

REPORT ON THE SEVENTH SEASON OF THE  
TRE'R CEIRI CONSERVATION PROJECT  
MAY TO SEPTEMBER 1995

REPORT NO. 185

PART 1: TEXT

Ymddiriedolaeth Archaeolegol Gwynedd  
Gwynedd Archaeological Trust

REPORT ON THE SEVENTH SEASON OF THE  
TRE'R CEIRI CONSERVATION PROJECT  
MAY TO SEPTEMBER 1995

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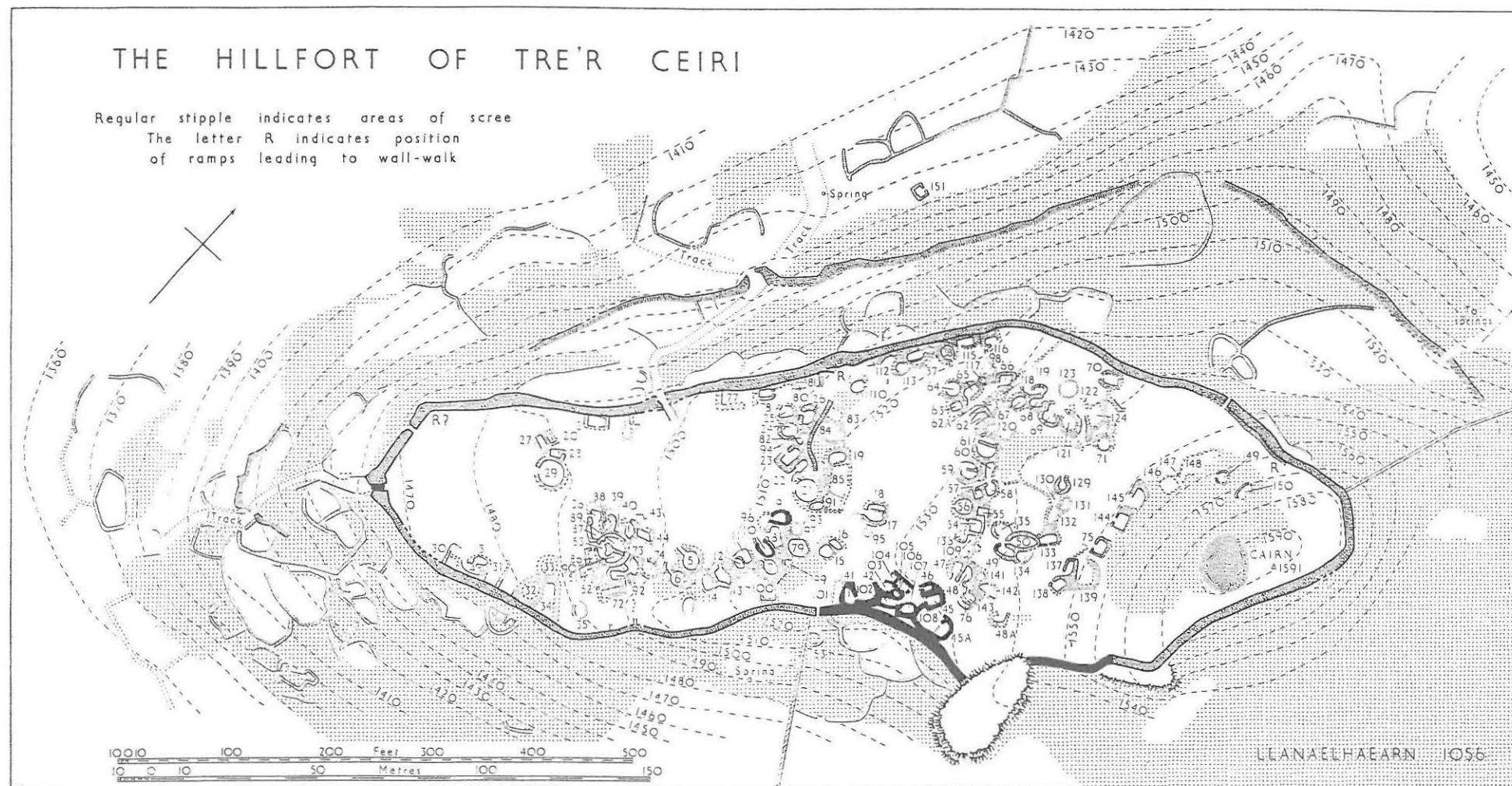


Fig.1 General Plan (after R.C.A.H.M.W., 1960), showing areas for conservation in the seventh season.

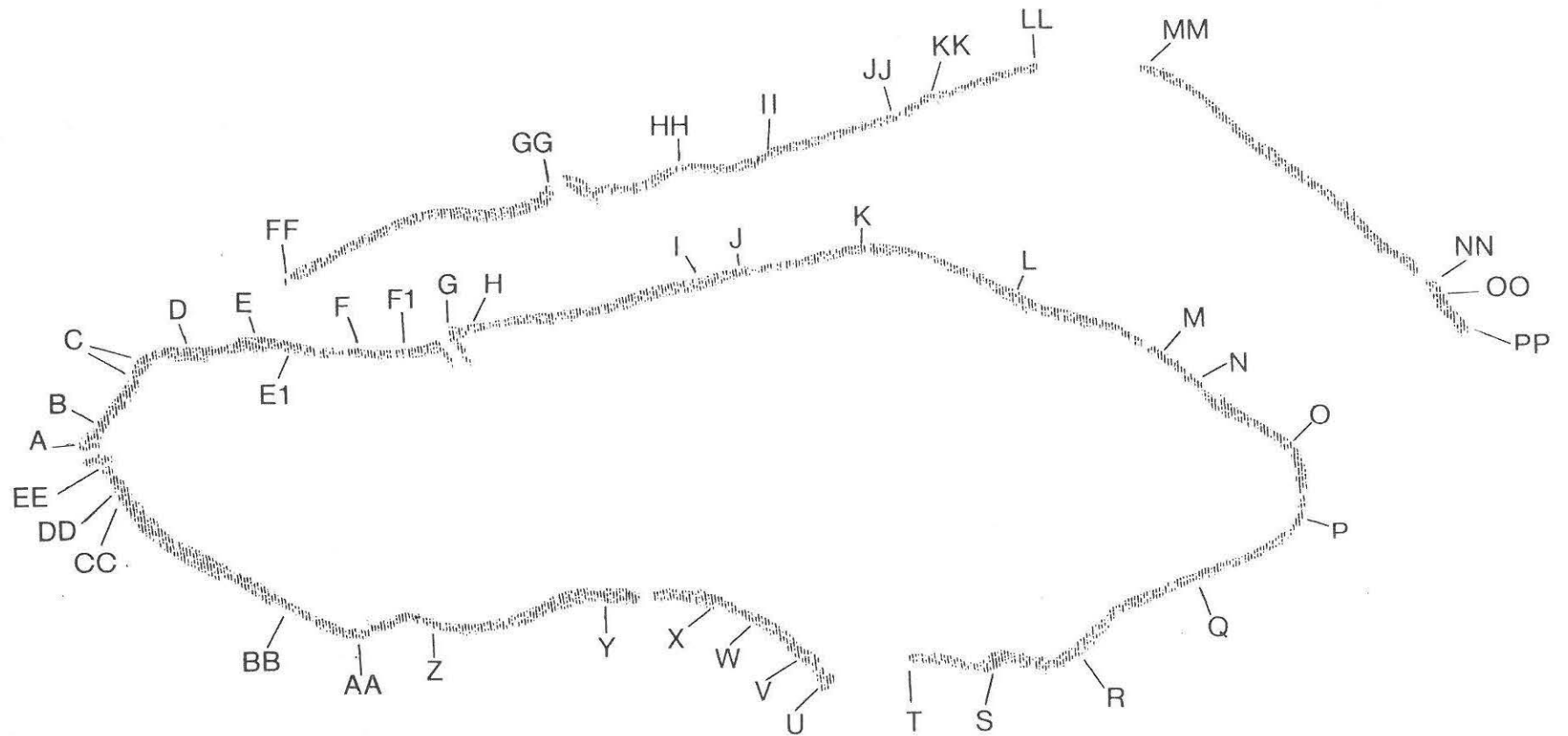


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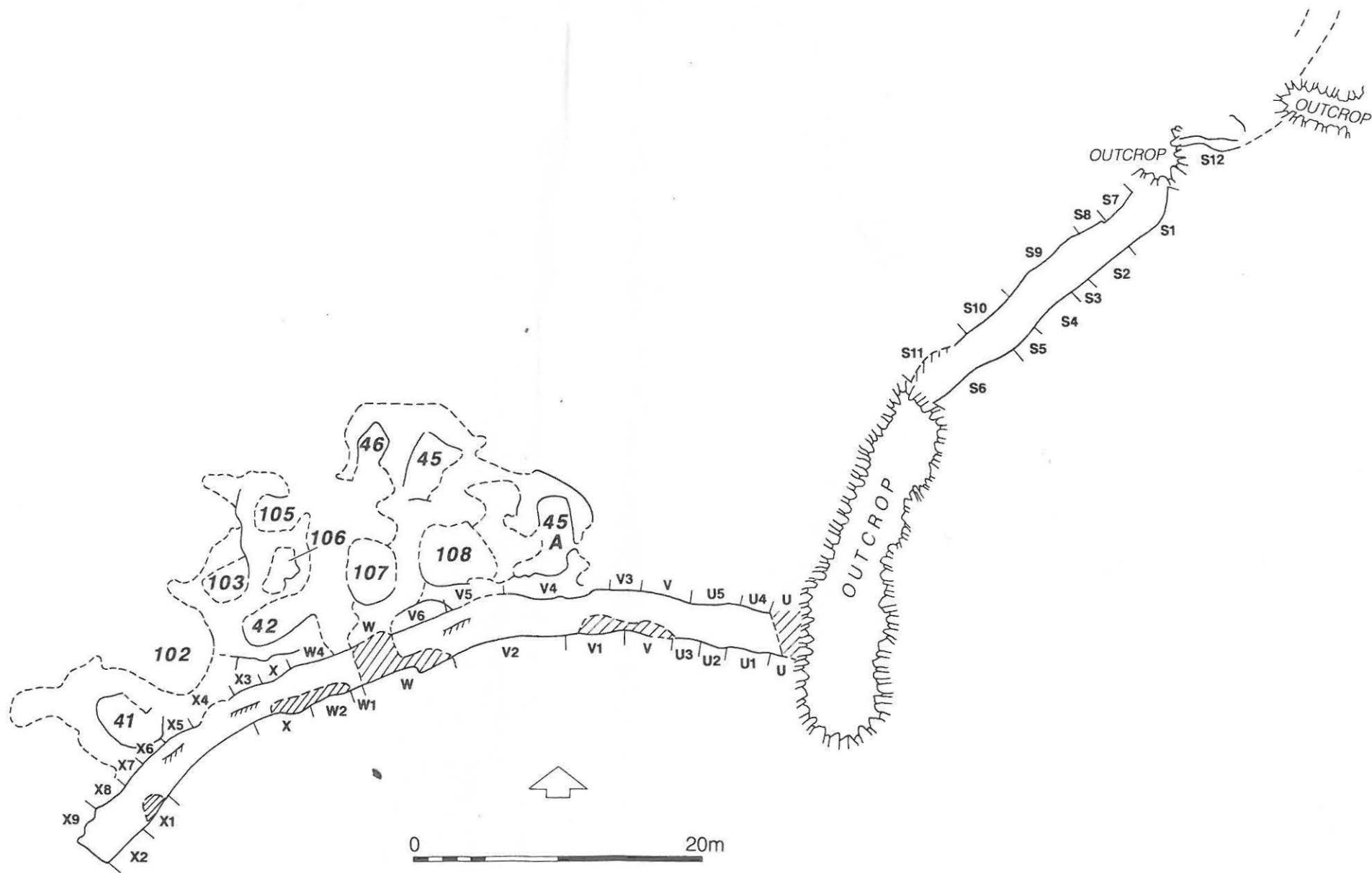


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## INTRODUCTION

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 Llŷn 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 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 main 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 to be the main entrance into the fort with a 15m long passage 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. 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. Further plans of the site were produced by R.C.A.H.M.W. 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 year programme which commenced in 1994.

The seventh season of the project began in early May 1995, work continuing on site until late September.

## STAFF AND SUPERVISION

Works were conducted by Mr W. H. Evans, Mr M. Jones-Parry and Mr I. ap Llyfnwy 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, Mr A. Davies or Mr T. Vowell of Cyngor Dosbarth Dwyfor, Dr M. Yates of Cadw and Mr J. Wyn of Gwynedd County Council.

## **PROGRESS IN THE SEVENTH SEASON**

Works in the seventh season were concentrated on the rampart between outcrop S and the south-east postern with additional works carried out on the group of 12 huts abutting the rampart in this area (see Figs. 1 and 2). Emergency consolidation was necessary on a further three fast eroding huts.

Weather conditions during the summer months were exceptional being amongst the hottest and driest since records began. Temperatures as high as 32°C were recorded on site. September was unusually wet, waterspouts and small tornadoes were recorded in the vicinity.

## **RECORDING METHODS**

The section of rampart and huts destined for conservation were surveyed with a total station as the existing plans have been shown to be inaccurate. All standing rampart faces were photographed in 2.0m segments from a standard distance of 4.0m, using a 28mm shift lens to correct the verticals. This ensures that the 2.0m segment to be recorded appears on the central 40% of the negative thus lessening the effects of optical inaccuracies produced at the edge of the camera lens. In this way an overlapping pre-conservation sequence of all consolidated areas has been produced. This method of photographic recording was not always suitable for the huts due to the lack of space in the interiors. A shift lens was used where appropriate but as the ground is reasonably level around the huts more accurate 'straight on' photographs were taken using a levelled camera where possible. All masonry in the huts designated for conservation was recorded in detail, as above, along with more general views of the entire structures.

A detailed written and photographic record was kept of the works as they progressed, supplemented with measured drawings where photographs could not show 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. A Sharp PC-3000 hand held computer was purchased at the beginning of the season in order to allow the entering of photographic records onto a database on site.

## **DETAILS OF WORKS COMPLETED**

Details follow of all conservation works completed during the seventh season. Works conducted on the main rampart wall can be located by reference to the numbering scheme produced by K. Dallimore in 1978 (Fig. 2) and detailed location plan, Fig. 3. Works conducted on the huts can be located by reference to Fig.1 (R.C.A.H.M.W , 1960) and detailed location plans, Figs. 6, 9, and 10. 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 were 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.



## The Ramparts

Two separate lengths of rampart were consolidated. The first was an 11.2m length between outcrops S and T. This was well preserved, apart from the eroded south-western end which is a favourite lookout point for visitors. The second area of consolidation was a 27m length of rampart between outcrop S and the south-west postern. This was again generally well preserved, the outer face standing up to 2.5m in height with traces of parapet surviving, suggesting that it was standing close to its original height in places. There were however a number of serious collapses in both the inner and outer faces. A further length of semi-collapsed facing, collapse S12, was surveyed and photographed.

### *Collapse S12 (Fig. 3)*

The western end of this collapse stands on bedrock but the eastern end has been carried over 2m down the slope by a movement in the scree. A 2m length of the facing however remains intact even though it is displaced and leaning back at an acute angle. The masonry has fallen to a point of stability and serves as a good illustration of the ability of the masonry to survive as a face even after severe disturbance. The collapse was planned and photographed (Plate 1) and no further action was taken.

### *Wall S-T Outer Face*

#### *Collapse S1 (Fig. 3)*

The north-east end of this stretch of wall abuts a rock outcrop which separates collapses S1 and S12. This outcrop is not marked on the Plowman Craven (1980) or the R.C.A.H.M.W. (1960) plans. The face ran initially from north to south for 2.7m and consisted of little more than a few headers lying on the bedrock amid a jumble of core that had fallen from above (Plate 2). Beyond this the face turned to the south-west and was more stable rising quickly to a height of 1.0m before falling to 0.6m and then gradually rising to 1.8m. This part of the collapse was 2.9m in length and consisted of very untidy masonry that was probably a result of movement in the lower part of the wall (Plates 3 and 4).

Plate 5 shows the centre of the collapse, where the wall curves to the south-west, after clearance of the disturbed stone (stone A has been marked on Plates 2, 5 and 6 as a reference point). The 2.7m of rampart abutting the outcrop was in a very poor state of preservation but enough basal headers remained to give a reliable indication of the line of the wall. Masonry was added across the whole of the collapse in order to fill the dips in the face and support the core and thus the inner face. Plates 6, 7 and 8 show the collapse after consolidation. A void at the base of the wall was packed with four stones. The packed void is marked with a V on Plate 7.

#### *Collapse S2 (Fig. 3)*

The face to the south-west of S1 was generally sound for 3.7m, standing to a maximum height of 2.2m (Plate 9). There was a small dip in the facing towards the south-west end of the collapse which was filled with masonry (Plate 10) before the wall top was secured.

#### *Collapse S3 (Fig. 3)*

This was a 1.4m wide dip in the outer face (Plate 11). The *in situ* masonry was stable and the dip was filled with 0.5m of new facing to bring it to the height of the surrounding wall (Plate 12).



### *Collapse S4 (Fig. 3)*

This 3.6m length of wall was standing to a stable 2.5m (Plates 13 and 14). Six stones were added to points of potential weakness in the top of the facing (Plates 15 and 16) and core was packed behind the headers.

### *Collapse S5 (Fig. 3)*

S5 was a 2.1m long dip in the upper part of otherwise stable 1.3m high facing (Plate 17). There was a large overhanging slab on the wall top at the south west of the collapse beyond which the face dropped sharply to collapse S6.

The dip was infilled with a maximum of 0.4m of new masonry. A course of heavy slabs was added to the wall top and the overhanging slab was used to stabilise the top of S6 at the junction with S5 (Plate 18).

### *Collapse S6 (Fig. 3)*

The face between S5 and outcrop T was not as well preserved as the rest of the outer facing in this area. The erosion on the corresponding length of inner face (collapse S11) appeared to be linked to this so both areas were examined together (see below).

## ***Wall S-T Outer Face***

### *Collapse S7 (Fig. 3)*

The inner face at this point stood on top of the bedrock. This 3.0m length of rampart was constructed from large blocks of stone and was stable (Plates 19 and 20). The line of the inner face was not however, clear. Two faces could be traced, the lower was built from angular blocks of bedrock and may have formed a platform for the building of the main rampart. The upper face, 0.8m behind this, gave the impression of being part of a parapet as it was set back from the line of the face to the south-west. On closer examination it could be seen that the wall top was too wide to form a usable parapet suggesting that the facing represents the inner face of the rampart.

Collapse S7 was stable but was threatened by the loss of material from the outer face which was beginning to undermine some of the large stones. The masonry was secured by raising the height of the outer face during the consolidation of collapse S1.

### *Collapse S8 (Fig. 3)*

The low facing, built from large blocks of stone, could be seen to revert to a definite line and was stable for 2.2m (Plates 20 and 21). Some of the stones were very rounded on top but less weathered and more irregular underneath suggesting that they had been levered from the nearby outcrop. No works were necessary here.

### *Collapse S9 (Fig. 3)*

This 5.5m length of facing was again stable, surviving to a height of 1.0m (Plates 21 to 24). The upper course was tipped backwards with the ends of the stones embedded in the core. The facing was therefore stable. One stone was added in order to fill a small dip in the face that was a point of potential instability (Plate 25).

### *Collapse S10 (Fig. 3)*

The face fell to the level of the scree over the next 4.0m (Plates 26 and 27). The upper courses were loose and disturbed. The collapse was stabilised by the addition of stones to the wall top

thus grading the wall down evenly from a height 1.1m at the north-east to 0.4m at the south-west. The additional stones are shown on Plates 28 and 29.

*Collapses S11 and S6: A possible small entrance (Fig. 3)*

The area around the distinctively shaped outcrop T is frequented by visitors to the site as it provides a good vantage point for viewing both the site and the surrounding countryside. As a result there has been some erosion. The inner face could not be traced between the end of S10 and the outcrop (Plates 30 and 31). The outer face was correspondingly low. It fell from 1.7m at the end of S5, to close to ground level at the centre of the collapse, before rising to 1.6m at the south-west where the collapse was bounded by a 1.9m long upright slab and the outcrop (Plates 32 to 34). There was a large spread of stone along the expected line of the inner face and it was felt visitors would respect the area if the rampart was better defined. It was therefore decided to undertake minimal clearance along this line in order to attempt to trace the line of the face.

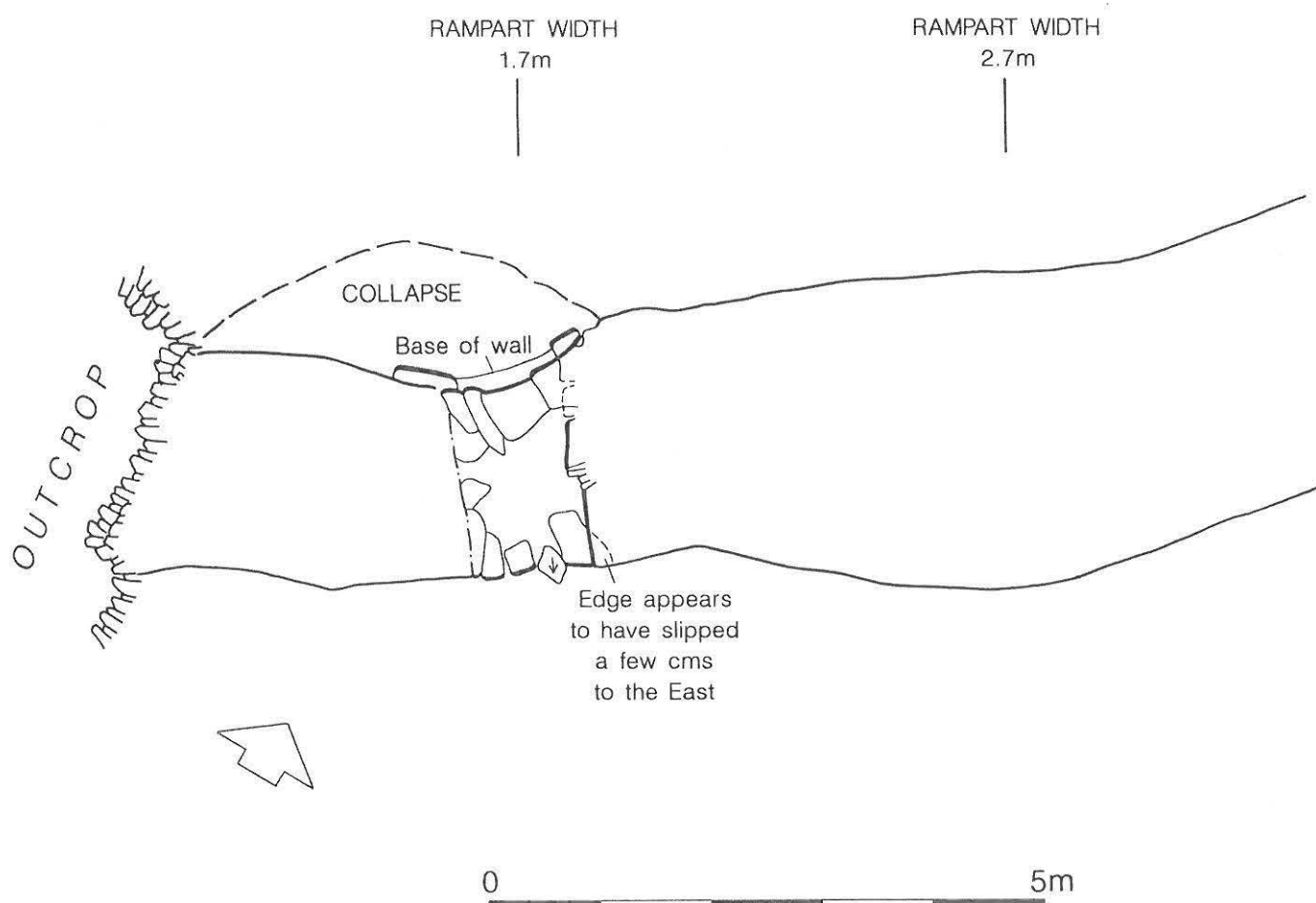


Fig. 4 Plan of collapses S6 and S11 after clearance showing possible entrance.

After clearance it could be seen that the basal course survived across the whole of the collapse with the face rising to 0.5m in places (Plate 35). It did not however follow the expected line but turned 3.5m from the outcrop, to form a shallow inturn (see Fig. 4). The rampart narrows from 2.7m to 1.7m at this point. The facing in the inturn was low and ragged and contained mainly small stones. This area resembled that around the blocked southern postern suggesting that there was another blocked entrance here. There was a corresponding dip in the outer face (Plate 36) but there were no straight joints in the masonry indicating the edge of an opening in the wall. Loose core was removed from the wall along the projected line of the entrance and a fairly convincing face constructed from mainly small stones laid as headers was identified in the expected position along the north-eastern side (Fig. 4). There was no surviving facing on the opposite side but the core in the passage was jumbled and small in contrast to the stones to the south-east. Close examination of the outer face showed that the facing was semi-collapsed and a straight joint may have existed on the north-east side of the entrance. Figure 5 illustrates the slippage that may have occurred as a result of a collapse further to the north-east. It should also be noted that the stones in the centre of the blocking face were smaller than the headers in the rampart to either side. This facing would therefore have eroded faster, perhaps accounting for the dips in the height of the wall at this point.

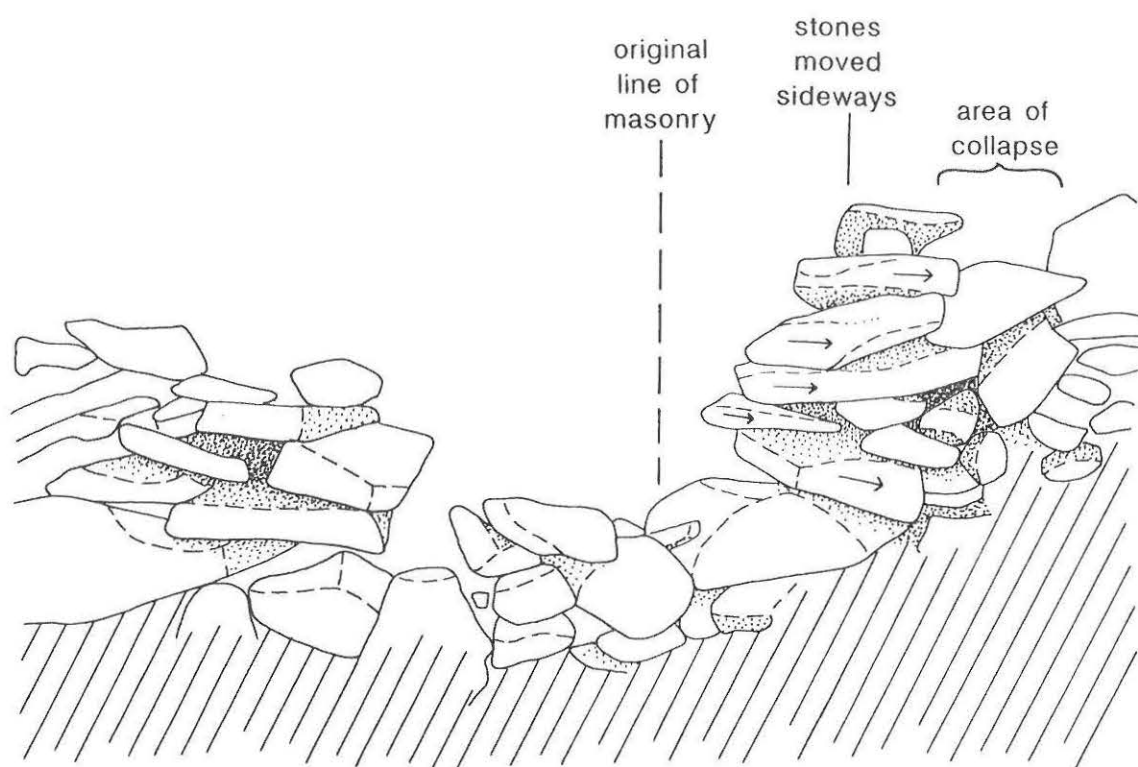


Fig. 5 Collapse S6, possible entrance, after clearance showing slipped facing.

The balance of the evidence suggests that there is a blocked postern at this point but the lack of definite joints in the inner and outer facing and the absence of facing on the south-western side also allow other interpretations. The inturn and associated facing could represent a repair in the facing or a constructional detail such as one of the common and as yet unexplained changes in building style seen elsewhere in the ramparts.

The dips in the inner and outer faces were filled with new masonry, effectively hiding much of the evidence for the entrance. The level of clearance of the core was marked with polypropylene cord and random stone was added behind the facing (Plates 39 to 43).

### **Wall U-Y Outer Face**

#### *Collapse U (Fig. 3)*

A narrow footpath ran through the rampart adjacent to outcrop T. There was no extant facing on either the inner or outer face but the amount of rubble on the steep scree to the outside of the collapse suggested that there had been a major failure at this point, probably as a result of a slippage in the scree. The gap in the outer face was 1.6m wide (Plate 44). The erosion caused by the path had reduced this area to a sloping bed of small angular stones typical of rain washed subsoil identified elsewhere in the fort. The steep slope in front of this was very unstable.

The area had been discussed during the preliminary site meeting of the season and it had been decided that, in order to prevent further erosion, the footpath should be closed off by the construction of a face across collapse U. Unfortunately there was no suitable, stable base available for the construction of a face. Some of the small stones were therefore cleared from the line of the rampart in anticipation of finding bedrock or facing that had been buried by the eroding subsoil. Neither were found and clearance was halted when it began to threaten the facing to the west (Plate 45). The stones were somewhat larger at this level and a platform was made for the new facing. About 0.8m of masonry was added in order to make the top of the outer face level with the inside of the fort (Plate 46). The unstable slope in front of the collapse was stabilised by the addition of a large number of stones from the scree, effectively forming a buttress to the lower part of the wall.

#### *Collapse U1 (Fig. 3)*

The facing rose gradually from ground level to 1.8m over the next 3.0m and was mostly secure (Plate 47). The upper courses were somewhat loose and in places partially obscured by disturbed stone from the wall top. This was stabilised at the same time as collapse U by the addition of 0.8m of masonry at the edge of U where the face was rising steeply from ground level. It was only necessary to add two or three courses of stone to the rest of the collapse in order to bring the outer face up to the level of the inner (Plate 48). No *in situ* stone was disturbed.

#### *Collapse U2 (Fig. 3)*

Collapse U2 was a 1.7m wide, shallow dip in the outer face (Plate 49). The facing below the dip was held in place beneath a large 1.1m long slab. There was a slight bulge in the face in the centre of U2 but this did not appear to be threatening the stability of the wall because there were plenty of large stones and long headers in the facing. The dip in the wall top was filled with a maximum of 0.3m of masonry (Plate 50).

It was noted that the stone in U1 and U2 was of a poorer quality than elsewhere on the fort. Several stones appeared to have broken within the rampart face, cracking into small blocks as opposed to the usual concoidal fractures. There were also a number of large rounded cobbles in the wall in the vicinity of outcrop T; a phenomenon not noticed elsewhere on Tre'r Ceiri.

#### *Collapse U3 (Fig. 3)*

The facing at this point was very random consisting mainly of large blocks. The upper 0.4m appeared to partially collapsed but had fallen to a point of stability (Plate 51). A small dip in the facing at the west of the collapse was filled. The upper courses in this area were reset, the stones being retained close to their original positions. The reset and additional stones are indicated on Plate 52.

### *Collapse V (Fig. 3)*

This was a serious 3.4m wide collapse in the outer face (Plates 53 and 54), the wall falling steeply from 1.7m at the east to close to the level of the scree at the centre of the collapse. The basal courses of the lowest part of the wall were partially obscured by fallen stones. The face graded gradually up to 1.6m at the west of the collapse.

The fallen stone was cleared and it could be seen that the facing had survived to a height of 0.5m at the centre of the collapse. The *in situ* masonry was basically sound although there were a lot of small stones in the lower facing; a factor that may have contributed to the instability in this area. A maximum of 1m of new masonry was added in order to support the core and the extant masonry to either side (Plates 55 and 56).

### *Collapse VI (Fig. 3)*

This was 4.0m wide, steep sided dip in the outer face (Plate 57 and 58). The wall to either side survived to a height of approximately 1.7m falling steeply to 0.4m at the centre of the collapse. This low facing was sound but the unsupported masonry at the west of the collapse was very unstable.

The collapse was cleared of rubble and two unstable, displaced slabs (Stones A and B, Plate 58) were removed from the wall top at the west and reset. The unstable masonry was carefully pinned during the clearance and was consolidated by the addition of supporting masonry by filling the dip in the face in the usual fashion (Plates 59 and 60).

### *Collapse V2 (Fig. 3)*

V2 was the most obvious area of collapse in this stretch of wall; little facing was visible for 7.6m the outer face having been reduced to a rubble slope (Plates 61 to 64). Occasional headers could be seen within the rubble, particularly at the centre of the collapse.

After the clearance of the rubble in front of the line of the face it became clear that the collapse was not as serious as it first appeared (Plate 65). A minimum of 1m of stable facing survived beneath the tumble. There was however no obvious reason for the collapse; the fallen stones were all good headers and there was no evident fault in the surviving facing. It seems likely that this was a case of deliberate damage. Up to 0.8m of masonry was added to the surviving facing bringing the outer face to the same level as the inner (Plates 66 to 67).

### *Collapse W (Fig. 3)*

Collapse W was 6.6m long, representing an area of gradual deterioration in the condition of the rampart. The face was preserved to a height of 1.8m to the east and 2.1m to the west, falling gradually to ground level at the centre of the collapse where there appeared to have been a major failure in the base of the wall (Plates 70 to 72). The visible portion of the wall seemed to describe a sharp kink suggesting a discontinuity but as 1.8m of facing could not be reliably traced it was not easy to interpret the remains. The core was preserved as a 1.1m high vertical face behind the low part of the wall leading to some speculation about an earlier phase of building within the rampart. Careful examination however showed that the 'face' formed by the core did not extend beyond the visible area. The stones were small and not laid as typical headers. This suggested that the stones were well laid core and that the facing had peeled away as it fell leaving the core *in situ*.

Plate 73 shows the collapse after clearance. The basal courses had survived in the centre of the collapse showing that the apparent discontinuity was in fact a severe and very pronounced bulge in the base of the wall, a feature typically caused by scree movement beneath the rampart.



It was decided to leave the bulging masonry *in situ* as it was secure and could be used as a base for new masonry without compromising the stability of the wall. The surviving facing across the whole of the collapse was secured by the addition of a maximum of 1.2m of new stonework thus supporting the core, the surrounding masonry and the inner face (Plates 74 to 76).

#### *Collapse W1 (Fig. 3)*

The facing was stable for a distance of 1.1 beyond collapse W (Plate 77). A void close to the base of the wall was examined but the facing was supported adequately by the surviving long headers. The force that is needed to wedge stones into a void can disturb stones within the wall, hence no further action was taken here.

#### *Collapse W2 (Fig. 3)*

This was a 2.8m wide shallow dip in the outer face (Plate 78). The height of the wall fell gradually from 2.3m at the edge of W1 to 1.3m at the centre of the collapse. The three stones marked with an X on Plate 79 were slightly reset and the dip was filled with new masonry. No *in situ* facing was disturbed.

#### *Collapse X (Fig. 3)*

This collapse was a continuation of W2 the face falling again to 0.5m before grading steeply up to 2.0m at the west (Plates 80 and 81). The steep western side of the collapse was somewhat unstable. Three slabs forming the face at the bottom of the slope had clearly fallen from above. They had however fallen to a point of stability and were left in position. The dip was filled with up to 1.0m of new masonry (Plates 82 and 83) in order to support the masonry above the slabs.

#### *Wall X-X1 (Fig. 3)*

The rampart between collapses X and X1 was exceptionally well preserved, standing between 2.0 and 2.7 m in height. The facing was sound and no consolidation work was necessary.

A marked change in masonry style was noted 1.0m to the north-east of X1 (Plate 84). The lower courses to the south west of this point were constructed from neatly laid, large sub-rectangular slabs and blocks in striking contrast to the small random stonework surviving above and to the north-east of this point. This sudden change in the masonry is unusual on Tre'r Ceiri although building styles do vary considerably around the fort. This can often be attributed to variations in the size and shape of available stone. This explanation is unlikely here as the change in style is very pronounced and there is no obvious change in the stone on this part of the fort. The more regular stonework may therefore represent an earlier phase of building or a constructional detail associated with the building of the nearby postern.

#### *Collapse X1 (Fig. 3)*

The outer face becomes untidy at the edge of X1, the face falling from 2.0m to 1.0m before rising again to 1.6m at the south-west (Plate 85). The face at the centre of the collapse contained a number of slabs which had obviously slumped from above. There also appeared to have been some lateral movement in the facing to the north-west. One slab (stone A, Plate 85) was pushed back into the face and several courses of masonry were added in order to bring the face up to the level of the surrounding rampart (Plate 186). The total width of X1 was 2.8m.

#### *Collapse X2 (Fig. 3)*

The remaining 3.8m of facing before the eastern postern was of the same regular construction as the lower part of the wall to the north-east (Plates 87 and 88). The upper courses were loose and displaced in places and were stabilised by the addition of the stones indicated on Plates 89 and 90.

### *Wall U-Y, inner face*

#### *Collapse U (Fig. 3)*

There was no surviving facing for 2.0m adjacent to outcrop T (Plate 91). The outer face had been raised to the height of the inside of the fort. No further action was taken apart from infilling behind the outer face and securing the wall top.

#### *Collapse U4 (Fig. 3)*

The 2.0m of facing to the west of U consisted of three large blocks of stone resting on a jumble of smaller stones (Plate 92). All had been undermined as the core had eroded from behind them when the outer face was lost. The block on the corner was reset close to its original position (Plate 93). The other two blocks were stabilised by the addition of core to the wall top.

#### *Collapse U5 (Fig. 3)*

Collapse U5 consisted of 3.4 m of 1.0m high facing (Plates 94 and 95). This was very rough in appearance and several stones had been displaced from the upper course. This was stabilised by the addition of the stones indicated on Plates 96 and 97.

#### *Collapse V (Fig. 3)*

The face fell from an average height of 1.0m, to 0.2m at the centre of this 3.6 m wide collapse (Plates 98 and 99). The lowest part was obscured by loose stones and a 0.7m long flat slab that was leaning against the rampart.

The displaced stone was cleared revealing the intact lower courses of the wall (Plate 100). The line of the face had changed slightly at the east side of the collapse, following a line parallel but slightly in front of the previous one. The surviving facing was stable and survived to a height of 0.5m. The cleared stones were used to raise the face by 0.4m at the centre of the collapse (Plates 101 and 102), allowing the stabilisation of the wall tops.

#### *Collapse V3 (Fig. 3)*

The facing was stable for the following 2.5m although the upper course of masonry was not secure (Plate 103). The obviously displaced stones were reset. The top of the face was secured by the infilling of any gaps where stones had been lost and the addition of a course of heavy slabs (Plate 104).

An alignment of stones was noticed within the rubble lying in front of collapses V and V3, forming a linear feature in the region of 6 metres in length. It was only possible to trace one or two courses of masonry the top of which were level with the interior of the fort. There was not time to record the feature in detail during this season's work but it is anticipated that a total station plan will be produced at the beginning of next season. A more detailed discussion will therefore appear in the 1996 report.

#### *Collapse V4 (Fig. 3)*

Collapse V4 denotes the length of rampart where hut 41a meets the rampart. This area was examined by Bersu, Gresham and Hemp in 1939 (*ca.* 1939) who cleared the hut of heather and recorded that it was built against the rampart.

The inner rampart face survived to a height of 0.8m at the edge of V3 but was effectively reduced in height by the terrace formed by the southern wall of hut 45a which stands around 0.4m above ground level. The face could not be easily traced along the top of this terrace as the area was quite eroded (Plates 105 to 107). It was therefore necessary to ascertain the line of abutment in order to consolidate the area correctly.

Loose stone was cleared from the area, and the face was found to be semi-collapsed beneath the rubble (see Plates 108 and 109). A few more stones were removed from in front of the face but the rampart could not be traced below this level. The lowest visible course was about 0.5m below the present wall top. Almost all the headers had slumped forwards at this level and only random stone and voids could be seen below them. The interior of the hut was about 1m below the lowest course of masonry. This relationship is best explained by considering the method of construction of the huts. The interior of most huts on the site is below ground level and it is presumed that they were built by digging into the scree and, using the stones gleaned from this exercise, building a face around the edge of the resulting hole. This would also allow enough stone to build a low wall around the top of the hut but the interior would remain below the original ground level. The present ground level within a group of huts is sometimes seen as the level of the hut floors, whereas the original ground level was close to the top of the hut walls. Hut 45a was not, as is often stated, built against the rampart but was, in the most part, dug in front of it. Only the upper courses would be expected to abut the outer face. The hut was presumably built away from the rampart in order to avoid undermining it. This was only partially successful as the lower courses of collapse V4 were considerably slumped.

The line of the inner rampart face could be traced across V4 so the stone removed from in front of the buried facing was reinstated. The line of the rampart was then defined by the addition of up to 0.4m of masonry to the surviving inner face. This also raised the inner face to the height of the outer and allowed the wall top to be consolidated. The facing for approximately 1m to either side of the terrace was also rather dilapidated. The upper courses were displaced and unstable so the loose stone was cleared and sufficient masonry added to raise the height of the face to the level of the wall top. The additional stones are indicated on Plates 110 to 112. The conservation of hut 45a is described below.

#### *Collapse V5 (Fig. 3)*

The inner face of the rampart could not be traced with any certainty for 4.2m beyond V4 (Plates 113 to 114). The collapse was probably caused by the loss of masonry from the wall of hut 108. This would have removed support for the base of the rampart. Some of the loose stone was cleared from the collapse but no definite facing was identified. Occasional stones could be seen, within the tumble, on the expected alignment about 1m below the wall top. There were not enough to allow a definite line to be projected and it is possible that the base of the wall has been completely lost.

As it was not possible to trace or project the line of the inner face with any certainty the cleared masonry was replaced in a stable fashion. This fabricated collapse now acts as a buttress, supporting the wall top (Plates 115 to 116).

#### *Collapse V6 (Fig. 3)*

The area between the outer face of huts 107 and 108 appears to have been dug into the scree, in marked contrast to the construction methods used in the area around collapse V4 (above). The 4.0m length of facing bounded by the wall of hut 108 to the north-east and collapse W to the south-west survived to a height of 1.6m and was generally stable. The facing was constructed from larger than usual stones and was very irregular (Plates 117 to 119). There were a number of voids at the base of the wall suggesting that some stone had been cleared to below the level of the base of the rampart.

The upper course of stone was very untidy and some stones had been lost, allowing core material to spill forward. The *in situ* facing was supported by the addition of several stones to the wall top (Plates 120 to 122). Stone A on Plate 118 appeared to be on the point of collapse but was in fact the end of a long header and was therefore stable.



### *Collapse W (Fig. 3)*

A D shaped enclosure, centred around collapse V6, is depicted on modern plans of Tre'r Ceiri (e.g. Fig. 8). Collapse W marks the south-west end of the enclosure and it has been assumed that the south-eastern wall of hut 107 abuts the rampart.

The facing to either side of W stands to a height of 1.8m. The masonry appeared to have failed low down in the wall and stones eroding from the top of the rampart forming a steep rubble ramp reaching to within 0.4m of the wall top (Plate 122).

Plate 123 shows the collapse after clearance; the base of the wall had slipped forward about 0.3m. The three stones beneath the scale on Plate 123 were reset elsewhere as they could not be pushed back into the wall without causing further disturbance and a large header marked as stone A on Plate 123 was pulled forward slightly. This formed a stable base for the addition of new masonry. The stone from in front of the collapse was used to build the facing up to the same height as the wall top (Plate 124). There was no evidence for the existence of the continuation of the wall of hut 107 towards the rampart. It must therefore be assumed that the south west end of the D shaped enclosure was formed by rubble from collapse W.

### *Collapse W4 (Fig. 3)*

Collapse W4 was a 4.3 m length of instability in the upper facing (Plates 126 and 127). The masonry in this area was some of the most irregular in the fort. The upper 0.3m was not stable, particularly in the south western end of the collapse.

It was possible to stabilise most of the original masonry by packing core behind the headers and adding stones to the wall top. Several stones were removed from the more obviously collapsed area at the south west end of W4 and replaced with a 0.3m depth of irregular facing (Plates 128 and 129).

### *Collapse X (Fig. 3)*

The wall had a pronounced batter at this point; probably due to the subsidence caused by the loss of the outer face. The face survived up to a height of 1.6m (Plate 130). A number of stones at the top had been displaced; these were reset or stabilised by the addition of the stones indicated on Plate 131. The total length of the collapse was 2.2m.

### *Collapse X3 (Fig. 3)*

The rampart turns slightly to the south at the junction between X and X3. The facing was preserved to a height of 1.3m before falling to ground level, 2m later, at the edge of X4 (Plate 132).

The top of the face was again loose and was stabilised by the addition of a course of heavy slabs to the top of the wall (Plate 133).

### *Collapse X4 (Fig. 3)*

The inner face could not be traced over the next 3.6m as a major collapse had occurred (Plates 134 and 135). Stone had eroded from the wall top to form a rubble slope. Very rough, 1.1m high, facing could be seen emerging from beneath the rubble at the south-west of the collapse.

The collapse was cleared and it could be seen that facing had survived up to a height of 0.4m beneath the tumble. Plate 136 shows X4 after initial clearance; the smaller displaced stones above stone A were removed. Stone A was pushed back into the wall and stones B and C were reset. This provided a solid base to which of 0.7m of stonework was added in order to support the surrounding masonry (Plates 137 and 138).

### *Collapses X5 and X6 (Fig. 3)*

The 4.5 m of inner face above hut 41 (Plates 139 and 140) are characterised by a large number of voids at the base of the wall. These potential sources of weakness were examined in some detail. No facing could be seen below the voids suggesting that the base of the wall had been undermined. The long headers in the wall provide a fair degree of stability as much of the weight of the facing is centred within the wall. The jumbled nature of the facing across X5 suggests that some displacement has occurred.

There was some debate in the site meetings about the phasing and construction of the huts and ramparts and it was felt that the voids should not be filled unless absolutely necessary as they provide important structural information about this area of the fort. A greater understanding of the relationship between the huts and ramparts was achieved during the post conservation work. Comparisons between this area and that around collapse V4 (see above) suggest that the original ground surface was similar to, or slightly above, that of the present. The loss of stone from the wall of hut 41 would therefore have removed support from the base of the inner face of the rampart. The hut was also dug into the scree very close to the rampart and it is difficult to see how this could have been achieved without causing considerable disturbance.

The voids were not packed but the consolidation of the hut wall should ensure that there will be no further movement in the masonry. This area will be re-examined and monitored during the rest of the project. The top of the facing was ragged across the whole of the two collapses. A small dip at the south west end of X5 was filled with three headers and the rest of the wall top was secured by the addition of stones where necessary. The new masonry is indicated on Plates 141 and 142.

### *Collapse X7 (Fig. 3)*

This was a 1.8m wide collapse. Much of the 0.8m high facing had fallen to a point of stability. Headers A and B (Plate 143) protruded from the face but were left *in situ* as they were supporting the masonry to either side of the collapse. Stone C could not be reset and was removed. The void that had been beneath C was packed with one large stone. Two slabs were added to secure the wall top (Plate 144).

### *Collapse X8 (Fig. 3)*

There was a small collapse in the upper facing, 1.5m to the south-east of X7 (Plate 145). A large slab had fallen from the rampart and was leaning against the base of the wall. Another, larger, slab had fallen into a hole in front of the rampart. The stone was too large to move and was therefore left in the hole where it provided some support for the base of the wall. Several short stones, that had probably fallen from the core, were removed from the facing and were replaced with five headers, one of which was the slab that had been leaning against the rampart (Plate 146).

### *Collapse X9 (Fig. 3)*

The ground rises between X9 and the postern, the inner face could not be traced with certainty but may be represented by stones half buried in the turf along the expected line of the wall (Plates 147 and 148).

### *Wall U to Y, general comments.*

Several lengths of parapet were recorded during the conservation works:

An 1.7m long alignment of stones was noticed in the wall top above collapse U4 which presumably represents the last trace of parapet at this point.

A 3.3m length of parapet stands above the junction between collapses V5 and V6. This was in danger of being undermined by collapse V5 but the wall top is now secure.

Smaller less well preserved traces of parapet were recorded above collapses X3 and X5 (see Fig. 3). These features were not consolidated as this would have involved total rebuilding of the masonry in order to make it secure.

## **The Huts**

All of the huts designated for consolidation during the seventh season were planned using a Geodimeter total station (Fig. 6). Smaller details were added to the plans by hand.

The collapses referred to in the text are represented by the area between the scales on the pre-conservation photographs unless otherwise indicated.

### ***Hut 45A***

Hughes recovered a blue faience bead, several pot boilers and a fragment of a rim of a black pot from this hut in 1906. His unpublished plan (Fig. 7) shows the hut as being roughly D shaped with a break in the west wall. The hut was re-examined in 1939 by Bersu, Gresham and Hemp (Anon *ca.* 1939) who cleared the vegetation from the walls and suggested that the hut was 'L-shaped with rounded ends'.

The sub-rectangular, somewhat rounded, northern end of the hut was little changed from Dallimore's (1978) description of 'a low scatter of stone [with] walls up to 0.25m'. The southern end of the hut, set against the rampart, was also eroded with facing surviving up to 0.4m. The following collapses were consolidated:

#### ***Collapse 45Aa (Fig. 6)***

The northern wall had collapsed to close to ground level (Plate 149), but could be seen to continue for close to 1.0m below the level of the interior of the hut. The loose stone was cleared from the collapse. The sloping flat slab, partially hidden by vegetation to the left of the central scale on Plate 149, could not be reset without considerable disturbance to the wall. A large irregular block was imported from the scree to form more suitable base for new masonry. The cleared stone was then used to raise the facing to the level of the wall core. The new masonry is shown on Plate 150.

#### ***Collapse 45Ab (Fig. 6)***

The west wall of the hut consisted of a 0.9m length of 0.4m high, sound facing (Plate 151). One stone was added to the top of this in order to support the core. The height of the facing at the south of the collapse dropped steeply to ground level leaving poorly supported masonry. This was stabilised by the addition of three heavy slabs (Plate 152).

#### ***Collapse 45Ac (Fig. 6)***

The east wall of the hut was low with only occasional facing stones standing above the level of the interior (Plate 153). The core was standing above this. Several stones, shown on Plate 154, were added to the facing and the wall top was stabilised.



Fig. 6 Plan of huts centred around 107 before conservation.

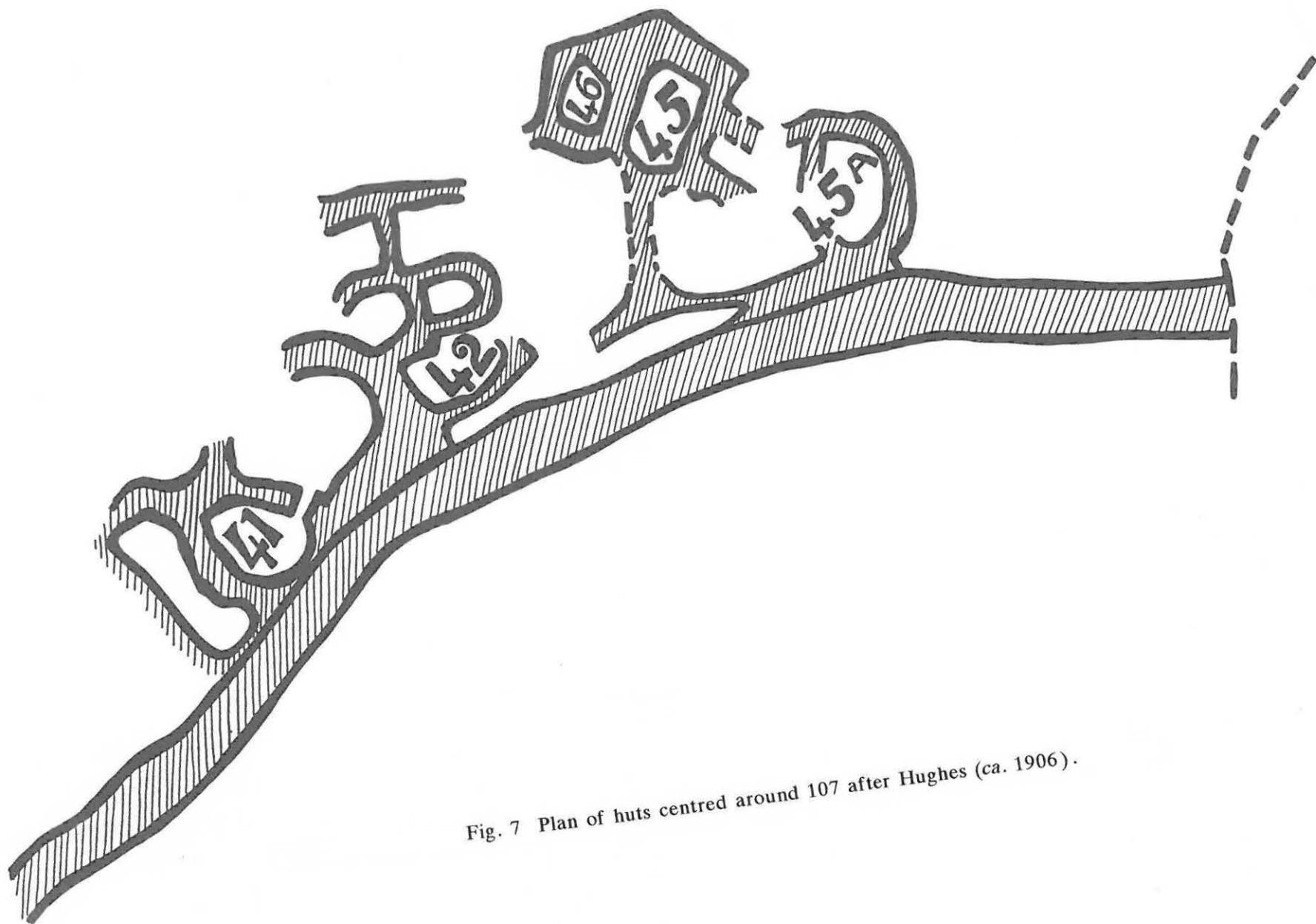


Fig. 7 Plan of huts centred around 107 after Hughes (ca. 1906).



### *Wall top 45A a,b and c (Fig. 6)*

The wall tops in this area were fragile and prone to erosion. Several conservation techniques had been tested in the first season of the project (Boyle, 1990) but no firm conclusions had been reached. The most satisfactory method was found to involve locking upright stones together on the top of the wall core. This method necessitated the importation of large amounts of small stone from the scree and was found to be impractical in later seasons. Additional problems were revealed when the areas where this technique was first used were examined; the upright stones, when walked upon, had acted as levers, and had displaced some of the upper facing. This technique was clearly not suitable for the consolidation of fragile walls close to a footpath and was therefore not used during the seventh season.

A minimal approach was adopted at first, which involved resetting as few stones as possible, in order to avoid excessive disturbance to the intact masonry. This produced a rough looking wall top which was not very durable. After some experimentation it was found that the most effective way of consolidating the wall top was to ensure that the top of the facing was stable and then to pack the core very carefully using small stones to fill the interstices between the larger stones in the core. The stones were not wedged tightly in order to avoid the displacement of the stones at the top of the facing. Stones were occasionally introduced vertically into the wall top in order to discourage lateral movement of the core. Plate 155 shows the wall above 45Aa after consolidation.

### *Collapse 45Ad (Fig. 6)*

The southern wall of the hut forms a step about 1.8m in front of the rampart (see also collapse V4, above). The south eastern corner of the hut was semi-collapsed (Plate 156).

Stone A, shown on Plates 156 and 159, was left *in situ* and the void beneath it packed. There was a large amount of displaced stone standing above the surviving facing at the eastern side of the collapse (Plate 157). This was cleared, and reused to create a stable terrace between the rampart and the hut (Plate 160).

There was a slight discontinuity just to the west of the centre of the collapse which presumably represents the stub of wall shown on Hughes plan (Fig. 7). It is no longer clear if this is part of a wall but it suggests that Bersu, Gresham and Hemp's (*ca.* 1939) of the hut as being L shaped may be incorrect.

There was a void beneath one of the large slabs in the facing close to the western end of the collapse (Plate 158). This was examined and the slab was found to be poorly supported. The void was packed with four stones (Plate 161).

The facing survived to a height of 0.7m at the west of the collapse. The upper courses were loose and contained a large proportion of small stones. After minimal clearance two heavy slabs were added to the wall top in order to secure the both the core and the weak facing (Plate 161).

### *Hut 108*

Hughes (1907) depicted this hut as being roughly oval with facing at the south and north east. When Bersu, Gresham and Hemp cleared the hut in 1939 (*ca.* 1939), the inside of the wall could be traced for most of its circumference. The wall was described as being well preserved and standing to a height of over 0.6m, with a break in one of the longest sides. Griffiths (1946) recorded 0.6m high facing at the south and west of the hut. Dallimore (1978) described the hut as being 'fair but overgrown' with walls in places up to a height of 1.0m. The R.C.A.H.M.W. (1960) plan (Fig. 8) depicts the south-west and north-west corners as being square.

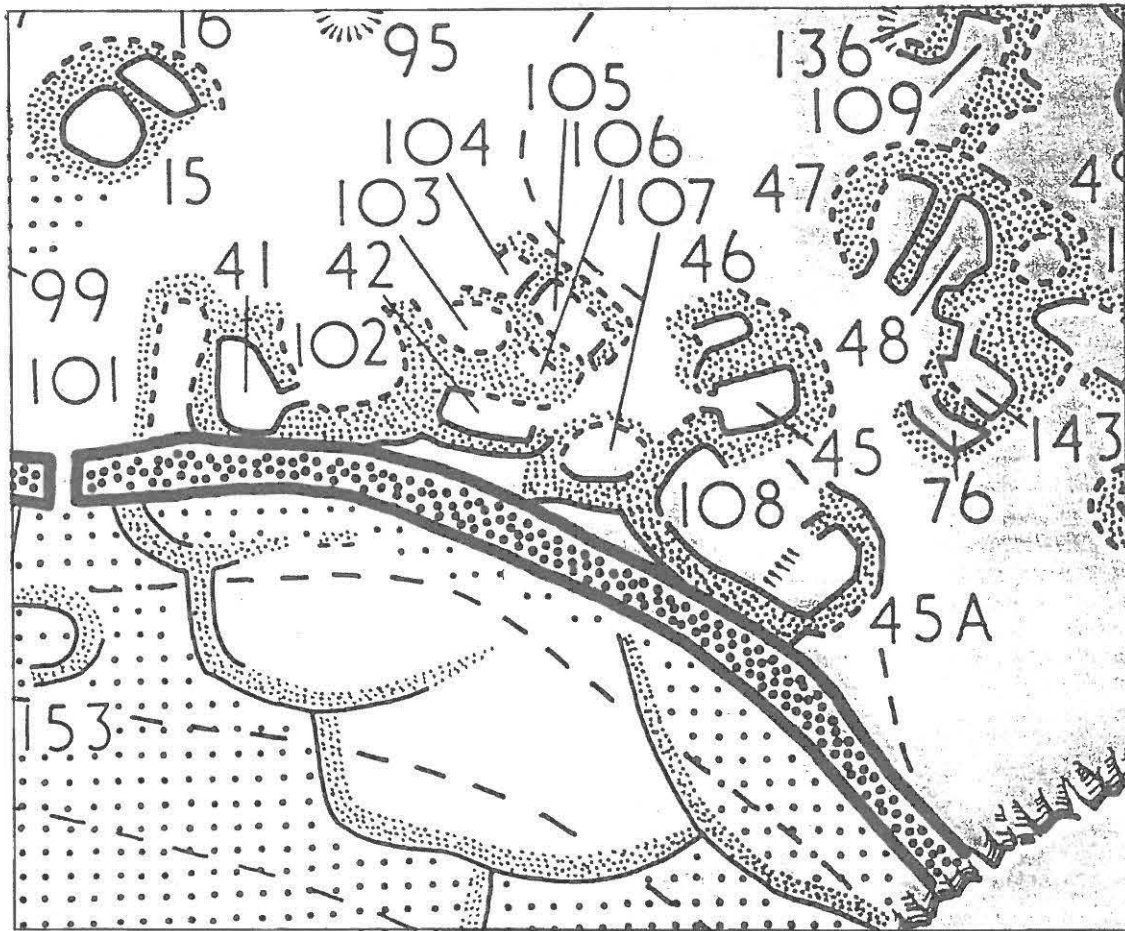


Fig. 8 Plan of huts centred around 107 (R.C.A.H.M.W. 1960)

Fig. 6 shows the hut as surveyed at the beginning of this season. Much of its perimeter, particularly on the east, was only visible as an overgrown slope. The hut was approximately square in plan with very rounded corners and internal dimensions of about 4.0m x 4.0m. The facing at the south end of the hut (108a) was mainly collapsed although occasional stones indicated its line. Examination of the wall top showed that the south wall of hut 108 abutted the east wall of 107 the outer face of which formed the west wall of 108. A 1.5m length of facing was identified at the north-east corner of the hut. This was low but stable.

#### *Collapse 108a (Fig. 6)*

The loss of stone from the southern wall of the hut (Plates 162 and 163) had undermined the rampart (see collapse V5) so it was necessary to add some stable masonry. Plate 164 shows the area after clearance of the loose stone. Only one, short, 1.0m length of facing survived to any height suggesting that there has been considerable damage to this hut since it was cleared in 1939. The basal course of the wall could be traced for about 1.0m to the east of the upstanding facing. One edge-set stone (stone A, Plate 164) marked the line of the face to the west. Occasional smaller stones suggested the line of the corner of the hut, but the western wall could not be traced with any certainty beyond this. The cleared stone was used to construct a 0.6m high face around the *in situ* masonry along the south of the hut (Plates 165 and 166). This merged into the rebuilt collapse V5 at the east. The new facing was not continued beyond the south-western corner as the line of the wall was uncertain.

## *Hut 107*

Hut 107 was not identified on Hughes' plan, presumably all that was visible at this time was the short length of wall, shown running parallel to the rampart. The hut was excavated by Bersu, Gresham and Hemp in 1939 (*ca.* 1939). Their description is as follows:

'The more southerly hut [107] was almost completely cleared out to discover the nature of the deposits and to find possible dating evidence. Its wall could not be traced on the west side, where it had probably collapsed. It was most complete on the east side where it stood between 2 and 3 feet [0.6 and 0.9m] high. The diameter of the hut was 12 feet [3.7m] and its construction was of large stones irregularly laid to an inner face, but without orthostats. The outer face was not uncovered.'

The hut was cleared to the base of the wall but no occupation layer was found.

Griffiths (1946) recorded that the inner face was 1.4m high on the north-east and south-east and 0.7m on the south-west. Dallimore (1978) recorded that the hut was overgrown, with walls up to 1.75m in height. It is not clear why successive writers have recorded progressively higher walls. It is possible that there had been further unauthorised excavation below the level of the walls before Griffiths' survey but Dallimore's 1.75m seems to be unlikely (see scale on Plate 167) and was probably a typing error.

The only facing visible when the hut was surveyed at the beginning of this season's work was at the south and south-east. The rest of the perimeter was overgrown, and was recorded as a steep slope.

### *Collapse 107a (Fig. 6)*

A 2.2m length of facing was visible, standing up to 0.8m in height (Plate 167). This was bounded by a fairly stable area of collapse (107b) to the north-east, and a 0.6m x 0.4m void (107c) beneath a large stone to the south-west.

There was a scattering of unweathered, loose stones, which may have been dug out of void 107c, on top of the wall. These were cleared and it was found that the facing beneath was basically stable. A slight dip in the top of the wall was filled with a large slab (Plate 168).

### *Collapse 107b (Fig. 6)*

The wall to the north east of 107a had eroded to a slope consisting mainly of large stones (Plate 169). There was one unstable area which was consolidated by the addition of a heavy stone which was taken from the tumble above the collapse (Plate 170).

### *Collapse 107c (Fig. 6)*

The void at the south west of 107a appeared to be a case of recent deliberate damage. The area around it was littered with unweathered stone ranging from large headers to typical small core (Plate 167). There was no obvious reason for this excavation.

The void was packed with four headers and a number of smaller stones (Plate 168).

### *Collapse 107d (Fig. 6)*

There was a small instability in the outer face of the hut where several stones had been lost from the wall. The dip was filled with the four stones marked on Plate 171.



## ***Hut 45***

Hughes excavated this hut in 1906 (Hughes, 1907) and found a stone pounder. Griffiths (1946) recorded that the walls were of poor construction with inner faces standing between 0.3m and 0.45m in height. He also recorded a possible entrance, about 0.45 wide, in the southern corner of the hut. This is shown on the R.C.A.H.M.W. (1960) plan (Fig. 8). Hughes' unpublished plan (Fig. 7) shows a break in the wall at this point but it is not clear if it represents an entrance. Dallimore (1978) records that Hut 45 was 'only just recognisable as a hut'.

The eastern wall of the hut had been reduced to a line of rubble mainly due to erosion caused by a path which crosses the wall and passes out through the presumed entrance. The inner face of the southern wall could be traced but the area was again heavily eroded and had reached a point of stability. The northern and western walls were also poorly preserved and were showing signs of recent erosion.

### ***Collapse 45a (Fig. 6)***

The west wall of the hut was very unstable. The inner face survived to a maximum height of 0.6m but was generally low and semi-collapsed (Plates 172 and 173). There were signs of recent erosion so it was decided to reset some of the disturbed stone in the upper facing. The reset stones are shown on Plates 174 and 175. The wall top was stabilised in the usual way.

### ***Collapse 45b (Fig. 6)***

The northern wall of the hut was low with facing standing up to 0.3m in height (Plate 176). A small section of facing had fallen forwards in the centre of the wall and was very loose. An attempt was made to clear the fallen masonry but slab A, shown on Plates 176 and 177, was larger than anticipated and could not be moved without disturbing a considerable length of facing to the west. The slab was also tilted forwards at about 45° so it was not possible to build on top of it. The stone lying on top of the slab in the pre conservation photograph was moved on to the wall top above it and a heavy slab was bedded into the core above the collapse (Plate 177). This stabilised the area by preventing the core from spilling over the low part of the facing. The wall top was stabilised using the methods established in hut 45A.

## ***Hut 46***

This small (3m x 2m) sub-rectangular hut was excavated by Hughes in 1906 who recorded that 'This Hut drew blank'. Both Griffiths (1946) and Dallimore (1978) noted that the hut was poorly built and that facing survived to a height of around 0.5m. Griffiths also suggested that the entrance was on the south although this was not identified by Hughes.

There appeared to have been little deterioration since 1978. Facing could be traced on the north-western and north-eastern walls of the hut where most of the small stones had been eroded from the face leaving stable large stones. The south-eastern wall (Fig. 6, 46a), which is shared by hut 45, contained a number of loose or displaced stones in its upper course (Plate 178). These stones were reset and are indicated on Plate 179.

## ***Hut 106***

Hut 106 has not been officially excavated and appears on Hughes' (ca 1906) plan (Fig. 7) as a D shaped enclosure. Griffith (1976) described the hut as:

'A small oval chamber, 7 ft. [2.1m] x 5 ft. [1.5m] internally, with walls about 2 ft. [0.6m] high. It is choked with fallen stones'

Dallimore (1978) recorded erosion to the east of the hut.

There has been some erosion since the above descriptions. Rough facing could be traced around the east of the hut. A rough but probably original entrance was identified at the south. The north and west of the hut were choked with unweathered stone that had been disturbed from a path running along the north wall. It was not clear how much masonry had been lost and how much had been buried but the north of the hut had been reduced to a very steep, fast eroding, slope (Plate 180). The centre of the hut was full of stone, and as a lot of this had been recently eroded from the path it was safe to assume that some could be reused without disturbing any archaeological deposits. A rough stone buttress (Fig. 6, 106a) was constructed against the north of the hut in order to stabilise the eroding area (Plate 181). It is anticipated that the footpath will be diverted away from the end of the hut.

### *Huts 102, 103, 104 and 105.*

These huts were examined at the beginning of the season. All remain unexcavated and are visible as low spreads of stones with little or no exposed facing. There has been little change from the descriptions in Griffiths' (1946) and Dallimore's (1978) reports and it is assumed that they have eroded to a point of stability. The huts were planned but no consolidation work was carried out. A footpath runs across huts 104 and 105 and it is anticipated that this will be diverted before the end of the project.

### *Hut 42*

Hut 42 was excavated by Hughes in 1906 (Hughes, 1907). The finds were listed as:

- '(a) Two small fragments of iron.
- (b) Stone (? pounder).
- (c) White Pebble.'

His plan (Hughes, *ca.* 1906) shows a roughly oval hut with a break in the north-east wall which may correspond to the entrance (Fig. 7). The north-west wall is shown to be formed by the outer faces of huts 103 and 106.

There was presumably less detail visible when Griffiths surveyed the hut in 1946, he wrote:

'On the SE a very good wall, 3 ft. 6 ins. [1.1m] thick and 2 ft. [0.6m] high on both faces, follows an angular line and is separated from the SE wall of the fort by a narrow alley 1 ft. 6 ins. [0.5m] wide. On the SW a very thick wall (7 ft. [2.1m]) stands 1 ft. [0.3m] high. Otherwise the walls are low and ruined and the form and dimensions of the hut are not clear.'

Two collapses had occurred since 1946 and there had been some disturbance of the hut floor in front of the southern corner, the rest of the hut appeared to be unchanged.

#### *Collapse 42a (Fig. 6)*

A 1.2m length of outer facing had fallen forward. The displaced stones were used to fill the dip in the facing. No *in situ* masonry was disturbed. It was difficult to produce adequate photographs of this collapse due to the proximity of the rampart. The new masonry is marked on the post conservation photograph; Plate 182.

#### *Collapse 42b (Fig. 6)*

A 1.2m length of the inner face of the south-west wall had partially collapsed, leaving core spilling forward into the hut (Plate 183). The basal course was intact and was marked by a large stone, the top of which can be seen beneath the new facing on Plate 184. The stone lying in the hut was used to raise the height of the facing to 0.8m, thus retaining the core.

### *Void 42c (Fig. 6)*

A void low down in the wall (V on Plate 183), just to the left of 42b, was packed with four stones (Plate 184).

### *Possible treasure hunter hack; 42d (Fig. 6)*

There was an old, much weathered and overgrown, hole in the floor of the corner of the hut (see Plate 183 below V). This did not appear to be endangering the wall. A few spare stones were put in it during the consolidation of 42b but it was not completely filled in.

## ***Hut 41***

When Hughes excavated the hut in 1906 (Hughes, 1907) he recovered fragments of a bronze beaded torque, the remains of an iron loop, part of the base of a red earthenware vessel, two rim sheds from a black pottery vessel, charcoal, pot boilers, burnt stones, a small pebble, burnt bone and the jawbone of a horse. His plan shows the hut to be roughly oval with an entrance on the north-east (Fig. 7).

Griffiths (1946) recorded the hut in some detail:

'A good oval hut 15 ft. x 9 ft. [4.6m x 2.7m] internally, set against the SE wall of the fort and against hut 102 on the SW. The floor is 4 ft. 6 ins. [1.4m] below the general ground level. The hut wall is 4 ft. [1.2m] thick, but approaches the fort wall closely on the SE, where it is only 1 ft. 6 ins. [0.5m] thick. A good inner face stands 5 ft. 6 ins. [1.7m] high on the S. In the E corner is an entrance, apparently about 2 ft. [0.6m] wide, but now blocked with fallen stones.'

Dallimore (1978) again recorded higher facing than Griffiths and stated that the 'west and south wall [are] preserved up to 2.0m'. In this case and in hut 107, Dallimore's measurements seem to be suspect; 2m high facing in this hut would bring the height of the wall to close to the top of the rampart.

Griffiths description also makes sense when seen in the light of the survey carried out at the beginning of the season. There appears to have been some erosion since 1946. The inner face of the hut survived up to a height of 1.4m and was nearly level with the ground outside the hut. The upper courses had been much disturbed. Griffiths recorded that the ground level outside the hut was 1.4m above the floor so this seems to at least partially confirm his measurements. It can therefore be assumed that about 0.3m of facing has been lost from the top of the wall. This is also suggested by the overhang recorded in the rampart behind the hut (see collapse X6, above). The facing in the hut wall stands a little below ground level and there is a 0.2m to 0.3m gap beneath the lowest course of the rampart. This suggests that the hut was dug in front of the rampart and that the facing in the hut has eroded to below the original ground level thus undermining the inner face of the fort wall. Neither Griffiths or Dallimore recorded surviving facing in the north-east wall.

The hut was surveyed early in the season and works were carried out on five areas of collapse:

### *Collapse 41a (Fig. 6)*

The approximate line of the north-eastern wall was indicated by a rough alignment of stone running from the northern corner of the hut to the 0.6m high facing at the corner of the entrance (Plates 185 and 186). The loose stone was cleared from the collapse, down to the level of the hut floor, but there was no sign of a basal course (Plate 188). The corner of the entrance was found to be extremely unstable. The pre-conservation photograph did not show the stones at the base of the wall so the masonry was re-photographed. The stones were marked (Plate 187) and the facing was dismantled (Plate 188). The masonry was unstable

because there was no basal course at the level of the hut floor. The lowest 0.3m of 'facing' consisted of random stones.

It is usual, even in the most severe collapse, to be able to identify the reason for the collapse or to be able to see the displaced facing stones. In this case there were no remnants of the lower courses of the wall at the level of the floor of the hut. It appears that this side of the hut had been badly disturbed and perhaps partially rebuilt. The facing on the south-east side of the entrance (41e) does not correspond to the line shown on either Hughes' (ca. 1906) or the R.C.A.H.M.W. (1960) plan. It was also badly built from very small stones in a style characteristic of the occasional modern rebuilds found in various places around the fort. There was no indication as to when the disturbance had occurred; it is possible that it dates back to Hughes' excavations. The alignment of the stones in the upper part of the collapse suggests that either an attempt had been made to rebuild the wall after it had been undermined by excavation or that the upper courses had slumped when the base of the wall was lost.

It was necessary to build a new face on this side of the hut in order to revet the core and eroded stone, the construction of a stable 'built collapse' would have entailed the importation of excessive amounts of stone and the loss of line of the wall. It was decided to replace the marked masonry from the edge of the entrance on a stable base. Stones A to J were reset close to their original positions. A 0.7m high face was built across the rest of the face, following the line suggested by the alignment of the stones seen in the collapse (Plates 189 and 190). This also corresponds to the line of the wall on Hughes' plan (Fig. 7).

#### *Collapse 41b (Fig. 6)*

This 1.3m wide collapse was very similar in appearance to 41a although a little better preserved (Plates 185 and 186). Plate 191 shows 41b after partial clearance. The western side had completely collapsed but the remains of facing could be seen on the east. All of the stones were tilted forward suggesting that the wall had also been undermined in this area. The collapse was cleared but no intact facing was identified. The stones at the east were little more than roughly aligned collapse and could not be retained.

Plate 192 shows the area after clearance and the addition of two courses of masonry to indicate the line of the wall. Stones A and B were taken to be evidence of a roughly bonded corner to the hut but clearly are part of the wet wall of the hut which could be traced for 1.0m behind the cleared line of the northern wall which presumably previously abutted it. The new masonry was continued to a height of 0.9m (Plates 189-190).

#### *Collapse 41c (Fig. 6)*

The northern end of the curving south-western wall of the hut was low and unstable (Plate 195). A large upright slab (stone A, Plate 195) had slipped forward from the facing causing the masonry above it to slump. This had fallen to a point of stability and no further action was taken.

A void adjacent to stones A and B (Plates 192 and 198) was packed with three stones and the base of the wall was supported by a large heavy slab. The facing above this was stabilised by the addition of new masonry up to the height of the current ground level (Plate 198). No *in situ* masonry was disturbed on this section of the collapse which is shown between the scales on Plate 198.

The rest of the wall was better preserved with facing standing to a height of 1.0m (Plates 193 and 194). A large displaced slab (stone C Plate 197) was pushed back into line with the rest of the face. The top of the facing was littered with loose stone. This was cleared or reset and several large slabs were added to the wall top raising it to the height of the top of the core (Plates 196 and 197).



*Collapse 41d (Fig. 6)*

The inner face of the hut runs approximately parallel to the rampart for 1.5m (Plate 199) before being butted by and obscured by the facing that forms the south-east side of the entrance (collapse 41e). The facing across 41d consisted of a high proportion of large blocks of stone and was stable to a height of 0.8m. A displaced flat slab, 0.6m in length, stood above this. The slab was loose, tipped backwards and supported by one stone. The slab and stone were removed and the wall top beneath levelled by the addition of one facing stone and some core. The slab was reset on top of the stabilised wall top (Plate 200).

*Collapse 41e (Fig. 6)*

The south-east side of the entrance (Plate 199) does not follow the line shown on Hughes' (*ca.* 1906) plan and is not parallel to the opposite side. The facing consists almost entirely of small stones and is noticeably different in style to that found elsewhere in the hut. The masonry style in 41e resembles that in several recent (*i.e.* within the last 100 years) sections of rebuilt masonry that can be seen around the fort. It is therefore very probable that this is a modern feature although it is not clear why the oblique line was chosen for the masonry. There seemed to be little virtue in disturbing the facing so several stones were added to the top to stabilise it and no further action was taken. The entrance passage was choked with loose, fallen stone. This was stabilised by the resetting of several stones in order to provide support for the facing to either side (Plate 200).

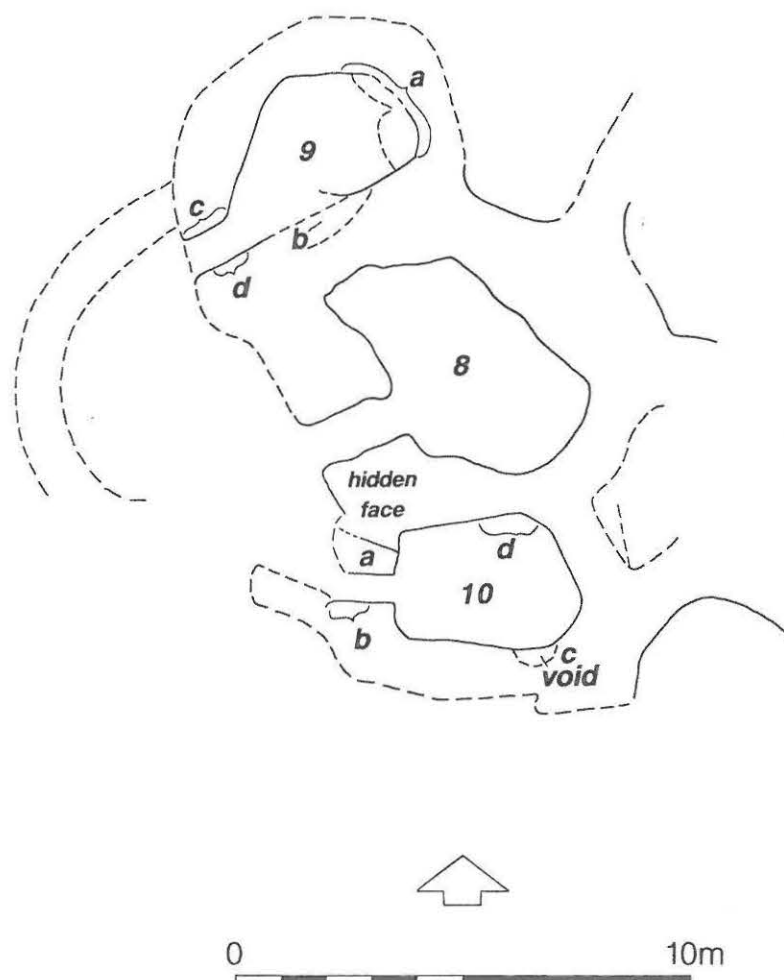


Fig. 9 Plan of huts 9 and 10 before conservation.

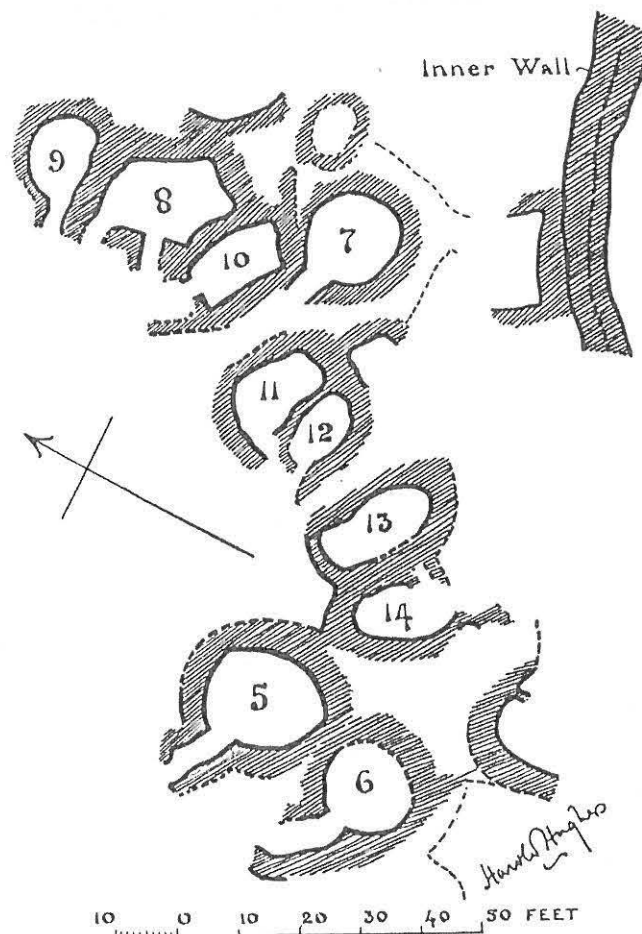


Fig. 10 Plan of huts 9 and 10 by Hughes (Baring-Gould and Burnard, 1904)

### *Hut 9 (Fig. 9)*

Hut 9 was excavated by Baring-Gould and Burnard in 1903 (Baring-Gould and Burnard, 1904) and planned at the same time by Hughes (Fig. 10). No finds were recovered but it was recorded that, 'regularly-built drain-like cavities acted as catch-pits under the paved floor. There was no drain to carry the accumulated water out of this hut.' A 0.9m wide, west facing, entrance was recorded along with hut walls of 1.8m in height.

Griffiths (1946) recorded the hut in detail:

'A very well constructed hut of irregular outline, its SE side straight, its NW side curved. It measures roughly 10 ft. x 9 ft. [3.0 m x 2.7 m] internally, and its floor is 4 ft. [1.2 m] below the general ground level. On the S it is set against Hut 8, from which it is separated by a wall 5 ft. [1.5 m] thick, with an inner face 4 ft. [1.2 m] high. The NW wall is carefully constructed and is 3 ft. 6 ins. [1.1 m] thick, with an outer face 2 ft. [0.6 m] high and an inner 6 ft. [1.8 m] high. On the W is a narrow entrance 1 ft. 6 ins. [0.5 m] wide.'

There had been some damage by 1977. Dallimore writes:

'Entrance well preserved. Walls up to 1.50m to 1.75m. Small collapses in south and south-east. East wall has a hack creating a compartment like feature - ? result of treasure hunters.'

Hut 9 was not originally scheduled for conservation in the seventh season but it was noticed, at the end of the sixth season, that the entrance was collapsing. When the hut was surveyed

early in the 1995 season (Fig. 9) the north side of the entrance had collapsed down to ground level. Serious collapses were also recorded in the eastern and southern walls. The maximum height of the inner face was 1.6m and no outer face was visible. The hut is very close to the main footpath between the south-west entrance and the cairn and is frequently visited. The northern wall has certainly been eroded; the footpath passes over the spread of rubble that marks the wall top.

#### *Collapse 9a (Fig. 9)*

The treasure hunter hack and associated compartment like feature recorded by Dallimore (1978) had deteriorated considerably. There was a large void, measuring 1.9m x 0.7m, beneath facing that was little more than rubble, supported two or three long headers at the south and propped up on three fallen stones at the north (Plate 201). This area was on the point of collapsing completely and none of the facing was close to its original position. It was decided, in view of its proximity to the path, to clear this area and build a new face.

Clearance was started at the centre of the collapse. It soon became obvious that the facing to the north was partially supported by the stones in the collapsed masonry. The threatened facing was re-photographed. It had not been recorded in enough detail because it had not been anticipated that it would be under threat. The stones were marked in the 2m of facing to the north and west of the collapse. As clearance progressed the marked facing became increasingly unstable. Eventually, it was decided to dismantle some of the facing in order to prevent the damage that could be caused by an uncontrolled collapse. The masonry marked on Plate 202 was carefully dismantled. Plates 203 and 204 show the collapse after clearance. Only one possible basal stone survived confirming that the facing had been undermined. The line of the wall had been better indicated by the semi-collapsed facing above the void. Using this and the surviving stone as a guide, new facing was laid across the collapse (Plates 205 and 206). All but three of the marked stones were replaced close to their original positions. Slight adjustments were made where necessary because the facing had formed a slight overhang. Stones 2 and 6 could not be reused as they were part of the collapse and could not be integrated with the rest of the face. Stone V was replaced in order to make an adjustment in the lower part of the facing; the lower *in situ* stones were tilted forward and the replacement stone was used to provide a level platform for the facing above it. The wall was rebuilt to a height of 1.2m, this being the level of the ground on the outside of the hut.

#### *Collapse 9b (Fig. 9)*

There was a 1.8m wide collapse in the south wall of the hut the face having being reduced to a rubble slope (Plates 207 to 209). There was no mention of a collapse in this location in any of the previous reports. There was only slight lichen growth on the fallen masonry so it can be assumed that the collapse had occurred during the past two decades.

The rubble was cleared from the line of the face. Care was taken to avoid disturbing the extant facing on the other side of the dividing wall between huts 8 and 9. Plate 210 shows the collapse after initial clearance. The face had bulged out just to the right of the scale. Stone A was about 0.1m off line and a line of tilted, small headers could be traced across the rest of the collapse. These were also somewhat off line and totally unsuitable for use as a base for new masonry. The displaced stones were cleared from the collapse and the result is shown on Plate 211 (stone B is marked as a reference point). One possible header can be seen in the centre of the collapse. It was known from both Hughes (*ca.* 1906) and the R.C.H.A.M.W. (1960) plans that the wall was originally straight so the gap in the facing was filled with new masonry (Plates 212 to 214). An attempt was made to retain stone A close to its original position in the facing but it could not be made secure and was used elsewhere.

#### *Collapse 9c (Fig. 9)*

The north side of the entrance had recently collapsed and was marked by a heap of unweathered stone (Plate 215). The collapse was cleared revealing stable but somewhat

displaced stone. Further stone could be seen beneath that shown on Plate 216, indicating that the line of the face was close to that indicated by the orientation of the left hand scale. It was decided to build the new passage wall along this line. This proved to be very difficult as there was very little masonry that could be used as a good base. It was also necessary to add a stone to the inside corner where there was only a small platform available to support a stone. Eventually a long stone was set at a slight angle so that its weight was centred within the wall. Three attempts were made at rebuilding the corner before the face shown on Plate 217 was produced.

#### *Collapse 9d (Fig. 9)*

Several stones had fallen from the face on the inside of the south face of the entrance (Plate 218). The unstable and severely displaced stone was cleared. Stone A (Plate 219), a large fallen header, could not be moved without causing extensive disturbance. Masonry was added around stone A to the height of the facing to either side (Plate 220). The rest of the entrance passage was untidy but stable. A layer of stone was added to the floor of the passage in order to protect the base of the wall.

#### *Hut 10*

Hut 10 was excavated by Baring-Gould and Burnard in 1903 (Baring-Gould and Burnard 1904). They recovered a gilded bronze fibula, a corroded iron ring and a melon bead. A 0.8m wide, north-west facing, entrance was recorded, along with hut walls standing to a height of 1.2m.

Griffiths (1946) described hut 10 thus:

'A sub-rectangular hut of fairly good construction, 14 ft. x 7 ft. 6 ins. [2.3m x 4.3m] internally. The floor is 2 ft. [0.6m] below the general ground level. On the N it is set against hut 8, from which it is separated by a wall 5 ft. [1.5m] thick. The inner face of the hut wall is 3 ft. [0.9m] high on the S, 5 ft. [1.5m] on the N. On the west is an entrance 2 ft. 6 ins. [0.8m] wide, with a sloping passageway partly blocked by fallen stones.'

Dallimore (1978) recorded intact walls up to 1.75m in height and a threatened collapse in the east wall.

Four areas of collapse were identified at the beginning of the seventh season.

#### *Collapse 10a (Fig. 9)*

The north side of the entrance had collapsed and its increasing deterioration was the reason that this hut was chosen for conservation during this season. It appeared that several stones had been lost from the base of the wall causing the masonry above to slump (Plates 221 and 222). The line of the entrance was marked by the collapsed masonry, most of which had slipped to the east. The collapsed stone was cleared revealing an intact basal course. Stone A (Plate 223), on the inside of the entrance was sloping to the east at an angle that would not allow it to be used as a base for additional masonry. The stone was removed and small packing stones added in order to produce a level surface. The stone was then replaced.

An additional reason for the collapse was also revealed. A 1.0m high face (Plate 224) was uncovered behind the collapsed facing (marked as hidden face on Fig. 9). The masonry represented by collapse 10a could not have been bonded into the rest of the hut wall and would therefore have been somewhat unstable. The hidden face presumably represents an earlier entrance to the hut. This group of huts shows other signs of remodelling or rebuilding, there is also a blocked entrance in the south-west wall of hut 8 (see Hughes' plan; Fig. 10).



The passage was re-defined by the addition of new masonry along the line of the surviving basal course. The slab that had originally been lying at an angle on top of the wall used about half way up the new facing (Plates 225 and 226).

*Collapse 10b (Fig. 9)*

There was an area of instability in the south side of the entrance where several stones had been lost from the wall. This was consolidated by the addition of the stones shown on Plate 227.

*Collapse 10c (Fig. 9)*

There was a 0.7m x 0.9m void in the southern wall of the hut. Four large slabs appeared to have fallen from the upper part of the facing at the top of the void (Plate 228). These stones were cleared. The orientation of stones A and B, shown on the post clearance photograph (Plate 229), suggest that the facing may run behind the current line of the wall, forming part of an earlier phase of building. Unfortunately no further investigation was possible. The void was packed with the stones shown on Plate 230.

*Collapse 10d (Fig. 9)*

The top of most of the northern wall of the hut was overhanging the base by about 0.3m. This had resulted in a collapse in the upper part of the wall shown on Plate 231. The whole of the wall was examined in detail before any action was taken due to the danger of precipitating a serious collapse by removing stone from a curved area of overhang. The wall to the west of the collapse contained a high proportion of long headers and was stable. There was also a straight joint in the wall at the west edge of the collapse forming a break in the integrity of the face and suggesting that the masonry to the left hand side was self supporting. The loose stone was cleared down to the level of the two large triangular stones (A and B, Plates 231 and 232) in the centre of the collapse. The resulting dip in the face was filled with the new masonry indicated on Plate 232.

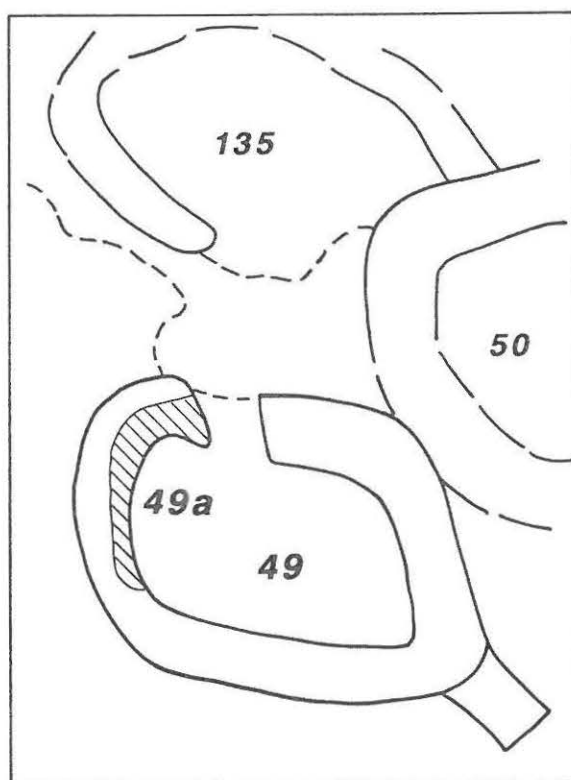


Fig. 11 Plan of hut 49 (after Plowman Craven and associates, 1980)

## ***Hut 49***

### ***Collapse 49a (Fig. 11)***

Emergency consolidation was carried out on the inner face to the south-west side of the entrance. The 1m high facing in the entrance passage was completely unsupported due to the fact that the core and facing had been lost from behind it. The jumbled stone seen between the ranging rods on Plate 233 was cleared. No surviving facing was identified. A new face was built along the presumed line of the wall and core was packed behind the facing in the entrance (Plate 234). No further action was taken but a quick examination showed that much of the hut was very unstable.

## ***Hut 137***

### ***Collapse 137a***

This collapse was conserved at the end of the sixth season (Hopewell 1994) but the newly constructed corner was thought to be too contrived and square. The new masonry was dismantled and a more rounded corner was constructed (Plate 235).

## **The south-west entrance**

Several stones had been displaced from the passage floor and the deposits below were being eroded (Plate 236). Several slabs taken from the loose stone to the outside of the entrance were added to the passage floor (Plate 236).

## **Footpaths**

A management plan for a controlled footpath network was prepared by Cyngor Dosbarth Dwyfor. This is currently under consideration.

## **ACKNOWLEDGEMENTS**

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