

Excavation of the Dalladies long barrow, Fettercairn, Kincardineshire

by Stuart Piggott

THE SITE

The barrow about to be described is on the farm of Dalladies, Fettercairn, in NE Scotland 15 km inland and NW of Montrose, on the edge of a fluvio-glacial gravel outwash terrace above the River North Esk, which at this point is running S, 400 m to the W (NGR NO 627673). It lies at a height of about 40 m, and the local coastal plain of which the terrace forms a part rarely rises above 100–150 m except in the ridge of the Hill of Garvoch, which reaches 260 m, between Laurencekirk and the coast, while the foothills of the mountains forming the Highland Massif rise steeply 6 km inland to the W. The immediate vicinity of the barrow is flat, and hardly above 40–50 m in elevation, and much of it only drained to make effective agriculture possible within the last century and a half: surviving patches of bog such as that between Bogmuir and Moss-side of Eslie, 4 km from the long barrow to the N (NO 645712), indicate the former condition of parts of the area, which is now farm land or afforested. (Fig 1; Henshall 1972, 562, KNC 8.)

The long barrow was recognised as an antiquity only recently, by Dr Wilfred Dally of Edzell and the Arbroath Antiquary Club, having been marked on the Ordnance Survey large-scale maps as an oval enclosure containing a fir plantation, but not as an antiquity. By the 1960s the plantation had vanished (though roots and disturbances found during excavation confirmed its former existence) and the barrow was grass-covered and standing largely in pasture, though ploughed at its W end. It was a conspicuous feature on a low local crest of land, some 65 m long and 2.5 m high at its E end, and a textbook long barrow to any field-worker familiar with, for instance, the monuments of the Wessex downland, but unfamiliar to those with a knowledge limited to local antiquities in a context where round or long cairns of stones, not earthen mounds, were alone immediately recognised as prehistoric burial monuments. This is not an unimportant fact, but one directly related to our knowledge of the distribution of antiquities, itself dependent on the standard of field archaeology in any given area. It is well shown again by the manner in which the long barrows of the Lincolnshire Wolds were only recognised as such around 1930 though the type had been defined in Wiltshire at the end of the eighteenth century (Phillips 1933), and by the fact that those of eastern Scotland are only now beginning to be seen as a distinctive type, as may be realised by comparing the maps in Atkinson 1962 with those of Henshall ten years later (1970; 1972). In the past unrecognised as antiquities by antiquaries and peasantry alike, and vulnerable to the agriculture that has so heavily exploited the Scottish east coast for a couple of centuries, our known long barrows of the region may well represent only a portion of the original total, though informed field work and air photography may well add to their number.

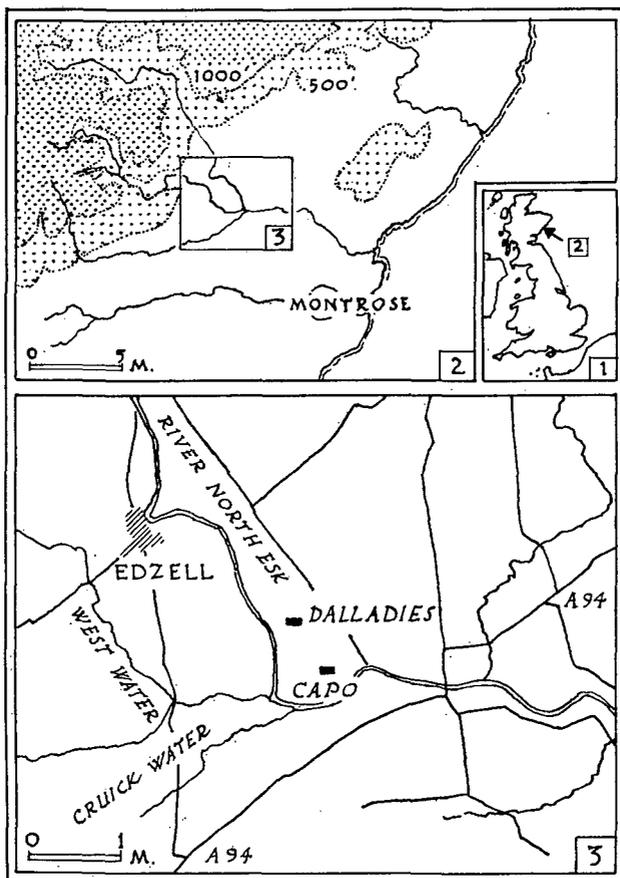


FIG 1 Location map, Dalladies and Capo long barrows

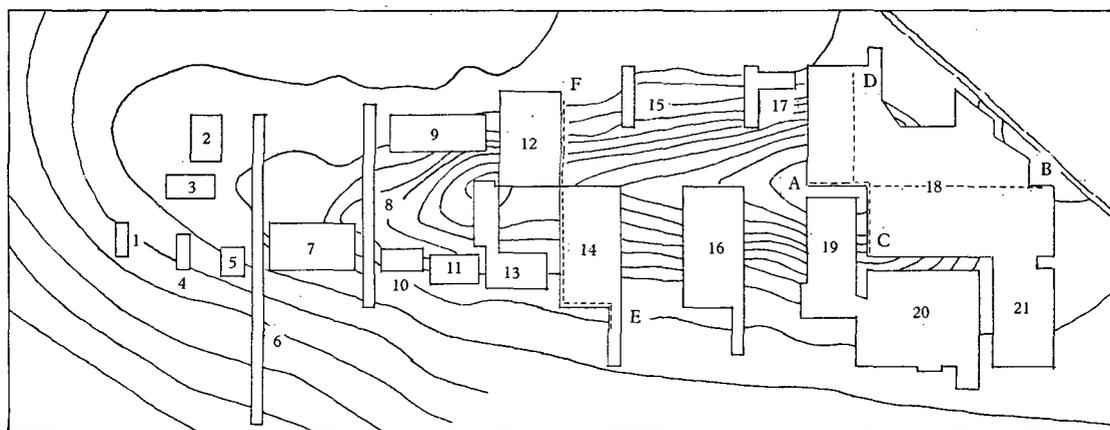


FIG 2 Dalladies long barrow: cuttings diagram and section lines 1970-71

When discovered as an antiquity of outstanding importance, the barrow in 1968 was already only a short distance from the encroaching edge of an extensive area of gravel-digging, and was threatened by imminent destruction. Once the archaeological emergency was realised, the owner of the land, Mr H J Kennaway, and Messrs Clark, the gravel extractors, offered every facility to the Department of Archaeology of the University of Edinburgh by not only giving sanction to excavate, but by diverting the working of the pit face for two years while this could take place. We are deeply grateful for this enlightened action, and for the continuous help and co-operation given us by Mr David Walker and the gravel pit personnel throughout our work. With financial provision from the Department of the Environment this was carried out under the joint direction of the writer, Miss M-J Mountain and Dr T F Watkins in two seasons; four weeks in 1970 and six in 1971, after which the site was finally removed (interim reports in Piggott 1972; 1973).

THE EXCAVATION

A contoured survey of the barrow at intervals of 0.25 m reinforced the superficial impression that at the NE it had been partly destroyed by ploughing in the past at a point where a field wall runs NW-SE, but that otherwise it was a symmetrical mound 65 m long, with an axis 75° E of true N, rising to a height of 2.5 m above the surrounding ground level at the eastern end, where its maximum width was 18 m, and tapering westward laterally and vertically to a width of 9 m where it merged into the plough-soil. There were some minor irregularities, mainly along the crest, which excavation showed to be the result of rabbiting, burying sheep or cattle, or former tree-stumps. There were no detectable signs of the flanking quarry-ditches to be expected on analogy with the English long barrows.

In anticipation of a ground-plan involving linear and axial features, again on analogy, the excavation was planned on a grid of basic 5 m wide cuttings (fig 2), of which Cuttings 12 and 14 were first dug to give a transverse and 10 m of a longitudinal section, concurrently with a series of small cuttings (1-6) to establish the western end of the mound and to search for quarry-ditches concealed by ploughing. The absence of such a ditch in the S part of Cutting 6, and the failure to detect significant anomalies by geophysical survey, was simultaneously explained as the mound was excavated in Cuttings 12 and 14 and found not to be of quarried gravel but of layers of turf and top-soil evidently obtained by stripping a large superficial area to a relatively slight depth. The only linear features encountered were lateral stone revetment walls, and outside these a pair of very small lateral ditches, and these were followed in Cuttings 8-11, 15-17, 19 and 20. The E end was then excavated in what eventually became Cuttings 18 and 21, in anticipation of an axial funerary feature, but an unbroken crescentic dry-stone façade was found, and when a massive mortuary structure indeed appeared, it was lying eccentrically to the NW of the façade (figs 2, 3).

At the conclusion of the excavation, what remained of the mound W of Cuttings 18 and 19 was removed mechanically under archaeological supervision, but no further features were found except two secondary cist burials, A and C, B and D having been found previously in Cuttings 13 and 19 respectively.

THE STRUCTURES AND SEQUENCE

To anticipate an argument set out in detail below, a complex structural history must be assumed to account for the observed features in both the mortuary structure and the long barrow

within which it is contained. The former's eccentric position relative to the formal planning of the latter might itself suggest a difference in date between the two and there is support by analogy for such a situation, while the fact that the mortuary structure has itself a complex history makes it credible that the first event on the site was the building of Phase I of its sequence, a structure probably roofed and presumptively funerary, carried on massive upright timbers set in large post-holes. This structure, some 8 by 5 m, lay on a NW-SE axis with its entrance to the NW. There follows an interval of unknown duration but probably of not less than half a century, at the end of which time the timbers had rotted and the site could be cleared and levelled. On the same basic plan, and for incorporation in a long barrow of quite different orientation, Phase II follows, with boulder walls at sides and back, and a new pair of posts at the NW entrance, now built of sandstone slabs integrally bonded in with the northern long barrow revetment, itself built concurrently with the lower part of the mound, which can also be shown to have been tied in with the making of the Phase II boulder walls. The building of the mound of turf and top-soil necessitated shallow surface stripping, and the condition of the northern of the two small ditches flanking the barrow suggests that it was partly erased in this process, implying that the ditches were a primary feature of the barrow plan, and therefore antedating Phase II of the mortuary structure (itself strictly contemporary with the initial building of the barrow) by however short a period of time.

Within the boulder walls of the Phase II mortuary structure was a lightly built timber feature involving horizontal logs and apparently a light roofing largely of birch-bark. This was deliberately burnt, and radiocarbon dates of $3240 \text{ bc} \pm 105$ (I-6113), $2710 \text{ bc} \pm 50$ and $2585 \text{ bc} \pm 55$ (SRR-289, SRR-290) were obtained. The later pair is to be preferred. Meanwhile the mound of the long barrow continued to be built until it covered the burnt structure and boulder walls and was at a slope of about 30° , when an elaborate stone setting of quite unknown purpose was constructed over and approximately on the axis of the mortuary structure, constituting a Phase III. The mound was then completed in such a manner as to cover the façade and revetment walls and the 'extra-revetment' slabs laid in front of them. After an interval of over a millennium, secondary burials were made along the crest of the barrow, still evidently regarded as a sacred site, and Pit 2 may represent a grave with unaccompanied crouched burial of the same period. Finally, at a date which by analogy may be contemporary with the adjacent Dalladies II site, of the first century AD, the 'Late Ditch', cutting the N end of the façade, and Pit 1, with contained iron slag, were dug.

DETAILED DESCRIPTION: THE BARROW

The barrow itself comprised two structural elements, the mound and the stone walling forming lateral revetments and a frontal façade at the E end. At the W end ploughing had progressively degraded the mound and destroyed the revetments so that the terminal details are unknown. Roughly parallel with the revetments were two small flanking ditches to N and S, the former almost obliterated for much of its length by what may be interpreted as the removal of turf and top-soil to provide material for the mound. On this assumption the flanking ditches were constructionally earlier than this process.

THE DITCHES

The S ditch averaged *c* 1.5 m in width and 0.5 m in depth below the undisturbed gravel, and had a shallow U section; the N ditch where apparently intact had the same proportions.

The rounded butt-end of the S ditch was found at the E and its W end was established by default between Cuttings 4 and 5 60 m away; on the N the E end was lost where modern disturbance and the field wall had mutilated the NE corner of the barrow, and the ditch was progressively degraded westwards, but apparently changed alignment between Cuttings 12 and 15.

The ditch filling was uniform and showed no coarse primary gravel silt, but was of dark soil with small stones throughout, from the plough-soil downwards, presumably as a result of earthworm action. No trace of a bank remained on either side of either ditch. No finds were made in any of the excavated portions. At the E end the two ditches were *c* 24 m apart and at the W, *c* 10 m, running more or less straight on the S but with the change of course noted, of *c* 1.5 m, on the N. Basically then the ditches delimited a trapezoidal area 60 by 24 by 10 m, open at either end on the same long axis as the barrow.

THE MOUND

At an early stage of the excavation of Cuttings 12 and 14 the superficial appearance of the fine-grained laminated mound material, showing horizontal banding of yellow-brown and grey-white layers, or, alternatively, of dark grey or black masses of similar structure in cross-section, immediately suggested a stack of turf, and in places of burnt turf, consonant with the fact that flanking quarry-ditches had not been found. This impression was confirmed in detail by a pedological examination carried out by soil-scientists from the Macaulay Institute of Soil Research, Aberdeen, to whom our grateful thanks are due for their enthusiastic co-operation. They concluded (Romans, Durno and Robertson 1973) that the mound 'had been constructed of stacked-up turves presumably cut from the surface round about the site' and that there were 'patches of gravelly material, as well as of relatively stone-free turf, indicating the turf layer on the ground was variable in depth, but nowhere very thick': individual turfs averaged about 12–15 cm thick in their compressed state. The blackening of some of the layers of stacked turfs was due to dust and small fragments of wood charcoal, identifiable as Oak (*Quercus* sp.) in 'an intimately mixed mineral/humus A horizon', and in both the mound material, and the buried soil on which it had been built, the circumstances indicate 'that the surface distribution of charcoal and slight translocation of clay took place before the turf was cut to construct the barrow' over a short time interval that might however have had a minimum duration of a dozen years. In sum, the situation is interpreted as that of 'a brown podsol forest soil developed under deciduous woodland in which oak was an important component' (although scanty pollen grains also attest Alder (*Alnus* sp.) and Birch (*Betula* sp.) with fern spores as well) which had been cleared by a process involving fire – some sort of 'slash-and-burn' or *Brandwirtschaft*. The implications of these important conclusions are discussed in a later section: for the present however, we can accept a basically turf mound.

The three main components in the make-up – turf, burnt turf and sandy gravel – occurred in varying proportions and in no regular relationship, the barrow having evidently been built piecemeal in dumps of varying sizes. The three sections in fig. 4 show typical profiles, one linear and axial at the E end (A–B) and two transverse, one running obliquely over the mortuary structure (C–D) and one centrally across the mound in Cuttings 12 and 14 (E–F). A higher proportion of turf was unburnt rather than burnt, so that two areas must have been drawn on for mound material, one still containing charcoal from presumptive slash-and-burn clearance and the other clear of it and so presumably of longer standing as a cleared area. The only element of regularity observed was that the edges of the mound bonded into the revetments and façade of dry-stone walling were of burnt rather than of unburnt turf, and burnt turf was especially

freely used at the eastern end and around and over the mortuary structure. One mass SW of this feature, at a point where cut in axial section, had a vertical face to the W held by presumptive wattle-work and at least one vertical stake driven into the old land surface and about 1 m high. The weight of the burnt turf E of this had apparently pushed it obliquely to the W, which would imply that that part of the burnt turf stack was temporarily free-standing for a short time at least. The feature could not, however, be traced on the N wall of Cutting 19, only a metre southwards. In the upper part of the mound above this area, in unburnt turf, were further traces of vertical stakes, but these could be related to no structures.

An inexplicable feature occurred in the NW corner of Cutting 16. An irregular disturbed area 0.75 m deep below the crest of the barrow and not less than 2 m across, overlay a regularly cylindrical pit with vertical walls nearly 1 m in diameter, and with a total depth below the crest of 1.75 m. The vertical sides of the pit and its filling of clean turf and gravel, only with care distinguishable from the undisturbed mound section, show that it had been cut and filled almost immediately. It contained no artefacts. Water-worn boulders similar to those forming the walls of the mortuary structure occurred sporadically in the turf mound, and on the old land surface and in the lowest part of the mound make-up in Cutting 16 was a large pile of such boulders, about 1.5 by 3 by 1.25 m overall, but with no evidence of any function other than perhaps representing surplus building stones from the structure 10 m away to the NE.

Traces of the original ground surface survived under the mound, with a profile similar to that of the turf used in its construction, 'but the A/B horizon merges rapidly into more ochreous, very stony material' 'rather closer to the original ground surface than the condition of the stacked turf would have led one to expect had the profile remained subsequent to burial'. This modification, it is suggested, could have come about 'by the action of a rising water table in the underlying terrace gravels', for the modern water table has been drastically lowered by agricultural drainage and the gravel working itself, and as the barrow would have been built at the beginning of the Sub-Boreal climatic phase (Zone VIIb), a rising water table might result from the increased rainfall following the climatic deterioration of the Sub-Atlantic phase (Zone VIII) (Romans, Durno and Robertson 1973; Piggott 1973 on climatic change). The old land surface was examined for land mollusca by Dr J G Evans, but with negative results.

At the time of excavation the mound was covered with modern turf and top-soil, and had suffered in places from rabbits (e.g. in Section E-F) and the burying of farm animals (e.g. a sheep in the 'Disturbed Pit' in Section C-D and a cow at the S end of Cutting 12). The ancient secondary pits or cists are described in a later section.

Except for those associated with the mortuary structure, no artefacts were found in the material or on the old land surface, except for two fragments, which re-united, struck from a small nodule of ochreous pebble flint, at the base of the mound in Cutting 14.

THE REVETMENTS AND FAÇADE

Both sides of the barrow were delimited on their outer edges by low revetment walls, built on the old land surface and integrally bonded into the lowest layers of blackened turf. In each, the outer wall face was vertical and hardly more than 0.75 m high, and of four to five courses at most of dry-walling made of Old Red Sandstone slabs. Above this, on the lowest slope of the turf mound, was a roughly set mass of small water-worn boulders and large pebbles. Neither element could have had an existence independent of the backing of the turf mound. The colour contrast of the red dry-stone wall face and the grey boulders was striking, and could have been intentional, but the revetment could never in whole or part have been a feature exposed to view

DALLADIES LONG BARROW EXCAVATIONS 1970-71

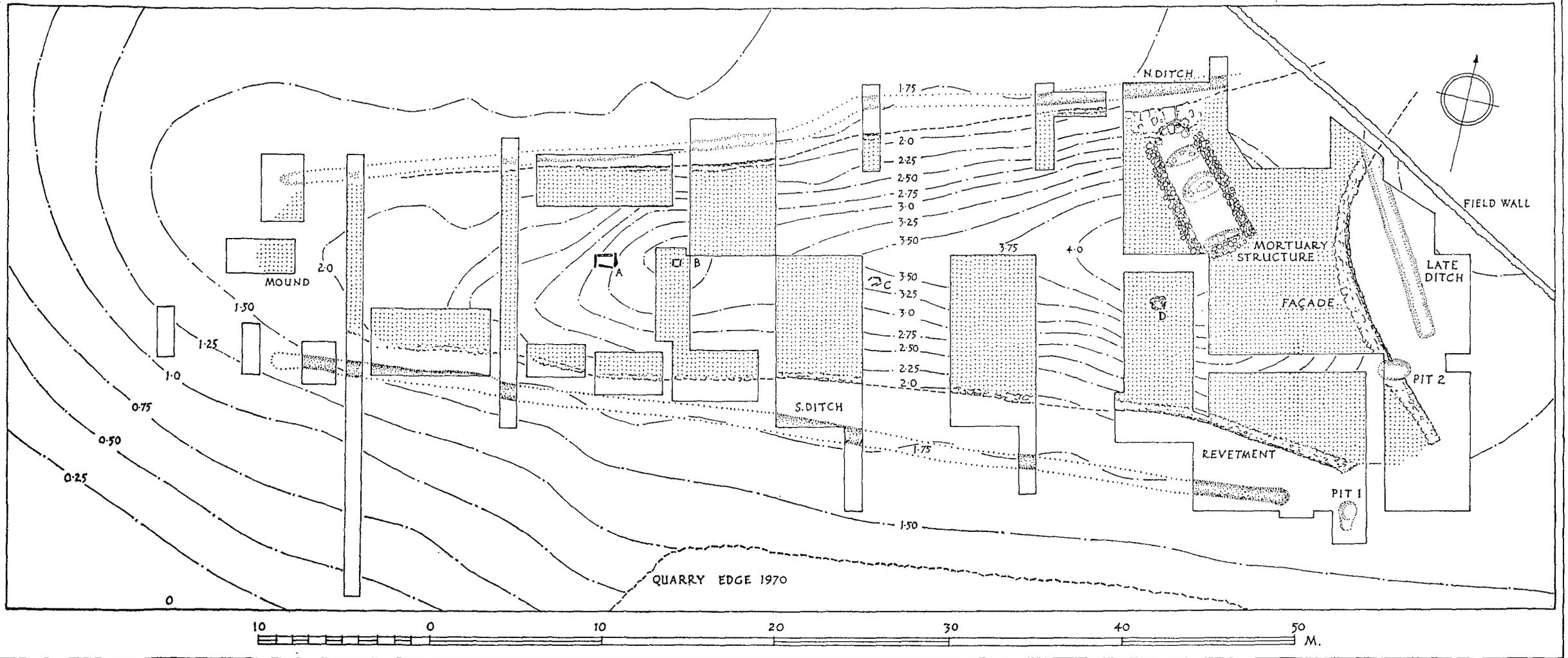


Fig 3 Dalladies long barrow: general plan of excavations. A—D, secondary burials.

for long, as the rapid deterioration and collapse of excavated stretches left exposed between the excavations of 1970 and 1971 showed. Outside the wall face was an area of stone pitching of from one to three layers of slabs, running parallel with the revetment with an irregular outer edge and from 0.5 to 1.0 m in width. Careful examination showed this not to be the slip from the collapsed upper parts of a once higher wall, but deliberately laid 'extra-revetment' construction which had been carefully built with its inner edge hard up against the lowest courses of the revetment wall, or occasionally against vertical slabs placed close against the wall face. There was no direct evidence as to whether this could be interpreted as a deliberate 'tidying-up' of originally fallen courses of walling as has been suspected elsewhere (Powell 1973, 11, with refs) but on the whole this appeared unlikely. The consolidation of the turf mound backing the wall, especially at the façade, tended to cause a backward rather than forward tilt of the upper courses. (Figs 3, 4, 5.)

Exactly the same constructional features obtained for the shallow crescentic façade except that it was more massively built, up to nearly a metre high with the upper courses tilted back as the turf behind them became compressed, and with the arc of its plan filled with 'extra-revetment' up to 2 m wide on the axial line (fig 5).

Although ploughing round the edges of the barrow renders the situation uncertain, it appears probable that revetments and façade alike were deliberately covered in antiquity, and the façade concavity with its attendant projecting 'horns' completely masked.

The lateral revetments and façade together delimit the formal plan of the completed barrow. The south revetment was in a better state of preservation than that on the north, which had been destroyed at its NE end, but both became progressively ruined and eroded, and difficult of precise definition, as one moved westward, and while this must in part have been due to ploughing, the revetments may themselves have deteriorated in quality towards the west end. Beyond Cutting 8 their remains were exiguous on the S and absent on the N, and the nature of the terminal revetment, if any, is unknown. But at Cuttings 9 and 10 the revetment walls were 12 m apart, whereas at the position of the mortuary structure, in Cuttings 18 and 19, 35 m to the E, they were 18 m apart, N to S. E of this point the N revetment was destroyed or inaccessible under the field boundary, but on the S it took a turn outwards and continued for a further 10 m when it, and the accompanying 'extra-revetment', abruptly ended at a point at which, on the assumption of symmetry, the walls would have been 20–24 m apart. The surviving SE end of the façade similarly ended without junction with the S lateral revetment; at the NW end it was cut into by the ancient 'Late Ditch' and the modern field dyke. There was no entrance or break, nor signs of any symbolic entrance, in its massive structure. There was no evidence that revetment or extra-revetment originally continued to join the two features at the SE 'horn'. The walls ended cleanly and abruptly, and there were no remains of broken walling or scattered slabs in the plough-soil covering the critical area. No trace of the 'horn' was perceptible by ground or air observation, nor was it shown by contouring, before the excavation. If it had been represented by a three-dimensional turf-built feature, it had been obliterated by ploughing.

The plan presented by the mound within its revetments and façade is that of a trapezoid or truncated triangle, the wider end of which, that at the ENE, takes on a characteristic form recognised in northern Scotland since the 1860's by Joseph Anderson – cairns which 'from their peculiar prolongations of the extremities I have called "Horned"' (1866, 444). Comment on the relation of this plan at Dalladies to Scottish 'horned cairns' as a whole is reserved for a later section (p 41).

The source of both the Old Red Sandstone slabs and the water-worn boulders and pebbles was presumably the River North Esk, which cuts through laminated beds of sandstone and has wide beaches of boulders, pebbles and shingle along its banks.

THE MORTUARY STRUCTURE

The most interesting and most complex feature of the site was however what for convenience has been designated the Mortuary Structure at the NW corner of the barrow in Cutting 18. As has been indicated, analogy had suggested the likelihood of axial features, and the excavation was planned accordingly, but in the event the eccentricity of its position, and the fact that in the normal process of excavation the highest and latest stone structures in the building sequence were encountered first, led to the mortuary structure emerging piecemeal and in the reverse order of its original building. The high-level stone settings on the slope of the mound and just below the turf, now assigned to Phase III, were the first intimation of unusual features at this point, and it was not until these had been recorded and removed that at a lower level the tops of the boulder walls of Phase II, around 0.75 to 1.0 m above the old ground surface, emerged and indicated a rectangular arrangement some 3 m by 7.5 m, opening on to a paved entrance between a pair of post-holes (B and C), down to which the Phase III stones had sloped. This boulder enclosure once defined, its interior could be excavated with two transverse baulks left for cross sections (fig 7, V-VI and VII-VIII), and the mass of stones, turf and burnt material of the upper level of Phase II (IIb), recorded and removed. On the old ground surface there then appeared the burnt timbers of Phase IIa at a lower level, and eventually a further pair of entrance post-holes (A and D) and three very large D-shaped pits holding decayed posts (E, F and G) were found, belonging to a primary unburnt timber phase constructionally antedating the boulder walls and two burnt levels in Phase II a/b, and so forming a Phase I. Having described the sequence of excavation, it is however logical to reverse this, and take the constructional phases in the order of their inferred original building (figs 4, 6-11).

Phase I

The isometric sketch (fig 6) shows schematically the features of Phases I and IIa. The arguments for the separation of an initial Phase I are as follows. Structurally, the boulder enclosure overlaps the big D-shaped post-holes E F G, though this would not preclude its co-existence with the posts which had been held in them and which were distinguishable as areas of dark grey slightly greasy replacement soil, as these would have stood free of the boulder walls. The single post-holes A and D, however, had the tail-end of the walls over them, and A had been cut through by Post-hole B. Most significant however was the fact that whereas all the woodwork assignable to Phase II was burnt (except the posts B and C), no trace of burning was seen in Post-holes A, D, E, F or G. It is therefore assumed that we have a primary unburnt phase constituted by these post-holes. The cup-marked slab overlying a soil stain in F was clearly secondary to it.

In A and D it was not possible to detect clear post-cores but the dimensions would have been those of B and C, about 0.3 m in diameter. There was however no sign of the posts having been removed in antiquity. The packing was gravel and small stones. In E, F and G the packing was uniformly of dirty gravel without more than an occasional stone, and the pits, up to 2.0 by 1.4 m and 0.5 m deep, seem disproportionately large to take the not very massive posts indicated by the replacement soil. In E there appear to have been three posts, the central one especially well marked and 0.3 m in diameter; that to the NE was *c* 0.4 by 0.25 m and that on the SW *c* 0.25 m in diameter. Between the central and SW post was a broad lateral stain suggesting a horizontal timber. In F the soil stains were more vague, with a wide shallow area with no distinct central post (if one existed), but firmer indications of a 0.25 m diameter post at the NE end and at the SW stains at two levels suggesting an outward-leaning post. In G, a rotted

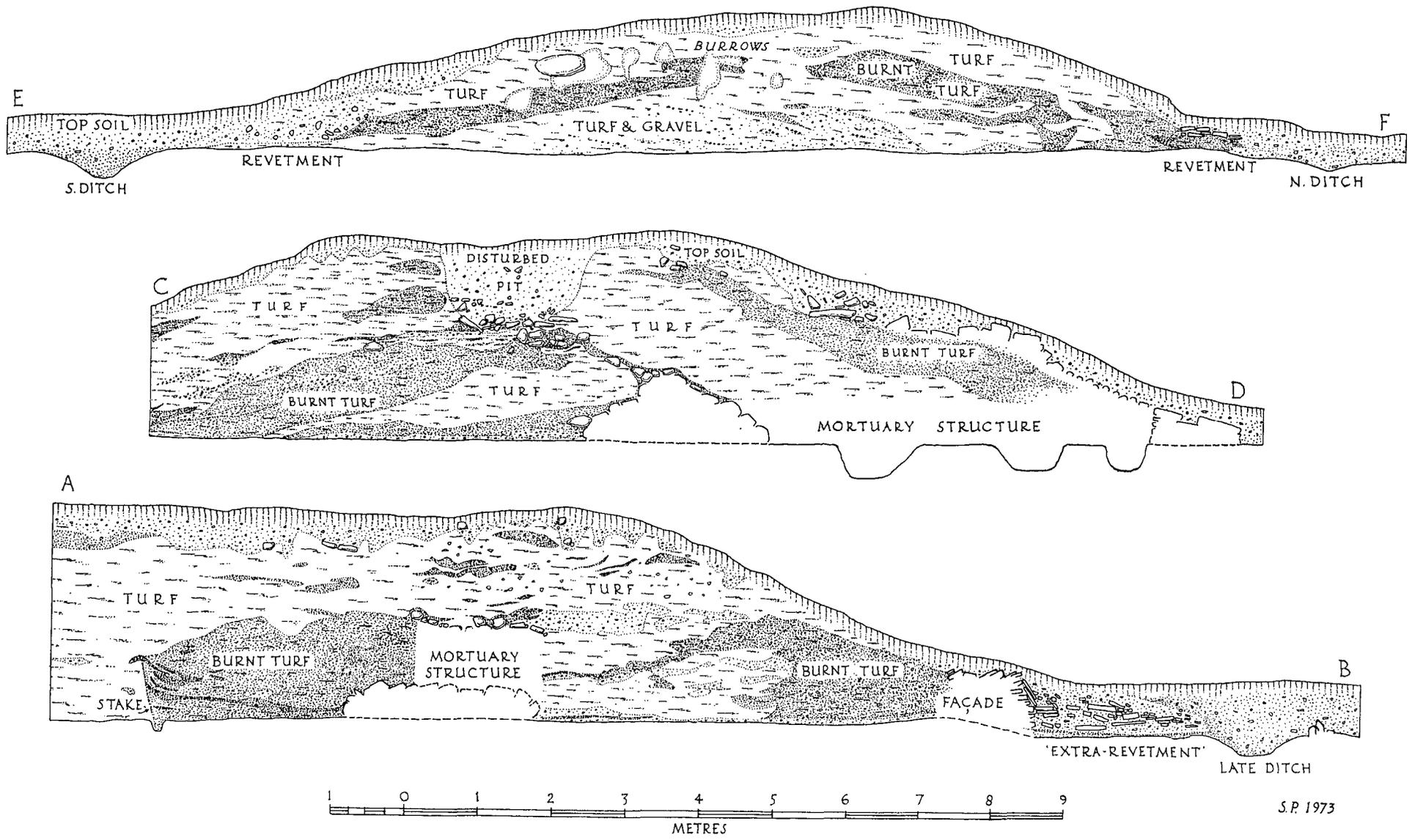


FIG 4 Dalladies long barrow: sections

DALLADIES LONG BARROW
EAST END

SOUTH REVETMENT

PIT 2

EAST FAÇADE

LATE DITCH

STONE SETTING

FIELD WALL

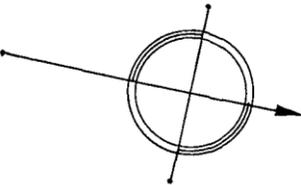
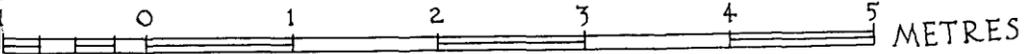


FIG 5 Dalladies long barrow: plan of façade

S.P. 1973

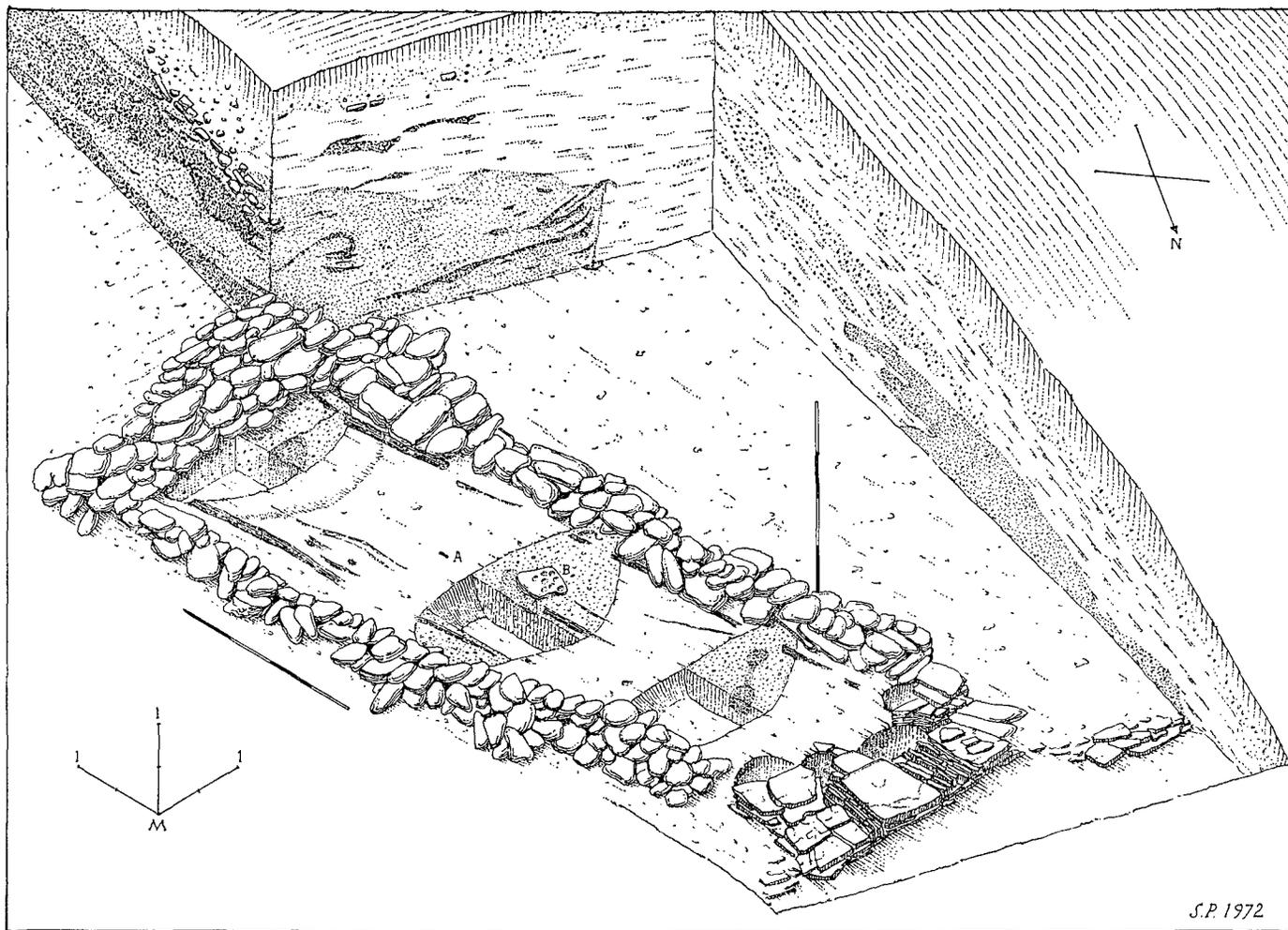


FIG 6 Dalladies long barrow: isometric sketch of mortuary structures: A, plano-convex flint knife; B, cup-marked stone

post was very clearly visible as a central feature, 0.5 by 0.3 m, with a thin but distinct stain as from a thin plank or hurdle partition touching it on its outer (SE) side and running the length of the hole, 2.2 m overall. The post-stain extended downwards for *c* 0.3 m; the central post in E for *c* 0.4 m.

The post-holes and post-stains suggest a structure rather than an unroofed setting of free-standing uprights, though whether ridge-roofed or not it is impossible to say. The lack of evidence for wall posts could however be held in favour of a gabled arrangement in which the ridge was held on the central post of E and the single post of G, with possible intermediates represented by the less defined stains in F, with the roof sloping to the ground and with perhaps a span of 2.5 m and the ridge-pole 5 m long. The SE end would have been closed by a wattle (or less likely, thin plank) wall, and at the NW it would have been open, for it is difficult to incorporate posts A and D as structural elements, and it can only be suggested that they were a free-standing pair in front of a roofed structure. Such a gabled mortuary structure was first inferred in the first phase at Wayland's Smithy long barrow, and since in other English sites with varying degrees of conviction. In Scotland, the Neolithic barrows at Pitnacree (Perthshire) and Lochhill (Kirkcudbrightshire) offer possible parallels, and the whole question, and those raised by Phase II at Dalladies, is discussed below (p 41).

This first-phase structure, as we saw, was not subject to the burning which brought to an end Phase II. It preceded this phase, which is integrally tied in to the building of the long barrow, but there is no reason why the Phase I structure as originally built should have any connection with the barrow which only later came to incorporate it as an awkwardly skew feature, and it can therefore be regarded as free-standing, in a manner comparable with a group of broadly contemporary and probably related mortuary structures in Denmark, again discussed below. If adequately thatched or with a sod roof it could have had a relatively long life, especially if kept in repair, when a duration of centuries would not be out of the question. These are imponderables, but a life of a generation or two – say 25 to 50 years – would be a reasonable minimum assumption. Although it cannot be directly demonstrated, the building must have substantially rotted *in situ*, and the site cleared before the building of Phase II was entered upon. The fact that there was no sign of the removal of any posts, but that replacement soil representing timbers rotted as they stood was present in holes E, F and G implies such a situation. The features of the filling above Post-hole E recorded in Section V-VI (fig 7) are difficult to explain, but the loose and stony soil, with flat stones over it, which here breaks the collapsed turf of the mound between the Phase II boulder walls, lay immediately beyond the central post-core of that hole.

Phase II

Whatever the function of the Phase I structure, it is hard to escape from the concept of some sort of mortuary significance, since its site was in Phase I re-defined and incorporated, however much at variance with axial planning, within a long barrow with a quite different orientation. No direct evidence of a strictly funeral usage was however found: the single fragment of the unburnt cranium of a child, found under slabs forming part of the filling over the collapsed burnt roofing of Phase II immediately NW of the central post of E, is not only the only piece of human bone, burnt or unburnt, from a primary context in the barrow, but it could belong equally to the first or the second phase. The cup-marked stone overlying wood stains in F is certainly secondary to them, but the plano-convex flint knife further to the SE on the old land surface is ambiguous (though probably of Phase II), and in any case neither can strictly be attributed to a burial deposit.

The re-definition of the primary feature in Phase II seems then to have taken place on a

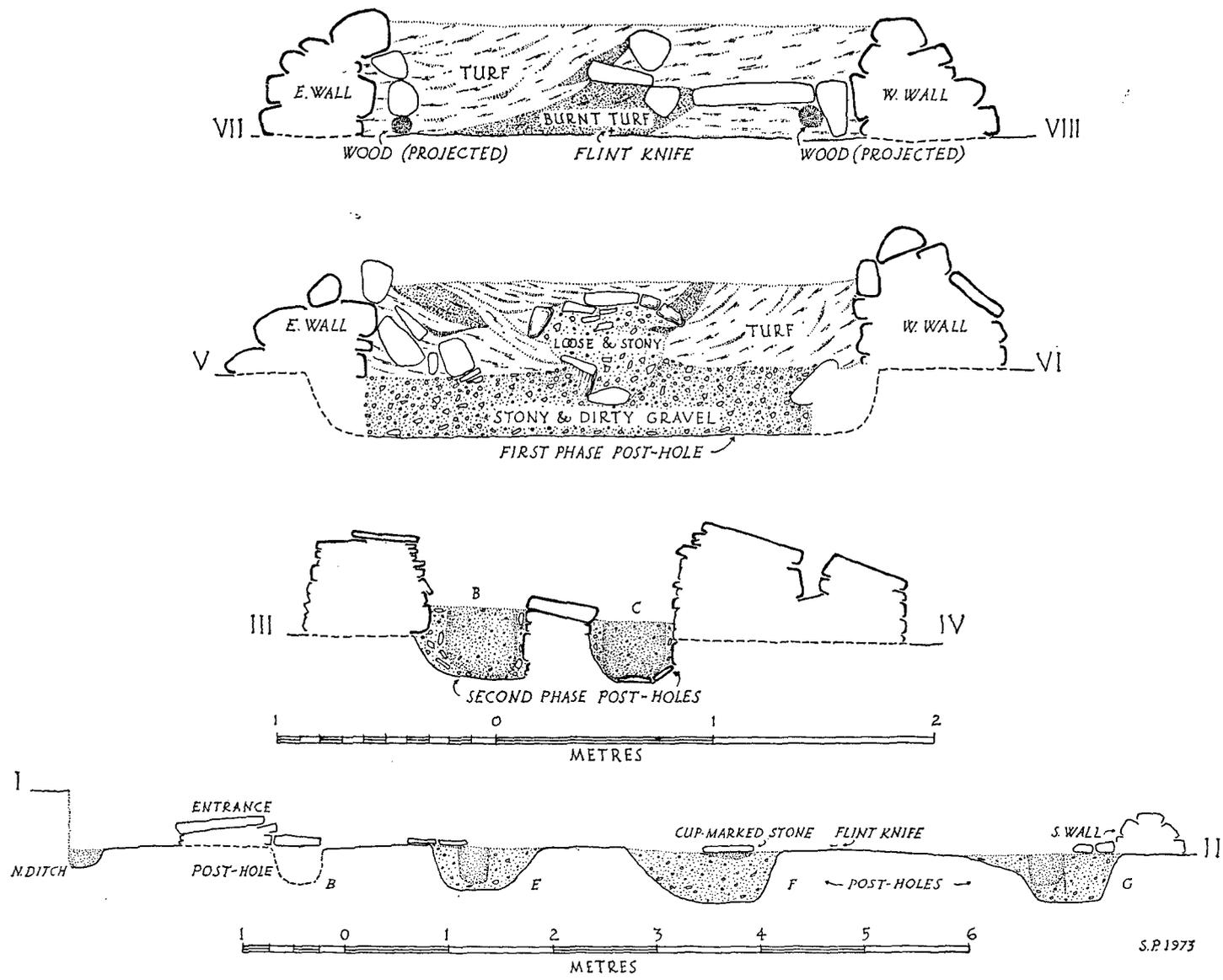


FIG 7 Dalladies long barrow: sections of mortuary structure

cleared site of dimensions and orientation which were respected and repeated, the sides and the SE end being marked by rough walls built of water-worn boulders. Their inner faces were more regular than the outer edges, and the lateral walls averaged 0.75 m to 1 m in width, standing to a height of around 0.5 m. The end wall, at the SE, was more massive and incorporated larger stones, which were on the whole up to sizes within the lifting power of a single man. The fact that in the process of excavation the walls could be isolated from the turf make-up of the barrow mound and still stand, and that a distinctive feature of their construction was the presence of numerous and often large air-spaces between the boulders, still voids when the surrounding barrow material was removed, argues for the walls having an independent structural status for however short a time in the building sequence. It could however be seen, especially where the relationship of the NE wall to the mound construction could be observed, that the latter was piled up steeply from the outer base of the wall, so that there may have been a point in the sequence when the walled enclosure lay in a steep-sided trench as the mound rose above it on the NE, SW and SE. At the latter point the inner edge of the wall appeared to be roughly along the line of the timber or wattle back wall of Phase II, as if it were visible or at least respected at the time of construction.

At the opposite (NW) end the boulder walls were merged into a construction of sandstone dry-walling about to be described, and overlay the two post-holes A and D, in which the posts had presumably rotted as no sign of damage to the holes by their removal was visible. The dry-stone walling formed an elaborate and more massive part of the long barrow revetment wall on its northern side, and consisted of a symbolic 'entrance' to the second phase mortuary structure, contrived by building up two 'door-jambs' to a surviving height of 0.5 m above the old ground level, 1 m apart. These jambs were built from their basal courses, but the lower part of the opening, to a height of 0.25 m, had been filled with further stone construction, leaving straight joints with the jambs on either side. On the W, a width of about 0.35 m had been floored by dry walling on edge, the long axes of the component stones being laid parallel with the inner face of the jamb, while the centre and greater part of the threshold area was occupied by a single massive slab, its long axis of 0.8 m lying transverse to the revetment line. On the NE side was a narrow strip of flooring of edge-on slabs similar to that on the SW. At the inner edge of the entrance slab were two post-holes, B and C, of similar size and proportions to the A and B post-holes of Phase I but set slightly beyond and between them, with B cutting the edge of A. These B and C post-holes held posts whose cores, 0.3 m in diameter, were clearly detectable, with a packing of stones and gravel, and the dry stone-walling had been carefully and skilfully built around the standing posts: its unbroken preservation showed that the posts must have rotted *in situ* after its completion. Centre-to-centre the posts were 0.7 m apart, leaving an entrance gap between them of 0.4 m, bridged by a slab which continued the floor level of the 'false entrance' through the revetment just described. The post-holes contained replacement soil with no signs of burning, but the posts were unambiguously part of the Phase II construction.

The area within the boulder walls and the revetment threshold was filled with rather large stones and burnt or unburnt mound turf. Some stones were boulders, at times clearly tumbled in from the tops of the lateral walls (cf Sections V-VI and VII-VIII), but a large proportion, particularly in the lower levels of the filling, were sandstone slabs lying horizontally and, particularly in the area around post-hole E and the entrance, on or nearly on the old ground surface. Burnt and charred material also occurred, in increasing quantity under the higher part of the mound in the last third of the enclosure to the SE, and this eventually resolved itself into a lower level, on the old ground surface, of horizontal lengthways timbers of various scantlings (Phase IIa) and, predominantly over this, thin flat areas of burning which in places where flat

stones protected it could be identified as sheets of birch-bark (Phase IIb). The wood at the lower level included well preserved charred beams lying against the base of the lateral walls and up to 15 cm in diameter, so heavily impregnated with hydrated iron oxide as to render identification of the species very difficult, but Dr Hayes reports that in the SW angle was possibly Cherry (*Prunus* sp.), showing signs of burrowing by wood-feeding mites or beetles, and the beam opposite this against the NE wall was possibly Birch (*Betula* sp.). All the timbers lay horizontally and on the long axis of the enclosure and, apart from the two instances just mentioned, were of very slight scantling. There were no traces of transverse members, and traces of only a sporadic upright stake or two (fig 9).

The stains and bark traces at a higher level (fig 10) included a couple of vertical stakes and some longitudinal streaks, and the best preserved pieces of Birch bark (*Betula* sp.), still when found retaining some of the silver and pink colouring of freshly stripped bark, lay under some massive sandstone slabs that overlay the boulder wall on the NE about midway along its length, and were separated from the upper stones of the wall by up to 25–30 cm of the turf make-up of the mound, which had therefore, at this point at least, been built over the boulder wall before the deposition and charring of the bark sheets.

The circumstances described above can best be interpreted as some sort of light wooden framework lying within the enclosure, over which a very light roofing of bark was placed. The absence of any trace of transverse members (rafters) and the very light scantling of the longitudinal elements (purlins), together with the total lack of evidence for uprights of any size beyond thin sticks, preclude any form of ridged or gabled roof, and while some sort of flat bark covering seems demanded by the evidence, it is difficult to visualise any structural skeleton adequate to carry it, let alone anything heavier that might involve, for instance, the flat stone slabs found in the filling. The duration of the timber and bark structure is wholly unknown, but the latter at least would have a short life; if the infestation of one of the lower timbers with mites and beetles took place after it was placed in position, this might argue a lapse of time. It is clear that the whole structure, however contrived, must have been deliberately burnt before the filling-in of the mortuary enclosure with slabs, boulders and the turf and topsoil of the main barrow mound. However supported, the bark roofing must at one point at least have oversailed not only the NE wall, but a thickness of mound material above it as well. There was no evidence that the burning affected posts B and C, which as we have seen must have decayed *in situ*.

Reference has already been made to the fragment of a child's skull found under a slab on the old ground surface and attributable to either Phase I or II of the mortuary enclosure. The only remaining finds were a stone slab bearing 9 cup-marks on its upper surface and lying flat, partly over the thin soil stain in Post-hole F, and, shortly to the SE of this, a fine plano-convex flint knife lying on the old ground surface. They are both presumably to be assigned to Phase II but neither is necessarily a funerary deposit. No pottery whatsoever was found.

Phase III

After the burning of the wood and bark structure of Phase II the building of the barrow mound evidently continued, sloping up southwards from behind the stone revetment and threshold until it completely covered the walls of the filled-in mortuary enclosure. When it was practically at its final stage and at an angle which eventually consolidated to about 30°, a completely inexplicable stone setting was constructed on the slope, to be encountered in the excavation just below the modern turf of the barrow (figs 4, Section C–D; 11). Immediately within the revetment was an area of small rounded stones and pebbles forming a surface layer to the turf make-up, but beyond this, sandstone slabs were used for a quite different form of setting with no

understandable plan, with a dozen or so slabs set vertically, but the majority lying at angles so that they formed two sides of a trough or gutter-like formation into which they pitched from both sides, for a length of 3 m or so and with a width of about 1.25 m. In the top soil at the upper end of this arrangement was a small abraded piece of the rim of a neolithic pot, the only primary sherd from the entire barrow. Beyond, after an interval of nearly 2 m, was an amorphous mass of water-worn stones spread on the upper part of the turf mound at its highest point.

The slab setting overlay the mortuary enclosure on its NE side, but not strictly on its long axis: at the time of its building the boulder walls would have been buried and invisible in the barrow mound. It was impossible to decide whether the trough-like arrangement was the result of deliberate building in a V-section groove in the mound material, or of subsequent settlement, and the whole arrangement is not only without parallels but does not in itself suggest any likely utilitarian or ritual function. It is also impossible to know how long the posts B and C survived, but they must have stood up at the edge of the barrow after its completion for some time.

With this final constructional phase of the mortuary structure we end the description of the primary barrow features. There remain for description the secondary burials, the late pits 1 and 2, and the transverse ditch at the E end.

THE SECONDARY BURIALS

The position of these is shown on the main plan, fig 3. Burial A was found in the final removal of the mound by mechanical means, between Cuttings 8 and 13; B in Cutting 13; C again in clearance just beyond Cutting 14, and D in Cutting 19. All lay a short distance below the present surface of the mound on its crest. In addition, a disturbed pit at the highest point of the mound, intersected by Cuttings 18 and 19, must be mentioned as a possible fifth burial site (fig 12).

Burial A

This was a massive cist approximately 1 by 0.6 m with its long axis nearly E-W, formed of four upright slabs with multiple overlapping slabs as a cover, and about 35 cm deep. Centrally on the floor formed of undisturbed barrow material was a scattered cremation, and in the SE angle was a crushed beaker which seemed originally to have contained or have been lying on a group of worked flints, comprising three small thumb-nail scrapers, two small broken blades with steeply retouched edges, and a small water smoothed pebble with a mottled grey and white surface, resembling a bird's egg. Over the cremation and sloping diagonally from the top of the E end-stone of the cist down to its floor at the E was what appeared to be a burnt plank of wood (Oak; *Quercus* sp.) some 25 cm wide and 2 cm thick. The whole cist had been filled with replaced mound material above and below the plank.

Burial B

A small square cist 45 cm across with in places reduplicated side-slabs, and complicated overlapping roof-slabs, and a floor of barrow material. It was filled with replaced earth and scattered cremated bones, among which was a minute fragment of highly oxidised bronze or copper, possibly from an awl.

Burial C

A small oblong cist of rather rough construction, 0.5 by 0.3 m, with its long axis nearly E-W, with capstone, and earth filling which could have been accidental or deliberate, with fragments of an unaccompanied inhumation.

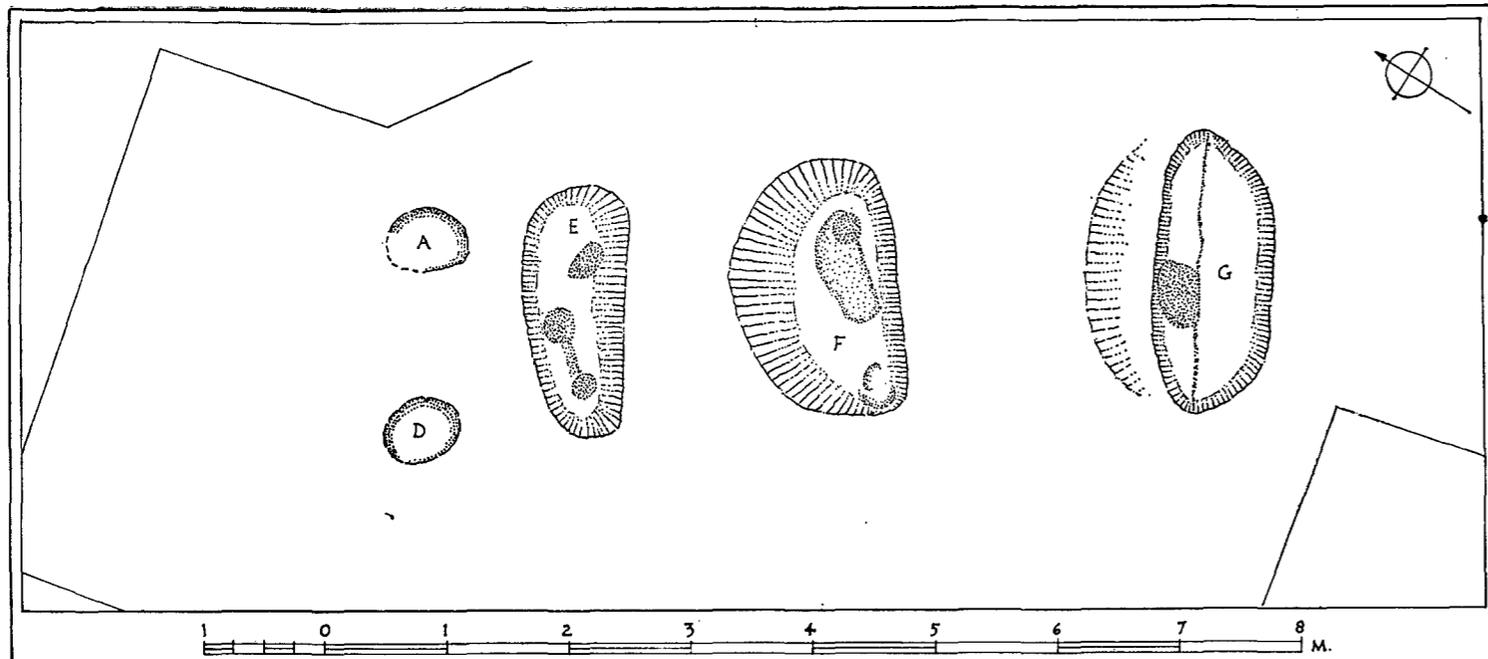


FIG 8 Dalladies long barrow: Phase I of mortuary structure, with post-holes and post-cores

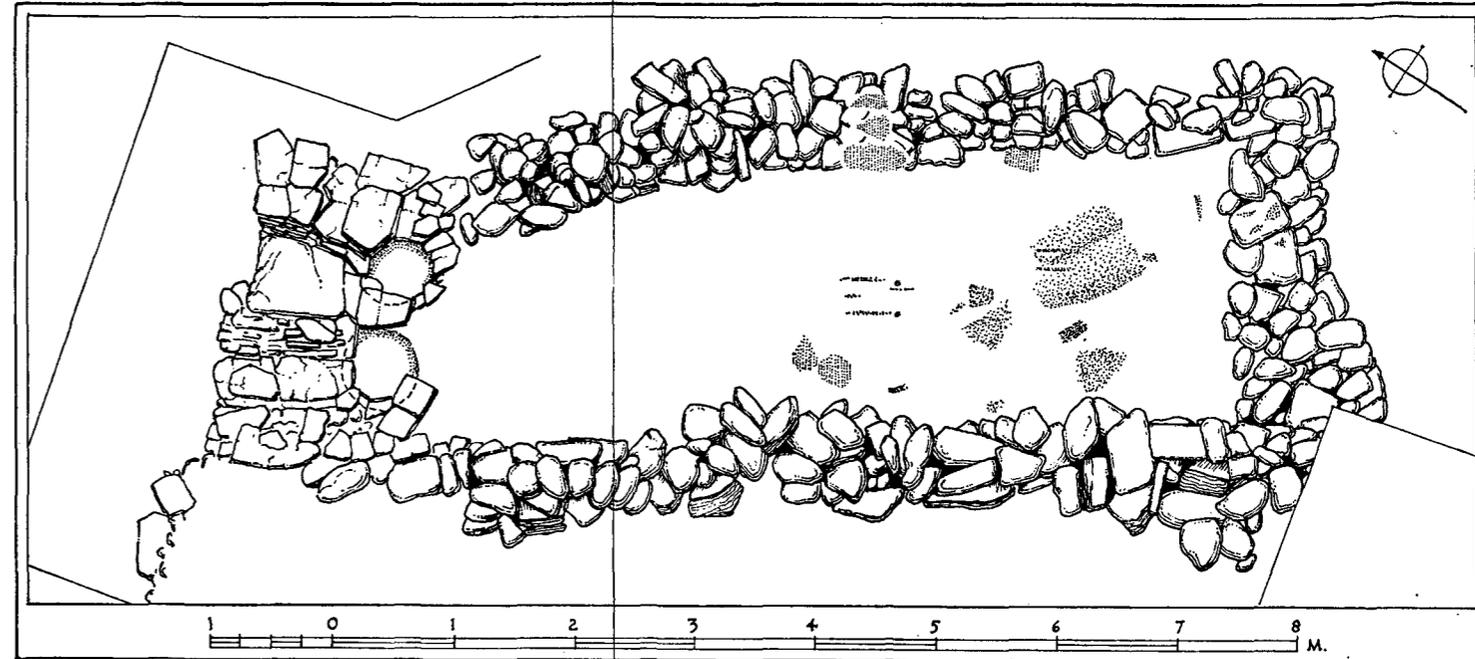


FIG 10 Dalladies long barrow: Phase IIb of mortuary structure, with upper levels of burnt birch bark (lines) or probable bark (stipple)

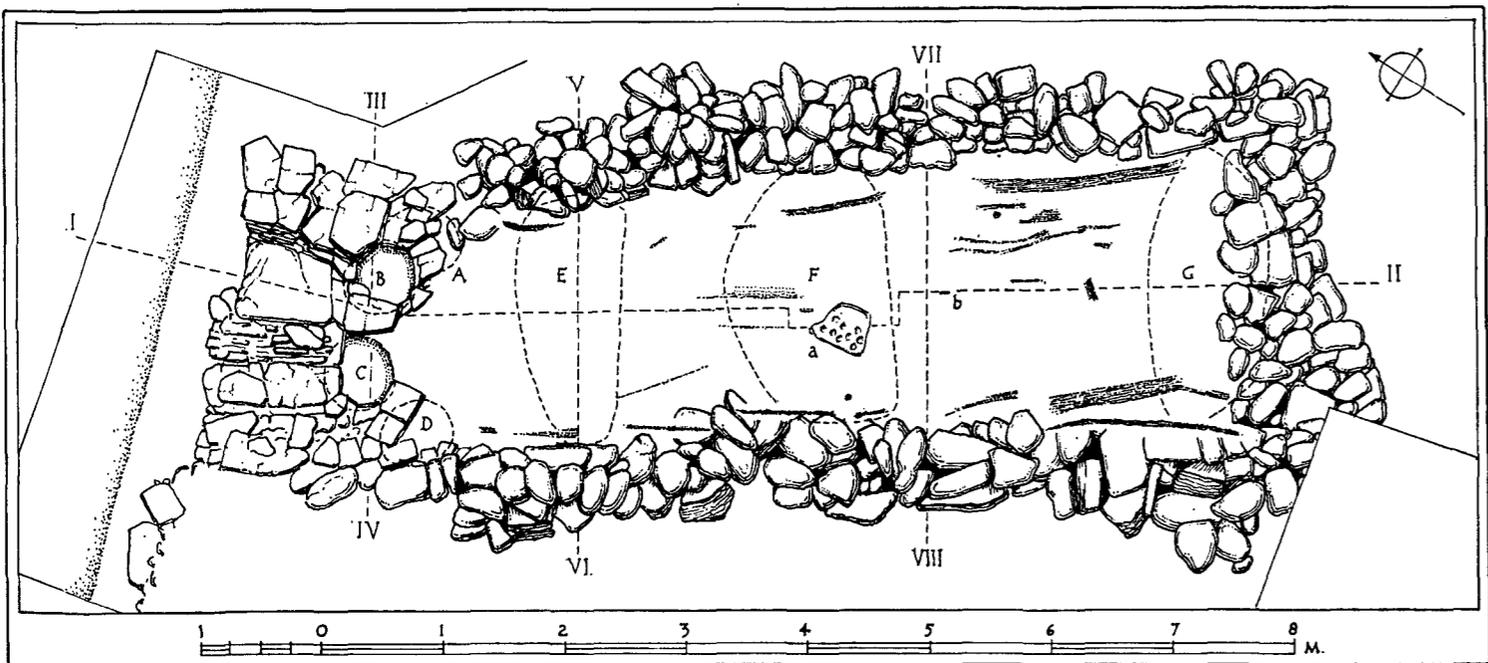


FIG 9 Dalladies long barrow: Phase IIa of mortuary structure, with section lines; a, cup-marked stone; b, plano-convex flint knife; burnt wood on old land surface

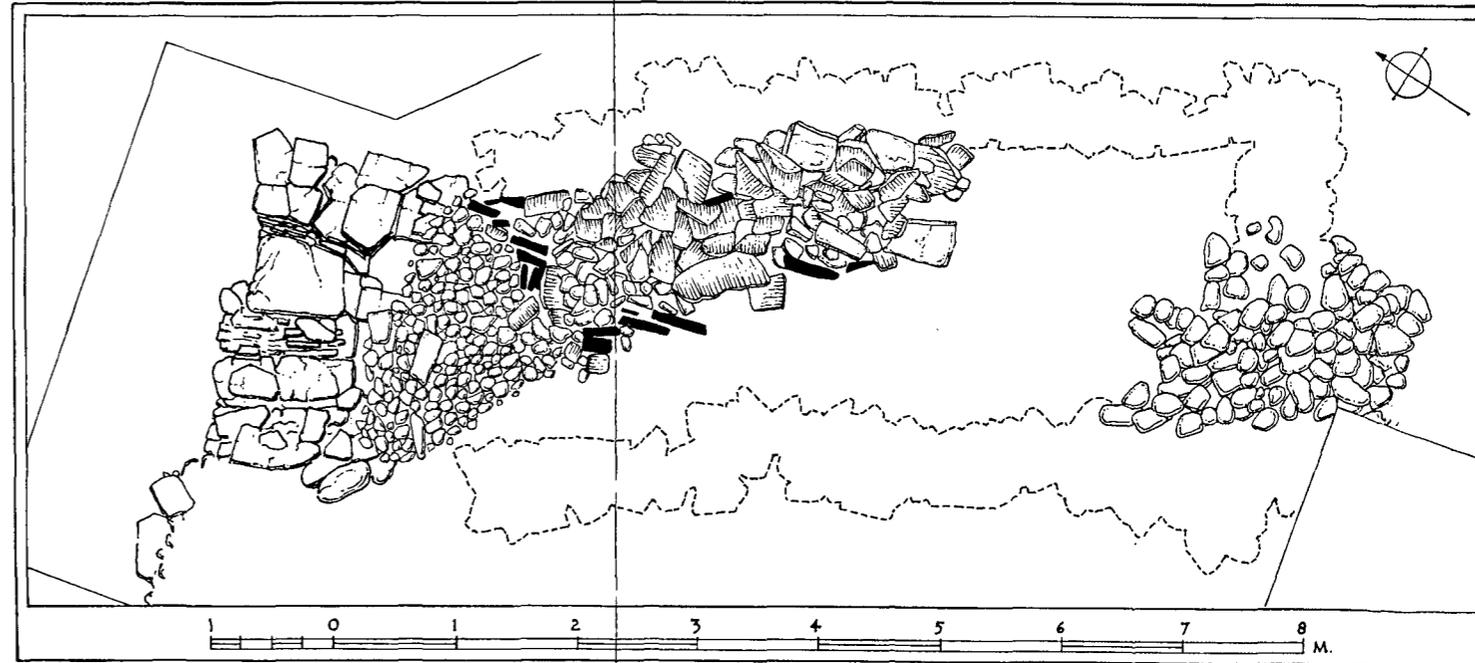


FIG 11 Dalladies long barrow: Phase III of mortuary structure, with stone arrangements on sloping mound

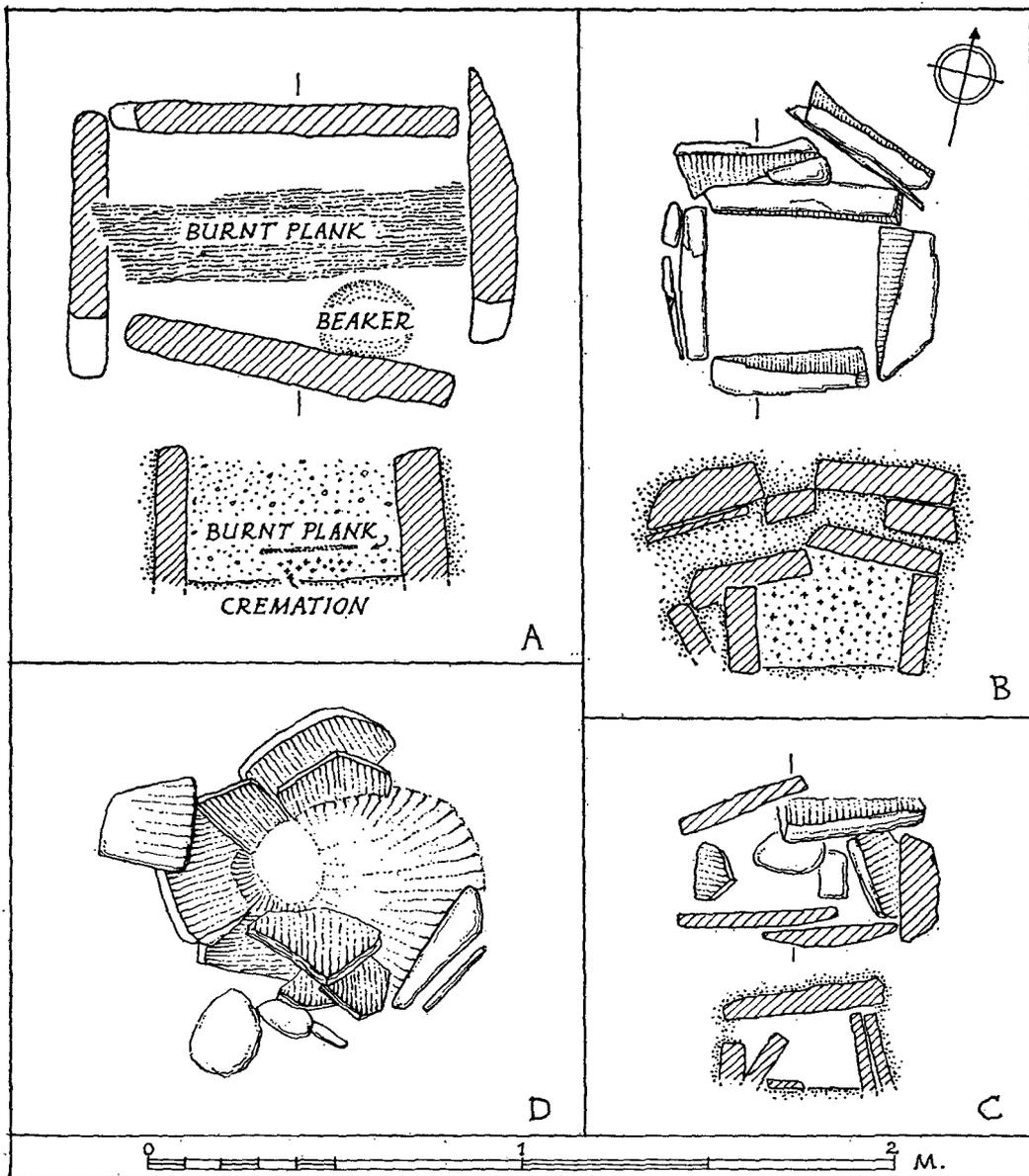


FIG 12 Dalladies long barrow: secondary burials in mound, A-D

Burial D

This was not a built cist, but a shallow pit dug into the long barrow mound and partly lined with small stone slabs in its lower part; its upper edges above the stones were indetectable. In its filling were fragments of cremated bones and poorly preserved sherds of a very coarse vessel of food vessel type.

Disturbed pit

A disturbed area below the highest point of the barrow, nearly 1.25 m deep, was marked on the surface by a slight depression and appears in Section C-D (fig 4). There was a modern sheep burial in the upper part and at a lower level flat or sloping slabs suggested a pit lining similar to Burial D just described, with a single incised beaker sherd, but no signs of burials.

POST-BARROW FEATURES

At the E end of the barrow were two pits and a length of ditch demonstrably or inferentially of later date. *Pit 1* lay 1.5 m S of the termination of the S lateral revetment with its long axis N-S, c 2 m overall. Its N end was deeper, 0.4 m below the old land surface, and 1.25 m across, and the floor sloped up gradually to the S end. It contained scraps of charcoal and cremated bone, and fragments of iron slag, associating it with the features excavated in the Dalladies II site to the SW of the W end of the barrow, which dates from the first century AD onwards.

Pit 2 was neatly cut, oval and flat bottomed, with its long axis E-W, c 2 m by 1.25 m and 0.5 m deep. It had been dug through the façade of the long barrow towards its S end and so was clearly later. It contained no finds but its general character suggests that it could have been a grave containing an unaccompanied crouched inhumation dissolved by soil acids, as was assumed with two similar pits at the Croft Morag stone circle (Perthshire) (Piggott and Simpson 1971).

The *Late Ditch* cut through the barrow façade at its N end and so again is later in date. A stretch of 12.5 m running straight NW-SE was excavated, 1 m wide and 0.25 m deep and ending in a square butt-end. On the top of the filling stones had collected including much broken quartz, and in the fill was half a flat perforated piece of sandstone (fig 14, 13) comparable with those found in the Dalladies II site mentioned above, suggesting that the ditch was contemporary with that site, and with Pit 1. E of the ditch was a setting of small slabs on edge.

FINDS

From the barrow

1. Tiny sherd from the rim of a neolithic bowl, hard dark brown ware with fine quartzite grits, semi-burnished surface. Top soil at upper end of Phase III structure of Mortuary Structure. (Fig 13, 2)
2. Scraper on the end of a blade of yellow-brown pebble flint, retaining part of surface on one side. Dark soil over entrance to Mortuary Structure. (Fig 13, 3)
3. Sandstone slab c 46 by 42 cm overall, much cracked and flaked, with eight cup-marks and part of a ninth on its upper surface, averaging c 7.0 to 5.0 cm in diameter and c 3.0 to 5.0 cm deep. Over filling of Post-hole F of the Phase I Mortuary Structure. (Pl 8a)
4. Finely worked plano-convex flint knife of mottled grey flint. On the old land surface on axis of Mortuary Structure, SE of Post-hole F. (Fig 13, 1)

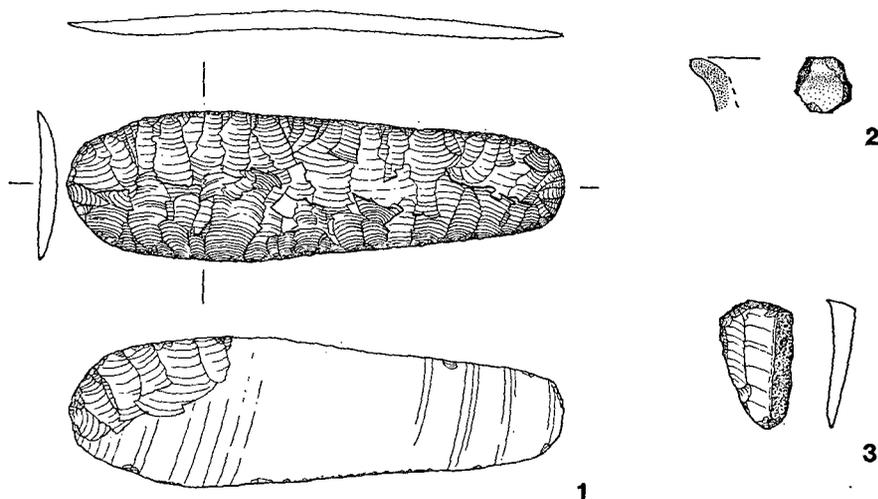


FIG 13 Dalladies long barrow: 1, plano-convex flint knife from Mortuary Structure; 2, pottery sherd from Mortuary Structure Phase III; 3, flint scraper, soil above NW end of Mortuary Structure (1:2) (Drawings by A S Henshall)

From the Secondary Burials

5. Many sherds of a beaker (mainly very small), very friable dull brown ware heavily tempered, but with a fine slip on the outer surface, decorated with irregular incised lines forming double diamonds on the neck and body and two horizontal lines at the cordon. A member of Clarke's S4 group; Lanting and van der Waals' NE English Step 6 (Clarke 1970, cf S4 1520 from Linlathen, Angus; Lanting and van der Waals 1972). From Secondary Burial A. (Fig 14, 1)

6. Almost spherical pebble of grey flint, faintly mottled. From Secondary Burial A. (Fig 14, 2)

7. Scraper, made on a thin flake from a pebble of ginger brown flint. From Secondary Burial A. (Fig 14, 3)

8. Scraper, made on a split pebble of mottled dark grey flint and retaining part of pebble surface. From Secondary Burial A. (Fig 14, 5)

9. Scraper, made on a flake of buff pebble flint. From Secondary Burial A. (Fig 14, 4)

10. Flake of speckled ginger brown flint, one long edge steeply trimmed, one end broken. From Secondary Burial A. (Fig 14, 6)

11. Flake of speckled ginger brown flint, one edge trimmed, one end broken. From Secondary Burial A. (Fig 14, 7)

12. Five lumps broken from split pebbles of brown-grey flint, almost certainly from two pebbles, two pieces fitting together. From Secondary Burial A.

13. Twenty-seven sherds of a food vessel, very friable brown ware, the surface worn and irregular, decorated outside by impressions of twisted cord, and on the rim bevel by whipped cord. From Secondary Burial D. (Fig 14, 8-11)

14. Wall sherd from a beaker, friable heavily gritted ware with black core and a fine reddish slip on the outer surface and incised decoration. From the Disturbed Pit in Section C-D. (Fig 14, 12)

From the Late Ditch

15. Irregularly shaped flat piece of red sandstone, broken through a perforation which has been roughly chiselled from both faces. From filling of the Late Ditch. (Fig 14, 13)

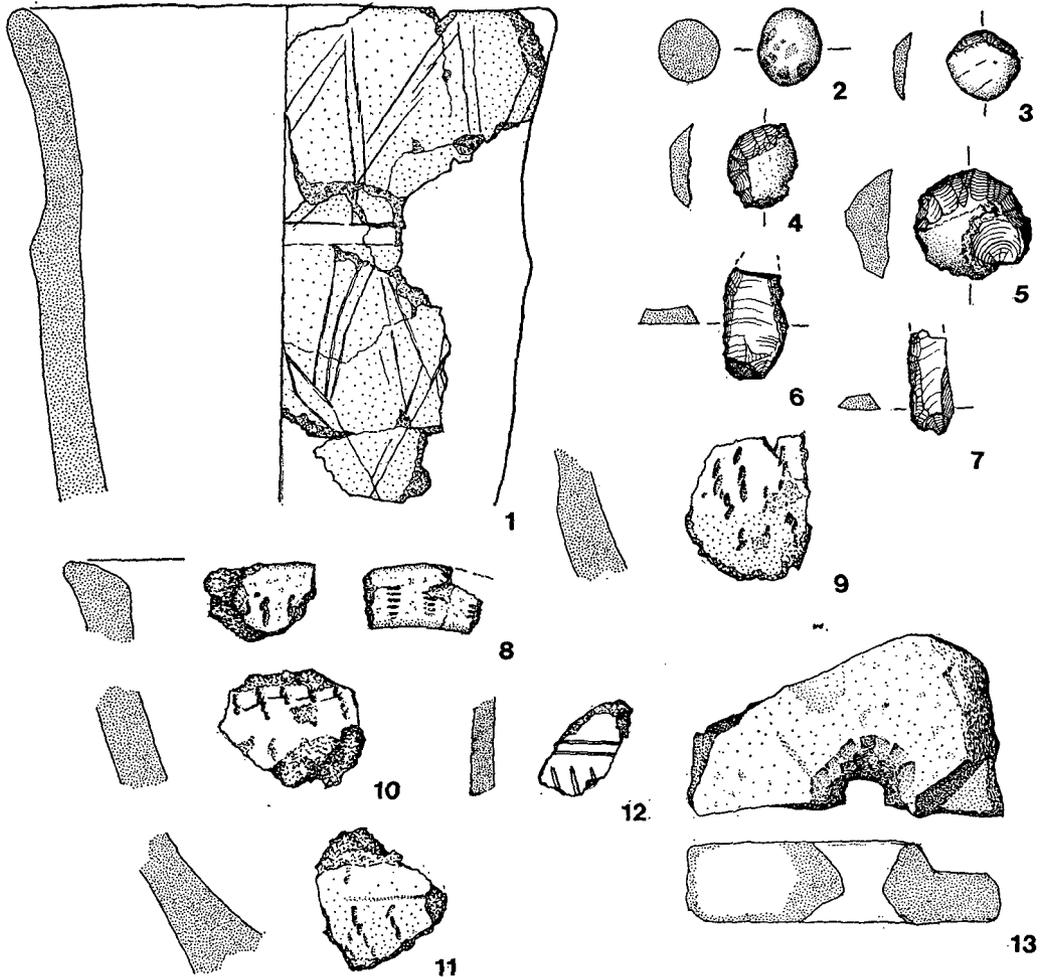


FIG 14 Dalladies long barrow: finds from secondary contexts. 1, beaker; 2, pebble; 3-5, flint scrapers; 6-7, flint blades, all from Burial A; 8-11, food-vessel sherds from Burial D; 12, beaker sherd from Disturbed Pit (all 1:2); 13, perforated stone slab from late ditch (1:4) (Drawings by A S Henshall)

DISCUSSION

THE BARROW AND MORTUARY STRUCTURE

Many of the aspects presented by the results of the Dalladies excavation have been dealt with, concurrently with the conclusion of the work in the field, by Miss Audrey Henshall in the second volume of her magisterial survey of Scottish chambered tombs and allied monuments, and in a separate paper (Henshall 1970; 1972). The interim report on the excavation of the

Lochhill long cairn in Kirkcudbrightshire (KRC 14) has raised highly significant questions with regard to mortuary structures, and some important comments have been made on this site, contemporary with Dalladies and some 200 km away to the SSW, by the excavator (Masters 1973). There remain however a few points of general interest arising from the wider implications of the Dalladies evidence.

Little new can be said of the barrow as a member of a now well recognised type of long barrow or cairn without external traces of a stone-built burial chamber in the 'megalithic' tradition: it would fall into Henshall's Type 2 (a long barrow/cairn added to an earlier structure) variety D, but as the mortuary structure is non-megalithic and not accessible from the E end, it (and Lochhill) would form a new sub-variety iv (Henshall 1972, 211-26). While the concave façade in itself could fall within the permissible range of those related to the English series (*eadem*, 228-40), the outward flare of the lateral revetments towards the E end brings it within the 'horned' type of plan, characteristic of Caithness and Sutherland and the Orkney-Cromarty chambered cairn group (*eadem*, maps in figs 20, 21). Locally, Dalladies is an addition to the group of long barrows already represented by those of Gourdon and Hillhead Plantation, Arbuthnott (KNC 3 and 7), some 20 km to the NE, and that at Capo (KNC 9) only a kilometre to the SE.

A word may be said about the use of horizontally laid turf as mound material, demonstrated at Dalladies and to be suspected at the other three sites just mentioned, and elsewhere where 'earth' rather than stones constitutes the mound and there are no signs of flanking quarry-ditches, which in fact have not been recorded at any Scottish long barrow. The technique of stripping turf and top-soil from an extensive but shallow area is in fact analogous to the surface quarrying of oolite slabs from the uppermost levels of the rock in the Cotswolds, and recent excavations have shown its widespread use in fourth- or third-millennium monuments, as well as its well-known use in second-millennium (Bronze Age) barrows. In Scotland, the Pitnacree round barrow with a mortuary structure akin to Dalladies, and a C14 date of *c* 2860 bc, has a make-up largely of turf, some of it forming grey stained layers, and the old land surface appeared to have been cultivated (Coles and Simpson 1965); in Ireland it was used extensively at the passage-grave of Newgrange, where the turf had been cut from land left fallow after cereal cultivation, with dates around 2500 bc (O'Kelly 1969, 1973). Turf was also used for part of the mound at Knowth (Eogan 1969) and more extensively, at Fourknocks (Hartnett 1957; 1971). And in yet another passage-grave, Barclodiad y Gawres in Anglesey, sods of a marsh peat were used (Powell and Daniel 1956, 23). All these instances of turf usage imply man-made areas of open country, whether for pasture or arable, and some implications of this are further discussed later.

The mortuary structure, both in itself and in its relationship to the long barrow, deserves fuller comment. In general, its nearest congeners are in Scotland, at Pitnacree under a round barrow and at Lochhill under a long cairn (Coles and Simpson 1965; Masters 1973). The resemblance of the latter site to Doey's Cairn, Dunloy (Ballymacaldrack) in Antrim (Evans 1938) was pointed out by Masters, and one might suggest that another comparable feature was the 'Transverse Trench' under and eccentric to the mound of the Fourknocks II site (Hartnett 1971). In general, resemblances exist with a number of English long barrows such as Wayland's Smithy (Atkinson 1965) and others, including Fussell's Lodge, where variants which may not all represent the same structures in detail exist and seem clearly allied (Ashbee 1966; 1970; Daniel 1967; Ashbee and Simpson 1968). On the Continent, an interesting series of Danish neolithic sites have particular bearing on the Dalladies problem (Stürup 1965; Madsen 1971).

We have seen that at Dalladies a first phase (unburnt) structure based on upright posts carried in large axial post-holes can be separated from a second (burnt) phase which is integral with the building of the barrow. At Pitnacree, a Phase I comprised two large post-holes for a

massive pair of unburnt posts about 3.3 m apart centre to centre, which was overlaid by a Phase II boulder enclosure about 6 by 1.0 m containing burnt wood, the whole on a NW-SE axis. At Lochhill, the first structural phase involved three large post-holes for massive timbers (the outermost D-section half-stems as at Wayland's Smithy), 6.0 m apart, and with a shallow façade of 16 posts. Subsequently a boulder enclosure was made within a cairn, and the timber structure (including birch-bark) was burned. At Doey's Cairn there was extensive burning, with a great deal of burnt and charred bark, probably birch. The burning in Yorkshire long barrows has still not been properly explained in detail, but can hardly be unconnected, while in Wessex there are not only the variants on the mortuary house theme just noted, but the burning of the fore-building at Nutbane to be considered (Ashbee 1970; Manby 1970). The long series of ritual acts and consequent timber constructions on this site offer interesting comparisons with Dalladies, especially the embanked burial enclosure of Phase 2, with two axial posts (III and IV) 3.0 m apart, and a pair at the entrance (I and II), equivalent to A and D, and their replacements B and C, at Dalladies. The boulder walls of the latter would be the equivalents of the chalk banks derived from small quarry-ditches at Nutbane (Morgan 1959).

Such long building sequences (seven phases of construction before the actual building of the barrow were reasonably inferred at Nutbane), naturally raise the question of the status of the Dalladies mortuary structure in its primary form, especially in view of its awkward relationship to the axis of the long barrow. In the vast majority of instances where such structures have been identified or inferred, they have been axial to and at the broader (usually easterly) end of the mound, presumably implying a continuity of purpose and performance, in which the final construction of the long barrow was a culminating act implicit from the first mortuary building. At Wayland's Smithy and Lochhill however (and perhaps Dunloy) a stone-chambered cairn or barrow encapsulated an earlier mortuary structure, in the first instance preserving its unusual N-S orientation so that both phases had the same axis. Here we have a situation analogous to that recently demonstrated in so many instances of stone-chambered cairns, with the incorporation of one or more smaller, often round, cairns with contained passage-graves in a long cairn (Powell 1973, 31 with refs). But in such cases as Nutbane or Fussell's Lodge, the question arises as to whether, at some stage and for an indeterminate length of time, some form of timber-framed mortuary structure or structures existed as a self-sufficient entity with an axis later to be accepted for the long barrow; at Giants' Hills, Lincolnshire, with the burial arrangements half way along and at right angles to the barrow axis, the problem is posed in another form and one more resembling Dalladies (Phillips 1936). With a circular barrow, orientation is not involved, but the first phase of Pitnacree seems a likely claimant as an originally free-standing structure, and if one accepts as related the extraordinary 'trench' under the mound of Fourknocks II, 10.6 m long, 1.6 m wide, containing four 'pits' and full of wood burnt *in situ*, this was joined at right angles by a megalithic roofed passage leading to the edge of the mound to the NE in a manner comparable to the Pitnacree passage leading slightly obliquely from the SE end of the mortuary structure there.

It is further suggested that in addition to the evidence for the incorporation of earlier chambered cairns within long cairns we may consider two Cotswold sites as comparable in another sense (Corcoran 1969, 97-9). At West Tump (GLO 8) a long 'chamber or trench' without orthostats and slightly dug into the ground was at right angles to the barrow axis a third of its length from the narrow end, and joined to a gap in the revetment wall by a short passage with upright walling slabs. The 'trench' was about 4.5 m long and 1.2 m wide, and contained multiple burials. The Pole's Wood East barrow (GLO 24) had an axis NNE-SSW and, about centrally, covered a 'trench' about 8.5 by 2 m and 0.6 deep, obliquely on a WNW-ESE alignment with

at its NW end 'a kind of passage or gallery . . . limited by oolitic slabs set on edge' which does not however appear to have opened onto the revetment. Multiple burials were again contained by this feature, which, with West Tump, may perhaps be related to the boat-shaped trench grave with multiple burials, 3.3 by 1.4 m and 1.0 m deep under a round cairn known as The Soldier's Grave near the Nympsfield long barrow (Clifford 1938). At all events we have instances of non-megalithic mortuary structures, probably dry-walled, which may well have been incorporated in long barrows rather than being integral parts of their primary planning. What in fact we seem to have are versions of the 'non-megalithic long grave' with an inferred flat timbered roof which Daniel (1967) has pointed to at Bonnières-sur-Seine and elsewhere.

With regard to the structure likely to have been represented in the first phase at Dalladies we may go a stage further in identifying comparable sites unconnected with long barrows in Denmark, where, as Madsen has recently shown (1971), half-a-dozen Early Neolithic mortuary structures based on a pair of post-holes holding the uprights for a ridged roof have been identified, most without any covering barrow. The best known of these is Konens Høj, explicitly compared by its excavator to Wayland's Smithy (Stürup 1965), with a radiocarbon date of *c* 2900 bc, and belonging to TRB phase C; the significance and interpretation of what appear to be analogous structures in a Phase B long barrow at Lindebjerg, with a date of *c* 3060 bc, are uncertain pending an authoritative excavation report (Liversage 1970). But the Danish burial-places without barrows, together with less close analogues in sites such as Stein in Dutch Limburg, or Nordhausen and Niederbösa in Germany (Ashbee 1970, 88–90), all suggest that similar circumstances may have existed in neolithic Britain, and free-standing mortuary structures broadly comparable to Dalladies Phase I may be found elsewhere still not encapsulated in a later long barrow. Flat-roofed as well as gabled structures must be allowed for, and the use of bark at Dalladies, Lochhill and Dunloy suggests an interesting link in techniques between the sites, as does the deliberate burning here and elsewhere. We would therefore envisage a situation in which an originally free-standing mortuary structure could be incorporated within a long barrow in two ways, either with a continuance of ritual intention in planning and orientation (whereby the earlier structure would be made axial, and at the broader end of the mound) or as a feature contained without reference to its orientation or dominant position, as at Dalladies. A parallel in ritual performance might be seen in the inclusion of rectangular or circular stone or timber structures within structurally later burial mounds or henge monuments of rather later date.

A final point must be made, if only to be left unresolved: how far can the building we have called the 'mortuary structure' be accounted funerary on the grounds of a single skull fragment and two artefacts? In other comparable structures burials have been present as inhumations or cremations, so that a funeral function has been unambiguous, even if the deposition of the bodies followed exposure or storage elsewhere, and the survival of the one fragment at Dalladies suggests that we can hardly invoke the total solution of all other bones in acid soil conditions. There may be one line of possible interpretation, borrowed from what has recently been inferred from not dissimilar circumstances in many stone chambered tombs, where 'the theory that the deposits in the chambers were cleared out at intervals has much to commend it' even though it 'has sobering consequences which have not been squarely faced. It follows that little or nothing belonging to the first burials may remain' (Henshall 1972, 164–5). It could also follow that the burials themselves could equally well be removed, and we know that skulls and individual bones were in fact abstracted from chambered tombs in a number of instances (Piggott 1962, 66–7). If the Phase I building at Dalladies was a free-standing and accessible ossuary, bones could be subtracted as well as added during its life, or they (and any grave-goods) could have been removed wholesale when the site was refurbished and incorporated into the barrow in Phase II.

In the absence of burials, the deposition of the cup-marked slab and plano-convex flint knife cannot necessarily be said to be funerary in the strict sense.

DATE AND CULTURE

In the interim report on the excavations (Piggott 1973) the question of the absolute dating of Dalladies in the context of British long barrows as a whole was touched on. The 13 radiocarbon dates then available spanned (doubtless by chance) exactly a millennium in C14 years, and no more than this when converted to the calendar dates of *c* 4340 to 3340/2980 BC. Over this period, the dates were spread remarkably evenly in time, but, it appeared, in no relation to geography: of the first 5 dates (*c* 3415 to 3120 bc) three barrows were in Wessex and two (Dalladies and Lochhill) in Scotland, and though the latest (Skendleby, *c* 2410 bc) is in Lincolnshire, its two predecessors are in Wiltshire.

The Dalladies date of 3240 bc \pm 105 was obtained by a single reading by Isotopes Inc., from charred wood from the Phase II beam lying in the SW angle of the boulder enclosure. Check determinations by the radiocarbon laboratory of the Scottish Universities' Reactor Centre at East Kilbride were then made, one from the same timber and another from that on the opposite side of the enclosure, and readings obtained respectively of 2710 bc \pm 50 and 2585 bc \pm 55 (SRR-289, SRR-290). The last two dates are mutually consistent and would allow of an average date *c* 2600 bc (*c* 3390 BC) which cannot be reconciled with the earlier date, which must therefore be put on one side as an inter-laboratory inconsistency for the moment. A model of neolithic colonisation in the south, followed by a slow transmission northwards, had seemed inadequate as the early dates from N Ireland became known, and with the original Dalladies date, and that from Lochhill of 3120 bc \pm 105 (I-6409, also Isotopes Inc.) it appeared that not only had settlement taken place in S England, N Ireland and Scotland as far north as lat. 57° by 3000 bc, but that impressive burial monuments such as Fussell's Lodge or the Dalladies long barrows were already being built. The new radiocarbon dates mean however that, whatever the status of Lochhill, Dalladies must be moved to a position near the end of the list, not far removed from Nutbane in Hampshire (2730 bc \pm 150) and the latest example, Giants' Hills, Skendleby, in Lincolnshire (2410 bc \pm 150). The comparable mortuary structure under a round barrow at Pitnacree in Perthshire would be a little earlier, with a date of 2860 bc \pm 90. At Dalladies forest clearance had already taken place before the barrow's construction, and in no instance would one expect that such monuments, with their implications of co-ordinated communal labour, would be the products of colonists in their initial entrance phase of settlement.

In the absence of primary pottery save for one tiny sherd, and with the lack of settlement sites and the paucity even of stray finds in NE Scotland, any attribution of the barrow to a neolithic 'culture' is a virtually nugatory exercise. The rim sherd from the top soil over the Phase III mortuary structure would be at home among the open carinated bowls of the north-east, whether at Easterton of Roseisle or Tulloch of Assery B, which may in their turn have Yorkshire affinities (Henshall 1972, 177). The plano-convex flint knife, a type well known in Early Bronze Age contexts, (Clark, 1932) appears to have its origins in earlier flint-working traditions, and in Scotland the association at the chambered cairn of Cairnholy I (KRK 2) with pottery analogous to the Dalladies sherd may be significant. Other examples are known from the Clyde tombs, the finest, from Giant's Graves (ARN 11) being 9.7 cm long (*eadem* 185). The Dalladies knife is exceptional in size (13.3 cm long) and workmanship, while the quality of the flint which would produce such a blade makes it clear that either it or the raw material was imported from some such area as the Yorkshire Wolds, an area not inconsonant with the affinities

of the barrow itself and perhaps the sherd. The cup-marked slab again is a type with a very wide cultural and chronological range, and on present showing the Dalladies stone is the oldest, and the only really well dated example (Simpson and Thawley 1972).

SOCIAL AND ECOLOGICAL ASPECTS

It was pointed out in the interim report (Piggott 1973) that the use of turf to build the barrow opened up more than one line of enquiry. In the first place, approximate calculations could be made, on the basis of the figures obtained by the simulation of prehistoric labour conditions in experimental earthworks, of the time and labour involved in the building of such a mound (Jewell 1963; Jewell and Dimbleby 1966; Coles 1973, 68–78). The Dalladies turfs were *c* 15 cm thick in their compressed state, and applying the compression factor of *c* 36% observed in the Overton Down experimental earthwork, would have been *c* 20 cm when first dug and piled, forming a mound of *c* 1470 cu m. This would represent the product of 0.73 ha (or rather over 1.5 acres). From experiments with primitive tools the approximate labour expended would be of the order of 5750 man-hours. In a recent reconstruction of a Roman rampart with turf-built faces it was found that turfs of Roman military regulation size, roughly 44 by 30 by 15 cm, weighed a little over 30 kg and could be carried by one man: in black Africa at the beginning of the century a porter carried a load of about 25 kg (half a hundredweight) on a day's march of 25 km, and the turf would not have to be carried very far (Coles 1973, 81; Vigneron 1968, 141). No such standardisation would of course have obtained in neolithic times, but rough limitations of effort are obvious; what remains problematical is the technique employed to cut and pare turfs rather than merely hacking up the surface, and the possible use of stone axes, and of scapula shovels (as in flint-mining) might be considered. The labour involved in stone building on the site would have varied from what would seem to be the relatively rapid piling-up of the mortuary enclosure boulder walls to the skilful laying of good quality dry-stone walls for the façade and revetments, and the boulders used again mostly seemed roughly of a size portable by one man, though the use of sledge or travois is not excluded in the transport over the minimum 400 m or so from the river. The diameter of the timbers used in the first phase mortuary structure nowhere exceeded 50 cm and averaged 30 cm, and, if of oak, would fall into the 25–50 cm range of trees aged between 50 and 100 years, existing in natural stands of deciduous forest at about 28 to the hectare, and so easily obtainable at a short distance from the site where forest still stood (Jessen 1948, 177). The presence of oak trees in the vicinity is attested by the charcoal fragments in the burnt turf of the mound.

The possible relationship between the estimated man-power necessary to build neolithic ceremonial monuments, and hierarchies of social organisation and authority has been sketched by Renfrew for Wessex (1973). Dalladies falls within the normal long barrow range centred on *c* 5000 man-hours, the lowest of his categories, to be followed by causewayed camps, henge monuments, cursus, and exceptional affairs like Silbury Hill, and in terms of population estimates Renfrew finds Atkinson's demographic model based on the assumption that all members of the population were buried in the long barrows to give an 'impossibly low' figure, as others have felt. He prefers the more usual assumption that only certain classes of person were buried in such monuments, and suggests a population density of one person to anything between 10 and 50 hectares, and forming social groups of from 20 to 100 persons. In such a society the assumed 500 man-days required for building a minimal long barrow could be provided within the territory by co-operation between family groups.

'I am not aware', writes Renfrew, 'of ethnographic parallels for the construction of such

a monument as a long barrow soon after the colonisation of new land', but quotes the well-known evidence of plough agriculture under the South Street (Avebury) long barrow. At Dalladies we may have evidence of a barrow being built immediately after at least local forest clearance, if we accept the slash-and-burn interpretation of the burnt turf used in its construction, even if the unburnt turf came from cleared areas of longer standing, from which the charcoal had been leached away. As we saw, the total volume of turf (when originally cut) would have been c 1470 cu m, derived from a total cleared area of 0.73 ha, which must, by the process of removing the turf and top-soil, have been rendered useless for plough or pasture. In some approximate estimates of the amount of cleared forest in terms of human population (in neolithic Central Europe), Neustupný suggested communities of c 20 persons requiring some 15 to 20 ha arable land, or approximately 1 ha per person, so that the Dalladies figure, for what it may be worth, comes very near his estimate for one individual (Neustupný 1969, 65). With this evidence from NE Scotland may be taken that from the broadly contemporary monument of Pitnacree in Perthshire, 80 km to the SW, where on the old land surface 'the disturbed nature of the soil, marked by the angled position of the sherds and fragments of stone found in it, suggests cultivation' (Coles and Simpson 1965, 41). Further excavations will no doubt produce additional evidence of neolithic monuments being built on deforested land.

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APOLOGIES

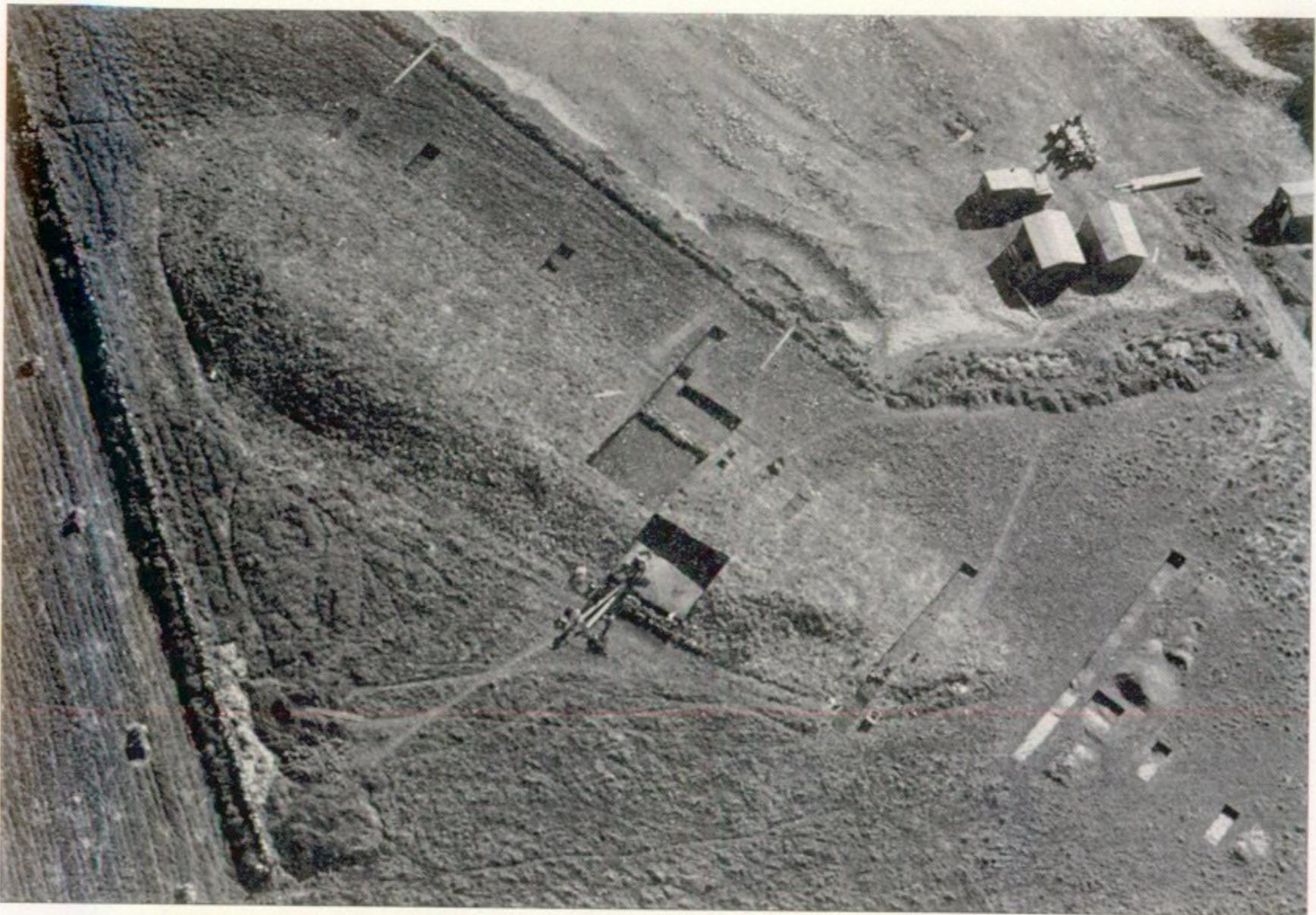
Owing to unforeseen circumstances, reports on the human remains from the secondary burials are not available at the time of the compilation of this report.

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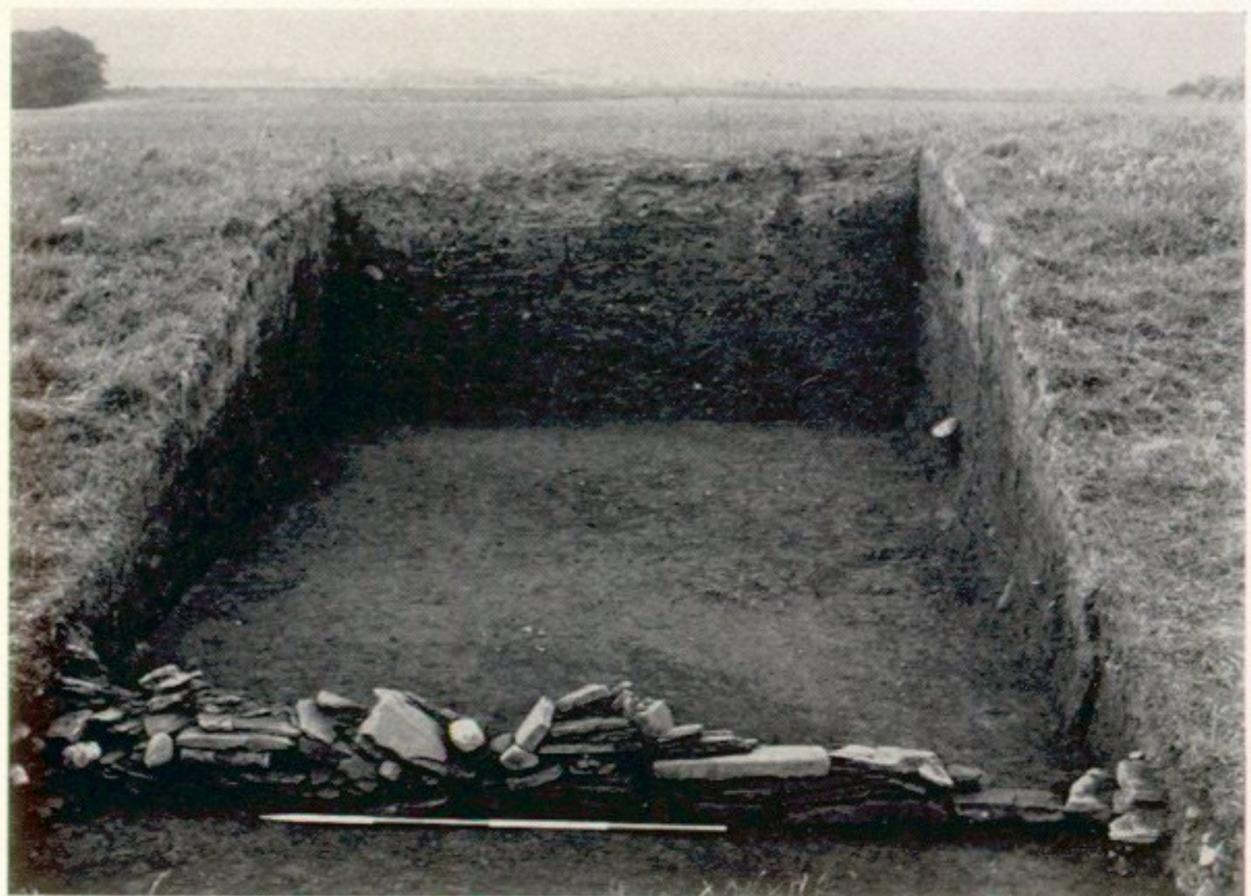
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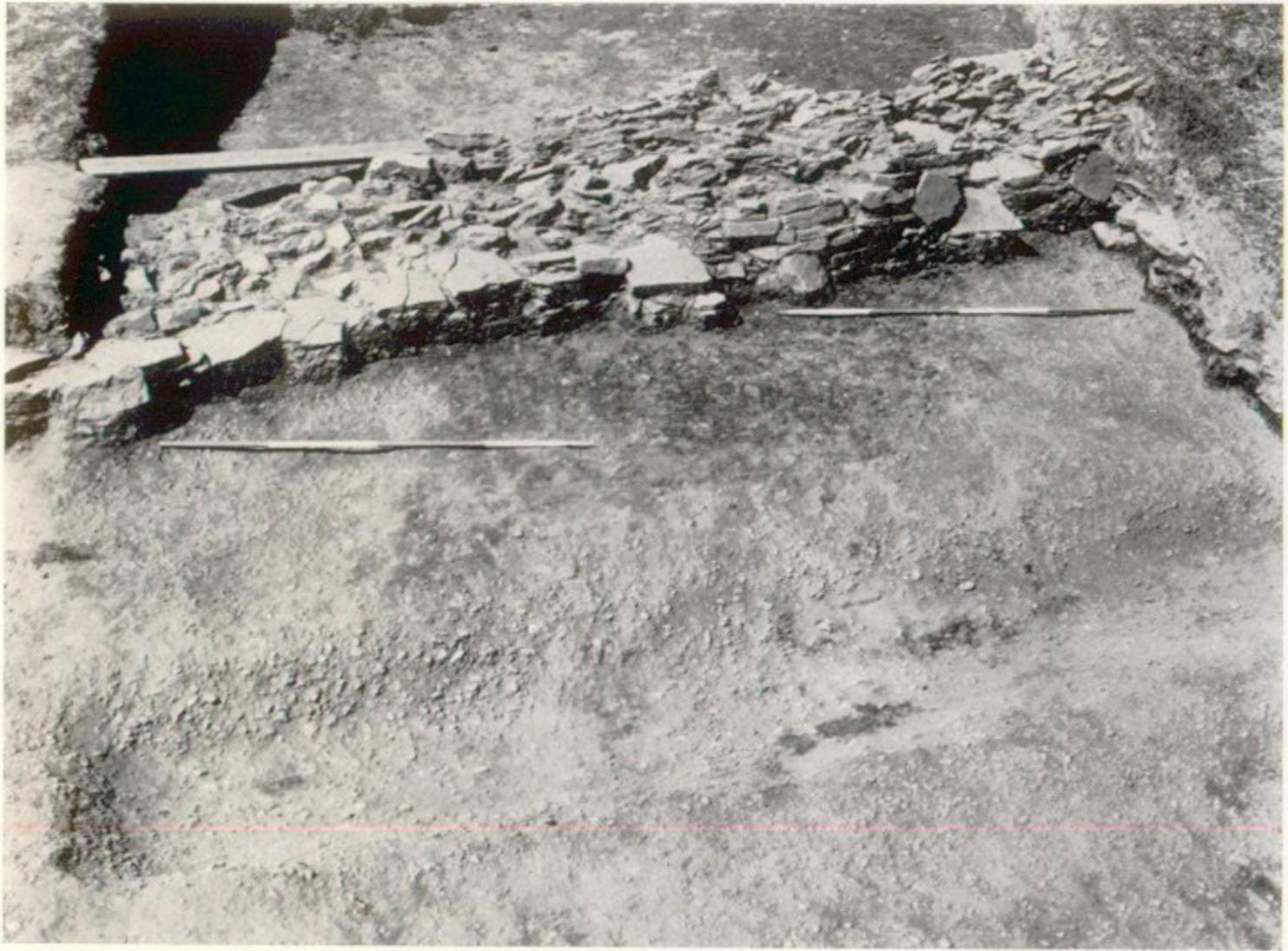
a Air photograph of excavations, 1970



b South revetment wall in Cutting 10



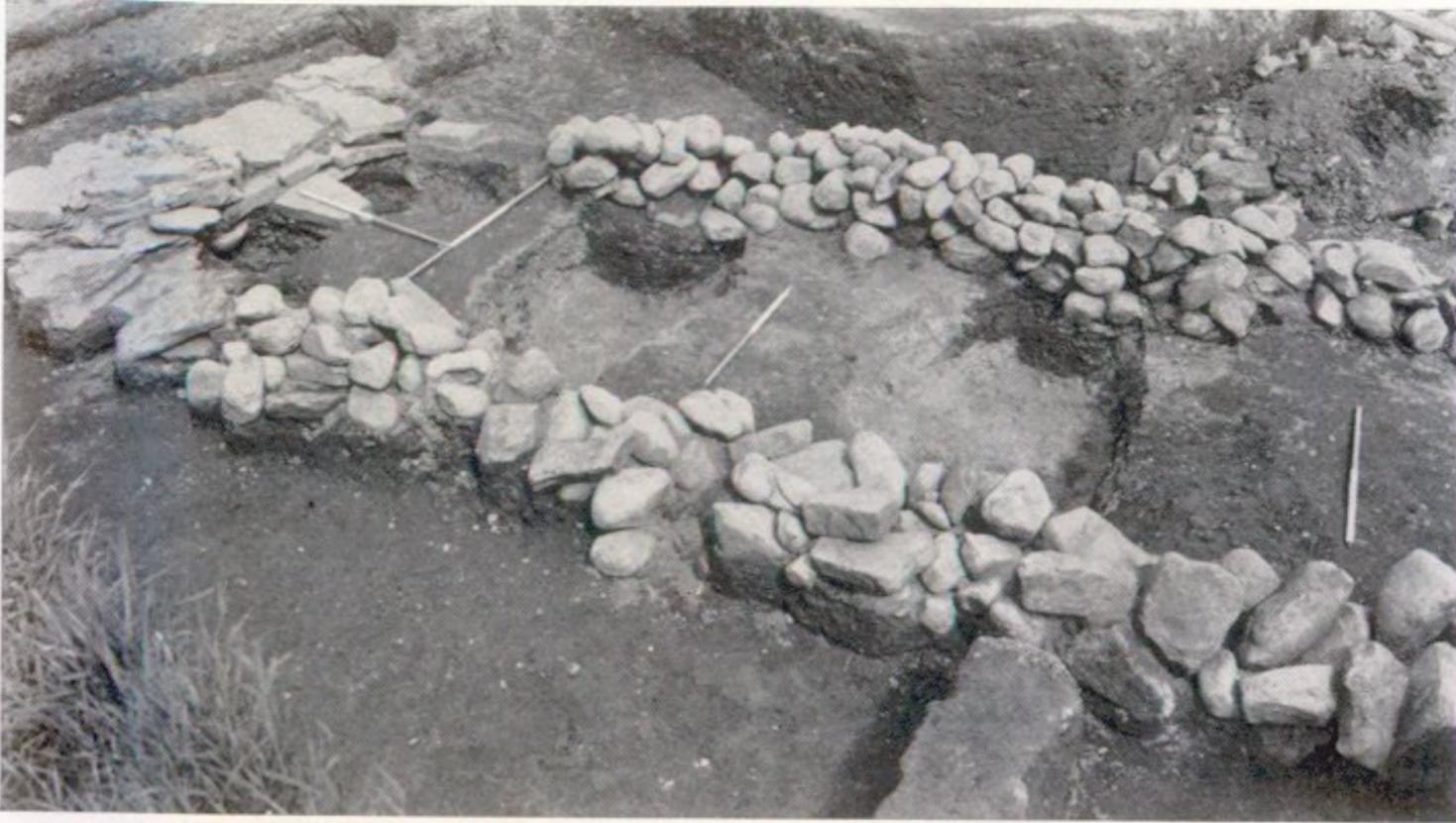
Façade with extra-revetment at its S end



a Façade exposed, with Late Ditch in foreground



b Detail of Façade face with vertical slabs



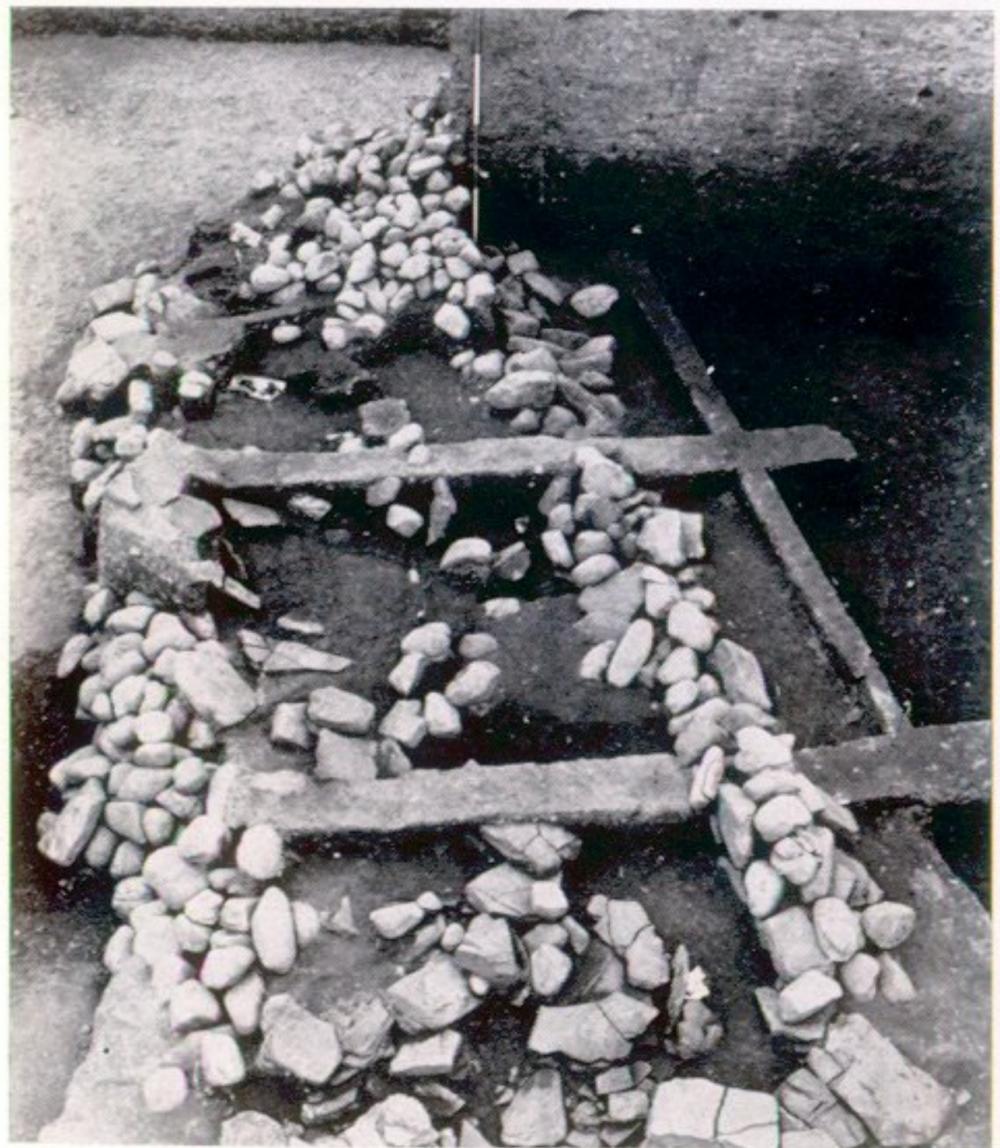
a Mortuary structure fully excavated from SW



b Mortuary structure: Phase II entrance and post-holes B and C



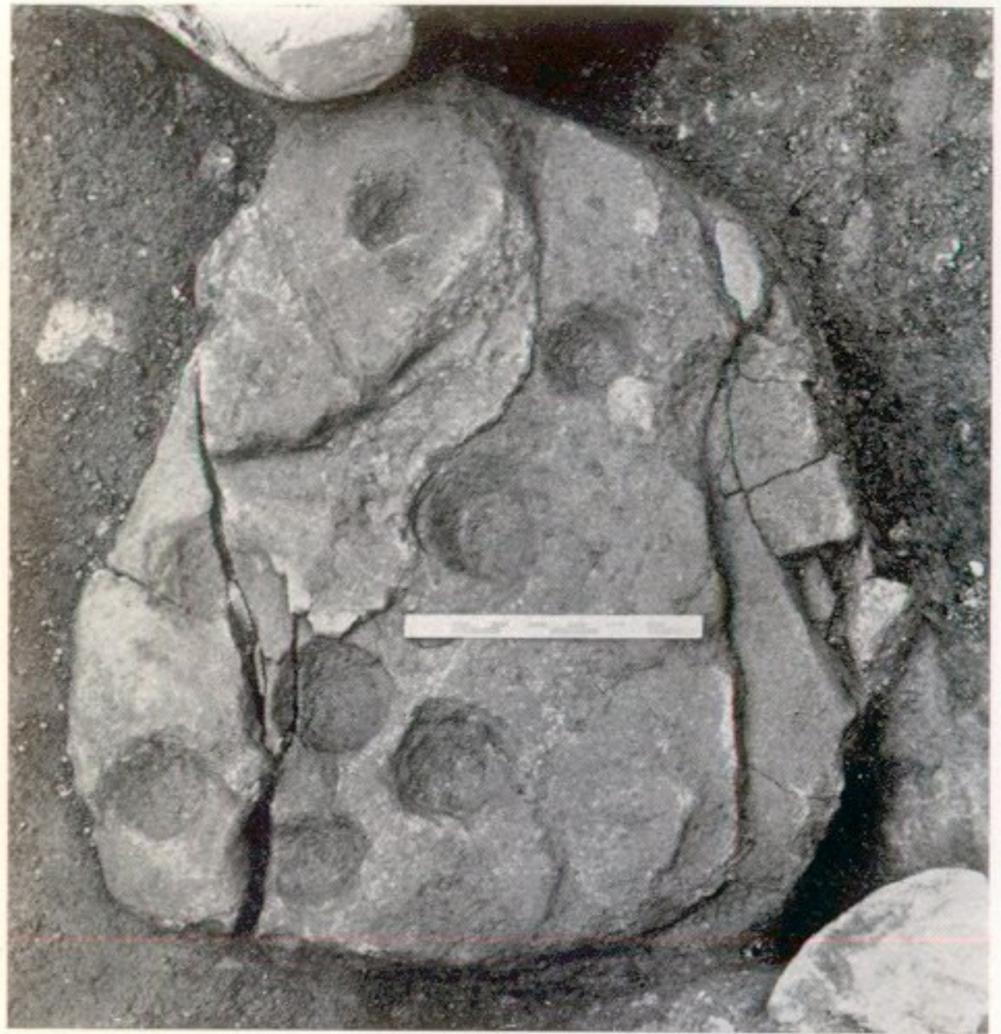
a Mortuary structure fully excavated from NW



b Mortuary structure partially excavated from NW



Mortuary structure: Phase III structure from NW



a Cup-marked stone from Mortuary structure Phase II



b Charred birch-bark under stone slab, Mortuary structure Phase II