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REPORT ON THE FOURTH SEASON OF THE TRE'R CEIRI CONSERVATION PROJECT JUNE TO NOVEMBER 1992

PART 1: TEXT

D. HOPEWELL

INTRODUCTION

Tre'r ceiri, Llanaelhaern (SH373466), occupies the easternmost of the three peaks of Yr Eifl, which rises to 485m OD. Although the fort is one of the best preserved stone built hillforts in Britain, 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 programme aimed at the consolidation of the site. The Gwynedd Archaeological Trust was commissioned to supervise archaeological aspects of the project and record works as they progressed.

Supervision and recording in the first three seasons was undertaken by S.D. Boyle, who has now taken a post with R.C.A.H.M. Scotland. Archaeological works were conducted in the fourth season by the writer, with 6 weeks assistance from J.J. Carver.

The fourth season of the project began in May 1992, with a preliminary phase during which the condition of those areas due for conservation was recorded. The main works began on 29 June continuing until 2 October.

Staff and Supervision.

Conservation works were conducted by W.H.Evans, D.Ll. Jones and D. Hughes, all of T.I.R. stonemasons, Penrhyndeudraeth, under the supervision of the writer. Monthly site meetings were attended by Mr A. Davies and Mr H. M. Hughes of Cyngor Dosbarth Dwyfor, Dr. M. Yates of Cadw, Mr. J. St. Paul of Gwynedd County Council and Mr D. Longley of Gwynedd Archaeological Trust, at which the progress of the project was discussed and work programmes arranged.

Progress in the Fourth Season.

Work was conducted in two areas during the fourth season: Approximately 40m of wall running from collapse L5 towards the north-east end of the fort was conserved. This included the replacement of the lintel on the north postern. About 25m of wall between collapses EE and D, including the south-west entrance was conserved.

Recording methods.

As in previous seasons, the areas to be conserved were first photographed as an overlapping sequence of 'before conservation' views using a 28mm shift lens at a constant distance of 4m, on black and white and colour print film. A written description then followed, where each collapse was allocated a code based on Dallimores 1978 report (see fig. 2). A complete written and photographic record was made of all works as they progressed, supplemented with drawings where appropriate.

Details of Work Completed

Details follow of all conservation works completed during the fourth season. All works were carried out on the main rampart wall and can be located by reference to the numbering scheme produced by K. Dallimore in 1978 (fig. 2).



Fig.1. General Plan (after R.C.A.H.M. 1960) showing areas for conservation in Phase 4.

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



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MAIN WALL L6-M.

This stretch of wall some 13m long is generally well preserved. 8 areas requiring conservation were identified, 4 on the outer face and 4 on the inner.

Collapse L6 (Fig. 3).

This was a small area of instability at the top of the outer face (Plate 1). A 1m length of the upper course had become loose as the wall stepped up 0.45m at the east of the collapse. No *in situ* masonry was removed. The wall top was stabilised by placing several heavy headers onto the loose masonry (Plate 2).

Collapse L7 (Fig. 3).

1.6m east of L6 there was a 4.2m long dip in the outer face (Plate 3). The face was standing to a height of 1.4m to the west, falling to 1.0m in the centre of the collapse and stepping up steeply to 1.6m to the east. The *in situ* masonry was stable but core material was spilling forwards over it.

The loose core material was removed along with a few larger stones recently disturbed from the wall top. The dip was filled with large stones to retain the core (Plate 4).

A small void in the base of the wall at the western end of this stretch was packed with 3 stones.

Collapse L8 (Fig. 3).

There was a 1.7m wide and 0.9m deep collapse in the top of the outer face at this point (Plate 5). The core was retained above the collapse up to a height of 0.7m but was beginning to slip forwards. After the unstable core was cleared the face was rebuilt to the height of the surrounding extant masonry (Plate 6). No *in situ* facing was disturbed.



Fig.3. Wall L6 - M, locating collapses conserved during 1992 season.

Collapse L12 (Fig. 3).

A 2.9m wide and 1.0m deep collapse had occurred just to the west of the banquette at the north postern (Plate 7). There was a pronounced bulge in the wall at this point and it was assumed that the basal courses had slipped forward, causing the collapse.

The stones at the edge of the collapse were numbered and the tumbled masonry cleared. After clearance it became obvious that several courses of masonry had survived beneath the rubble (Plate 8). The basal courses had not slipped forward and the bulge in the wall was original masonry. This was planned, see fig. 4. Stones B,C,D,E, and Q were removed during clearance. B was too short to put back, the rest were replaced as closely as possible to their original positions. Stones H to P were held in place during dismantling by packing the void beneath K. H was pushed back slightly. The face was rebuilt to the height of the core standing behind it (Plate 9).



Fig.4. L12, after removal of tumble, showing bulge in wall.

Collapses L9,L10,L11 and L13 (Fig. 3).

These collapses in the inner face were recorded but were not conserved this season.

Collapse M: The North Postern (Fig. 3).

During the first season's work on Tre'r Ceiri the outermost lintel was broken and temporarily replaced with another stone (Plate 10). The broken lintel was taken to Cadw for repair, where the broken pieces were resin bonded and pinned together with 2 stainless steel rods. This was delivered to Tre'r Ceiri by helicopter on 17 August (Plate 11).

Consolidation of the north postern was carried during the first and third seasons work (see Boyle S.D., 1990 and 1992.) and was well advanced when work was suspended. The outer eastern corner of the passage had been rebuilt in 1989 but was felt to be unacceptably different in style to the original masonry. The build was too regular and the corner too square (Plate 10). It was decided to dismantle all the rebuilt masonry and attempt a restoration more closely mimicking the style of the original masonry. The outer four lintels were removed and the corner was taken down to ground level by removing the face and pinning unstable masonry and core as it was uncovered (Plate 12). The original corner was semi-collapsed but appeared to be somewhat

rounded and built out of relatively small irregular stones (Plate 13). The area to be rebuilt was very small and no further masonry could be disturbed without jeopardising a considerable length of *in situ* wall. It was felt that the original corner could not be exactly duplicated as there would be no way of tying the small stones into the main body of the wall. As this passage is open to the general public, safety is of paramount importance and an inherently unstable, though archaeologically correct, corner would not be acceptable. A compromise was produced by laying some stones diagonally into the corner thus breaking its line. The central three lintels were then replaced.



Fig. 5. Method for reducing loading on the repaired lintel.

It was not possible to accurately assess the load bearing capacity of the repaired lintel. It was thus necessary to avoid point loading and minimise the weight bearing on the centre of it. This was achieved by placing the now discarded replacement lintel above and behind the repaired stone and running long headers over this as in fig. 5. A void was thus produced above the repaired lintel which was loosely packed with stones.

Before conservation there was a ragged 0.5m deep dip in the wall as it ran over the north postern. As the presumed reason for roofing the passage was to carry the wall across the postern it seems likely that the wall originally stood to a height of at least 1m above the lintel. Safety however is of paramount importance here and it was felt that it would not be possible to secure a wall of this height without additional loading on the repaired lintel. It had also been observed that visitors to the site often climb onto the wall above the postern. If a potentially fragile face was built here there would be a danger of dislodged stones falling on the heads of visitors passing through the postern. It was decided to grade the wall down from the original face standing to the east and west and rebuild to a height of about 0.2m above the lintel thus replicating the masonry standing before conservation. The inner face was built to the same level and it was ensured that the top of both faces were secured with large heavy stones (Plates 14 and 15).

WALL N-O

12m of the inner face running east from collapse N were photographed. The wall was in generally good condition with a somewhat ragged parapet surviving along much of its length. There was only time to work on one collapse this season but it is anticipated that this area will be included in next seasons programme.



Fig.6. Wall M-O showing position of collapse N1 (after Plowman Craven, 1980).

Collapse N1 (Fig. 6)

A 3.7m length of the inner face had collapsed where the wall steps up the hill 23m east of the north postern (Plates 16 and 17). The face stands to a height of 1.5m to the west of the collapse and 1.6m to the east where the ground rises 1.1m and is revetted by a face running south at 90° to the main rampart. The parapet stands to a height of 0.2m above the collapse and is in a ruinous condition.

The stones at the edge of the collapse were marked A-Z and the collapsed rubble cleared. After clearance it could be seen that the face was still standing to a height of 0.5m at the centre of the collapse. A number of large flat stones lying at the base of the wall at ground level were uncovered. These appeared to be a continuation of the 'lower banquette' that runs east from the north postern. All *in situ* facing was stable and it was not necessary to disturb any of the marked stones.

Loose core was removed and the face was rebuilt to the height of the surrounding masonry using the stones cleared from the collapse (Plate 18). There was an area of potential weakness in the face at the east of the collapse where there was a 0.5m step up in the wall. *In situ* masonry was in danger of displacement so the face was graded up to the top of the step to provide greater stability (Plate 19).

WALL B1-C

The outer face of this 15m long stretch of wall was generally in good condition apart from collapse C where a footpath across the rampart had become established. The inner face was ruinous for much of its length. The blocked west postern was visible at the south of collapse C. In all, 7 separate areas of collapse were identified. Work began on collapse C moving south towards B1.



Fig.7. Wall EE-D, showing areas conserved during the 1992 season (Plan, S.D.Boyle, 1992)

Collapse C (Fig. 7).

Dallimore recorded a collapse running from close to the north-west corner of the fort to the south of the west postern, erroneously measured as 16m wide. It was decided to limit collapse C to the 4.0m area running up to but not including the west postern. The wall in this area was built on a steep scree slope.

i. The outer face.

The outer face had collapsed completely for 3.5m at the north of C (Plates 20 and 21). 0.5m of facing remained to the south of this standing to a maximum height of 0.8m (Plate 22). This was built from small stones and was only marginally stable. The upstanding masonry was numbered. The rubble at the north of the collapse was cleared revealing large amounts of loose core which tended to fall forwards over the cleared area. The core was pinned giving a degree of stability, and the clearance completed. Part of the facing at the south collapsed during clearance, it had presumably been supported by the tumbled masonry. This revealed the lower courses which were tipped forwards at an angle of about 30° (Plate 23), presumably caused by a movement or settling of the scree. In view of its weak construction of small stones it seems unlikely that the face standing above this could have survived such a major upheaval. It is therefore conceivable that this length of facing was a later, possibly modern, rebuild. It was decided to dismantle this face as it was extremely fragile and as the lower courses needed to be reset. The line of the wall was recorded and all the marked stones removed.

3.6m of facing had been lost (Plate 24), the tipped forward lower courses gave a good indication of the wall line at the south. It seems safe to assume that the face ran in a straight line between this and the surviving wall to the north. There appeared to be little virtue in trying to reset the numbered stones as they were too small and probably not original. The collapse was rebuilt to a height of 1m to retain the core and discourage visitors from climbing over the wall (Plates 25-27).

ii. The inner face.

There was a 2.8m long dip in the inner face here (Plate 28), the wall falling from 1.0m at the north to 0.4m at the centre of the collapse and stepping back up to 1.0m at the south. There were a number of slabs lying at the base of the wall and behind the facing. All *in situ* masonry was stable and the loose stones were set on top of this, thus grading the step at the south for greater stability (Plate 29).

A large void was noticed below ground level at the base of the wall, presumably due to settling of the scree slope outside the fort. This presented no immediate threat to the wall.

The West Postern (Fig.9).

Hughes recorded this postern on his original (unpublished, 1906) plan but did not include it in his published report (*Arch Camb*, 1907). Griffiths described it as 'a gap or postern 10 ft long and about 4 ft 6 ins wide' he also noted that 'the postern has been blocked, apparently deliberately, on its inner and outer ends, and has become partially blocked at the centre by fallen stones'.

The outer face (Collapse B6) curved inwards to a 0.8m wide, rubble choked, entrance (Plate 30). The face was stable and stood to a height of 1.0m. The passage running through the wall contained some rubble which had apparently fallen from the sides (Plate 31). No facing was visible at this point. The inner end of the passage was less well defined (Plate 32) being a 3.2m long dip in the inner face (collapse B3). The face falls from a ragged 0.6m at the south to 0.2m near the north end of the collapse. At this point the face steps up to 1.0m, possibly defining the north side of the entrance. The low facing was partially obscured with loose stone.

When the tumbled masonry was removed from the outer end of the passage a rough face constructed from large blocks of stone, up to 0.4m long, was revealed (Plate 33). This was blocking the entrance and clearly abutted the south side. No clear relationship could be seen on the north side as the incurving outer face appeared to be partially collapsed.



Fig.8. West postern, after clearance.

The loose stone was cleared from the inner face revealing two courses of uncharacteristically rectangular blocks, up to 0.8m long, running across the northernmost 2m of the entrance (Plate 34). One of these blocks had tipped backwards, apparently into a large void in the scree beneath the wall . The main inner face could be traced, curving inwards behind the blocking face to form the south wall of the passage (Fig. 8 and Plate 35). The northern wall could not be traced, it may have been lost as a result of the scree movement seen in this area. The line of the passage was clear however as it contained few small stones characteristic of the wall core (Plate 31). The postern had obviously been blocked at both ends without infilling the passage. It was therefore decided to build up the outer blocking face to the height of the rest of the wall thus discouraging access at this point (Plate 37). The inner face was stable but very low. Several abortive attempts were made at adding masonry to this, it was felt however that this was masking the entrance and adding little to the stability of the wall. The face at the south of the collapse was stabilised by placing heavy slabs on the wall top. Several small stones were added to the rest to support potentially fragile masonry but no height was added to the wall (Plate 38).

Collapse B5 (Fig. 7).

1.4m south of the west postern was a 1.2m long and 0.3m deep dip in the outer face (Plate 39). Several displaced stones lying above the *in situ* masonry were cleared. No original facing was disturbed and the dip was filled with heavy headers taken from the scree (Plate 40).

Collapse B4 (fig. 7).

This was a small, 0.7m long and 0.5m deep, dip in the outer face just to the south of B5 (Plate 41). All *in situ* masonry was stable and large headers were placed in the dip (Plate 42).

Outer wall top B4 to B (fig. 7).

Many of the stones on the top of the outer face were loose and were reset. These stones are indicated on plates 43 and 44 with black crosses.

Collapse B2 (Fig. 7).

0.4m of 1.0 m high stable facing remained to the south of B3 (Plate 45). The face then fell to a height of 0.3m rising raggedly over the next 2m to 1.0m. There was a void beneath the large header seen just to the right of the right hand scale on plate 45. This was packed to ensure the stability of the wall above it. A small amount of loose core was removed from the top of the stones at the base of the collapse. These stones were found to be stable and the face was rebuilt to a height of 0.8m (Plate 46).

Collapse B1 (Fig. 7).

Some 5.2m of the inner face between collapses B and B2 were in a very ruinous condition (Plate 47). A 1.7m length of facing survived at the north, standing to a height of 1.2m. the upper 0.6m was unstable, four possibly *in situ* stones were marked A to D (Plate 48) and the loose masonry dismantled. The remaining 3.5m was mostly obscured by collapsed masonry, with occasional lengths of the lower courses visible beneath the tumble. The displaced stone was cleared revealing intact lower courses standing to a height of about 0.2m, rising briefly to 0.6m 1m from the south end of the collapse (stone X on plate 49). At this point there was a 1.7m long and 0.3m deep stretch of facing standing above stone X. This face clearly did not continue down into the wall and stone X could be seen to run under it. This face is similar in construction to the parapet seen elsewhere in the fort except for the inner walkway which is only 0.7m wide. It appeared to be in line, albeit at a higher level, with the 'parapet' surviving at collapse A1 (see below), perhaps forming a ramp-like structure.

There was enough cleared stone to rebuild collapse B1 to a height of 0.6m thus retaining the core. Stone D remained in situ and stones A, B and C were replaced close to their original positions (Plate 50). The rest of the collapse was rebuilt, the wall top grading down towards collapse B (Plate 51). Two large slabs were placed above the ramp/parapet face to stabilise it.

THE SOUTH-WEST ENTRANCE AND ASSOCIATED FEATURES: COLLAPSES EE TO B1

Introduction.

The most common approach to Tre'r Ceiri is from the south-west where a number of pathways converge and wind up the steep slope towards the south-west entrance. The last 15m of footpath is very steep and rocky and two alternative routes into the fort had been established, running over the ramparts at collapses B and C. The resulting erosion had left the area around the entrance in a very dilapidated condition. The speed of erosion can be demonstrated by comparing photographs of the entrance taken in 1956 (Plate 52) and 1992 (Plate 53), where significant changes can be seen to have taken place to most of the features shown. The fragility of the area was further demonstrated when further erosion was noted between the pre-conservation recording of the

entrance in June 1992 and the start of consolidation work in August 1992. The area was surveyed in November 1991 and a detailed description and proposal produced (Boyle S. D. 1992). It was proposed that the surviving wall lengths should be stabilised and that if possible the entrance should be redefined.

Dallimore recorded two collapses at the south-west entrance; EE, described as a general collapse to the entrance and A, where the corner of the entrance is collapsing. A was described as being 5.0 m wide and refers to the corner on the north-west side. This definition of collapse A was found to be too generalised so it was subdivided into collapses A2, A3, A4 and A6. Collapse B, described by Dallimore as being 2m wide, is also relevant to this area.

General Description of the South-West Entrance before conservation (Fig. 7).

The footpath runs between two rough walls for about 15m before reaching the main rampart wall. There is no visible facing on these walls except for the final 5m on the north west side where a ragged face appears to abut the fort wall. The path next runs between two club shaped 'bastions' or thickenings of the inner rampart wall which form a passage about 5m long (Plate 53). The north-western wall of the passage is well preserved standing up to 1.8m high. The south-eastern wall was more difficult to trace as convincing facing was only visible for its outermost 0.8m. The passage was 1.5m wide to the outside apparently widening to 1.9m as it opened into the fort. The bastions to either side of the entrance had been reduced to practically featureless heaps of loose stone as had the main rampart running for about 5m to the north.

Collapses B and A1 (Fig. 7).

A well established footpath ran over collapse B and was commonly used as an alternative to the south-west entrance.

i. The inner face.

Collapse A1 consisted of a 2m long stretch of rather loose facing standing to a maximum height of 0.9m at the south and petering out at the north (Plate 54). Lying in front of this were a number of large stones.

The inner face had completely collapsed for the whole of B (Plates 55 and 56). No obvious basal courses were visible and collapsed masonry had spilled forwards over the probable line of the inner face. It was decided to clear both collapses together. When the loose stone had been removed the basal courses could be traced across the whole of collapse B (Plate 57). It became obvious however that the face standing at collapse A1 was not continuous with this and was more likely to be a length of parapet. Unfortunately the basal courses could not be traced across A1 with any certainty. Some in situ facing had survived to the south of the collapse and it seems likely that this was originally continuous with the face at collapse B. The face of the 'parapet' at A1 did not run down into the wall, 2 large almost certainly *in situ* slabs run under the bottom of the face and thus indicate the minimum height of masonry originally standing in front of this (Plate 58).

Using this as a guide the inner wall face was rebuilt using a line extrapolated from the surviving face at the south of A1 to the basal courses at collapse B. It was then graded up across B to the height of the rebuilt face of collapse B1 (Plates 59 and 60). The face of the parapet at A1 was very loose and mainly semi-collapsed. Only the lower courses and two large stones, A and B on Plate 58 were stable and could be considered to be *in situ*. The loose masonry was dismantled and rebuilt. Particular care was taken to secure all rebuilt masonry by laying large heavy stones on the edges of the walls and where possible on the wall tops.

ii. Collapse B outer face and collapse A2 (Fig. 7).

The damage caused by the footpath running over the rampart was most evident at this point (Plate 62). Dallimore recorded the collapse as being 2.0m wide in 1978, at the beginning of this

seasons work it was 5.0m wide. At the north end of the collapse 1.2m of the face is still standing to a maximum height of 1.4m. This stretch of facing deviates 28° to the west from the line of the wall and is bounded to the north by an apparent straight joint (Plate 63). A few tumbled stones were removed from the base of the wall revealing the lower courses. It could now be seen that several large slabs near the base of the wall had slipped forwards by at least 0.3m taking the whole of this length of facing with them (Plate 64). The lower 0.3m appeared to be stable with loose recently disturbed masonry above it. There was no visible surviving facing for the next 2.5m, the erosion around the footpath had reduced this area to a featureless rubble slope with stone spilling downhill for several metres (Plate 65). Beyond this was a 1.0m length of very unstable and ragged facing running towards and apparently in front of the bastion (Collapse A2, Plates 66 and 62). The facing seemed to be built on loose scree and the most southerly portion was beginning to slide downhill. Unfortunately between initial recording in June and conservation in August this length of facing had further collapsed making it difficult to trace. The loose rubble was carefully cleared from the collapse but no lower courses were found.



Fig. 9. Collapse B, outer face, after clearance.

As clearance continued a substantial wall face was discovered to have survived beneath the collapsed masonry, running from the surviving face to the north to the bastion to the south. Further clearance revealed another possible face running about 1.0m in front of this (Plates 68 and 69).

The innermost face was 1.0 to 1.2m high and was stable. This face appeared to be uniformly weathered, all the stones were rounded with no sharp edges (Plate 70). it was similar in appearance to the outer face standing elsewhere on the fort although having been buried it lacks the covering of grey crustose lichen that grows on every undisturbed stone on Tre'r Ceiri. At the south the face runs behind the bastion (Plate 71). A small void between the bastion and the buried face was revealed when loose stone was cleared from the wall top making it possible to trace the face within the wall, running from north to south, for some 1.8m (Plate 72). It then turns 90° to the east where it could be traced for a further 3.5m. The void was between 0.05 and 0.2m wide at the top and continued down into the wall in front of the face for up to 1.3m. It was therefore obvious that the bastion was a separate construction that had been butted against the wall. As the bastion was semi-collapsed the core had shifted somewhat forming a void along the abutment.

The face that had been uncovered in front of this was less well defined. It stood to a height of 0.75m at the north falling to 0.5m at the south and was very roughly built from a mixture of large slabs and headers and smaller irregular stones (Plate 73). This could be traced for a length of 6m, running 1m south of and parallel to the innermost face described above. The line of the facing could not be established with any certainty at the south. Its relationship to the slipped forward face to the south and the bastion to the north could not be established due to its ruinous condition. It seems unlikely that this face stood to any great height due to its poor quality of building. The most probable function of this masonry seems to be as a buttress, stabilising the scree at the base of the wall. Similar features can be seen to the south-east of the south-west entrance and in the scree to the north of the fort. however as the morphology and extent of this feature could not be clearly defined any interpretation must be conjectural. In view of its inherent instability any consolidation work would entail almost total destruction so the area was planned (Fig. 9) and photographed and the face carefully reburied.

The relationship between the innermost face and the facing to the north of it was somewhat problematic. the slipped forward facing was standing 0.3m in front of the line of the buried face. The buried face however ended in an area of collapse and clearly did not run behind the slipped forward face (Plate 74). If the basal course of the slipped forward facing is plotted in relation to the rest of the wall the face is nearly continuous albeit with a pronounced bulge at the point of collapse. It was thus decided to rebuild this area as a continuous face. The stable but off line masonry to the north was marked (Plate 63) and the recently disturbed stones above it cleared. Stone H was loose and so was pushed back flush with the rest of the face and the collapsed stone was removed from the gap between the two lengths of facing. During this clearance several voids were revealed where the facing had slipped forward and become detached from the core. These were packed and the collapse was rebuilt, connecting the two lengths of facing (Plate 75).

The rest of the newly exposed face was in good condition. Two stones were loose and were marked A and B (Plate 76). A was pushed back 0.2m and B was removed and reset. Standing above the extant face was about 0.3m of loose displaced core and stones from the wall top (Plate 77). This was cleared and several courses were added to the wall in order to retain the core (Plates 78 and 63). This added a maximum of 0.6m to the height of the face.



Fig. 10. South-west entrance (Hughes 1906)

The Northern Bastion (Fig. 7).

In 1956, Hogg described the inner rampart at the south-west as being 'slightly thickened by a roughly semi-circular external bastion on each side'. The northern bastion, running from collapse A2 to the entrance passage, was in a very poor condition and was subdivided into 2 collapses.

i. Collapse A3 (Fig. 7).

A 3m length of rough facing had survived, standing to a maximum height of 1.0m. The face was very roughly built from large irregular stones (Plate 79). It was all somewhat unstable and ran into areas of undifferentiated collapse at the north-east and south- west. As the loose stone lying at the base of the wall was cleared, it became clear that the bastion was built on loose scree, this would account for its instability. 2 large slabs were propping up part of the face (Plate 80, stones A and B). 2 or 3 long stones were running down between the stones in front of the bastion (Plate 80 stone C), possibly introduced in an attempt to pin the scree. Only the lowest 0.3m of facing was stable, the majority of stones above this having been recently displaced. These stones were carefully removed, revealing some loose core and a 1.5m long and 0.6m high stretch of facing (Plate 81). This was unweathered and did not continue down into the bastion. It is probable that this facing was an internal structure within the core of the bastion.

As the bastion face ran towards the main wall at collapse B it had collapsed down to ground level (Plate 79). A few possible facing stones were uncovered turning to the N.N.W. following a similar line to the now reburied 'face' at collapse B (see fig. 9). There was not enough *in situ* masonry in this area to demonstrate a reliable relationship between the 2 faces of collapse B and the bastion. It was therefore decided to leave the collapsed end of the bastion as a rough slope (Plate 82).

ii. Collapse A6 (Fig. 7).

Running 1.7 m from the south-west end of A3 to the outer corner of the entrance passage was a steep unstable rubble slope. Hughes' plan in 1906 showed the bastion as convex thickening of the wall. In 1956 (Plate 52) the majority of the core was still standing within the area shown on Hughes plan. By the beginning of the 1992 seasons work this area had become seriously eroded. Loose stone was spilling downhill for 2m and the remaining core was very unstable (Plate 83).

A large amount of tumble was removed from the bastion and the slope in front of it. The basal course at the north continued for 0.3m beyond the edge of A3, where it emerged that 1.4m of facing had been completely lost, presumably due to scree movement (Plate 84). To the south of this the face continues for 1.2 m before turning north-east into the south-west entrance. It was decided to rebuild collapse A6 along a line extrapolated between the ends of the surviving lengths of facing. The face was built to a height of 0.8m, the minimum required to retain the core, using large irregular stones cleared from the collapse (Plate 85).

The South-West Entrance Passage: Collapses A5, A4, A7, EE1 and EE2 (Fig. 7).

The passage running between the bastions has usually been seen as the main entrance to the fort and has consequently suffered from severe erosion. 5 distinct areas of collapse were identified.

i. Collapse A5 (Fig. 7).

The central 3.0m of the north-west side of the passage was standing between 0.8 and 1.0m high. The upper 0.4m of facing in the centre of this area was not covered in the usual grey lichen and was poorly built from small stones (Plates 86 and 87). The 1956 photograph (Plate 52) of the south-west entrance shows a collapse in this area. It was therefore obvious that this was a recent rebuild. As it was unstable, the surrounding original masonry was marked and the rebuild was dismantled. Stone I was loose and was rotated 90° to form a stable platform for the rebuild. The face was reconstructed above this to a height of 1.2m (Plate 88).

ii. Collapse A4 (Fig. 7).

A 1m length of facing had collapsed between A5 and the outer corner of the passage. The stones to the north-east had already been marked (Plates 85 and 86) so the remaining masonry was marked T to Y (Plate 89). After clearance it could be seen that stone T had slipped forward, probably causing the collapse, and that X and Y were *in situ* (Plate 90). The collapse was rebuilt to the height of the surrounding masonry (Plate 91).





iii. Collapses A7, EE1 and the Passage Floor (Fig. 7).

The northern corner of the passage had partially collapsed (A7). 1m of facing at the inner end of the passage was standing up to 0.3m above the collapse and a large amount of stone had fallen into the passageway (Plate 95). It was therefore decided to clear the passage floor and collapse EE1 at the same time as A7. 2.8m of facing on the south-eastern side of the passage, including the inner corner, had been lost (EE1, Plates 92-94). It was generally assumed that the passage widens to about 2m at its inner end, indeed a small stretch of unweathered facing similar to upper A5 was standing here (Plate 93). This was obviously a recent rebuild, the stones were small and it was standing on tumbled core. Hughes, however, in 1906 cleared the passage 'sufficiently to ascertain its plan' and uncovered 'some stones low down, which in all probability, indicate the outline of the wall; though on the other hand, they may form portions of a rough paved way'. These stones suggested that the entrance narrowed to 2 ft (Fig.10).

Much of the stone laying at the inner end of the passage was recently disturbed and initial clearance revealed the presence of large amounts of collapsed masonry at the base of the northeast wall, much of it in the area of collapse A7 (Plate 95). This was carefully removed revealing 3 large stones on the south-east side of the entrance; 2 large slabs set one on top of the other forming a convincing eastern corner to the passage and another 0.6m long apparently in situ facing stone (Plates 96 and 97). Hughes presumably recorded the tops of these stones in 1906. The floor of the passage was still covered in stones many embedded in a layer of black sticky peat. This peat contained a number of fragments of aluminium foil and plastic and sat over hollows in the stones beneath it. It had therefore been redeposited, recently washed or carried down from the eroded areas to the north-east of the entrance. The area was planned (Fig. 11) and the peat and loose stone removed. Beneath this was a number of worn stones (Plate 98). The stones at the inner end of the passage were irregular but well set. The rest of the passage contained a number of small flat slabs which butted up to but did not run under the base of the wall. This was presumably the remains of the original paving. The stones to the south-east of the newly uncovered facing appeared to be dislodged core sitting on scree and natural subsoil. A small area of turf was peeled back along the presumed line of the inner face to the south-east of the entrance but no more facing stones were found (Plate 36, foreground). It appears that the inner end of the passage was blocked by collapse A7 causing a deviation of the path to the southwest, thus creating an area of erosion and an apparent widening of the passage.

After the above clearance it could be seen that the northern corner of the passage had collapsed down to ground level. The stone forming the corner on plate 99 was loose and tipped to one side. This and the two loose stones above it were removed (Plate 100). No *in situ* masonry was disturbed and the corner stone was replaced close to its original position. The collapse was rebuilt with 3 large slabs to a height of 0.8m (Plate 101). Collapse EE1 was rebuilt along the line of the *in situ* facing using the stones cleared from the passage floor (Plate 102). The inner end was built to a height of 0.75m rising to 1.1m where it met the extant facing at the southern corner of the passage (collapse EE2).

Some of the smaller flat stones on the passage floor were loose. Several attempts at pinning and chocking were made but with limited success. The stones were lying on loose small scree which may have been disturbed during clearance. As no large definitely *in situ* slabs were threatened it was decided to leave this area over the winter to allow the substrate to settle and reassess the situation at the beginning of next seasons work.

iv. Collapse EE2 (Fig. 7).

A 1.9 m length of facing survived at the southern corner of the passage standing to a height of 0.7m. The 3 large stones to the right of the left hand scale on plate 105 appeared to form the corner of the passage, the rest of the masonry being part of the rough wall running downhill from this. Loose core standing above and laying in front of this facing was removed. It could then be seen that the rough wall abutted the corner of the south-east bastion. The face at the passage\bastion corner was built up to a height of 1.1m (Plate 106). The rest of the loose masonry in the area was temporarily pinned to prevent further collapse before next seasons conservation work.

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