

II. ACCOUNT OF THE EXCAVATIONS AT BIRRENSWARK, AND DESCRIPTION OF THE PLANS AND SECTIONS. BY JAMES BARBOUR, ARCHITECT, F.S.A. SCOT. (PLATES III.-VIII.)

Birrenswark Hill, in the parish of Hoddam, lies three miles north of the Roman station of Birrens, and ten as the crow flies from the end of Hadrian's Wall, at Bowness, in Cumberland. Its base is about 700 feet above sea level, and the summit rises to an altitude of about 920 feet, the highest point reaching 939 (Plate IV.). The hill is isolated, its sides are steep and at places precipitous, and the summit is a nearly level plateau. Owing to the peculiarity of configuration and commanding position, it forms a conspicuous and remarkable feature of the landscape; and the summit affords extensive prospects of the country in all directions, the English hills, the Solway, Bowness, and Birrens being within view and a number of Scottish counties overlooked.

At a place like this it is not surprising that evidences should be found of military occupation; and the remains of artificial works of this description, grouped about the hill, are not less unique than the hill itself.

The remains, as will be seen by referring to the accompanying plan (Plate III.), consist of a number of works lying round the base of the hill, and of others on the hilltop. Of the first are a large camp of rectangular type on the south side of the hill; another of similar character, but smaller, on the north side; remains of an entrenched roadway, AB, at the east end, for communication between these; a small fort, C, at the west end of the hill; and an enclosure, D, at the east end; also the minor adjuncts, E and F, on the plan.

The south camp contains a small rectangular redoubt, G, at the north-east corner, and a circular work, H, at the west end.

A circumvallation likewise extended apparently round the base of the hill on the east and south, one end joining the north camp, and the other

the west fort. It is yet continuous from the north camp to the east enclosure ; between the east enclosure and the south camp, where the site is partly under cultivation, only a fragment, K, is left ; west of the south camp the line is again traceable some way, L, and at its junction with the west fort. These, together with the north and south camps, would embrace two-thirds of the circuit of the hill. Over the remaining one-third there is no trace of entrenchment, and such would hardly be required. The hill there is skirted by land still marshy, although elaborately drained, which would, there is little doubt, be impassable formerly, and the ascent which starts out of it is steep and difficult to climb. In this way the marsh and artificial works together would entirely circumvallate the hill.

In the middle of these works rises the elliptical truncated cone of the hill, the top of which is a large fort, shaped after the outline of the plateau. The west end of the fort is cut off by a transverse rampart so as to form a pear-shaped enclosure, M, within which, towards the west, is a small fortlet, N.

It is a circumstance to be noted that the three larger works are each environed with fortifications provided with gateways on the several sides, and are independently complete and defensible.

With the view of throwing light on vestiges so extensive and apparently important, the Council of the Society of Antiquaries resolved to institute exploratory excavations, and accordingly operations were begun on 20th June last. Three workmen were employed, and sometimes four, under the superintendence of Mr Alexander Mackie, as Clerk of Works ; and after three months' labour the investigation had been carried through and was brought to a close.

Obviously, in this case, the excavations must bear an exceedingly small proportion compared with the extent of the surfaces presented for examination. The south camp covers over 13 acres ; the area of the north camp is nearly 8 acres ; the hilltop fort measures 17 acres ; and the total area within the circumvallation would extend to not less than 100 acres. The ground actually turned over in the course of carrying out

the exploratory operations, on the other hand, little exceeds an acre in extent. One inference to be drawn is, that the seemingly rather sparse collection of relics recovered must be multiplied many times to represent the volume of objects probably scattered over the unopened ground.

The excavations were directed chiefly to testing the accuracy of General Roy's plan and of the Ordnance map; ascertaining the character and structure of the ditches, ramparts, and gateways; and examining the interior areas for vestiges of work, and for evidences of occupation. The relation the several works bear one to another was also kept in view.

The following operations were conducted:—Sections were made through the entrenchments at a number of places; several of the gateways were excavated, and trenches were cut longitudinally and across the interiors of the enclosures. The interior of the redoubt in the north-east corner of the south camp was wholly uncovered of earth, and in the centre of the camp a considerable extent of ground was opened in making search for a prætorium.

In proceeding to examine the several works in detail, according to the evidence afforded by the exploratory excavations, the nature of the site may be first alluded to. According to the Ordnance Geological Map the rock formation at the base and sides of the hill is Old Red Sandstone, and at the plateau top it is porphyrite. While at the hilltop the rock is harder, it also lies for the most part at the surface or nearly so, and the depth of soil increases gradually lower down. It is suggested that the formation described and other conditions to be noticed in due course may have imposed some of the irregularities of the plan, and variations in the design of entrenchment, which the encampments exhibit; and the constructive methods discovered, wherein stone is largely applied, were probably influenced through the abundance of such material to be readily got by quarrying on the spot.

THE SOUTH CAMP.

This camp, apparently the most important of those at the foot of the hill, lies at its south base. Its surface is slightly undulatory, and steeper at some places towards the north, and according to section X.Y. (Plate IV.) the altitude rises about 70 feet between one side and the other.

The Ground Plan (Plate III.).—The outline of the ground plan may be described as a distorted rectangle, having the sides approximately rectilinear. Some of the divergences from geometrical form of outline exhibited seem, as before suggested, to have resulted from practical considerations, as, for instance, at the south and east sides, where the rampart follows an abrupt elevation of the ground. The south line is straight but for a slight deflection northwards at the west end, and the east side runs in an even course up to its junction with the redoubt; the angle, however, at the south-east corner of the camp, is acute. The north boundary, so far as the line lies between the two outmost gateways, is also straight, but beyond these points it deflects southwards, slightly to the west, and markedly towards the east. The west defence is pushed forward at the centre, forming a knee, from which on either side it runs in a straight line to join the north-west and south-west corners of the camp respectively; and the deflection is just sufficient to admit the small circular work, H, within the camp without impinging on the rectangle of the area, as it might be defined by a straight line drawn from the extremities at the rear of the rampart. That this is not accidental is further evidenced by the way in which the circular work fits in with the side of the street and with the rampart, which shows a perceptible shoulder concentric with its circumference. All the corners of the camp are rounded.

The dimensions over all, including the redoubt, are:—On the south, 900 feet; on the north, 850 feet; on the east, 600 feet; and on the west, 700 feet; average length, taking into account the forward bend at the west, 900 feet; and width, 670 feet. The interior length extends approximately to 840 feet, and the width to 580 feet.

Three entrances give access to the camp from the north, the centre one

being about 50 feet wide, the others 35 feet. Each is guarded by a quasi-circular mound or tower, about 60 feet in diameter at the base. These mounds are known locally as "The Three Brethren." The interspaces, it should be noticed, are equal, evidencing that the work was not set out without line and measure. Central gateways occur also at the south, the east, and the west, each guarded by a traverse, but of oval form.

The redoubt, G (see fig. 8), is rectangular, with rounded corners; and an unprotected gateway at the south gives entrance to it from within the camp. The interior dimensions are :—from north to south about 100 feet, and 70 feet from east to west. The work shows a want of alignment with the camp, which, together with other indications of severance, suggests a possible difference of epoch in relation to the main work.

Within the redoubt again is a small square enclosure, lying diagonally in the centre. It measures about 30 feet each way, and the likelihood seems to be that it was superimposed on the original work at a subsequent period. *Unlike the redoubt itself and the camp, it is disposed with true orientation.*

The small circular work, H, at the west end of the camp measures 80 feet in diameter, and shows an entrance about 10 feet wide towards the south.

The streets do not remain so definitely marked, except at the gateways, as to allow of the lines being traced with certainty on the plan. Doubtless they would traverse the camp from east to west and from north to south, in connection with the entrances, and there might be others.

It now only remains in connection with the plan to notice the water supply. The supply is derived from a fine spring known as "Agricola's Well," which rises about midway between the east and the west, and towards the north side of the camp. As a rill it flows in a small and slightly wimpling ravine southwards, and escapes through the south rampart at a point a few feet west of the south gate. Before reaching the rampart, however, it passes through a circular basin of some size, artificially made.

The Ditches.—The enceinte of the camp is of the common single ditch and rampart type. The ditch is V-shaped, with steep scarp and counterscarp, and at the north side of the camp, where the earth is of less depth, it dips at the bottom into the rock, or debris of rock, 2 feet or more (Plate V. fig. 1).

The rampart is earth-built and in layers. At the base is a bed of finer earth, about 9 inches thick, probably the original soil on the site with that from the area of the ditch added; over this a bed of clay, $1\frac{1}{2}$ to $3\frac{1}{2}$ inches thick, occurs, and above the clay the mound is carried up and brought to its full height with earth and debris, which increases in roundness of grain as it nears the crown, as if applied in the order it was cast from the ditch. Remains, but scanty, of brushwood bonding occur in the earth composing the rampart, and at two places charcoal was found at the base in some quantity.

Probably, as already suggested, the abundance of stone obtainable on the spot may have induced the builders to adopt methods not previously met with in the Society's excavations of insuring for their work the qualities of strength and endurance. Thus the front of the rampart, from the natural ground surface, or lower, upwards to the crest, was found to be faced with a pitching of stones (Plate V. fig. 1); and the ditch, at the north side of the camp at least, is also lipped with stones, and partially so faced on the counterscarp. The pitching of the rampart varies in the quality of material and workmanship, as if skilled and less skilled workmen were employed, and it is also more disturbed at some places than others. Where in best form and most perfect, the stones, which are flattish and unshaped, do not lie level on the bed, but slope, so that the lower edge of one overlaps the upper edge of another somewhat after the manner of slates on a roof.

At the rear of the rampart, where the ground was opened, a pavement, about 5 feet wide, was usually found, but at one point kerbing takes its place. Generally the pavement is of heavy material and good workmanship, but, as in the case of the pitching, the quality varies.

Allowing for diversities of the kind alluded to, these ramparts exhibit,

so far as opened, uniformity of structural detail. The turf was removed at one or more places on each of the several sides of the camp, and in every case stone pitching was disclosed. The sections cut in the rampart at the north side, and a partial cutting at the south, showed lamination similar in each case, but it was not observed at the west side.

In addition to the stone-work before described, a piece of an exceptional kind occurs. Four feet below the crest of the rampart, at the north side of the camp, there is a single stone, measuring $4\frac{1}{2}$ feet by $2\frac{1}{2}$ feet and 5 inches thick, as from the quarry, lying flat (Plate V. fig. 1). It is pierced with six holes under an inch in diameter, and running in a long slanting direction, in which were pieces of charcoal. The holes are apparently natural.

The fortifications of the redoubt at the north-east corner of the camp are of a different type, and consist of a ditch and double rampart (figs. 2, 3, 4), half the earth got from the ditch having been cast inwards and the other half outwards. There is a structural difference also, in so far as the stone pitching is absent. On the other hand, remains of lamination and brushwood, as previously described, are disclosed in both the front and rear ramparts.

Under the inner rampart of the redoubt, at the north (Plate V. fig. 4), is a layer of stones corresponding with those discovered in similar positions at Birrens and Ardoch. It measures 8 feet in breadth in the direction of crossing the rampart, but how far it extends lengthwise was not ascertained. It is of excellent workmanship, and remains in perfect order. The stones are well fitted, and bedded and cemented together with worked clay. There is also a layer of very thin stones at the base of the outer rampart, which is not indicated on the drawings.

The counterscarp of the ditch between the ramparts at the same point shows a kerbing at the lip of stones two courses high, and lower down there are three courses, the faces of which are splayed to suit the slope. The stones are bedded and jointed with clay.

The most important piece of masonry, however, in this connection consists of two parallel walls crossing the centre of the north rampart of the

redoubt (Plate VI. fig. 5). The walls flank a passage, 4 feet 8 inches wide, which is floored with a hard substance, like concrete. Each wall is 3 feet in thickness, and the remains rise at the highest point to 3 feet and extend 24 feet in length. The length northwards is complete, but at the south, where there is a collection of stone debris, the ends are broken off and imperfect. The walls are fairly built, and towards the passage the faces are finished with greater care. The position this structure occupies in the rampart and its passage-like form seem to mark it as a gateway originally, closed by subsequent alterations.

In regard to the dimensions of the fortifications described, those of the camp are larger at the north than elsewhere, partly resulting from the rearward fall of the site, but doubtless also of design, in order to equalise and adapt the defences in view of the opposing higher ground. The width on that side varies from 42 to 58 feet over all, but on the other sides, where the rampart is reared on a natural bank or on rising ground, it is contracted to from 30 to 35 feet. The double rampart of the redoubt and the intervening ditch together measure 48 feet across.

The ditch of the redoubt is much silted up, but the ramparts do not seem to be materially disturbed. The camp ditch is correspondingly silted, but the rampart, although disturbed more or less, continues for the most part in comparatively good form, and at the section (Plate V. fig. 1) it is apparently perfect, or nearly so, as the stone pitching of the face remains in order up to the crown.

The Gateways.—The east gateway of the camp was first examined, and the work consisted in excavating the traverse ditch and clearing away the earth from the rearward area. As disclosed, the entrance measures about 40 feet in width, and the roadway passing into the interior without depression at the ditch or rise at the rampart, has been surfaced with pavement of heavy stones (Plate VI. fig. 6), of which about one-half remain on the ground, but in a disturbed state. The oval traverse, measuring about 50 feet in length and rising 9 feet above the bottom of the ditch and 3 feet above the paved roadway, remains apparently of the height it was originally. It is pitched all round, like the front of the rampart of the camp, with

flat stones ; and the well-formed V-shaped ditch fronting and flanking the traverse, 7 feet in depth below the ground surface outside, is also partially faced in the same way.

The gateways at the west end and the south side of the camp are of similar design, and the partial clearing of the earth from the west one disclosed a roadway surfaced with pavement.

The three gateways of the north side of the camp, as previously stated, differ from those just described in so far as the protecting mounds are circular and of larger dimensions, being so designed, it is presumed, in order to adapt them to the particular circumstances of the situation.

With a view to investigate the centre one, the roadway and half the traverse ditch were cleared, and a section was carried from the south side half-way through the mound (Plate VI. fig. 7). The roadway, like those at the east and west, had been surfaced with pavement, of which however only a fragment remains. The traverse, or tower, which is built over a rough pavement, exhibits nothing special in the disposition of the earth composing it, but, like the oval traverses, it is stone pitched all round, and seems to be of the full original height. The ditch, which dips 2 feet into the rock, is also partially stone-faced. The mound rises 12 feet above the surface of the gateway, $10\frac{1}{2}$ above the bottom of the traverse ditch, and about 2 above the surface at the outside of the ditch.

Of the two others, the east one was excavated, and discovered to be similar to that just described, and the one on the west, so far as appears, also corresponds.

The Interior of the Camp, as disclosed by the excavations, appears to have been widely surfaced with pavements. The pieces, however, are in such a disturbed and imperfect state as to preclude inference regarding their purpose or meaning. Remains of stone-work exist also all along the margins of the rivulet ; the circular basin near the south of the camp, through which the water flows, is stone-faced in thin receding courses, and there are stone remains adjacent to where the rivulet passes through the rampart. But the most important vestiges of this description were discovered in the centre of the camp, and consist of walling, pavement,

and debris, evidently of large and important buildings, etc. (S). The traces were followed 180 feet in length from north to south, but both ends were broken off, and no idea of what the full length or the width might be could be obtained. A part of the front wall, which is sufficiently well defined, measures $2\frac{1}{2}$ feet in thickness, and 30 feet backwards is another marking of a wall of similar thickness. The remains lie on the east side of the main cross street, and 30 feet back from its centre; they block the main longitudinal street, and while not parallel with the former, the front lies at right angles with the latter. The position is very similar to that of the Prætorium at Birrens.

At the centre of the main cross street, and opposite the south end of the remains just described, there is a small fragment of stone-work (T) disposed as a segment of a circle, and measuring about 12 inches in thickness. It is mentioned in relation to another fragment of similar form in the redoubt to be presently noticed.

The interior of the redoubt (fig. 8) showed patches of pavement and a good deal of stone debris, as if the whole area had been so floored; possibly other purposes also may have been served. Two drains disclosed should be noted as resembling in construction one found within the hill-fort. One starts at the north of the area and runs eastwards a short way, and then southwards at the rear of the east rampart; and the other, starting at the same point, with a space of 18 inches of uncut earth between them, runs north-west, and falls into the ditch between the ramparts. The depth is about 4 feet, and the trench is filled with angular quarried stones of good size tumbled in. Towards the west of the area there is a group of four post-holes and the piece of stone-work of segmental form before alluded to, and at the north-east corner is another group of three post-holes. The holes are not sufficiently numerous to define the form of enclosure the posts may have served to support; but so far as they lend themselves in that direction, a circular plan 17 feet in diameter would best fit in with their disposition. The circumference of such a circle applied to the first group would describe the outer curve of the segment of stone-work, pass through three of the holes, and leave the

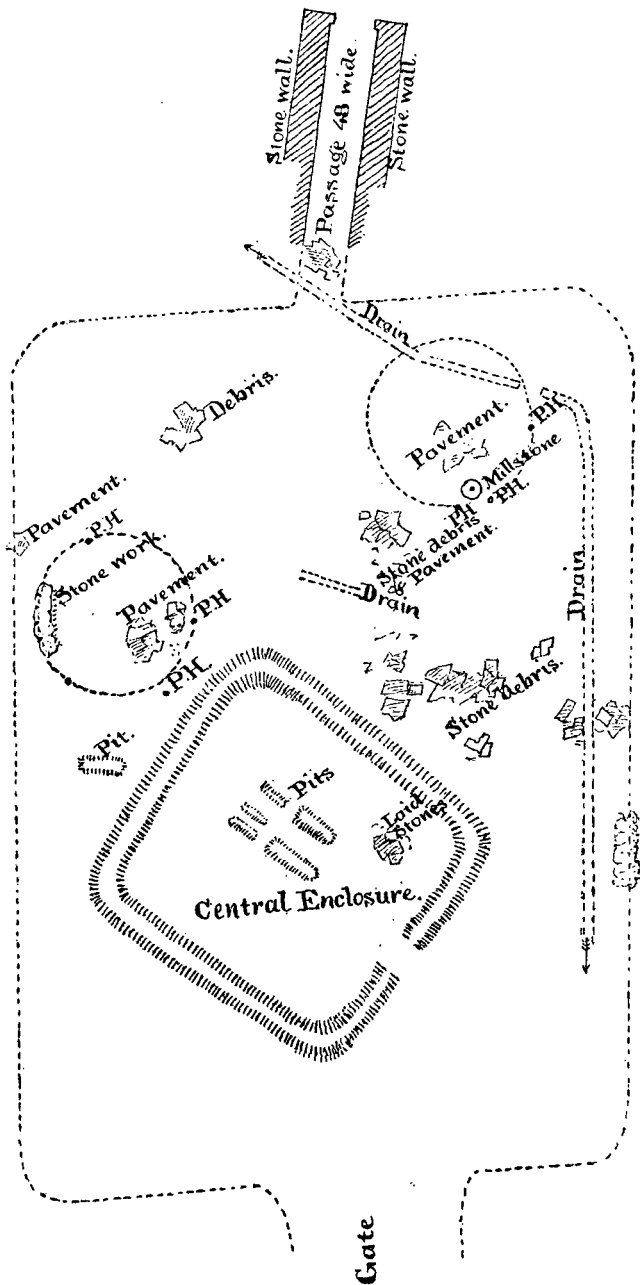


Fig. 8. Interior of Redoubt.

fourth outside at a distance of 1 foot, and applied to the last group the circle would pass through all the three post-holes. Within the area of the latter circle a granite under-millstone lies, apparently *in situ*, and near it are fragments as of the upper stone.

It remains in connection with the redoubt to notice a group of small pits, six in number; five are within the central enclosure, and one is outside. Of those within, two lie side by side with an interspace of 2 feet, and measure 5 feet 6 inches by 2 feet 3 inches, and 7 feet by 2 feet 3 inches respectively; the remaining three, which measure about 3 feet 6 inches by 1 foot 6 inches, lie immediately west of the two first, and all are disposed lengthwise, due east and west. The one outside the enclosure is similar to the two first described, but shows a little departure from the orientation. The pits, which are about 3 feet 6 inches deep, were filled with soft sandy earth sufficiently distinct from the surrounding till, and in one was a quantity of quarried stones.

The small circular enclosure (H) within the west end of the camp, when examined by cross-trenches, showed a hollowed and saucer-like interior, the deepest part of which reached the rock and appeared slightly sunk into it. A small mound of earth, dressed roughly on the face and rear with stones, surrounds the hollow, rising a little above the outside surface mostly, but at the north it is sunk so that the top falls below the level of the camp floor.

In closing the description of this camp, one or two of the more outstanding characteristics it exhibits may be recalled. In tracing out the ground plan, it seems to have been the design of the builders to utilise whatever advantages the site might afford with a view to securing the greatest strength at the least expenditure of labour, although involving some irregularity of outline. The defences, also, are varied in form and dimensions, and otherwise adjusted according to the particular circumstances obtaining at the several parts of the camp. At the north, where the opposing ground is high, they are larger than elsewhere, and the gate defences appear to be designed specially to meet the requirements of the situation. It is a characteristic that both scarp and counterscarp

are very steep; and in order apparently to sustain the built-up earth in such form, a pitching of stones is applied to the former, and partially, to the extent presumably found requisite, to the latter also.

The entrances are skilfully designed, so that approach to the interior can be had only through narrow openings on either side, flanked right and left by the rampart and the traverse; and the traverses, while rising but little above the opposing ground, together with the formidable ditches, seem effective barriers.

In regard to the degree of permanency characterising the camp, it has hitherto been classed as a temporary one. The structural details of the fortifications, as before described, do not, however, afford any support for this, but for the contrary view, and the large central buildings and extensive heavy pavements of the interior evidence intended occupation more or less prolonged.

Coming to the evidence of occupation, which is not plentiful, regard must be had to the very small proportion of the area examined, and to the probable disappearance of much in former times. At a point in the interior, opposite the buildings and on the other side of the rivulet, the earth showed abundant traces of charcoal, and more limited traces of it were met with at several other places. A millstone has already been mentioned as lying in the redoubt, where several small fragments of grey pottery, the bottom of a bronze vessel, a whetstone, a piece of slag, and a considerable quantity of iron in shapeless pieces, one of them attached to remains of an oak plank, were also recovered, as were likewise two stone balls, one of them in the east trench, and several leaden sling-bolts. Within the camp were recovered a number of these sling-bolts, ten in one group, others singly, one from the counterscarp of the north ditch, a number of stone balls, singly, an iron spear-head and fragments of another weapon, an iron axe-head and part of another, quantities of shapeless iron, slag, a bronze ring, half of a small stone disc, a bead, a worked flint flake, and a fragment of red pottery, horseshoe of iron, several whetstones, leaden whorl, and two fragments of glass or paste, probably bracelets. The relics will be more particularly described by Dr Anderson.

There has doubtless been occupation, but any idea of the probable duration cannot be inferred. The impression formed on the evidence revealed by the excavations is that a period which might be described as temporary would hardly satisfy the conditions; and there does not, on the other hand, seem to be any reason requiring the conclusion that the occupation was not of extended duration.

THE NORTH CAMP.

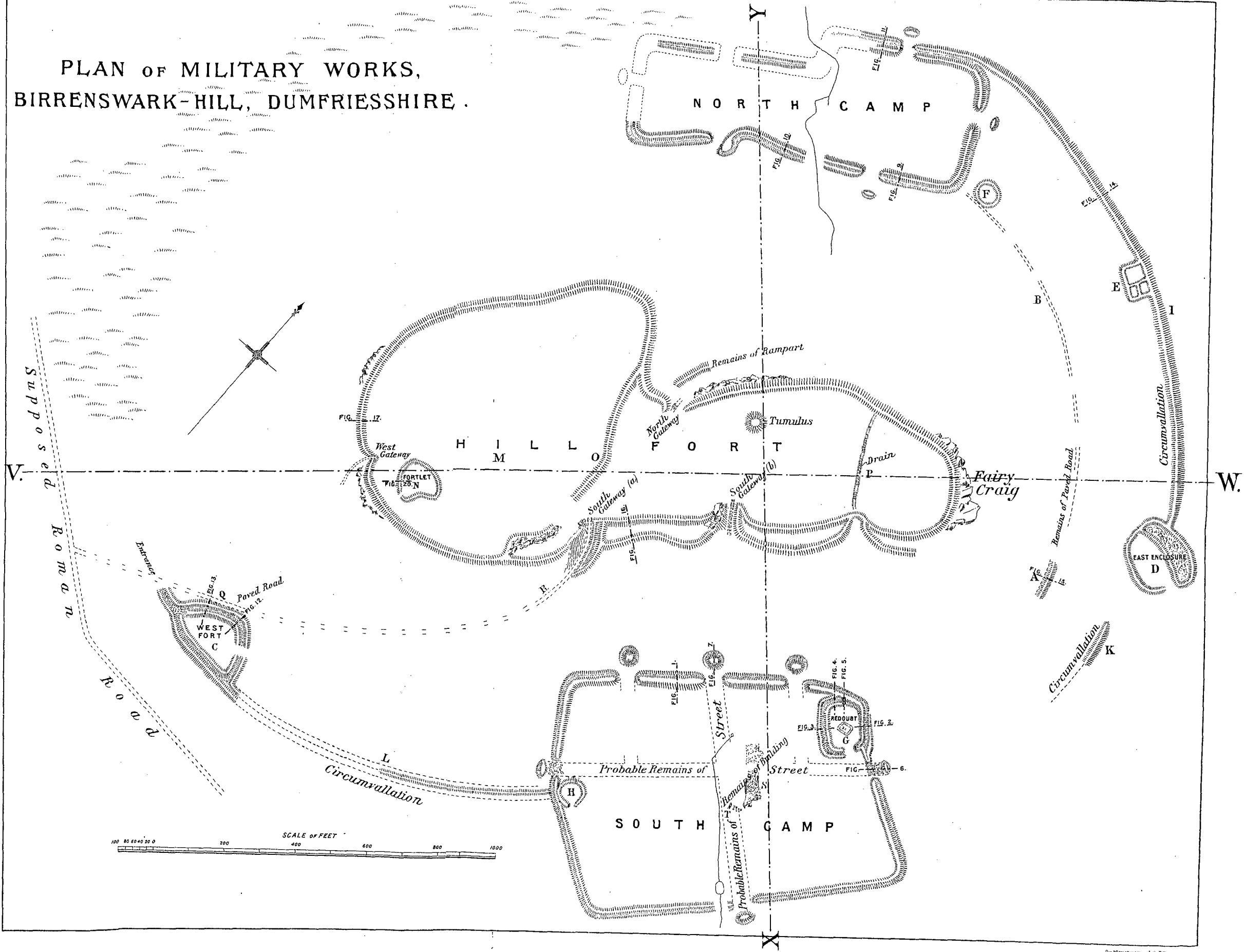
This camp, which lies at the north base of the hill, opposite and out of view of the south one, is partially destroyed, the entrenchments on the north and west sides being almost obliterated. On the south and east, however, they remain in good form, and short returns at the north and west serve to define the lengths of the sides. With the aid of these returns and the marks of the destroyed works remaining, the plan of the camp has been followed (Plate III.). While fairly rectangular, it presents several peculiarities. The line of the north side, starting from the north-east corner, runs westwards nearly half-way, where there is a southward set-off, diminishing the width of the westward area, and giving the appearance of two camps of ordinary proportions but different widths conjoined. The south side also shows a curious inward bend in connection with the west gateway there, which is also peculiar. From the south-west corner the line runs straight but with an inward slant until it reaches the gate, on the opposite side of which there is a corresponding slant, so that the gate recedes rearward, and the divergence is just sufficient to provide for the projection of the traverse, which in this instance is attached to the rampart.

The site has a slight inclination northwards, and part of the north side follows a natural bank, on which the rampart has been built.

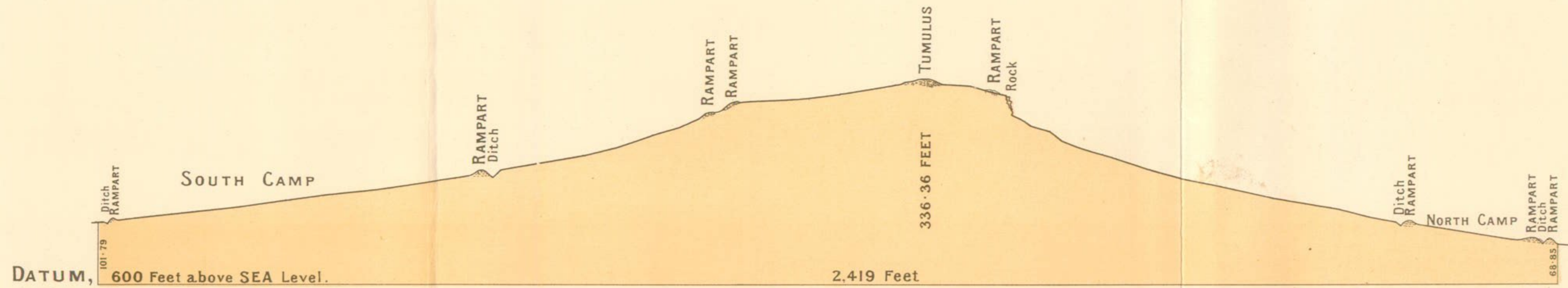
The dimensions over all are : length, 1000 feet ; width of east portion, 400 feet ; and of west part, 300 feet.

There are six gateways, one at the east and west respectively, and two at each side.

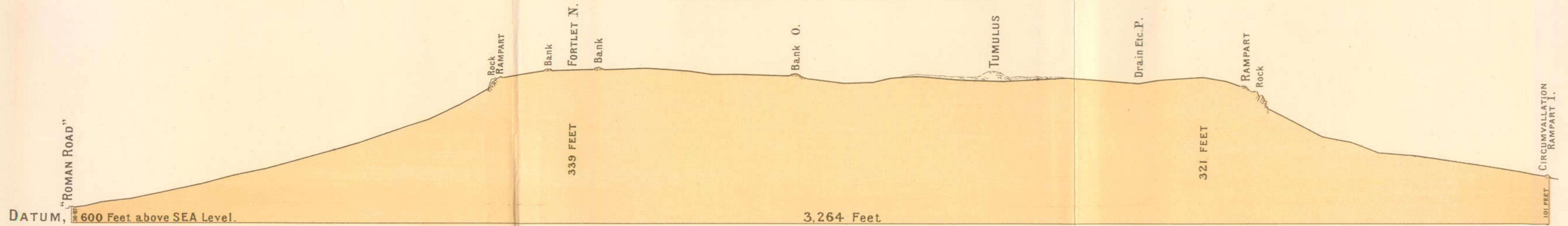
PLAN OF MILITARY WORKS, BIRRENSWARK-HILL, DUMFRIESSHIRE.



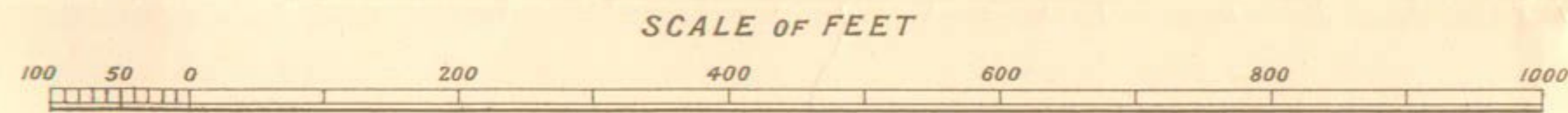
BIRRENSWARK - HILL.



SECTION ON LINE X.Y.



SECTION ON LINE V.W.



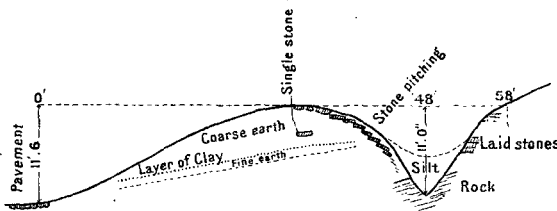


FIG. 1. SECTION OF NORTH RAMPART SOUTH CAMP.

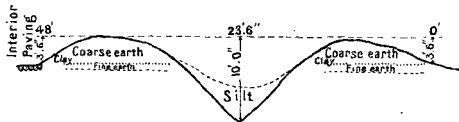


FIG. 2. EAST RAMPARTS OF REDOUBT.

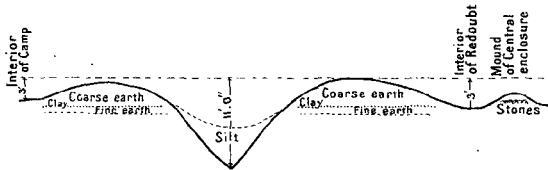


FIG. 3. WEST RAMPARTS OF REDOUBT.

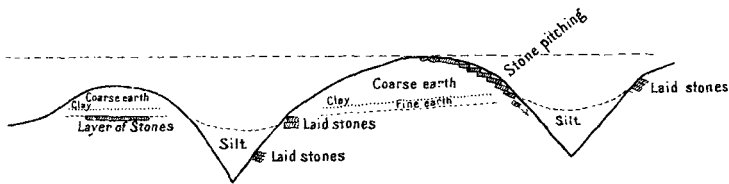


FIG. 4. NORTH RAMPARTS OF REDOUBT. (DOUBLE PART).

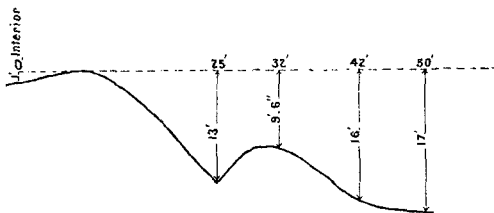


FIG. 11. NORTH RAMPART, NORTH CAMP (DOUBLE).

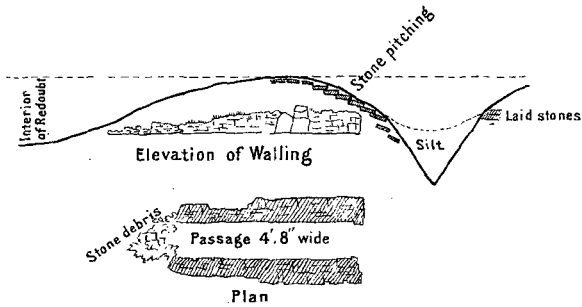


FIG. 5. NORTH RAMPART OF REDOUBT (SINGLE PART)

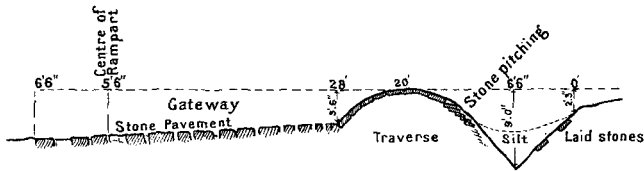


FIG. 6. EAST GATEWAY, SOUTH CAMP.

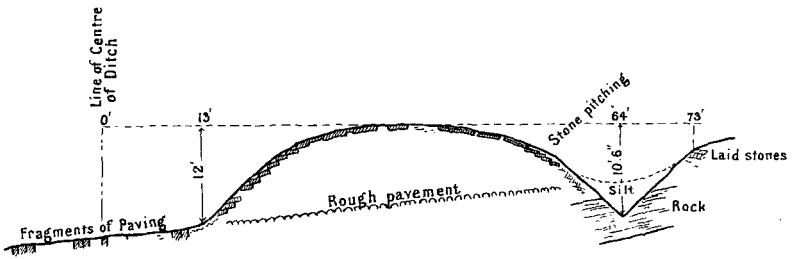


FIG. 7. TOWER OF CENTRE NORTH GATEWAY SOUTH CAMP.

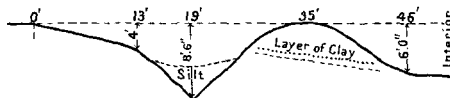


FIG. 9. SOUTH RAMPART OF NORTH CAMP.

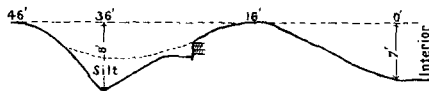


FIG. 10. SOUTH RAMPART, NORTH CAMP.

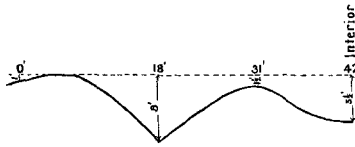


FIG. 12. EAST RAMPART, WEST FORT.

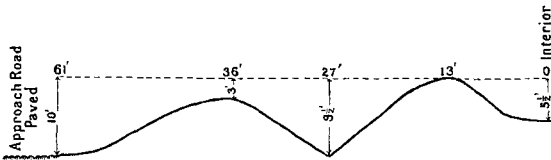


FIG. 13. NORTH RAMPART, WEST FORT.

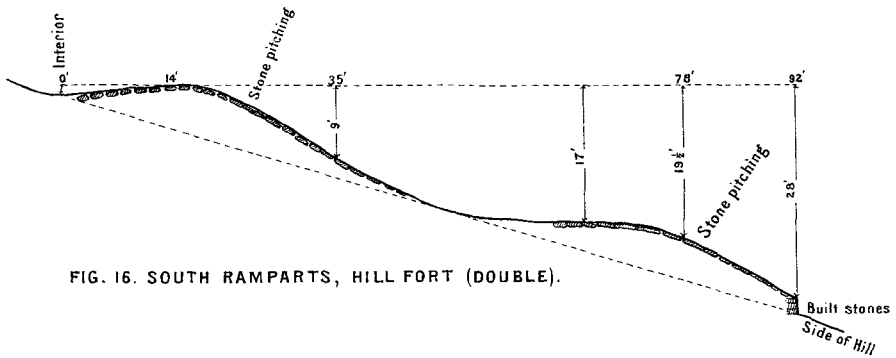


FIG. 16. SOUTH RAMPARTS, HILL FORT (DOUBLE).

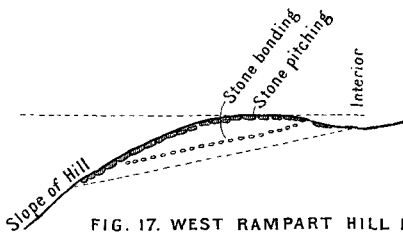


FIG. 17. WEST RAMPART HILL FORT.

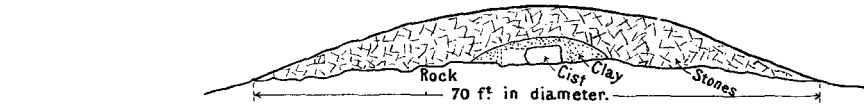


FIG. 23. HILL TUMULUS.

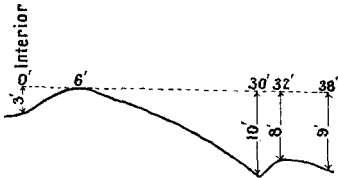


FIG. 14. EAST CIRCUMVALLATION MOUND.

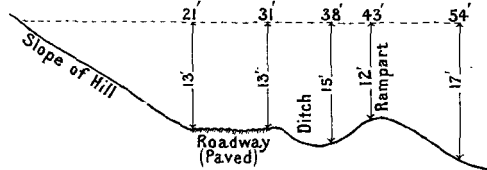


FIG. 15. ROAD ON EAST SLOPE OF HILL.

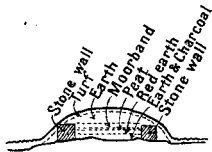


FIG. 20. MOUND OF HILL FORTLET.

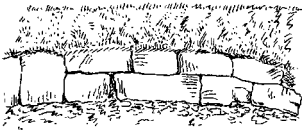


FIG. 21. ELEVATION OF MOUND
1/8 inch scale.

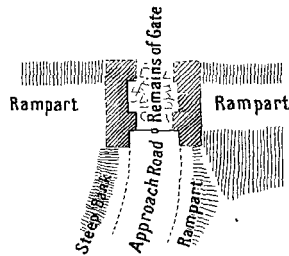


FIG. 19. SOUTH GATE (A) HILL FORT.



FIG. 22. REMAINS OF GATE.
1/8 inch scale.



FIG. 18. SOUTH GATE (B) HILL FORT.



The entrenchments unaccountably differ in type, for whereas the single ditch and rampart prevails on the south, east, and west sides, the double rampart with intervening ditch is found on the north.

Generally the works exhibit constructive methods similar to those described as prevailing at the south camp, but they are not always well marked. The layers of finer earth and clay found in the base of the rampart of the south camp were here well marked in one section (Plate VI. fig. 9). The stone pitching of the front, however, is not generally well defined, which may be accounted for by the circumstance that a great part of the ditch is cut in hard splintery rock, which seems to have been applied partially as a substitute. One section was exceptional (Plate VI. fig. 10). At the rear of the ditch is a narrow berm, and a perpendicular facing of well-built stone-work about 18 inches high, behind which is the earthen rampart.

The rampart of the north side, where it is double (Plate V. fig. 11), like that of corresponding form at the redoubt of the south camp, gives no indication of stone pitching on the front.

A pavement similar to that disclosed at the rear of the rampart in the south camp was found here also.

The gateways are all sufficiently distinct, but in the case of the west one on the north side no mark of the traverse remains.

As already stated, the west gateway (Plate III.) on the south side is peculiar. The rampart is pushed rearwards upon the camp, so that the gate stands at the apex of a broad but shallow triangular recess, and the traverse, instead of being as usual a separate mound with a passage on either side, is formed by turning the end of the rampart on the east side of the gate southwards, and swelling it into a beak-like shape with an elevated centre. There is an entrance on the west side of the traverse only. The gateway had a surfacing of gravel over a heavy stone pavement, partly wanting, below which was another pavement of stone-work of some kind. The lower part of the traverse ditch has been quarried out of very hard rock, the northward projection of which may possibly account for the rearward divergence of the entrenchments. Several large detached blocks of stone remain in the ditch.

The other gateways, which appear all to be of one design, have projecting oval traverses similar to those of the east, west, and south gates of the south camp.

In the interior of the camp were discovered at several places pavements, but nothing of definite form.

Apparently, the source of water supply has been a small stream which runs northwards through the camp. It rises under a perpendicular cliff of rock at the north side of the higher part of the hill.

A stone ball and two pieces of iron were recovered at this camp. The excavations in the interior were very limited, and so far little evidence of occupation was discovered.

The Fort at the west base of the hill (C, Plate III.) is peculiar in regard to shape and some other circumstances. The plan, which is inaccurately represented by Roy, and imperfectly at least on the Ordnance Map, is triangular, the base being at the south and rectilinear, but with a knee towards the west end, while the sides are unequal and show an outward curve. The enclosing defences consist of double ramparts and an intervening ditch (Plate VII. figs. 12 and 13), identical in type with those of the redoubt of the south camp and the north side of the north camp, and corresponding also in structure with the former. The interior area is hollowed out so that the floor in the centre is lower than the ground outside, and at the rear of the rampart it is paved or laid with stones, the work being carried some way up the rampart. An opening through the ramparts, towards the east, shown on Roy's plan as an entrance, was examined, but the result was inconclusive.

At the west corner there is a narrow opening in the inner rampart, giving access from the interior of the fort to the ditch; and by passing through and following the ditch a few feet southwards, an opening is reached on the right hand which leads into a narrow passage running westwards a distance of 20 yards. It is 4 feet wide, and the outer ramparts of the camp are carried along it, one on either side. The floor is laid with stones, one of which showed a small cut-out water channel. This seems to have been the entrance.

The finds recovered here—a broken quern and a piece of bracelet of opaque glass—were of the same character as those found in the other camps.

The Enclosure at the east base of the hill (D, Plate III.) is divided into two compartments, and there is an entrance from the south. The shape is not correctly represented either on Roy's plan or the Ordnance map. The enclosing and dividing mound, composed of a mixture of earth and rock debris dug out of the interior, which, as regards the west division, is hollowed out, measures 12 feet across and 2 feet in height. There is no ditch. The west part exhibits no artificial flooring, but the east division, which is on a higher level, is floored with flat stones of irregular shape, well fitted together. The back of this enclosure rests on a natural bank.

THE CIRCUMVALLATION.

Between the north-east corner of the north camp and the east enclosure, D, the line as indicated on Roy's plan remains well marked. There is a ditch in front with a rampart in the rear, built on rising ground. At a section made through the rampart (Plate VIII. fig. 14), a small fragment of moulded and colour-decorated glass, being probably part of a bracelet, was recovered in the earth at the base. A little south of the east enclosure another fragment of the work, K, also shown on Roy's plan, is still distinguishable. It stands on a height, and the interspace, which is a hollow, is so commanded by the works on either side as to suggest that it may have served as an entrance to the fortress. The continuation of the circumvallation L, from the west end of the south camp towards the west fort, as indicated by a single line on Roy's plan, is also traceable on the ground. The branch ends of the rampart remain, one joining the south camp and the other the west fort, and perceptible lines indicate its prolongation from the south camp some way westwards. A section showed a slight mound outside the ditch and higher ground inside, as if this part had been of the double rampart and intervening ditch type.

Referring to the small rectangular work of three apartments, E, at the

east end of the hill, shown on Roy's plan, these and several other similar works (not marked on the plan) were examined, but without result, and it is impossible to say whether they were part of the military works or not. One lies near the south-west corner of the south camp, a group of three of large size are situated some distance south of the same camp, and one of curious design is placed between the west fort and the "Roman Road."

Outside the south-east corner of the north camp is another small work, F. It is circular and about 45 feet in diameter. The interior has been hollowed out, and the earth and rock-shivers therefrom used in building a small enclosing mound about 12 feet wide and 2 feet high.

Roy's plan shows traces of a work, B, starting from the south-east corner of the north camp and extending southwards along the east end of the hill, and after an interval a fragment of a mound, A. The first is discernible, but with difficulty; the second, which remains in good form, was examined and found to be the protecting rampart on the east side of a road which has evidently joined the south and north camps (Plate VIII. fig. 15). The roadway, which is 10 feet wide and surfaced with flat stones laid as pavement, is cut out of the slope of the hillside, and between it and the rampart is a ditch, the only one in connection with the work; a sandstone ball was recovered from the ditch.

An ancient road passes a few yards south of the west fort, running west and north-west, as indicated on the Ordnance map. It is known as the "Roman Road." Its surface was exposed at six different places, disclosing stone pavement composed of flat laid quarried stones, but the work was more or less disturbed. At one point the trimmed edging remained, of which, however, the stones were not materially larger than those in the body of the work. The best preserved part showed a roadway about 10 feet wide, with a hollowed continuation or water channel along the side next the hill, 2 feet wide. The work is fairly similar to the pavements within the camps and with the piece of roadway at the east end of the hill before described.

Another piece of road, Q, R, also paved and apparently branching from the last, runs in an easterly direction along the north side of the west

fort, and touching the end of its narrow entrance. Marks, not very clear for some way, but distinct further on, can be traced of its continuation to the south-west shoulder of the hill, where it passes by a clearly-marked track round to the main gateway on the south side of the hill fort.

Two conclusions may be suggested as following on the circumstances described. The shape of the west fort may be consequent on its position in the angle between the two roads; and its purpose probably was to serve as a guard-room for the entrance to the fortress, which here apparently branched off the "Roman Road."

HILL FORT.

The hill fort (Plate III.) occupies the whole plateau, measuring from east to west about 1700 feet, and from north to south 700 feet at the west part; while the east part, owing to an abrupt contraction near the middle, is reduced to about 400 feet in breadth. At the point where the contraction is, a depression of the surface crosses the plateau, and another slight hollow occurs near the middle of the east part. The outline is sinuous; in particular, a recess marks the north side at the point where the contraction of the width occurs. One not so deep lies opposite on the south side, and there are two others on the same side further east, the interspaces being about equal. The sides of the hill are everywhere steep near the top, and at several places the face is perpendicular. A stretch of precipitous rock margin, known as "The Fairy Craig," occurs at the east end of the hill, another at the north side near the point of contraction of width, and at the west end also there is a good deal of rock falling abruptly from the crest. The ascent to the plateau is easiest on the south side.

The Defences.—The plateau is entirely encircled with an artificial rampart, which follows the sinuosities of the crest; and on the south side, where the ascent is not so steep, there is a second line, in front of the first, which also follows the windings of the ground, maintaining, except at the gateway returns, an approximately uniform difference of level, but not an equal distance from the first.

In addition to the encircling ramparts, a mound (O, Plate III.) is built over the crest of the natural bank on the west side of the surface depression before mentioned, dividing off the broader part of the camp at the west end into a separate fort, within which, at the west side, is a small heart-shaped fortlet, N; and at the eastmost recess of the south side, where the slight hollow is, an artificial work, P, crosses the hill in nearly a straight line.

Four gateways afford entrance to the plateau, situated, respectively, one at the west end, one in the recess on the north side, one in the middle recess, and another in the west recess on the south side. The east recess on the south side, although now crossed by the rampart, had probably been a gateway also.

The encircling and outward ramparts do not in this case stand up materially above the surface in the rear (Plate VII. figs. 16, 17), and to the ordinary observer are not very apparent; but the slight elevation, greener tint, and protruding stones sufficiently mark the position. The encircling rampart may be described as a trimming of the crest of the hill, the artificial work being generally 30 feet wide at the base and 4 feet high in the centre, and the scarp dies into the slope of the hillside. There is no ditch, which is the main differentiating feature of the hilltop defences. Possibly this circumstance is consequent on the builders' methods, but more probably it was compelled by the nature of the site, with its steep scarp and rock structure. The most outstanding characteristic these ramparts present is the stone pitching of the front. While absent, or partially, at one or two places, it has doubtless been constant, both in the case of the encircling rampart and the outer one on the south side of the hill. The best sections show the work in very complete form, and continuous from the base to the crown. The ramparts here, while not so steep on the front as those of the camps below, equal in this respect the mounds at Birrens. A number of sections made at intervals revealed the inner structure of the mounds. At the east recess of the south side of the hill, the core was found to consist of large stones heaped together. At other two places it was formed of heaps of earth and stone

intermixed. These conditions, however, were probably accidents or disturbances, as the other sections all exhibited earth structure; and in one section a peculiar description of bonding occurs, which seems to evidence tenacity on the part of the builders to this mode of treatment, whatever the material at command for the purpose might be. It consists of a row of roundish flat stones, very regularly disposed in a straight line from side to side, and with narrow interspaces, about half-way up the mound (Plate VII. fig. 17).

The mound separating the east and west parts of the plateau is built of earth over a ridge of rock, and shows no intermixture with or covering of stone. It is not more than 2 feet high above the rock.

The gateways are no less interesting than the defences just described. Differing, and necessarily, from those below, they are not less skilfully arranged. Traverses are wanting, but advantage is taken of the recesses in the sides of the hill in which to lay out the approaches so that they are dominated and flanked by the returning ramparts on either side.

Of the west gateway, which is a little recessed, nothing remains but broken pavement. Leading from it is a narrow path, 4 feet wide near the gate, and $2\frac{1}{2}$ feet further away, formed by cutting out the hard rock a depth of 2 feet. It passes west and southwards, round a steep escarpment of rock, on which the enceinte returns.

The north gateway is situated in a deep recess of some width, which is flanked by precipitous ramparted heights on either side. In this case, also, only disturbed pavement marks the structure, and on one side is a fragment of a drain 12 feet in length, with a channel 12 inches square, sides of stone, and covers of whinstone averaging 30 inches long, well fitted together.

In the historical part of the paper, Dr Christison shows that a well, situated on the north side of the hill, has been described as having been fortified. A spring rises at the base of the precipitous rock-face, a little way east of the north gate, and a piece of rampart, earth-built and stone-faced as before, remains, leading from the gate in the direction of the spring, which was probably the source from which the supply of water

for the fort was obtained, as nothing of the kind has been discovered on the hilltop. The runner passing through the middle of the north camp is fed from the same spring.

Of the two south gateways, the east one (Plate VIII. fig. 18), which stands behind a small gorge, shows an oblong pavement floor, trimmed on the straight edges, and measuring $15\frac{1}{2}$ feet rearwards by $9\frac{1}{2}$ feet across, constructed of flat unhewn stones embedded in clay. At the south end marks of walling $2\frac{1}{2}$ feet thick and a square outline are visible, and seem to indicate that the gateway was a stone-built superstructure. The approach is by a narrow way in the bottom of the gorge, which for a length of 20 yards is covered with large stones, very unevenly disposed, as if either they had been much disturbed, or were so arranged with a view to impede progress towards the gate; and it is defended by the double line of rampart returning on either side, coalescing at the gate, and maintaining a higher level, and so commanding and flanking the approach.

The remaining gateway (Plate VIII. fig. 19), being the west one on the south side, was probably the main entrance. The approach is of greater width than the others, the gradient is easier and more uniform, and the roadway is better formed. The roadway is partly cut in the rock, which is dressed to form the surface, depressions being made up with pavement. It curves from the west, northwards, round the east side of a steep escarpment, on the top of which the outer rampart of the fort returns, flanking the entrance on that side. There being no natural flanking on the other side, the builders have supplied artificial defences, consisting of a double tapering mound, carried alongside the roadway. The gateway stands in line with the encircling rampart of the fort, which in this instance has no returning bend. It shows stone foundations consisting of stumps of flanking walls in front of the gate; a threshold, with a scuntion on one side and broken walling on the other, from which the opening would seem to be about 4 feet in width; an interior space, measuring 3 feet 6 inches rearwards by 6 feet across, marked with fragments of enclosing walls and paved with flat stones. The remains indicate that this gate also was probably a stone-built structure.

The Interior.—The dividing rampart has already been described, and the line of artificial work crossing from south to north near the east end has also been mentioned. The latter shows a rounded surface like a roadway, the crown 9 inches higher than the sides, but of soft earth. Under or alongside is a drain of good depth, constructed similar to those found in the redoubt of the south camp, previously described.

In regard to the small west fortlet (N, Plate III.), when carefully surveyed, the plan is found to be symmetrical, and resembles a horseshoe, pointed at the north, and with a base at the south composed of two straight lines, which retire towards the centre and from a re-entering angle (Plate III.). No apparent reason for this peculiar shape has been discovered, and it seems as if it were simply fanciful. The extreme length over all from north to south is about 130 feet, and the greatest width is equal to the length. The enclosing mound, measuring about 12 feet across and 3 feet 6 inches in height, exhibits exceptional modes of construction (Plate VIII. figs. 20, 21). On either side is a face wall about 2 feet in height, and varying from 1 foot to 3 feet 9 inches in thickness, resting on the rock surface. The walls are well built of large quarried stones, disposed in courses of one to three in the height, cleft fair and clean on the face, and roughly squared in the joints. While no tooling appeared on the face, unmistakable marks of the mason's pick were discovered on the bed of a displaced stone. The space between the face walls is filled, and the mound is carried up to its full height with earth, built in layers in the following order: earth mixed with charcoal or decayed brushwood, 6 inches thick; red soil, 3 inches thick; peat or turf, black and very distinct, 2 inches thick; a mixture like iron rubbish, but probably moor-band, 6 inches thick; and the remainder earth, and the surface turf.

The entrance (Plate VIII. fig. 22), which is on the west side, is much destroyed. Its width is about 4 feet, and several flat stones mark the floor.

Another kind of structure has now to be noticed. It is a tumulus 70 feet in diameter (Plate VIII. fig. 23), standing at the highest point of the middle part of the plateau. While the artificial work at the centre

is only $5\frac{1}{2}$ feet high, owing to the fall of the ground it stands 10 feet or more above the level of the outer circumference. A section was opened through the cairn from east to west, when it appeared that the cist had been destroyed. One stone, 4 feet long and 2 feet 4 inches high, remained in position, and five others lay at hand which had evidently belonged to it, also some fragments of charred bone. Orientation does not seem to have been observed; the cist lies nearly parallel with the length of the hill. The construction of the tumulus shows the rock surface under it slightly sunk for the reception of the cist; over the cist was a small mound of clay rounded so as to carry off the water, and above the clay rose the wide, flat cairn of stones, disposed as if in layers concentric with the clay core. The pieces which composed the cist, as well as the smaller and more angular stones making up the cairn, correspond with the description of rock on the hillside, whence it is presumed the material was obtained.

At the east end of the plateau the rock surface seems to have been utilised as a floor, the depressions being levelled up by stone pavement. Stone pavements are very extensive, both at the east and the west parts. Some vestiges, but uncertain, as of walling, were also disclosed. These remains, however, furnish no definite information, further than showing how elaborate the preparation of the camp has been.

Charcoal and fragments of charred bone were plentiful, and generally appearances of occupation were much more abundant here than in the lower camps.

Among the relics discovered were a considerable number of leaden sling-bolts, singly and in groups, twenty at one of the south gates, and twelve at the other; one or two stone balls; scraps of iron, not plentiful; leaden whorl, similar to one found in the south camp; at the east end, two small transparent glass discs; in the fortlet, a bead similar to one found in the south camp; two fragments of glass bracelets, one in the substance of the enclosing mound of the fortlet; and outside the fortlet, on the rock, and covered by a stone, a small intaglio.

All the details disclosed by the excavations have now been described,

and it only remains to say a word regarding General Roy's plan and the Ordnance map, both of which have proved very serviceable in connection with the carrying out of the exploratory works. On the former, many vestiges appear, not indicated on the latter, and which are not now readily observable on the ground. The plan is generally, although not strictly, accurate. The only points requiring notice are the gateways at the south side of the south camp. At the centre there is shown on the plan a projecting return of the fortifications, which does not exist, and which evidently has arisen through joining the line of a modern drain with the traverse of the gate. Two small openings like gates, but without traverse, are shown, one on either side of the centre projection, but no opening exists corresponding with the west one; and in regard to the east one, while an opening for drainage exists, no indication of a gateway could be discovered there.

Two points only need to be mentioned in regard to the Ordnance map. There is no tumulus near the small fortlet at the west end of the hilltop as indicated; and the fort at the east end of the hilltop is at least inaccurate, and it is doubtful whether there is any separate fort here at all.