XIII.

"FORT" AT SCOTSTARVIT COVERT, FIFE.

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When mapped in 1892 on the 25-inch map, the oval enclosure, with a circular bank inside, at Scotstarvit Covert [3] marked as "Fort" was covered

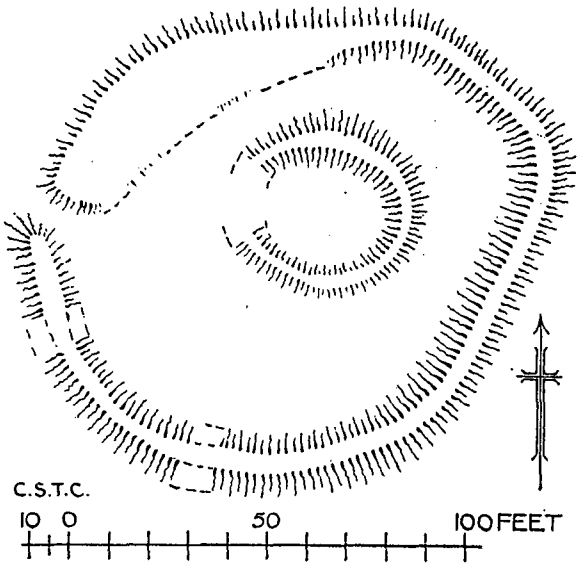

Fig. 1. Plan of Scotstarvit.

with oak and beech trees. Its features must then have been distinct, as the details of an overgrown site are not easy to discern, and yet it is mapped quite accurately. In its present state only a trained archæologist would recognise it as an ancient monument, for during the First World War the

[1] For details I am indebted to the Keeper of the Rosenborg Castle, Copenhagen. It was last used in 1840.

[2] Information from the Director of the Royal Armoury, Stockholm. I have been unable to consult the description published by R. Cederström, *De Svenska Riksregalierna*, pp. 172–9 (Stockholm, 1942).

[3] Nat. Grid ref. 37/361108.

covert was cut down, trees were dragged over the site and gaps created in the flattened banks. The site became infested with rabbits, and digging for them by the gamekeepers did not improve matters.

The *Inventory of Fife* [1] contains a plan drawn apparently after a visit on 26th April 1926, here reproduced as fig. 1 by the kind permission of H.M. Stationery Office. The site is recorded as "Fort" under No. 23, and the relevant parts of its description are: "In cutting down the trees, the ramparts, which are nowhere more than three feet high, have been much spread and in places broken to provide a passage. The construction is of a simple character consisting of two roughly circular lines of ramparts lying one within the other and composed almost entirely of earth. The inner line is now very much spread and broken, but it appears to have enclosed an area of about 24 feet in diameter [at least 30 feet on the plan]. The outer one is more clearly defined, although much broken upon the west quadrant. At the west there are indications of an entrance 12 feet wide. The fort measures approximately 120 feet by 150 feet over all."

This description virtually coincides with the O.S. map. Removal of bracken revealed the damage, and showed that intensive quarrying had taken place at the outside of the outer bank, leaving many stones lying about. The present-day appearance of the earthwork is shown on the plan, fig. 2. Those features, which are evidently artificial, are given by hatching. The contours are in 1-foot distance, and a grid of 10 m. = 32 feet, repeated on the detailed plans, is laid over the plan. The excavated area is marked by stippling.[2]

The enclosure is built on a long, narrow, slightly inclined terrace which interrupts the steeper slopes half-way up the southern side of the broad Eden Valley. The valley bottom, roughly 120 feet above sea-level, would be marshy and covered with trees. The slopes, rising to about 620 feet, provide when cleared good pasturage and fertile fields. But no traces of old cultivation (lynchets and the like) are to be seen in the surroundings of the enclosure; if they ever existed, they have been obliterated by modern cultivation. The terrace is well suited for habitation, especially as on it a spring provides good water 200 yards south-west of the enclosure. There is a fine view to the north, west and east. To the south the hills bar the outlook, and from the higher slopes the whole of the earthwork can be overlooked. From this and from the fact that the configuration of the ground provides not the slightest natural protection, it is clear that the name "Fort" as applied to the site is a pure convention.[3]

The excavation was started in 1946 with trial holes in the vicinity of the

[1] Edinburgh, 1933.

[2] The level of the 350-foot contour in fig. 1 is taken from the 1-inch O.S. map, and our level is by this only approximate, but sufficiently exact for the purpose of the archæologist.

[3] A more discriminate use of the utterly misleading term "fort" on the O.S. maps is long overdue.

site to get information about the character of the subsoil. Then two trial trenches, 1 and 2 (fig. 4), 1·50 m. wide, were made crosswise through the outer bank, through the supposed entrance in the west, and through the middle of the inner circle. Then followed the uncovering of the southern part of the central area. In 1947 the northern part of the central area was

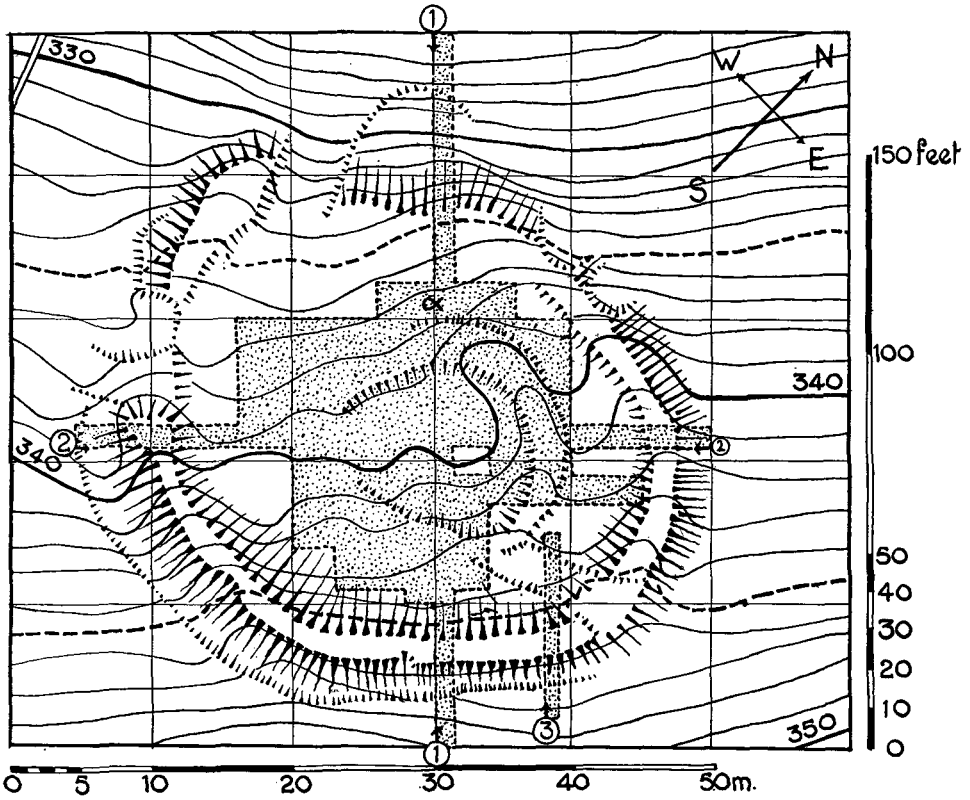

Fig. 2. Plan of Scotstarvit with 1-foot contours, excavated area, and position of sections surveyed 1946 by Dr Maria Bersu.

investigated, and for demonstration at an excursion of the British Association the southern outer bank was cut again. Altogether four weeks' digging was spent on the site. Voluntary labour only was used.

The work was made easy by no deep layers having to be removed. The forest humus is now replaced by a black modern humus, there is practically no habitation layer, and the surface prior to the occupation of the site is only preserved under the bank and elsewhere on short stretches. The untouched subsoil and depressions due to vanished structures are practically everywhere reached directly after the removal of the modern humus. The

subsoil is either (1) a harder, pale sandy material, the decayed local calciferous sandstone of Carboniferous Age without any foreign material, but with occasional blocks of sandstone, worked up and moved by drift in glacial times; or (2) a looser, fine, somewhat more yellowish sand, also a glacial formation with many foreign stones and occasional big boulders, transported by ice from as far as the Highlands. Subsoil 1 is confined to the central area. Both types would form an ideal soil for the excavation of a site with wooden structures if the place had remained undisturbed. But the disturbances and removal of the higher strata, alterations due to leaching of the modern humus and secondary infiltration of the top levels of the untouched soil, iron-pan deposits in the sand, rabbit burrows and curious disturbances by fern roots, necessitated very careful and tiresome work with the trowel. Any results obtained were due to the patience and endurance of the student helpers, and all would have been in vain if the excavation had not been started at a time of year when the soil was wet and the slight differences in colour showed up well.

The Outer Bank.

The five widely separated sections through the outer bank show uniform features, and from this we can deduce that the construction of the outer bank was the same all round. But we got only incomplete information as the bank nowhere remains undisturbed. In fig. 3, 1, 2, 3, are shown four typical sections cut at right angles through the outer bank (southern side and middle of eastern side) and an oblique one through the western side. They also give a good idea of the present day appearance of the low broad bank. Under the modern black humus A an upcast of clear white sand B lies in the north, east and south. (On the west in our cutting the bank has been levelled in modern times.) The false bedding in the sand B shows it to have been piled up in small loads on what was then the turf line, a light brownish sand C. Towards the outer slope of the bank some stones and some bigger blocks are embedded in B and C. Upcast B and old turf line C are further out dug away by a shallow ditch-like depression E, with a flat bottom sunk in the untouched soil and filled with mixed greyish sand D. Turf line C reappears again outside E. In the south of the enclosure a shallow depression on the site of E is visible on the surface; it looks like a silted-up ditch outside the bank, and is neither mentioned in the *Inventory* nor marked on the older 25-inch map. Variations are that in the east (fig. 3, 2) the upcast B is mixed with darker layers of soil B 1, with occasional remains of charcoal and some minute fragments of cremated bones. Very little of C has remained here. In the south-east (fig. 3, 3), covering B on the inner slope, there is a layer of yellower soil B 3, resembling C, and overlying it greyish sand B 4. It looks as if B 3 indicates a surface with vegetation. Towards the outside of the bank, upcast B has either been heightened secondarily or was originally higher, and has been in part washed down towards the inside after B 3 had grown up. In the cutting through the northern side of the enclosure (fig. 3, 1) no surface indications of the bank are left. The position of an outer face D 1 is given by the remains of a packing of heavy stones set at a deeper level than turf line C, which, despite rabbit burrows, is here recognisably steeper than on the south. The

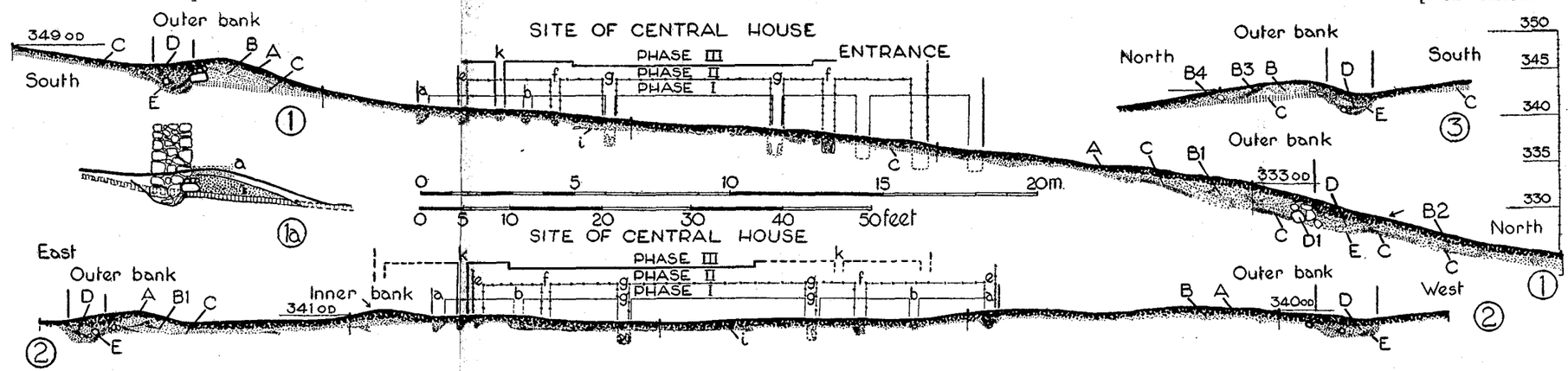

Fig. 3. Sections through fort (see fig. 2).

[*To face p.* 244.

face thus forms the revetment of a kind of terrace, and outside it layer D indicates a depression E as on the south. The brownish sand B 2 further out was deposited as downwash from the bank inside, now represented only by the broad upcast B 1 before the upper part of the stone face D 1 had vanished; and it is obvious that much material has been washed away since then.

Some bits of china found in the filling D in both southern cuttings date it to modern times, so E is clearly a robber trench; and the stones embedded in upcast B and turf line C are the last remains of the outer stone face of an earthen bank. Yet it is unlikely that the people who robbed the stone face dug much deeper than the lowest course of the facing, and as further the dimensions and outline of E are everywhere the same, this depression with its flat bottom sunk to one foot deep in the untouched soil must also be an original foundation trench for the heavy blocks of the facing. This implies that the enclosure bank was quite solidly built, but not enough is left to show how high this face had been originally. Even in the present reduced state the upcast B contains more material than was gained by digging the foundation trench, and so was more than incidental but had a specific function. It was spread out to a width of 10 feet, and piled up to a height of at least 3 feet behind the 2-foot-wide stone face. No traces of a stone or wood inner revetment were found, so there is no reason to deduce a defensive purpose in the nature, say, of a raised rampart walk (upcast) behind a stone parapet (stone face), or still less of a high bank with vertical inner and outer face and a filling of sand. The evidence of section 3, fig. 3, layer B 3, indicates that the upcast was indeed piled up obliquely against the dry wall face, presumably to give it more strength and solidity than the revetment alone could provide. As the builders took the trouble to collect such heavy blocks as those still preserved, to carry them to the site, to scoop out a foundation trench and to pile up the upcast for an enclosure bank of about 300 feet circumference, the stone face must surely have been high enough to provide adequate shelter for the enclosed area; in other words, the bank would be as high as modern field walls fulfilling the same function to-day, *i.e.* 7 to 8 feet (fig. 3, 1 *a*). It remains to be seen what other clues we get for a reconstruction of the enclosure bank from the type of occupation inside it.

There are no clear indications that the bank was repaired, and none that it had been moved after it had been built.

Nothing can be said about the construction of the entrance. Our cutting on the west, where, according to the *Inventory*, surface indications of one existed, showed that the foundation trench was continuous here (cut obliquely, fig. 3, 2, west). A modern but disused field road crossing the enclosure (fig. 2) has, on the east, worn down the bank and given a false impression. (For the most likely place for an entrance see below, p. 255.)

The Enclosed Area.

The area enclosed by the outer bank measures about 1800 square feet. It slopes down less from south to north than the ground outside, which suggests either that a less inclined part of the terrace was chosen for the enclosure or that it was levelled. If in the section fig. 3, 1, we connect the stretches where the old surface is still preserved, we see that on the south the turf line C has been dug away, whereas on the north sand B 1 is heaped

on it. But most of the material which was used for levelling the area has been washed down.[1]

Interpretation of the surface indications (fig. 1) led to the conclusion that the bank in the middle of the enclosure was a "hut-circle" whose outline would give the dimensions of the only structure on a site of no complex character. It turned out—as so often—that surface evidence is not of much value for the assessment of details; surface indications provide only general and minimum information about what has actually been built. The two first cross-cuttings through the enclosed area showed at once that two kinds of deposit below the humus A filled depressions in the untouched subsoil, one dark and almost black, the other light brown. This difference in colour suggested that they were not contemporary. The "hut-circle" seemed to have no relation to what were clearly post-holes and foundation trenches filled with the light brown soil. This suggested remains of another building not concentric with the earthen bank. The evidence of the cutting through the latter was disappointing, in so far as no structural remains related to the bank itself were to be seen in the level of the untouched subsoil. The remains of the bank consisted of light brownish sand, heaped upon untouched soil (fig. 3, 2), with no indications of ever having had a stone facing. The stones scattered on the surface were therefore certainly not used in the construction of this bank, like those orthostats or dry-stone wall faces so often a characteristic feature of a "hut-circle." Indeed it early became clear that we were dealing with remains of circular structures built essentially of wood, which is rather surprising in a district where stones are easily obtainable. By uncovering the whole central area the post-holes, foundation trenches, and the remains of the inner bank fell into a distinct pattern, and lines interrupted in our narrow cuttings by secondary changes in the subsoil or by the fern roots could be seen to be really continuous. As the foundation trenches sometimes crossed they could not all be contemporary, and as some were concentric or eccentric to each other, it was possible to establish a sequence of three different systems of structural remains indicating consecutive wooden buildings. The arrangement of the post-holes, and differences in character and colour of their filling, corroborated the evidence provided by the foundation trenches.

The Circular Building in the Central Area.

Fig. 4 gives the plan of the excavated area at the level of the untouched soil; discolorations are shown by stippling; depressions in it by lines and hatching, set stones are marked. The difference in shade of the post-hole fillings is also given. Fig. 5 shows how these remains are to be assigned to the three consecutive wooden buildings of respectable size.

[1] But there was not such prominent terracing for the site of the central building as is to be seen on the "concentric circle" sites of North-west Wales (*Antiquity*, vol. xviii. (1944), p. 194).

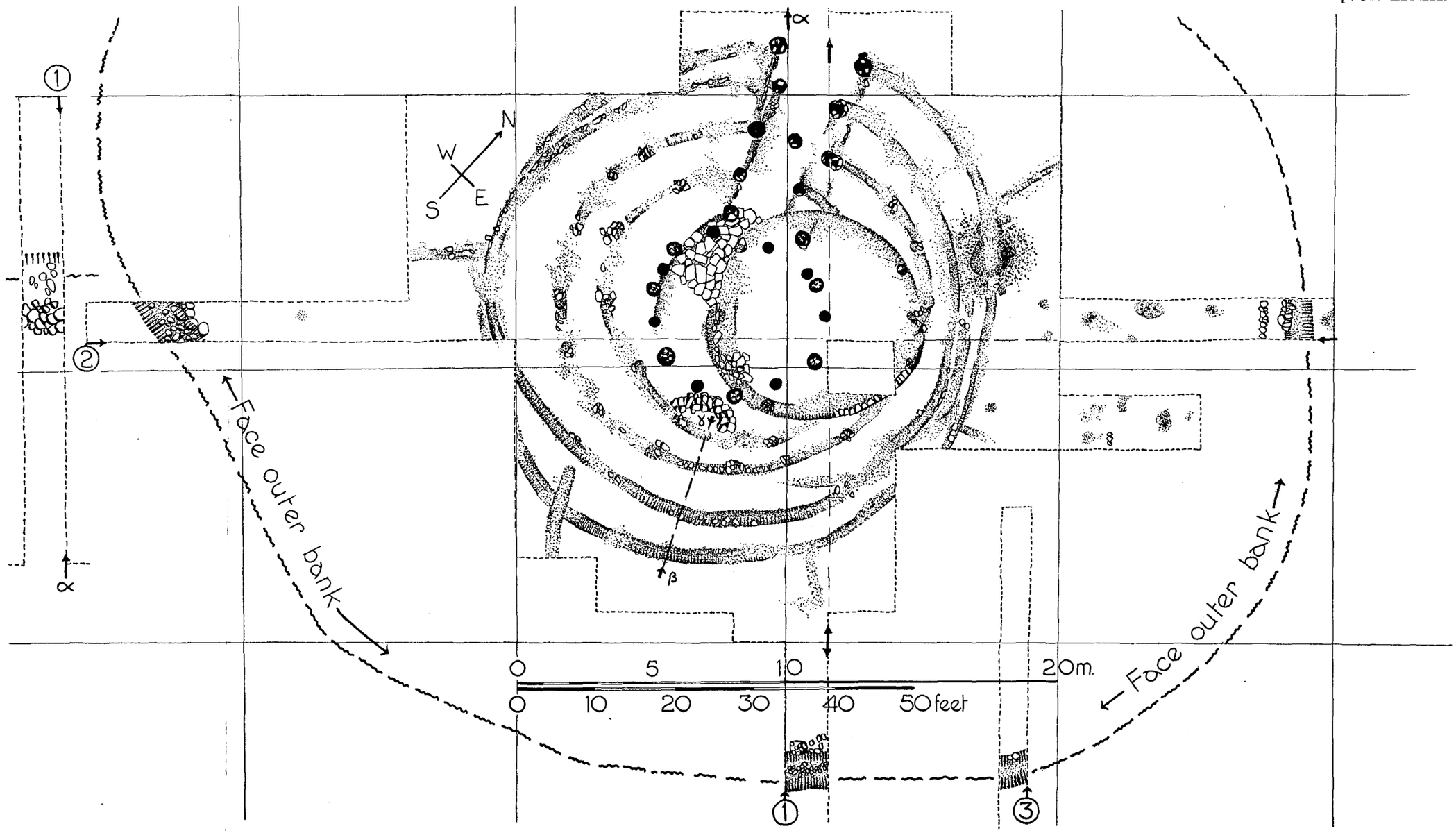

Fig. 4. Plan of excavated area. (For section β–γ see fig. 8; for sections 1–1, 2–2, 3, see fig. 3.)

As all three were built roughly on the same spot, each reconstruction was only a stage during a continuous occupation of the site. The buildings were completely rebuilt in each phase, but it looks as if Phase II was effected by gradually dismantling the structural parts of Phase I, whereas the ground

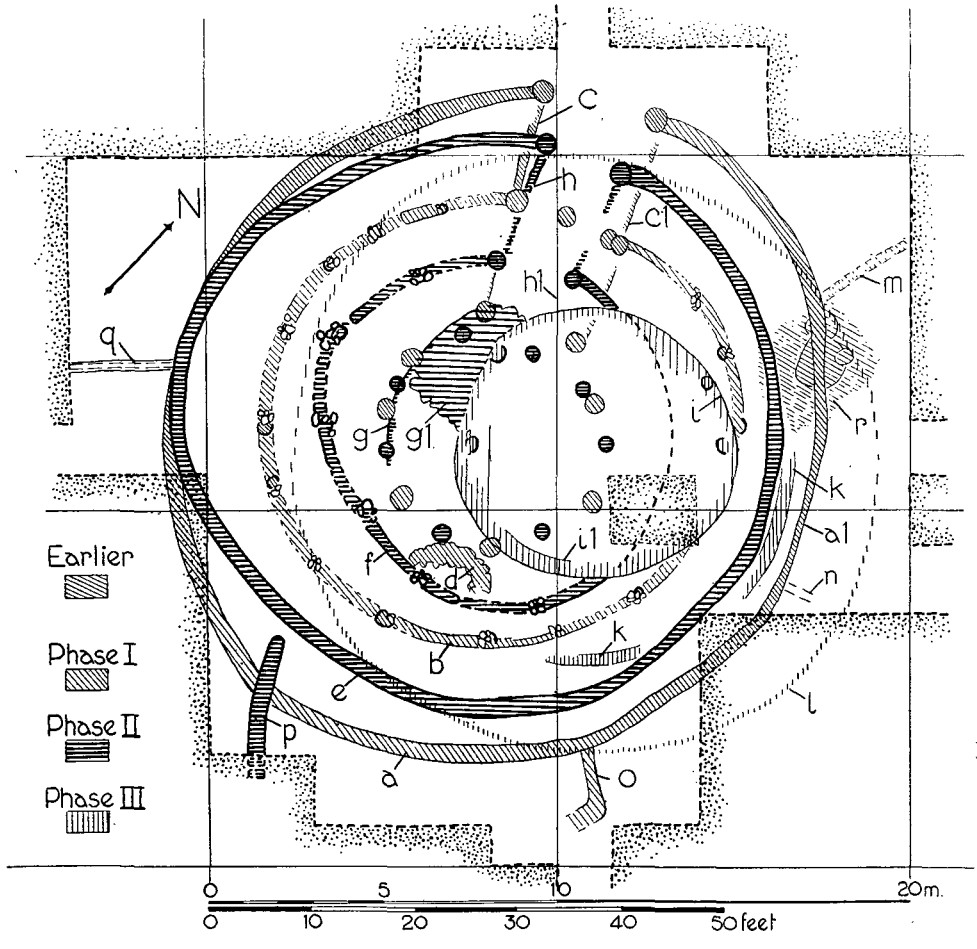

Fig. 5. Diagram of structural remains in central area.

plan suggests that the building of Phase II had been pulled down completely before that of Phase III was erected. The following gives the evidence upon which the above sequence is based.

Phase I.—In plan the building consists of four elements:

I, 1. Outer Ring.—A circular foundation trench (*a*, fig. 5), 19 m. in diameter, indicates the site of a continuous outer wall of wooden posts. Where best preserved the trench is 30 cm. wide and cut 30 cm. into the untouched soil. Its section (β–γ, fig. 8) is roughly **V**-shaped, but the outer edge is distinctly

vertical and the inner sloping at almost 45°. The filling is uniformly light brown, and very few packing-stones were found. On the north there is a gap, 3 m. wide, and the trench ends at each side of it in a substantial post-hole sunk 50 cm. deeper. These, like all the others mentioned later, are vertical and filled with packing-stones, which in most cases lost their original position when the wooden post decayed. Both are filled with soil of the same colour as the trench. This outer ring (*a*) cut in the north-east older black deposits (see p. 255). On the east, at *a* 1, it looks as if a stretch of the outer ring had once been replaced (repaired), for there on a stretch of 4 m., instead of being V-shaped, it forms a narrow U and is cut 5 to 10 cm. deeper.

I, 2. Middle Ring.—Concentric and 3 m. within the outer ring [1] runs a band of soil (*b*) of the same colour. When removed, this brown soil was seen to be sometimes the filling of another, U-shaped, trench (fig. 8 gives a section where it is best preserved), but sometimes it faded out, hinting at an original unevenness in depth. At intervals averaging 3 m. there were isolated packings of stones flatly embedded in the untouched soil, associated in five instances with shallow depressions 15 cm. deep resembling post-holes. A definite gap on the north corresponds to that in the outer ring, and is flanked by two post-holes corresponding to the outer two in situation, depth and colour. The eastern hole was once replaced, and in the middle of the gap there is another post-hole of the same dimensions.

I, 3. Inner Ring.—Within the middle ring in turn, again at 3 m. distance, there are eight post-holes sunk 30 cm. in the untouched soil, arranged in an irregularly spaced circle 8 m. in diameter. Two are in a straight line with those flanking the gaps in 1 and 2, and all had the same light brown filling.

I, 4. Entrance Hall.—Shallow narrow foundation trenches, *c* and *c*1, with upright set packing-stones or, where badly preserved, a depression line only, connect the flanking post-holes with the two in the inner ring. On the eastern side of *c*1 a short stretch forming a channel 20 cm. deep continued towards II, 2, then, being cut into by the sunk inner area of Phase III (see below), it was only 10 cm. deep until it reached the innermost gap. On the western side the corresponding part of *c* could not be fully ascertained, but coincided presumably with the foundation of *c*. The evidence was further blurred by the pavement, and we may have overlooked it.

To Phase I belongs further a semicircular packing of stones (*d*) set in clayey sand, placed on the untouched soil in the south between 3 and 4. This packing, partly preserved in two layers, has survived only in a fragmentary state. It may have once formed a full circle, but no certain explanation can be given of its purpose—perhaps it is the remains of an oven, as stones in the upper layer show marks of fire on the outside, and as the sand inside the arc was reddened.

A diagrammatic plan of the building in Phase I is given in fig. 6.

Phase II.—With the exception of the post-holes of the inner circle, the features of Phase II show no difference in colour of filling compared with Phase I.

II, 1. Outer Ring.—The foundation trench of the outer ring *e* coincides on the west with that of Phase I, then to north and south it runs between I, 1 and I, 2. As II, 1 is cut deeper into the untouched soil than I, 1 and is constant

[1] The terms "concentric" and "circular" are not used in the geometrical sense. The outline of our circles deviates in all three phases somewhat from a true circle in the east, where they are cut into the sloping surface of the ground, whereas the term "concentric" fits somewhat better, as 1, 2, 3 retain the same centre in I and II.

in depth, the relative age of both features is given. On the south a number of packing-stones have survived (fig. 8, section β–γ). The gap on the north was narrowed to 2·50 m., but remained at the same place, again flanked by two post-holes 30 cm. deep. The diameter of the outer ring was less than before, 16 m.

II, 2. Middle Ring.—The asymmetry of the middle ring *f* is still stronger than in Phase I: distance from the outer ring on the east 3·50 m., on the west 2·50 m. Here again it remains doubtful if there was a continuous deep foundation trench. The section is U-shaped (fig. 8), and in detail *f* shows the same features as *b*. There are packings of stones at regular 3 m. distances; at five of these packings are shallow depressions of 15 cm. maximum depth like remains of post-holes, and the gap in the north is flanked again by two deep (30 cm.) post-holes.

II, 3. Inner Ring.—The 5-m. ring of eight posts *g*, 1·50 m. distant from 2, is on the same perimeter as I, 3. The post-holes lie in the intervals between those of I, 3; they are smaller in diameter, filled with darker greyish-brown soil mixed with some charcoal, and are neatly cut with vertical sides and flat bottom 50 cm. down in the hard calciferous sand. There were no packing-stones so it looks as if the diameter of these holes corresponds to the dimensions of the timber which was set in them. Once more two of the holes were in a straight line with the outer flanking posts. On the north-west a slight depression indicated that the area surrounded by II, 3 was sunk. In it were the remains of a carefully laid pavement *g*1 of flat stones, whose surface was 10 cm. deeper than the level between II, 1 and II, 2. The pavement covered over one post-hole of I, 3.

II, 4. Entrance Hall.—The outer flanking post-holes were again connected by a narrow foundation trench, *h*, *h*1. If the stones at the edge of pavement *g* were still in position, it looks as if the pavement of II, 3 continued at the same level into the entrance.

The scheme of II is given in fig. 7, on the same scale as that of I; the type of the building remained the same.

Phase III.—The little that remained of the structure of the third building justifies the interpretation that it was again of the same type.

III, 3. Inner Ring.—The best preserved part of Phase III is a level circular area *i*, 8 m. across, sunk in the untouched soil, 15 cm. in the south and 5 cm. in the north, the difference being due to the original slope. The surface is smooth and hard, with charcoal and minute splinters of calcined bones trodden in. Round the southern edge a shallow foundation trench *i*1 is preserved for a length of 2 m., with a shallow post-hole 15 cm. in depth. Four other post-holes of similar dimensions are preserved at the western and eastern edges. There is further a carefully laid pavement at the southern edge preserved in one row of flat stones, and remains of a similar broader pavement in the south-west. The centre of this circular area is 3 m. to the east of the centre of I, 3 and II, 3, and we see it as the element III, 3 corresponding to them. Post-holes and foundation trench would have the same function as the ring of posts in I, 3 and II, 3. The relative age is given by the fact that III, 3 cut away parts of II, 2 on the west, and also the pavement in II, 3 which lay 10 cm. higher.

III 2. Middle Ring. III, 1. Outer Ring.—On the east, remains of a shallow foundation trench *k* ran concentric with the circular area III, 3 at a distance of 2 to 3 m. It could be the last vestige of the outer wall of a building much smaller than the others, but we prefer to interpret it as element 2 of building III for the following reason. If we consider the position of the

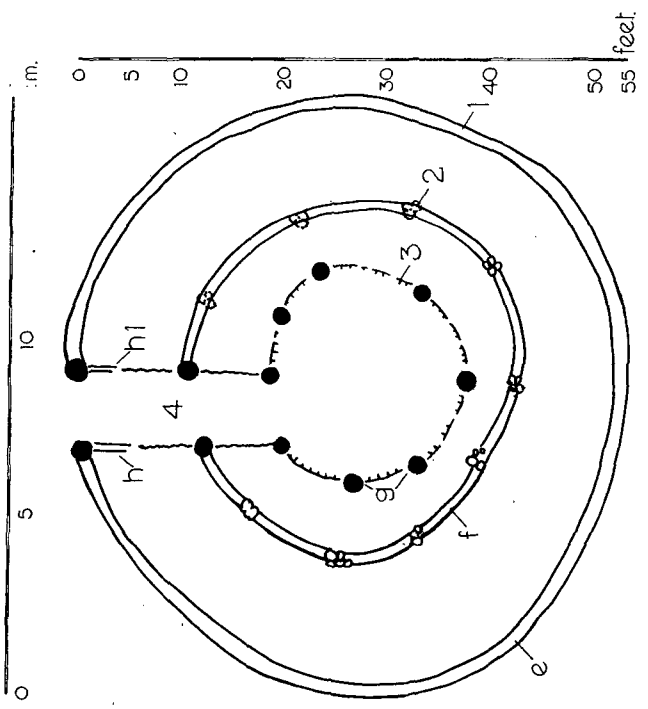

Fig. 7. Central house, Phase II.

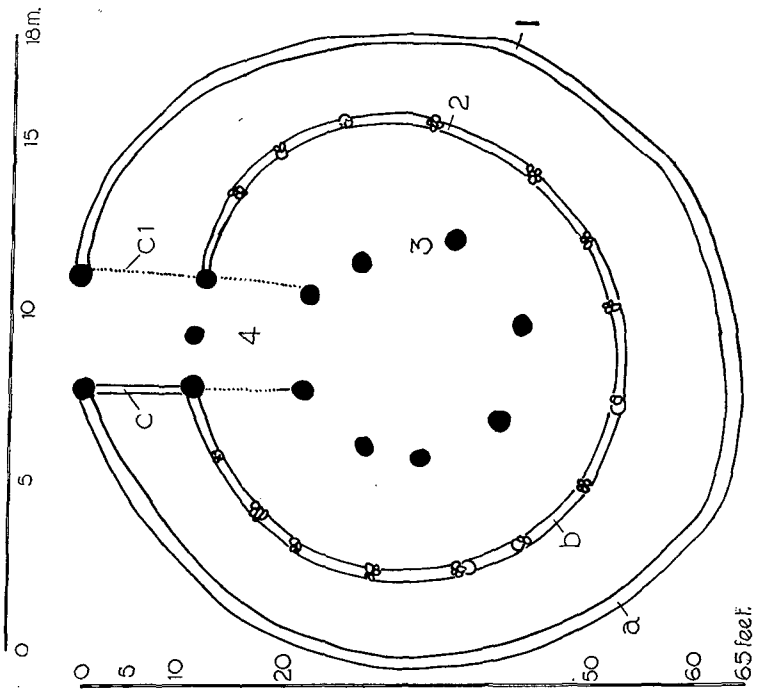

Fig. 6. Central house, Phase I.

earthen bank of the "hut-circle," we see that its remains are completely eccentric to the outer ring and inner ring of I and II, but concentric with trench *k*, which is 2 to 3 m. inside it. (It is 3 m. wide at the base, and its highest point is marked *l* on fig. 5.) So we see in it an indication for an element III, 1 which has left no traces in the untouched soil, but corresponds to the outer circle of the buildings in Phases I and II (see p. 253).

Building III would then have had roughly the same diameter as I and II (16 m.). From its position in relation to them it is obvious that, if a similar earthen bank was associated with either, it had to be removed when the centre was moved 3 m. to the east in Phase III.

III, 4. Entrance Hall.—Unfortunately nothing remained of the entrance either on the north or on the east. If the entrance was again flanked by post-holes it certainly did not lie on the west, as the gap in the inner circle in the plan, fig. 1, suggests, for nothing was there found which could be interpreted as remains of them or of their packing-stones. On the north there were, apparently simply embedded in the modern black humus, packings of stones in the area of the earlier entrances; they might conceivably have been connected with the structure of the entrance in III, but as they were superficial we did not plan them before they were removed.

The reason why so little is left of the buildings is clear if we look at the N.–S. and E.–W. sections through the central area (fig. 3, 1, 2). We see that with the exception of the sunk area III, 3 and the remains of the pavement in II, 3, nothing of the floor of the buildings has survived. Even the level of the untouched soil has been affected by modern disturbances and by the modern secondary humus A. In the entrance area some of the old surface C has survived between I, 1 and II, 1 (fig. 3, 1), which could not have happened if the level of the entrance had been deeper than the old surface C.

We had already seen (p. 245) that there are indications that in the northern part of the central area earth (B 1, B 2) had been originally piled up to level it, and during habitation in Phases I and II. The difference of almost 1·5 m. in level between the southern and northern sides of foundation trench I, 1 (*a*) shows that this upcast must have been quite considerable, which explains why so little of the structure of III has remained: for inside the building the foundations of that phase did not reach the natural soil. The section through the northern part of the bank shows that material from the inside (B 1) had been washed down before the face of the northern bank had been robbed, and still more (B 2) went when the northern outer bank was levelled.

Other Structures Connected with the Building (fig. 5).

In the area uncovered there are outside the circles of the foundation trenches five trenches *m*, *n*, *o*, *p*, *q*, all U-shaped in section. They have the same filling as the foundation trenches of the buildings and all end near element 1 of the different phases, which they meet roughly at right angles. One, *o*, a very shallow trench on the south, seems to turn through a right angle and then fades out. The others stretch into the unexcavated area. First we thought that these depressions were water runnels or drip channels made by water from the roof of the building. But this cannot be the case, as they run partly against the natural slope. They must be structural features belonging to the different phases of the building—*m* and *o* certainly to I, *p* to II, *q* probably to II and *n* earlier than III. If they are foundation trenches for continuous rows of timbers, the lay-out excludes their

taking walls of buildings attached to the circular building, and they look like foundation trenches for fences.

Reconstruction of the Buildings.

We see in 1 (outer ring of a phase) the outer wall of the building, and assume that all the area inside it was roofed over. No traces of individual posts were seen in the trench, nor were short stretches of the circuit dug deeper than the rest. As no packing-stones were used, the timbers, almost 30 cm. thick, had been set without intervals and formed a solid continuous

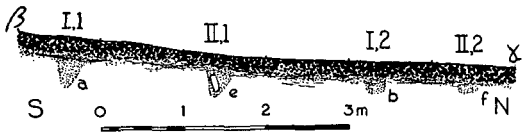

Fig. 8. Section through outer and middle rings of circular building in central area. Phase I and II (see fig. 4).

wall. As the trench is vertical on the outside and cut in the hard untouched soil, this wall was deliberately built to resist a thrust acting from the inside of the circle, *i.e.* it was able to withstand the outward thrust of the weight of the roof. In foundation trench 2 (middle ring), packing-stones originally all associated with post-holes were set at regular intervals. These post-holes show where isolated vertical posts stood in a circle, forming roof supports; as their function was only to prop up the rafters bridging the span of the roof, the holes are shallow. The foundation trench between these post-holes in 2 is shallower than 1. It is badly preserved, but there was in any case a partition here. This partition will, in parts at least, have formed a solid continuous high wall, namely, where we found a U-shaped foundation trench. We do not know if a light partition reached the roof all round. The deep-set posts of the inner ring 3 in I and II are again roof supports, and could carry a substantial weight even if they were quite high. Only a few posts at the edge of III, 3 have survived, but we assume that there was once a full ring of them also. The shallow foundation trench (*i*1), which likewise survived only in part, indicates a partition along the edge of III, 3—an assumption which gets support from the fact that a sharp vertical edge of that inner area is preserved. Similarly, there was a partition or revetment along the edge of the sunken area II, 2, for a sharp edge is preserved to a higher level than the pavement there.

On both sides of the entrance hall (4) narrow foundation trenches indicate partition walls, but we do not know if they reached the roof. The strong post-holes at the end of rings 1, 2 and 3 suggest that the hall was roofed. But as the areas between 1 and 2 and 2 and 3 would not be accessible if the partitions were high, these may have been at least in parts only low revet-

ments. We do not know where the door was situated, no threshold for example being recognisable, though the deep post-hole in the middle of the gap in I, 2 (fig. 6) may indicate that the door was recessed so that a kind of porch was formed between 1 and 2. The size and intervals of the post-holes, and the arrangement of the foundation trenches, are adequate for supporting rafters on which a sod roof could be placed, but hardly adequate for a thatched roof.[1] At least the area inside 3 was paved in Phases II and III, and this area was lower than the two outer zones. No drains exist inside 1, so that the rain-water was carried over the roof to outside 1; but no drip channels are to be seen, again an indication how much the soil has been worn down by the disturbances and how many details have gone. As so little of the floor inside the buildings is preserved, it is difficult to carry the deductions for a reconstruction of the building further from the evidence of our excavation alone.

It remains still to discuss how the earthen bank of the inner circle, which we consider as a feature associated with the wall in Phase III, fits into the reconstruction. We know from other circular buildings that such banks may be the remains of two different features: A. The bank represents upcast piled against the outer wall to function as a kind of buttress.[2] B. It is generally assumed that the low banks of hut-circles are the remains of walls originally much higher, with stone or wood revetments outside and in; the bank's function is to support the rafters laid upon this broad outer wall. We saw that no traces of a revetment (for B) or a foundation trench (for A) have survived in III, and that if an upcast had existed in I and II it could not have been preserved (above p. 251). If we venture at all to approach in these circumstances the problem of the earthen bank, it is because the discussion may be helpful for the interpretation of the evidence at better preserved sites. We have already dismissed the conception that the U-shaped foundation trench *k* of Phase III was for the outer wall of a much smaller building, and the earthen bank is too far away from *k* to function as an upcast against it. On the other hand, as the hypothetical outer wall of Phase III cannot have been more than 4 m. from a middle wall *k* (otherwise it would raise difficult structural problems with regard to bridging the span of the roof), the position of the earthen bank indicates that it was *between* the hypothetical outer wall (1) and the middle wall (2, *k*). So it seems more likely that the earthen bank had function B. If we are right in thinking that the buildings in Phases I, II and III are identical in type, a similar earthen bank would have been part of building I and II also. Were the

[1] For thatch as roof-cover see the theoretical discussions in "Excavations at Little Woodbury," *P.P.S.*, vol. vi. (1940), p. 88. Further experience has now induced the author to assume that the house at Little Woodbury had a roof covered with sods (*Antiquity*, vol. xx. (1946), p. 81).

[2] *Cf.* Lissue, *Ulster Journal of Archæology*, vol. x. (1947), p. 30; vol. xi. (1948), p. 131. *Cf.* Ballacagen, *Journal of the Manx Museum*, vol. v. (1945–46), pp. 177–182.

banks in I and II also loose sand as in III, such loose sand would need an inner and outer revetment. 1 and 2 in I and II would serve for a revetment very well, taking timbers strong enough to retain a bank of considerable height. I, 1 and II, 1 are even too strong for such a purpose, for such massive outer walls can in no case have been higher than 1·5 or 2 m., as otherwise a building 19 m. across would have had too high a roof. Apart from this, however, the distance of 3 to 4 m. between 1 and 2 is out of all proportion for the width of a bank of function B, and a high wall of this breadth would have left, after the decay of the revetment, much more remains than are shown in fig. 1. So we think that the earthen bank was originally an upcast

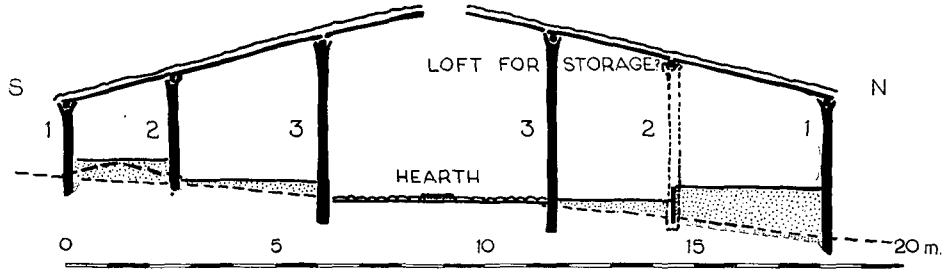

Fig. 9. Scheme of reconstruction for central house.

to raise the level of the area between 1 and 2 to 50–60 cm. compared to the level of 1 outside the house and 70 cm. compared to the level inside 2. Such an arrangement would allow benches or beds in the zone near the outer wall, and would serve to keep the inside of the house dry, for we saw that the centre was sunk. If we are right in this reconstruction, the roofed-in area would consist of three rings at different levels: (*a*) raised bench between 1 and 2, (*b*) space between 2 and 3 more or less level with ground outside 1, (*c*) area inside 3 sunk in the ground. To reach the sunk area the entrance would need lateral revetments, such as are preserved in I and II (foundation trench *c*, *h*). The partitions along 2 and 3 fulfilled the function of revetments whether they reached the roof or whether only to the highest level of the floor inside the house.

In fig. 9 a reconstruction is tried in a N.–S. section through the building, and on the left the timber in trench 2 is drawn as such a revetment. The dimensions are based on those of Phase I. The reconstruction takes into account the special conditions arising from the sloping ground. The reconstruction also gives probable vertical dimensions. Comparison with the remains of the outer bank in fig. 3 shows how disproportionately much material is missing if the earthen bank had been 5 feet high and had fulfilled function B.[1] It shows also how disproportionately thick such an outer

[1] The width of an earthen bank between 1 and 2 interpreted in a reconstruction on the lines of B would lead logically to the idea that the Scotstarvit house was a kind of "wooden" broch or dun. The

wall would be. So the earthen bank will represent here another function than A or B; in other words, we will have to see if the earthen banks of "hut-circles" also have not sometimes other functions than generally assumed for them.

As the buildings I and II have an entrance opening to the north, the entrance to the enclosure will have been most likely on the north also, on the axis of the entrance hall. But we had no time to uncover this area.

The evidence of the soil gives no clue to the purpose of the buildings. The buildings and enclosure are later than the remains discussed in the next paragraph.

Older Remains.

As already mentioned above, I, 1 (*a*) and I, 2 (*e*) are cut in the east into older deposits (*r*, fig. 5). One of these, marked with small crosses in fig. 4, is a hearth, a shallow depression 15 cm. deep in the untouched soil, and filled with ashes, dark soil, and small fragments of red burnt clay. No hearthstones were found, but reddening of the subsoil indicates quite intensive firing. To the west of the hearth lie two shallow pits (respectively 15 and 20 cm. deep) filled with dark, somewhat unctuous soil. The same blackish soil, quite distinct both from the filling of the foundation trench and post-holes and from the modern black humus, lies in a thin stratum surrounding the pits and hearth and peters out further away from them. Indistinct spots of the same layer were found further east in sandy subsoil in an area much disturbed by rabbits, and filling the burrows to a considerable depth, 40 cm., thus indicating it must have been quite widely spread there and thick. This material is to be found in the upcast B 1 (fig. 3, 2) of the enclosure bank on the east, but in a secondary position apparently collected from its original deposit in the neighbourhood. Traces were also found there under the bank itself in a small hollow (post-hole?) in the untouched soil, and in another just outside the enclosure face. No remains of it were found in the western part of the enclosure. So the occupation in this earlier period seems to be confined to the eastern part and spreads possibly even beyond it.

The Finds.

Finds were scarce, as almost always on such habitation sites in Scotland. There are, first, some minute fragments of pottery, and I am obliged to

author had indeed in mind the possibility of such an interpretation when, after the 1946 campaign only parts of the southern half of the house had been uncovered (see Sir Lindsay Scott, *P.P.S.*, vol. xiii. (1947), p. 27, and note 3). But the uncovering of the whole house, as also Sir Lindsay Scott's detailed studies "On the Problems of the Brochs" (*ibid.*, pp. 1–36), have induced the author to see in the Scotstarvit house a type closely connected with the Little Woodbury house and the variations (see below, p. 259) of the aisled round-house.

R. B. K. Stevenson for his report on the pottery as on the worked flints and pitchstone (here printed as Appendix I). A. D. MacGregor (Geological Survey of Great Britain, Edinburgh) kindly investigated the pitchstone petrographically (Appendix II). Expert opinion was also kindly provided by Miss M. I. Platt, of the Royal Scottish Museum, on the small fragments of cremated bones which represent all that is left in the acid soil from food-waste. She says: "I do not consider that the cremated fragments of bone are human, but what exactly they are it would be difficult to say. As a guess only I would say they belong to sheep." M. Y. Orr (Royal Botanic Garden, Edinburgh) has reported on the charcoal remains, and states that among the material submitted to him are 49 pieces of oak charcoal with 4 small fragments of willow.

Date.

Scarce as the remains are, the two periods of occupation can be dated by them. One group of the pottery is dated by the food-vessel fragment and the pitchstone flakes to the Bronze Age, the other group to the Iron Age. The date, early centuries A.D., suggested by Stevenson from the affinities of the second group with the native pottery of Traprain Law can, I think, be narrowed down. If the site had been occupied during the Roman occupation we should have found Roman pottery, as it is quite common on native sites, even outside the occupied area. If the "native ware" and the earlier prehistoric pottery survived the climatic conditions, the much better fired Roman pottery would have survived also if it had ever reached the site. We have moved enough material on the site to use the negative evidence of the lack of Roman import for dating purposes: Scotstarvit lies in an easily accessible position not far from main lines of communication. This makes a date either before Roman influence penetrated into Fife, or after the Roman occupation of Britain more likely. And between these two alternatives, before the middle of the first century A.D. or after A.D. 400, preference should be given to the earlier date. For even if native pottery of the Traprain Law type was still used after A.D. 400, Roman imports still lingered on in native sites after this date.

Summary and Conclusions.

1. Not much can be said about the occupation in the first period, as we uncovered only the western part of a probably larger inhabited area stretching beyond our excavation. Hearth as well as hollows, charcoal and calcined bones, are definite indications of a habitation site, and it was an open settlement. There are no indications that it was a burial site. We have no remains of permanent structures or houses, but the dark-coloured deposits are spread over too big an area to have been produced by a temporary

occupation round one hearth only. The evidence of the rabbit-holes, which suggests that there was once a considerable habitation layer, makes more likely a fairly intensive occupation over a considerable time than a short occupation over a considerable area with several fireplaces. As so far no other habitation sites of the food-vessel culture are known from Scotland, it is a pity that no time was left to follow up this matter. The main importance of this chance discovery is that we know now in what situation their open settlements may be found; they should be fairly common in Fife in view of the many burials known.[1] Another point of interest is the pitchstone imported from the west of Scotland to this settlement (see Appendix II).

2. Our enclosure is hardly contemporary with the small but strongly fortified multivallate hillfort of contour type which lies on the same level and on the same terrace as our enclosure 600 yards to the east of it. It is listed in the *Inventory* [2] as Our Lady's Wood Fort, No. 166. No finds are known from it, but this type is regarded as being of Iron Age date. Though the fort can also be overlooked from the higher slope, it has been built on a natural defensive site. A steep valley running at right angles to the axis of the Eden Valley dissects a spur from the terrace. The outline of the fort is defined by a bank girding the plateau, and two banks and three ditches (each at the outside of each bank) following one after the other without interval. This fort situated so near to our site underlines by its carefully chosen position the unmilitary character of our enclosure, and shows what kind of position was chosen if one intended to build in this area a site of a defensive character. So peaceful conditions existed when Scotstarvit was, as we think, built about or shortly before the beginning of the first century A.D. These conditions persisted for some time, as the wooden building inside Scotstarvit was reconstructed twice. As there were no indications that these reconstructions during a continuous occupation became necessary for other reasons (*e.g.* fire) than the natural decay of the wooden structure, the site will have been occupied for, say, one hundred years. This fits the fact that the enclosure bank showed no signs of any changes. Only experience from other similar sites can show if the relatively small number of relics in relation to the duration of the occupation is an indication of a periodical occupation of the site—*i.e.* that the inhabitants moved seasonally to and from other areas, that they went to the hills during the summer with their flocks and returned during the winter to the lower ground. There are in Perthshire quite a number of habitation sites,[3] some with pottery of the same period as that from Scotstarvit, situated on levels about 1000 feet, which could only be inhabited with difficulty during the winter. Houses

[1] *Fife Inventory*, Introduction, p. xxix.
[2] P. 86.
[3] For sites in Perthshire *P.S.A.S.*, vol. lxxx (1948), p. 131.

left uninhabited during the summer would need more repairs than constantly inhabited ones, so the rebuilding of the house may even indicate a shorter duration. We know too little about the happenings at this period in this area to say if this conclusion allows us to date the building of Scotstarvit more closely to about A.D. 80, as the disturbances caused by Agricola's expedition would certainly have brought peaceful conditions to an end here. We know nothing about the date and type of habitation inside Our Lady's Wood Fort, and cannot therefore say if it was earlier or later than Scotstarvit, and if it had any connection with our enclosure. The finds give no direct clues to the purpose of the enclosure and of the buildings, and tell nothing about the cultural relations between the inhabitants and the various contemporary Iron Age cultures.[1]

Some help about purpose of building and enclosure bank can be got from the analysis of the lay-out of the buildings and their pedigree from ethnological parallels [2] and comparison with buildings of similar type in the British Isles. Our building belongs genetically to that group of circular dwelling-houses with vertical outer walls and conical roof, which has the roof supports arranged in such a way that the centre of the house is left free of posts and the hearth can be built there. From this we can assume that there was in the centre of the building a hearth and that it was a dwelling-house. The ethnological parallels show that it represents an advanced stage in the development of this group. In the prototype a single ring of roof supports is concentric with the outer wall. (In the long development of this group another line of evolution has branched off where the centre is also left free for the hearth by the roof supports, but in which the posts of the inner ring are not arranged concentric with the outer wall but in a pattern symmetrical to the main axis, through entrance and centre.) The maximum diameter of the prototype is limited by the possibility of bridging the span between the outer wall and the supports inside, and if houses with a bigger diameter have to be built, this technical difficulty is overcome by the addition of one or more concentric rings of posts. The house is enlarged by accretion, and the central area retains the original lay-out. At Scotstarvit one such ring has been added in order to get a house of a bigger diameter, and we have therefore the three elements: (1) outer wall, (2) middle wall and (3) inner ring. If by intrusion of another architectural element the entrance of the house of our group is derived from a porch and, as in our type, constructed as an entrance hall, ethnological parallels indicate that the intrusion of this element (4) is a feature common to houses with a floor sunk into the ground and with earthen roof. The excavation evidence had already brought us to the assumption that this was the case at Scotstarvit.

[1] A detailed study of the Scottish native pottery is still awaited, and there is no stratigraphical evidence for the exact dating of the native pottery at Traprain Law.

[2] F. Oelmann, *Haus und Hof im Altertum*, Berlin-Leipzig, 1927, p. 22.

For the evolution of the houses of this group we cite the following examples from the British Isles. The small prototype is known from Maiden Castle in two variants, with concentric roof supports around the hearth and unconcentric ones.[1] At Little Woodbury we have a slightly smaller variant than Scotstarvit of the enlarged type with concentric roof supports and with entrance hall.[2] There the inner ring is reduced to four posts set in a square equidistant from the middle ring. The Manx raths and the rath at Lissue, Co. Down,[3] are examples of the type where the house is so big that many more rings have been added as roof supports. These big houses share with Little Woodbury and Scotstarvit the entrance hall; and the floor level inside the house steps down in terraces to the central area around the hearth. As nothing of the floor at Little Woodbury is preserved, we do not know if that house too had floors at different levels. It may be that the drain *Dr b* indicates that such was the case.[4] So we possess a genetically well-established series for the evolution. The type with concentric roof supports can be traced back by the example of Little Woodbury and Maiden Castle to an Iron Age A–B context, whereas the type with no concentric roof supports around the hearth is known from Maiden Castle in an Iron Age C context.[5] We have not enough finds from Scotstarvit to state if this context with the Iron Age A–B civilisation of the south of England, suggested by the similarity of the house-type, has any significance for the cultural relations of the inhabitants of Scotstarvit enclosure.

The big houses, Little Woodbury like the Manx raths and Lissue, are definitely farmhouses, the homesteads of wealthy farmers. In Little Woodbury the main accent is laid on corn growing and in the raths on cattle raising. The Scotstarvit house with a diameter of 60 feet exceeds in size the bigger farmhouses of the Iron Age farmsteads in the south and west of England, which measure on the average about 45 feet in diameter. It is also bigger than the roundhouses in the hut villages and farms (enclosed or unenclosed) in Wales or in the north of England. It has the same dimensions as the smaller of the farmhouses of the rath, crannog, cashel type in Man, Ireland and Scotland, where all the buildings of a farm, dwelling-house, storage rooms, byres and so on, were under one roof. I think we are entitled to see in the Scotstarvit enclosure also, the homestead of a wealthy farmer, and there are no signs that the owner of the enclosure had any other occupation than farming. The big dwelling-house was surrounded by a solid wall

[1] R. E. M. Wheeler, *Maiden Castle, Dorset* (London, 1943). Site D, figs. 18–19, house DB, house DB 2. In house DB 2 there are also ovens belonging to different phases in a position like our fragmentary oven *d*, fig. 5.

[2] Little Woodbury, *P.P.S.*, vol. vi. (1940), p. 78.

[3] *U.J.A.*, vol. x (1947), p. 30; vol. xi (1948), p. 131.

[4] The incomplete ring at house II at Little Woodbury (*loc. cit.*, fig. 27) may be the remains of a similar partition or revetment.

[5] The farm ("concentric circle site") at Llyn du Bach, Penygroes, Caernarvonshire, reported in *Arch. Camb.*, has also a house with non-concentric roof supports.

(enclosure bank), which provided reasonable protection against wild animals and occasional robbers. This wall enclosed the farmyard, which was subdivided by solid fences (walls *m–q*) radiating from the farmhouse. As the enclosure could not be completely excavated, we do not know if there were other buildings besides the farmhouse inside the yard, but enough was uncovered to say that no other solid building of sizable dimensions could have stood there. We are certainly not dealing with a village-like community.

If cattle raising was the main occupation of the owner of Scotstarvit, a certain discrepancy arises from the fact that the big farmhouse takes up almost half of the enclosed area, and that the yard is not only relatively but absolutely rather small if it had to shelter the flocks of a wealthy man as indicated by the size of the farmhouse. If Scotstarvit were a summer homestead on a high level, no solid protection like our enclosure wall would be needed during the summer for all the flocks of a wealthy man, but it is situated at a low level where occupation during the winter is certain; and it is just in winter that room for sheltering cattle is a necessity. There are two alternative explanations: (*a*) either the homestead was only the residence of someone of high social standing who as overlord over other people was not directly concerned with his flocks, or (*b*) corn growing was the main occupation of the owner and so not so much space for cattle was needed. We still know too little about the social organisation of the Iron Age people in Scotland to say if alternative (*a*) is likely, but the fact that the fields surrounding the site are to-day first-class corn-growing land fits (*b*) well. Perhaps the size of the house was necessary in order to have room to store the grain inside the house in baskets in an upper floor over the central area. The substantial silo pits which were in use so commonly among corn-growers in the Iron Age in the south of England are unknown in Scotland.[1]

Any attempt to estimate the numbers of farms like Scotstarvit will always remain quite unreliable, as such sites are apt to be destroyed by modern agriculture without leaving any traces behind. We shall never learn how common these sites have been, and if we try to compare the number of these sites with those farms where more stones have been used and so have survived better, we will get only unconclusive results. Nevertheless the excavation at Scotstarvit has helped to show that the type of farm with one relatively big dwelling-house in a central position in a yard, whether the enclosure is round or rectilinear, represents an integral part in

[1] It may well be that the souterrains (the type with long narrow "segmented" chambers) are an equivalent for the souterrain silos in the farms of southern England. Their present-day condition is misleading. They were well suited for this purpose, and certainly quite dry when the surrounding area had been roofed over, as we supposed was the case in the raths. But there are no indications that there was a souterrain at Scotstarvit, and in none of the enclosed farm sites of the type of Scotstarvit is a souterrain known to have existed. So, unless we find the traces of special storage buildings above ground, the big house had to provide the storage room for grain (see fig. 9).

the social structure of the Iron Age civilisation of the British Isles. Defective as surface evidence admittedly is, reliable plans and detailed study of the terrain, coupled with experience obtained from excavated sites, reveal that many homesteads or settlement sites are originally farms of the Scotstarvit, Little Woodbury type or of the directly related variations, but with a complicated lay-out simply due either to the addition of other buildings during a long occupation, or to reoccupation with new buildings and even the construction of a new complete farm.[1] There may also exist cases where in a more specialised economy secondary permanent structures in the yard were from the start components of the farm, but I would think that homesteads with a number of circular buildings of relatively equal size arranged in a pattern like that near Pen y Bryn Uchaf, Llanwonda,[2] are offshoots of other lines of evolution than Little Woodbury or Scotstarvit.

The author is conscious that he has gone rather far in the interpretation of a badly preserved and not completely excavated site. He did so in order to touch some of the many problems involved in habitation sites, the social history of the Iron Age, and the correlation with habitation sites of knowledge gained from the typological study of implements and pottery. He hopes that he got some threads, but only future excavations will show if these threads can be woven into a solid fabric with the pattern of the historical and cultural perspective.

ACKNOWLEDGMENTS.

The St Andrews Branch of the League of Prehistorians has earned the thanks of those interested in the early history of Scotland because it intentionally refrained from excavating an impressive site of exceptional size but of only limited value. I do not want to conclude without thanking those who helped us to reach these results at Scotstarvit. A grant by the Carnegie Trust made the excavation possible. Permission to dig on the site was given by the owner, the late Colonel Black of Edenwood, and, it being a scheduled monument, by the Ministry of Works, which also gave permission to use Scotstarvit Tower as headquarters during the first campaign. The Secretaries of the League, Messrs T. B. Mitford and G. P. Henderson, not only organised everything splendidly for the not too easy task of a first

[1] The plans published in *Roy. Com. Anc. Mon., Westmorland* (London, 1936), provide a good illustration. There are simple sites like Scotstarvit, such as Howgill Fold, Warcop (Nr. 13, p. 239), Bampton-Towtop Kirk, Crosby Ravensworth (Nr. 73, p. 33), and Smardale Demesne Waitby, south settlement, southern enclosure of eastern group (Nr. 9, p. 234). The big site of Eweclose, Crosby Ravensworth shows in the enclosure in the north-west corner how a simple site has "disintegrated" by later additions to a complicated one (Nr. 25, p. 84). In one of the few completely excavated sites of our type, Milking Gap, Northumberland (*Arch. Æliana*, vol. xv. (1938), p. 334), the evidence of the soil is not conclusive for dividing up the different huts into different phases. The excavator, Kilbride-Jones, had already suggested that hut 2 is a later addition, and the plan strongly suggests that huts 4 and 5 and probably also hut 3, are not components of an original lay-out of an enclosure with one central hut (1) inside it.

[2] W. Hemp and C. Gresham, *Antiquity*, vol. xviii. (1944), p. 188, fig. 3.

excavation undertaken by the League, but also worked untiringly on the site itself. Professor and Mrs Stuart Piggott helped kindly with advice and actively on the site; and I am also obliged to Mr Cumming, Professor of Geography at St Andrews University, for valuable advice on the geology of the site. The common effort of the voluntary helpers, mostly students from St Andrews University, Messrs Henderson, Hooper, O'Mearon, Turner, provided an outstanding example of what can be done by voluntary labour in four weeks if real interest, as was the case here, gives inspiration to the work. The same applies to those helpers who could lend a hand only occasionally and took on themselves hard work, like Mr R. A. H. Farrar, Weymouth, and Mr Douglas, the headmaster of Bell Baxter School at Cupar, and his boys. But a special word of thanks is due to the ladies, to Mrs Roberta Sinkalska (during the fortnight in 1946) and to Mrs Henderson, who took in both years such excellent care of the well-being of everybody in the camps.

APPENDIX I.

Mr Stevenson reports on the finds as follows:—

The dozen and a half sherds of hand-made pottery from Scotstarvit are mostly very small.

From the hollow and hearth older than the structures comes a fragment with grey-black core containing grits, whose brick-red surface bears three close-set parallel whipped cord impressions. It appears to represent an Early Bronze Age food-vessel, or perhaps "Late Neolithic" Peterborough ware. Two featureless sherds stray on the site might belong to the same period; one is rather soapy to the touch.

Two rims of dark ware probably belong to the period of the structures. One, from a foundation trench of Phase II, curves inward to an uneven lip, and is of slightly sandy fabric with large grits. The other comes from the stone front of the outside bank. Its surface is rough and horizontally striated, the fabric being similar to that of the other rim but not markedly sandy. The rim is flattened with a hollow below the inner edge of the lip, and had been some $8\frac{1}{2}$ inches in exterior diameter. There is a sooty deposit on the inside. The other sherds are reddish, at least on their outer surface, usually thinner, and sandy with a dark core. The only one that requires further mention seems to bear a $\frac{1}{2}$-inch-wide cordon moulding; its fabric is slightly sandy, but contains large grits and is about $\frac{1}{2}$-inch thick. Only very tentative conclusions can be drawn from such scanty data. However, a similar mixture of sandy and non-sandy wares occurs at Traprain Law,[1] where the flattened and inturned rims and even the cordon would be in place. This suggests a contemporary date for Scotstarvit—in the earliest

[1] Childe, *Prehistory of Scotland*, p. 250.

centuries A.D. When, if ever, the sandy ware ousted completely the gritty ware which continued the Bronze Age cinerary urn tradition is still unknown.

The four pitchstone flakes found stray were all small, less than 1 inch long, and blade-like. They resembled the flakes of similar material found at Hedderwick, East Lothian,[1] and in Lauderdale. In the early hollow there was a small knife of grey flint, made from a hog-backed flake pointed at both ends, with the upper edges steeply retouched and the upper surface of one tip also worked (size $1{\cdot}55 \times {\cdot}4 \times {\cdot}25$ inch). Near the hollow was found a flake of rich red flint, with pronounced bulb of percussion, wanting the distal end. Its upper surface is the rough outside of the original pebble, except along one side where a narrow flake had been removed to form an edge which shows signs of use (size $1{\cdot}9 \times 1{\cdot}3 \times {\cdot}35$ inch). The only general account of pitchstone implements is that by Mr Mann.[2]

APPENDIX II.

The Assistant Director of the Geological Survey of Great Britain, Edinburgh, reports:—

I have examined under the microscope slices cut from the specimens. All the specimens are fragments of pitchstone, and strongly recall the well-known pitchstone of Arran. They contain the localised radial groups of large crystallites, fringed with arborescent growth of smaller crystallites, which are so characteristic of the Arran occurrences. They bear no resemblance to glassy andesites from the Ochil Hills area. I think it highly probable that Arran was the source of all the Scotstarvit flakes.

The dark, glassy-looking flake from cutting I is the most glassy rock. The glass contains extremely minute, evenly disseminated, embryo hair-like crystals (crystallites).

The greyish cherty-looking specimen from cutting V is a very similar pitchstone. The glassy groundmass is, however, slightly more devitrified owing to disseminated development of extremely minute hair-like embryo crystals (crystallites).

The greenish-grey flake from cutting IV, with glossy surfaces and more stony-looking interior, is also a pitchstone, but is very considerably devitrified and rather opaque owing to the development of minute hair-like embryo crystals, and also to the greater concentration of the larger embryo crystallites with arborescent growths. I do not know why the flake should have glossy surfaces and stony-looking interior.

[1] *P.S.A.S.*, vol. lxiii (1928–29), p. 35.
[2] *Ibid.*, vol. lii, pp. 140–9; see also *Prehistory of Scotland*, p. 30.