones (Plate 253). The scales on the photograph indicate the two lines of facing. The two one metre scales follow the continuation of the masonry containing stones A and B which could be traced for 1.4 m beyond the marked stones before being lost to collapse. This is presumed to be part of the original roundhouse wall. A further face could be seen abutting the above, below stone b, and running in a roughly westerly direction across the hut towards the facing at the end of 3b which it presumably originally joined. As it can be assumed that this was the latest phase of building it was decided that new facing could be added along this line in order to provide much needed stability to the north side of the hut. The area around 3c was first hand drawn (Fig. 19) and photographed in detail. The new facing shown on Plate 254 was then added. The core was carefully packed in order to support the earlier phase of masonry. Te extent of clearance was marked in the usual way with polypropylene cord.

Collapse 3d

The eastern end of the hut had also been reduced to a rubble slope (Plate 255). In addition to this part of the vegetation mat from above had fallen down the slope and was now growing amongst the stones. The remains of the corner of the hut were however still visible.

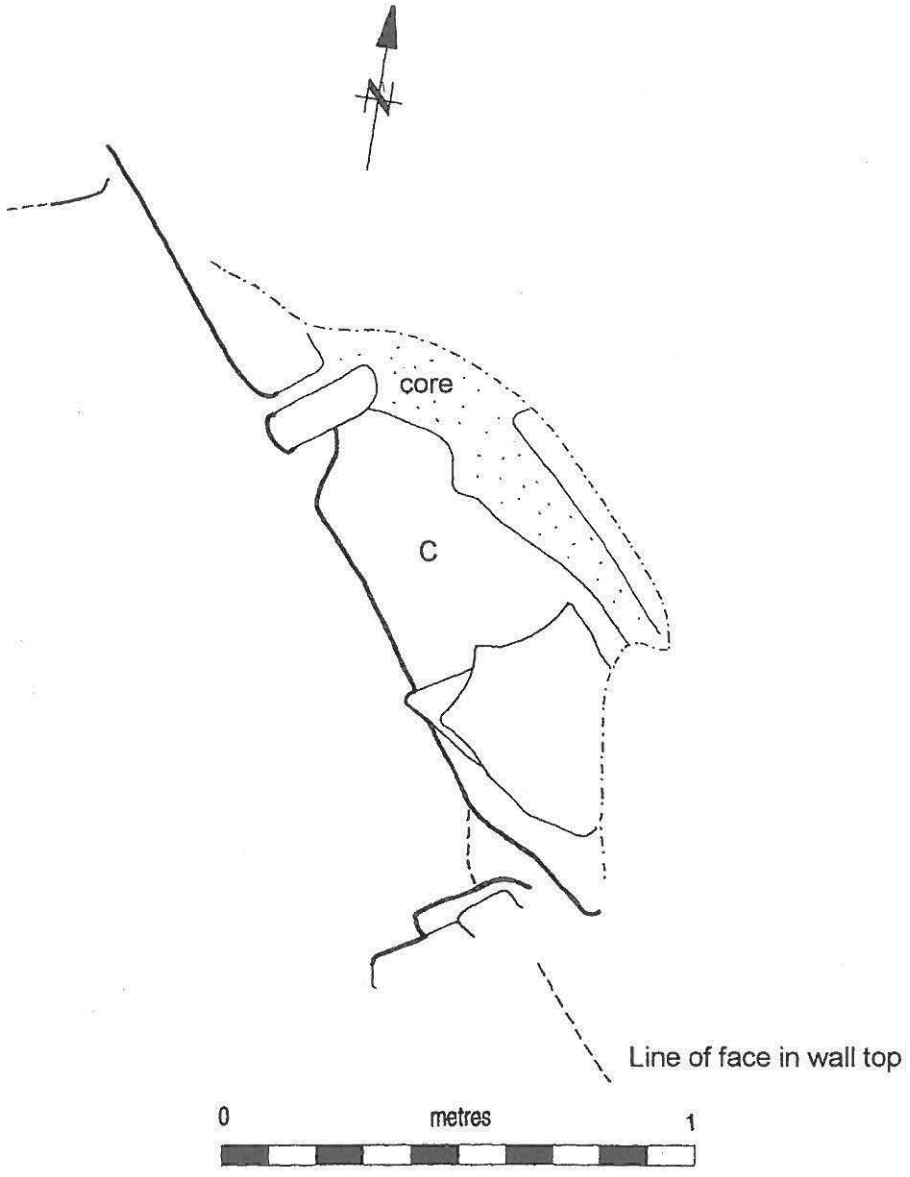

Fig. 20 Plan of collapse 3d, after clearance.

The collapse was cleared revealing a large basal stone between the corner of the hut and the facing revealed during the clearance of 3c (Plate 256 and Fig. 20). The junction between the dividing wall and the continuation of the face beyond 3d was however not entirely clear. The lower part of the wall, (stones C and D etc) could not be traced behind the dividing wall for more than 0.2m. The top of the wall was overhanging (stone E and above) but could be traced on this line behind most of the width of the dividing wall. The loss of only the base of the wall behind standing masonry cannot easily be explained. It could have been the result of subsidence and it is even possible, although unlikely, that the line of stone visible in the wall top behind the dividing wall had been added during the excavation of the hut in 1904. It can probably be assumed that the dividing wall was built against the original roundhouse wall, as in other huts, but further investigation was not possible without the destruction of *in situ* masonry.

New masonry was added above the newly revealed basal course. The line of the facing in the corner was kept somewhat vague as the original wall line was not known (Plate 257).

Collapse 3e

The top of the dividing wall was covered in loose stone above somewhat overhanging facing standing to a height of 0.4 to 0.5m (Plate 258). The collapsed western end of the wall had been supported during the conservation of 3a. The loose stone was cleared and the *in situ* masonry was found to be stable. Up to 0.3m of new facing was added to the top of the wall using heavy headers (Plate 259). The new stones that were added were, on average, larger than those found in the facing below. This was necessary as they had to retain the core and masonry on the wall top and provide some general stability to the dividing wall the other side of which had completely collapsed (see below, collapse 4g) .

Hut 4 (Figs 16 and 17)

The southern wall of this hut was standing to a maximum height of 1.7m but was in most places on the point of collapse. The most unstable parts were consolidated first as it appeared that large portions of the wall could collapse unexpectedly.

Collapse 4a

A number of stones had fallen out of the face here (Plate 260), presumably because the wall had been built close to the inner face of the rampart thus precluding the use of long headers. The surrounding facing consisted of small stones and was loose. Some displaced core material was carefully removed from within the void which was then packed with eight stones (Plate 261). This successfully locked the *in situ* masonry into place.

Collapse 4b

A serious slump and collapse had occurred here causing a marked discontinuity in the face (Plates 262 and 263). In all a 3m length of facing had been destabilised, running well into the entrance passage. The actual collapse was only about 0.4 m wide but this had pushed the wall off line and had caused a 0.2 to 0.3m overhang. The facing at the west of the collapse gave the impression of being well preserved but was found on closer examination to be structurally unsound. The stones were therefore marked A to Z and 2 to 8. It became obvious as clearance of the fallen stone progressed that the overhanging facing could not be preserved so some of the marked stones were carefully removed from the wall. An uncontrolled rock fall did however occur, dislodging all of the marked masonry apart from stones M, S, 4 and 5. All of the marked stones were recovered and the rubble was cleared from the collapse. Plate 264 shows 4b after clearance, stone S is indicated as a reference point. A large slab (stone 9) was lying clos to the line of the wall and this probably indicated the original cause of the collapse. It seems that this stone was originally standing upright in the face, possibly in order to compensate for the large stones, including one orthostat, in the core/scree behind it. The stones behind the fallen slab appeared to be semi-collapsed facing continuing on a line suggested by another flat orthostat (Stone 10) in the wall. Further examination proved to be inconclusive as there was a lot of random rubble in amongst and more importantly below the large stones. A basal course

could however be traced across the rest of the collapse, from stone 9 to the entrance. Stone 10 must also have been incorporated in this line of facing as plans by Hughes (*ca.* 1906) and RCAHMW (1960) (Figs 18 and 19) show a regular curve in the wall here. Stone 9 was therefore set upright in the wall (Plate 265) allowing facing to be constructed across the whole collapse. The marked stones were replaced close to their original positions although minor adjustments had to be made in order to compensate for the previous overhang. Small packing stones Y, Z, 6 and 7 were discarded. New masonry was added above stone 9 using wedge shaped stones to allow for the presence of stone 10 behind the line of the face. Plates 266 and 267 show the collapse after conservation.

Collapse 4c

The outside end of the south-west side of the entrance passage had been eroded down to the top of the edge set stone adjacent to the right-hand scale on Plate 263. New masonry indicated on Plate 267 was added above this in order to provide support for the upstanding core and the rebuilt masonry in the rest of the entrance passage. Several irregularly placed stones were also added to the outside of the passage in order to provide further support.

Collapse 4d

This was a 1.2m wide collapse in the facing of the southern half of the hut, 1.2m to the north-east of void 4a. The masonry had collapsed to a height of between 0.1 and 0.4m and was partially obscured by rubble (Plate 268). This was cleared, allowing the base of the wall to be seen more clearly (Plate 269). There was one 0.3m wide jumbled area in the centre of the collapse where an upright stone, now off line and immovably buried in the hut floor, appeared to have been lost from the face. There was also a sloping slab in the base of the wall here making the addition of new masonry difficult. As the base of the wall was close to the present floor level, stones were packed against the buried upright, forming a level platform. New masonry was added above this and above the *in situ* facing to a height of 1.0m (Plate 270). The 0.3m length of untidy masonry to the north-east of 4d was stable.

Collapse 4e

The north-eastern corner of the hut, i.e. the junction between the curving roundhouse wall and the dividing wall, had been reduced to a rubble slope although facing stones could be traced within the collapse for about 1.2m (Plate 271). The loose stone was cleared revealing surviving masonry standing to a height of between 0.1 and 0.6m as far as the presumed corner of the hut (Plate 272). Some overhanging masonry could also be traced behind the collapsed dividing wall. Rubble was cleared from a 1.2m length of the dividing wall but no facing could be found. The rubble was reinstated in a stable but irregular manner. The new masonry indicated on Plate 273 was added to the *in situ* wall, producing a stable and well defined wall.

Collapse 4f

The northern side of the entrance consisted of several stones insecurely balanced on top of a large block of stone that had itself slipped off the base of the wall. Plate 274 shows the inner corner of the entrance from the interior of the hut and Plate 275 the northern side of the passage. The block had settled into a stable position and could not be moved without completely destabilising the surrounding masonry. The slab (Stone A) on top of the block was turned and reset. One other stone (B) was also reset. The remaining voids were then packed with stones from the scree (Plates 276 and 277).

Hut 30 (Figs 16 and 17)

This unexcavated hut was planned by Hughes (*ca.* 1906) and RCAHM (1960) both of whom recorded the western side of a rectangular hut with internal dimensions of about 5.5m x 3.0m. A dividing wall was also recorded running from east to west across the centre of the hut. Griffiths (1946) and Dallimore (1978) also only recorded significant masonry on the west. Fig.16 shows the survey carried out at the beginning of the present season. The majority of the hut was overgrown and the eastern side could not be traced. The outer face of the western wall was standing to a height of 0.3m in places and there was one minor area of

instability (30a).

Collapse 30a

This was a small dip in the outer face of the western wall (Plate 278). A few displaced stones from the core were cleared from the collapse and the dip was filled with new masonry (Plate 279).

The north-eastern group of huts: General notes

The following huts, located towards the north-eastern end of Tre'r Ceiri, were not originally scheduled for conservation during the present season. The conservation of the ramparts had however progressed a lot faster than expected so ten extra huts were surveyed and photographically recorded at the end of August.

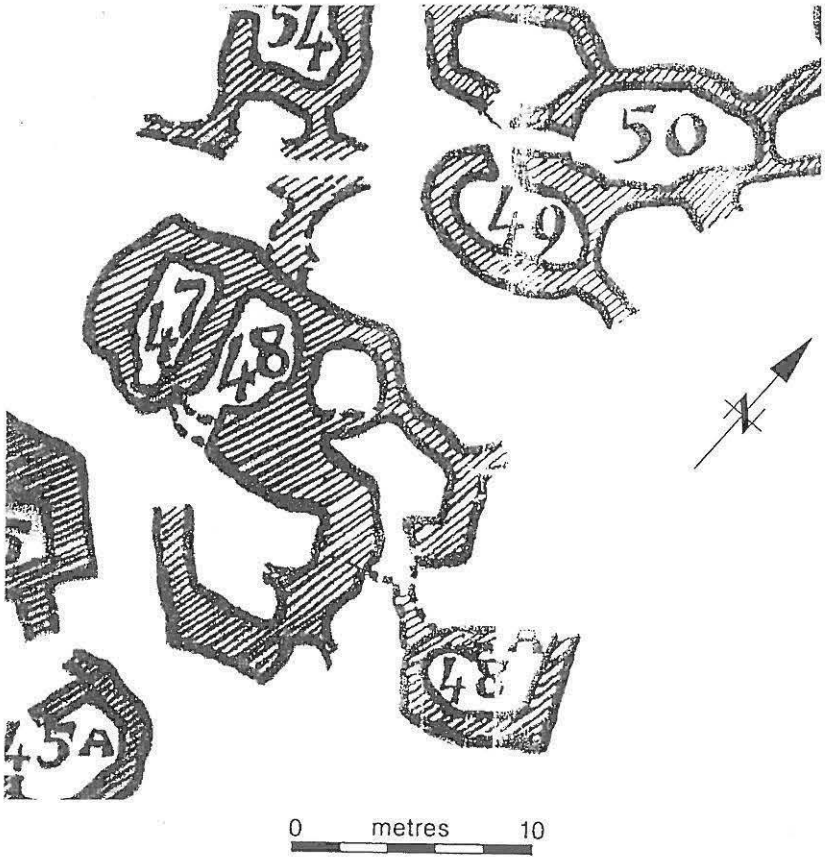

Fig. 21 The north-eastern group of huts (Hughes *ca.* 1906).

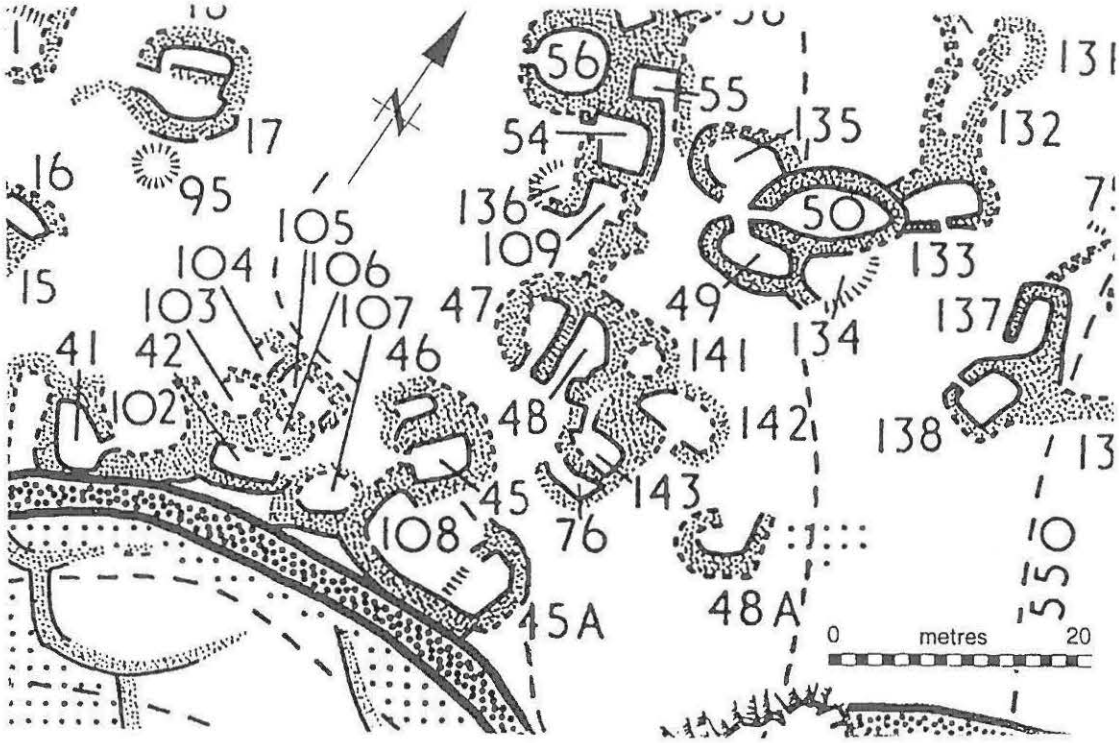

Fig. 22 The north-eastern group of huts (RCAHMW 1960).

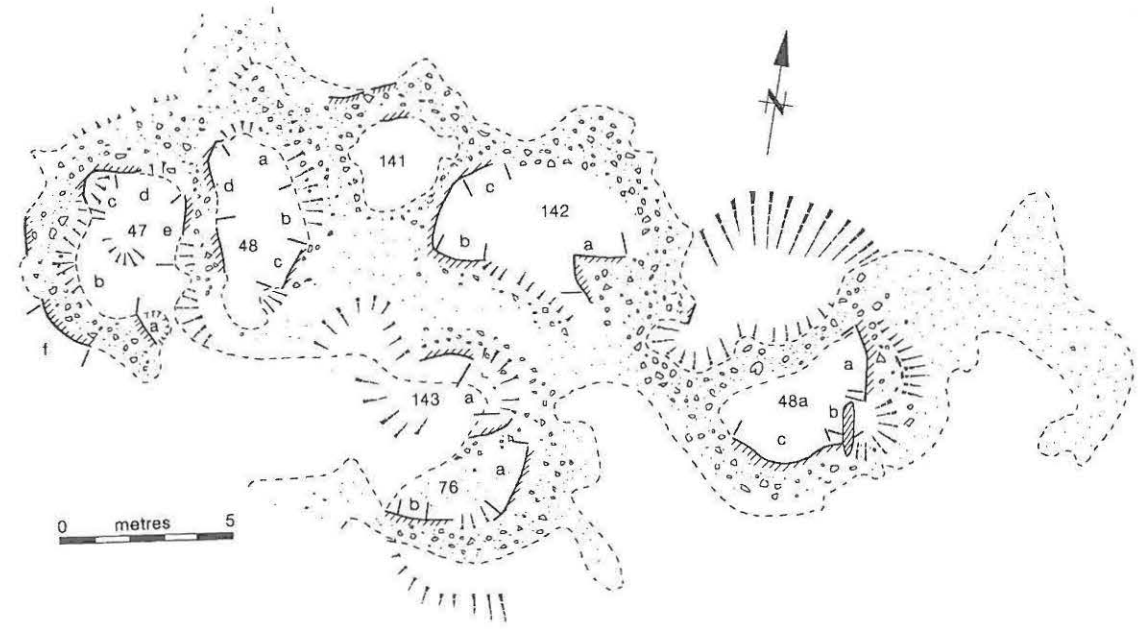

Fig. 23 Huts 47, 48, 48A, 48B, 76 and 141 to 143, before conservation.

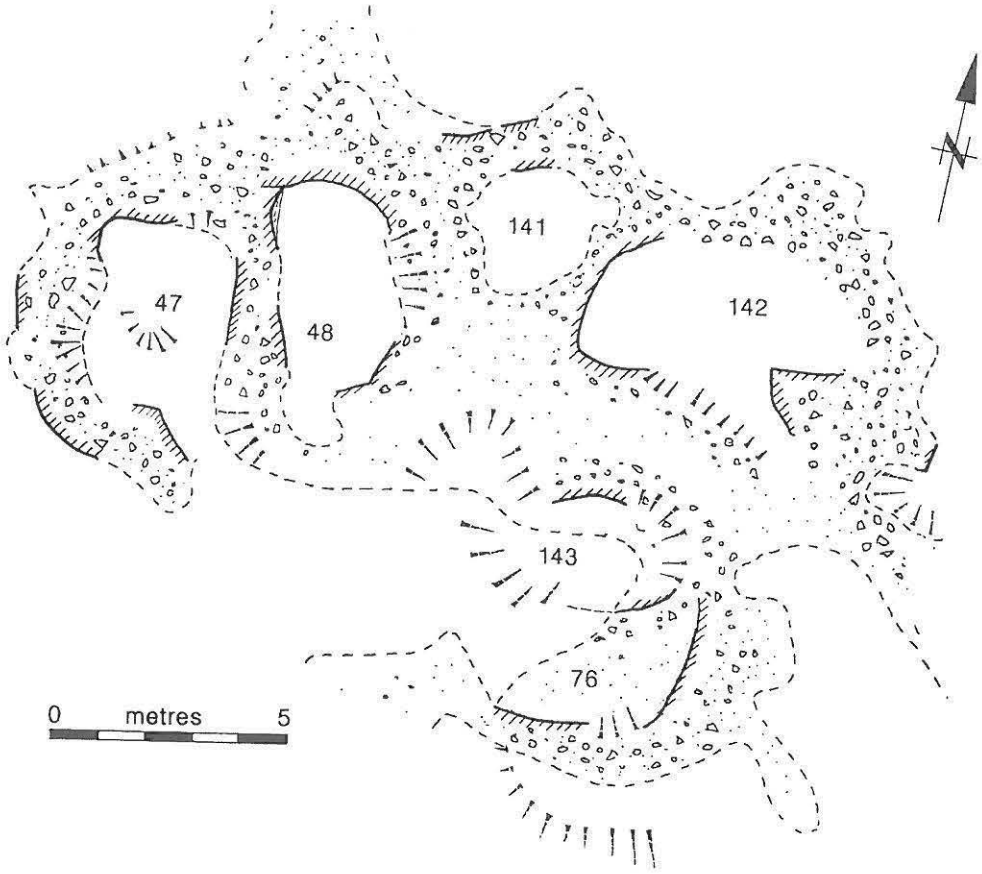

Fig. 24 Huts 47, 48, 48A, 48B, 76 and 141 to 143, after conservation.

Hut 48A (Figs 23 and 24)

This hut was excavated by Hughes in 1906 who reported the following finds:

(a) Small fragments of iron.
(b) Remains of a bone.
(c) Stone probably used as a "pounder".

Hughes's plan depicts a small D-shaped hut with a break in the north-western wall (Fig. 21).

Griffiths reported the following in 1946:

> The only example of an isolated hut in the fort. It is of irregular outline, approximately 14 ft. [4.3m] by 6 ft. 6 ins. [2.0m] internally. It is set against the scree on the NE, and the floor is 3 ft. [0.9m] below the general ground level. Fallen stones litter the interior. The NW wall is ruined and appears as footings only; the other walls are 4 ft. 6 ins. [1.4m] thick. The inner face stands 3 ft. 6 ins. [1.1m] high on the E and SE. There is no entrance.

There had been some deterioration in the condition of the hut by 1978 as Dallimore reported that a large treasure hunter hack had caused the collapse of the east wall.

Griffiths failed to recognise that, far from being an isolated hut of irregular outline, hut 48A was one of a pair of D shaped huts that had been created by the subdivision of a roundhouse with an approximate internal diameter of 6m. The previously unrecognised hut to the north-west (48B Fig. 23) was poorly defined being

an overgrown hollow with only a few facing stones visible in the western wall.

When examined at the beginning of the present season the most noticeable thing about this hut was a serious collapse in the south-east corner, where the wall had been undermined by the treasure hunter hack recorded by Dallimore. A 2m long stone was lying with one end on the hut wall and the other in the interior of the hut. The eastern and southern walls were still standing although both contained areas of collapse.

Collapse 48Aa

The eastern wall was standing up to a maximum height of 0.6m with collapses at both ends (Plate 280). Core and loose stone were standing up to 0.5m above this. The *in situ* masonry was stable so stone was added to the top of the wall (Plate 281). The ends of the wall were stabilised by the addition of heavy irregularly placed stones where the line of the face could not be traced.

Collapse 48Ab

The corner of the hut had been undermined by a large treasure hunter hack that had been dug to below the level of the base of the wall (Plate 282). The 2m long stone at the south end of the collapse appeared to have rolled from the ground above the wall and could not be safely moved. It was however supporting the masonry to the south-west and protecting a short length of facing beneath it. The rest of the corner of the hut had completely collapsed. A small amount of clearance was undertaken here but it was soon confirmed that the wall had failed from the base. The cleared stone was reinstated in an irregular but stable fashion in order to stabilise the slope behind the line of the face (Plate 283). During the above works a hand forged iron nail was found hammered into a wood packed hole in the end of the underside of the 2m long stone. There was also another hole, which was 10cm deep, next to this (Plate 284). The holes appeared to have been drilled using a quarryman's jumper. The hand made nail suggests a date of around the early part of the present century. There are no records of any enterprise that would entail the above procedure and there is no obvious reason for anybody to have gone to the effort of drilling holes in the rock. The stone had obviously fallen from above so it is unlikely that the holes were drilled when the stone was in the hut. It is possible that the holes were drilled by the workers on either the 1904 or 1906 excavation. The men were recruited from Bethesda and were almost certainly quarrymen who were out of work following the industrial unrest of the preceding years.

Collapse 48Ac

The rest of the southern wall was sound apart from instabilities in the upper 0.2m (Plates 285 and 286). It was standing to a height of 1.0m at the east, grading down to ground level over the next 4m. Some of the discrepancy in height was however due to differences in the level of the interior of the hut. The loose stones were reset and a few heavy slabs were added to the wall top (Plates 287 and 288).

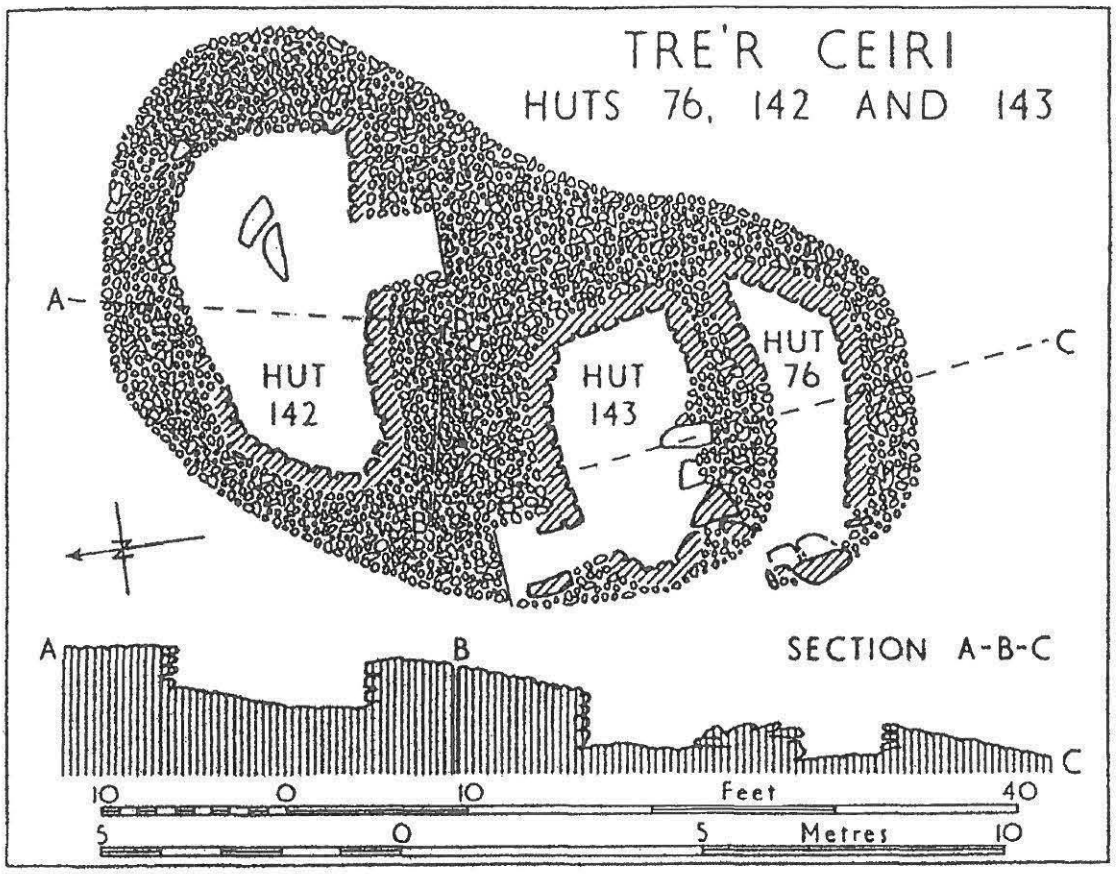

Fig. 25 Huts 76, 142 and 143 (Hogg, 1960).

Hut 142 (Figs 23 and 24)

This poorly defined hut was first planned by Hughes (*ca.* 1906, Fig. 21) who depicted an irregular structure with an angular outline. The hut was excavated by Hogg in 1956. Facing was recognised on the south and west and 'floors were ill-defined and carried no occupation material'. He recorded that 'a large slab had been set upright against the wall presumably to forestall collapses'. A plan and cross section of the hut were also produced (Fig. 25, Hogg 1960). The hut was planned at the beginning of the present season and there appeared to be little change from the above although a little erosion may have occurred to the wall tops. The upright slab could not be located.

Collapse 142a

The corner of the eastern side of the entrance passage was well defined within the rubble, with facing extending into the passage itself for a length of 1m (Plate 289). This had, curiously, not been recorded by Hogg. Loose core was standing up to 0.3m above this low facing and some recent erosion had occurred. New masonry was therefore added to the top of the *in situ* facing, adding definition and stability to this part of the hut (Plates 290 and 291).

Collapse 142b

The western end of the southern wall could be traced for 2.0m but was jumbled and loose. The facing was standing to a maximum height of 0.2m (Plate 292). The loose stones were reset adding 0.2 to 0.3m to the height of the facing (Plate 293).

Collapse 142c

The rest of the surviving north and north-western wall was stable apart from a patch of loose stone at the end of the facing (Plate 294). Several heavy stones were added to the end of the wall in order to support the upstanding facing (Plate 295).

Hut 141 (Fig. 23)

This was a small circular structure with an internal diameter of 2.5m. No masonry was standing above ground level and only a 0.7m length of facing was visible. There was no instability or erosion so no consolidation was carried out.

Huts 143 and 76 (Figs 23 and 24)

These two huts, which are another example of a subdivided roundhouse, were excavated by Hogg at the same time as hut 142 (Fig. 25). Few specific details apart from the plan were published in the report although it was noted that 'the floors were ill-defined and carried no occupation material' and that 'much of the walling was ruinous'.

The plan produced in the present season shows much less facing than Hogg's plan. This is mainly because the huts were backfilled after excavation allowing the regrowth of grass and heather. Some erosion had however occurred, most noticeably at the east end of hut 143.

Collapse 143a

Hogg recorded facing across the eastern end of the hut but at the beginning of the present season all that remained was a rubble slope that was not providing any support for the northern and southern walls (Plate 296). A limited amount of clearance was undertaken in order to locate the facing that can be seen on the photograph of the 1956 excavations (Plate 297). All but one stone of the facing was located (Plate 298). It was however in a very unstable condition. All of the stones were lying at angles suggesting that the wall had, at some point, been undermined. Hogg appeared to have uncovered the facing in this condition so it can be assumed that any damage occurred before this. As the wall seemed to have been undermined there was no scope for the addition of new masonry as clearance would not uncover the base of the wall. Occasional stones at the south of the collapse appeared to be close to their original positions and could be seen to abut the dividing wall suggesting that the eastern wall was an end locking wall as seen in huts 17 and 18 (Hopewell 1997). The rubble was reinstated and an irregular slope was constructed behind the hut. This included several large stones that were positioned at the edge of the upstanding masonry to the north in order to prevent further erosion at this point (Plate 299).

Collapse 76a

The masonry at the western end of hut 76 was poorly defined and loose although it was only standing to a maximum height of 0.2m (Plate 300). Stone A was reset and three other slabs were added to the top of the *in situ* masonry (Plate 301). The facing at the north of the collapse appeared to run behind the end of the dividing wall suggesting that it was part of the original roundhouse wall.

Collapse 76b

A single stone was reset on the top of the partially overgrown southern wall (Plates 302 and 303).

Hut 47 (Figs 23 and 24)

This hut was excavated by Hughes in 1906 who reported the following:

(a) Sixteen "pot boilers,"
(b) Half a "rubber." This stone appears to have served the double purpose of a "rubber" and

"pounder."
(c) A fragment of bone.

His plan (Fig. 21) shows a sub-rectangular hut with a narrow southern end. The narrow point in the southern wall was not shown as an entrance.

Griffiths examined the hut in 1946:

> A hut of irregular outline, approximately 14 ft. [4.3m]x 9 ft. 6 ins. [2.9m] internally. The floor is 1 ft. [0.3m] below the general ground level. The hut wall is of poor construction and undetermined thickness, except on the SW where the hut is set against hut 47: here the wall is 4 ft. 6 ins. [1.4m] thick. Inner faces also of poor construction, stand 1 ft. [0.3m] - 2 ft. 6 ins. [0.8m] high. On the south is an entrance 3 ft. 6 ins. [1.1m] wide.

Dallimore's description in 1978 records some deterioration:

> North wall has facing up to 0.75m. Nearly all remaining walls collapsed. Severe recent hacks by treasure hunters.

It appears that the treasure hunter hacks recorded by Dallimore resulted in the total destruction of parts of the hut. By the beginning of the present season the majority of the western wall had been reduced to a rubble slope with the hole in the floor clearly visible in front of it. A further hack had resulted in the destruction of the north-eastern side of the entrance passage.

The outer face was still standing in several places and seemed to imply that the western wall was originally curved, running further to the west than the inner face shown by Hughes (Fig. 21). This presumably defines the outline of an earlier phase of masonry and shows that huts 47 and 48 were formed by the subdivision and modification of an earlier roundhouse.

Collapse 47a

There was a 0.5m deep hole in the floor of the entrance passage. The south-eastern side of the passage was standing up to a height of 0.6m and was stable (Plate 304). The north-western side could not be traced. The hole was packed with stones from the scree (Plate 305).

Collapse 47b

The western wall was badly collapsed (Plates 306 and 307) as noted above but a small amount of clearance was undertaken in order to see if any original masonry had survived. The facing could be traced for 0.8m beyond the edge of 47a (Plate 308) before reaching an obviously displaced edge set stone which appeared to have been dragged from its original position by the collapsing wall to the north. The rubble was carefully reinstated and four stones were added above the surviving facing in order to support the inner end of the entrance passage (Plate 309). No further clearance was undertaken.

Collapse 47c

The north-western corner of the hut had also been undermined by a treasure hunter hack. The facing had slumped a little but was still standing despite a large void at the base of the wall (Plate 310). The void was packed and the hole was filled in. Several supporting stones were also added at the western edge of the collapse where the height of the wall dropped steeply towards collapse 47b (Plate 311).

Collapse 47d

The rest of the northern wall consisted of partially collapsed masonry. The base of the wall had failed, causing the facing to slump forwards (Plate 310). This was stable in places. Any large disturbance to this area would have almost certainly destroyed 47c so a void in the centre part of the collapse that was the main

source of the instability was packed and no further action was taken (Plate 311).

Collapse 47e

The dividing wall between huts 47 and 48 was not stable (Plates 312 and 313). The facing in hut 47 had failed, causing masonry in hut 48 to fall back into the wall. The bottom of the wall had survived in hut 47 and could be seen to continue for at least 0.4m below ground level. Some of the loose stone was cleared from the face while taking great care not to disturb the other side of the wall. This revealed a total length of 1.8m of surviving masonry, the majority of it standing to a height of less than 0.2m (Plate 314). The cleared stone was used to construct a 0.4 to 0.6m high face across the collapse (Plates 315 and 316). No *in situ* masonry was disturbed.

Collapse 47f

A minor instability in the outer face of the hut (Plate 317) was stabilised by resetting two stones on the wall top (Plate 318).

Hut 48 (Figs 23 and 24)

This hut was excavated by Hughes in 1906 who reported as follows:

> (a) many small fragments of black pottery.
> (b) Many "pot-boilers."
> (c) Charcoal.
> (d) A small circular stone ball, just over 1/2 in. in diameter.
> (e) Rotten black matter (probably decayed earthenware).

His plan shows a semi-circular hut with an entrance at the south although a broken line was drawn across the entrance presumably showing that an earlier phase of building was traced at the time of excavation.

Griffiths's (1946) report on the hut was as follows:

> A hut of irregular outline, approximately 14 ft. [4.3m] x 19 ft. 6 ins. [5.9m] internally. The floor is 1 ft. [0.3m] below the general ground level. The hut wall is of poor construction and undetermined thickness, except on the SW, where the hut is set against hut 47; here the wall is 4 ft. 6 ins. [1.4m] thick. Inner faces, also of poor construction, stand 1 ft. [0.3m] - 2 ft. 6 ins. [0.8m] high. On the S is an entrance 3 ft. 6 ins. [1.1m] wide.

It appears that the walls had further collapsed by 1978 as Dallimore reported:

> Walls almost entirely collapsed, but still clearly defined up to a height of 0.5m. Partition preserved at north and on 48 side between 0.5 and 1.0m.

A 1m length of facing was standing at the south of the hut at the beginning of the present season but the rest of the main hut wall was ruined. The ends of the dividing wall were fragile but still standing, the centre had completely collapsed.

Collapse 48a

There had obviously been a collapse in the northern wall close to the junction with the dividing wall as the masonry here had slumped sideways (Plate 319). The line of the wall could not be traced beyond this with any certainty (Plate 320).

The vegetation mat was peeled back from the base of the wall allowing the basal course to be traced for a total length of 2.8m. A wedged-shaped stone (A, Plate 321) had fallen out of the base of the wall at the west of the collapse and this had resulted in the sideways slumping of the masonry here. Forward sloping stone

B was probably the cause of this. Stone B was reset and stone A was put back into the base of the wall. New masonry was then added above the stabilised basal course in order to fill the gap in the facing. This added greatly to the stability of the facing to either side. The facing at the eastern end of 48a could be traced below the current ground level for a short distance before being lost to a serious collapse in the base of the wall (Plate 322). Stone was packed into the hole in front of the face and the loose stone above ground level at the end of the collapse was stabilised by the careful addition of several heavy slabs. This helped to support the jumbled facing at the centre of 48a (jst to the left of the right-hand scale on Plate 319). This facing had slumped backwards into the wall and was therefore reasonably stable and needed no further conservation. Plates 323 and 324 show 48a after conservation.

Collapse 48b

The centre of the eastern wall had failed from the base and the rubble was stable so no consolidation was necessary.

Collapse 48c

A 2m length of irregular but fairly sound masonry was standing up to a maximum height of 0.5m (Plate 325). A small void was packed close to the centre of the collapse and one stone was reset on the wall top (Plate 326).

Collapse 48d

The facing at the northern end of the division between huts 47 and 48 wall had tipped back into the wall as a result of subsidence caused by collapses 47d and 47e. This was reasonably stable but the central portion of the wall had fallen forwards (Plate 327). Two obviously displaced headers were pushed back into line and 0.2m of masonry was added to the wall top bringing it to the same height as the facing in hut 47 (Plate 328). The rest of the dividing wall was low but stable so no further action was taken.

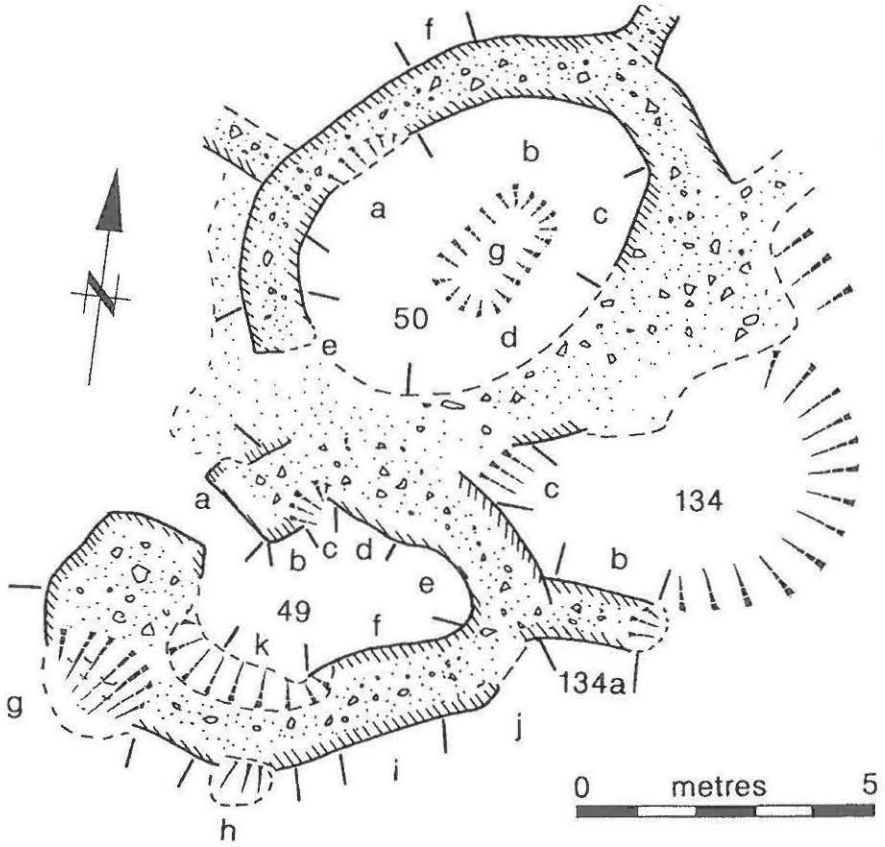

Fig. 26 Huts 49, 50 and 134, before conservation.

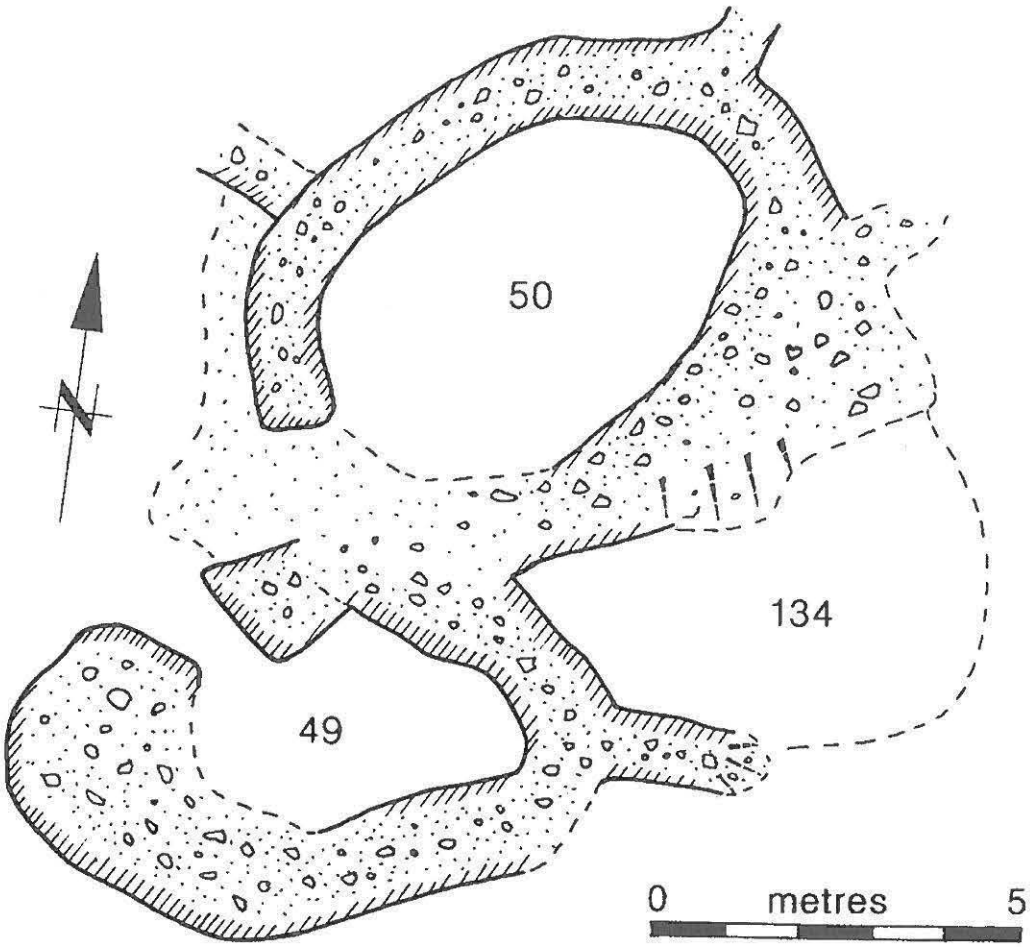

Fig. 27 Huts 49, 50 and 134, after conservation.

Hut 49 (Figs 26 and 27)

Hut 49 was excavated by Hughes in 1906 who reported that a fragment of bone was found. His plan shows a slightly asymmetrical oval hut with an entrance on the north-west. Griffiths described the hut in some detail in 1946:

> A very good oval hut, 18 ft. [5.5m] x 8 ft. [2.4m] internally. The floor is uneven but it is not sunk below the general ground level. The hut wall is 5 ft. [1.5m] thick and has an inner face 3 ft. [0.9m] high (reaching 5 ft. [1.5m] on the NE), and an outer face 3 ft. [0.9m] high (reaching 5 ft. [1.5m] on the SE). There is no outer face on the N, where the hut is set against hut 50, which is at a higher level. On the NW an entrance 2 ft. 6 ins. [0.8m] wide is partly blocked by fallen stones.

Dallimore recorded treasure hunter activity in the east of the hut where the wall was standing to a height of 1.5m. Elsewhere facing was present on most sides of the hut although the walls were beginning to collapse.

It seems that most of the significant damage to many of the huts that have been examined during the present season was caused by an outburst of treasure hunter activity in the late 1970s that continued into the early years of this project (Boyle, 1990 and 1991). The walls of hut 49 had been very badly undermined and emergency repairs were carried out to a section of the inner face just to the south of the entrance in 1995 (Hopewell, 1996).

Fig. 26 shows the results of the survey carried out in July 1997. The facing had only survived around 45% of the interior of the hut even though the walls were standing to a typical height of 1.0m. The facing that remained was mostly unstable and semi-collapsed. There were also three serious collapses in the outer face. The first part of the hut to be consolidated was the entrance as this was on the point of collapse and could have been disturbed by works elsewhere.

Collapse 49a

The north-eastern side of the entrance was very unstable so all the stones across collapses 49a and 49b were marked (A to Z and 1 to 7). The outer corner of the passage (Plates 329 and 330) was unstable because a long slab, stone I, had slipped forwards, bringing the facing above with it. The masonry could not be pushed back into line as core had fallen in behind it. Stones H, I, E, F, K and L were taken from the wall and G was pushed back into line with the facing below. After clearance of a little core material the stones were put back into the wall in what is presumed was their original positions before the collapse (Plates 331 and 332). Stone F was turned on its side in order to allow the insertion of stone H into the wall.

Collapses 49b and 49c

The inner corner of the north-western side of the passage (49b) had been destabilised by a recent (unweathered) collapse close to the end of the northern wall (Plate 333). The facing between the collapse and the corner had all slumped slightly towards the collapse. Unfortunately much of the slumped masonry was supported by the fallen stones in the collapse which was in itself very unstable. A small amount of clearance was undertaken but in order to prevent an uncontrolled collapse 12 marked stones, Y, Z, X, S, U, W, T, V, R, 4, 5 and 6, were removed from the wall. Plate 334 shows 49c after partial clearance. Stone 8 had tilted forwards in the wall and had probably caused the collapse. The face to the east of this turned into the wall and was presumably part of an earlier phase of building, so the facing was not tied together at this point. Interestingly the stone beneath 8 did not respect this relationship and may represent either a repair or a floor level. Stone 8 and the stones noted above were cleared fom the wall. Stone 8 could not be replaced but the other stones were put back into the wall as new masonry was added to 49c (Plate 335). Stones W and Z were replaced in almost identical positions, U was turned slightly, small packing stone T was discarded and an extra stone was placed beneath the inner end of S to compensate for stones lost during the slump. Stones R, X and Y were all put back close to their original positions and 4, 5, and 6 were discarded as they were small stones from the core that had fallen into the collapse. A long pinning stone was introduced into the corner of the passage beneath stones M and W.

Collapses 49d-f general.

The western half of the hut had been destabilised by the digging out of the floor at this end of the hut by treasure hunters the hole extending to 0.2 to 0.4m below the base of the wall. This had resulted in voids in the base of the wall. The facing was in many cases only kept standing by the cantilever effect of the weight of the wall on the back of the long headers at its base. The hole was therefore carefully infilled using loose stone from inside the hut and stone imported from the scree below the cairn (under supervision of the writer). The voids were carefully packed during this process.

Collapse 49f

Unfortunately the infilling of the hole had come too late. The whole of the facing across 49f (1.8m) was seen to move forwards a few centimetres as the hole was being filled. The top of the facing was overhanging the base by a minimum of 0.2m and all the stones had slumped forwards and were tilted downwards at an angle of between 30° and 45°. Nothing could be done to stabilise the facing, so the stones were marked, A to Z and 1 to 17 (Plates 336 and 337). All of the numbered stones were cleared apart from 9, 10 8 13 4 5 6 ?11 12 14 15. Plate 338 shows the collapse after clearance of all but the base of the wall. This is a good example of a semi-collapsed wall that had been undermined by having holes dug into the hut floor in front of it. Stones from the basal course had fallen into the hole and the front of the stones close to the base of the wall had slumped downwards. In most cases this would have precipitated the collapse of the facing above but in this case the stones had locked together and were still standing on the base of the wall

that was tipped foreword at 50°. There was however no doubt that this was on the point of collapse and that the slightest disturbance either by a visitor or even a sharp frost would have completed the process started by a treasure hunter a number of years ago.

The tilted stones were cleared from the wall and were reused in different positions. A new stable wall base was constructed and the marked stones were replaced as close as possible to their original positions. This process had to be something of a compromise as adjustments had to be made for the original slumped angle of the stones (Plates 339 and 340). Stones 3 and 4 had not been removed from the wall but were pushed back into line with the rest of the facing. Stones A and D were not replaced close to their original positions as the adjustments made in the positioning of the reset facing in order to compensate for the angle of the stones had not left enough space for them. Some new masonry was added to the top of the wall in order to support the outer face and core.

Collapse 49d

This was a shallow, 1.1m wide, dip in the top of the inner face of the northern wall (Plate 341). The wall had been undermined here and had bulged out slightly. The loose stone which had spilled forwards over the collapse was cleared. Stone A had tilted forwards in the wall but was easily reset to form a level base for the addition of the new masonry shown on Plate 342.

Collapse 49e

The facing in the eastern end of the hut was standing to a height of 1.2m. This was sound apart from a small dip in the top of the face in the corner of the hut which was filled with new stones (Plates 341 and 342).

Collapse 49g

The outer face of the south-western corner, which was more angular than the sub-oval inner, had collapsed. A 2.2m length of facing had collapsed to close to ground level and the facing to either side was loose and jumbled (Plates 343 to 346). The central part of the collapse was cleared revealing large basal stone A which had slipped off the base of the wall causing the facing above it to move forwards and collapse (Plate 347). Stone A was put back into the wall and facing added above it to a height of 0.7m (Plates 347 to 349). Four stones were also added to the wall top to the north of the main collapse.

Collapse 49h

This was a 1.8m wide collapse in the outer face of the southern wall (Plate 350). The wall to the west of the collapse was low but stable. The wall to the east was standing to a height of 1.1m. The facing at the centre of 49h had been reduced to ground level and there were several displaced headers on the ground in front of the wall. The fallen stones were cleared revealing a large slab (Plate 351) that had slipped forwards. This could not be reset in line with the rest of the facing without damaging the surrounding masonry. The stone was however level and stable so core was packed behind it and masonry was added up to the height of the inner face (Plate 352).

Collapse 49i

This 2m length of facing was stable apart from some loose stones on the wall top (Plate 353). Two stones were reset and these are indicated on Plate 354.

Collapse 49j

The 1.8m of outer face adjacent to the junction with hut 34 had collapsed (Plate 355). The rubble consisted of large stones and was almost all locked together so no clearance was undertaken because no *in situ* stonework was under threat. A small patch of loose stones was stabilised by resetting one large block and packing other stones into the rubble beside it (Plate 356).

Collapse 49k

After the conservation of the outer face, a few loose stones were noticed in the otherwise stable semi-collapsed facing to the east of 49f (Plate 357). Several stones on the wall top were reset and a void in the facing was packed (Plate 358).

Hut 134 (Figs 26 and 27)

This was a poorly defined hut, visible as sub-rectangular overgrown hollow set between the southern wall of hut 50 and the eastern wall of hut 49. Both Griffiths (1946) and Dallimore (1978) recorded a stub of wall on the east side of hut 49.

Collapse 134a

The south side of the stub of wall was partially collapsed but could be traced for 1.6m. An irregular basal course could be traced but the upper wall consisted of two large slabs balanced on loose core (Plate 359). This was cleared and replaced with stable facing (Plate 360) in order to support the better preserved north face of the wall.

Collapse 134b

The north side of the stub of wall was stable apart from where the wall graded down steeply to ground level at the east (Plate 361). Several stones were reset here and these are indicated on Plate 362.

Collapse 134c

Most of the northern wall of hut 134 had been reduced to a shallow and reasonably stable rubble slope that did not require conservation. Some facing had however survived close to the north-eastern corner of the hut but there was an unstable collapse at the junction between the northern and eastern walls (Plate 363). The unstable stone was cleared revealing facing running in a straight line to the junction with the outer face of hut 49 (Plate 364). The relationship between the two walls was not entirely clear but the outer face of hut 50 could not be traced beyond the junction and stone A appeared to be tied into the wall of hut 50 suggesting that both walls were built at the same time. The poor condition of the masonry however makes this phasing less than certain. New masonry had to be added to the collapse and this followed the *in situ* basal courses and thus giving the impression of a single phase of building (Plate 365).

Hut 50 (Figs 26 and 27)

This large oval hut was excavated by Baring-Gould and Burnard (1904) who reported the following:

> There was no rubble filling in this hut. The floor was on the clay, and this was studded with fragments of charcoal. The wall was 7 ft. [2.13m] high and must have been even higher, for the hut was choked with 3 ft. [0.91m] of *debris* from it. In this *debris,* 1 ft. 6 ins. [0.5m] above the clay floor, part of the bottom of an earthenware pot was found.

Griffiths provided a description of the hut in 1946:

> An oval hut, 25 ft. [7.6m] x 12 ft. 6 ins. [3.8m] internally, very well preserved on the N and W. It is set against Hut 49 0n the S, and the floor is not sunk below the general ground level. The S and E walls are ruined, but the N and W walls are 3 ft. [0.9m] thick and have an inner face 4-5 ft. [1.2-1.5m] high and an outer 4 ft. [1.2m] high. There is no entrance.

Dallimore recorded facing on the north and east standing to a height of between 1.25 and 1.5m and also a large treasure hunter hack in the centre of the hut.

Fig. 26 shows the survey produced at the beginning of the present season. The internal dimensions of the hut were 6.2m x 4.2m. The inner face was standing up to a height of 1.3m and the outer to a maximum of 1.8m. It is not known if Baring-Gould and Burnard were referring to the inner or outer face when they recorded it as being over 2m in height but as the interior of the hut consisted of overgrown stones and their excavation proposal stated 'the earth and turf should be replaced on the floor of the hut after exploration' it is possible that some material was reinstated thus reducing the visible height of the wall. The north side of an entrance on the west of the hut was well defined, this was also recorded on plans by both Hughes (ca. 1906) and RCAHMW (1960).

Collapse 50a

The inner face of the hut was standing to a typical height of 1.0m in the north-west quadrant. There was a minor instability in the wall top and a 1.5m wide collapse down to ground level (Plates 366 and 367). Most of the stone had slumped sideways into the centre of the collapse but had, unusually stayed within the wall. This was somewhat unstable and was beginning to fall forwards. It was therefore decided to remove the displaced stone from the collapse. The masonry to either side was stable so it was possible to clear down to the bottom of the wall in a V shape (Plate 368) with minimal disturbance. The cleared area was then filled with new masonry (Plates 369 and 370). The wall top was also stabilised by the addition of a few stones.

Collapse 50b

The facing in the northern end of the hut was well preserved and standing to a height of 1.0 to 1.2m (Plate 371). There were a few voids in the lower part of the wall which were packed with the stones indicated on Plate 372.

Collapse 50c

The gently curving south-western wall was not very well preserved. The inner face could be traced for 1.5m (50c, Plate 373), after this only a line of rubble could be seen (50d). The standing facing was stable apart from a void at the base of the wall. Two packing stones were inserted in order to support a long slab (Plate 374).

Collapse 50d

The south-west wall could be traced beyond 50c only as a line of loose stone (Plates 375 and 376). This was not all weathered, therefore there had been some recent erosion. The loose stone was cleared from the line of the wall revealing a 2.7m length of facing standing to a maximum of 0.2m above the interior of the hut (Plate 377). The facing also extended to 0.2m below ground level. One or two courses of well-set masonry were added above this in order to protect the *in situ* facing and retain the core (Plates 378 and 379).

Collapse 50e

The northern side of the entrance passage was moderately well defined but suffering from recent erosion. The inner corner had collapsed and stone was being lost from the wall to the north (Plates 366, 380 and 381). The fallen stone was cleared from the wall revealing some unstable but *in situ* facing at the inner corner (Plate 382). This had not survived above ground level and contained a number of voids where the wall had apparently been undermined at some time. These were carefully packed with core in order to produce a level platform. New masonry was then added to the end of the wall up to a height of 0.8m (Plates 383 to 385). This produced a gently sloping wall top thus preventing erosion of the masonry to the north.

Collapse 50f

A small dip in the top of the outer face at the north of the hut was filled with new masonry (Plates 386 and 387) and one loose stone was reset.

Collapse 50g

The large rectangular treasure hunter hole in floor of the hut, presumably that recorded by Dallimore, was infilled with stone left over from the works in huts 49 and 50 along with a few stones from the scree (Plate 388).

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PART 2

NOTES

The 'before conservation' Plates of the ramparts have the extent of the collapses marked on them. The new and replaced masonry is marked on the 'after conservation' Plates with black dots in a similar position to the drill holes.