IV.

THE DEFENCES OF KAIMES HILL FORT, MIDLOTHIAN.

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As a condition of their consent to the destruction by quarrying of part of the scheduled monument at the west end of Kaimes Hill, the

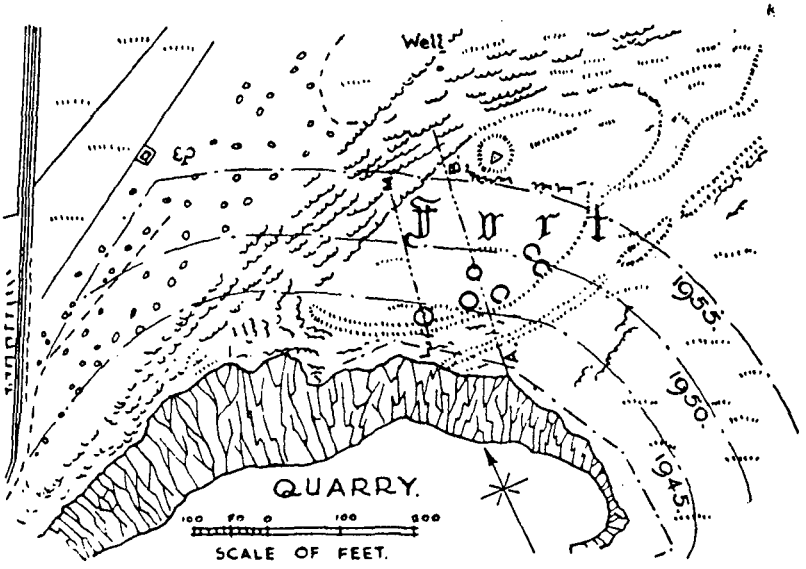

Fig. 1. West end of Kaimes Hill, showing areas scheduled for quarrying between 1940 and 1955, hut circles, and sections AB and LM.

Ancient Monuments Board stipulated that an archæological examination of the threatened works should be carried out and that the quarry should provide labour for this operation. The Board invited me to supervise

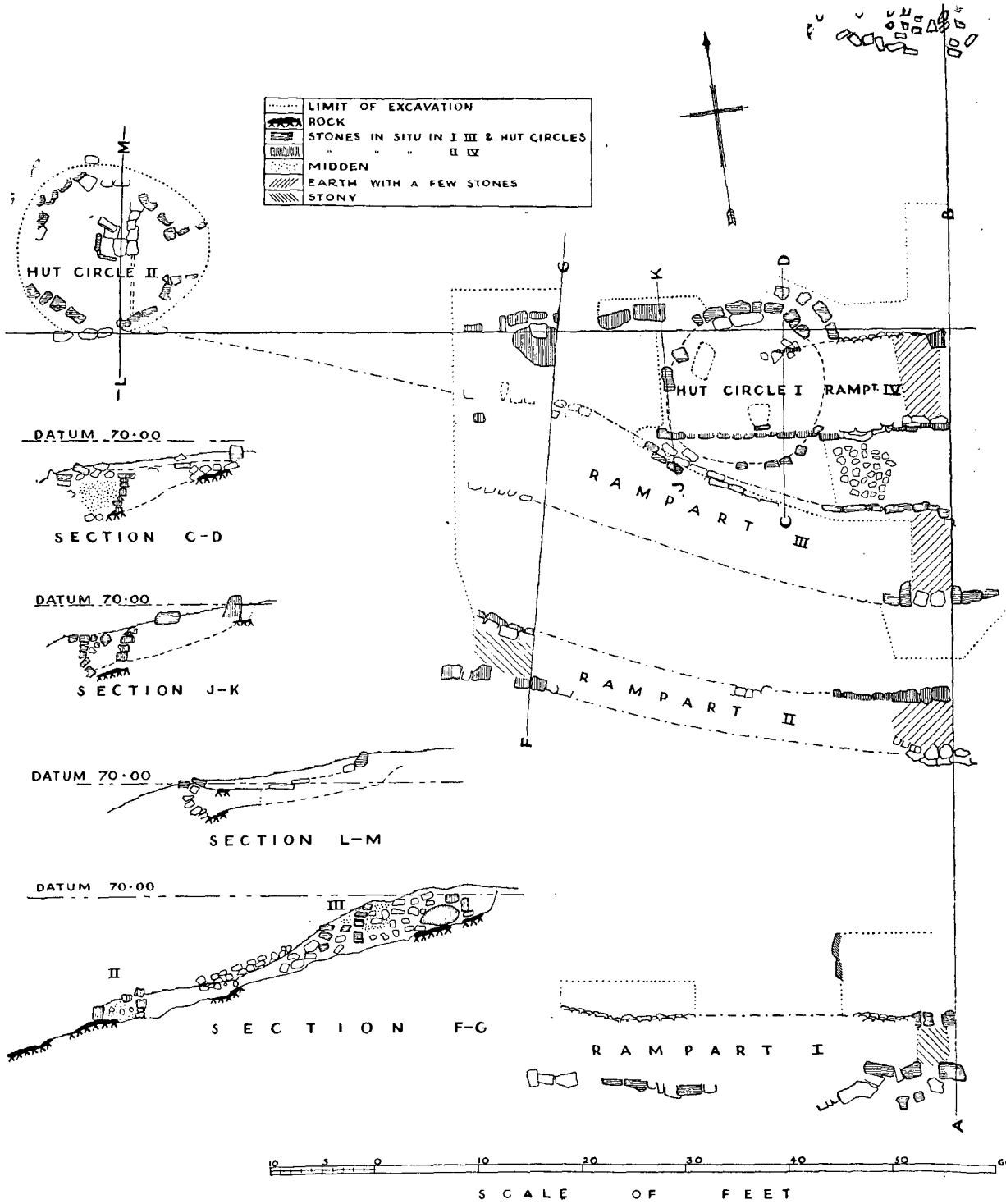

Fig. 2. Kaimes Hill. Plan and sections.

this work, which was carried out in June and July 1940. Under war conditions operations had to be restricted to determining the structure of the ramparts in the threatened area and their relations to one another and to the hut-circles which occur on or close to the apparent crest of the inner rampart. Two sections were accordingly cut through the ramparts, and the two most conspicuous circles in the doomed zone were examined. The first section, AB, cut all ramparts along a line selected to pass through a grassy hollow just within the lower rampart that looked like a hut-site; it eventually led to the exposure of two hitherto unrecognised lines of defence—Ramparts II and IV. An enlargement westward established the relation between Rampart IV and a hut-circle (No. 1). Section FG was chosen because a strip of the outer face of Rampart II, poorly preserved in Section AB, showed through the turf. Actually, when joined to Section AB, it gave us the intersection of Ramparts III and IV. Finally Section LM was designed to elucidate the structure of the best preserved of the hut-circles scheduled for demolition in the next five years, but gave in addition the relation of this typical circle to Rampart III (fig. 1).

The south face of the hill, which was alone affected, slopes up northward at an average rate of 3 in 10 and consists almost entirely of the native trap-rock, often bare, in patches covered with thin turf. The inclination is not really smooth, but is interrupted by a series of natural steps and terraces of which the builders of Ramparts II and IV in particular took advantage. Nor do the contours run quite smoothly east and west. Section AB happened to follow a very shallow gully along which the contours bend back northward.

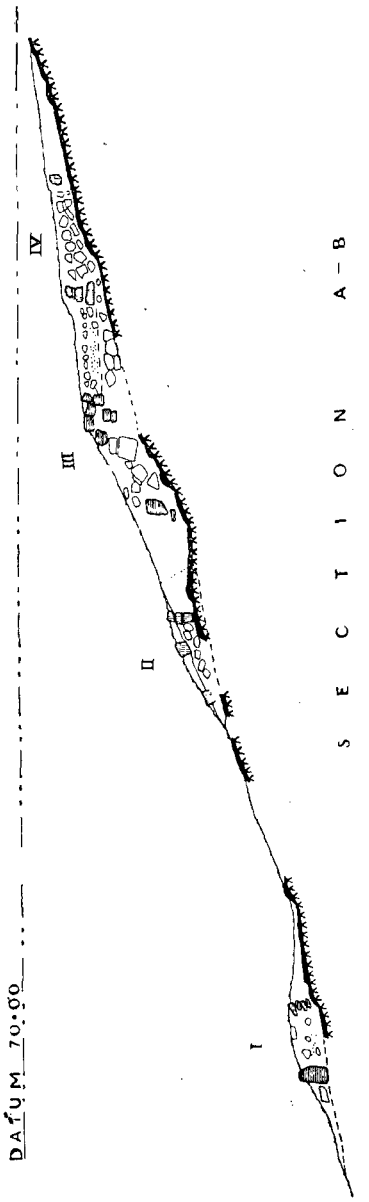

FIG. 3. Kaimes Hill. Main section across Ramparts.

When the hill is viewed in profile, Ramparts I and III conspicuously interrupt the smoothness of its curvature; Rampart II can be just discerned as a low hump east of Section AB (farther west it is masked by scree from III), but Rampart IV was not superficially visible anywhere. These ramparts represent at least two quite distinct defensive systems, but it will be convenient to number them in serial order, beginning with the lowest and outermost.

Rampart I is clearly visible all round the south and east of the hill and is duly marked on the O.S. maps as well as in the Royal Commission's plan [1]; in our area its crest lies between 47 and 49 feet above our datum.[2] It was cut through by our Section AB, and its outer and inner margins were exposed for distances of 25 and 28 feet respectively west of AB. The outer "face" is formed of large blocks ($1\frac{3}{4}$ feet long $\times 2\frac{1}{3}$ feet high $\times 1$ foot thick and $2\frac{1}{3}$ feet $\times 2\frac{1}{2}$ feet $\times 1\frac{2}{3}$ feet are typical dimensions) entirely devoid of any sort of dressing. These are generally set upright, but in places two blocks had been piled one on the top of the other (Pl. XIII) rather than built in courses (the stones in question measure respectively $2\frac{1}{2} \times 1 \times 1\frac{1}{3}$ feet and $1\frac{2}{3} \times 1 \times 1$ foot). The facing blocks do not usually rest on rock, and in no case could a prepared rock-cut bed be detected for them. Packing-stones or wedgers have been inserted under several of the facers, but many have fallen forward or slipped down the hill. Our section utilised the gap left by one such stone which was lying prostrate in front of the line of the face (fig. 2). An accumulation of blocks in front of the facers may be just due to such slipping and collapse, but may partly have been deliberately piled up to strengthen the face; the small upright stone, shown in front of the face in fig. 2, is thus planted very firmly on the rock as if it were meant to stand where it does.

This rude face retained a core of earth mixed with broken rock which seemed to have been piled up against it. To form an internal support for this core small stones had been packed against it, forming a "back face" devoid of any regularity of coursing but yet capable of standing 2 feet high on the line of section (Pl. XIII). The total width of the bank is thus a little over 6 feet. The bank can never have risen very much higher than at present and would hardly constitute a formidable military obstacle. It was most probably designed to support a palisade of stout posts driven into the rampart core. The sockets for such posts probably would not penetrate to the rock—indeed on the theory the whole point of the rampart was to avoid the quarrying of post-sockets. None were observed in the section. But the basalt exhibits a columnar structure, and grass-roots soon work down along its fracture-planes so that it would be possible to make plausible-looking post-holes even by hard brushing!

[1] *Inventory, Midlothian and West Lothian*, No. 216.
[2] An arbitrary base 114·8 feet below the hill summit's trig. station.

Rampart II appears a little east of AB, as an inconspicuous terrace or step below the crest of III and some 12 feet above Rampart I on the 59-foot contour (Pl. XX, just above end of staff). On line of section it was scarcely perceptible, and west thereof it is masked by the scree of stones fallen from Rampart III. Three stones in line projecting through the turf on the lower margin of this scree gave the position of its outer face where Section FG started (Pl. XIV); the blocks in question, dressed flat on the top and outer face, rest firmly on the rock and measure respectively $1\frac{1}{2} \times 1\frac{1}{4} \times 1$ foot, $1\frac{1}{2} \times 1\frac{1}{2} \times 1$ foot and $1\frac{3}{4} \times \frac{3}{4} \times 1\frac{2}{3}$ feet. AB was traversed by two lines of stones either of which might represent the outer face (fig. 2), but there are many loose stones both within and without these lines protruding through the thin turf or resting precariously upon the sloping rock.

In Section FG $5\frac{1}{2}$ feet in from the outer face a fine inner face to Rampart II was discovered (Pl. XV). It still stands over 2 feet high and consists of two courses of medium-sized stones (*e.g.* $1\frac{2}{3} \times \frac{3}{4} \times 1$ foot and $1\frac{1}{4} \times \frac{3}{4} \times 1\frac{1}{4}$ feet), while a third course was represented by a stone 4 feet long (visible behind the staff in Pl. XIV) where it had fallen back outwards from the line of the face. The rampart's core consisted here of stones and earth and may, like Rampart I, have supported a palisade. In fact in the section a triangular hole, only 6 inches deep, was actually found in the rock, which is here flat; the hole may be natural but would serve to take the base of a post. The inner face was exposed in Section AB too, and was followed westward for 12 feet. Here, too, the face was fairly well preserved with two or even three courses in position and using stones as much as 3 feet long.

Against the inner face of Rampart II there was an accumulation of black soil 1 to 2 feet deep, relatively free from stones, but, in Section AB, containing burnt animal bones. Larger stones that may have fallen from the top of Rampart II lay above this deposit. In neither section did stones which could be derived from Rampart III lie against the face of II, though the debris comes down to and over the probable line of the face.

Rampart IV must be described before III as its construction is clearer and its presence has to some extent modified the lay-out of the later rampart. Its front face stands in Section AB some 25 feet back from the inner margin of Rampart II upon a terrace of rock on the 63–64-foot contours. It was preserved to a height of $3\frac{1}{3}$ feet in places and was traced westward from AB for $28\frac{1}{4}$ feet, but the preserved height diminishes in this direction as the level of the rock terrace rises as if the top of IV had been levelled off. The face is mostly built with flat slabs having straight outer edges, nicely coursed throughout and standing with a batter of 1 in $3\frac{1}{4}$ (Pl. XVI; fig. 2, CD, JK). Wedging-stones have sometimes been inserted under

the foundation course in which large blocks are frequently used. These do not always stand on the rock, but often on what is presumably the soil covering the rock when the rampart was built.

The coursed face supports a rubble core consisting of angular blocks mixed with earth, extending northward for 10 feet on line AB. At this point the rubble filling terminates abruptly in a very rough face, resembling the inner face of Rampart I, north of which there were hardly any stones, though there was an accumulation of 2 feet of soil under the turf (Pl. XVII). In Section FG, however, Rampart IV was faced internally with slabs and blocks on edge (Pl. XVIII). Between FG and AB the line of this face is continued eastward by two very large blocks on edge projecting through the turf; the biggest measures $2\frac{2}{3}$ feet high, 3 feet long and over $1\frac{3}{4}$ feet thick at its base. Three slabs, now forming the north wall of hut-circle 1, seem to have been displaced from facing the older rampart on the same line a little farther east. Finally, a large slab, now lying on the turf and seen in the foreground in Pl. XVII, had probably once stood erect on the same line against the irregular wall which now delimits Rampart IV just west of AB.

In Section FG an enormous boulder measuring over $4 \times 3\frac{1}{2} \times 2$ feet had been incorporated in the core of Rampart IV (fig. 2). Between this boulder and the facing slab shown on the left in Pl. XVIII was a space over 6 inches wide filled only with black earth free from any stones, and at its base the rock dipped steeply as if quarried. So the masonry Rampart IV, too, may have been reinforced near its inner margin by a timber breastwork.

Hut-circle 2 is built right over the line of Rampart IV, the northern margin of which can be seen disappearing under the circle wall in Pl. XVII. Stones from the north face have been displaced to form the circle wall, while its floor is just the stump of the rampart core. There is thus no doubt that Rampart IV had gone out of use before the hut-circle was built. It had in fact been long previously replaced by Rampart III, to make room for which the older work had been partly demolished. Twenty-eight feet from AB the outer face of Rampart IV stops abruptly to make room for Rampart III (Pl. XXI). In Section FG only one stone that might have belonged to the foundation of IV could be detected. The inner face still survived in the eastern part of this section, but seems already disturbed on the west (Pl. XVIII, right). In Section LM instead of the inner face of IV we encountered on its line the collapsed Rampart III. This rampart is accordingly later than IV.

Rampart III, whose ruins now form the most conspicuous feature on the western part of Kaimes Hill, follows a quite different line from Ramparts II and IV and is constructed on different principles. Unfortunately these did not make for permanence, and the work is in such a ruinous condition that its line and structure are not easy to define. In Section AB

we were exceptionally fortunate in finding the foundation of the outer face in position 8 feet from the back of Rampart II and preserved over a distance of nearly 12 feet (Pl. XIX). At both ends of this strip the foundation blocks had slipped, and no corresponding face remained in position in the 10-foot wide Section FG.

The basal course of the rampart face in AB consists of quarried blocks, squared in front and on top, of lengths $2\frac{3}{4}$, 1, $2\frac{1}{2}$, and $1\frac{1}{2}$ feet and heights 1, $2\frac{1}{4}$, $1\frac{1}{2}$, and $1\frac{1}{3}$ feet. Three are lying horizontally, but the second is set on edge, being $2\frac{1}{4}$ feet deep (fig. 3). Only one block was resting directly on a boss of rock, the rest on soil generally with wedging-stones under them. No further courses of masonry rest in position upon this foundation. Hardly any stones, fallen outwards, were found outside, *i.e.* south of, the line of face just described. But above and behind it was a stony slope on line AB culminating 7 feet above its base and 8 feet behind it in a crest of stones projecting through the turf (Pl. XX), which can be followed all round the western part of the hill.

In Section AB the slope was found to be formed of an accumulation of stones, mostly 1 foot cube or larger, lying in disorder with much earth between them against the rock which rises in steps 3 feet (from 57·5 to 60·5) in the 8 feet of section (figs. 2, 3). The stones definitely gave the impression of having fallen back inwards from one or more faces in which they had once formed southward-fronting courses. But no foundations for an inner wall were discoverable in the chaos.

Above and north of the rampart crest the unexcavated slope flattens out so that the rampart seems to support an almost level terrace or platform. On the line of Section AB the edge of this terrace is 10 feet south of Rampart IV, but farther west it converges upon the latter, actually crossing the line of its outer face some 20 feet from AB. On line AB and for some 15 feet west thereof the space between the crest and the outer face of Rampart IV was relatively free from stones save for a superficial layer just under turf in the area of hut-circle 1. It is filled with a deposit of soft black earth containing broken bones and teeth of sheep and small ox, in fact a sort of midden deposit. It is upon this deposit that hut-circle 1 rests in so far as it projects south of the edge of Rampart IV.

Removing the loose midden, beginning at the face of IV, we found stones increasingly numerous as we approached the crest of III, and at the crest-line the stones would in fact stand upright in a sort of breastwork, 2 to 3 feet high (Pl. XXI, left). In part of this area we exposed at the base of Rampart IV and roughly level with the rock terrace on which this stands a well-made pavement in and under the midden deposit (Pl. XVI). There was a layer of midden under the pavement, and below

that angular blocks mixed with reddish soil. No hearth or other structures were found on this pavement, and the breastwork cannot be said to stand upon it since paving and midden extend right under it to come out on the stony slope south of the crest.

The breastwork is clearly not an "inner face" to Rampart III. The component stones are not laid in courses but are resting at all angles, and there is midden between and under them. It is rather the result of the collapse of some structure which has simply fallen backward on to an already existing accumulation of midden in such a way that its topmost courses have fallen furthest northwards and become embedded in the midden (fig. 2, J–K). Nevertheless this "breastwork" can be followed westward to Section FG and beyond. Some 17½ feet west of AB the topmost stones that have slipped backwards from the crest are resting partly as usual on midden but partly against the disturbed upper courses of Rampart IV's south face. Eighteen feet from AB Rampart IV breaks off altogether, its line being occupied with loose stones and midden material till at 20 feet distance the stony "breastwork" itself actually crosses the line of Rampart IV to reappear in Section FG (Pl. XXI).

This latter section cuts Rampart III after it has joined and destroyed the older rampart's southern face. The whole slope of the hill behind the inner face of Rampart II was covered with a scree of loose stones presumably cleared off from Rampart III. But large stones resting on virgin soil were first encountered 12 feet north of the inner face of II when the rock was already 2 feet higher than under that rampart. Though none of the stones uncovered here was firmly planted nor supported any building, it is likely from the general plan that the face of III should have stood about this line. Behind it the accumulation of large stones above the sloping rock increased in depth till at 16 feet from II the pile of stones would stand in a vertical face fully 2 feet high, but all lay at different angles with much earth between them (fig. 2). Nowhere was any building found, but the ruin of Rampart III reached its crest on line FG 21 feet from II in a ridge of stones projecting through the turf that carries on the line of the breastwork already described. Beneath it and to the south, too, broken bones and midden material were mixed with the stones. Viewed from the side the whole mess, including the breastwork, again gives the impression of having fallen backwards—on the south-west of the section, obviously over the isolated block left over from the face of IV, on the east partly against the huge boulder belonging to the core of Rampart IV.

Finally, in Section LM we again encountered the breastwork under the wall of hut-circle 2 (fig. 2). Here it had crossed the line of the inner face of IV too, which was here totally missing. It possesses the familiar lack of structure (*cf.* p. 53).

These observations prove that Rampart III was built after Rampart IV. It differed so radically in structure from the latter that it could not just override or incorporate its face when the two structures coincided. The older work had rather to be removed bodily to make room for the new construction. This must have been lofty enough to support the platform on which hut-circle 1 was subsequently erected. The retaining wall of this platform must have risen at least 9 feet above the wall base exposed in Section AB, and probably a couple of feet higher since some of the stones embedded on the midden against the inner edge of the "breastwork" had apparently once stood upon it. Neither the shallow scree excavated in FG nor the few stones outside the face in AB would suffice to build a wall of anything like this height. The face of the terrace must then for the most part be represented by the stones found behind the line of face which we have already described as having fallen backwards on account of their observed inclination.

Now, though the quantities of stones and earth removed from behind the line of face in both cuts were really substantial, the large blocks surviving would not suffice for much more than a single face of the requisite elevation; at best two parallel faces or stages might have been built with them. In no case was material available to represent a compact rubble core like that of Rampart IV, nor, even allowing for loss by erosion, was the intercalated earth sufficient to make up the defect. The simplest explanation for these deficiencies seems to be to postulate rows of vertical posts backing up the assumed masonry face and horizontal beams tying it, not into a parallel inner face as in an ordinary Gallic wall, but rather into the sloping face of the hill itself. This stone and timber wall could then have supported the platform of made earth—midden and broken stones—that still survives behind the so-called breastwork. The latter would of course be just the result of the hypothetical face's collapse backward upon the platform core as the tie-beams and uprights decayed. Owing to the nature of the rock, the sockets, if any, for the timbers could not be detected. Dr G. Bersu has, however, described to me forts constructed on the above plan on the Continent, such as the Hradišt of Stradonice near Praha, and when he inspected Kaimes Hill with me in 1938 was impressed by the similarity of its appearance to that of the Continental forts in question.

Hut-circles.—Two hut-circles, standing on the platform formed by Rampart III, were visible in the threatened area and were explored. Circle 1, 12 to 25 feet west of AB, stands as already stated largely on the stump of Rampart IV. The northern segment of its wall is in good condition and is formed partly of stones originally belonging to the inner face of Rampart IV. The six best stones, beginning on the east, measure respectively:

(1)	1 foot 6 inches broad	by 1 foot 5 inches high	by 1 foot 2 inches thick.
(2)	1 ,, 3 ,, ,,	1 ,, 5 ,, ,,	1 ,, 1 inch ,,
(3)	1 ,, 3 ,, ,,	1 ,, 1 inch ,,	1 ,, 2 inches ,,
(5)	2 feet 5 ,, ,,	1 ,, 5 inches ,,	1 ,, 0 ,, ,,
(6)	1 foot 8 ,, ,,	1 ,, 6 ,, ,,	1 foot 1 inch ,,
(7)	0 ,, 7 ,, ,,	1 ,, 2 ,, ,,	1 ,, 0 inches ,,

The first three stand nearly vertical with wedging-stones under them; they rest on a layer of earth and rubble, the core of Rampart IV, going down 18 inches to the rock. Stone 4 has been split by weathering. Stones 5 and 6, which have been shifted just off the line of the inner face of Rampart IV, have both tilted forward on their bases into the interior of the hut. The outer wall was just a packing of earth and boulders against the internal uprights (Pl. XVII). Stone 7 might, on the analogy of Circle 2, be one jamb of the door. Next to it is a prostrate slab, the original position of which could not be precisely determined.

South and west of these stones it was not easy among many stones, projecting through or just covered by the turf, to distinguish those defining the hut from those belonging to Ramparts III and IV. The somewhat arbitrary selection made gives the circle a diameter of 14 to 15 feet. The floor level was given by the bases of the north wall slabs and by a few vestiges of paving, particularly slab O. For the rest the floor had been completely destroyed by grass roots, and deturfing revealed immediately under the sod merely a bed of angular stones lying at all angles. No hearth survived. A large prostrate slab (Pl. XVII, centre), found partly bare of turf a little south of the supposed centre, had once stood upright in a socket recognisable among the stones right on the line of Rampart IV's south face and might have formed a fire-back. The stony substructure of the hut floor extended beyond the southern edge of Rampart IV to the crest of Rampart III, but it was impossible to distinguish with confidence the hut's boundary and substructure from the stones fallen inwards from Rampart III.

Hut-circle 2, situated 76 to 90 feet west of AB, was better preserved than No. 1. The stones of the wall indeed are less substantial than those forming the north wall of Circle 1, but a sufficient number could be recognised to define a circle 12 to 14 feet in diameter. The northern half of the circle had been paved, largely with small thin slabs that had been split and displaced by grass roots. The floor, thus defined, slopes down north to south at least 1 in 6 feet. In the southern half of the circle hardly any paving survived and the floor level had to be defined by the bases of the boundary slabs.

Near the centre two kerbs, set at right angles, and each about 2 feet long, define a paved area, presumably the hearth (Pl. XXIII). The flat slab

found resting upon the western kerb (Pl. XXIII) may have stood upright to form a fire-back on the north. To the north and north-west were vague suggestions of a bench or daïs—note particularly the horizontal slab in front of the wall shown in Pl. XXII, upper left. East of the hearth four solid slabs served as lintels to a drain (Pl. XXII). Under these slabs the channel was found empty but not lined with stones. It runs north and south almost parallel to line of Section LM. South of the hearth only a few lintels survived, but the exit of the channel through the southern wall was quite clear and is visible in Pl. XXIII.

On the east of the circle a gap, 3¼ feet wide, marked the site of the doorway. The northern cheeks of the entrance passage were traceable for a distance of 4 feet (Pl. XXIII), but the paving had gone. On the south the stones had been so badly disturbed by rabbits and nettle roots that the line of the passage wall was doubtful. The stones of the south wall of Circle 2 abut against or mingle with others which, diverging from them, connect up with the crest of Rampart III exposed in Section FG, and carry on the same line westward from Section LM. The arrangement gives the impression that the rampart crest was already very much in its present condition when the hut was built.

This impression was confirmed by a trench dug along line ML southward through the unpaved portion of the hut-circle. Below the assumed floor level there was, 18 inches south of the hearth, a deposit of black soil practically free from stones extending downwards 2 feet to the solid rock. As we approached the rampart line, however, stones became increasingly common, and just below the circle wall they were sufficiently numerous and close together to stand more or less vertical like the "breastwork" in Sections AB, CD, and JK (fig. 2). But in no case did they constitute a wall like the inner face of Rampart IV in FG or even AB. Under and among the stones some 5 feet south of the hearth began a bed of soil similar in texture to the "midden" of Section AB–CD and, like it, containing animal bones, but here red in colour (? peat-ash). It extended southward among the closely packed stones right into the heart of the collapsed rampart, 2 feet beyond the false face just described. It is therefore clear that here too the accumulation of stones, just as in Section AB, has fallen back upon a pre-existing artificial deposit. But in Section LM it was abundantly clear that the collapse had taken place before the construction of the hut-circle. For the latter rests upon the fallen stones, none of which has fallen into or lies upon the hut floor.

Conclusions.

This emergency excavation, confined to an intrinsically unpromising area, has allowed the recognition of three phases of human occupation

on Kaimes Hill. The first is represented by Rampart IV, a stone-faced wall with rubble core 10 feet thick, with which may plausibly be connected the outwork termed Rampart II, a stone-faced bank that may have supported a palisade. This system was replaced by the terrace construction termed Rampart III, whose stone and timber revetment followed a different line from Rampart IV but cut across it, whereupon the older work was destroyed to make room for it. Rampart I may belong to the same system, and was in any case almost certainly standing at the same time as Rampart III. Finally, when the revetment of Rampart III had collapsed, hut-circles were built upon its now sloping terrace, which provided the most nearly level foundation available on the southern flank of the hill. East of the area scheduled for immediate destruction, and therefore unexamined, is a hut-circle that seems to stand upon Rampart I as Circle 2 stood upon III.

Unfortunately no relics were recovered to date any of these occupations. Only a shapeless crumb of poorly made pottery was discovered. Half a dozen carefully rounded sling-balls were found in the midden both inside and outside the breastwork formed by III's collapse. From the same deposit came bones and teeth of young ox and small sheep (identified by Miss M. I. Platt of the Royal Scottish Museum). Several hammer stones were picked up, one against the inner face of Rampart IV in Section AB. Slag was found beneath the floor level of Hut-circle 1, at the base of the midden deposit outside Rampart IV near the intersection with III and at the base of Rampart III in Section AB, probably connected with the occupation noted here against the inner face of Rampart II. Finally, just inside Rampart I a very much corroded iron arrow-head of Roman or Romano-Caledonian pattern was recovered. More numerous and helpful relics are of course to be expected from the more sheltered and less steeply sloping areas farther east.

1. Rampart I, outer face.

2. Rampart I, "inner face."

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Rampart II, outer face.

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Rampart II, inner face.

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Outer face of Rampart IV on AB.

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Back of Rampart IV and Hut-circle 1.

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Rampart IV, inner face in FG.

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Rampart III, face in AB.

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Debris of Rampart III.

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Back of Rampart III and end of IV.

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Hut-circle 2 looking north-west.

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Hut-circle 2 looking south-east.

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