

Excavation of a settlement and souterrain at Newmill, near Bankfoot, Perthshire

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with a contribution by G Barclay†

SUMMARY

The accidental discovery of a souterrain beside the A9 road 14 km (8·7 miles) N of Perth led to its complete excavation and the investigation of several hundred square metres of the settlement with which it was associated. A single grave of the Beaker period was also discovered during excavation and is reported elsewhere in this volume. The souterrain was a massive example of the 'southern Pictland' group, and the settlement consisted of timber-framed circular houses of the familiar British Iron Age tradition. Little material cultural remains were recovered, but a series of radiocarbon dates places the souterrain's construction in the last century or so bc, its use contemporary with the timber houses alongside, its destruction around 200 ad, and the continued use of the site into the 9th century at least.

INTRODUCTION

The site, which is now totally destroyed, lay at NGR NO 084324, enclosed between a bend in the old A9 to the E and the line of the re-aligned A9 to the W (see fig 1). It lay in a field belonging to the farm of Newmill in the parish of Auchtergaven, Perth and Kinross District, Tayside Region. The old A9 had taken a line around the foot of an inconspicuous, low, oval hill of fluvio-glacial outwash sand and gravel, on which the previously unrecorded site was found in connection with the work of re-aligning the road through a cutting in the hill to eliminate the dangerous bends. The top of the hill was about 43 m above OD. Because of the changes in topography caused by the new road and associated gravel-extraction the site is shown both in relation to the contours of the hill as they existed immediately before work began and in relation to the present layout of roads (fig 1).

Originally it was intended to carry the road through the hill in a cutting, but subsequently it was decided to use the eastern half of the hill as a source of material for sub-base for road-building. During exploratory trenching with the back-actor of a JCB IIIC tractor shovel the souterrain was cut through. By a remarkable chain of accidents the unrecognised phenomenon was seen and identified by Dr M E C Stewart and Mrs D Lye of Perth, who advised the local planning authority and the Inspectorate of Ancient Monuments of the matter. Planning permission was given so as to allow time for excavation, and the present writer was asked to undertake the investigation of the site prior to destruction. At very short notice an excavation was planned and mounted, funded by the Department of the Environment, and carried out between 10 August and 10 September 1977. The number of people working on the site varied from three at the

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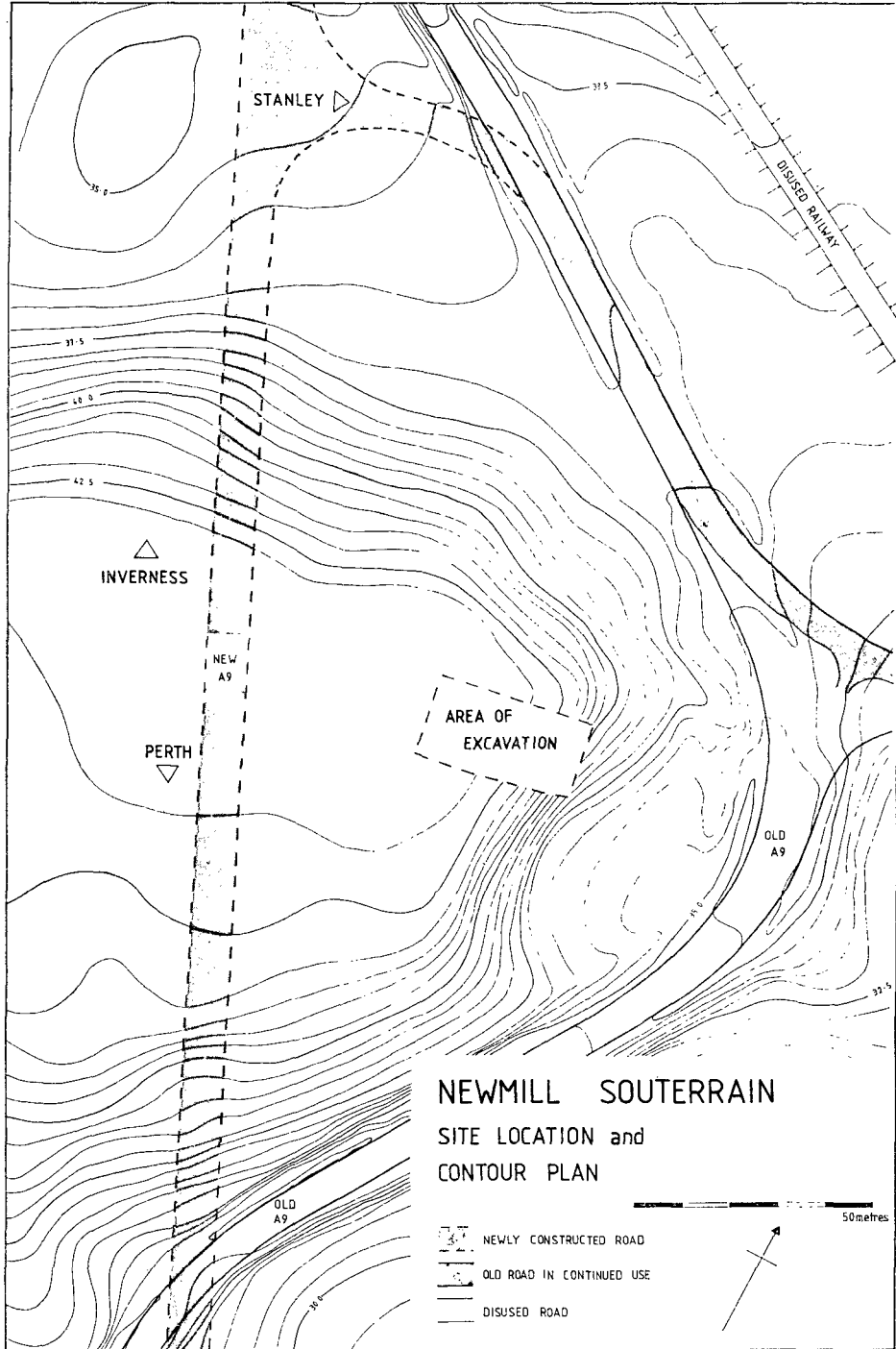


FIG 1 Location of excavation area in relation to present and former roads, and contours as before 1977 roadworks

beginning and end of the operation to a regular team of eight to ten, a force which might be doubled by volunteers at weekends.

It is a pleasure to acknowledge the financial and personal support of the Inspectorate of Ancient Monuments at all stages of the work. I am happy also to acknowledge the co-operation and help of the contractors in charge of the road-works and gravel-extraction, R J McLeod & Co and their subcontractors. I am particularly grateful to the project manager for the contractors and the subcontractor responsible for digging the gravel for agreeing to extend the time allowed for archaeological excavation beyond the time limit in their planning permission when it was impossible to arrange the commencement of the excavation earlier than two weeks before the deadline. The highest accolade should be given, however, to the small team of volunteers who undertook and completed an excavation out of all proportion to their numbers and the time available. Essential recruiting agents as well as part-time participants were Dr M E C Stewart and Mrs D Lye. It is no exaggeration to say that the work could not have been finished without the help of those people who came from all points of the compass to offer their help at weekends or for odd days as they could manage. I should also thank the Secretary of the Royal Commission on the Ancient and Historical Monuments of Scotland for sending excellent photographers and the Commission's Hi-Spy camera to take the high-level photographs from which Plate 10 was made up. And I am equally happy to have the opportunity of thanking Mr Tom Berthon of Perth for his contribution in photographing the site both from the air (under most inappropriate weather conditions) and on the ground.

The objectives of the investigation were to excavate the souterrain completely in order to learn about its destruction or decay, its structural history and function, and its chronology by means of radiocarbon dating. The possibility that a settlement existed of which extensive traces might be recovered was in the forefront of the writer's mind because of the experience of the excavations at Dalladies Site 2, Kincardineshire (see pp 122-64). Thus a second set of objectives was to search for and investigate traces of occupation and activity beside the souterrain and to try to relate the souterrain to the settlement. In the event it was found that the souterrain was scarcely contained within the area which had been agreed with the contractor would be available for excavation, and the portion of the settlement which was investigated was tantalisingly insufficient. On the other hand there were constraints within which we were forced or chose to work. In the first place the cutting in which the road was originally planned to run was already cut before the writer was involved, so that the area of the crown of the hill to the W of the excavation area was already lost. The areas to the N and S of the excavation area were conceded to the contractor without investigation as a *quid pro quo* for an extension of the time-limit on the excavation. On the other hand it was a calculated risk taken in the knowledge of the likely size of the excavation team and the very limited time available. The key area, to the W of the excavation area, was lost before the excavation was planned.

The excavation area was stripped by a Liebherr 911 tracked back-actor fitted with a broad toothless blade. The machine and operator were loaned by the contractor free of charge, and were brought a long distance for the purpose, for which I was very grateful. The area was then roughly cleaned by hand before being carefully cleaned twice by trowel and brush. Thus the souterrain, the contractor's machine-dug soundings and a number of soil- or soil-and-stone-filled features cut into the gravel subsoil were located. The rest of the excavation fell technically into two parts. The souterrain was investigated so as to yield a reasonable number of sections through the fill in so far as that was consonant with the need for haste. Except at the foot of sections the lowest portion of the fill of the souterrain was left to be excavated carefully, separately from the rest and as one entity representing (perhaps) the use of the structure as opposed to its fill.

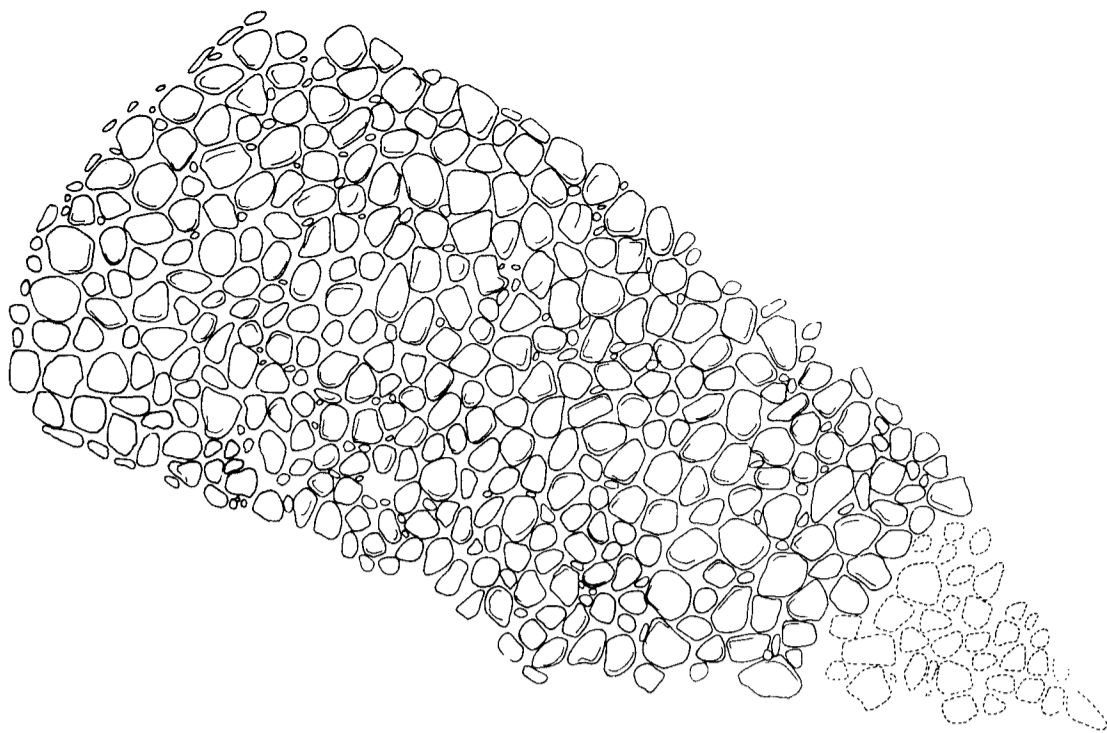
Once the structure was clean and recording was complete the floor was removed throughout. In some places it was possible to observe and investigate the trench in which the souterrain had been built. On the surface of the subsoil above the souterrain the various features were investigated as appropriate. Most of the smaller post-holes proved to be shallow, full of rootlets and worm action and often cluttered with stones; sections were very difficult and slow to cut and the information gained was almost none. In view of the necessary haste sectioning was abandoned except where it seemed there might be useful information to be won. The pits, which were shallow affairs, were sectioned, and portions of a slot resembling a palisade trench were sectioned axially. Elsewhere it was found that the post-packings in the slot were detectable for the most part without sections. Although the first careful double cleaning of the surface yielded plenty of features it was found that there were obvious lacunae in some of the plans. Re-cleaning the surface after it had been exposed for two or three weeks not only produced a number of anticipated features but also a very large number of quite unexpected ones. Exposure and brief weathering of the subsoil surface ultimately almost doubled the number of post-holes in the southern half of the excavation area.

SOUTERRAIN

In dealing first with the souterrain and turning subsequently to describe the findings on the gravel surface of the top of the hill it is not intended to imply that the souterrain should be first in our thoughts when attempting to assemble our understanding of the site as a whole. As already explained the excavation task fell naturally into two parts. The souterrain is here described first because, although both parts of the excavation were pursued simultaneously, the souterrain at first took priority because of its size and the enormity of the job of simply emptying it. Once the outline of the souterrain had been fully identified on the ground its excavation was pursued with utmost vigour and was brought substantially to completion in a little over two weeks. After that almost our whole attention was given to the gravel surface. Thus the description of the work follows in a sense the way the work was conducted.

The objectives of the excavation of the souterrain have already been outlined. What follows here, after a brief summary of the main features of the souterrain and a short account of the method of its investigation and recording, is a detailed description of the structure. This is followed by a description of the fill of the structure. Discussion of questions raised by these observations or questions relating to souterrains in general are reserved either to the discussion section of this paper or to the concluding essay by Gordon Barclay.

In summary, then, the souterrain was found to consist of a single, simple, curving, passage-like chamber with two entrances set close together at the S end and a blank end-wall at the N end. The walls and floor were built of rounded, water-worn stones. No trace of a roof was found. The chamber was about 2.5 m wide at its southern end and broadened to 4 m wide at floor level at the terminal. The souterrain was so laid out that its southern end was in the slope of the hillside and its floor was close to ground level; the northern end lay under the hilltop and the floor there must have been almost 3 m below the original ground level. The fill was of soil, gravel and sand and mixtures of those materials. Having located the outline of the souterrain we excavated it in large blocks, allowing us to observe and record three main transverse sections and one axial section through the fill. Another axial section was cut through the lower fill of the passage of the axial entrance, but it would have been too dangerous to cut axial sections in most of the chamber. Upon completion of the excavation of the fill of the souterrain plans were drawn of the top of the walls (fig 2a) and elevations of the passage of the axial entrance. The paving of the floor (fig 2b) and the elevations of the walls (fig 3) were recorded photographically, the



MACHINE TRENCH

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PAVING ON SOUTERRAIN FLOOR

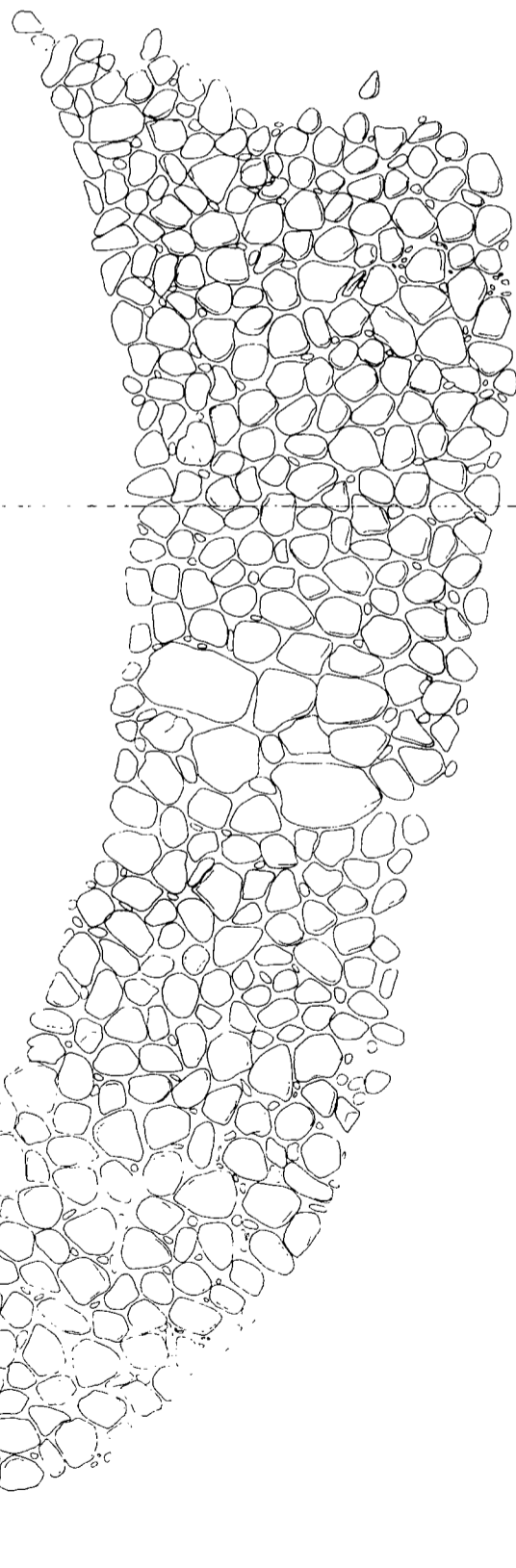


FIG 2b Plan of souterrain paving

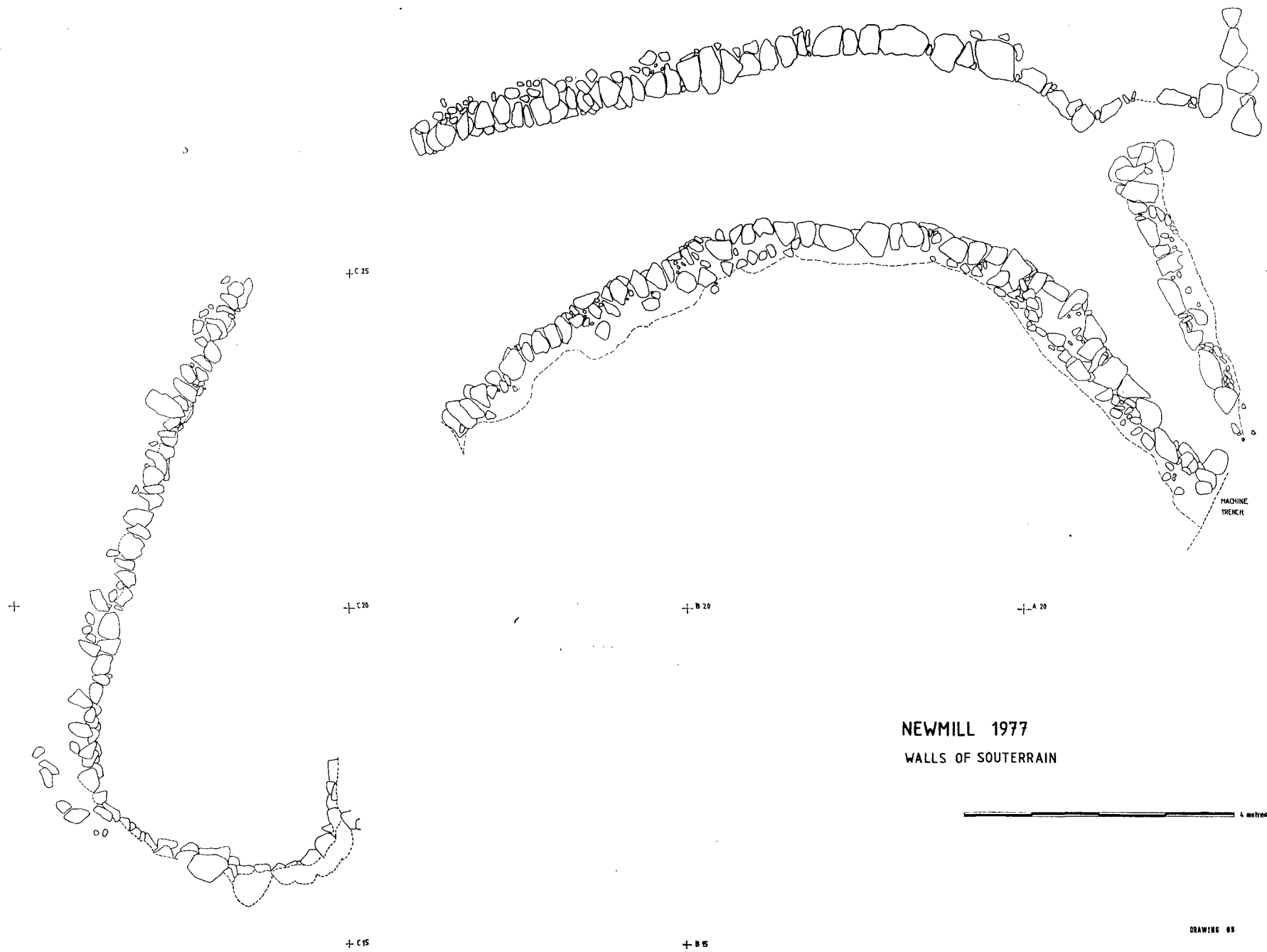


FIG 2a Plan of souterrain. Walls planned at the level of top surviving stone

drawings being produced photogrammetrically for the publication; the purpose of this device was to save time on excavation at the expense of a good deal of draughtman's time after the event.

The souterrain had been built in a great trench dug in the natural sand and gravel subsoil. Since the tops of the walls lay below the surface of the gravel almost everywhere it was the edges of the trench rather than the stones of the wall which were used to trace the ground-plan of the souterrain. Everywhere except at the axial entrance the walls of the souterrain lay remarkably close to the sides of the trench; the walls had been built against the sides of the trench and necessarily the walls were the same thickness at the top as at the bottom if the sides of the trench were not to be undercut, practically impossible in gravel. Where the contractor had accidentally sliced through the souterrain it was possible to clean up the edges of the cut through the outer wall and see that there was no packing between the back of the wall and the side of the trench; the wall-construction was designed to be of one thickness from top to bottom. Finally, as the site was being destroyed by gravel-digging and the 'wrong' side of the terminal wall was exposed it was possible to confirm these observations in general and to add that where the terminal wall and corners were constructed to overhang the interior the trench was apparently cut to match. Quite how this was managed is unclear, but the inability of the gravel to stand if undercut would require the cutting of the trench to proceed step by step with the construction of the wall. The floor was laid on a bed of disturbed, soft gravel. The passage of the axial entrance was built in a narrower trench with sloping floor to accommodate the ramp, at least in its outer half. Below the lower part of the ramp was a backfilled cavity which extended outwards under the walls. This overcut trench was also cut too wide, for behind the wall-stones at this point, immediately around the doorway of the axial entrance, there were amounts of soil and small stones used as packing, and the outline of the over-wide trench could be made out in plan. The backfill of the overcut trench below the passage was made up of gritty gravel, soil and much fresh charcoal, which produced a determination of 2005 ± 90 bp (55 ± 90 bc, GU-1022).

The first stage of the building of the souterrain was to erect the base-course of the walls. With one exception the stones chosen were water-worn boulders. All the stones were very large and were set on edge or on end, a common feature of souterrain masonry. The functional explanation of this technique would presumably be the combination of the wish to use the largest practicable stones for economy with the need to build the wall of constant thickness from top to bottom. The relatively smaller stones which composed the upper parts of the walls were similar in geological origin and in their rounded, water-worn surfaces. Such erratics do not occur in the fluvio-glacial gravels, as we had ample opportunity to observe, but are to be found in and around the local stream-beds, washed out of their highland zone sources. The nearest stream, the Ordie Burn, passes the site to the W about 200 m distant, and we observed boulders of the kind used to build the souterrain at various points in the stream bed and in its narrow flood-plain. Although the source, or the probable source, was quite close to the site, the very volume of many of the stones and the quantity required in total might be thought to point to the use of some sort of wheeled transport. The irregular bases of some of the stones had been compensated by the use of small packing stones, invisible or at least scarcely noticeable once the floor had been laid to the walls. The upper parts of the walls were constructed from smaller stones of the same geological types and the same water-worn source. Although on a significantly lesser scale than the stones of the base-course the upper stones were nevertheless large and heavy.

Noting that the wall stood 2 m in height and that the stones were rounded water-worn boulders and not convenient slabs it becomes clear that the building of these walls was the work of people with considerable skill, experience and confidence. At the stage when the walls were being cleaned for photographic recording the skill and experience of the builders became specially

apparent. It was found that almost all of the small stones in the interstices of the wall were not elements of the fill of the souterrain, but were elements in the construction of the wall itself. These small stones acted as pegs and wedges holding the structure firm. We must remember that not only was the construction entirely dry-stone, but the building material was not very suitable for such a scale of construction; and we should not be misled by our own traditions of neatly coursed masonry into thinking that the Newmills masonry was careless or untidy. Inevitably the appearance of the work is affected by the material used; but the scale and strength of the Newmill walls can be in no doubt. Not only did the souterrain walls stand firm and unbudging once the fill of the souterrain was removed, but we also know as a result of the radiocarbon dates obtained that they had stood firm for a period of centuries while the souterrain was in use. Finally, during the destruction of the site, it was found that it was necessary to bulldoze the terminal wall very firmly for it would not fall down of its own accord once the gravel was removed from around it, nor would it fall if simply pushed with a tractor shovel.

Throughout much of their length the walls of the souterrain were preserved to their original height of about 2 m. They were built vertical or very nearly so, with the exception of the terminal wall and the two corners joining the side-walls to the terminal wall. There the upper parts of the wall overhung by as much as 45 cm. The purpose of this overhang can only be guessed at, for it would not seem to be connected with the corbelling of walls observed at certain other souterrains. There the purpose is to reduce the span to be roofed with stone slabs: at Newmill, to say nothing of the stone roof being entirely without visible remains, the corbelling was carried out not on the side-walls but on the end-wall. Perhaps it was a means of strengthening the terminal by binding the top of the wall, using the pressure from the overhanging gravel behind and diverting the thrusts downwards and outwards. The tops of the walls were neatly finished flat a clear 20 cm or so below the surface of the subsoil, and a good deal further below the then ground surface therefore. Here and there odd stones were found above the top of the wall proper insulated from the top of the wall by a certain amount of slightly discoloured gravel such as was noted in the narrow spaces between and behind the topmost stones of the wall proper.

Unfortunately an error of judgement in the early stages of the excavation of the souterrain has made the interpretation of the relationship between the tops of the walls and the level of the surface of the subsoil difficult for lack of observation. The problem is the obvious one, namely that the tops of the walls had been reached in excavation before the question now posed had been considered. Since near the entrances the tops of the walls were showing at the level of the base of the ploughsoil and since it was difficult to disentangle the plan of the contractor's machine-dug sounding from the plan of the main part of the souterrain where no wall-stones were projecting excavation proceeded by removing the top of the fill of the presumed souterrain to find the edges of the trench and the tops of the walls. It is of course by no means certain that excavation of the relevant material with the problem in mind would have produced an answer.

Close to the two entrances at the southern end of the chamber the outer wall was less than one metre high as found, and the inner wall also progressively reduced in height to the doorway of the axial entrance. At this point the souterrain was situated in the slope of the hillside, and the preserved height of the walls varied with the steepness of the slope: the hill-slope was gentle above the inner wall and it was almost full height, while the slope was much steeper by the outer wall; where there was no slope the walls were preserved to full height. The question is whether the souterrain was built 2 m high all around but had lost the upper parts of the wall through erosion, whether it was built as found with a very low wall on the outer side, or whether there was some intermediate explanation. The observations point to an intermediate answer, namely that the outer wall was higher as built than as found, that it originally projected above ground

level, but that it was deliberately reduced when the souterrain's life was ended. Other evidence suggests that a certain amount of erosion has also taken place, though not enough to account for more than the loss of one or two courses of stone from the wall.

In the first place there is evidence that the outer wall near the side-entrance was not built quite like the rest of the walls. The boulders of the base-course were smaller and lower at this point, and a clear discontinuity can be seen further along where 'normal' construction was resumed (fig 3). The implication of the low base-course is that it supported a lower wall than the 'normal' 2 m. The floor of the souterrain by the two entrances was littered with building-stones. The further into the chamber one went the fewer the stones became. There was a tendency for the stones to lie in greater numbers below the outer rather than the inner wall, although this does not show clearly in the transverse section, fig 4. The coincidence of useable building-stone on the floor of the souterrain only where the walls were found to be of less than 'normal' height suggests, though it cannot prove, that the stones on the floor came from the walls, and predominantly from the outer wall. It is no more than an intuitive estimate that there was enough stone on the floor to account for a further three or four courses on the outer wall and yet to leave enough to account for a lost course off the inner wall. What would be important to establish is the height of the top of the outer wall relative to the then ground level, and that cannot be done with any precision at all. The importance of the question is of course that if the outer wall were formerly considerably taller than as found and if the original ground level were only a little higher than as found then the souterrain would have projected above the surface of the ground at this point. When we consider the passage leading to the side-entrance it will be argued that the passage was cut down very shallowly into the hill-slope, and that would be additional evidence, if the argument is accepted, that the souterrain's outer wall was free-standing and above ground at the point.

In describing the base-course of the souterrain wall it was said that one stone was different in geological origin from the others. This stone was of sugary sandstone, off-white in colour, and it was a quite sharply faceted block, which had clearly not been substantially water-worn (pl 13a). It was more remarkable for another reason however; it bore among various markings on the surface which faced into the souterrain several cup-marks. It is entirely disputable how many of the marks on the surface were made as cup-marks, but at the very least one is beyond reasonable doubt a cup mark. Another is apparently unfinished, displaying rough peck-marks.

The floor of the souterrain was very carefully laid using water-worn boulders similar in geological origin and immediate source to the stones used to build the walls. Very great skill was shown in the selection of stones and in their laying: the stones varied considerably in their size and bulk, and their flattest surfaces had been chosen and the stones set in a soft gravel matrix to produce a near level surface. In particular the fitting of stones was admirable, for there were few spaces where small 'filler' stones were required despite the fact that the stones were generally of rounded outline. In the part of the chamber nearer the entrances there were two or three straight joints in the paving, and there was one quite clearly detectable 'panel' of paving defined by straight joints to either side and the use of larger and flatter stones than the rest. It is possible that these joints mark repairs to the floor or that they are the consequences of some restructuring of the souterrain. On the other hand they may be no more than the signs of varied hands at work in the original construction of the floor; and for want of other evidence that there was any later reshaping of the souterrain perhaps that simpler hypothesis is to be preferred.

The general shape of the chamber was a long, narrow, curving area. The length along the axis of the chamber from the main doorway to the end wall was 20.75 m. The chamber was narrower near the doorway, being 1.80 m wide at 3.50 m from the doorway, and wider at its further end, being 4 m at its maximum. The terminal wall was nearly straight being linked to the

side walls by curving corners. The curve of the chamber's inner wall was on a radius of about 7.50-8.0 m. Near the entrances the smooth arc of the inner wall was broken; there the chamber began to narrow perceptibly and its axis bent in to meet the axial entrance passage.

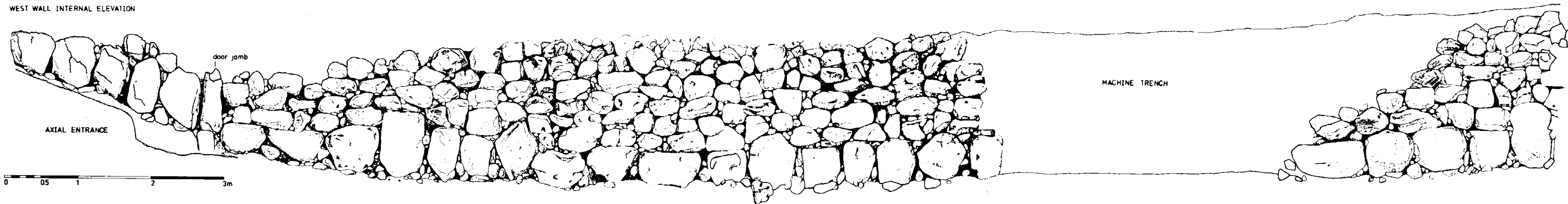
No trace of the former presence of a roof was detected on the wall tops, nor were there any collapsed remains of a roof on the floor or in the fill of the souterrain. And yet if the structure had been unroofed during its lifetime soil would have built up on the wall tops and trickled down among the stones of the wall, which was certainly not the case where observations could be made. Similarly aeolic deposits, however small, would have accumulated between the paving-stones on the floor, and all soil was conspicuously absent from the floor. Further discussion of the roof is postponed until the general discussion at the end of this report; here it is simply concluded that the chamber was probably roofed, though the roof must have been completely removed in order that the chamber could be comprehensively filled in with material thrown in from all around the edges.

At the southern end of the souterrain chamber there were two entrances. The more impressive was by means of a paved ramp leading down between orthostatic walls to a stone-framed doorway. It was laid out approximately on the axis of the souterrain's chamber, and is here described as the axial entrance (pl 13b). The other entrance was less detailed, smaller and opened through the outer wall of the chamber only a short distance from the doorway of the axial entrance. In order to avoid introducing subjective interpretations of the two doorways let us avoid calling one of them the 'main' door and the other the 'secondary' entrance, and refer to them as the axial and side entrances.

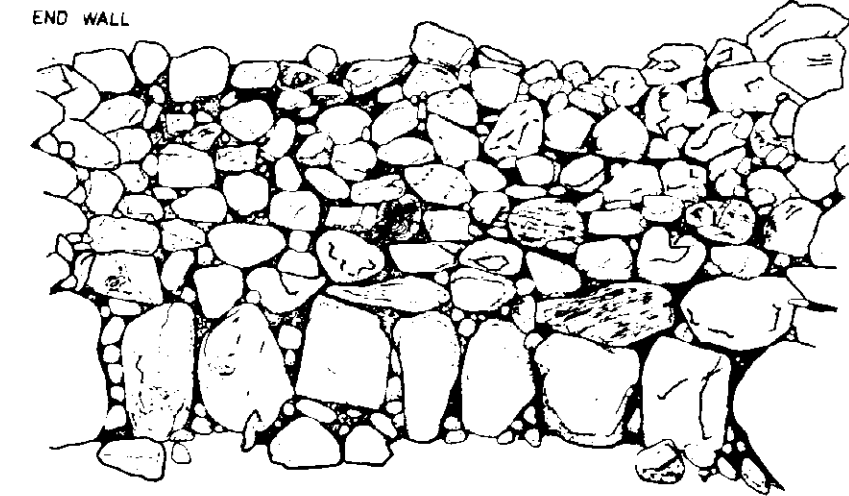
The mouth of the side entrance was marked by two upright stones set like pillars 0.60 m apart. They stood a mere 0.60 m high, and there was no clue as to whether the doorway was only that height or how it was completed. A suitable triangular stone with a long flat hypotenuse had been selected to serve as the threshold and was set roughly level with the floor of the passage and at a height of some 0.25 m above the floor of the souterrain chamber. There were no detectable fittings, or traces of fittings, for swinging a wooden door, or for bolting or barring it. A passage led in to the doorway. It was short, angled and narrow like the doorway. Its floor was approximately horizontal and unpaved. Its sides were formed of large rounded boulders, one of which was missing. The socket of the missing stone was easily found, a small, very shallow depression in the gravel, no more than could have been produced by the weight of the stone itself compressing the subsoil. There were no stones fallen into the passage to indicate that the passage walls had ever been higher than the single line of boulders found. In recent times at any rate the slope of the side of the hill was such that the stones of the passage walls must have been very close below the surface, and it seems very likely that the missing stone was ploughed out in modern times. There is evidence that this slope of the hill had suffered a certain amount of erosion. On the upper part of the slope, across the souterrain opposite the side-entrance there were small post-holes which had been severely truncated, and the reconstruction of two of the wooden buildings which had stood there gives reason to believe that many more small post-holes have been entirely removed by erosion. Even the large post-holes nearest the souterrain's southern half were much less fully preserved than their neighbours to the W. The truncation would appear to have been of the order of 0.10 m or more, enough to remove small post-holes but not of great significance in relating the side entrance passage to the then ground level. The sides of the passage, a single course of boulders, would have served to retain the sides of the trench cut to act as the entrance, but would not have reached to the then ground level. No trace of sockets for wooden members was noted when the passage walls were dismantled, and of course there was no sign of a roof of stone slabs in the form of either complete

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WEST WALL INTERNAL ELEVATION



END WALL



EAST WALL INTERNAL ELEVATION

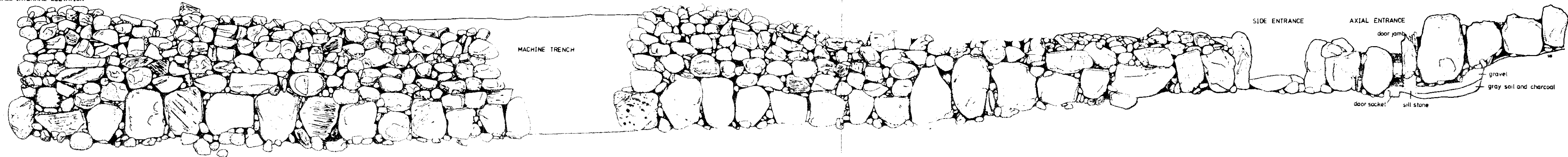


Fig 3 Elevation of souterrain walls

or broken slabs on the floor of the passage. Turning for a moment from recorded observation and inference to speculation, one may reflect that if the comfort of the person approaching were a consideration then the entrance passage might well have been unroofed; if it had been roofed at the height of the wall-tops then the only approach would have been by crawling. As far as the closing of the doorway is concerned it would have been possible to close it with a wooden shutter from either the inside or the outside leaving no archaeologically detectable trace; it would have been marginally easier to close the door with an internal shutter than with an external one, which would imply a doorway controlled from within the souterrain and leading from the souterrain via a short passage onto the slope of the hill. A final observation may be made here since it relies upon the side entrance passage though it concerns the souterrain itself: if it is accepted that the side entrance passage walls were built as they were found and that the then ground level was only a little above the wall tops, then that is further evidence that the outer wall of the souterrain at this point projected above the then ground level.

The axial entrance (pl 13b) was more elaborate than the side entrance. Its sloping passageway was paved; its passage-walls were impressively constructed of orthostats; and the jambs of the stone-framed doorway were large and set to form a rebate against which a swinging wooden door might close. At the doorway the chamber of the souterrain was at its narrowest, 1.00 m wide. The doorway itself was formed of three selected stones, two jambs and a threshold. The threshold was a step up from the chamber floor, and was a carefully chosen stone with a good flat surface which filled the width of the doorway. The jambs were tall slabs set at right angles to the axis of the entrance. The tops of both jamb-stones had been broken off approximately at the level of the top of the passage wall orthostats. As seen by one entering the souterrain the right-hand jamb-stone had split vertically when the top of the stone was broken off. The split was parallel to the axis of the entrance and thus at right angles to the axis of the stone. This strip of the inner edge of the door-jamb had tilted into the souterrain chamber, its upper end coming to rest upon the top of the outer wall of the souterrain chamber as recovered in excavation, its bottom end remaining close to its original position. Many shattered fragments of the upper portion of this stone, which was a block of mica schist, were recovered from the surviving top of the chamber wall between the axial and side-entrances. No trace of the upper part of the other jamb-stone was found, or at least recognised. In the angle between the right-hand jamb-stone (again as seen by one entering down the axial entrance passage) and the chamber wall there was a gap in the paving. When the paving was removed a cylindrical hole in the gravel subsoil was recovered exactly corresponding to the gap in the paving. The hole had been refilled with a soft, dark soil which may be interpreted either as the replacement soil for the wooden post which decayed *in situ* or as uncompacted refill of the souterrain which had trickled into the void left by a withdrawn post. The cylindrical hole, only about 0.10 m in diameter and about the same in depth, was not a post-hole with packing material but if anything simply the socket left by a post which had formerly stood there. It was too shallow to have held a post firmly upright, and one should probably imagine that the upper part of the post was held firm against the wall in some way. Presumably the post served to support a door, swung on something like leather strap-hinges perhaps. If one may reconstruct the chamber door in this way then one may also observe that the door swung into the chamber. No trace of a bolt-hole or slot for a bar was detected, but that is not surprising in a dry-stone wall like that of this souterrain, which provided ample opportunity without recourse to making holes for bolts, bars or pegs. No evidence was noted as to the height of the doortop or the nature of the lintel; no large stone, either whole or in pieces, was found on the floor which might have served as a lintel.

The floor of the passage was paved with flatter, smaller stones than the floor of the chamber.

The laying of the stones seemed more careless or less skilful, and the resultant floor was somewhat irregular with stones set at odd angles or partly overlying one another on occasion. The stones were embedded in and covered by a greasy, black soil of the kind commonly associated with the floors of houses; it was as if the ramp had been much used, had accumulated domestic debris which had been trampled in, and had been added to with a stone here and there from time to time. Finally it should be noted that the irregularity of the sloping floor of the passage was greatest where there occurred the edge of the over-dug foundation trench for the souterrain chamber, to which reference has already been made (*supra* p 169). Across the ramp at that point was a quite uncomfortable 'break of slope' where the deliberate backfill of the over-dug foundations had been compressed with the use of the passageway.

The walls of the passage were composed of selected flat boulders erected on end. The passage was 3.40 m long from the threshold and reached up to a point where the paving was only just below the surface of the gravel subsoil; even if the original construction had stretched further it would not have survived in the ploughsoil, so it is fair to say that the archaeological loss at this point, if any, must be very small. At the top end of the entrance ramp the side-walls were built of much smaller, lower stones than those at the foot of the ramp; in general the tops of the walls corresponded with the gentle slope of the top of the subsoil, though a few had projected a little into the topsoil. Here it must be emphasised that the mechanical stripping of the topsoil from the site did not extend to this extremity of the souterrain, which lay below the temporary fence erected to demarcate the area of excavation and was therefore hand-dug. Any displacement of the side-wall stones must be the result of agricultural activity. In short it was purely a piece of good luck that the entrance lay where it did. If it had extended further it would have been destroyed or badly damaged in gravel extraction, and if it had been shorter it would have been damaged in the removal of the topsoil: as it turned out we are able to conclude that almost nothing of the entrance ramp was lost prior to excavation. The axial entrance may be reconstructed as a passage which began at ground level near the top of the side-slope of the hill; it descended steeply and diagonally across the contours of the slope to a stone-framed doorway closed by a door which one pushed open to the right; the chamber was then reached by a step down from the threshold to the paving of the chamber.

THE SOUTERRAIN FILL

Leaving aside the two entrance passages, the chamber of the souterrain was excavated in four segments of which one was merely the re-excavation of the machine-dug trench across the chamber; in this last segment we were glad to accept some mechanical help in the second removal of the already disturbed soil together with the large wall-stones mingled in it, but otherwise the fill was excavated entirely by hand. S of the machine-dug trench were two segments separated by a narrow baulk, the S-facing side of which was prepared for examination and recording as a transverse section (section A-B, fig 4). A second section (section E-F, fig 4) was recorded on the S face of the segment close to the machine-dug trench. Between these two sections a third section was cut through only a part of the fill to define the stratigraphic position of a large hearth or shallow furnace found part way down through the fill (section C-D, fig 4). An axial section (section I-J, fig 5) was dug from the end-wall of the terminal to meet the fourth and last transverse section (section G-H, fig 5), which was cut as close to the machine-cut trench as was possible while still being approximately at right angles to the axis of the chamber.

The first point to remark is that there was no floor-deposit anywhere in the chamber of the souterrain. At the southern end of the chamber stones which are believed to have fallen or been

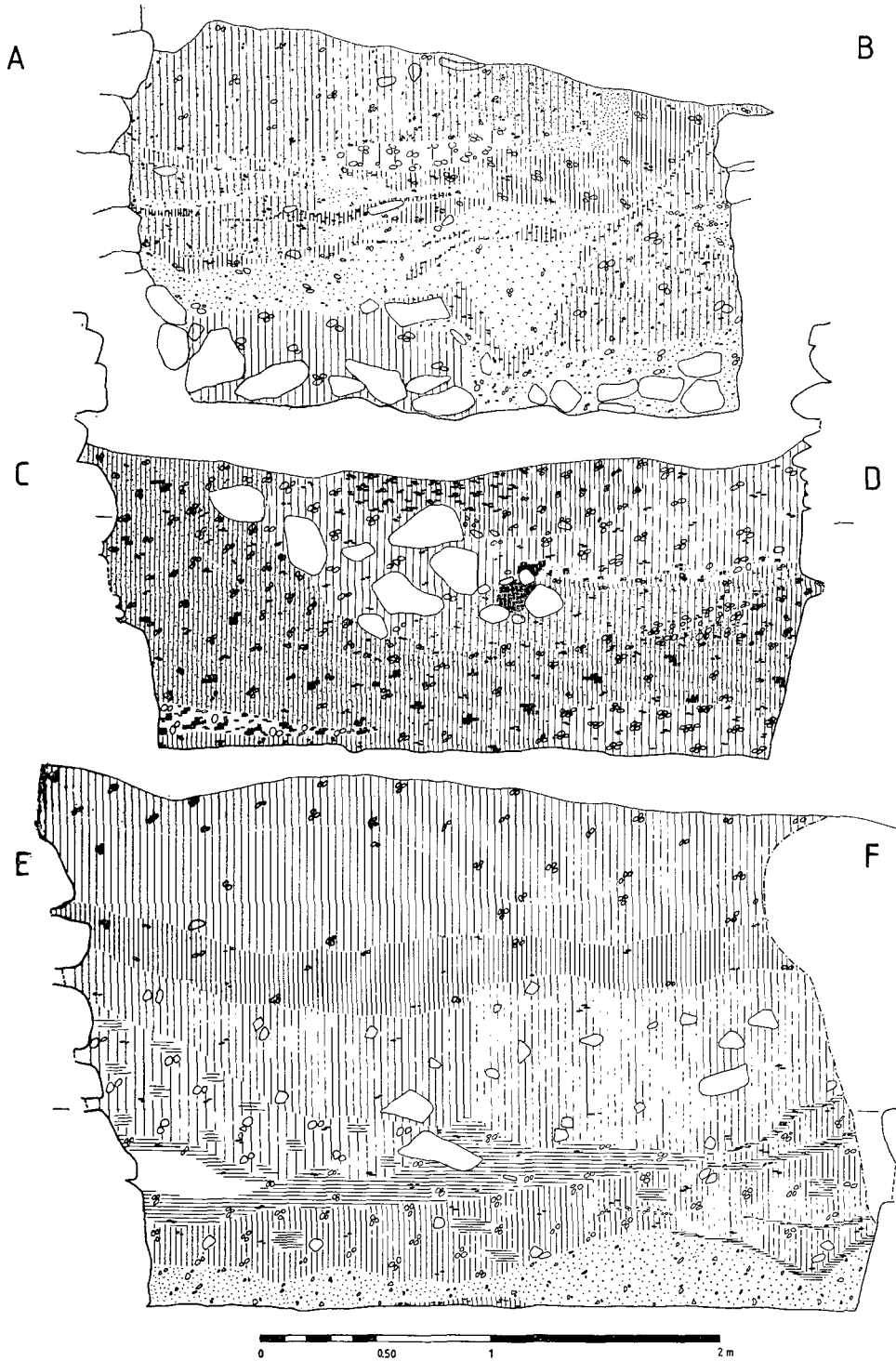


FIG 4 Sections through fill of souterrain, A-B, C-D, E-F. See fig 5 for key

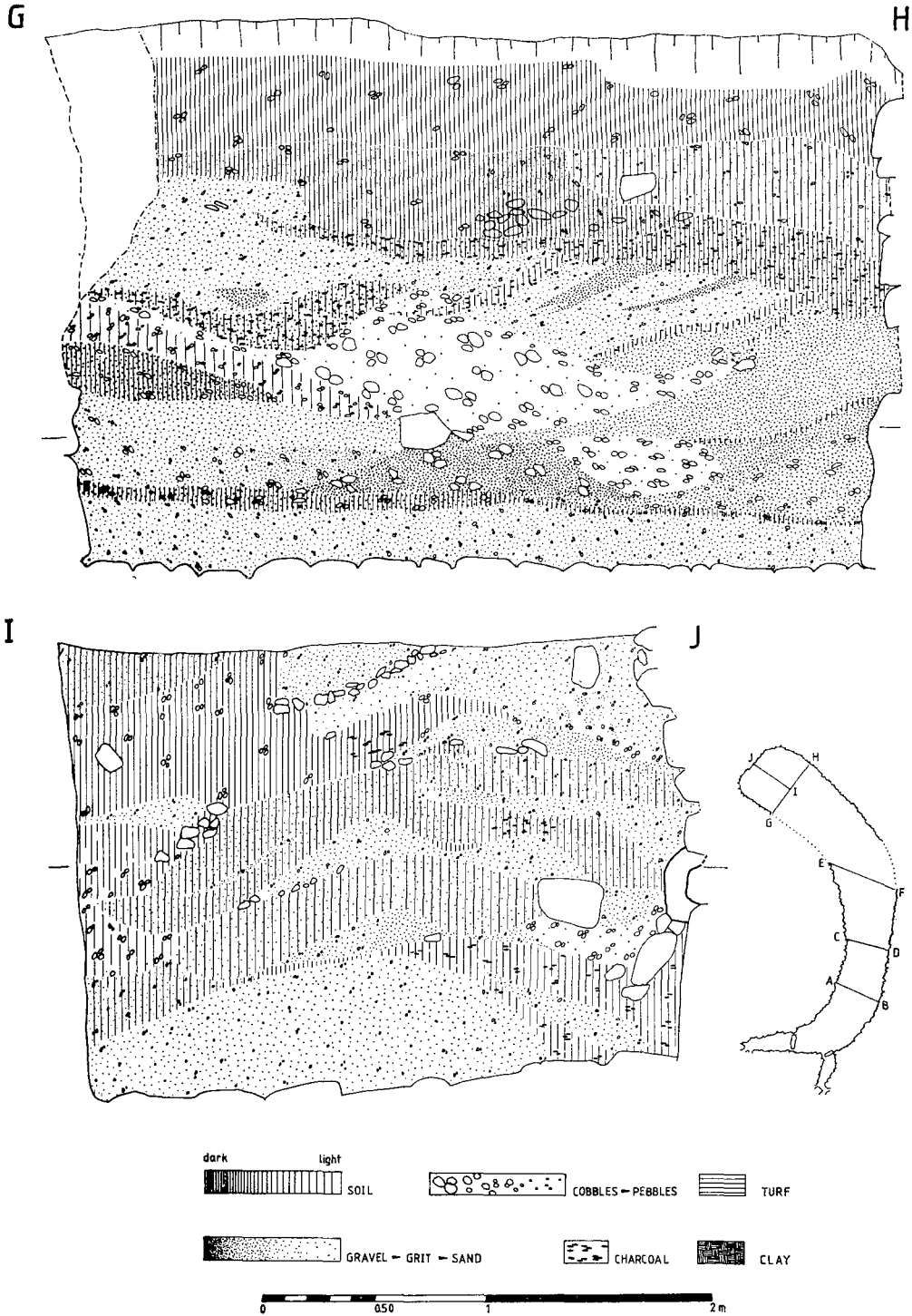


FIG 5 Sections through fill of souterrain, G-H, I-J

pushed from the tops of the walls, mainly from the outer wall, lay directly upon the paving in a loose matrix of slightly gritty brown soil. Especially at the very bottom there were airspaces here and there among the stones, which is also illustrative of the fact that the overlying fill was thrown in straightaway and in considerable quantity, for there was no opportunity for any wind-blown silt to accumulate among the stones nor for small amounts of fill to erode down among the vacuous rubble. In the centre and the N end of the chamber the fill lay directly on the stones of the paving. In those places where gravel was the first material to fall upon the floor it was observed that the gravel had slipped into the narrow interstices between the rounded, water-worn boulders which served as paving. As the paving stones were lifted towards the end of the excavation this observation was confirmed and it was found that the base of the gravel fill actually met the soft gravel bed in which the paving was set: there was not only an absence of accumulated soil on the floor but there were grounds for concluding that the floor of the souterrain had been scrupulously cleaned, to the extent of scraping or brushing between the stones, throughout its life.

Two more notable absences may be remarked, The base of the fill lacked any trace at any point of a primary silt such as might have begun to accumulate if the souterrain had been abandoned before being filled in; and there was no collapsed or thrown down roofing material. It may thus be inferred that there was no appreciable lapse of time between the end of the use of the souterrain and the throwing in of the fill, and that the roof of the souterrain, supposing it had one, must have been lifted off for the filling of the souterrain chamber. This latter inference is confirmed by the observation that the fill of the souterrain was distributed in such a way that it must have been tipped or thrown from all around the upper edge of the chamber. The components of the fill were diverse and much of the fill was composed of discrete zones of the different components disposed in such a way as to suggest most strongly that the refilling of the chamber was essentially a single process. Further, there was so much gravel used which cannot have been derived from the immediate edges of the souterrain (presuming that is that the gravel dug out to allow the building of the souterrain was not retained in massive dumps at the side) that the conclusion must be that gravel (and by implication topsoil) was brought from somewhere else. Again, the soil component of the souterrain fill was rich in charcoal, unlike the modern topsoil of the excavation, but remarkably poor in broken artefacts or remains of domestic refuse, so that the inference again is that the material was not refuse or soil including refuse from the area around the souterrain or the settlement but was dug and brought from a distance. And this interpretation of the fill as artificial, deliberate and a single process is in accord with the interpretation of the broken jamb-stones of the axial entrance doorway and the deliberate reduction of the outer wall of the chamber near the side-entrance.

There were several demonstrations of the assertion that the fill of the souterrain was deliberate and artificial as opposed to natural and slow. In the first place none of the expected characteristics of a naturally produced backfill could be observed: there were no smooth silt-lines, no horizon of stabilisation with typical soil-growth, and no collapse of the wall-heads as the cone of erosion spread. In view of the homogeneity of the natural subsoil underlying the topsoil all around the souterrain, the lack of homogeneity between any of the transverse sections argues against the filling of the chamber being the result of a uniform process; rather it accords with the tipping in of whatever material arrived at whatever point on the edge at whatever moment. Again, since the southern half of the souterrain is set into the slope any natural erosion into that part of the chamber would arrive from the up-slope side, which is patently not the case in the key-section, A-B; on the other hand, if there were a building standing close above the souterrain (as will be discussed at greater length below), then the souterrain chamber fill might be expected to be tipped in predominantly from the downhill side, which provides a convincing model for

interpreting several of the transverse sections. The manifest discontinuities in the refill's structure bear no resemblance to the way in which a natural fill would accumulate, but seem to illustrate well the throwing in of basket- or barrowloads of assorted material. In this respect the axial section of the terminal is particularly narrative: the first filling material was thrown from the lip of the chamber above the terminal wall and accumulated in a pile in the centre of the floor with the larger, rounder cobbles and clods of soil rolling to the edges of the heap; against the foot of the terminal wall uncompressed lumps of soft soil and airspaces were found for a considerable height up the wall as the fill accumulated, the looseness of the material being assured by the protective overhang of the upper part of the wall. Especially at the terminal end of the chamber there were clear indications of massive heaps of material thrown towards the centre of the floor and also many minor tip-lines which may only be interpreted as lesser amounts of material heaped this way and that.

A comparison of the transverse sections shows that there was a general tendency for more gravel to be used near the terminal and more topsoil to be brought to the southern end of the chamber. This may indicate a slight primacy in the filling of the southern end of the chamber, which received the first soil dug for the purpose, but the speculation is of little significance when so little time seems to cover the whole operation of obliterating the structure. In the area between our transverse sections A–B and E–F the first material to be thrown into the chamber was a thin layer of turfy topsoil. At the section A–B a pile of brown soil had been tipped in over the outer wall and was piled up against it; the thin layer of rich topsoil overlies this localised pile and then spreads out across the paving towards the further side of the chamber.

So far as could be observed the backfilling of the souterrain proceeded as essentially a single event. At the terminal end there seems to have been a pause while the deposited material was levelled before tipping began again, but there is no obvious hiatus in the sections which suggests any real break or change in the process, which seems to have been intended to remove all trace of the souterrain. Clearly, since the task involved the fetching and tipping of approximately 120 cubic metres of soil and subsoil, the process would have taken several days or weeks and occupied the labour of a number of people (the reverse process of excavating it gave us as excavators a clear impression of the size of the task). At some stage in this process a shallow depression was deliberately made in the centre of the fill and a large and hot fire of charcoal was lit (see section C–D). The amount of charcoal left in the hollow was considerable, far too much to think of the fire being a temporary cooking-hearth. The fire had burnt at such a temperature as to discolour the underlying soil to a depth of several centimetres, showing clearly that the fire had burnt *in situ* and that the charcoal was not merely discarded there from a fire elsewhere. The charcoal lumps were large and sharply faceted, as one might find in the ashes of a bonfire, showing again that the fire was *in situ* and that the ashes had not been trodden and comminuted over a period of time. The sample from this context provides an excellent radiocarbon dating sample for the purpose of giving us a date for the destruction of the souterrain. The date obtained was 195 ± 55 (ie uncorrected radiocarbon age; GU-1019).

The fill of the side-entrance passage was simpler than that of the chamber, a more or less homogeneous brown soil with fine gravel or coarse grit admixture. At the base of the fill, on the floor of the passage there were traces of a small fire of twigs having burned. A clear line of division separated the fill of the passage from the fill of the chamber. Unfortunately no section was cut axial to the passage, through the doorway and into the chamber, as was done for the axial entrance. Therefore no drawn record exists of the abrupt distinction which was noted. The material of the side-entrance passage fill may be interpreted as a homogeneous natural fill of soil mixed with gravel silting through and over the boulder wall.

The axial entrance passage was quite different in certain respects but in one important detail its fill was similar to that of the side entrance passage. Its excavation was begun in plan, but it became clear that its fill was different from that of the adjacent souterrain chamber. The uppermost stratum was similar to the ploughsoil of the field, a fine, dark brown loam. Below that was a stratum, thicker towards the lower end of the passage, of fine grit, small gravel and soil blackened with comminuted charcoal fragments. There was a discontinuity between this stratum and the fill of the chamber, and an axial section was cut through the lower fill of the passage and doorway in order to investigate this phenomenon (fig 6). In section the discontinuity was even more impressive, an absolutely clear-cut and vertical division between the fills of the chamber and the passage. The lower fill of the chamber at this point immediately beside the doorway was a vacuous tip of stones from the upper part of the outer wall at the base, becoming increasingly mixed with very loose soil and gravel which was quite uncompacted and variegated. In the passage on the other hand there was a sticky black material, almost clay-like in consistency

AXIAL SECTION THROUGH ENTRANCE

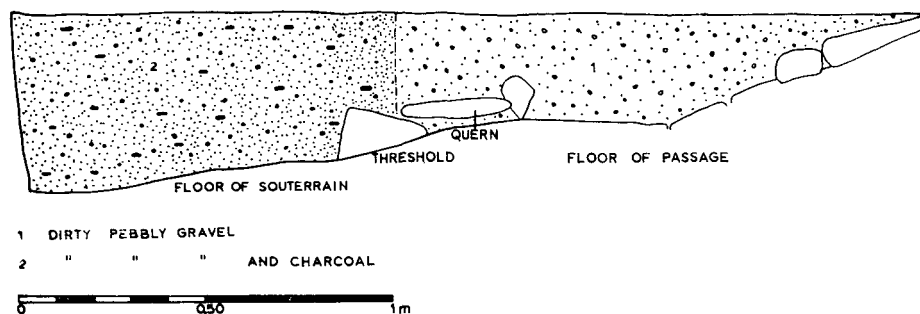


FIG 6 Axial section through lower part of fill of axial entrance passage, seen from NW

but with a fine grit component, lying among and upon the paving stones. Had such a deposit been recovered within a house it would be interpreted as a floor deposit. On the threshold stone itself lay half of the topstone of a rotary quern of mica schist (fig 11a) the only artefact found on the floor of the whole structure. Above the sticky floor deposit the fill of the passage was once more unlike the fill of the chamber, being a homogeneous mixture of soil, sand and gravel and a certain amount of fine charcoal fragments. In comparison with that other homogeneous fill, that of the side-entrance passage, it was much darker with charcoal and more gravelly in texture.

In summarising the destruction of the souterrain, then, it seems that the end of the souterrain's useful life was not decided on grounds of structural decrepitude; the walls, floor and entrances were found in perfect order except where deliberate demolition had taken place. The floor of the chamber was kept scrupulously clean to the last, and the fill was deliberate, constituting a single phase of activity over a period of several days or weeks. The souterrain was not abandoned to decay naturally; nor was there an interval between the end of use and demolition. Whatever roof the structure had possessed was first removed, causing damage neither to the tops of the wall, nor to the vertical edges of the trench in which the structure had been built. On the E side near the entrances the outer wall of the chamber had been reduced, presumably down to the then ground level, and the stones pushed on to the chamber floor. The wooden door and its

post at the axial entrance were removed and the upper parts of the two stone door-jambs were smashed. Both entrances, we may suppose, were then blocked with wooden shuttering, and the chamber was systematically filled with more than two hundred tons of soil and gravel dug from somewhere close by but outside the settlement proper. The side entrance passage, perhaps because it was small and shallow and away from the settlement, was left to fill up naturally. The axial entrance passage, which had not been kept clean like the chamber floor, continued to accumulate some floor-like deposit, and a broken quern stone was thrown in, implying that it remained open for some time after the chamber had been backfilled while occupation continued very near by. Finally, perhaps when the nearby occupation itself ceased, the upper part of the souterrain's axial entrance passage also silted up with the erosion product of the top of the slope of the hill, which was occupation debris, a thin soil and gravel subsoil. (It will be noted later that there is evidence from that area for the loss of quite an amount of material from the area immediately adjacent to and above the southern end of the souterrain and its axial entrance.)

Discussion of the finds from the fill of the souterrain can contribute nothing of significance to our understanding of the souterrain, since, with the exception of the rotary quern-stone, nothing artefactual was found directly associated with the souterrain. The few finds from the fill were incidental to the souterrain having been incorporated in the enormous quantities of debris needed for filling it. The relationship between the souterrain and the other structures of the settlement will be discussed later, when the other structures have been themselves discussed. The chronology of the souterrain based on its radiocarbon dates will also be left till later, as will the problem of identifying the function of the Newmill souterrain.

FEATURES ON THE HILL-TOP

Above the souterrain on that part of the top of the hill that was available for excavation 296 separate features were identified and excavated. Some of these proved to be composite features, for example re-cut post-holes, and some were found to have separable, identifiable features within them, as for example the slots, which contained individual post-sockets. It would be pointless to describe and illustrate each feature; here they are classified in categories, and each category is described and most are illustrated. The categories of feature recognised were (a) paved area, (b) slots, (c) pits, (d) post-holes (and stake-holes), (e) penannular ditch and (f) grave. These last two features formed a complex representing a beaker single grave and their excavation and its results are described elsewhere in this volume in order that they should not become lost in the much more extensive report on a settlement with which they have no connection. The remaining categories are described and discussed in the order listed above.

Paving (fig 9)

In the middle of the excavation area at the base of the modern soil the machine which stripped the site began to uncover large stones set side by side and flat. Inevitably there was some damage and a few stones were shaken or disturbed; the one or two stones which were moved out of position were discarded, but little overall distortion resulted. The paved area proved when cleaned to be laid a little above the surface of the subsoil in a very shallow hollow. In outline it was irregular and distinctly ragged, and except to the NW it was generally co-extensive with the hollow in the soil. To the NW of the paved area there was a small zone of fine, rich brown soil with a good deal of finely comminuted charcoal fragments generally distributed in it. This soil also lay in the shallow hollow, but there was no sign that paving had existed there. It is unjustified to believe that the surviving outline of the paving might coincide with its original extent, for any paving

outside the shallow hollow would have been vulnerable to ploughing; and the present tenant was able to confirm that the field had been ploughed and used for both cereal and root crops by him. He also commented that he had ploughed up sizeable stones foreign to the gravel subsoil.

The stones of which the paving was composed were selected water-worn stones of the same sort as had been used in the souterrain's construction. Like the paving of the floor of the souterrain this paved area was built of very substantial stones of inconvenient thickness, selected apparently for having one surface of near flatness. The fitting of the stones was excellent, but nevertheless it must have constituted a fairly uncomfortable surface on account of the convexity of the individual stones. It seemed that the purpose of the paving was to level up to some extent the hollow in the soil, for at the centre the paving was two layers thick, and still the surface was slightly concave. Although there were two layers of stone in part of the area there was no suggestion that the lower layer had constituted a first paving; the lower stones formed no surface, but were a means of filling. The relationship of the paving to other features and as part of a reconstructed building will be discussed later.

Slots

Two lengths of narrow slot cut into the subsoil were recovered. They are on the same slightly curving alignment, and may be considered as two parts of one interrupted feature. Together the slots ran right across the excavation area from the middle of the N side to the S end of the W side. The slots were narrow (on average 40 cm) and irregular both in breadth and depth (on average 30 cm). They had near vertical sides and a U-bottom. At intervals along the length of the southern segment were found the 'pipes' where wooden posts had stood. Since the posts had been set with pebble packings in a soil matrix it was impossible to determine whether the posts had been left to rot *in situ* or extracted. The spacing between posts was fairly regular at about a metre. The southern segment terminated at the interruption between it and the northern segment with a slightly bulbous post-hole, which was in fact a single post-hole, twice re-cut. No proof of the sequence could be discerned in the homogeneous soil fill of this complex, and the suggestion of re-cuts derives from the outline of the post-hole and in particular the contours of its base. The northern segment of the slot also had a post-socket at its terminal, but by no means any larger a post had stood there than elsewhere in the row. In this segment the fill and much of the post-packing was of soil and subsoil mixture, and post-sockets were accordingly hard to define; only two or three were located with any confidence. The difference in fill and packing-material was a function of changes in the subsoil consistency across the site, and does not constitute grounds for thinking that the two segments of slot belong to different modes of construction (perhaps of different periods); the north-western part of the site was marked by a softer, gritty sand subsoil with many fewer pebbles.

It seems reasonable to infer that the slot represents a more efficient solution to the problem of setting a relatively closely-spaced sequence of upright posts rather than digging separate, small post-holes. The posts in this slot were only 120–150 mm in diameter and would thus compare closely with modern field fence-posts. Perhaps the posts were set somewhat more deeply into the ground than those of today, and we may suppose on that analogy that they may have stood 1.2–1.5 m tall. On the grounds of their spacing, thickness and supposed height, it is more likely that they constituted a fence rather than any defensive work. The gap in the presumed fence is rather wide for a gateway, and there were no substantial posts to support a heavy gate, but of course there are other ways of closing such a gap, for example with a pair of light gates or with horizontal rails lying in brackets. Having only a fragment of the plan of the whole site and a part of the course of the fence, it is impossible to reconstruct the purpose of the fence or its relationship

to other constructions of the settlement. The southern segment of the fence could be stratigraphically related to two post-holes: the fence was earlier than a large, shallow post-hole near the southwestern limit of excavation and it cut into another, small post-hole belonging to another, earlier fence running in a different direction (fig 7).

Pits

Three shallow pits were found in different parts of the excavation area. One was excavated in its entirety (feature 200); about a half of another pit had survived for excavation (feature 320), having been bisected and half swallowed in the southern machine-cut trench prior to the site's recognition; and about a quadrant of a third was observed perched on the very north-western tip of the excavation area where it could not be safely reached for excavation. Observed from the gravel-working floor below it appeared to be a shallow, round-bottomed, circular hollow only 120-150 mm deep in the subsoil. Its estimated diameter at the level of the top of the subsoil was between 0.6 m and 1 m. The fill of the surviving shallow base of this fragment of a pit was entirely black and appeared to be composed of fine charcoal and ash fragments. The gravel subsoil beneath it was discoloured to a reddish orange for a depth of several centimetres, indicating that the pit had housed a fairly fierce fire.

A second pit had been cut in half (feature 320), but its plan can be seen to have been sub-oval. The maximum depth below the subsoil surface was 0.50 m. The section cut by the contractor's machine was cleaned and recorded (fig 7) to reveal a fill which was homogeneous in composition though complex in structure. All the fill was in tones of grey and consisted of mixtures of fine ash and charcoal (and a very few pebbles). The complicated section may be read to illustrate the repeated re-emptying (or, more accurately, partial re-emptying) and re-use of the pit. The gravel into which the pit had been dug and re-dug was scorched and discoloured here and there, and it seems reasonable to conclude that the pit was not dug to dispose of fire-debris but to contain fires. Charcoal from one component of the complex fill of the pit was selected for dating and a determination was produced of $ad\ 840 \pm 60$ (GU-1018).

The last pit to be described was the only complete example, feature 200 (fig 7); it was situated in the middle of the gap between the two lengths of slot already described. In plan it consisted of two roughly circular parts joined together to form a figure 8 with a fat waist. Its maximum dimension in plan was 3.96 m and its depth below the surface of the subsoil was a mere 0.16 m. The two parts were quite different from one another and an attempt was made to excavate the whole in such a way as to give an axial and two transverse sections. The sections were quite featureless, probably as a result of the shallowness of the pit and the action of roots and worms in the predominantly soil fill. In one part of the pit several very large stones with flat surfaces had been laid on a rich, brown humus in the base of the pit; the stones formed a sort of paved area almost at the same level as the modern subsoil surface. The upper fill of this part of the pit was a featureless brown soil. In the other segment of the pit the upper part of the fill was the same, but it graded into a grey-black soil at the base. In the lower fill were included some charcoal fragments and minute traces of calcined bone, some pebbles and some irregular angular fragments of discoloured stone, which seemed likely to have been fire-cracked. Again it would seem likely that the hollow had been used for the burning of a fire in one portion at any rate.

Post-holes

The most common category of feature cut into the subsoil surface was the post-hole. Within the area of the excavation and W of the souterrain more than 280 were located and

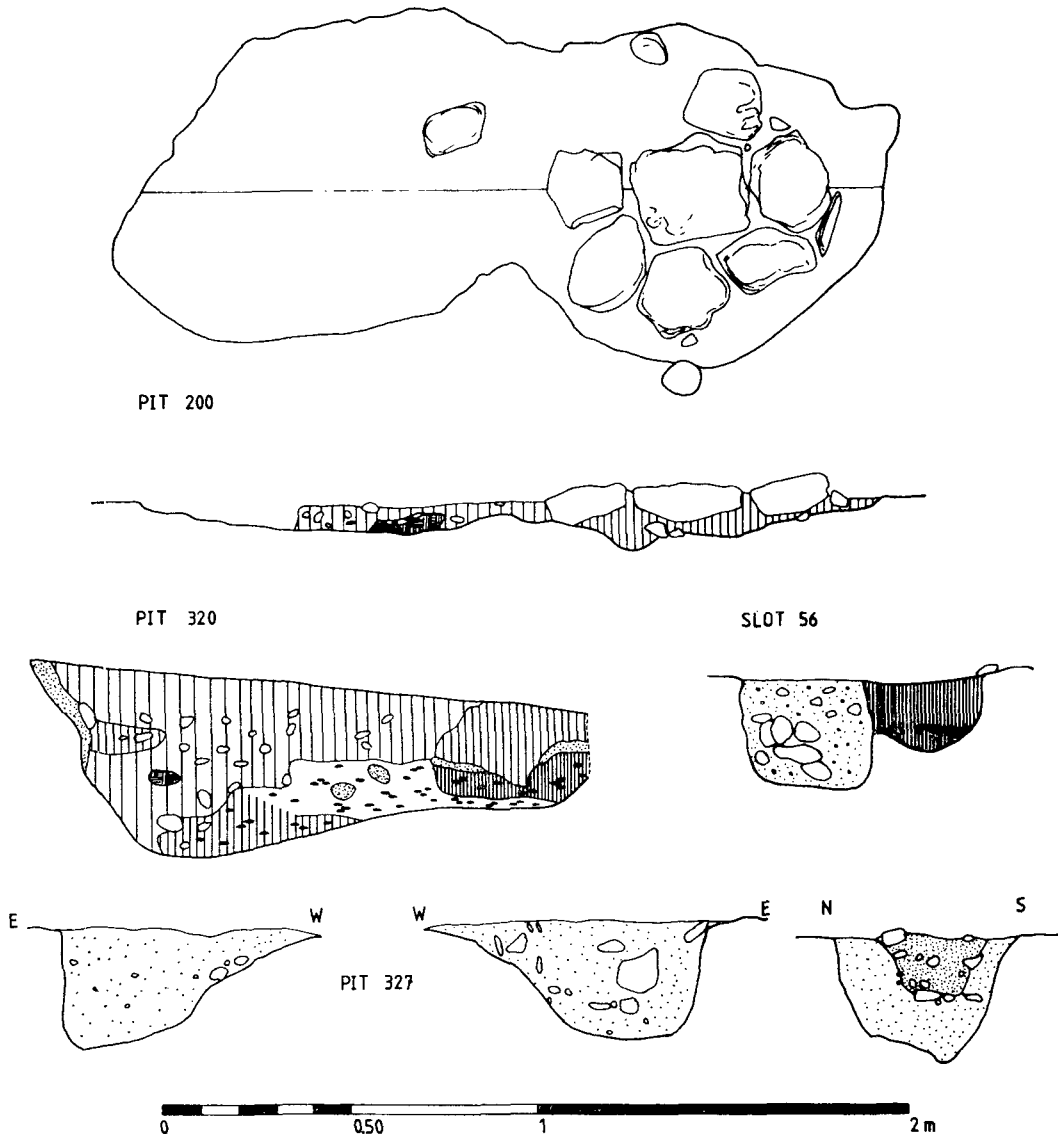


FIG 7 Pits and slots; sections

excavated. A small number of stake-holes was found in the area enclosed by the penannular ditch associated with the beaker grave, but it is probable that stake-holes were missed elsewhere on the site. The association of the stake-holes with the penannular ditch is arguably coincidental; the stake-holes were found in the most orange, most sandy area of subsoil, whereas if they had occurred in the more pebbly subsoil area, which accounts for most of the site, it is unlikely that they would have been detected.

The great majority of post-holes were fairly small and shallow, difficult and in the light of previous experience often profitless to excavate by the conventional method of sectioning. In view of the very pressing time factor and the small labour resources on the one hand, and

the low information yield on the other it was early decided to section the fills of only the large (and potentially deep) post-holes and those which apparently intersected one another where information of the size of posts, constructional methods and sequence of structural history might be anticipated. Since many of the post-packings were composed of large pebbles or cobbles and broken fragments of building-stone in small shallow holes it would have been impossibly time-consuming to clear good sections and the same information about post-size and whether the packing was intact (for what that information is worth) could be obtained in plan. Root action and worm activity had also thoroughly homogenised the soil in post-holes and other features to some depth below the surface of the surrounding subsoil; only low in the deepest post-holes was it possible on occasion to detect the post-pipe and distinguish it from the soil incorporated in the packing. The relatively few significant sections of post-hole fills are illustrated in fig 8; in addition a selection of profiles is given.

One set of eleven post-holes deserves special mention, that is the group of largest and deepest sockets, numbers 357, 93, 66, 70, 52, 89, 21, 227, 325, 345, 246, which form a near perfect circle around whose circumference they are almost evenly spaced (see fig 10). Two of these post-holes were noted by the machine-operator in the advancing face of the gravel-digging only a day or so before our arrival to begin excavation. Enough of them survived to enable us to note their position and depth if not their exact diameter; their packing composed of selected lumps of angular stones carefully jammed vertically against the base of the post and their depth related them to the better preserved members of the group, as is confirmed by their position at predictable points on the circumference of the circle. Post-hole 325 lay close to the edge of the site under the fence demarcating the excavation area and it was excavated entirely by hand from the turf down once the fence had been removed along most of the southern edge of the area. Its packing stones were found to begin slightly above the level of the subsoil. Several of the larger post-holes produced quantities of charcoal from amongst their intact post-packings to serve as radiocarbon dating material; the dates obtained serve as general *terminus post quem* dates for the post-holes and thus the structures to which the posts belonged. Two of the set of 11 largest post-holes produced internally consistent dates of 1865 ± 60 bp (ad 85 ± 60 ; GU-1024) and 1890 ± 55 bp (ad 60 ± 55 ; GU-1025). A third large post-hole which does not belong to the eleven-post circle produced a date of 1910 ± 55 bp (ad 40 ± 55 ; GU-1020), statistically indistinguishable from the other two, but tending to be marginally earlier.

Assuming that the post-holes were dug in sets when buildings or other structures were erected on the site, the stratigraphic relationship between individual post-holes could enable us to relate structures in chronological sequence, if only we may identify the sets to which the individual features belong. As already described, a fence, represented by a fairly straight line of quite small holes, at regular intervals, was observed to be earlier than the fence represented by the interrupted slot. Of greater significance is the observation that post-hole 66, one of the 11-post ring, was the last to be dug in the group of intersecting holes 66, 333, 334, 335, 337 (fig 8). None of the post-holes in the 11-post circle had a disturbed packing; either the posts had been carefully withdrawn vertically, perhaps for use in another building somewhere else on the site, or they had been left to rot *in situ*. The latter of these hypotheses is perhaps preferable in view of the fine, unadulterated soft soil which filled the cavities left by the posts; if the posts had been withdrawn the sockets might have been expected to collapse or to silt with occupation debris. From the evidence it would seem that the 11-post ring belonged to a late, and possibly the final, phase of building activity on that part of the site of the settlement.

In addition to the two fences and the 11-post circle described already, a third fence may be inferred from the near straight line of fairly evenly spaced post-holes running E-W along the N

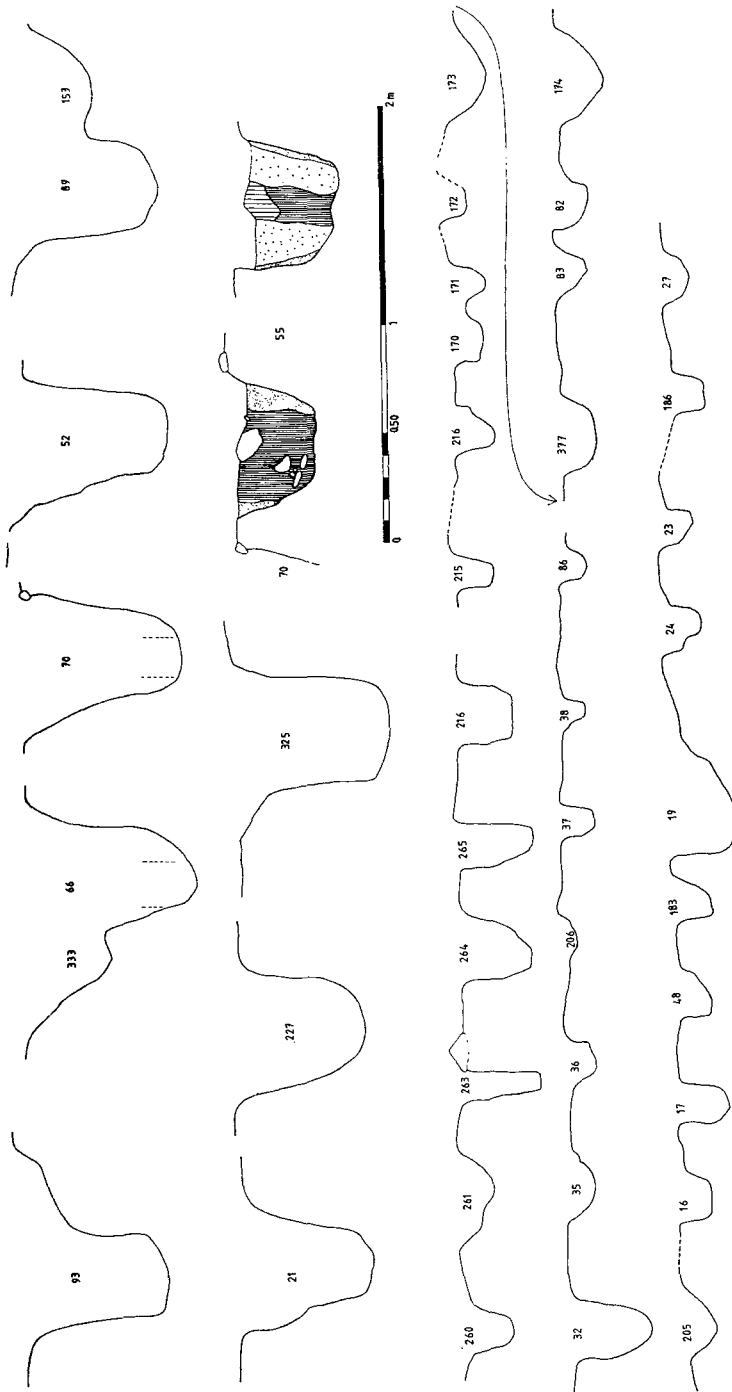


FIG 8 Sections and profiles of post-holes

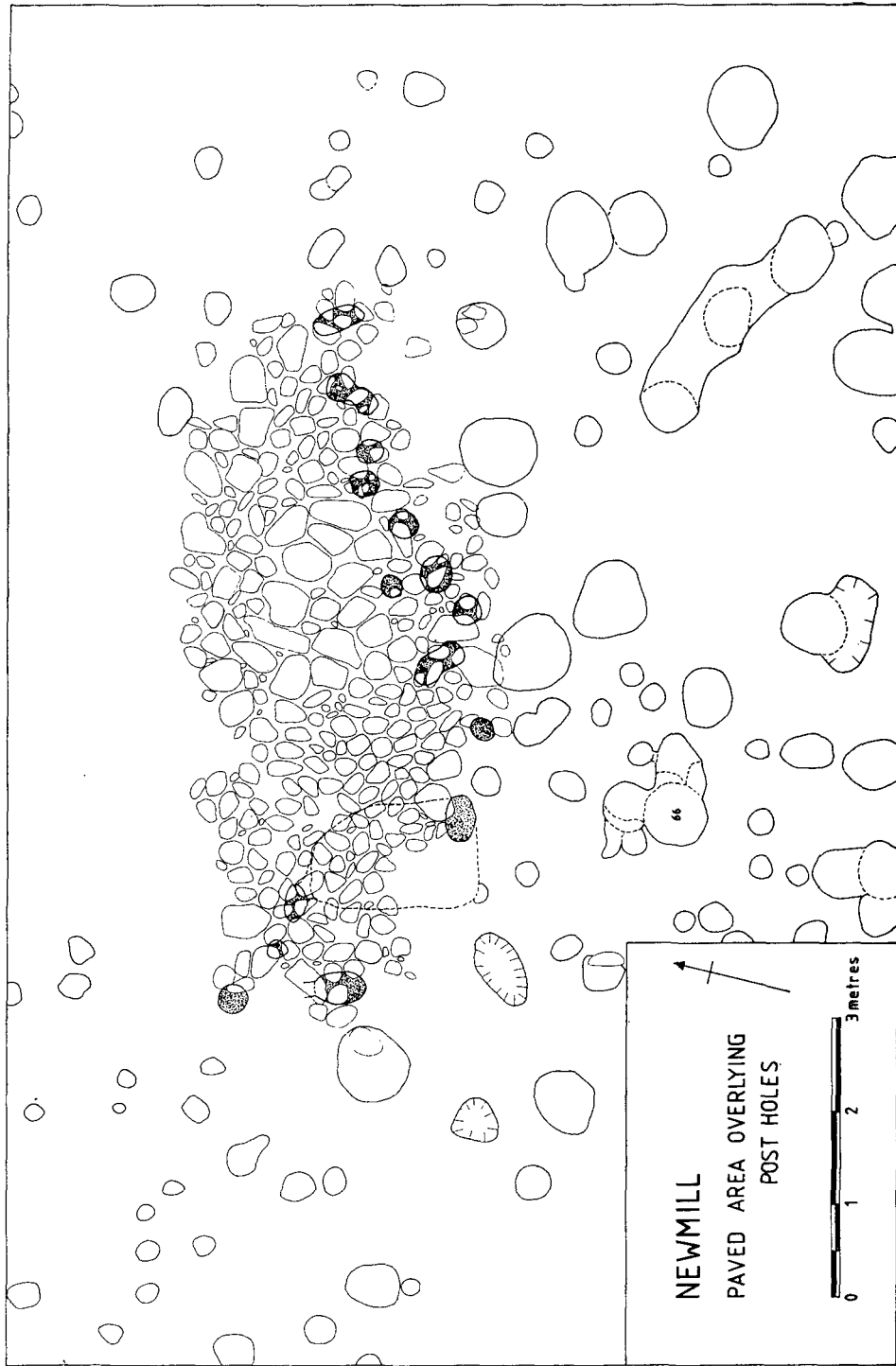


FIG 9 Plan of paved area re-imposed on plan of post-holes

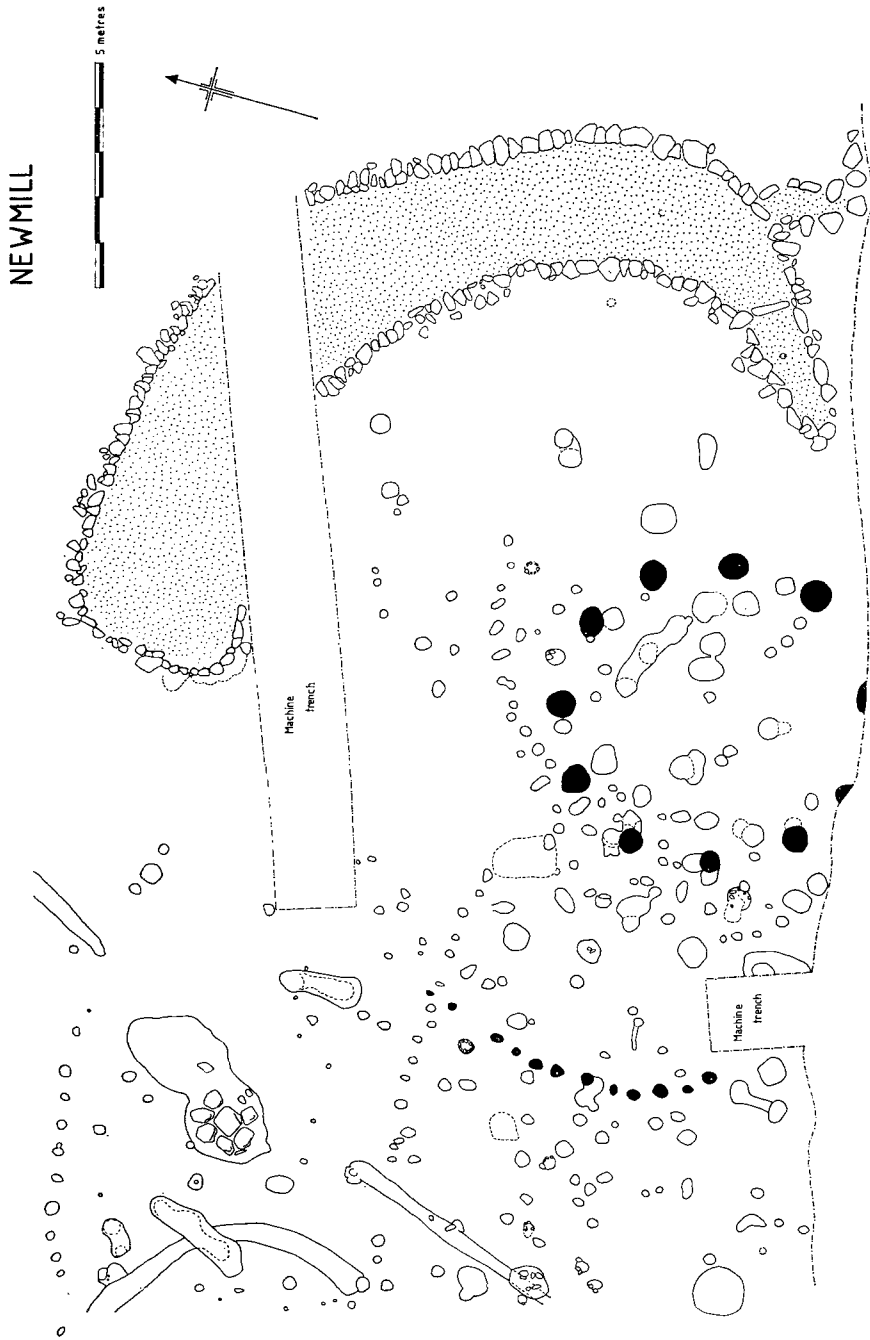


FIG 10 Plan showing post-holes of the hypothetical last house of the sequence blacked in

edge of the excavation area. Among the remaining large post-holes with which the 11-post ring was entangled there may be other circles, but there is none that is obvious. There are also visible on plan two arcs of small, shallow, closely-set post-holes, which may have held upright the posts of walls belonging to circular buildings. The reason for suggesting that the arcs represent the outer walls of buildings is simply that the spacing between the posts is very small and inconvenient if access were intended between posts. Further discussion of the significance of some of the post-holes in terms of buildings on the site will be reserved for later in the paper, but here it may be remarked why the arcs are discontinuous and not full circles. In the case of the arc on the smaller diameter its western extension seems to be lost in the welter of other post-holes; its south-eastern extension fails as the holes seem to have been dug to an absolute depth while the surface of the hill slopes slightly downwards, and the post-holes simply decrease and disappear. Perhaps the ground was more level when the structure was erected, or possibly the posts for the building were pre-cut to a uniform length and the holes to accommodate them had likewise to be dug to an absolute depth whatever the surface of the ground. The arc on the larger radius was beset on all sides. It runs almost to the lip of the excavation area on the southern side, and was lost in the gravel-digging. To the N the depth of successive holes was declining as the arc ran into the very extremity of the hollow partly filled by the paved area. By the time the machine-cut trench was reached only the odd truncated post-hole in the series can be recognised because it falls on the extrapolation of the arc; then the contractor's trench obliterates all features. Again extrapolating the arc where it swings out of the shadow of the contractor's trench we find that the slope of the hill has begun, a slope which seems to have been further eroded after the abandonment of this particular house-site to judge from the upper deposit in the axial entrance passage; almost every trace of small post-holes has gone in this area with the exception of two very tentative hollows located by careful cleaning, found to be a mere centimetre or two deep and to lie on the extension of the curve.

Finally it requires to be noted that there is every indication that the excavation area failed to contain the whole settlement site at least to the NW and S. To the E of the souterrain were sited the massive spoil dumps so that the extension of the site in that quarter remains an unexplored hypothesis. No features of any kind were noted in the strip excavated alongside the souterrain and the slope of the hillside was sufficiently steep, one would have thought, to make the construction of any features very inconvenient. In sum, then, the almost level hilltop W of the souterrain had been the scene of much and varied building activity in timber at a period contemporary with the life-span of the souterrain but not necessarily restricted to that period. There is no way of estimating how early the constructional sequence began, but there is the radiocarbon date from one of the pits to show that there was still activity on the site in the 9th-century AD.

SMALL FINDS

The excavation was very poor in terms of small finds which could serve either to illustrate the lives of the inhabitants, their cultural affinities, or the relative chronological relationships within the site or between this site and others. It is perhaps not surprising that the hilltop's subsoil surface was unrewarding in this respect; the cultivated topsoil was stripped and removed unexamined, and there was little surviving floor or trodden surface below the level of former ploughing. On the hilltop hope had to be restricted to finding objects or fragments which had been incorporated into post-packings or which had percolated down post-pipes as the posts decayed. The amount of such material will obviously be related to the volume of broken and

discarded debris allowed to lie on site; where soil conditions are acid (as they were at Newmill), or when a people's material culture was not rich, at least in things made in durable materials, or when a society is fairly strict about disposing of rubbish, the archaeologist is in difficulties. On the other hand the souterrain chamber had been deliberately backfilled, and there was a reservoir of more than 200 tons of soil and subsoil in which any amount of rubbish or waste might be incorporated. However, even here artefactual finds were very infrequent, reflecting presumably the origin of the material utilised. Certainly there were no deposits or lenses of domestic rubbish observable in the fill, such as might have ensued if the backfilling of the chamber had been used as an opportunity to dispose of collections of refuse; and it is not difficult to believe that, if such a large chamber had to be filled, the material for filling it could not have been dug up on the site itself without creating a very large hole or series of holes as hazardous as that which was being filled. Thus the vast bulk of the chamber refill might be expected to be brought from nearby but from outside the settlement area, and in such circumstances few artefacts and little rubbish should be expected, especially bearing in mind that a good half of the refill material was subsoil, not topsoil.

The most common find by far was charcoal. It occurred everywhere in small quantities and frequently in considerable concentrations. More than one hundred *loci* of charcoal concentrations were recorded, some of which were of more than 100 gm bulk. There is no quantitative means of comparing sites with one another in this respect, but it is the impression of the present writer from his own experience that Newmill, like Dalladies 2 (see pp 122-64), was rich in charcoal. The question occurs to mind, therefore, whether so much charcoal, amounting to several kilograms from a relatively brief excavation, and contrasted so markedly with the shortage of other finds or refuse, may not be the product of some larger-scale industrial process rather than the scattered ashes of domestic hearths. Most of the charcoal consisted of small pieces of wood, though two fragments of carbonised hazelnut shell were found in two different *loci*.

Other products of human activity were burnt or calcined bone, waste products of iron-working, some sort of coke-like fire-product, and animal bones and teeth. Calcined bone, mostly in quite minute quantities and reduced to the consistency of crumbly specks of chalk, occurred very widely. Thirty-seven separate *loci* were recorded including one or two in the first trowelling of the site, several in the packings of post-holes and almost universally in the souterrain chamber fill. The most significant observation is that the material was also found in both shallow pits associated with burning, contexts which may be considered primary in contrast to the other situations such as the packing of a post-hole or the fill of the souterrain chamber, which must be considered secondary or derived situations. If it is possible to identify the fire-pits as the probable source of the charcoal and calcined bone, it is tempting to plead economy of hypothesis and suggest that the three tiny finds of a coke-like substance, the two finds of some sort of iron waste-product and a lump of glassy waste-product may also have been dispersed by-products of the industrial process signified by the fire-pits.

In only twelve *loci* were finds of animal bone or teeth recorded. All were associated with the souterrain. Six were occurrences of teeth, one being cheek-teeth still in a segment of mandible. Five more were pieces of post-cranial bone. And the last was a portion of cranium and the base of an attached horncore, whose find-spot was slightly ambiguous. The fragment was found in a crevice in the inner wall of the axial entrance passage close to the doorway and only a little above the floor; it is possible to imagine that it could have fallen naturally into this recessed position, but it is also possible that it was pushed into place deliberately. The remaining find-spots were more straightforward: animal teeth were found in the natural fill of the side-entrance passage, in the sticky black floor-like deposit of the outer end of the axial entrance passage, and in three

spots in the souterrain chamber fill; animal bone fragments were found on five occasions in different parts of the chamber fill. It is conspicuous that many of the finds were in situations better insulated from the acid effects of the subsoil than the small post-holes could provide. The incorporation of bone and teeth in the souterrain chamber fill may be used to suggest that some of the disposal of rubbish was off-site. All the identifiable bones and teeth were of cattle.

Artefactual remains were extraordinarily scarce. One very small, featureless sherd of pottery was recovered from the uppermost fill of the souterrain chamber midway along its length. It is only some 20 mm across at its greatest dimension. The fabric is a uniform brick-red throughout, a hard-fired, fine clay with sharp fracture facets and minimal inclusions of fine grit. The inner surface is untreated and preserves part of the thumbprint of the potter, suggesting a closed shape for the vessel; the outer surface is smoothed and was fired to a lustrous, deeper red. Four small fragments of unrecognisable iron artefacts were recovered; one piece was located in the silting of the lower end of the axial entrance passage, while the remainder were scattered in the general fill of the chamber of the souterrain. All four pieces seem to represent discarded scraps of broken or useless metal.

On the threshold slab of the axial entrance was found a damaged topstone of a rotary quern (fig 11). If the interpretation of the observations is correct then it fell or was thrown there when the souterrain chamber was already backfilled but, the old axial doorway being blocked, the entrance ramp still lay open. The stone of the quern is mica schist. The edges are damaged and the stone had split almost across the centre; just over half survives. In section it was thin and flat. The tapering central hole is more than half complete and the surviving piece also contains the simple stick-hole by which it was revolved. The context is not precisely dateable, but must be placed very soon after the filling-in of the chamber of the souterrain, since the stone lay directly on the threshold where silt and rubbish would have rapidly begun to accumulate. The date on the destruction of the chamber (ad 195 ± 55) would seem to provide a close *terminus post quem* for the deposition of this broken quern. Another three small fragments of querns were tentatively identified: all were of mica schist, otherwise not represented on the site, and all three preserve something of the curve of the outer edge of a quern, but none retains any trace of the flat grinding surface, hopper or stick-hole which could have permitted more positive identification. Two fragments came from the chamber refill; the third, a larger piece of a larger diameter stone which may have been a bedstone, had been used as a packing-stone in one of the post-holes (325) of the 11-post circle. Since the post-ring is dated it is a double pity that the quern-fragment may be only tentatively identified as such, for it represents surely one of the very few to which a dated context can be assigned.

A perforated piece of flat red sandstone was found in the uppermost fill of the souterrain chamber (fig 11b). A half of another such perforated stone came from the lower half of the fill near the terminal of the chamber (fig 11f); and a third perforated flat stone is represented by a broken half re-used as packing material in a post-hole (fig 11c). An intriguing fragment of slate (fig 11e) also came from a post-hole, but its context cannot be considered thoroughly secure since it was at the top of the packing and thus the base of the ploughsoil. It is a small piece, thin and smooth on either face and engraved on one face with fine, ruled lines in a square grid almost exactly 10 mm in dimension. At first it was thought that the piece might be a fragment from a child's school slate of comparatively recent times, but against this view it may be said that the lines are rather less fine than they should be and the intervals between them not as mechanically regular as one might expect. On the other hand if the object is not a school-slate fragment it is not certain what it is, unless one were to guess that it was the board for some game.

Well sealed in the packing of a post-hole (93) was a small piece of chipped stone. The

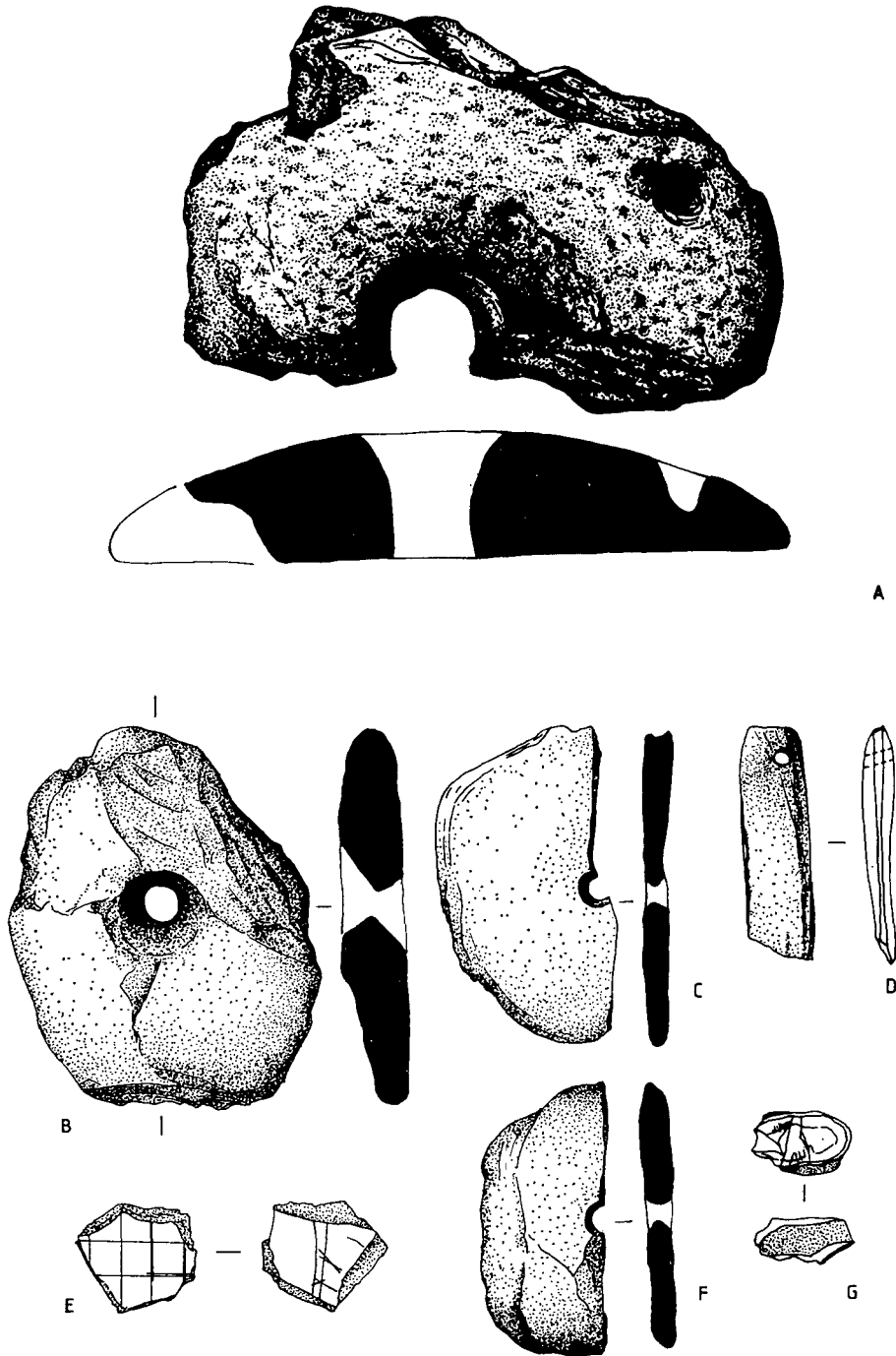


FIG 11 Small finds of stone. Scale: all except *a* 1 : 2; *a* is 1 : 4. *a* Rotary quern; *b*, *c*, *f*, perforated stones; *d* perforated whetstone; *e* engraved slate fragment; *g* chipped agate from post-hole fill

stone is a milky-grey mottled flint, probably originally a pebble. It has been manufactured into a blade-like form with one edge all cortex and the other nibbled with a not very neat retouch. There is no reason to think that it was not made and used by the occupants of the main settlement, even though it is of a material more usually connected with deeper prehistory. From a superficial deposit with no proper association with the structural remains of the settlement there came a perforated whetstone (fig 11d), which, like the chipped stone implement mentioned above, may well belong with the souterrain and settlement or may antedate (or postdate) it. The implement was found in the topsoil below the turf when part of the southern edge of the excavation area was being cleared by hand. The stone is a fine-grained, banded piece, long, narrow and thin. In section it is almost triangular, tapering to one side. The perforation is cylindrical, set slightly off the axis of the implement and not exactly perpendicularly bored. The further end has been snapped obliquely. There is evidence of plentiful use of the stone in that, a little below the perforation there is a distinct concavity on one surface. Using the area of wear as a basis for estimating the original length of the stone it would appear that very little of it has been lost through the fracture.

DISCUSSION

In this section of the report consideration is given to reconstructing various aspects of the life of the site, its builders and users: we shall see to what extent it is possible to reconstruct the chronology of events in the structural history of the site; we shall attempt to unravel the structural relationships of various elements of the settlement; and it will be necessary to review what light can be shed on the question of the function of the souterrain in the context of the settlement. The placing of the Newmill settlement and souterrain in the broader context of the 'souterrains of southern Pictland' is discussed at the end by Gordon Barclay, to whom the present author is indebted.

It will be useful as a first step in the discussion if we may consider the reconstruction of the souterrain and then the above-ground timber structures.

These latter to some extent can be reconstructed, as has already been partly discussed. There is the fence-slot with its interruption, and the two fences represented by lines of small post-holes. The structural reconstitution in the mind's eye is simple but the interpretation of such features is impossible. We know that the fence-slot was dug after one of the lines of fence-posts, so that we may not think of the two as contemporary with one another; the two lines of fence-posts are parallel and of similar size and spacing, but there is no way of telling if they should be understood together. In general, not knowing the extent of the features or their relationship to other features of the site, it is not possible to know whether they were corrals for stock, fences around houses, demarcations between properties or what.

More hope is offered by the dense concentration of post-holes in the middle of the southern half of the excavation area. It has already been argued that there is a set of eleven large post-holes of similar size and set at practically equal spacings around the circumference. The posts which were set in these post-holes were up to 30 cm in diameter and were set about 1 m deep in the ground (allowing for a depth of topsoil above the profile in the subsoil); such posts would have stood tall. Set on a circle of 6.6 m diameter such posts seem needlessly massive and tall to constitute the outer perimeter wall of a house. The two arcs of small, closely-set post-holes are suggested on the other hand to represent stretches of curving outer wall on diameters of 12.5 m and 17.6 m. If buildings of such a size stood in the site then the 6.6 m circle of massive



FIG 12 Site plan (the paving in the centre of the post-hole area (fig 9) is omitted for clarity)

posts could be considered to be a ring of main roof support posts. The larger arc of outer wall is apparently concentric with the 11-post ring, and it is therefore likely that they represent components of the same building, a large, circular house with a diameter of 17.6 m whose roof was mainly borne by an inner ring of tall, well-set posts (see fig 10).

One of the inner ring of 11 posts was shown to be the last (and the largest) in a series of large post-holes, and one may infer that similar large posts belonging to a similar building or several similar buildings almost as large as the last had previously stood on the same site. Just as the other large post-holes are not as massive as those of the 11-post ring so the remaining arc of small post-holes, belonging to a presumptively earlier building also, is of smaller diameter (estimated at 12.5 m). If there were one house earlier than the last, 11-post ring house, it should be possible to take the site plan, eliminate the post-holes of the putative last house on the site and see the plan of the earlier house. Since this does not happen and since there are still rather more large post-holes left in the concentration than are needed to reconstruct one earlier house we may conclude that there were two or more, thus a minimum of three houses standing in succession on practically the same site.

The paved area filling the concavity in this area may be seen as a partly paved floor in one or more of the houses in the sequence. In plan it fits with the post-holes of the last and largest house, and it overlies some post-holes of earlier buildings; it is not cut by any post-holes, and it seems reasonable to relate it to the last house, which we may now envisage as having a partly paved floor. No other internal features of the house or any of its predecessors was located, which is scarcely surprising in view of the observation already noted that the post-packing of post-hole 325, excavated by hand from the turf down, projected marginally above the surface of the subsoil into the modern ploughsoil. It is possible that half of the doorway of the house was identified. It would make sense to look for the doorway to the house somewhere between the NW and the S if the house and the souterrain were contemporary structures, as the radiocarbon dates indicate they were; the 'berm' between the house and the souterrain would have been inconveniently narrow as an approach to a door set anywhere from the SE to the N of the house. (As will be argued below, the last house in the series at least was integrally related to the souterrain, and the souterrain had a pitched roof; thus access would not have been possible across the top of the souterrain, as may have been possible with stone slab roofed examples.) It is tantalising to note that the surviving arc of perimeter wall appears to swing inwards and stop very close to the edge of the excavation area. There then appears a small group of post-holes, two of them linked by a shallow slot. It would seem likely that this group of post-holes and slot represents part of the porch and doorway arrangement, but only the mirror image of the arrangement and the recommencement of the arc of wall could have confirmed this suspicion.

No positive evidence was found in the souterrain to demonstrate that it had a history of construction and reconstruction or modification. It is, however, possible to interpret the refilled piece of trench around the lower end of the axial entrance passage in a manner different from that implied when it was described above. Then it was suggested that there was a minor miscalculation when the foundation trench for the souterrain was dug: a small area was over-excavated as it turned out when the southern end of the chamber and the axial entrance were built, and some backfilling had to be done. This is the most economical hypothesis, which accounts for all the observations in one explanation of structural simplicity, and which requires that the radiocarbon date from the charcoal included in the backfill under the lower end of the ramp's paving be closely associated with the initial construction of the souterrain. An alternative hypothesis can be constructed, which, though in some ways quite attractive, is not demonstrably preferable to the simpler one. We may begin by supposing that the backfilled area below and around the

lower half of the axial entrance passage was not cut in error but was the shape of an earlier phase of the southern end of the souterrain chamber, shortened and modified at a second time (when the axial entrance as we have seen it was also constructed or reconstructed). In this version the souterrain had two phases of construction, and the radiocarbon date refers to the reconstruction. Against the former hypothesis it may be pointed out that it falls into that category of explanation which presumes that archaeologists are clever enough to spot mistakes made by the fallible folk of the past. One wonders why the axial entrance was not adjusted to fit the slightly over-long chamber; or, if the entrance were the starting point of construction, why the chamber was not begun at the foot of the ramp. It is difficult to imagine that the whole digging operation was completed in sand and gravel before construction began; one rather suspects that the construction in stone followed immediately in step with the excavation in the manner of modern tunnel-digging. While it is possible to see objections to the former hypothesis there is no way from the internal evidence from within the souterrain itself to decide which is the more correct explanation, and, unless there are external reasons, that is evidence from outside the souterrain, for adopting the more complex hypothesis, the simpler, single-phase explanation should be preferred. It will be argued below that there is good reason to think that the axial entrance ramp of the souterrain was structurally integrated with the last and largest house in the series on the site adjacent to the souterrain. Since we may believe that there were earlier houses on the site it is quite possible that an earlier house was also linked structurally with an earlier phase of the souterrain through the predecessor of the axial entrance passage, but there is no evidence for any structural relationship of this kind, and the earlier house-plans are little comprehended. So we are left with no external evidence to help us resolve the issue, and must resort to the simpler hypothesis with which we started.

So much of the souterrain's structure had survived intact that little effort of imagination or reason is required to reconstruct it. The only missing structural element was the roof. On the analogy of those souterrains with stone slab roofs surviving it is probable that souterrains in general were roofed structures. Wainwright (1963) seems generally convinced not only that souterrains were roofed structures but also that they were roofed with stone slabs set on the wall-heads. For such a roof to be waterproof it must be set below ground level so that the stone slabs can be overlain with soil and turf. At Newmill such a roof structure could be entertained for the main part of the chamber, set as it was with the wall-heads below ground-level, but the southern end of the chamber particularly on its outer side in the area of the side entrance make it very hard to believe that the chamber was stone-roofed, for the wall-head is reconstructed as being above ground-level.

There are several reasons for doubting that the Newmill souterrain was roofed in stone. In the first place the local geology does not offer a suitable stone; any roofing slabs would have to be brought from a considerable distance, and each would have weighted several tons if it were to span the Newmill souterrain chamber. A greater problem than obtaining the stone and getting it to the site would have been to position it on the wall-heads, in which connection one of the observations made during excavation has a considerable bearing. The trench in which the souterrain was built was sheer-sided and the souterrain's walls were built against its sides. Above the level of the wall-heads, where these were below the level of the subsoil, the cut in the gravel subsoil continued upwards vertically. The heavy batter on the uppermost part of the cut seen around the terminal wall of the chamber (pl 3) was the deliberate result of the excavators' efforts to reduce the risk of pebbles falling on those excavating in the terminal below; when found the edge of the cut was vertical behind the wall. In such circumstances the hypothetical roof slabs would have had to be shaped to fit and then lowered gently and vertically into position.

All this is not to say that the task of finding and obtaining slabs up to 5 m in length, fitting and lowering them vertically into position was impossible at that period, but only to remark its improbability or at least its difficulty as against alternative methods of roofing in timber. Such slabs as would have been necessary to span the terminal would surely have been the largest known. Even greater problems would have been posed by the task of removing such a massive slab roof, for the excavation observations impose impossible constraints on the way in which it could be done. In the first place there were no broken fragments of massive slabs at the base of the chamber's refill, so we must suppose that the hypothetical roof slabs were not broken up (no easy task in itself) but were lifted off vertically, stone by stone, without any need to dig away or damage the top of the trench sides. Again, perhaps this manoeuvre was possible, but it scarcely seems very likely.

On the other hand a wooden-framed roof would be quite simple to fashion and instal for people used to building roofs on timber houses. And, even more importantly, such a roof would be possible to dismantle and remove leaving no trace of its former existence. Unlike a stone slab roof a flat timber roof would be hard to waterproof; neither thatch nor skins would work, and soil and turf would tend to make a timber roof sag in the middle. A pitched wooden roof could readily be made to span a 4 m wide chamber; and if its eaves were set on the wall-heads they would be below ground level and out of danger from the winds as well as enabling a thatch to drain into the gravel subsoil. Indeed it is difficult to think of any other reason for setting the height of the walls below the surface of the subsoil, nor of a more conveniently absorbent subsoil for the purpose. Hence, on the grounds that the excavation failed to produce evidence of a stone roof and indeed produced evidence which on the whole militates against such a structure, it is suggested that the Newmill souterrain was roofed with a gabled, wooden-framed roof which was removed at the destruction of the souterrain leaving no positive trace whatsoever. It remains to remark that such a roof would of course have projected above ground level. That part of the outer wall of the structure projected above the ground has already been suggested, and the idea that souterrains were not all totally under ground is not novel for it has already been argued for the strange souterrains at Dalladies Site 2 (see pp 122-64).

A most important question is that of the relationship, structural and functional, between the souterrain and the above-ground timber structures. The radiocarbon dates from the large post-holes 54 (GU-1020; ad 40 ± 55), 66 (GU-1025; ad 60 ± 55), and 325 (GU-1024; ad 85 ± 60) fall firmly within the range of those from the souterrain, for whose construction (or modification) there is a date of 55 ± 90 bc (GU-1022), a second date of 40 ± 70 ad (GU-1021) from not such a sound archaeological context, and for whose destruction there is a third date (GU-1019) of 195 ± 55 ad. It is fairly conclusive that the last house in the series at any rate was contemporary with the souterrain and in very close proximity. Indeed the projected circle of the perimeter wall of the house overlaps the axial entrance and crosses the souterrain plan practically at the axial entrance doorway. If the dating evidence and the reconstruction of the large house are accepted it therefore follows that the souterrain was entered from within the house by means of a descending ramp leading to a doorway situated under the wall of the house. Such a reconstruction of the structural relationship of the souterrain to the house makes useful sense of the side-entrance and helps to explain its proximity to the axial entrance. We may now understand that the side-entrance allowed access from the open air to the souterrain while the axial entrance linked the house to the souterrain. We may also admire the siting and design of the structures: the house was built on level or very nearly level ground; the souterrain was for the most part deeply buried in the contours of the hill; the side entrance to the souterrain provided a short, horizontal access to the chamber from the slope of the hill.

For the purposes of this discussion it is possible to dismiss quite quickly the artefactual remains, for they offer us little insight into either the chronology of the site or the cultural relations of its inhabitants; similarly the objects do not provide much illustration of the daily life of the people. The quernstone fragments bear witness to the cultivation of cereals in that agriculturally rich part of Scotland then as now, just as the scant harvest of animal remains from the excavation must stand as tokens of the keeping of cattle. The recurrent retrieval of various kinds of iron-working waste products from different parts of the site should be understood, together with the evidence of the fire-pits (bowl-furnaces?), to indicate that the inhabitants undertook their own iron-working.

In particular the artefactual evidence sheds no light on the question of the function of the souterrain. The circular above-ground timber structures may readily be identified as houses on the analogy of the very similar houses from Iron Age contexts elsewhere in Britain, but the function of the souterrain cannot be so easily attributed. No artefacts were found in the souterrain in positions which could lead us to suppose that that was where they were used; the quernstone on the threshold slab of the axial entrance seems to have been discarded broken, and only when the souterrain chamber was already extinct. The souterrain structure itself incorporated no details specially indicative of function; in particular there was no trace of a hearth or fireplace or burning on the floor such as might have accompanied any domestic use. No deposit was encountered on the floor or between the floor stones which could be analysed to yield information as to use; indeed the absence of floor deposit was a notable phenomenon.

No new hypothesis being forthcoming from these excavations it remains to range Newmill against those already proposed over the years. The domestic hypothesis seems most unlikely for the reasons discussed above, as is the idea of an 'earth-house' as a refuge from the winter's cold; without a fire the earth-house would be no refuge. As a refuge in time of trouble or sudden alarm the Newmill souterrain presents an exciting prospect, being in use at the time of the Roman advances into that part of Scotland, and very close to the line of those advances too. But as we have seen, part of one of the souterrain walls projected above ground level and it seems likely to have had a pitched roof. It was certainly no place in which to hide, nor could it be considered in any sense defensive, rather the reverse, offering the attacker admirable opportunity to dispose of all who shut themselves in it. In any case we should remember that the house alongside stood atop a small rise and was itself capped by a conical roof some 10 m tall, hardly self-effacing in the landscape; clearly there was no attempt to hide the settlement or its souterrain. And such a large chamber would have been far beyond the space required to hide a family. The idea of souterrains as hiding-places not against 'foreign' attackers but neighbouring tribesmen is equally untenable for Newmill, and indeed in general; neighbouring tribesmen would know of souterrains and their use as refuges, even if they did not possess and use them themselves.

Wainwright's conclusion in the light of his own research at Ardestie and Carlungie I (Wainwright 1963) that these large souterrains and others in the area like them were subterranean cow byres does not hold for Newmill. The lack of trodden soil rich in phosphate between and over the paving argues strongly against such an interpretation, even if there were reasons for imagining that the organically rich soils from the floors of Wainwright's souterrain could be attributed confidently and exclusively to cows. Many have wondered whether cattle could be persuaded to enter dark, underground byres, and Newmill provides additional cause for concern; cattle would either have had to negotiate the narrow twisting side-entrance passage and the very low doorway, or would need to be taken through the circular house and down the ramp.

The purposes suggested for souterrains and not so far ruled out for Newmill are thus reduced to two, that of a ritual function or that of food-store or granary. The ritual explanation,

most recently advanced for the fogou at Carn Euny in Cornwall (Christie 1978, 332-3) if somewhat tentatively, was one with which the present author dallied when completely puzzled by the strange details of the related souterrains at Dalladies 2, and it remains a possibility for Newmill which cannot be decisively dismissed. Many modern places of worship after all lack trace of their 'ritual function' and are bare buildings to house worshippers. Cleanliness may be a ritual characteristic, and as Christie remarks we should not expect to find ritual artefacts abandoned *in situ*. Two features of the Carn Euny fogou suggested to Christie a function other than or additional to the utilitarian one: the presence of 'cremated bone' associated with the building phase and the deliberate obliteration of the structure by filling in. At Dalladies 2 the present author found many tiny amounts of calcined bone, which at first were thought to be cremated bone, and similarly tiny amounts of burnt bone occurred at Newmill, which, in common with a number of souterrains, seems to have been filled in at the end of its life for reasons which remain mysterious. However, while not denying that the souterrain and its function may have had religious connotations to its owners and users, it seems to me that there are no grounds for supposing that the Newmill souterrain was a ritual structure, built to serve some cult.

The main requirements for bulk storage of food-stuffs are space, protection from the elements, ventilation and insulation from extremes of temperature, and the Newmill souterrain fulfils those requirements. It provided a great volume of roofed, ventilated space where temperatures would remain more even than the diurnal or seasonal fluctuations outside. Very approximately the souterrain's volume of space, excluding any space above the wall-heads, may be put at 120 cu m, which still leaves a very considerable storage capacity when the area around the entrances is excluded and a central access gangway is imagined. The dry-stone walls and the carefully maintained floor with its interstices between stones kept free would ensure some circulation of air all around; and the cleanliness with which the chamber was maintained also accords with the idea of a grain-store, as does the provision of two accesses, one from the open air for delivery (apparently closed from within) and the other direct from the house above for supply. There is good evidence from Newmill, as from many other of the eastern Scottish souterrains, of the use of cereals in the form of numerous quern-fragments; and in modern and historical times the whole area termed by Wainwright 'Southern Pictland' coincides with the area of considerable arable wealth as mapped by Coppock (1976). In sum, then, the most suitable explanation of the function of the Newmill souterrain would seem to be as a food-store and granary, although the evidence is mostly negative, or at best circumstantial.

It now remains to attempt to place the site in its deeper perspective and chronological context. It is clear that the area excavated did not comprise the whole settlement, but only its eastern or south-eastern extremity. If there were settlement at that point on the hill why not elsewhere in the area enclosed by the same contour? There is no obvious reason why that particular part of the hilltop should be chosen in preference to other parts. So far as can be gathered no other souterrain elsewhere on the hill was destroyed before excavations began. The only surviving portion of the original surface is now the western extremity of the hill; if there were another souterrain there it could be sought by aerial or geophysical survey, while a small pattern of soundings would soon establish whether timber buildings similar to those excavated by the souterrain had stood in that area. There are two further pieces of oral information to relate, whose value is difficult to estimate. In the first place more than one local visitor to the excavations, seeing the emergent souterrain, volunteered the remark that it was said thereabouts that there was a buried church nearby in that same field. The second piece of information is hearsay but of a different kind altogether: an archaeologist reported to me that, on an early visit to the site when the contractors had no more than stripped the topsoil from the broad line of the cutting

in which the realigned road was to run (that is, roughly across the centre of the hilltop), putative large post-holes were visible as blobs of dark soil in the gravel subsoil. If this report is accurate, and there is absolutely no reason to doubt it, it strongly suggests that some settlement had existed across the centre of the oval hill.

It is certain that the settlement extended beyond the area excavated, and it is probable that there were similar settlement remains at the centre of the hilltop, but it is not possible to relate the excavated part of the settlement to the nebulous whole with any degree of precision. There is, however, one observation that may be made concerning the single souterrain and the whole settlement. It seems that the one souterrain was integrally linked with the one unusually large house, while the rest of the settlement, or the most part of it at any rate, lacked any souterrain. In this respect the large house was different from the rest of the settlement, and it was also substantially larger than usual Iron Age houses. If the souterrain were for storage of food-stuffs it was certainly much larger than was necessary to store a year's supply of food for the family who lived in the house to which it was attached, even if we allow an extended family group; using the kind of figures given by Roman sources for storage needs for Roman army supplies (Davies 1971) the souterrain was large enough to support several hundred people. In view of the over-capacity of the souterrain in respect of its serving the large house it is tempting to speculate that the souterrain provided storage facilities for the rest of the settlement also, which lacked such facilities attached to individual houses apparently; but that suggestion raises insoluble problems of social interpretation. The question of the nature of the relationship between 'Roman and native' in this part of Scotland is scarcely furthered by the Newmill findings. The settlement represents part of a native settlement occupied in the 1st- and 2nd-centuries AD and probably much longer into the Pictish period, but there is absolutely no trace in the physical record surviving from the site of the Roman presence, which at times must have been very close indeed (Inchtuthil is only 8 km (5 miles) away and the Roman military route must have passed even closer). All that can be concluded is that life went on, culture and settlement apparently unchanged and unaffected.

The Newmill settlement was apparently in occupation in the 1st-century BC or very soon thereafter. If the souterrain was built then or in the 1st century AD and was abandoned and destroyed, for reasons which are not apparent, in the late second or early 3rd century AD. The general relationship between the site and the Roman advances into Scotland are not affected by the calibration of radiocarbon dates, which produces only small shifts at this period. The last in the series of timber houses on the adjacent part of the settlement site survived the souterrain for a while but was not afterwards rebuilt, and no further domestic occupation is attested in the excavated area of the settlement. However, there is the latest radiocarbon date to account for, that of $ad\ 840 \pm 60$ (GU-1018) from the excavated half of the truncated fire-pit. The age of the sample was so much more recent than anticipated that the laboratory, unasked, re-ran the test with the same result. The sample was large and the context secure in the heart of the much used fire-pit or perhaps bowl-furnace. There seems no reason to doubt that iron-working or some other process requiring a substantial furnace was still being pursued in the 9th century; and it seems rather unlikely that iron-working or blacksmithing was carried out in a blank field and rather more likely that such work was carried out near or in the settlement (as the recurrent charcoal and iron-working waste products from earlier contexts suggest). Thus we may reasonably conclude that the settlement, which had begun in the prehistoric Iron Age, and which had, almost literally, witnessed the Roman military ventures of the early centuries AD, was still in some sort of occupation and use well into the Pictish and Christian periods, even though its great circular house and its souterrain had long since been abandoned.

Newmill and the 'souterrains of Southern Pictland'

Gordon Barclay

INTRODUCTION

Three aspects of the souterrains of 'Southern Pictland', defined as the counties of Perth, Angus and Fife by Wainwright (1963), will be considered in this brief paper: following comparison of the known sites with Newmill and mention of additions to the known distribution of souterrains in Perthshire and Angus in the last two decades, the previous interpretations of these souterrains may be reviewed in the light of the new evidence from Newmill.

All available information on souterrains in Perthshire, Angus and Fife was summarised by the late Dr F T Wainwright (1963) around the framework of the reports of the excavations of two souterrains, Ardestie and Carlungie 1, carried out in 1949 and 1950. He had meanwhile published a brief general paper on Scottish souterrains (1953a) and carried out two small-scale excavations of souterrains in 'Southern Pictland', at Carlungie 2 (1953b) and Longforgan (1956). The four excavations provided the first adequately recorded evidence for the details of the construction and use of Scottish souterrains and his written work ordered the confused, inaccurate and often contradictory accounts of 18th, 19th and early 20th-century discoveries and excavations. Since the publication of 'The souterrains of Southern Pictland' little work has been done on the subject.

In 1961 Evelyn Clark, in a work describing Cornish souterrains included a brief chapter on Scottish examples summarising the known evidence. Sheila Grealey, in a survey of British and Irish souterrains in their Western European background, could only, by the nature of the work, deal generally with the 'Southern Pictland' evidence but provided a useful summary of the Scottish mainland and island material (1972). Since 1956 few excavations have been carried out on souterrains in Scotland. Site 2 at Dalladies, Kincardineshire, produced a series of small souterrain-like structures (*supra* pp 122–64), and the small souterrain excavated nearby at Northwaterbridge, Kincardineshire, considered by its publishers (Small, Cottam & Dunbar 1974) to be unfinished, in many respects accords with several half-timber framed, half stone-lined souterrains at Dalladies site 2. Consideration of these sites will be excluded from the present discussion since these souterrains have few features in common with the classic 'Southern Pictland' group. Outwith 'Southern Pictland' the souterrain at Rosal in Sutherland was excavated by Corcoran (1968). This long, straight passage has little in common with the 'Southern Pictland' series but the excavator's comments on some aspects of the structure are relevant to the discussion which follows.

ADDITIONS TO THE DISTRIBUTION OF SOUTERRAINS IN 'SOUTHERN PICTLAND'

Since Wainwright's list was published (1963) only three new souterrains excluding the Dalladies group have been recorded in the field, at Newmill, Northwaterbridge (Small, Cottam & Dunbar 1974) and West Park in Perthshire (Barclay 1981).

However, in addition to these the Royal Commission on Ancient Monuments of Scotland has, through its aerial photography programme, located several possible souterrains appearing as crop-marks. From their appearance it is possible that they are open examples, ie they have had their roofing slabs removed or were once roofed with timber. These sites are listed at the

end of this discussion. The discovery of crop-mark souterrains is likely to expand greatly the known distribution in all parts of lowland Scotland. It must be stressed however that without excavation the identification of these crop-marks as souterrains remains unconfirmed. Figure 13 based on Wainwright's map (1963) shows the present distribution.

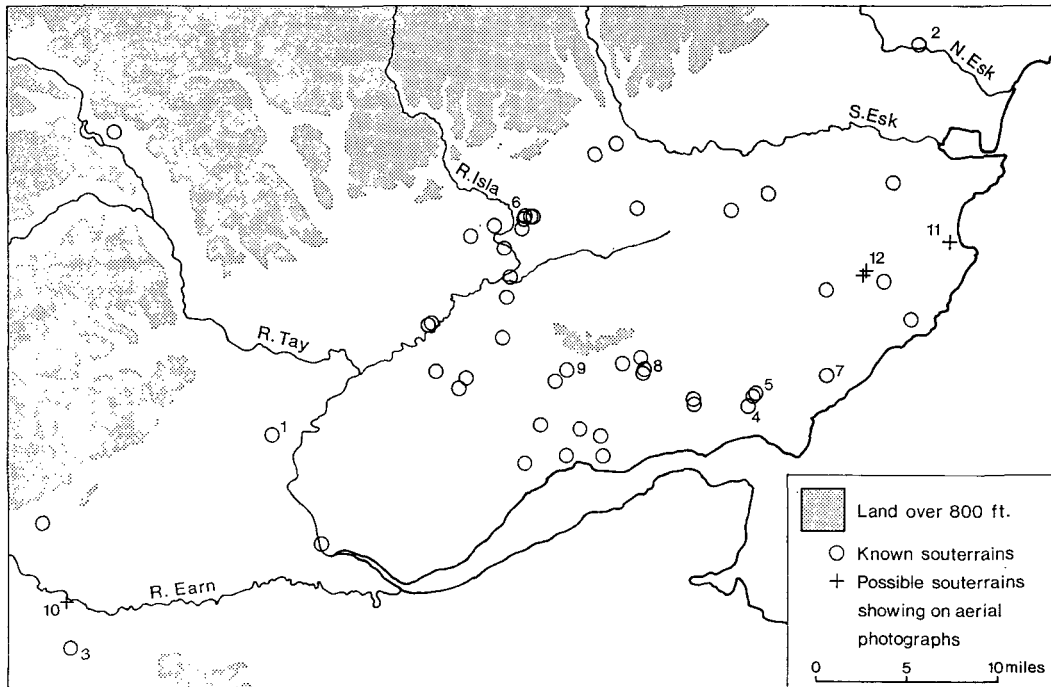


FIG 13 Souterrains in Angus and Perthshire

1 Newmill; 2 Northwaterbridge; 3 West Park; 4 Ardestie; 5 Carlungie; 6 Airlie; 7 West Grange of Conon; 8 Tealing; 9 Pitcur. Possible crop-mark souterrains; 10 Strageath; 11 New Barns; 12 Newton 1 and 2 (after Wainwright 1953b).

COMPARISON OF THE NEWMILL SOUTERRAIN WITH OTHER MEMBERS OF THE 'SOUTHERN PICTLAND' GROUP

Of the 57 souterrains in 'Southern Pictland' found or reputedly found before the publication of Wainwright's list there are adequate accounts for only a few. Only Wainwright's sites, the souterrain at Northwaterbridge and Newmill have been properly excavated. Newmill is, as far as it is possible to define, a typical 'Southern Pictland' souterrain. Individual structural features, shape and most dimensions can be paralleled at other sites (see below). However a major hindrance to research is the very variable quality of the reports of early discoveries. Dimensions were often reported inaccurately and structural elements of the same souterrain were in some cases described differently by two writers.

Shape

The characteristic tightly curved passage gradually widening from the inner end of the entrance to the terminal is found at Newmill, Conon and Tealing 3. The curve without the widening exists at Airlie 1, Ardestie, Longforgran and Barnhill. The 'annexe' of Pitcur 2, attached

to the long twisted main passage is itself the shape and size of a normal 'Southern Pictland' souterrain and for the sake of comparison will be treated as a separate unit in this paper.

Length

The complete lengths of only nine souterrains in the area are known (including Newmill). The majority of sites have not been fully excavated and many had been too severely damaged to allow even an estimate of the length to be made. It should be noted that most dimensions were reported to the nearest foot and that an exact conversion to metric measurement would lend a spurious accuracy to what were frequently only rough estimates. Therefore all dimensions are given in imperial measure with an approximate metric equivalent (note that Newmill was recorded using metric units). Newmill at c 65½ ft (20 m) long is of medium length, compared with the other members of the group, as are the Pitcur 2 annexe (60 ft, c 18.3 m) and Airlie 1, (67 ft, c 20.4 m). Rather shorter are Conon (54 ft, c 16.5 m), Lintrose (50 ft, c 15.2 m) and Mudhall (40 ft, c 12.2 m). Carlungie 1 (130 ft, c 39.6 m), Tealing 3 (80 ft, c 24.4 m) and Ardestie (80 ft, c 24.4 m) are considerably longer. Grealey (1972) states that the average length for 'Southern Pictland' souterrains is 80 ft. However the atypically great length of Carlungie 1 distorts the arithmetic mean. To the N in Grampian Region souterrains are known from 35 ft (c 10.7 m) to 60 ft (c 18.3 m) in length, almost half of the recorded examples being over 50 ft. They are of a similar shape to the 'Southern Pictland' type.

Width

Newmill at 11 ft 9 in (c 3.6 m) is the broadest souterrain known in the 'Southern Pictland' group. Carlungie 1, Fithie and the Pitcur 2 'annexe' are about 10 ft (c 3 m) wide. Carlungie 2, Airlie 1, Ardestie, Arbroath, Westhall, Mudhall, Bullionfield, Coupargrange and Tealing 3 are all substantially narrower, between 4 ft and 8½ ft wide (c 1.2-2.6 m). There is no obvious recurrent direct proportion of height to width.

Height

Of the souterrains whose wall heights are known, Tealing 3 (over 7 ft, c 2.1m), Newmill (6½ ft, c 2 m) and Carlungie 1 (in excess of 6 ft, c 1.8 m) are the highest. The walls of Bullionfield, Conon, the Pitcur 2 annexe, Longforgan, Westhall, Coupargrange and Mudhall are between 4½ ft and 6 ft high (c 1.4-1.8 m). Lower examples, between 3 ft and 4 ft high (c 0.9-1.2 m) were found at Ashgrove, Barnhill and Tealing 1. The lowest structure however is the souterrain at Ardestie where the walls were between 2½ ft and 3 ft high (c 0.8-0.9 m).

Outside 'Southern Pictland' in the Aberdeenshire group the majority of souterrains are between 4 ft and 6 ft (c 1.2-1.8 m) high though wall heights of only 16 in. (c 40 cm) are known (at the odd 'Y' shaped example at Meikle Kinord). A few taller examples are known; Buchaam, New Morlich and Mill of Torry are between 6 ft and 8 ft high (c 1.8-2.44 m). In Sutherland most souterrains are also between 4 ft and 6 ft high (c 1.2-1.8 m).

Compared with the recorded 'Southern Pictland' souterrains Newmill is thus of medium length, is close to the maximum height and is wider than the broadest known before the excavation.

Entrances

The two entrances found at Newmill can be paralleled at sites in 'Southern Pictland' and elsewhere. Dr Watkins has suggested that the axial entrance provided access from the associated surface structure, the side entrance providing access from the open air, and that the latter might

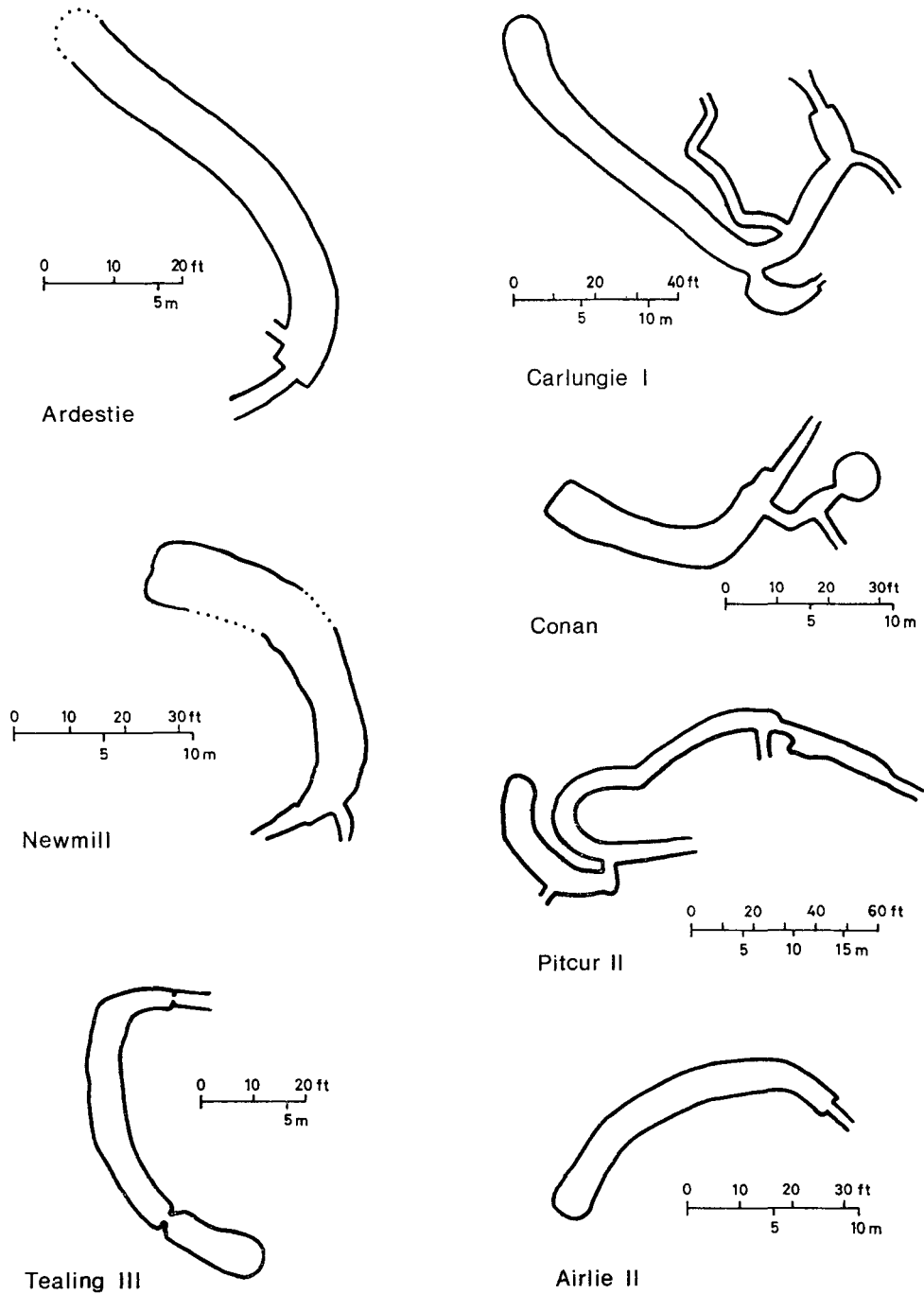


FIG 14 Simplified plans of selected 'Southern Picland' souterrains (after Wainwright 1953b)

have been used for filling the souterrain with materials to be stored, the former for the gradual removal of the stored food or materials, as needed, to the hut.

At Conon the side entrance passage might have fulfilled a similar function. At Carlungie 1 there are three side entrances, two of which appear to have led directly to the open air on the S and E of the passage. At Ardestie the side entrance provides access to 'hut 4' while the axial entrance seems to have led to the open air. At Pitcur 2 the main passage has also two entrances while the 'annexe', if the entrance to the main passage is counted, also has two. The remains of surface structures which presumably existed at Pitcur 2, Conon and other sites were not usually noted by early excavators.

Outside 'Southern Pictland' the souterrain at Clova 1 in Aberdeenshire has axial and side entrances. At Kintradwell in Sutherland a waisted chamber has an entrance at both ends, one a passage, the other a flight of steps. At Kirkton, also in Sutherland, the odd cruciform souterrain is entered at both ends of the longer of the arms (RCAMS 1911, 93). In the small outlying group to the S of the Forth the souterrain at Crichton Mains also has an axial and a side entrance but no known associated surface features. The isolated possibly 'Southern Pictland' type souterrain at Lynchat in Inverness-shire also has two entrances arranged as at Newmill.

Roofing

Wainwright in both his general works on souterrains (1953a, 1963) assumed that all souterrains were originally roofed with stone slabs and that where there was no trace of such a

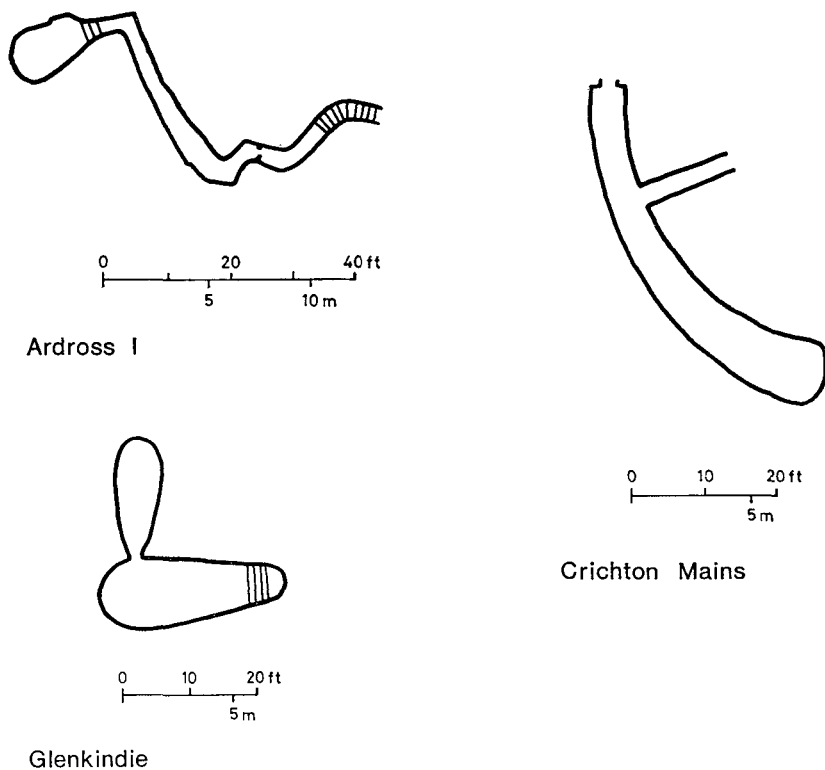


FIG 15 Simplified plans of selected souterrains outwith 'Southern Pictland' mentioned in text (after Wainwright 1953b)

roof, the slabs had been removed in antiquity or in recent centuries. However for reasons enumerated in his report Dr Watkins has interpreted the Newmill souterrain as a wooden roofed structure. Interestingly, earlier writers had also suggested that at least some souterrains were timber roofed (eg MacRitchie 1900, 204; Abercromby 1904, 21). More recently in his discussion of the Rosal (Sutherland) souterrain Corcoran noted that the four roofing slabs found spaced along the length of the passage were probably the only ones that there had ever been and that the rest of the souterrain had probably been roofed in timber (1968, 115). Grealey (1972, 36) agreed with Wainwright about roofing materials and suggested that souterrains were almost all stone roofed. Countering Abercromby's suggestion (1904, 121) that the Dinnet and Milton of Whitehouse examples had had wooden roofs she offered the argument that '... as this hypothesis was based solely on the negative evidence that no roofing slabs were noted at the site, it cannot be upheld...'. However, this 'negative evidence' is present at a sufficient number of sites for it to merit a reconsideration.

In 'Southern Pictland' at Ardestie and Carlungie respectively only 'two or three' and four slabs suitable for roofing were found, none *in situ*. At both sites they were found beside the complex entrances where such roofing slabs might well have had specific structural functions, eg adding strength to what may have been weaker parts of the structure or reflecting the needs of some activity or structure on the surface. It might be argued that the very low walls of the Ardestie souterrain (2½–3 ft) support the assertion that it had a pitched wooden roof. Wainwright produces no evidence for the destruction of the upper part of the walls or for the possibility that they were incomplete, so his assertion that the walls were slab roofed at a height of 2½ ft (0.75 m) perhaps should be best ignored. At Pitcur 2 the main passage was slab roofed but the 'annexe' with the features of a typical Angus souterrain, showed no sign of slab roofing (MacRitchie 1892; 1900) except, perhaps significantly, a lintel slab at the junction of the annexe and main passage, as may have been the case at Ardestie and Carlungie. At Tealing 3, where no roof slabs were found in position, Wainwright (1963, 214) suggested that the walls had been substantially corbelled to allow the few, short slabs located elsewhere to have acted as roof slabs (Jervise 1873, 187–293). At Westhall 1 no roof slabs survived. Jervise (1869) assumed that '... the flags which covered the top had been carried off and used for building purposes', although, as he admitted, he had no evidence to justify it. The souterrains at Arbroath, Carlungie 2 and Barnhill also produced no evidence of roofing slabs but as only small portions of them were excavated no firm conclusion can be drawn (*Arbroath Guide*, 23rd January & 6th February 1932; Wainwright 1953a; Hutcheson 1904). At Longforgan, where he examined only a small part of the souterrain, Wainwright suggested that the roof slabs had been removed with extreme care (1956). He noted the ease with which the slabs could have fallen into the souterrain, damaging the top of the wall in the process. Significantly the top of the wall, where excavated, showed no sign of damage. At Fithie (Angus) Wainwright (1963) also suggested that the slab roof, of which only three slabs remained, had been demolished at some earlier date. At Conon, Jervise (1862) noted that the main passage, unlike the S entrance passage, was not slab roofed at the time of excavation. He suggested that the slabs had been removed from the main passage 'with extreme care' as the walls appeared undamaged. Only one slab was found, fallen in the main passage. Again it is interesting to note that it lay by the junction of the main passage with the S entrance passage.

The writer is of the opinion that the available evidence is not adequate to justify Wainwright's assumption that all souterrains were at one time wholly roofed in stone and that all souterrains, where there is now little or no trace of stone slabs have had their roofs removed in antiquity or in recent centuries. At Rosal in Sutherland (Corcoran 1968) it would seem that only a small

part of the roof was ever made of stone. At Ardestie, Carlungie 1, Conan and at the annexe of Pitcur 2 the only evidence for slabs is at the junction of passages which were structurally weak elements. Wainwright asserts that the slabs at Carlungie (where over one hundred would be needed to roof the passage) were removed so carefully that little damage was done to the walls and that only 'three or four' fell during the process even though his own experience during the excavation showed that the fallen slabs were too heavy to move without first being broken up.

It has been suggested that the presence of corbelling on the upper parts of the walls of some unroofed souterrains, as in *some* of the stone roofed examples, is proof that they were once stone roofed. However the very fact of survival of those relatively fragile parts of the wall might instead support the argument that no massive roofing slabs had existed. The corbelling at Carlungie 1 expands the thickness of the wall in both directions, rather than merely closing the gap between the walls, and could have been designed as the wide base for a complete wooden roof rather than as the base for a slabbed roof.

REVIEW OF THE INTERPRETATION OF THE FUNCTIONS OF SOUTERRAINS

Wainwright (1963) interpreted the souterrains at Ardestie and Carlungie 1 as winter shelters for animals. While this interpretation is possible at these two sites, despite doubts about the space, height, light and air available for this purpose, souterrains with less space, narrower entrances and access only from the hut on the surface cannot reasonably be interpreted in this way. As Wainwright himself pointed out (1956b) the varied design of the souterrains suggests that functions differed; some may possibly have been animal shelters, more were likely to have been storage chambers and some, as Clark (1961) has suggested, may have had a ritual function. The souterrain at Ardross 1 (Fife), a chamber at the end of a long narrow twisting passage and the 'Y' shaped souterrain at Meikle Kinord (Aberdeenshire) cannot easily be interpreted as chambers for storage of material and may perhaps be better interpreted as ritual structures.

Dr Watkins has pointed out that Newmill, and indeed most Scottish souterrains were not suitable for use as animal shelters as suggested by Wainwright (1963) in connection with Ardestie and Carlungie 1. Their smallness, especially the Sutherland group, and the lack of external entrances, would suggest that Wainwright's interpretation cannot be extended to the majority of sites, including most in 'Southern Pictland'. The writer agrees with Watkins' suggestion first voiced by Wilson (1851, 79) and Leslie (1866, 353) that the main function of souterrains was storage. At the majority of sites there is only one entrance, from the house on the surface, through which stores may have been taken into and out of the souterrain. However at sites where the roof may have been of wood it is not impossible that incoming material could be taken in through an entrance in the roof or that the roof was partially dismantled when required. In the smaller souterrains the relatively small quantities of material to be stored might not have made a separate entrance to the open air necessary, all material in that case being carried in through the house on the surface. It should be noted that the cool conditions afforded by the souterrains would be distinctly advantageous for the storage of dairy produce and meat although the dampness of the air might have a detrimental effect.

Various authors have suggested that souterrains were refuges for keeping people or property safe in times of trouble. Wainwright (1963, 14) has argued convincingly against this interpretation:

'Were they refuges for use in times of danger? Not unless the people who went into them were determined to commit suicide. It would be impossible to defend a souterrain from the inside. . . . We now know that in Angus a souterrain usually protruded well above the

level of the ground, and we know that it was surrounded by a cluster of huts . . . and no stranger who approached the settlement could remain unaware of the souterrain.'

Corcoran (1968) and Watkins (above) have both noted that the souterrains at Rosal and Newmill respectively, if interpreted as storage chambers, were much larger than would be required for the occupants of the associated hut. Watkins has also noted that the associated hut at Newmill was the largest in the part of the settlement excavated. Abercromby's excavation of the settlement and associated souterrains at Kinord (1904) was too limited and too primitive by modern standards to allow any conclusions to be drawn.

Date

The dating of souterrains has been put on a firmer base by the radiocarbon determinations from Newmill. As no other examples in 'Southern Pictland' are firmly dated no useful comment can be made on the dating of these sites generally. Many souterrains have remained open until the present day; therefore artefacts found in them and to a certain extent in other souterrains which might also have remained open after their main period of use can only provide a *terminus ante quem*, eg the Roman pottery at Carlungie, the Ardestie amphora bung. There are unfortunately no examples of re-used Roman masonry known in 'Southern Pictland' as there are in Midlothian. Reliable *terminus post quem* radiocarbon dates for souterrain construction can therefore probably only be obtained from samples taken from behind walls and under slab floors as at Newmill. Further sites require to be excavated in order to provide a firmer chronological framework and to provide modern comparative material for the large amount of information provided by the excavation at Newmill.

ACKNOWLEDGMENTS

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APPENDIX

The radiocarbon dates

Lab no	Newmill code	Context	BP	Range (uncalibrated)
GU-1018	NM77.174.320	fire-pit	1110 ± 60	ad 780-900
GU-1019	NM77.063.104	chamber fill	1755 ± 55	ad 140-250
GU-1020	NM77.020.054	post-hole packing	1910 ± 55	15 bc-ad 99
GU-1021	NM77.185.110	below floor of souterrain chamber	1910 ± 70	30 bc-ad 110
GU-1022	NM77.187.113	below ramp of axial entrance	2005 ± 90	145 bc-ad 35
GU-1023	NM77.159.111	ramp of axial entrance	2100 ± 300	450 bc-ad 150
GU-1024	NM77.188.325	post-hole packing	1865 ± 60	ad 25-145
GU-1025	NM77.043.066	post-hole packing	1890 ± 55	ad 5-115

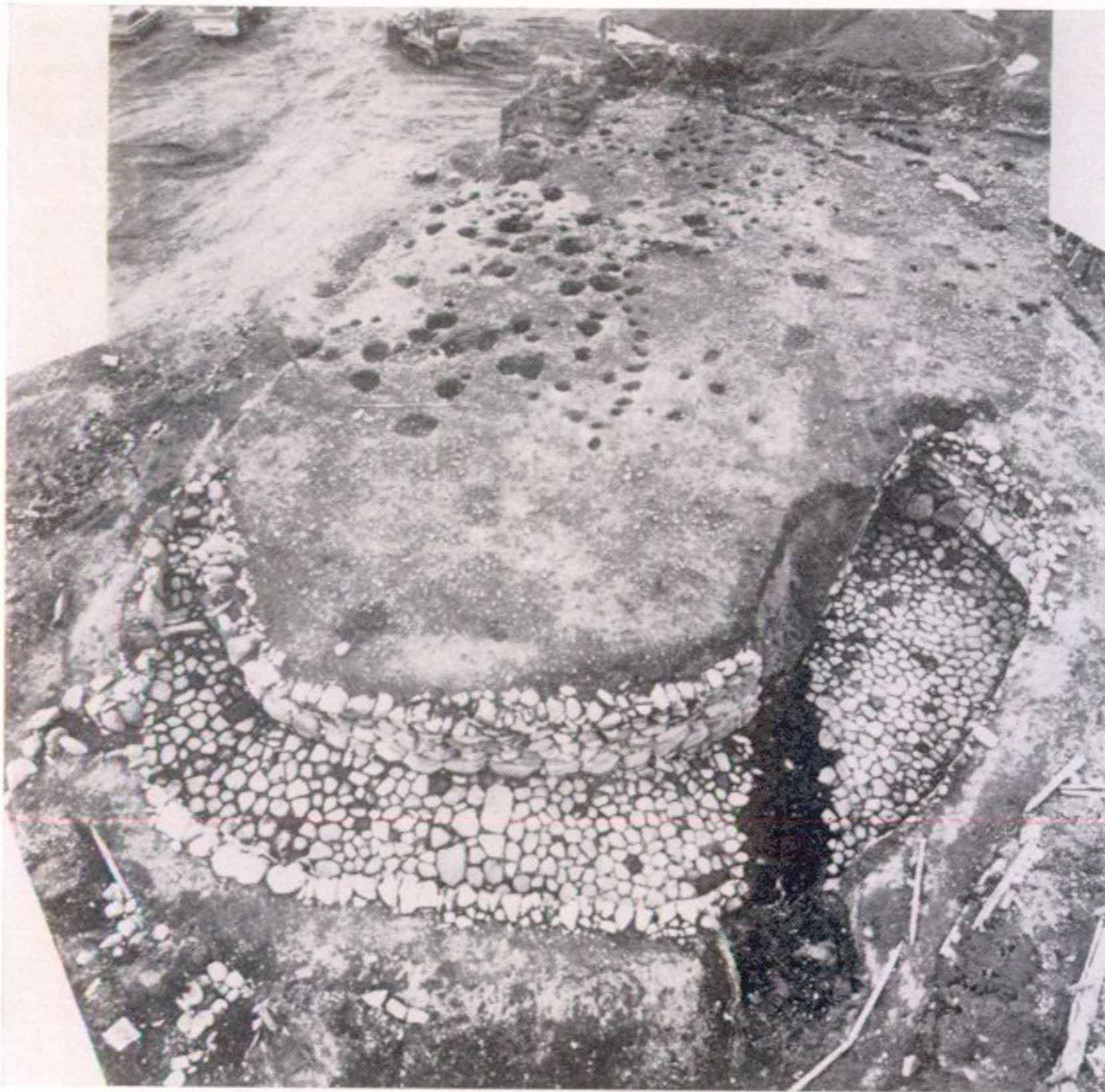
All the samples consisted of wood charcoal, with the exception of NM77.159.111, which was a black soil with visible charcoal fragments. The samples were selected by the present author and sent to Glasgow University radiocarbon laboratory by Mr P Ashmore of the Ancient Monuments Branch of SDD. The table lists them in the order of their laboratory codes. The excavation numbers consist of the site's signature (NM77), followed by the serial number of the sample in the finds register, followed lastly

by the code number of the context from which the sample came. The results of the tests are quoted here as dates before present (BP) in the conventional manner and then as ranges in the more usual BC-AD, except that, since the dates have not been calibrated to approximated true calendrical years, the abbreviations bc and ad are retained.

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Composite photograph of souterrain and most of excavation area (RCAMS, Crown copyright)



a S end of souterrain



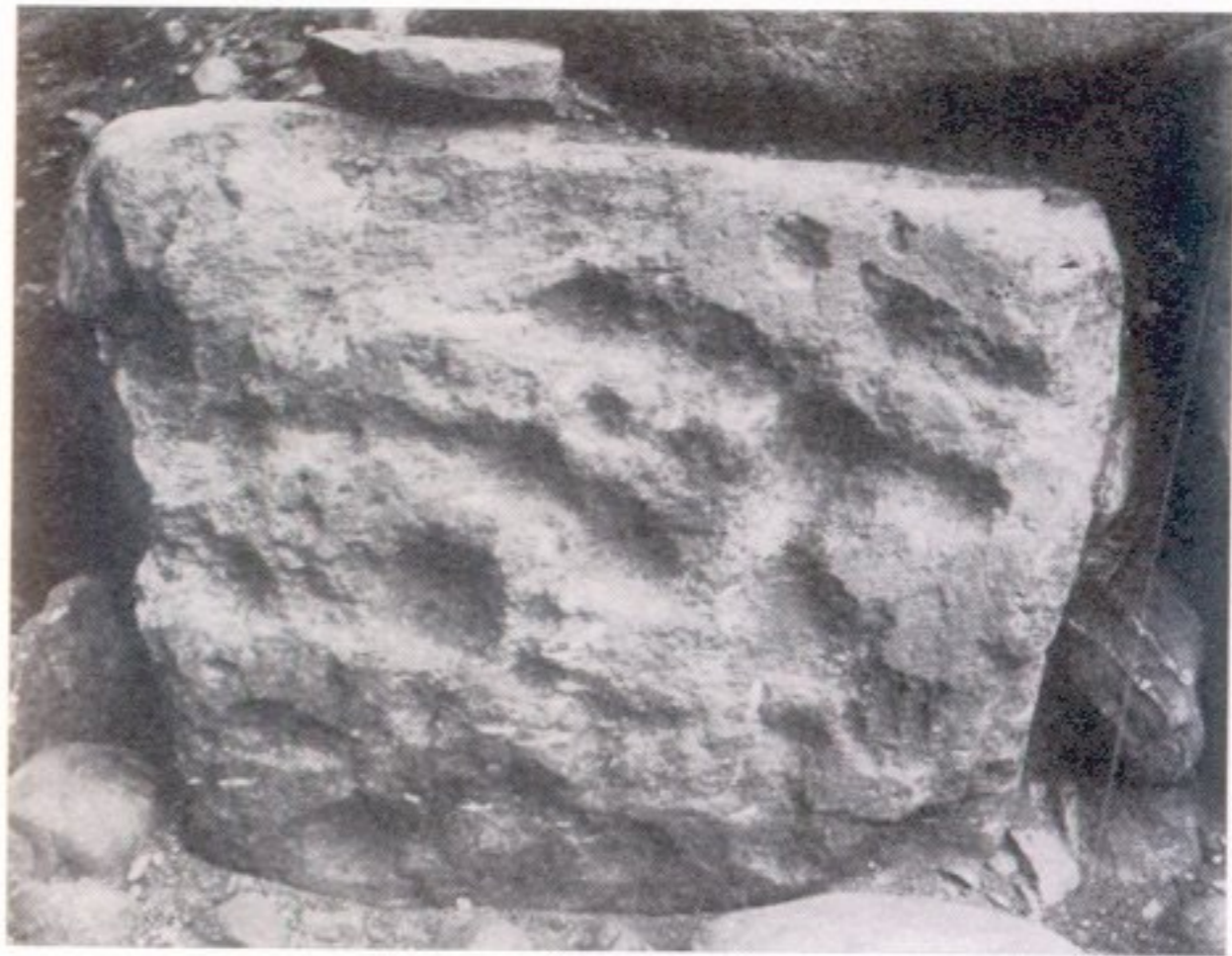
b Terminal of souterrain chamber



a Floor level view from entrance end of chamber



b Floor level view into terminal from mid-chamber



a Cupmarked stone at base of outer (E) wall



b Axial entrance from inside. The shattered left-hand jamb-stone was propped in position for the photograph