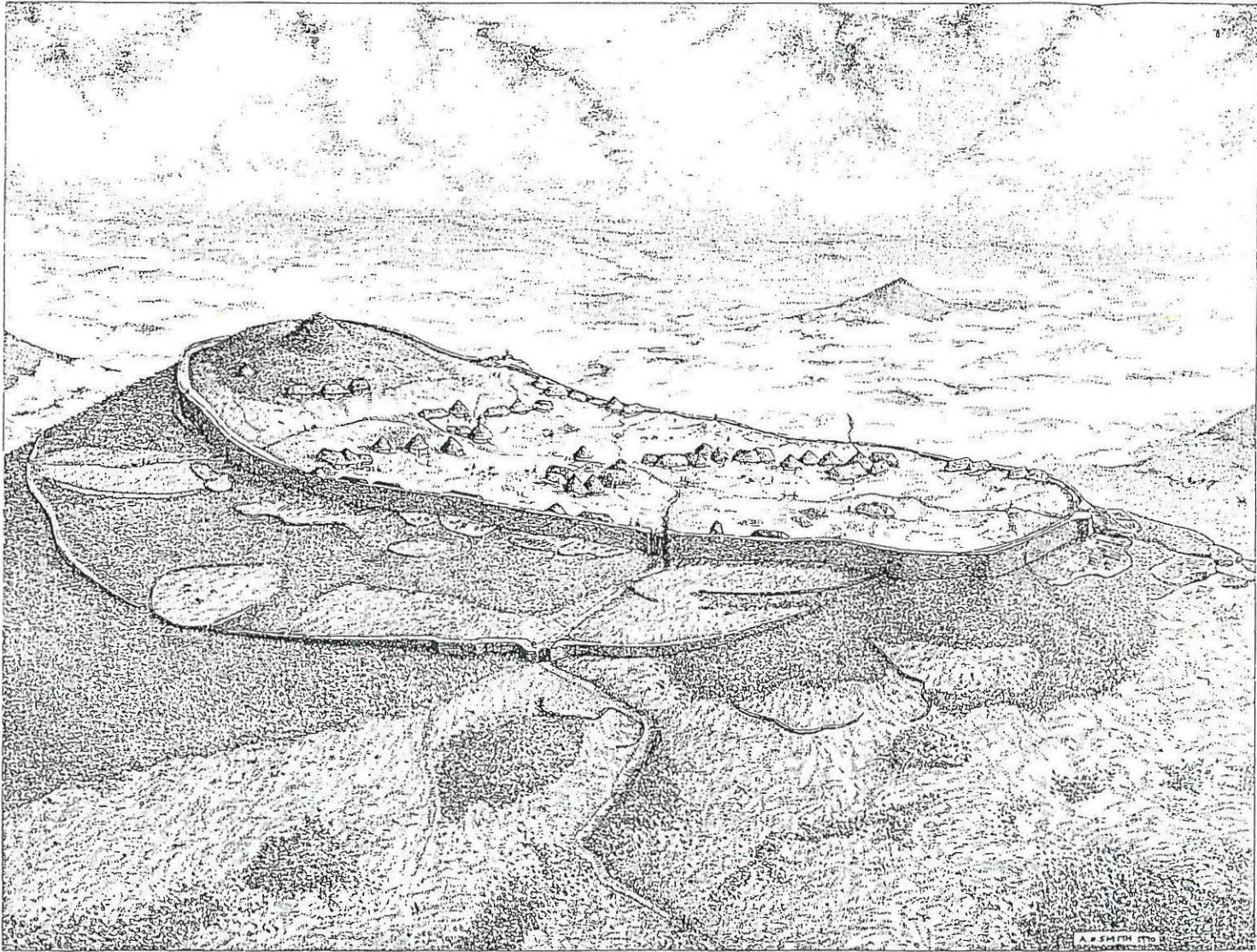


TRE'R CEIRI
CONSERVATION PROJECT
1989 - 90
PART 1: TEXT



Ymddiriedolaeth Archaeolegol Gwynedd Cyf
Gwynedd Archaeological Trust Ltd

REPORT ON THE FIRST SEASON OF THE
TRE'R CEIRI CONSERVATION PROJECT
DECEMBER 1989 - MARCH 1990

S.D.BOYLE

FOR

GWYNEDD ARCHAEOLOGICAL TRUST LTD.

PART 1: TEXT

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Introduction.

Tre'r Ceiri (SH373446) occupies the easternmost of the three peaks of Yr Eifl, which rises to 485m OD. The fort has often been described as one of the best preserved stone built hillforts in the British Isles, but in recent years there has been increasing concern about the rate at which the monument has been deteriorating, and in 1989 Cyngor Dosbarth Dwyfor, in conjunction with Cadw: Welsh Historic Monuments, embarked on a conservation programme with the intention of consolidating the remains. The Gwynedd Archaeological Trust was commissioned to supervise archaeological aspects of the project and record works as they progressed.

The first season of the project began on 11 December 1989, continuing until 2 March 1990, with a break of one week over Christmas. This report presents a detailed account of all works conducted during that eleven week period.

Previous Work on the Site.

There is no space here to discuss in detail the various surveys and excavations on Tre'r Ceiri, but as these are occasionally referred to in this report a brief account of them may be useful at this point.

Over the last century five excavations on the site have been recorded, and three plans of the fort have been produced. The first excavations were in 1887, or shortly before, when Hugh Prichard examined the structure of the rampart 'at a point a little to the east' of the north postern or sally-port (Prichard 1887). Rather more extensive excavations were conducted in 1903, when thirty two huts were examined (Baring-Gould and Burnard 1904), and three years later another thirty two huts were excavated and the two main entrances (on the SW and W) were cleared (Hughes 1907). At about this time Harold Hughes undertook the first survey of the site to modern standards (part of this is illustrated on Fig. 3). The published plan was 'intended as a key plan only to the sites excavated' many details requiring correction (Hughes 1907, 39). However a revised version was never published, and may not have been completed.

Further fieldwork was conducted on the site during the middle decades of this century, mostly by the staff of the Royal Commission on Ancient and Historical Monuments of Wales, then preparing the *Caernarvonshire Inventory* (R.C.A.H.M. 1960). In 1939 small scale excavations by W.J. Hemp, G. Bersu and C.A. Gresham examined five huts and part of the inner face of the main rampart on its NW side (Hogg 1960, 37-8 and Anon, n.d.). In 1946 W.E.Griffiths compiled a detailed description of the remains (Griffiths 1946) and in 1956 A.H.A. Hogg excavated part or all of another ten huts, and also examined the W entrance through the outer rampart (Hogg 1960). Also at this time a new plan of the fort was produced (Fig. 1).

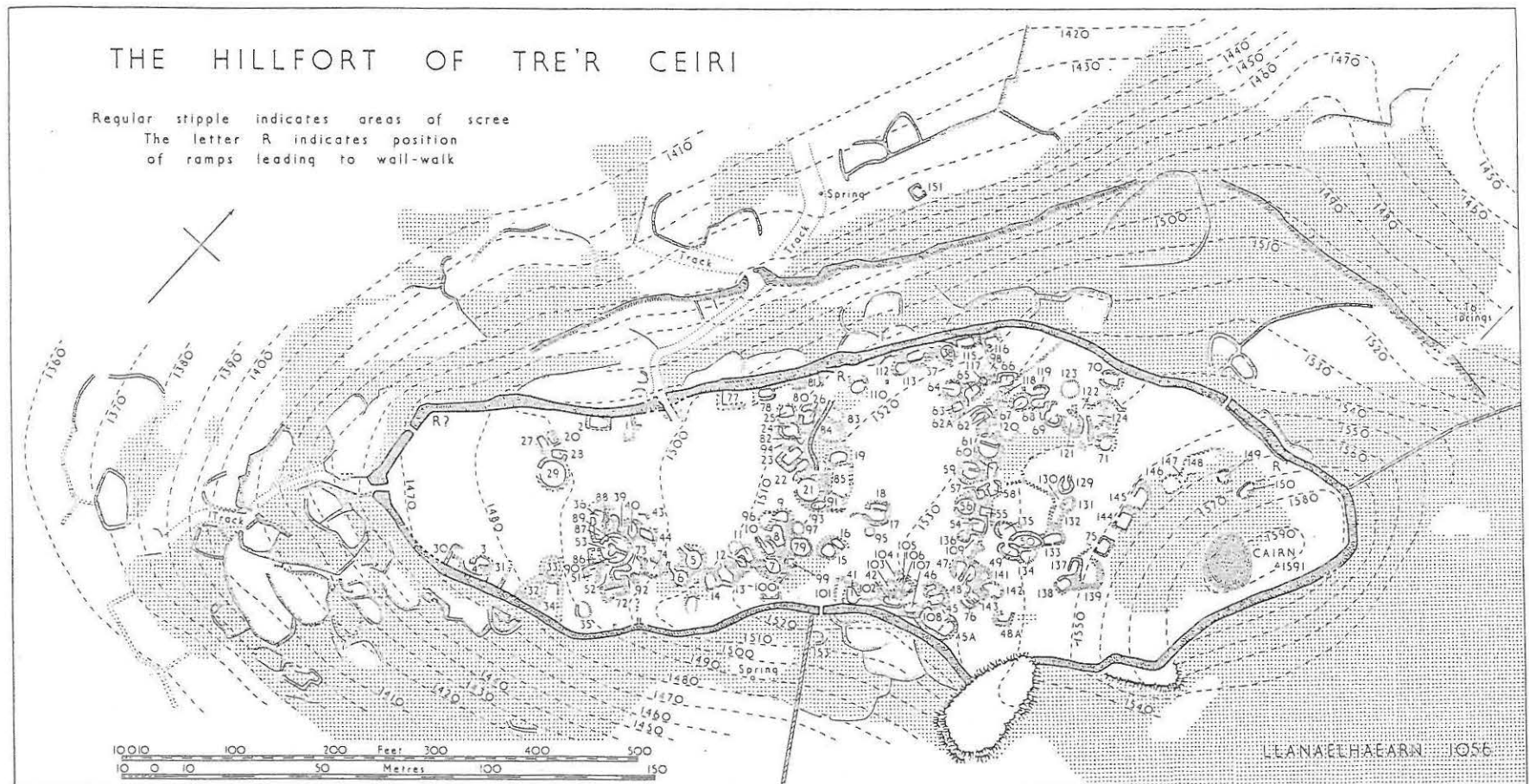


Fig. 1. General Plan (after R.C.A.H.M. 1960) showing areas for conservation in Phase 1.

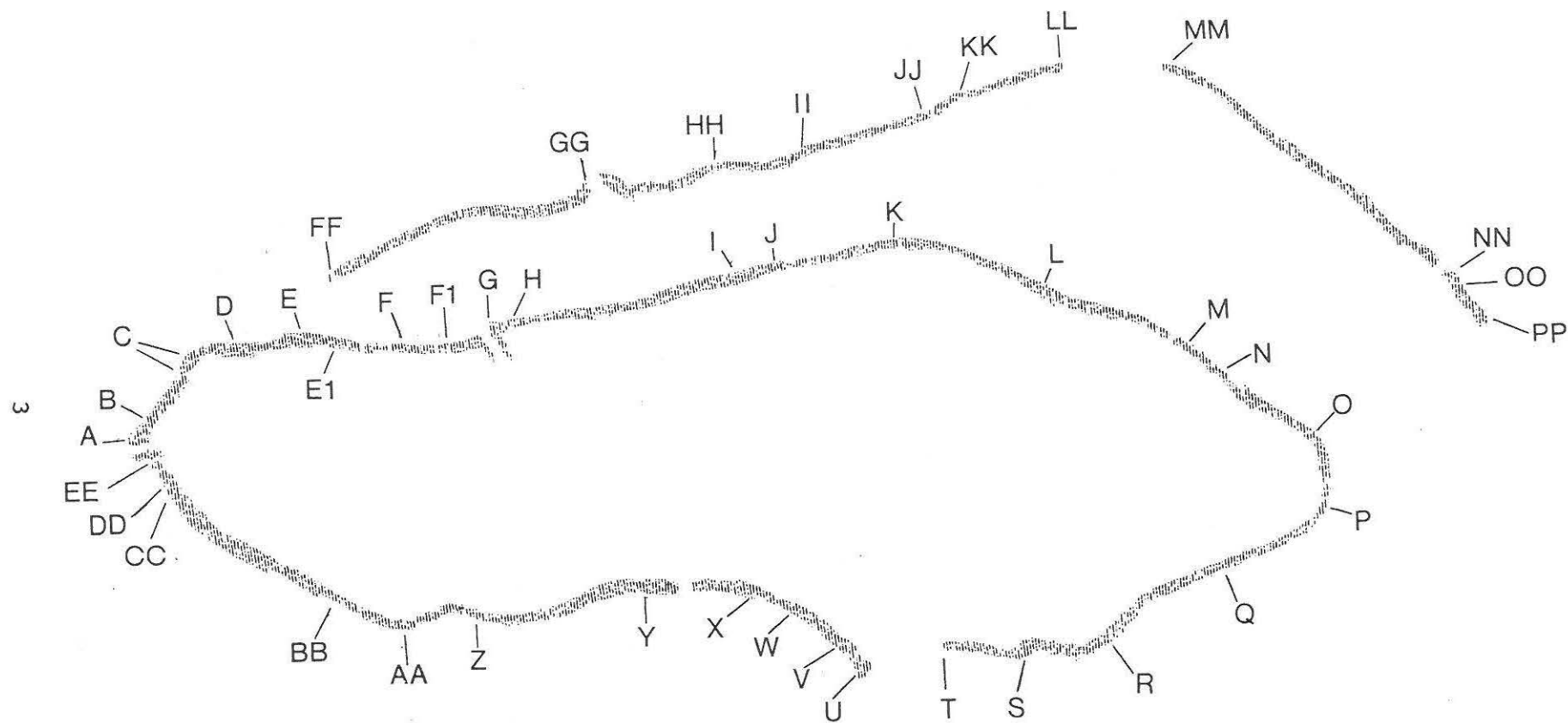


Fig. 2. The Ramparts: points of collapse (after Dallimore 1978).

In 1978 K. Dallimore reported in some detail to the Welsh Office (Ancient Monuments Branch) on the state of the monument, recommending a programme of consolidation and conservation to prevent further damage (Dallimore 1978). Of particular use to the present project is his survey of the condition of the ramparts, around which he identified and named 42 points or areas of collapse (Fig. 2). The most recent plan of the site, a photogrammetric survey produced in 1980, was also commissioned by the Welsh Office. Although in most respects this plan appears to be accurate, it was not drawn up from an archaeological viewpoint, and differs from earlier surveys in that it is largely lacking in interpretation (compare for example Figs. 4 and 5). It is therefore in need of much annotation on site, and it is hoped that there will be time for this during the Conservation Project.

Staff and Supervision.

Conservation works were conducted by three stone masons, W.H. Evans, W.O. Ellis and D.Ll. Jones, all of E & E Stone Masons, Penrhyndeudraeth, under the supervision of the writer. The writer has also been responsible for recording the condition of the monument before and after conservation, and also recording archaeological features revealed while work was in progress. During the last four weeks of the first season A. Smith assisted with the photography.

During the season regular site meetings were attended by Dr. M. Yates and Mr. M. Watkins of Cadw, Mr. A. Davies and Mr. A. Sturkey of Cyngor Dosbarth Dwyfor, and Mr. P. Fasham of the Gwynedd Archaeological Trust, at which recording methods and building techniques were examined and discussed, and work programmes were arranged.

Progress in the first season.

Three areas were designated for attention during Phase 1 of the project: the huts around roundhouse 53/89/90, the main rampart between the SW and W entrances, and a 30m length of the main rampart at the N end of the fort, including the north postern, or 'sally-port' (Fig. 1).

In the event works were carried out on only 11 of the 17 huts, and at only four points on the rampart. The principal reason for this was unquestionably the poor weather conditions. It was only to be expected that some days would be lost from a project conducted on such an exposed site in the middle of winter, but conditions were particularly severe: the Meteorological Office have reported that Wales suffered its windiest February on record. Difficulties were compounded by the loss of the mobile caravan. Parked below the SW entrance to the fort at 418m OD, this was destroyed in the storm of 26 January. A replacement did not arrive until the last week of the season, and on several days the lack of shelter resulted in work being abandoned more readily than it would otherwise have been. In all, work on site took place on only 27 days during the eleven weeks.

Teething troubles also slowed progress. The masons had to adapt their accustomed techniques to ensure that rebuilt masonry blended with original work and at the same time was secure enough to withstand the careless feet of visitors. In some cases restored walls had to be dismantled and rebuilt. A particular problem was developing a technique for securing wall tops: this is discussed below (p.29).

In a sense the slower than expected rate of progress was no bad thing. It allowed unforeseen problems, such as potential deficiencies in recording, unsatisfactory masonry techniques and misunderstandings over instructions to be identified, discussed and rectified at an early stage. It is anticipated that in future seasons work will proceed more smoothly.

Recording methods.

A full description was made of all works as they progressed, both in a 'day book' and on record sheets designed for the project. The written record was supplemented with photographs, sketches and occasionally plans and sections.

Photography.

All the areas designated for conservation during Phase 1 were been photographed in detail.

145 monochrome photographs were taken of the hut group before conservation began. As well as general views, all wall faces were photographed as close to 'straight-on' as possible.

Photographing the rampart was more difficult. Again, 'straight-on' views were taken, each frame covering approximately 1.5m of wall, in a series of overlapping sequences, with more general shots showing the position of the scales for each sequence. Attempts were made to ensure that each photograph was taken at approximately the same distance (4.5m) from the wall face, although on the irregular slopes outside the rampart this was not always practicable. In all 355 monochrome frames were taken of 145m of rampart.

Colour slides were also used, though usually only for general views and for points of particular interest. At a site meeting during the season Cadw requested that colour print film also be used for detailed recording, and to date a set of colour prints has been compiled for the SW half of the rampart between the two entrances.

During conservation, photographs were taken of collapsed walls being removed, of any features uncovered after the removal of the collapse, and of techniques used in rebuilding. A start was also made on a photographic survey of the monument 'after conservation'. In all over 1100 photographs were taken in the first season. Details of these have been stored on computer to enable rapid retrieval of required frames.

The quality of the prints varies. This was due to the weather, those taken in wet or misty weather often being flat and lacking in sharpness.

Drawing.

There was initially some misunderstanding between the writer and Cadw regarding how much drawing should be done during conservation. To avoid holding up works most recording was restricted to photography and a written description, supplemented by sketches. Although some 'formal' drawings were made, at other times masonry was dismantled with only a photographic record being made.

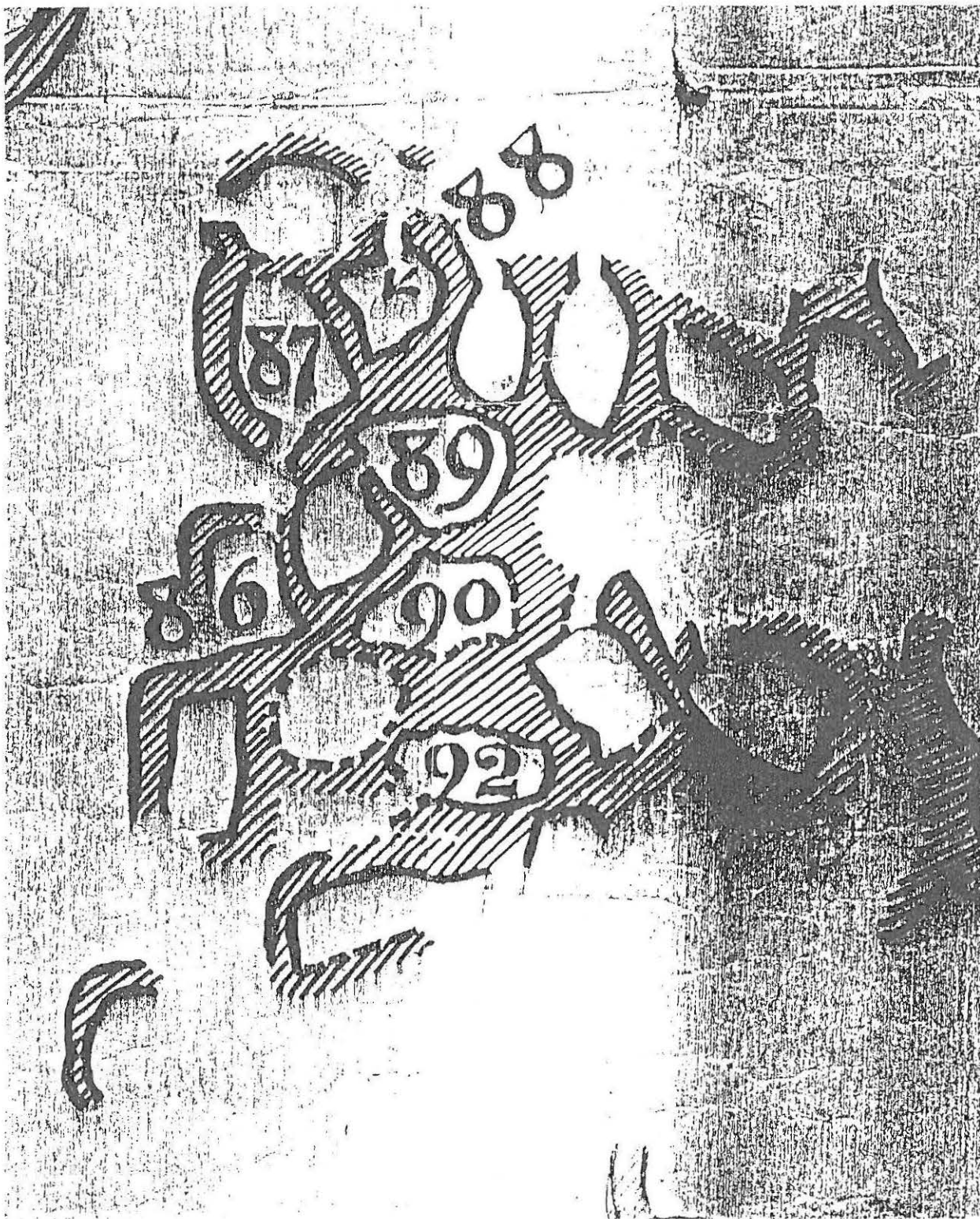


Fig. 3. Hughes' plan (undated, but c.1906) of huts 53/89/90 &c.
Scale: one inch to sixteen feet.

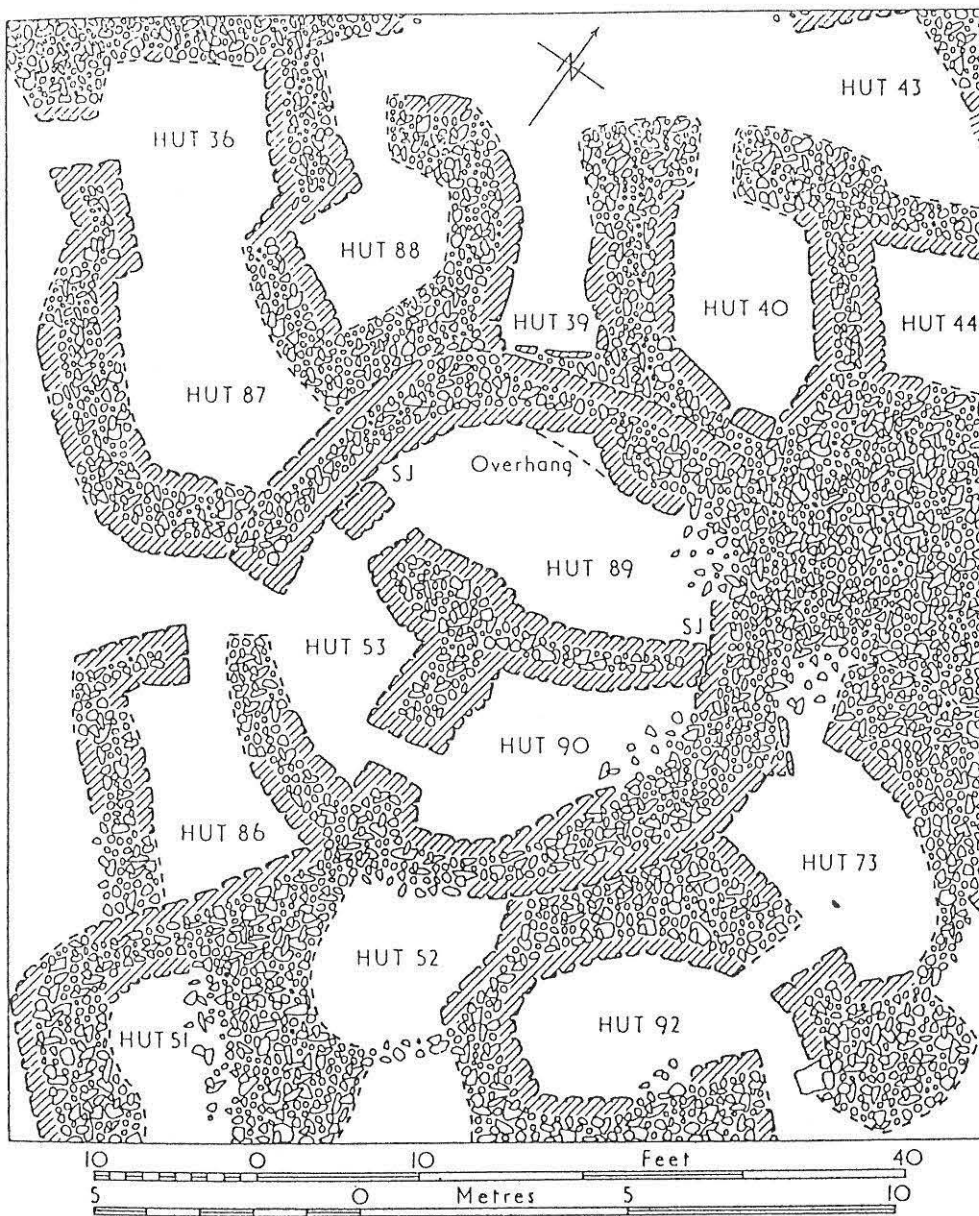


Fig. 4. Plan of huts 53/89/90 &c. from the 1956 excavations (after Hogg 1960).

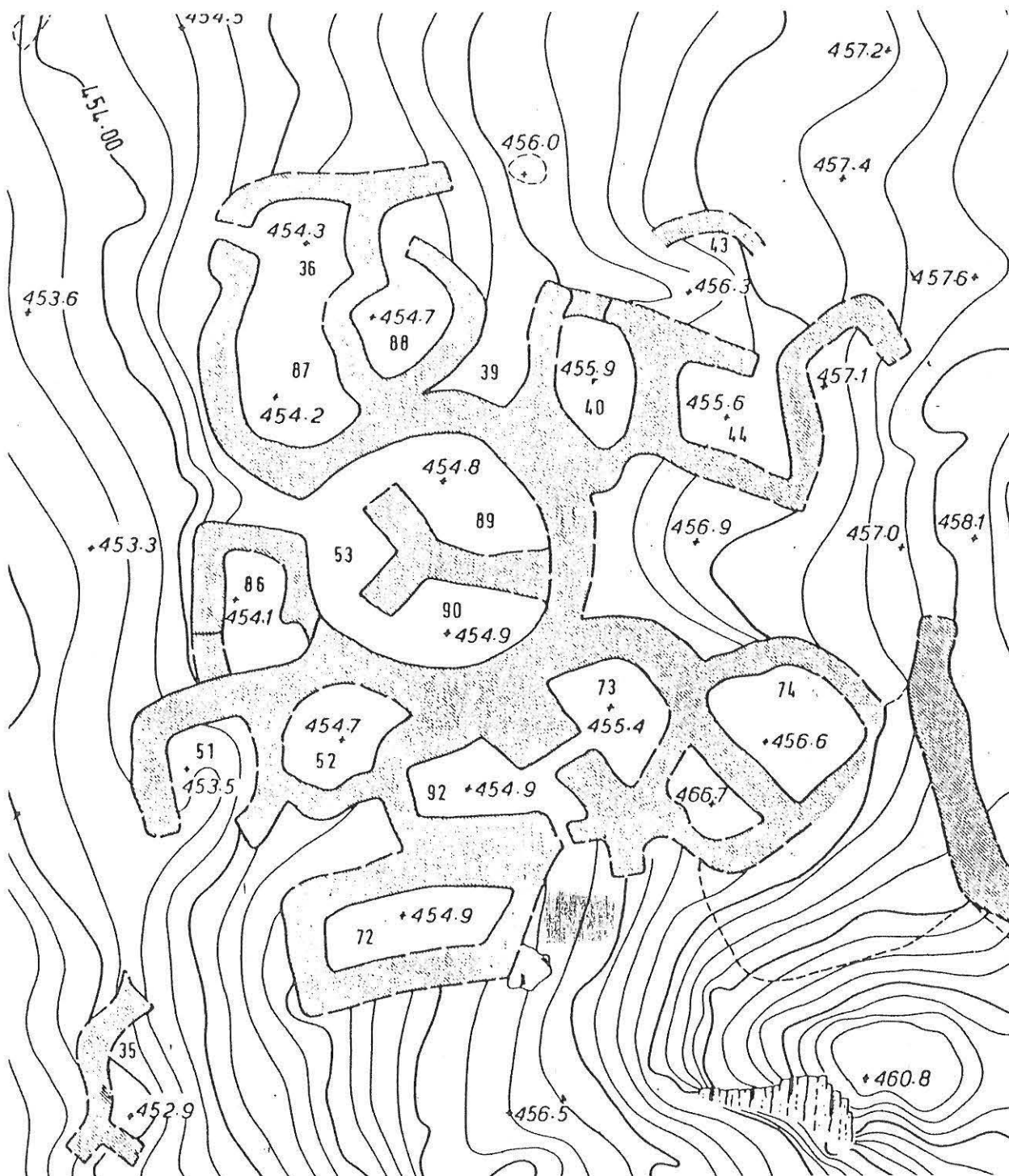


Fig. 5. Plan of huts 53/89/90 &c. from the 1980 photogrammetric survey.
Scale 1:200.

Details of Work Completed: The Huts.

The group of huts around roundhouse 53/89/90 (Figs. 3, 4 and 5) was chosen for conservation in the first season for four reasons.

- 1) Most of them had been excavated, and there was little likelihood of undisturbed archaeological deposits surviving. The stone masons would therefore be able to practice their techniques without the risk of causing irreparable damage.
- 2) Most of the group had been planned in detail during the excavations of 1956 and this plan would provide a useful guide for conservation work (Fig. 4).
- 3) The group lay across one of the most frequently used routes through the monument, and had suffered badly as a result.
- 4) As these were the first huts seen by most visitors, redefining them would enable other huts to be more easily appreciated and, hopefully respected.

There are seventeen huts in the group. Conservation work was carried out on eleven of these, as described below. To enable the text and the plates to be related more easily, the account of each hut is accompanied by a plan (from the 1980 survey) indicating the direction of view of each photograph (plate numbers are circled).

Hut 86.

A sub-rectangular hut on the SW edge of the group. Before conservation (Plate 1) much of the inner facing at the E corner remained standing, but the W end of the SE wall was much ruined and the N half of the NE wall had collapsed completely. The entrance in the NW wall was blocked, although both sides of the passage were visible (Plate 2). The position of the W corner was clear, although the stones were tumbled and spread. The S half of the SW wall was completely turfed over, but Griffiths' suggestion that there may have been an entrance here seems unlikely. In the E corner there was a hole 0.4m deep (Plate 3).

The hut was excavated in 1903, yielding 'an ox tooth and some tiny fragments of red pottery'. In 1956, Hogg was unable to trace the circuit of the outer face of round hut 53/89/90 at its junction with hut 86, as there had been 'a good deal of ruin and modern rebuilding' (Hogg 1960, 34), and therefore the relationship of 86 with the roundhouse could not be established. No further evidence on this point was uncovered in 1989, but the shape of the hut does suggest that it was built against a pre-existing roundhouse.

The tumble was removed from the inner face of the N end of the NE wall, revealing a core of large stones. Little remained of the wall face, but the surviving door jamb at the N end of the wall, and two large stones protruding from the core immediately S of this (Plate 4, above and to the left of the scale), indicated a wall thickness of c.1m, narrowing slightly towards the N end, much as planned by Hogg, and these stones were used as a guide

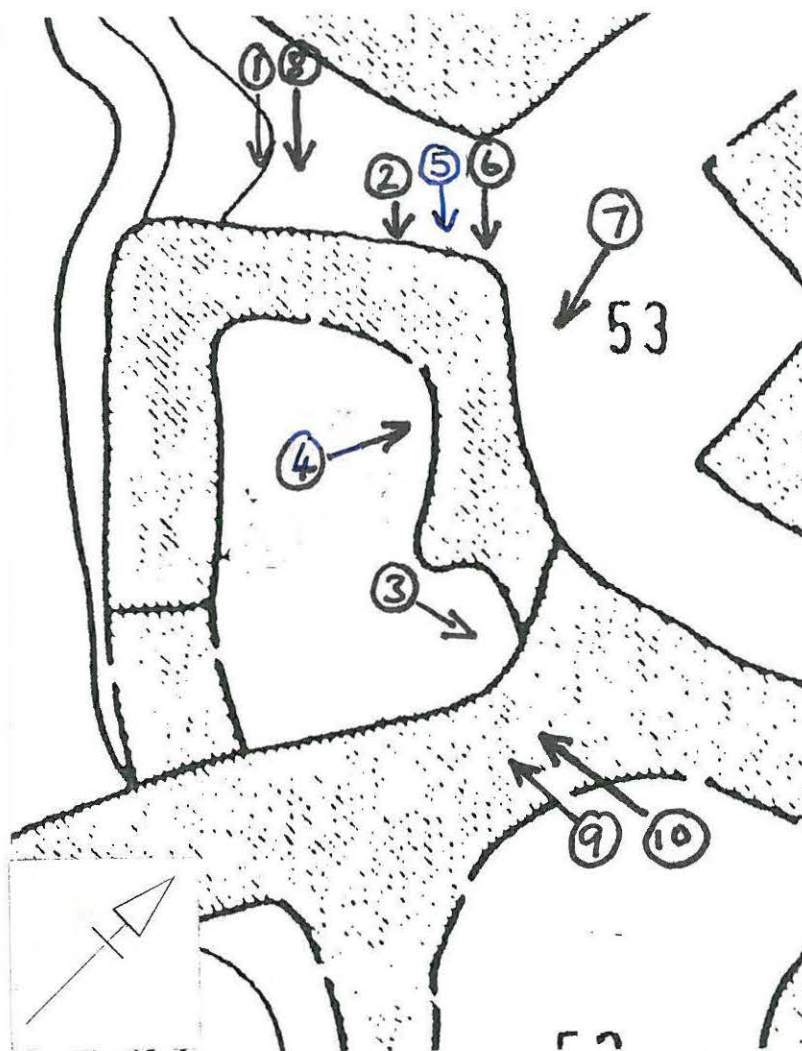


Fig. 6. Hut 86, showing direction of view of Plates 1 - 10.

for refacing the 'missing' part of the wall (Plate 5).

Much of the outer face of this wall (ie the inner face of hut 53) had also collapsed (Plate 6), and was rebuilt. Beneath the rubble a spread of black peaty soil, with numerous small stones was discovered against the wall face (Plate 7). This may have been spoil from the 1956 excavations, but it was not examined closely.

The entrance (Fig. 7) was cleared of rubble, and both jambs were uncovered. The E jamb had tilted inwards, and was pushed back. At the inner and outer edges of the entrance flat slabs underlay the walls (the inner one is visible on Plate 5). Between these part of another slab was noted within the passage, 100mm lower down. This was not fully uncovered, but it may be that this hut has a foundation of some depth. Small stones were used to level up the entrance passage (Plate 5).

Clearance of the rubble from the W corner of the hut showed that the basal course of the wall survived. Tumbled stones were used

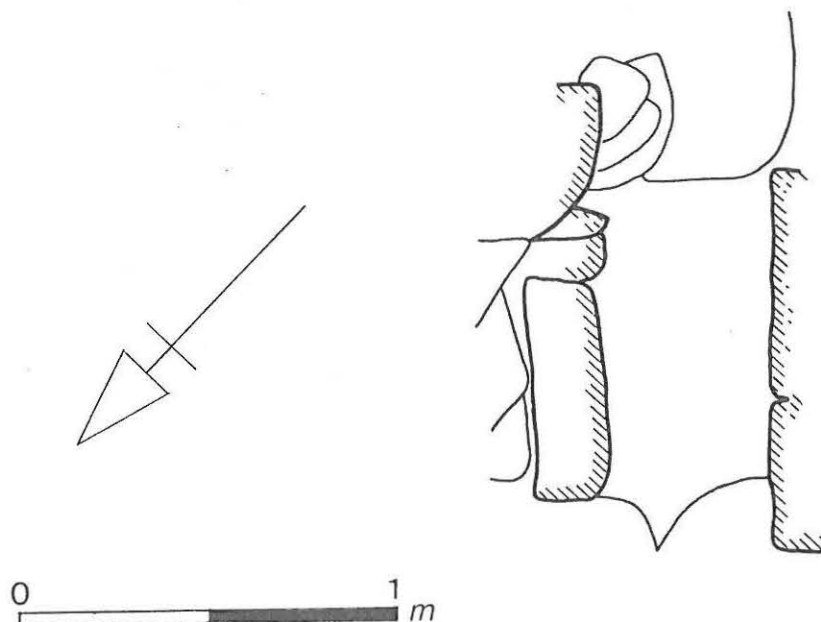


Fig. 7. Hut 86, entrance passage cleared.

to rebuild the wall. The outer face at this corner was in reasonable condition, although the W end of the NW wall had started to collapse and some refacing was necessary (compare Plates 1 and 8).

Spare rubble from the interior was used to build up the SE wall by one or two courses and to fill in the hole in the E corner of the building. Stones left over were spread about the interior to provide a roughly level surface (Compare Plates 9 and 10).

Finally, large slabs were laid on the wall tops (see discussion of wall tops below, p.29).

Hut 51.

A ruined hut immediately S of, and abutted by hut 86. The line of the outer face of the SW wall was clearly defined, two to three courses being visible above the heather (Plate 11), and part of the inner face of the NW side also survived. Otherwise walls were represented by no more than a low scatter of stones (Plates 12 and 13). The entrance was in the SE wall, at the S corner. The interior was pitted and uneven, although largely grassed over.

There are no records of any excavation of this hut, although the state of the interior, with holes up to 0.4m deep, would seem to indicate that there has been some illicit digging here. The walls certainly seem to have deteriorated during the last half century. Hughes planned this hut as a rectangular structure, with all inner faces surviving except at the S corner (Fig. 3), and Griffiths recorded both faces of the SW wall standing to a height of one foot (0.3m), although by then the NE wall was ruined. There seems to have been further deterioration during the next decade, as Hogg's plan of the hut shows only the outer face of

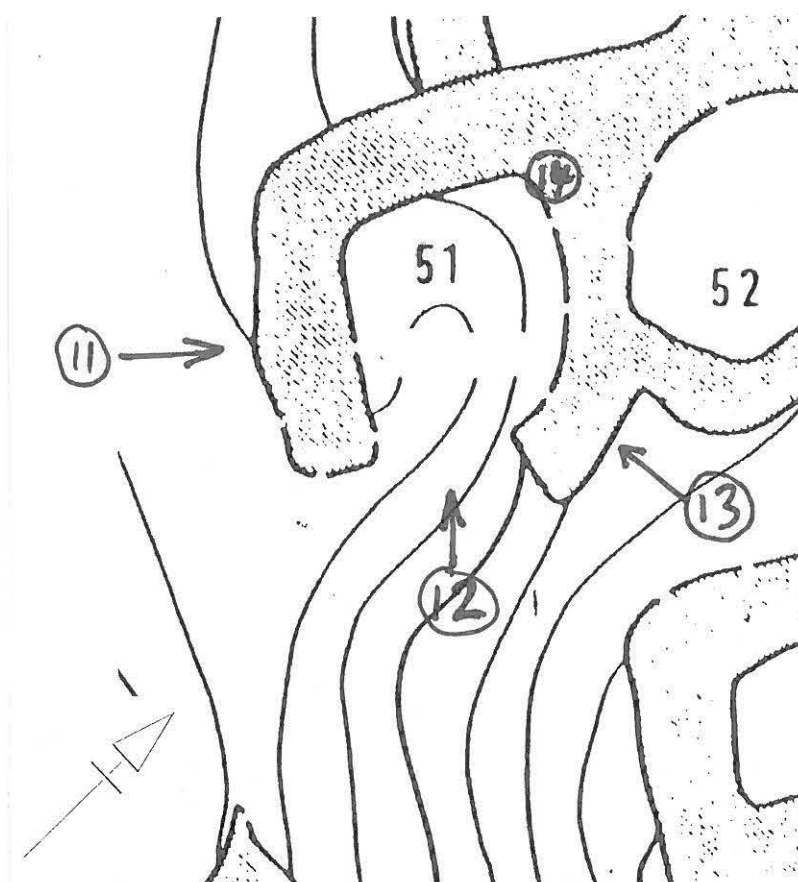


Fig. 8. Hut 51, showing direction of view of Plates 11 - 14.

the SW wall (Fig 4).

For the most part, these low rubble walls were stable, and little work was necessary. Apart from replacing the occasional fallen stone on the NW wall, the main cause of concern was at the N corner, where small core material from the wall between huts 52 and 86 was spilling out into hut 51. Removal of this rubble revealed more of the N end of the NW wall than appears on Hogg's plan, but also threw up a problem, in that two possible lines for the inner face of the NE wall became apparent. One of these was visible before work commenced, and can be seen in Plate 11 towards the top left of the frame, consisting of a short stretch of roughly built wall three to four courses high. The other possible wall face was uncovered during rubble clearance at the N corner. Plate 14 looks vertically down on the corner, with the NW wall running in from the top right. Immediately below the scale, at the base of the rubble, two large stones were uncovered, with roughly flat faces in line, suggesting a wall footing running off to the SE. No attempt was made to follow these footings, as this would have involved the disturbance of too much rubble.

The first of these two possible faces suggests a wall thickness of just under 1m, while the latter would provide a thickness of 1.5m. Without excavation it was not possible to decide between the two, although had all the rubble fallen from the 'narrow'

wall it would have been extremely high. However, it was felt that the problem of the loose core material at the N corner had to be addressed, and therefore two courses were built up on the line of the 'broad' wall to prevent further spillage. The result is not wholly satisfactory from either an aesthetic or archaeological point of view, and in discussions on site Dr. Yates has expressed a preference for the narrower wall, mainly because the evidence for the other wall is so slight. Alterations will be made this summer, and at the same time the holes in the interior will be filled in.

Hut 52.

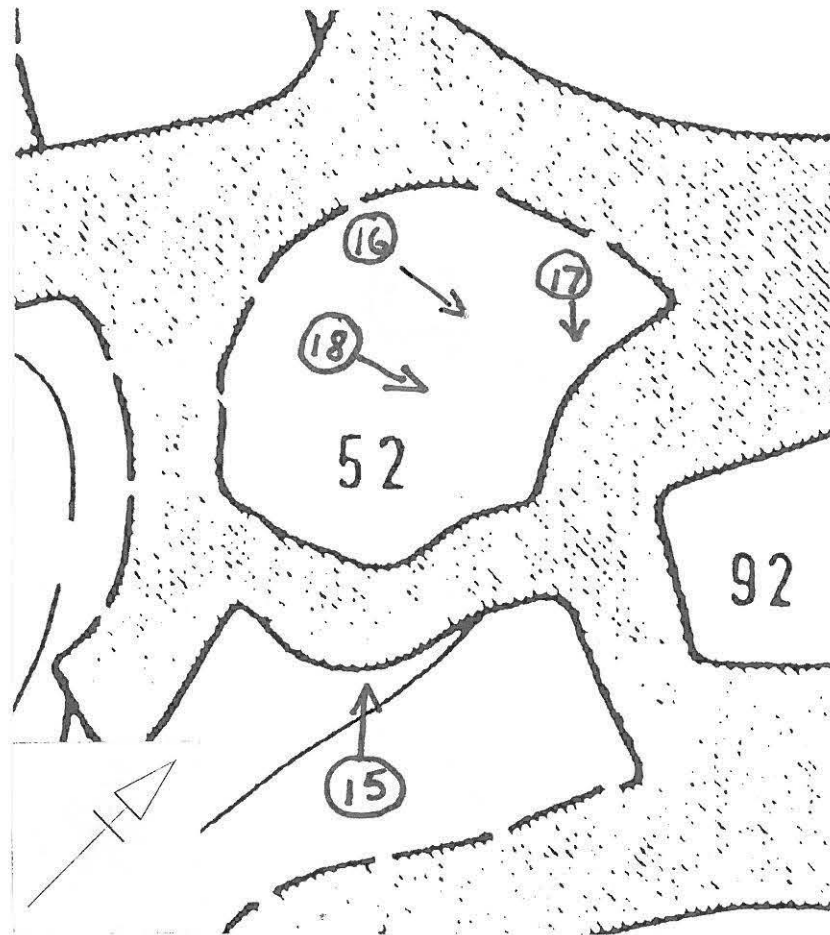


Fig. 9. Hut 52, showing direction of view of Plates 15 -18.

This 'hut' is little more than a grassed over hollow in the space between huts 51, 90 and 92, its shape largely defined by those huts. Only the footings of a SE wall indicate that this was ever a structure in any real sense. There is no record of it being excavated, although in 1956 Hogg apparently sought unsuccessfully to trace the outer face of roundhouse 53/89/90 where it forms the NW wall of this hut (Hogg 1956, 34). Hughes 'dots it in' as a rough circle, and from the descriptions of Griffiths ('perhaps...a circular hut') and Dallimore ('just recognisable as a hollow') its condition does not seem to have changed in the

last half century.

The common wall with hut 51, to the SW, has been discussed above. Otherwise the walls of the hut, though ruinous, were in no danger of further collapse, except at the SE corner, where part of the outer facing of hut 92 had fallen outwards, exposing loose core material (Plates 15 and 16, on the right of the frame in both cases). Clearance of fallen rubble revealed a well defined basal course of large stones onto which fallen stones were replaced (Plates 17 and 18).

Hut 72.

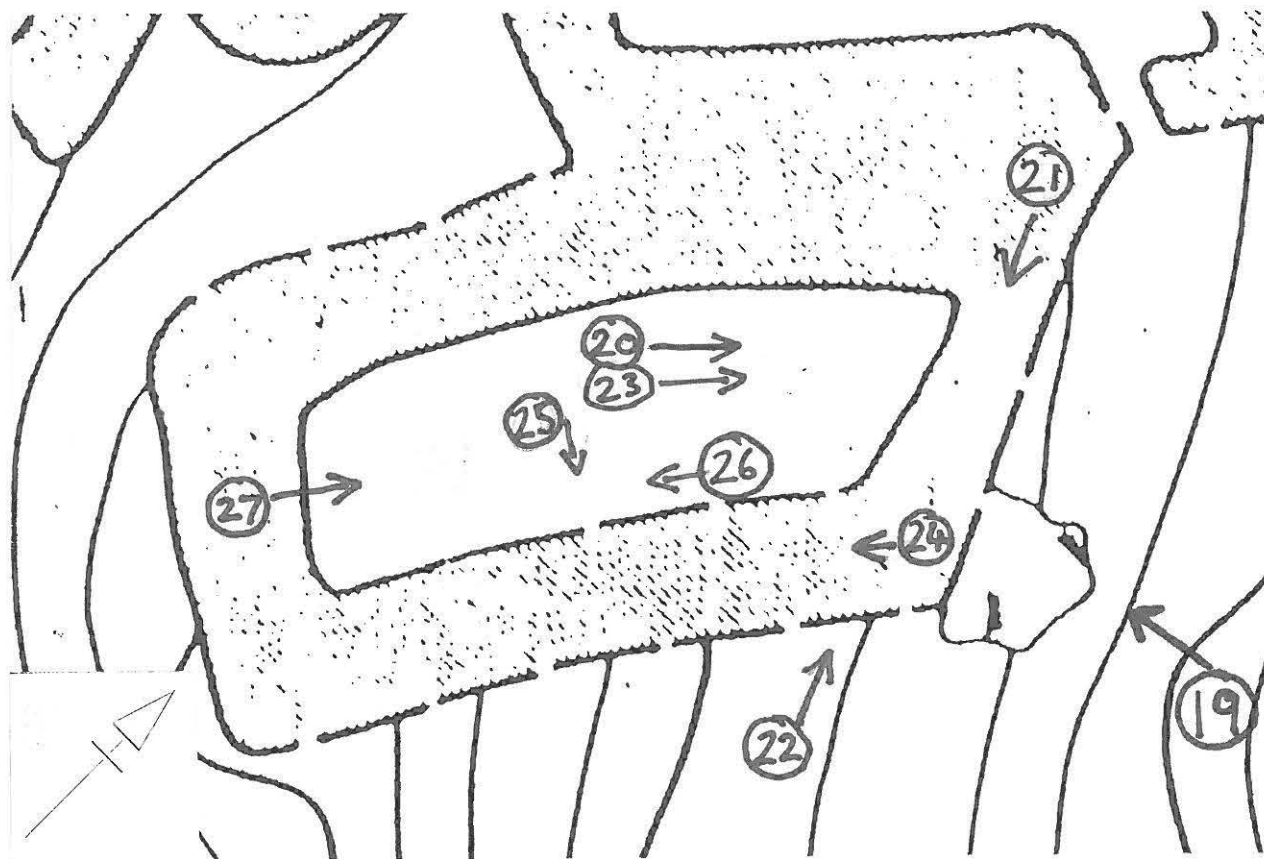


Fig. 10. Hut 72, showing direction of view of Plates 19 - 27.

A sub-rectangular hut on the SE edge of the group (Plate 19, left of picture). The NW wall survived to a height of c.1m, but only the footings of the SW and NE ends survived. The ground outside to the SE was up to 0.7m higher than the interior, so that the much tumbled remains of the SE wall appeared as little more than a revetment to the slope. The ground within was uneven, the level in the middle of the hut being 0.6m lower than at either end. There was no clearly defined entrance.

Hut 72 is listed as one of those excavated by Hughes in 1906, finds consisting of three 'pot-boilers' and the bone of an ox (Hughes 1907, 50). However this would appear to be a misprint, as

on page 55 of Hughes' report, in the 'Summary of Finds' there is no mention of hut 72, while pot-boilers and ox bones are listed as coming from hut 79, a hut some 70m to the NE which is not mentioned anywhere else in the text. Moreover, hut 79, but not 72, is numbered on Hughes' published plan, and 'only those "cyttiau" excavated in 1903 and 1906 are marked with figures on the plan' (Hughes 1907, 39). There is therefore a possibility that undisturbed deposits remain within this hut.

As there seemed to be little danger of the NW and SW walls collapsing, these were left undisturbed (but see below, under hut 92, for work on the core of the wall between the two huts). Most attention was needed at the NE end, where stones had been dislodged, exposing unweathered core material (Plates 20 and 21). The dislodged stones were replaced and the wall built up high enough (0.5m) to retain the core (Plates 22 and 23). As there was a shortage of stones here (fallen stones now buried in the heather were not dug out) a few slabs were brought from the scree to the NE of hut 74.

The other part of this hut needing attention was halfway along the SE side wall, where there was much loose tumbled stone (Plate 24, centre-right of frame), some of it recently collapsed, judging from the unweathered state of the exposed core material. Clearance of the fallen stones revealed a mass of small core material, too much to have come from the SE wall alone, as an unsuccessful attempt to use the fallen stones to continue the line of the wall confirmed. Before work began the masons had suggested that the tumble came not from the SE wall but from a partition jutting into the hut, but there was insufficient visible evidence to warrant building such a wall at the outset. When the heather was cleared away, however, evidence for a cross-wall 0.8m wide was found, consisting of two edge set slabs jutting out from the SE wall with a large boulder, lying at an angle, immediately beyond them (Plate 25). Although the side wall of the hut was much ruined, it appeared that the cross-wall was of one build with it, the edge set slabs running back into the core.

The boulder was twisted to provide a level foundation (Plate 26) and the loose stones in the hut were used to build it up to a height of c.0.5m (Plate 27). Dr. Yates and Mr Watkins have observed that, as finished, the gap between the end of the partition and the opposite (NW) wall of the hut is improbably wide, and have suggested that the partition should be 'stepped back' to indicate that it might have continued further across the hut. This will be done during the second season.

Hut 92.

A well defined hut to the NW of hut 72 (Plate 28). The inner faces of the hut walls stood to c.1.2m high, although part of the SE side had collapsed, and in many other places the facing was loose, buckled and in danger of collapse. The floor was pitted and uneven, with many large stones scattered about on it. There

were two possible entrances, one on the E which was partly blocked with loose stones and into which the S side of the passage had collapsed, and a possible second entrance on the N, leading through to hut 73, much obscured by rubble. The collapse of the outer face of the SW end has already been discussed under Hut 52 (above p.15).

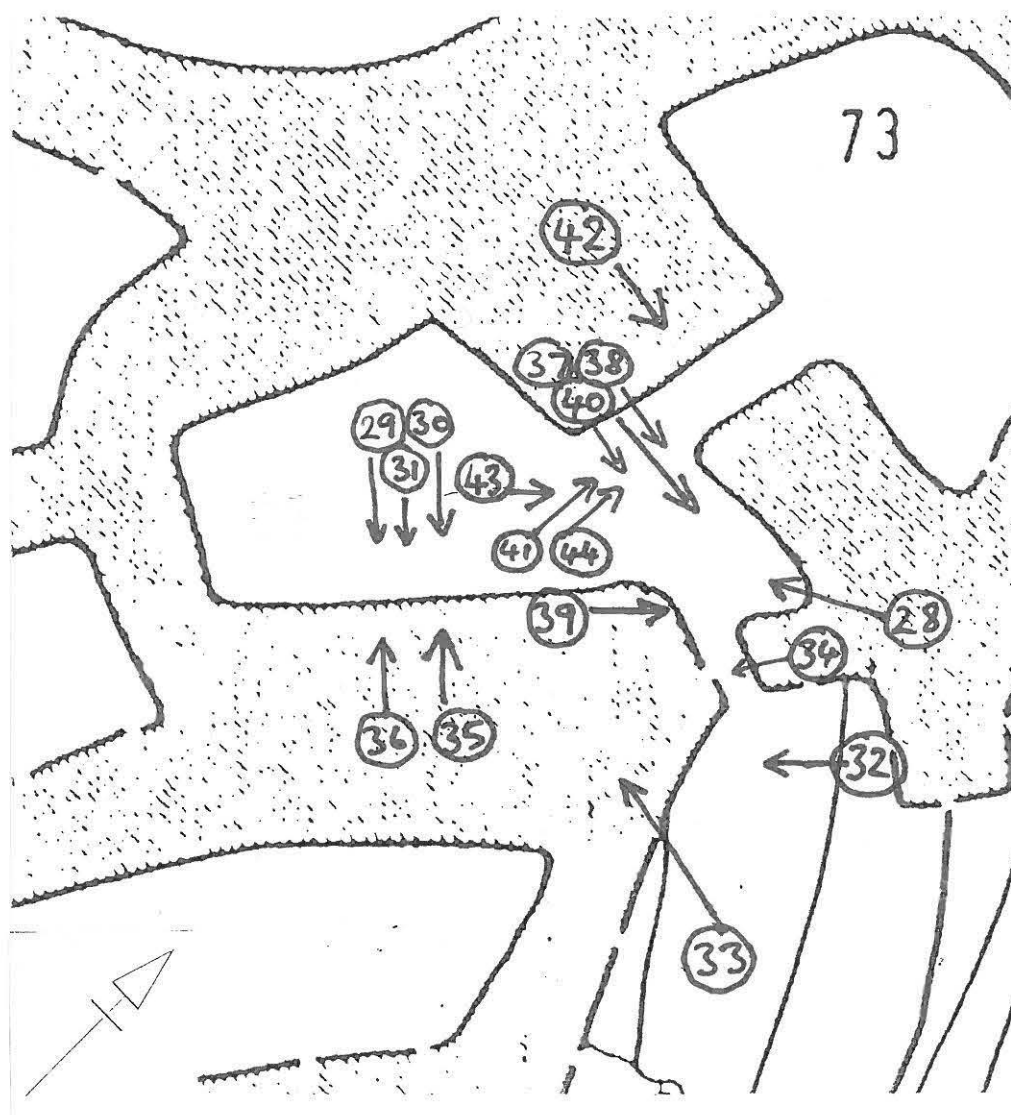


Fig. 11. Hut 92, showing direction of view of Plates 28 - 44.

This hut was excavated in 1903, but nothing was found in it. The report mentions only one entrance, facing 'north-east' (Baring-Gould and Burnard 1904, 11), which could refer to either of the two now visible. Hughes' plan (Fig. 3) is no help here: the only entrance he records is at the S corner, where the wall stands almost 1.0m high. In 1946 Griffiths measured the height of the inner faces as 4 feet, but does not mention any collapse. The E entrance was already choked, as was the possible N entrance. In 1956 Hogg established that the outer face of roundhouse 53/89/90 survived within the massively thick NE wall of this hut (Fig. 4), and therefore that 92 post-dates the roundhouse. His plan also

shows that the SE wall had started to collapse by the 1950's. In planning the possible N entrance, Hogg was rather more positive than earlier observers, but his plan is somewhat stylised, and it is unlikely that in 1956 the evidence was as unequivocal as is suggested.

The collapsed central stretch of the SE wall was addressed first. The rubble was cleared to ground level and the wall rebuilt using the same stones. It soon became apparent that the stretch of wall immediately to the SE was unstable (Plate 29) and it was decided to remove three to four courses of this in order to establish a good foundation for rebuilding (Plate 30). The whole of the wall was then built up to a height of c. 1.0m (Plate 31) and capped with large flat slabs to stabilise the top. At the same time the top of the outer face of the wall, against which the NW wall of hut 72 had been built, and which had been barely visible before work began, was exposed (compare Plate 32 with Plates 33 and 34).

Dr. Yates and Mr. Watkins have expressed dissatisfaction with the result of the work on the SE wall, as some of the stones used to pin voids in the wall below the rebuilt section are not tight, and it has been decided that this stretch should be taken down and rebuilt. This work has been held over until the second season.

The S end of the hut, and the NW side wall needed less attention. The upper courses on the NW had started to collapse, and much of the remaining masonry was loose (Plate 35). Stones were straightened here and the facing built up to the height of the core material behind (Plate 36). Otherwise the only work needed was the occasional pinning of voids to prevent further collapse.

The E entrance, was choked with rubble and the S side of the passage had partly collapsed (Plate 37). Removal of this debris uncovered a mass of small stones (Plate 38) but no evidence for any firm floor surface. Across the inner edge of the passage the front edge of a line of large stones was uncovered, with an upright slab immediately in front of these (Plate 39 and Fig. 12). This may be the remains of a sill or step, but no attempt was made to investigate it further.

As this was the obvious entrance for visitors, it could not be left as it was, or the exposed surface of small stones would soon have eroded away. Constructing a sloping ramp was ruled out on both safety and aesthetic grounds. The most sensible approach seemed to be the construction of rough steps, which as well as providing easy access to the hut, would help retain the stones on the passage floor. The result is illustrated in Plate 40.

It must be emphasised that apart from the possible step at the inner end, there was no evidence that the passageway was originally paved or stepped in any way. Indeed, it is open to question whether the entrance was an original feature of the hut. It is not shown on Hughes' plan (Fig. 3), and clearance of the

debris from the passage produced no evidence of any facing on its S side, in which the core of the SE wall of the hut was clearly visible (Plate 34, bottom right). It would certainly seem that the entrance was at least widened at some point but not refaced. The exposed core in this S wall of the passage seemed to be stable and no attempt was made to build a face, but it will need to be monitored for signs of deterioration during future phases of the Project.

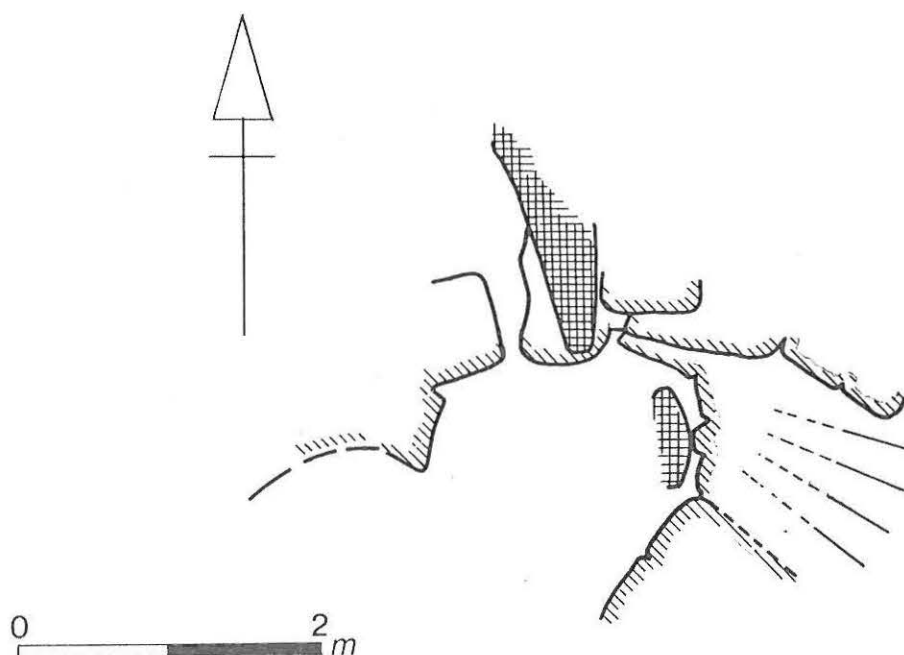


Fig. 12. NE end of hut 92, showing *in situ* facing stones. Cross-hatched stones are edge-set.

If there were doubts about the E entrance, the N one was even less convincing. A large upright slab might have formed an E jamb (Plate 41), and beyond it there appeared to be a sharp turn in the wall of hut 73 (Plate 42, beneath the left end of the scale). The only evidence for a W side to this 'passage' was a kink in the NW wall of hut 92 (Fig. 12), but the masonry on that side was extremely ruinous. Clearance of the rubble did not solve the problem. Two course of masonry, standing 0.35m above the modern ground level were uncovered (Plate 43), which might have served as a step or sill, but equally they might have carried the wall across the 'passage'.

It was decided that the safest approach would be to secure the exposed masonry in such a way that the question of this passage remained open. The first attempt at this resulted in too many stones being added to the supposed sill. These were removed on the last day of the season but the result (Plate 44) is still not wholly satisfactory and more work is needed here.

Hut 73.

A roughly oval hut to the N of hut 92, hut 73 had roughly built

walls in very poor condition (Plate 45, left of centre). There were two possible entrances, one leading from hut 92, which has been discussed above, the other on the NW side of the hut, blocked with rubble (Plate 46, to the right of the scale). The E wall had collapsed totally.

The hut has not been excavated. Hughes shows the NW entrance clearly (Fig. 3), but Griffiths was less certain about it, as by then it was blocked with rubble. Hughes' plan also shows that the E wall had already collapsed by the early years of this century.

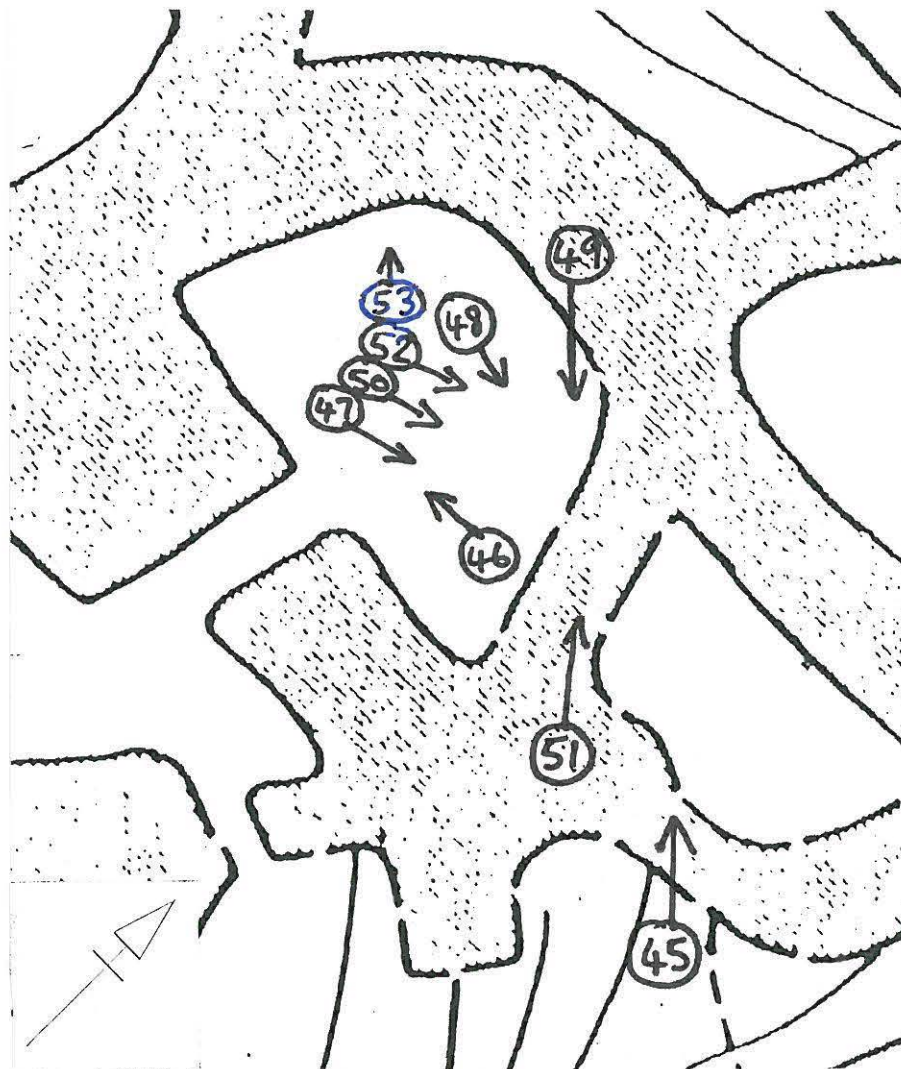


Fig. 13. Hut 73, showing direction of view of Plates 45 -53.

The E wall appeared to have been a revetment built against the steeply rising ground outside the hut. The revetment had totally collapsed, leaving a pile of loose tumble across which a pathway had been worn (Plate 47). As one of the aims of the project was to block off pathways across hut walls, the rebuilding of this wall was called for. The tumble was peeled away but nothing remained of the wall except at its very base, where four large stones were all that remained (Plates 48 and 49). One of these

had a flat, weathered face and was taken as a guide to the wall line when rebuilding (Plate 48, above and to the right of the scale, and Plate 49, immediately to the right of the scale). A further clue to the line of the wall was provided by the discovery of the outer face of the W corner of hut 74, concealed within the collapsed rubble (Plate 50, behind the scale), against which the E and N walls of hut 73 had been built. Plate 51 shows the outer face of hut 74 curving towards the N above the left end of the scale.

The wall was rebuilt to a height of c. 0.9m, the top flush with the higher ground behind it. At first the masons attempted to create a style which would blend in with the extremely rough, 'falling-down' appearance of the other walls in the hut. The result was criticised, however, for being too ragged, and a wall of more solid appearance has now been built (Plate 52).

In general, the other walls of the hut required little attention. Large stones which had been 'squeezed out' were pushed back into position, and occasional fallen stones were added to the wall tops. Immediately W of the main entrance rather more work was needed: the wall here had collapsed (Plate 46, to the right of the scale) and rebuilding the face was necessary (Plate 53). Finally, the rubble was removed from the NW entrance passage, the sides of which were found in place, and only occasional packing stones were needed to stabilise them (Plate 53).

Hut 36.

A small sub-rectangular hut at the W edge of the group. The walls were best preserved on the NE, standing almost 1.0m high (Plate 54). Otherwise they were almost totally ruined, particularly on the NW (Plate 55). Both sides of a blocked entrance were visible in the SW wall (Plate 56).

In 1946 Griffiths described a 'clearly defined' entrance on the SE, leading into hut 87, but this was not shown by Hogg, who planned the SE side of the hut as being entirely open to hut 87 (Fig. 3). There are now only faint traces of this SE wall, almost buried beneath the turf (Plate 57), but inspection of the SW wall of these two huts revealed the outer face of hut 87 turning towards the NW and continuing through the thickness of the wall, demonstrating that 36 had been built against it. The exposed end of this outer face to hut 87 is visible in Plate 57, above the right hand end of the scale.

As the collapsed walls of the hut were not likely to deteriorate further, and as there was doubt about their precise line, it was decided to leave them as they were. The standing portion of the NE wall may need some attention, but this has not yet been tackled. The only work done in this hut was the re-opening of the SW entrance, which involved no more than the removal of rubble, some of which was placed on top of the wall on the E side of the passage (Plate 58).

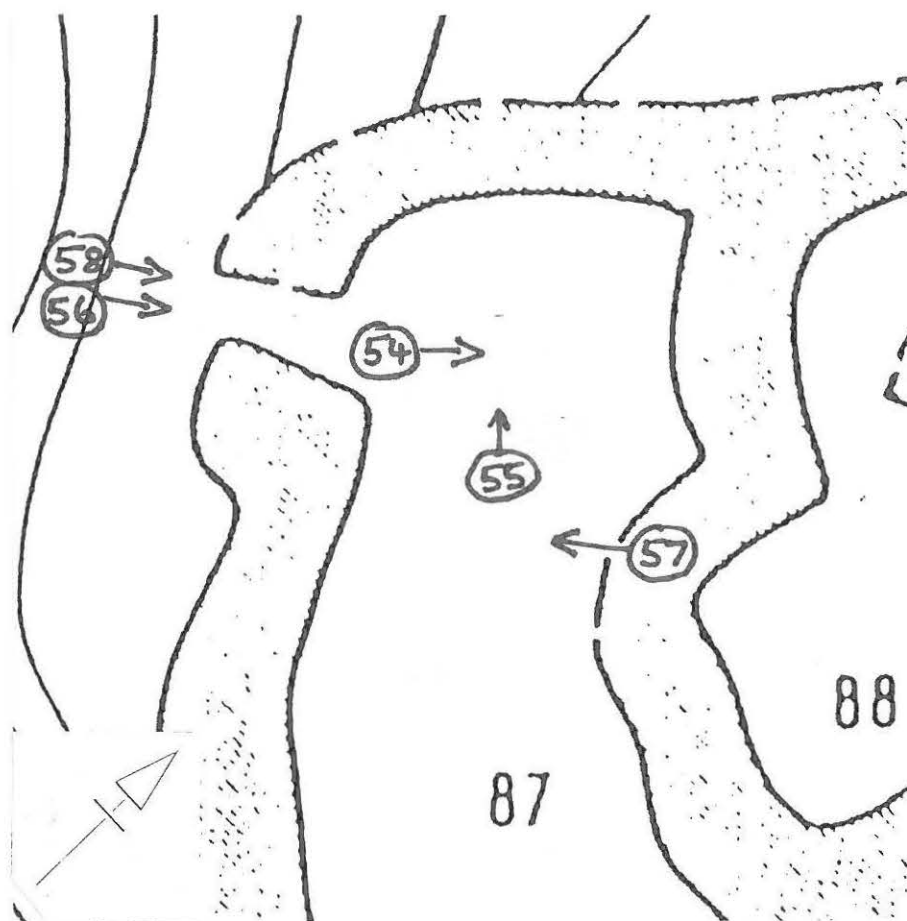


Fig. 14. Hut 36, showing direction of view of Plates 54 - 58.

Hut 87.

An approximately rectangular hut on the W edge of the group. The facing of the NE wall had collapsed (Plate 59), as had part of the facing on the E side. On the S and SW sides, the footings of the wall remained in place, partly grassed over (Plate 60), though reaching a maximum height of c.0.7m above modern ground level at the W corner (Plate 61). The NW wall has been discussed above with hut 36. The interior was littered with rubble and pitted with holes (Plates 61 and 62).

This hut was excavated in 1903, when 'a few sling stones' were found. The entrance was said to be on the W (Baring-Gould and Burnard 1904, 11), presumably through the now destroyed wall on the NW. Hughes, however, planned an entrance at the SE corner, opening into the passage leading into roundhouse 53/89/90 (Fig. 3). No entrance is now visible at this point: Hughes may have mistaken an orthostat in the outer face of 87 (Plate 63, centre of frame) as being a door jamb.

The collapse was stripped away from the NE wall. Only part of the basal course of the wall remained *in situ* (Plate 64), but this was enough to establish a convincing line for rebuilding. The first attempt at rebuilding this wall was criticised by Dr. Yates

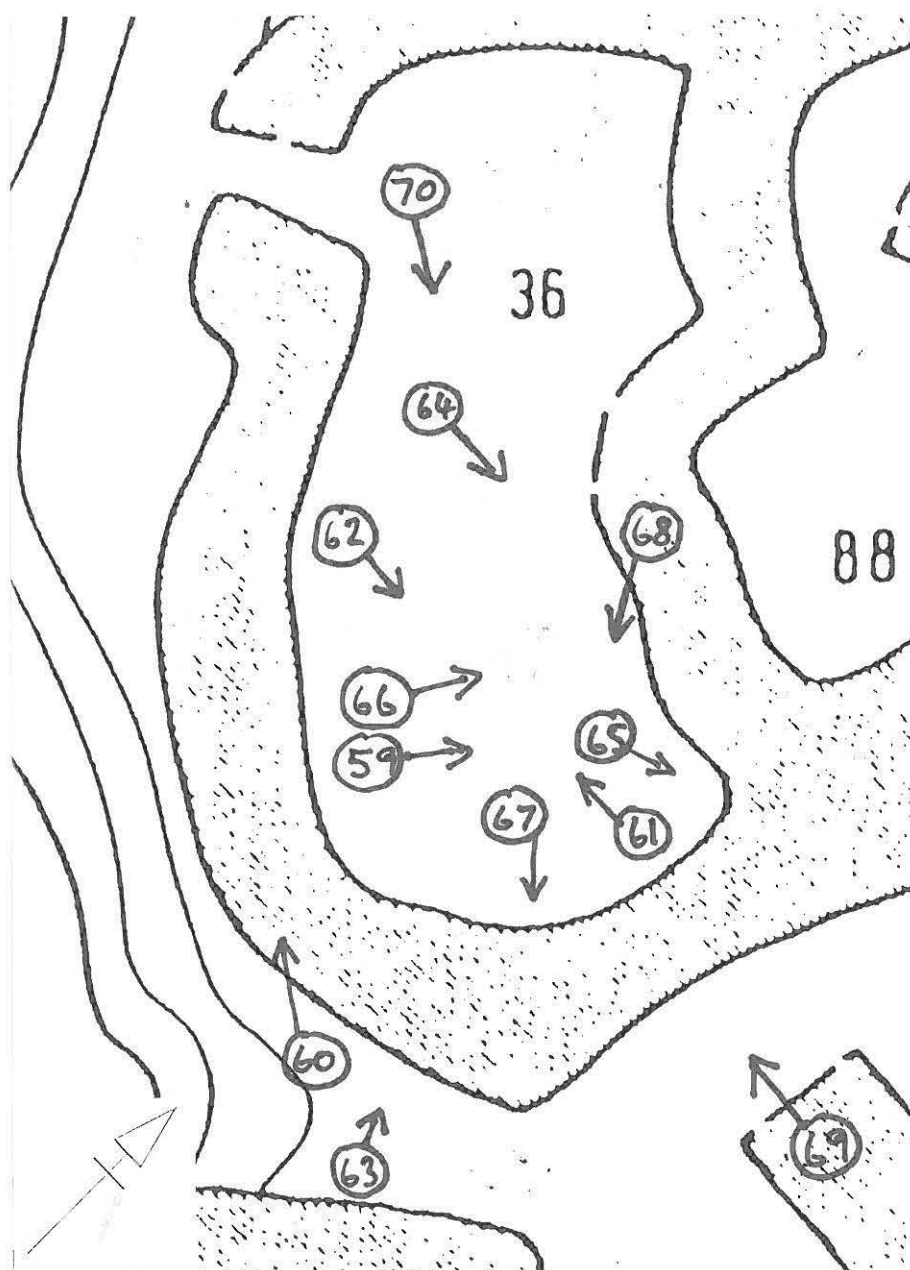


Fig. 15. Hut 87, showing direction of view of Plates 59 -70.

and Mr. Watkins as being unstable, and under their guidance the stone masons made a second attempt at rebuilding. On this occasion more of the core was removed than during the first attempt, revealing part of the outer face of roundhouse 53/89/90 (Plate 65), and thus confirming Hogg's observation (see Fig. 4) that hut 87 had been built against the roundhouse. The second attempt at refacing the wall (Plate 66) proved more stable, and its general style has been approved. The method used to secure the top of this wall is discussed below (page 29).

The facing of the E wall of the hut had also partly collapsed. Removal of the loose tumble at the SE corner showed that the outer face of the roundhouse wall continued into the core (Plate

67, to the left of the scale), thus demonstrating that the S wall of hut 87, like the N wall, was built against the roundhouse, and therefore that the long entrance passage to the roundhouse was not an original feature of its construction, but merely the result of later huts being built against it. Plate 68 shows the repaired inner face of the E and S walls of hut 87. The facing of the roundhouse wall continues into the wall immediately above the left end of the scale. In the background the S wall of the roundhouse can be seen curving round to meet it.

The SW wall of this hut was well defined, although in places reduced almost to ground level. The stones scattered about on either side of it were used to raise the height by up to 0.5m (Plate 69). Finally the holes in the interior were filled in to provide a roughly level floor surface (Plate 70).

Huts 53, 89 and 90.

These three 'huts' are subdivisions of one large roundhouse, and can be discussed together. The roundhouse measured approximately 7.5m in internal diameter, divided into three by a Y-shaped partition. Before conservation the best preserved stretch of wall was around the NW arc, which stood to about 1.0m high (Plate 71). On the W and SW sides the wall was much spread, and partly obscured by tumbled stones (Plate 72, left of picture), while on the SE side the wall, although in poor condition with much of the facing displaced, remained to a height of 1.0m (Plate 73). On the E, at the rear of the roundhouse, the wall had totally collapsed (Plates 74 and 75). The partition was of poorer quality than the outer wall, its construction employing fewer large blocks of stone. It stood just over 1.0m high, but it was much spread, appearing at first sight as little more than an amorphous pile of loose rubble (Plate 76).

The main entrance to the roundhouse was on the SW, a passageway passing between huts 86 and 87 into hut 53. Conservation work on hut 87 established that this passageway was not an original feature of the hut (see above). From hut 53, which might have served as an antechamber after the construction of the partition, entrances led eastwards into hut 90 (Plate 77) and northwards into hut 89 (Plate 78). Both of these entrances were obscured by tumbled stones.

Huts 89 and 90 were excavated in 1903, 89 producing an iron bill-hook. The entrances to these huts were identified at that time in the positions described above, but during his survey Hughes did not recognise the entrance to hut 90, his plan of the hut showing an unbroken W wall (Fig. 3), while in 1946 Griffiths could not find any 'clear trace' of an entrance to either 89 or 90.

None of these fieldworkers seem to have recognised the true nature of these huts: it was not until Hogg's excavations that it was demonstrated that together they formed part of a single roundhouse (Hogg 1960, 32-34). Indeed it appears that in 1903 the rear (E) wall of hut 89 was rebuilt too far to the W, thus

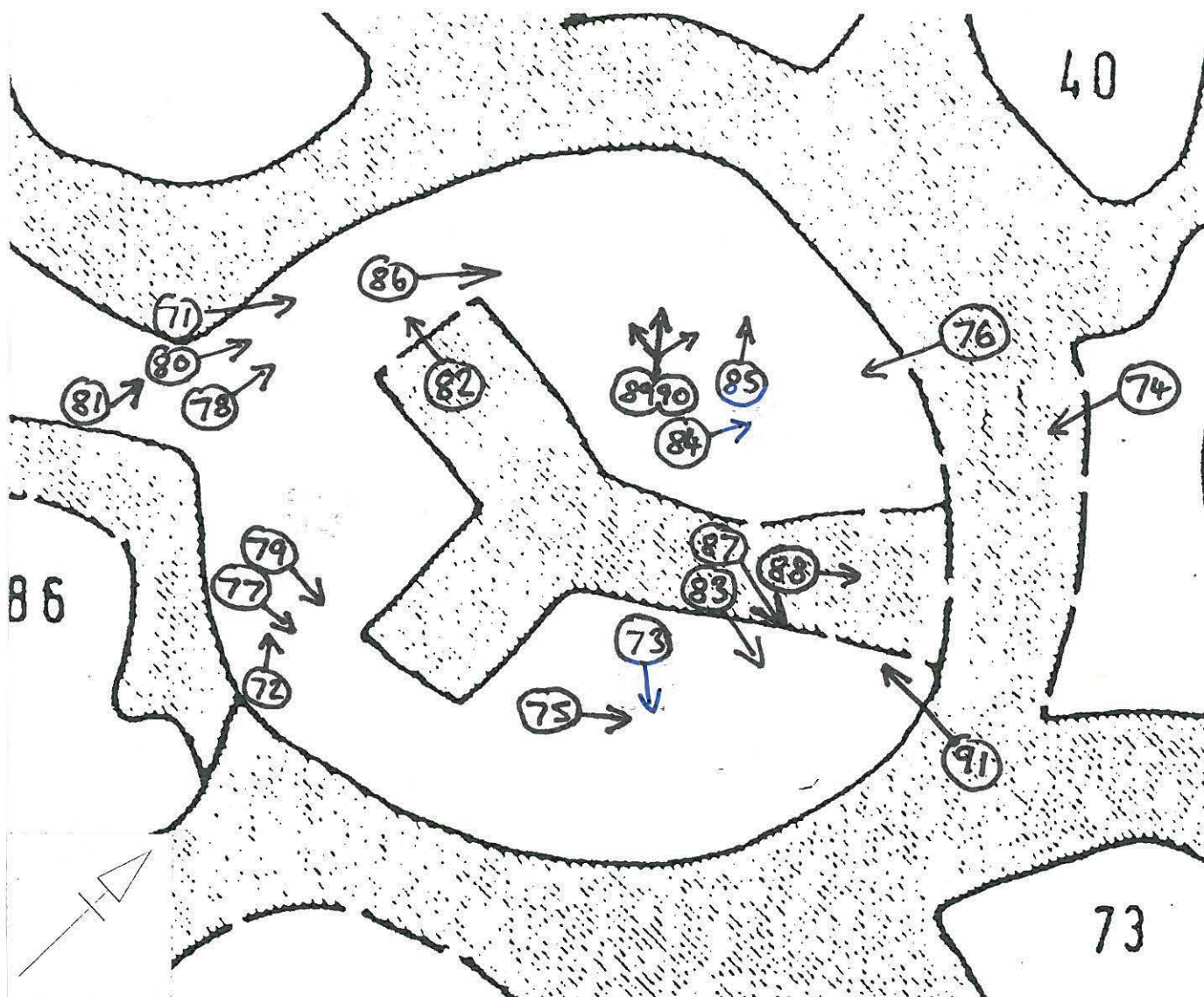


Fig. 16. Roundhouse 53/89/90, showing direction of view of Plates 71 - 91.

masking the shape of this hut, and only after the removal of this wall in 1956 could the original form be traced (Hogg 1960, 34).

The 1956 excavations established the positions of the entrances to huts 89 and 90. The excavation report is unclear as to how much restoration was attempted, but judging from the excavation photographs it seems that the doorways at least were rebuilt (Plates 79 and 80), the stones in the W jamb of the entrance to hut 89, in particular, having an unweathered appearance. The extent of the dereliction over the last three decades can be seen by comparing Plate 79 with Plate 77, and Plate 80 with Plate 78.

The restoration of the SW wall of hut 53 has already been discussed under hut 86 (above p.11), and the outer face of the W wall has been dealt with under hut 87 (above pp.23-24). The only other parts of hut 53 so far tackled are the inner face of the W wall, and the W jamb of the door into hut 89. Clearance of the

rubble revealed that only the basal course of the W wall survived (Plate 81, to the right of and parallel to the scale) but this was enough to provide a foundation for rebuilding. It is worth noting that at the S edge of the jamb, the foundations did not continue precisely the curve towards the SE, as planned by Hogg (Fig. 4), but flattened out slightly, running due south. Rather than attempt a correction of what may have been an error in laying out the hut, rebuilding followed the line suggested by the foundations. The resulting kink can be seen in Plate 69, immediately to the left of the rebuilt jamb.

Little remained of the jamb itself. In Plate 82 rebuilding has already started: the two stones in front of the scale have been placed to provide a secure foundation. Immediately in front of these can be seen the tops of two edge set slabs which provided a convincing front edge, and suggested a width for the jamb of c. 1.0m, which agrees closely with Hogg's plan. The edge set slabs were set so firmly into the ground that they are unlikely to have been inserted in 1956, and it seems safe to assume that they are original.

There was nothing to indicate the original height of this feature, but as it was desirable to ensure that it was clearly expressed, three courses of masonry were judged to be the necessary minimum. A small free-standing feature such as this is inevitably going to be unstable, especially as one can imagine it presenting an attractive platform for photographers. Unless it is bonded to the hut wall (which would be contrary to the evidence of the 1956 excavations) one can only trust that the 1989 reconstruction will last longer than the 1956 attempt. The result of the restoration can be seen in Plate 69.

The rear of huts 89 and 90 had almost completely collapsed. Only two *in situ* stones, supported by the end of the partition wall remained visible to indicate the original line. The rubble was peeled away in 'spits' so that any buried faces would be recognised in plan. In hut 90, at the very bottom of the rubble a line of large stones, most having roughly flat faces, was uncovered (Plate 83 and Fig. 17). Although these stones do not appear on Hogg's plan, there was no reason to doubt that they were indeed the footings of the roundhouse wall, albeit slightly displaced.

Rather less evidence for the wall was uncovered in hut 89 (see Plate 84 and Fig. 17). Immediately E of the overhang a length of masonry 1.5m long and two courses high was uncovered, as planned in 1956. To the E of this there was a gap of approximately 1.0m, with no hint of a face. One more stone was then found, protruding from the core about 0.5m above the (presumed) floor level, its tip approximately on the supposed wall line, and E of this was a second large stone, lying at an angle. There was thus a gap in the foundations approximately 2.0m wide. Nevertheless rebuilding the wall along a curve projected from the sections which did survive seemed justified. In the first place it is most unlikely that there was originally a gap in the wall here: the ground

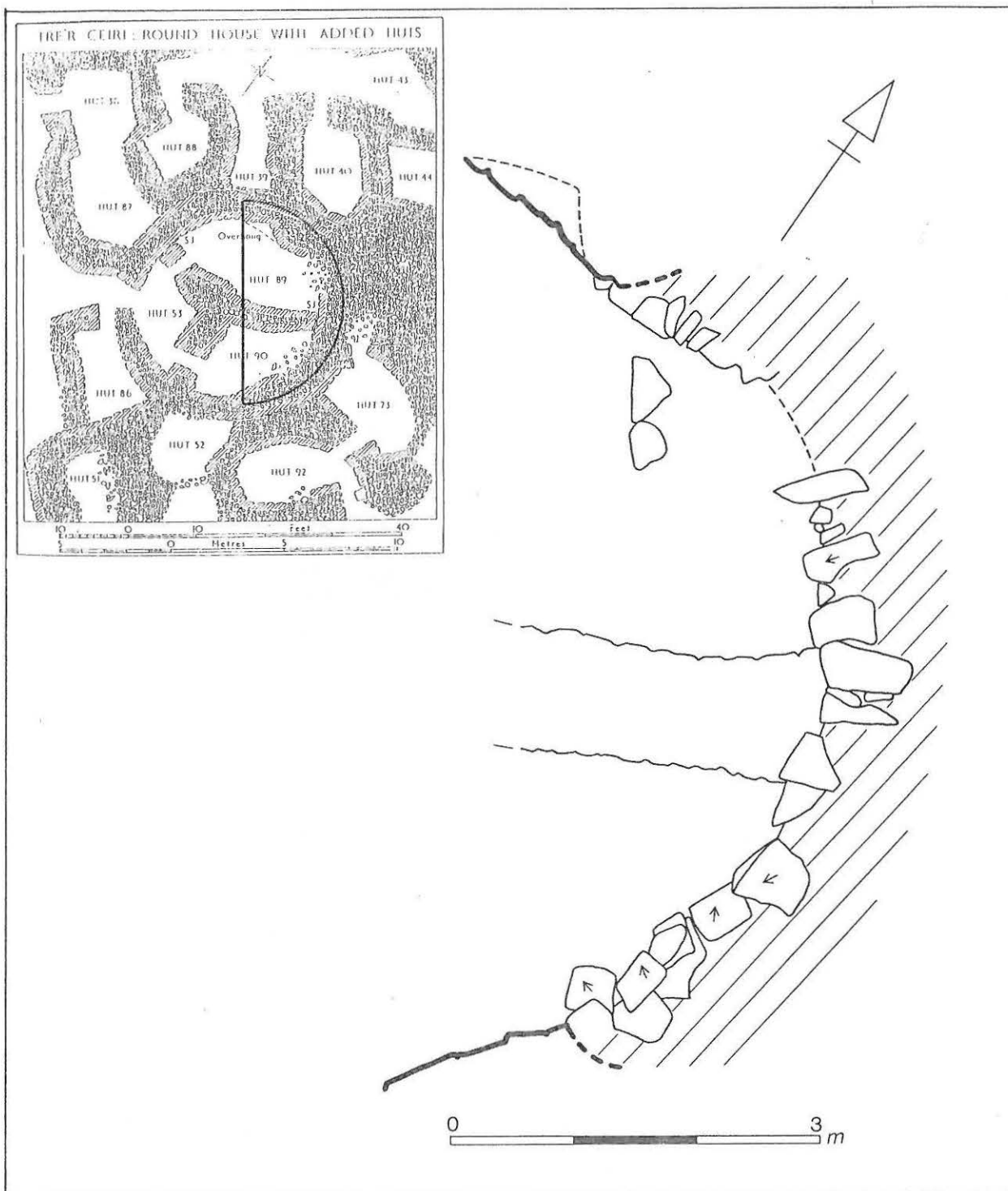


Fig. 17. Rear of roundhouse 53/89/90, showing surviving foundations.
Bold lines indicate standing wall.

behind the hut rises steeply and would not have been a suitable place for an entrance (of which there was in any case no evidence). Secondly, the surviving portions of the hut wall display masonry of a high quality: if it is accepted that the rear of the hut was closed off in some way, it is improbable that the builders would have been satisfied with anything other than a faced wall. Finally, one of the objectives of the Project was to block off the pathway which had been worn across the tumbled stones: building a wall would have the benefit of securing the surviving masonry to either side of the gap.

One final feature uncovered during clearance of the rubble must be mentioned. Close to the N wall of the hut, at a level just below the basal course of that wall, were two large stones, with flat upper faces (Plate 85 and Fig. 17). Mention has already been made of the wall across this hut which was removed during the excavations of 1956. Hogg (1960, 34) assumed that it had been built by the excavators of 1903, pointing out that it 'falsified' the shape of the roundhouse. The stones uncovered in 1989 may have been the foundations for this wall, but if the excavations of 1903 reached this depth, it is curious that they laid out the back wall on such a line, for they can hardly have failed to notice that the N wall continued further to the E (see Plate 85). This raises the possibility that the wall removed by Hogg was in fact a partition contemporary with the occupation of the hut, or at least that the 1903 excavators built their wall on top of the foundations of an earlier one. The temptation to explore further was resisted, however, and the stones have been covered over, undisturbed.

The rear wall of the roundhouse was rebuilt c.0.8m high, as shown on Plates 86 to 88. When working on the portion of it in hut 89, the masons pointed out that there was a shortage of good building stones (especially large ones) amongst the rubble. This may go some way to explaining why there had been such total collapse of the original wall. The method used to secure the top of this wall is discussed below.

The other stretch of roundhouse wall tackled in the first season was on the NW side of hut 89. The wall still stood approximately 1.0m high, but the upper courses (whose ragged style suggested that they were built up during the 1903 excavations) and portions of what was clearly original masonry were unstable and required attention. Before dismantling any of the wall, all stones were marked with waterproof crayon, and photographs, similarly marked, were used to assist reconstruction. In general the rebuilding of the wall presented no problems. The larger stones at least were almost all replaced correctly, although on occasions it was not possible to do so without compromising the stability of the reconstruction. The result can be assessed by comparing Plates 89 and 90.

Particular attention was paid to the corbelled overhang in this wall (Plates 89 and 90, to the right of the right-hand scale). There had been some worry about the stability of this feature,

and much discussion on how to approach it. In the event it proved a straightforward task to continue the angle of the overhang when rebuilding the upper courses of the wall, while the insertion of small pinning stones into gaps at the base of the overhang have ensured its stability without greatly altering its appearance. The final task in this hut was to spread the remaining loose stone about the floor to provide a roughly level surface (022/32A).

There is still more work to be done in the roundhouse. The SE wall of hut 90 presents a particular challenge (Plate 73), while holes in the floors of huts 90 and 53 have yet to be filled in. The central partition presents the greatest problem. The masonry is in extremely poor condition, and parts of it at least look as if they would need to be rebuilt from scratch. A decision on how, and indeed whether, to proceed has been deferred until a later phase of the Project. In the meantime this wall will be monitored for any further deterioration.

The wall tops.

Much time has been spent devising an effective method of capping the tops of the walls, on both the huts and the ramparts, which secures the wall faces and yet does not look out of place.

At the first site meeting it was suggested that pouring soil between the stones might help keep them in place, but when the Project began it immediately became clear that there was not enough soil available. Instead as an experiment, in huts 86 and 92 large slabs were used, where these occurred amongst the fallen rubble, to stabilise the walls. The result did not look quite right, but certainly provided stability (see Plates 5 and 33).

A similar problem emerged on the ramparts, and, again as an experiment, a length of parapet was reconstructed at one point (see Collapse 'N', below).

Towards the end of the season a more satisfactory method was proposed, involving locking upright stones together on top of the wall core (see Plate 92). The rough surface produced should discourage visitors from walking on the walls, while being secure enough to prevent collapse should it not do so. An added benefit is that the uneven appearance leaves open the question of the original height of the walls. The masons have had little opportunity to practice this technique, which remains a priority for the beginning of the second season.

Details of Work Completed: The Inner Rampart.

Two lengths of the inner rampart were included in the programme for Phase 1. The first was a 30m length on the north side of the fort, including the north postern, the so-called 'sally-port' (roughly points 'M' to 'N' on Fig. 2); the other was the stretch between the SW and W gateways, including the SW gate, about 105m in length (Fig. 2, EE to G).

Dallimore recorded ten points on these stretches of rampart where collapse had occurred. Most of these gaps were readily identifiable, and in general they did not seem to have deteriorated greatly in recent years. However, Dallimore recorded only the outer face of the wall, and made no mention of the inner face, parts of which had also collapsed. Furthermore, at a number of points on the outer face several smaller spills, not recorded by Dallimore, were noted. From the weathered nature of the exposed stones it appeared that at least some of these spills had developed by 1978. For the purposes of the Conservation Project these were identified by adding a suffix to the letters used by Dallimore: thus spill 'F1' was between Collapse 'F' and Collapse 'G', and 'E1' was between 'E' and 'F'.

There are also points where the rampart still stands, but where the condition of the wall makes collapse likely in the future. To identify such areas a detailed examination of the wall faces was started, recording bulges, voids and loose facing stones, whether the parapet survives etc. This work is time consuming, and during the first season only the outer face between gaps 'F' and 'G' was recorded, but when complete it is hoped that this survey, in conjunction with the photographs, will not only be valuable for identifying areas requiring attention, but will also reveal details of the construction of the rampart which would evade a more casual inspection. As an example, in Plates 93 and 94, showing parts of the outer face of wall length 'D' to 'E', there appears to be a rough bonding course of large boulders a little below halfway up the wall, the stones above this being generally larger than those below.

In the first season, three areas of collapse were repaired ('E1', 'F1' and 'N' on Fig. 2). A start was also made on the north postern (Dallimore's Collapse 'M').

The North Postern.

The N postern, the so-called 'sally-port', is one of three narrow entrances through the inner rampart. The passage had long been choked with rubble, but its importance lay in the fact that at its outer end it was bridged by a massive stone lintel, suggesting that the wall had originally been carried across the entrance, a feature unique among Welsh hillforts.

The earliest description yet found of this entrance is by Pennant. By then the entrance was already blocked:

'there was in one place a cell in the thickness of the wall, or perhaps a sally-port, in part stopped by the falling-in of stones' (Pennant 1783, 207).

In 1946 Griffiths measured the height of the front of the passage at 4ft. 6in. (1.37m) but by 1989 the height of the opening above the rubble was no more than 0.8m. One cannot know from which point Griffiths took his measurement, but comparison of a photograph taken during the 1956 excavations (Plate 95) with one taken in 1989 (Plate 96) showed that there had been further collapse in recent decades. The condition of the inner end of the passage had changed little since 1956 (compare Plates 97 and 98).

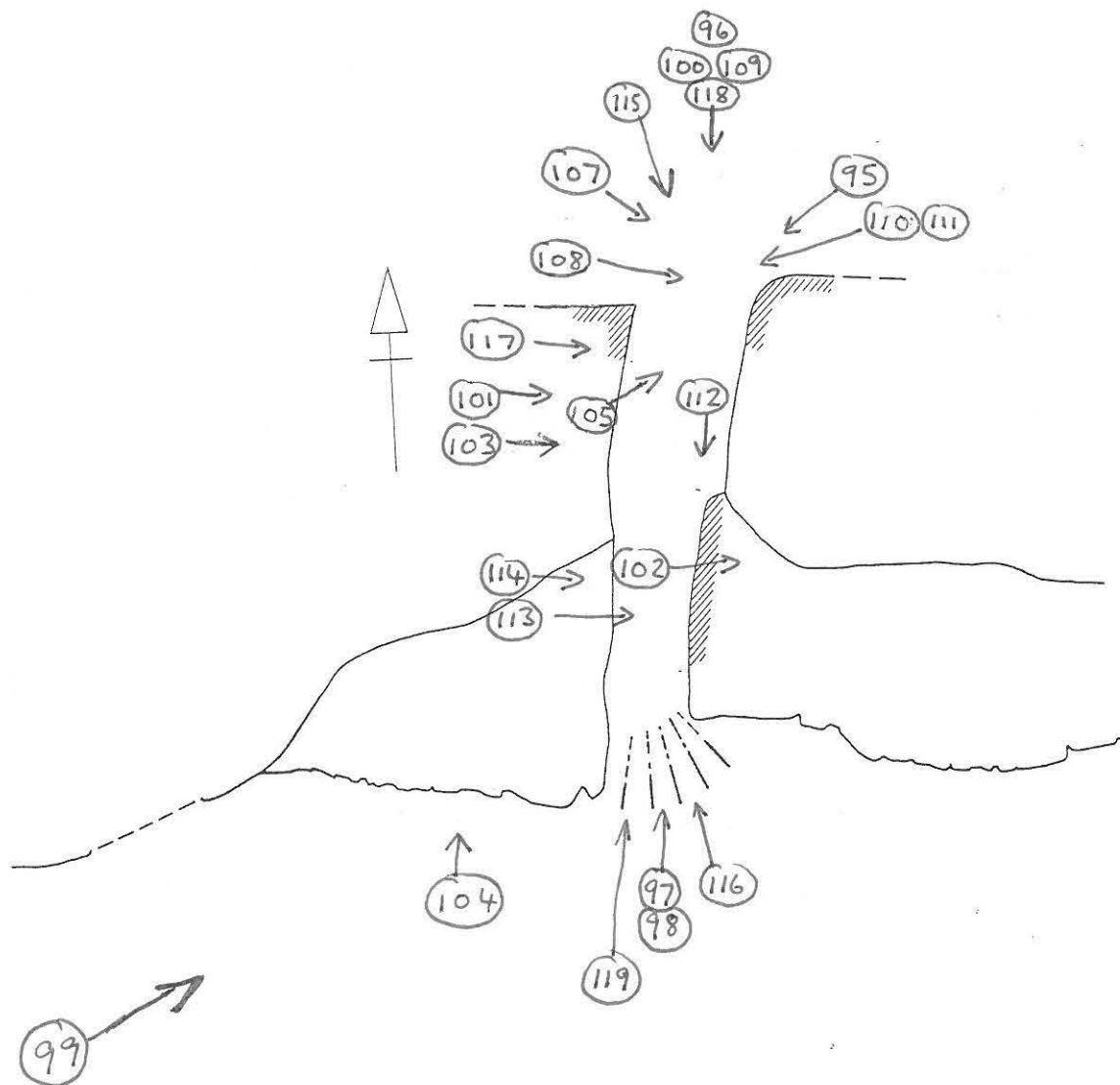


Fig. 18. North Postern, showing direction of view of Plates 95 - 118.

Against the inner face, to either side of the entrance, was an additional tier or step. Slight excavations in the late-nineteenth century by Prichard (1887, 257) established that this had been built against the face of the main rampart, and the excavator suggested that it might have been added as a buttress. Griffiths, however, thought that it might have been built to provide access to the wall top, and this interpretation was followed by the Royal Commission, who identified it as one of a number of 'sloping ramps' leading to the wall walk (R.C.A.H.M. 1960, 102). Before conservation this feature was much obscured by tumble, but there was no visible evidence that it sloped up to join the wall walk at any point (Plate 99).

One of the aims of the Conservation Project was to open up the passageway. Because of worries that the lintel might not survive another winter, instructions were given that work on this feature should begin as soon as possible. Therefore, after spending a week on the huts experimenting with building techniques, the masons made a start on the entrance passage on 18 December, by clearing an approach to it from the outside (Plate 100).

For reasons of safety, the stretch of surviving parapet immediately to the E of the entrance (Plates 100 and 101) was dismantled, the large stones being rolled down the inner face of the wall. Work then began on clearing the stones from the top of the passage.

The 'Ramp'.

It soon became clear that, behind the rubble obscuring the 'ramp', the inner face of the rampart survived, curving in towards the entrance passage (Fig. 19 and Plate 102). As clearance of the passage progressed, this facing became visible in the E side of the passageway (Plate 103, behind the scale) butted by the 'ramp'. No convincing surface was found to indicate the original height of the 'ramp', but rubble was removed to the level of its facing, leaving the inner face standing two courses high on the E side of the passage, but up to 1.0m on the W side (Plate 104).

There was no evidence that this feature led up to the wall walk, and the term 'ramp' therefore seems misleading. Prichard may have been correct that it was built to strengthen the wall, whose inner face here stands higher than anywhere else in the fort, although easy access to the wall top may also have been a consideration. The descriptive term 'lower banquette', used by nineteenth century writers (eg Prichard himself) would therefore seem more appropriate.

Work on the area around the postern was stopped before the surface of the banquette was stabilised, and a method of completing this has yet to be agreed.

The Lintel.

At the first site meeting, on 6 December, it had been said that the lintel should be supported *in situ* while the passageway was cleared and the outer corners of the passage, which provided only shaky support, were stabilised. It soon became clear, however, that the lintel could not be propped up safely, and that rather more dismantling and rebuilding would be needed in the passageway than had been envisaged. A decision was therefore taken at an early stage to remove the lintel while the passage was consolidated (Plate 105). After testing the weight of the stone the stonemasons were confident that it could be manoeuvred safely to the ground, and this was attempted. In the event one of the masons slipped on the wet rocks, letting go of the stone, which fell, breaking into three pieces (Plate 106).

This unfortunate accident has been the subject of much discussion, all fully minuted at site meetings. With hindsight it has become obvious to all concerned that the instructions given, and the preparations made for approaching the lifting of the stone were inadequate.

A decision has been made by Cadw that the stone must be repaired and re-erected, and the pieces have therefore been carried off the site and handed over to Cyngor Dosbarth Dwyfor while appropriate arrangements are made.

The Outer Corners of the Passage.

After the stone had been removed, it was clear that both of the outer corners of the passage required attention, particularly the E corner (Plate 107). This was unstable, with many loose stones, particularly towards the base of the wall. In view of the intention to open up the passage for visitors, it was felt that safety considerations were paramount here, and that rather than attempt to pin the original masonry, the whole corner should be dismantled and rebuilt. The facing was removed carefully to avoid dislodging the core and rebuilding began at ground level (Plate 108). It must be said that the rebuilt masonry (Plate 109) is different in style to the original, but it is to be expected that by the time the repaired lintel is returned to the site, the masons will be sufficiently adept at copying the style of the original work to attempt a restoration which is both safe and visually satisfying.

Rather less work was necessary on the W corner (Plates 110 and 111). The upper courses were loose and had tilted forwards. This was corrected by taking the corner down by approximately 0.6m and rebuilding. As far as possible the original stones were reused, but again safety considerations were considered paramount. The result can be seen in Plate 109.

The Passageway.

Within the passage itself, it emerged that the blocking material

was holding the sides in place. There was a particular severe bulge towards the inner end of the E side of the passage, where the face of the lower banquette threatened to collapse (Plate 112). It was necessary to dismantle a 1.8m length of this face, from the junction of the inner face with the lower banquette to just short of the inner corner of the passage, as indicated on Fig. 19 (compare Plates 113 and 114). The core material behind this face was also removed in order to provide a sound platform for rebuilding, revealing the original inner face of the rampart (Plate 114, to left of the scale).

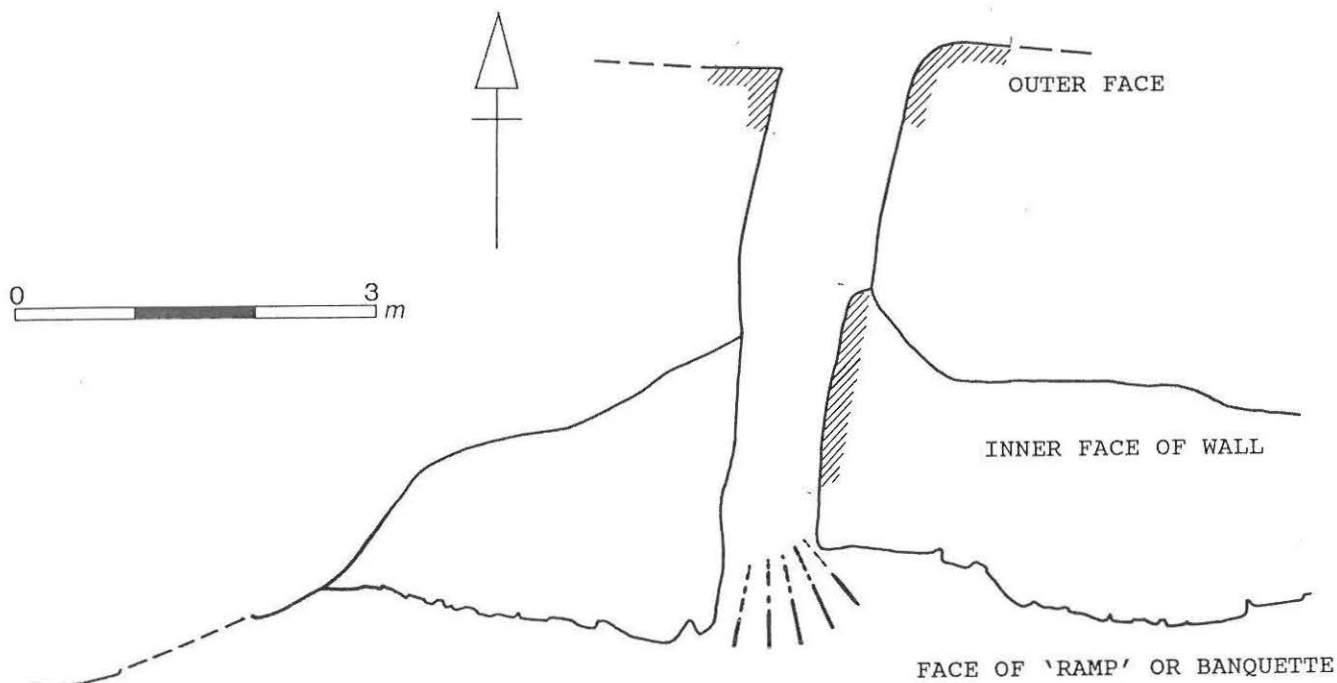


Fig. 19. North Postern, showing wall lines. Areas dismantled and rebuilt are hatched.

As with the outer E corner of the passage, no attempt was made to ensure that the original stones were returned to their original positions, though in the passageway more emphasis was placed on simulating the original style. There has been much discussion of this at site meetings, during which it has emerged that as in the case of the lintel there was a failure in communication between Cadw and those on site. Since then careful attention has been paid to ensuring that stones are replaced in their original position.

The rest of the passageway was on the whole stable. Some pinning was required at the base of the wall on the E side, just in front

of the junction of the lower banquette with the inner face (Plate 115, between the two scales), and at the base of the W side, towards the inner end, a gap in the masonry was filled with one large slab (Plate 116, at the bottom of the left hand scale).

The Floor of the Passage.

Little evidence was found for any floor to the passage. At the innermost end, as the ground dropped steeply into the passage, there was a spread of black peaty soil, apparently only a thin layer overlying bedrock. Elsewhere clearance continued until the bottom of the masonry was reached without any trace of a worn surface being found. It must be assumed either that the passage roof collapsed before a pathway had been worn through the entrance, or that, as is generally assumed to have happened in the huts, the floor has eroded or been washed into the scree below. To provide a roughly level surface, therefore, small stones were spread on the passage floor.

Re-roofing the Passage.

This work was carried out before the decision was made to repair the broken lintel.

Clearance of the rubble over the front of the passage had revealed the existence of a second lintel immediately behind the first, and during the removal of the collapse within the passage one other stone long enough to have bridged the gap was recovered (though its exact position was not recorded). The possibility that there would not be enough long stones within the blocked passage to restore the roof had been discussed before work began on site, and it had been agreed that in such a case suitable stones should be selected from the natural scree. Three stones were therefore selected from the slope beneath the summit cairn. While doing so great care was taken to avoid disturbing areas where there was any evidence of structural features.

There was little evidence to indicate whether all or only part of the passageway had originally been roofed, the sides surviving to an approximately constant height throughout its length. However the only purpose of roofing the passage would have been to carry the wall across it, and there was not enough rubble at the inner end of the passage to suggest the collapse of a wall standing to any great height. The lower banquette (and therefore the inner half of the passage) had certainly been added after the construction of the main wall, and it can only be assumed that the front of the passage had already been roofed. If the principal function of the banquette was simply to buttress an unstable inner face it may have been thought unnecessary to roof the passage and build higher, while if it was constructed to provide swift access to the wall top greater height would have been counter-productive.

It was therefore decided to roof only the outer half of the passage. Plate 117 shows the lintels in place. Working in

from the outer end (left to right) the photograph shows:

1. a new stone selected for its flat weathered face (see also Plate 118);
2. an original stone which had lain behind the broken lintel;
3. the stone retrieved from the passageway - this stone had an irregular shape, and in the photograph it is partly obscured by three smaller stones placed on top of it to support the fourth stone;
4. & 5. two new stones, the latter selected to provide a good surface on which to build and also for its flat inner face (see also Plate 119).

After the lintels had been secured, the wall was built up across them as shown on Plates 118 and 119. No decision has yet been taken on the final height of this restoration: work was suspended at this point to await the repair of the broken lintel.

Collapse 'N'.

This collapsed stretch of outer face (Plate 120), 4.8m wide and approximately 11.0m E of the North Postern, was first noted by Dallimore (Fig. 2). Clearance of the rubble confirmed that the collapse extended right to the bottom of the wall, only part of the basal course of the facing remaining (Plates 121 and 122), indicating that the collapse had followed the displacement of the lowest courses. Removal of the rubble was conducted with care, to ensure that the standing wall to either side of the breach, which rose almost vertically to its original height, was not disturbed (Fig 20). The core of the wall consisted of loose rubble, mostly small stones, with no evidence of any coursing (Plate 122).

When rebuilding the facing, large stones were laid 'end in' to the wall, and smaller material was piled behind these (Plate 123). The wall was carried up to the height of the surviving inner face, where it emerged that there would be a problem ensuring that the uppermost courses remained in place. After discussions with Cadw it was agreed that as an experiment a parapet, two courses high, should be built. At the same time an attempt was made to lock together the smaller stones on the surface of the wall walk. The rebuilt masonry is shown in Plates 124 to 126.

The inner face of this stretch of the rampart remained fairly entire. One minor spill was filled with the stones lying below it and one or two other fallen stones were replaced on the inner face and the face of the banquette below it. No dismantling of *in situ* masonry was involved here. The banquette had collapsed in places, and generally had a 'ragged' appearance, but as most of the masonry was stable no general rebuilding was attempted. Plates 127 and 128 show the inner face after conservation.

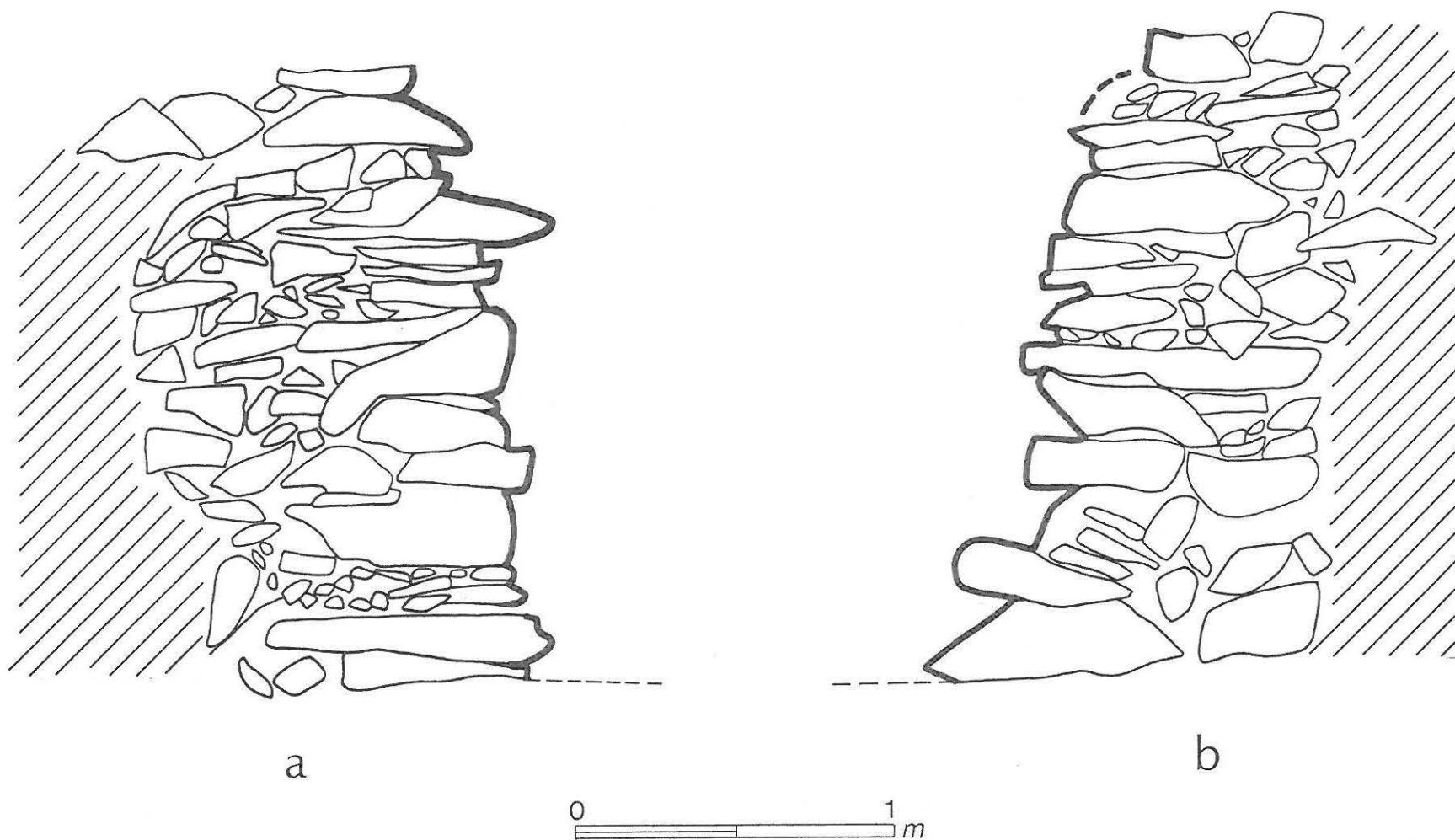


Fig. 20. Collapse 'N'. Sections through outer face of rampart,
(a) E-facing, (b) W-Facing.

Collapse 'E1'.

37m SW of the W gateway, a short length of the inner face had collapsed (Plate 129). As the tumbled stones provided easy access to the wall top, and as the area of collapse seemed likely to widen if this access was not blocked, it was decided to clear away the rubble and rebuild the face.

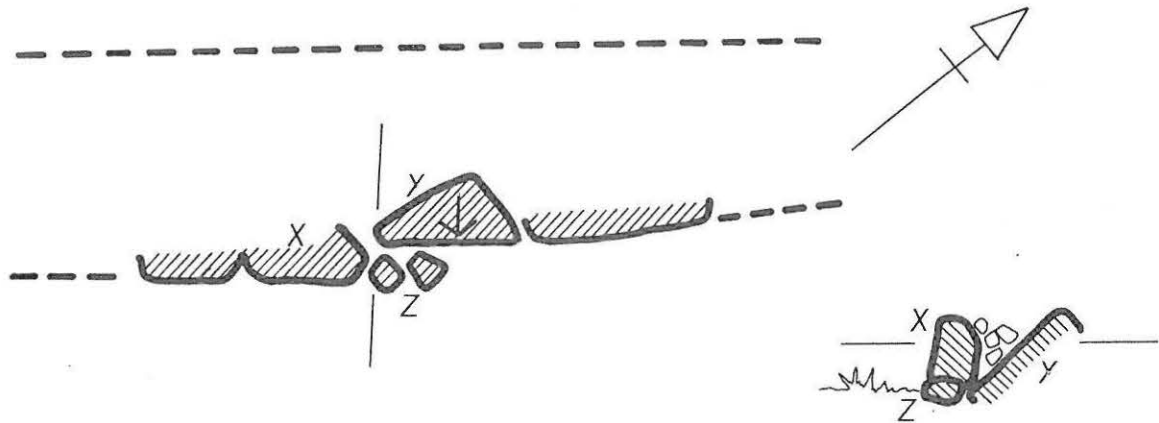


Fig. 21. Collapse 'E1'. Plan and section showing change in wall line.
Sketches only, not to scale.

Once the rubble was removed it was clear that there was a change in the alignment of the wall here (see Fig. 21 and Plates 130 and 131). In Fig. 21 the face of stone 'Y', was set back from the line running NE to stone 'X'. In front of this were two stones ('Z') which appeared to be *in situ*. As stone 'Y' had a sloping face, it seemed likely that these two stones had been placed to provide a foundation for the wall face, and the wall was therefore rebuilt on top of them. The result is shown in Plate 132. Further to the SW enough of the basal course of the wall survived to indicate the original line of the wall, and the loose rubble lying at the foot of the wall was used to build the face up to the height of the masonry to either side (Plate 136).

Collapse 'F1'.

10m S of the W entrance, for a distance of 5.5m, the upper courses of the outer face had fallen, leaving a breach where the wall height dropped from 2.0m to 1.3m (Plate 134, centre of frame). The surviving lower courses appeared to be secure, and replacing the fallen stones was a straightforward task (Plate 135, between the scales).

The top of the wall has yet to be made secure. By the time the upper courses came to be rebuilt there was a shortage of very large stones, and those that were used are perhaps too small to

provide the required stability (Plate 136). An attempt to secure the wall top will be made during the second season.

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