

II.

THE AGRICOLAN FORT AT FENDOCH. BY I. A. RICHMOND,
M.A., F.S.A., F.S.A.SCOT., AND JAMES MCINTYRE, F.S.A.
WITH CONTRIBUTIONS BY J. A. STANFIELD, ERIC BIRLEY,
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(i) INTRODUCTORY.

The southern border of the Highland massif is formed by the great boundary fault on the northern limits of Strathearn and Strathmore. Here the Highlands begin and the Lowlands end, and beyond this point, before the age of firearms, no invader of Scotland pressed. It has long been known that here too the permanent garrisons of Rome reached the farthest north-west frontier of that great empire, seizing the points where the principal rivers debouch into the plain, and thus controlling entry to and exit from the Highlands. The forts and temporary camp at Dealgin Ross,¹ by Comrie in Strathearn, were among the first Roman sites to be observed north of the Antonine Wall. Later, the legionary fortress² and forts at Inchtuthil, where the Tay emerges from the Dunkeld gorge, attracted attention and eclipsed all other Roman sites in the district. Earlier still, however, as Sir George Macdonald has shown,³ a Roman fort had been discovered by Colonel Shand in Glenalmond, at the point where the river Almond, leaving the narrow defile of the Sma' Glen, turns eastward towards the Tay. At that time the rampart and ditch of the fort were in good order, as described⁴ by the contributor to the *Statistical*

¹ The site was first described by Gordon, *Itin. Sept.*, 39, in 1726.

² *Proceedings*, xxxvi. 182-242. The site was first observed by Maitland in 1757, *History and Antiquities of Scotland*, i. 199.

³ *Proceedings*, lxxi. 374. The account is dated to 1788.

⁴ *S.A.*, xv. 256; cf. *Proceedings*, lxx. 400. Dr D. M. Forrester, of Broughton near Biggar, has shown us a *Sketch of water-tracks in Glenalmond*, made by the Duke of Atholl's agent, J. Stobie, on 21st January 1797. This shows the fort ramparts in good order except where covered by the farm of Easter Fendoch.

Account. Later, ploughing reduced them to low features difficult to discern, and the site was temporarily lost to knowledge for field-workers, who selected two unsatisfactory candidates for recognition as Roman earthworks, rightly dismissed¹ by Christison as negligible. The re-discovery of the site reported in the eighteenth century came in 1936, and has already been described² in these *Proceedings*.

The position is a good one, not unlike others of Roman choice, for example, the fort of Brough-by-Bainbridge in Wensleydale, or the newly-discovered fort at Loudon Hill in Ayrshire. The glacier which once occupied the Sma' Glen has formed³ a bold terminal moraine, centred on the mouth of the valley. This moraine is now divided by erosion into a series of irregular hummocks, most of which are unsuited to accommodate a Roman fort. None in fact exceeds, and many fall far below, three hundred feet in width, whereas the Roman engineer preferred to have at least four hundred feet in hand. Making the best, however, of the terrain at their disposal, and obviously desirous of selecting a site in full view of the glen, the Roman surveyors chose the largest and most regular hillock available, and planted upon it a fort 598 feet long and 320 feet wide. The unusual proportion, so different from the square or tertiate form normally chosen for Roman forts, is entirely due to the difficulty in finding a suitable position.

Tactically, the site chosen (Pl. LII, 1 and fig. 1) is good. The little plateau falls steeply on every side, southwards to the Fendoch Burn, and elsewhere to marshes indifferently drained by a nameless streamlet on the north. On the east the Romans did not occupy the tapering tail of the moraine, but supplied extra defences (see p. 112), intended to cancel any apparent advantage gained by massing there for an assault. True, the site is overlooked by hills on all sides; but this circumstance, disadvantageous in the days of long-range weapons, was of little moment when only hand-thrown missiles were in question. Much more important was the advantage conveyed by good lateral communications. To east the valley of the Almond offered an easy passage towards the site of Bertha, at the junction⁴ of that river with the Tay. To west the wide valley of the Fendoch Burn gave almost immediate access to Strathearn and the fort of Dealgin Ross. It is not known that the Romans provided this route, controlling the very fringe of the Highlands, with a metalled road, though the observation by Shand⁵ of a road leading from the south towards Monzie might suggest that they did so. But it is certain that the route was recognised and employed as a natural passage. No Lowland invader had ever pushed

¹ Christison, *Early Fortifications in Scotland*, 92-3, fig. 29.

² *Proceedings*, lxx. 400-406.

³ We are indebted for geological comments upon the site to Dr K. St Joseph.

⁴ *Proceedings*, liii. 145-152.

⁵ Quoted by Chalmers, *Caledonia Romana*, i. 146.

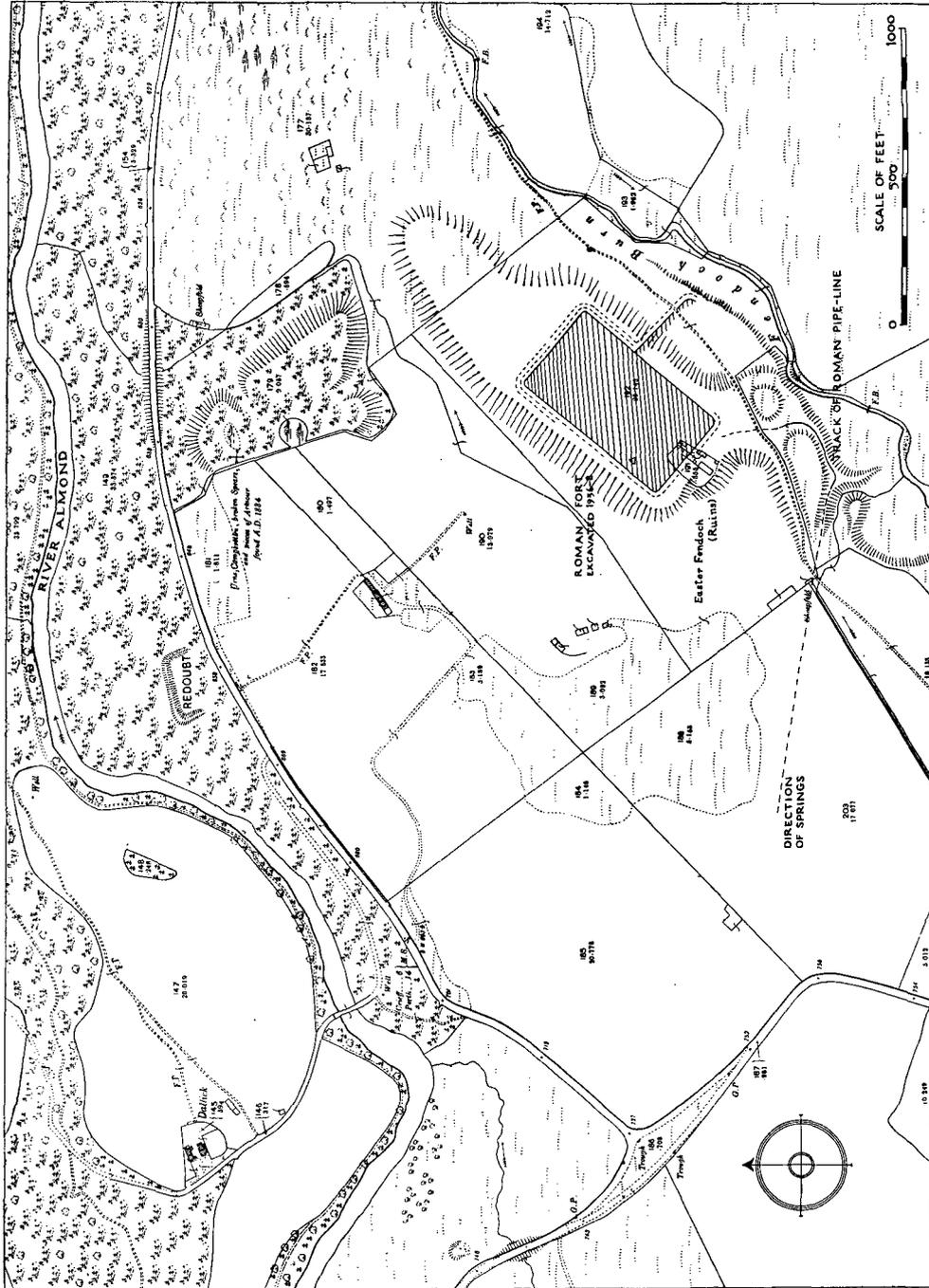


Fig. 1. The Site of Fendoch Fort.
(Based upon the Ordnance Map, with the sanction of the Controller of H. M. Stationery Office.)

closer to the Highland line, and none ever chose the positions for controlling it with greater ability. The significance of the Sma' Glen in Highland communications need only be emphasised by two observations. This was the gap chosen by General Wade for his main line of road into the furthest Highlands; while to-day the same pass carries a principal highway to Inverness, the natural centre of Highland administration.

(ii) THE DEFENCES.

(a) *The rampart* of the fort was examined in 1936 and 1937. It had been built in turf, but its reduced state and the porosity of the soil below it had induced heavy leaching, with the result that the lamination typical of turf-built structures had been reduced in definition (Pl. LII, 2). The ploughing down of the front also rendered the dimension somewhat difficult to estimate. In 1936 a section at the south-west angle gave a width of over 20 feet, where the rampart impinged upon an oven. Subsequent sections suggested that this estimate is rather too high. At the north and south gates, the post-holes of the tower denote a minimum width of 17 feet, for laid turf was everywhere visible; and this cannot be far from the truth. A second section at the south-west angle (Pl. LII, 2) revealed an interesting detail as to treatment of the back. While the front was entirely broken away, the back still exhibited an offset of turfwork at the foot of a sharp slope, resembling the arrangement¹ of Hadrian's Turf Wall and of the rampart of the inner annexe at the Antonine fortlet of Chew Green.

The profile of the finished structure thus resembled in general type examples already known. It began with a sharp slope at the back, and it is not likely that the front stood less steeply. Soon, however, the rearward slope must have become more gentle, in order to reduce the width of the rampart to a walk of some six feet at a not excessive height. The steep slope at the base of the back is to be explained² as intended to prevent access to the rampart-walk except at authorised points. No accurate estimate of the original height can be made upon this basis; but a rough calculation is nevertheless possible. Supposing the front to have stood at an angle of about 75 degrees, not an unreasonable slope for turf-work, while the back, after some 4 feet of almost vertical rise, assumed an angle of about 42 degrees, the angle of rest, a reduction in width from 17 feet to 6 feet would be effected at a height of approximately 12 feet. An addition of 6 feet for merlons and parapet would give an over-all height of 18 feet.

The walk on a turf rampart was normally framed in timber with a

¹ *Cumb. and Westmorland Arch. Soc. Trans.* ser. 2 (henceforward cited as *CW*²), xxv. 222-223; *Archaeologia Aeliana*, ser. 4 (henceforward cited as *AA*⁴) xiv. 143, for sharp slope at Chew Green.

² *CW*², *loc. cit.*

surface of corduroy or duck-boarding, as frequently illustrated on Trajan's Column,¹ though a gravel walk has recently been found in position on a low turf rampart at Petuaria.² When gravel or kindred material was available, as at Fendoch, it could be spread on top of the duck-boarding, so as to reduce the risk of slipping while strenuously engaged in defence. The front, as already observed, would be protected by boarded or wattled parapet and merlons. The merlons would be widely spaced, as on Trajan's Column,³ so that men armed with shields and spears might occupy the embrasures (Pl. LXI, 1). The close spacing common in other epochs had no place in an age when archer-cohorts were rare.

Behind the rampart the *intervallum*, an open space here 26 to 28 feet wide, leaves room for circulation and helps to place the buildings of the fort beyond the range of hand-thrown missiles. This was partly occupied by a lightly metallised road of gravel and shale detritus; but immediately behind the rampart and under its shelter an open strip, varying in width from 6 to 16 feet, was reserved for minor structures, such as ash-pits, ovens and fuel-stacks.

The single ditch surrounding the fort was found in 1936 to be 13 feet wide and 6 feet deep. It is separated from the rampart by a berm about 5 feet wide, while the upcast from it is disposed in a low-spreading mound beyond the defensive system. On the east front of the fort an outer ditch lay 11 feet beyond the inner ditch, and was itself 11 feet wide, but its depth was not tested.

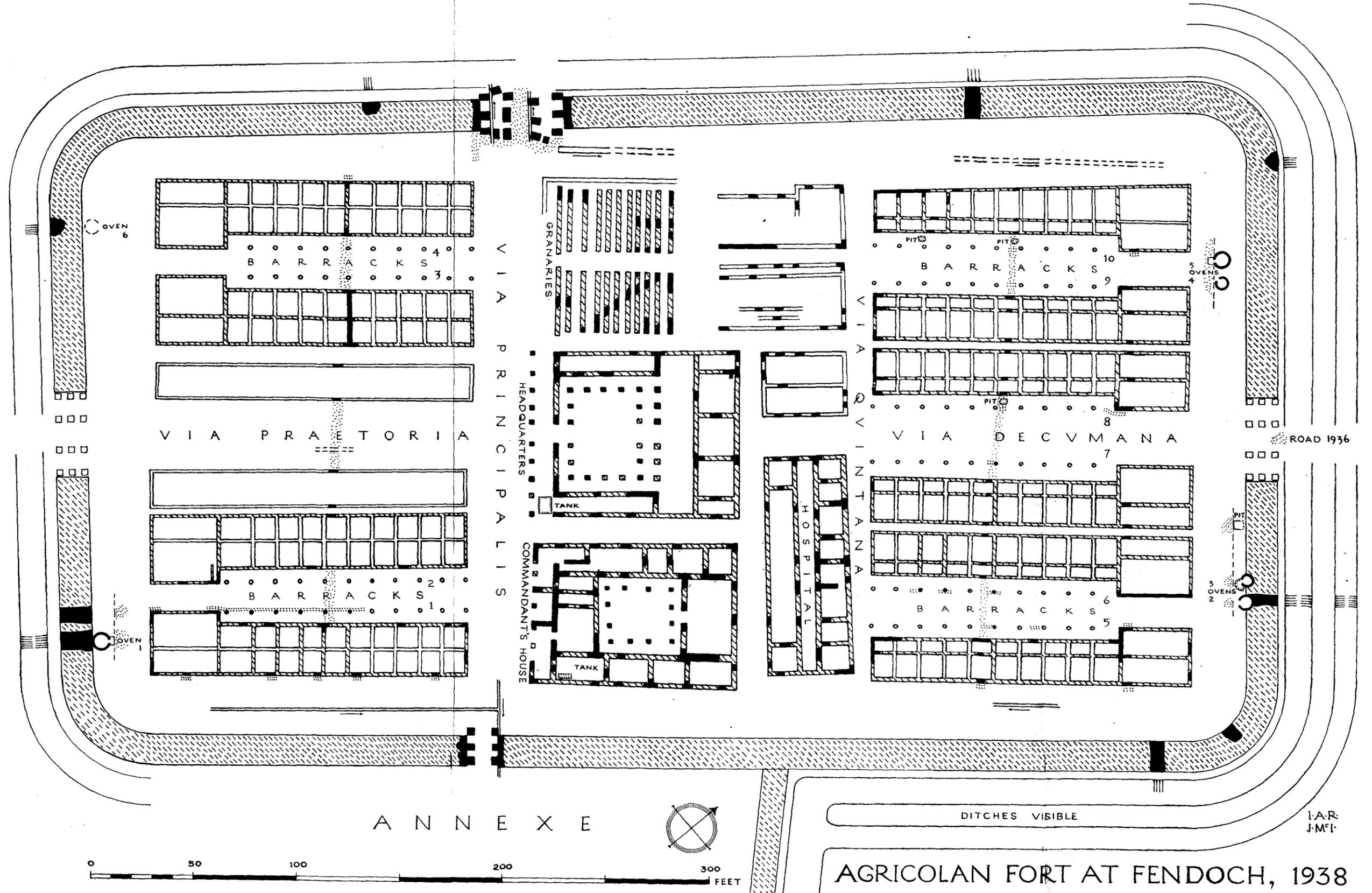
The careful planning of the internal buildings, described below, demanded, but did not receive, an equally careful planning of the defences, which should have been set out four-square, with strictly parallel sides; on the north front a discrepancy develops towards the north-east angle, adding some 18 feet to the over-all length of the east rampart, which measures 338 instead of 320 feet, as at the west. The length of the fort, however, remains constant at 598 feet.

(b) *The annexe* was first observed in 1937 by Mr F. G. Simpson, Hon. F.S.A.Scot., during a brief visit to the site. His practised eye detected a dark line suggestive of a ditch descending the slope towards the Fendoch Burn, at a distance of 215 feet behind the east side of the fort. Further observation revealed surface indications of an upcast mound outside the supposed ditch and a rampart inside it. The existence of these features was promptly verified by trial-holes, which showed that the rampart was of turf, like that of the fort. In 1938 a section across the ditch established that it had been V-shaped, $8\frac{1}{2}$ feet deep and 17 feet wide. At 200 feet south of the fort-rampart the ditch is interrupted by a causeway of un-

¹ *PBSR*, xiii. 5, 19; Cichorius, *Die Reliefs der Traianssäule* (hereinafter referred to as *Cichorius*), sc. xii. xx. etc.

² Corder and Romans, *Excavations at the Roman town at Brough-Petuaria*, 1937, 17-25.

³ *Cichorius*, sc. cxxxiv.



AGRICOLAN FORT AT FENDOCH, 1938

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Fig. 2.

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disturbed subsoil, 12 feet wide. This is occupied by a lightly-metalled disused road, which must, nevertheless, be relatively modern, for it is laid down on top of a thick layer of humus, well above the Roman level; it is marked as a footpath upon the 25-inch Ordnance Survey Map of 1900 (fig. 1), and those who constructed it no doubt took advantage of the gap in the Roman defences.

The east defences of the annexe, thus defined, continue towards the edge of the natural terrace above the Fendoch Burn. Before reaching the brink of the declivity, they curve westwards, but are almost immediately lost to sight, owing to an erosion by the stream. Further west, the relatively flat ground, which the defences were designed to contain, terminates in bold, steep hummocks. Hereabouts, then, the defences might be expected to return towards those of the fort. There is, however, no surface indication of their existence, nor was any ditch revealed by trial-holes on the neck of land linking the south-west angle of the fort with the hummocks. It is not likely that this side of the annexe was left wholly unfenced; but the rough ground and the stream and marsh beyond it certainly rendered elaborate defences far less necessary. A minor feature may thus have taken their place, slipping through our line of trial-holes.

Inside the annexe numerous trial-holes were cut on the flat ground by Messrs C. M. H. Millar, Carter, and Hall, and their pupils, from Trinity College, Glenalmond. These revealed no structural remains, but one hole produced traces of burning and some shapeless lumps of iron (see p. 148).

(c) *The Gateways.*—*The east gate*, at Fendoch the *porta decumana*, was located in 1936, by discovering the cobbled road which passed through it. In 1938 field observation discerned that this roadway occupied a central position in a low 40-foot gap, of the same width as the north gate. It was thus possible to assume that the planning of these gateways had been very similar, and no further excavation seemed called for. *The west gate*, or *porta prætoria*, lies below the ruins of Easter Fendoch, and is not likely to have been less large than the opposite and less important decuman gate. An excavation here would have involved heavy work in clearing the upper ruins, with the attendant probability that the farmstead had seriously damaged the Roman structure.

The pattern to which the east and west gates probably conformed is thus provided by *the north gate*, the *porta principalis dextra*. This was uncovered in 1938. It has (fig. 3) a frontage of about 36 feet, of which approximately 25 feet are occupied by towers and $10\frac{1}{2}$ feet by a carriageway. Its depth has been 17 feet. That the dimensions cannot be given accurately is due to the method of building, which was as follows. A secure anchorage for the structure was prepared by digging exceptionally large rectangular pits (Pl. LIII) to hold the main uprights. When these uprights had been placed in position and braced together the pits were

packed with rammed gravel and sand. Two drainage gullies (Pl. LIII, 1) were next cut, each actually in the packing of three post-holes. When the fort was disused and the posts had been withdrawn, provided that the rammed packing surrounding them had not collapsed, a pure greyish-purple silt from the adjacent turf rampart filled the holes which they had occupied. Thus, the post-holes impressed in the packing (Pl. LV, 1) are to

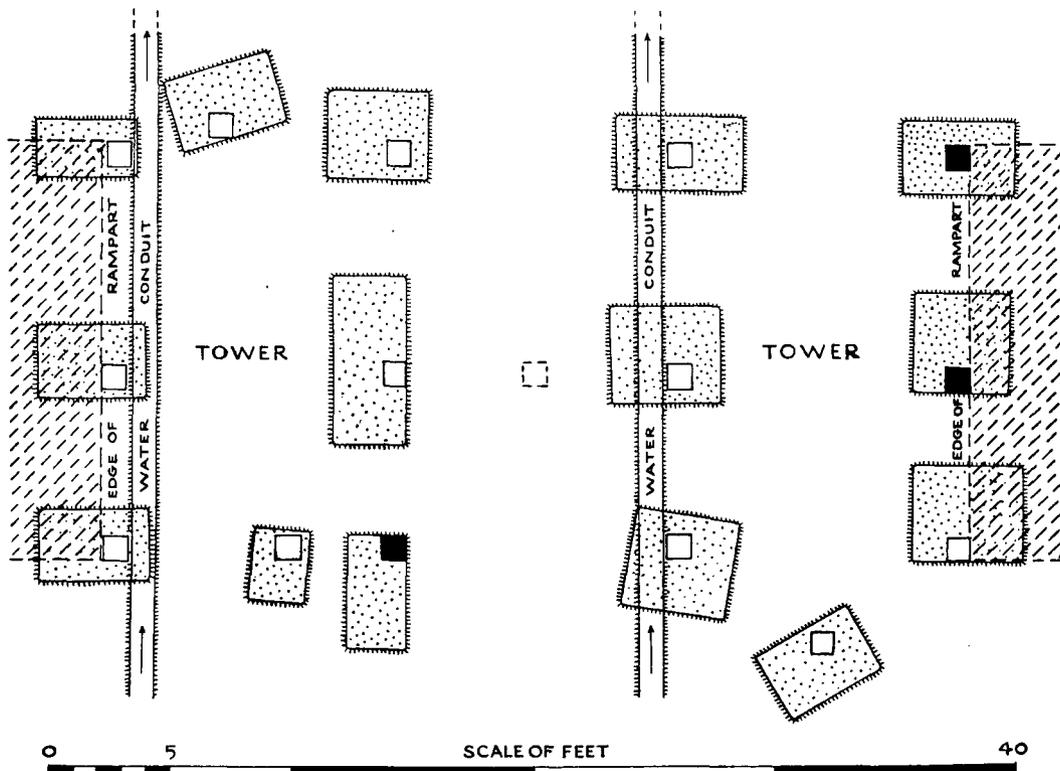


Fig. 3. North Gate at Fendoch. The outside of the gate is at the top.

be distinguished from the pits dug to receive both packing and posts; and while the pits were not difficult to discover, it was not always that the impresses of the posts had survived or attracted notice. The method employed may be compared with that used to set the great posts of the gateways in the sandy soil of Haltern¹ or Xanten.² At Xanten, the stone bed-plate upon which the bottom of the post had rested was often the only indication of the actual dimensions of the timber, but impresses also survived in the filling. Fendoch, like Haltern, produced no bed-plate, for

¹ *Mittheilungen der Altertumskommission für Westfalen*, v., 24, fig. 6.

² *Vetera (Römisch-Germanische Forschungen*, iv.), 35-36, figs. 24-28; cf. *ibid.*, pp. 62-63, for rather similar sockets from the houses of tribunes.

the gravel subsoil was reckoned so much firmer than sand. Thus, the impress of the post was the only clue to the exact position and size of the structure.

The pits indicate that the general plan of the gateway was a single passage-way between two towers. Neither tower had been erected on top of the turf rampart; for the fallen turfwork did not come into view until the east and west lines of pits were encountered, and several courses of standing turfwork became visible when the outermost limits of the pits had been reached. Thus, the rampart had evidently been laid up against boarding held between it and the posts which the pits contained. It follows from this conclusion that the fronts of the towers were not the open frameworks illustrated so frequently among the semi-permanent fortifications¹ of Trajan's Dacian campaigns (Pl. LXI, 2), but weather-boarded structures of more solid type.

In detail, the dimensions of the towers may be calculated as follows. Those of the east tower are fixed to east and north by two post-holes, and to west by the gully which crosses the pits so as to leave only limited space available for posts. A south limit is fixed by the relation of the southward lateral pits to the surviving south-east post-hole of the west tower. This results in a $12\frac{1}{2}$ -foot frontage and a depth of 17 feet. The arrangement does not include an irregularly-placed pit behind the tower, of which something will be said at a later stage (p. 118). The west tower is delimited on east and south by the post-hole in the south-east corner, to north by the front of the east tower, and to west by the gully crossing the filled pits. These conditions comfortably permit a $12\frac{1}{2}$ -foot frontage and a 17-foot depth matching those of the east tower. The passage between the two towers is $10\frac{1}{2}$ feet wide. The main uprights of the towers, as the three surviving impresses agree in showing, were one foot square in section, and it may be assumed that if the rampart rose to a height of some twelve feet the towers were not less than 28 feet high, allowing for a ten-foot upper storey and a six-foot crenellated top. An iron spike, $7\frac{3}{4}$ inches long and $\frac{5}{8}$ inch square in thickest section, and thus commensurate with the massive timbers attested, was found in the east tower (Pl. LX, 2).

Some differences between the towers may now be noted. The west tower was floored (Pl. LIII, 2) with packed gravel at least a foot thick, laid directly upon the subsoil and carrying a thin occupation-level of trampled dirt and ash. The east tower (Pl. LIV, 1) exhibited no such layer: only dark and thickly silted humus, washed down from the adjacent rampart, covered the subsoil. It seems evident, therefore, that while the basement of the west tower had been in use, presumably as a guard-chamber, the eastern tower had been closed. This difference no doubt accounts for a variation in construction. While the closed basement could be cross-

¹ *Cichorius*, sc. xv. xxxi. cxxxiv. etc.; cf. *PBSR*, xiii. 27-28.

braced internally, the open basement had to be free of such entanglements. Accordingly, an external upright has been set in a large pit at the front of the west tower, while a smaller pit at the back (fig. 3) has held a framing-post for the guard-chamber door. The back of the east tower is very differently treated. As already noted, a single large pit, as irregularly placed as the extra pit in front of the west tower, marks the site of a post which cannot have formed part of the main rectangle. It can be explained, however, as reinforcing an external staircase, which could be bracketed to the back of the tower at the main uprights, but might well require the intermediate support such as the post in this position would provide. It would suit a staircase about 3 feet wide.

Two more points in the planning may be noted. The lateral posts of the towers are not set at equal intervals. Eight feet separate them towards the front, 6 feet towards the back. An explanation of the difference is no doubt to be found in the arrangement of the adjacent rampart-walk. A broad turf rampart was built with a sharp front and less steep back. There would thus be room for the whole of the rampart-walk in front of the middle post, and the tower would be entered by a door hung upon this firm support. Secondly, the different interval may also be related to the gangway covering the gateway passage. As in the double gateways¹ of Haltern or Xanten the gangway and doors which it covered would be set well back. The closer relationship of the rearward posts would supply the extra strength there required. No trace of a sill was observed, but search was not made for a door-step: the main part in holding the doors shut must have been taken by great bars held in iron brackets. The space in front of the doors, some 10 feet square, must have been a death-trap into which few would venture and whence fewer would escape.

Finally, the road through the gateway is of gravel, a foot thick, tailing off rapidly beyond the entrance. It is thus much thicker than the intervallum road (see above, p. 114). The difference between the two is reconciled by a gradual slope in alternate layers of gravel and turf, four thick at the highest point. Similar ballasting of military roadways has been observed at Cawthorn.²

The ancient aspect of the gateway was no doubt similar to that of the gates of Xanten,³ as restored by Lehner. But while these gateways had bastions with fronts closely resembling the Fendoch gateways in size, their backs were L-shaped and unlike true towers such as appear at Fendoch. An attempt at restoration (fig. 4) must start, however, from the rampart-walk adjoining the gateway and governing the height of its first floor.

¹ Haltern, *Mitteilungen der Altertumskommission für Westfalen*, v. 24, fig. 6; Xanten, *Vetera*, 33-34, figs. 21-23.

² *Arch. Journ.*, lxxxix. 70.

³ *Vetera*, p. 34, fig. 23.

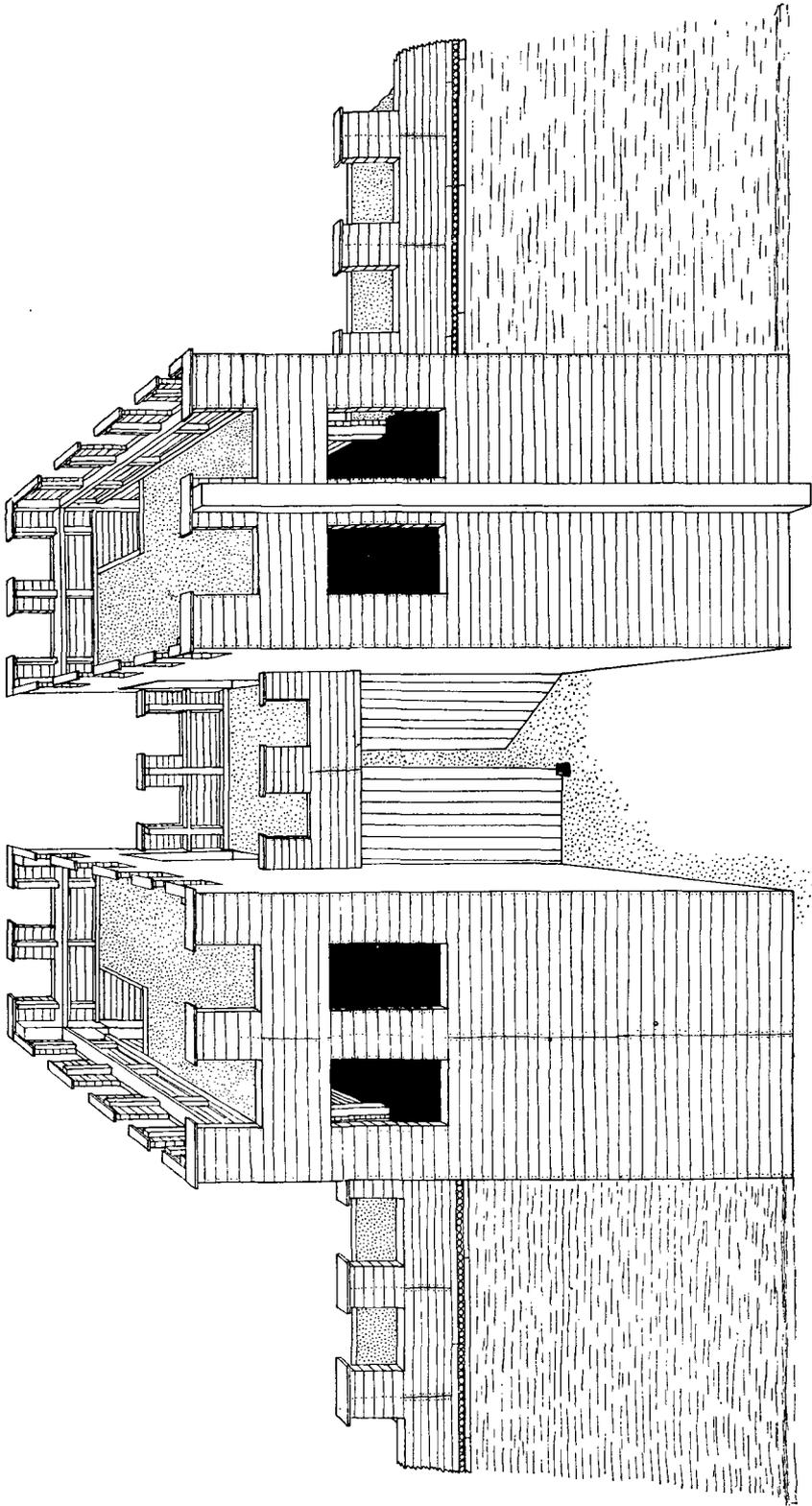


Fig. 4. Conjectural restoration of the North Gate, Fendoch.

This has been calculated at about twelve feet high. It can hardly be an accident that $12\frac{1}{2}$ feet is the dimension of the front of the towers; for timber-work involving cross-bracing is regularly built upon the square. This height is also suitable for the doors of the gateway, which would be hung behind a framework fixed between the rearward main posts of the passage, while the gangway would cross the passage above them. There is no need to suppose that this gangway was roofed: its front would be protected, as is assumed at Xanten,¹ by a parapet and merlons some 6 feet in total height. In its length of $10\frac{1}{2}$ feet one central merlon and two half-merlons to protect the tower-doorways, would suffice. The embrasures between them would thus be about $4\frac{1}{2}$ feet wide; none too large when it is recalled that the Roman soldier of this period appears (Pl. LXI, 1) on Trajan's Column² defending crenellated ramparts shield-in-hand, thus requiring a larger embrasure than was demanded by later custom, employing different weapons and armour.

Beneath the floor-level thus established the basements of the towers were differently treated. The east tower, where the basement, as noted above, was not put to use, required neither door nor window, and to the lower part of its back was applied an external stair. The west tower, where the basement served as a guard-chamber, was entered by a door at the east end of the south side and was probably lighted in addition from a rearward window: for it is unlikely that the front had loop-holes, suited only to weapons of a kind not supplied to the normal auxiliary cohort.

The upper storeys of towers furnished to the semi-permanent works figured upon Trajan's Column³ are open platforms (Pls. LXI, LXII), whence the defenders, protected by their own armour, rained down missiles upon the heads of assailants. A boarded structure, however, would possess at least a parapet to screen its occupants: while the divided front of the west tower creates in effect two windows. These must have been high, for use with spears or *pila muralia*,⁴ and 5-foot windows would probably fit the requirement. Access to this floor-level was probably confined to the stair behind the east tower. The flat roofs of the towers would be reached by ladders from the first floor, and must have had a parapet and merlons, the latter attached to the main uprights.

The south gate of the fort (fig. 5), leading to the annexe, is on that side of the plateau which is least open to attack. It is thus a minor gateway, requiring less elaborate protection. These facts are reflected in the design, which is that adopted for many minor Roman gateways, for example, the milecastles⁵ of Hadrian's Wall. The passage-way

¹ *Loc. cit.*

² *Cichorius*, pl. 24, sc. xxxi.

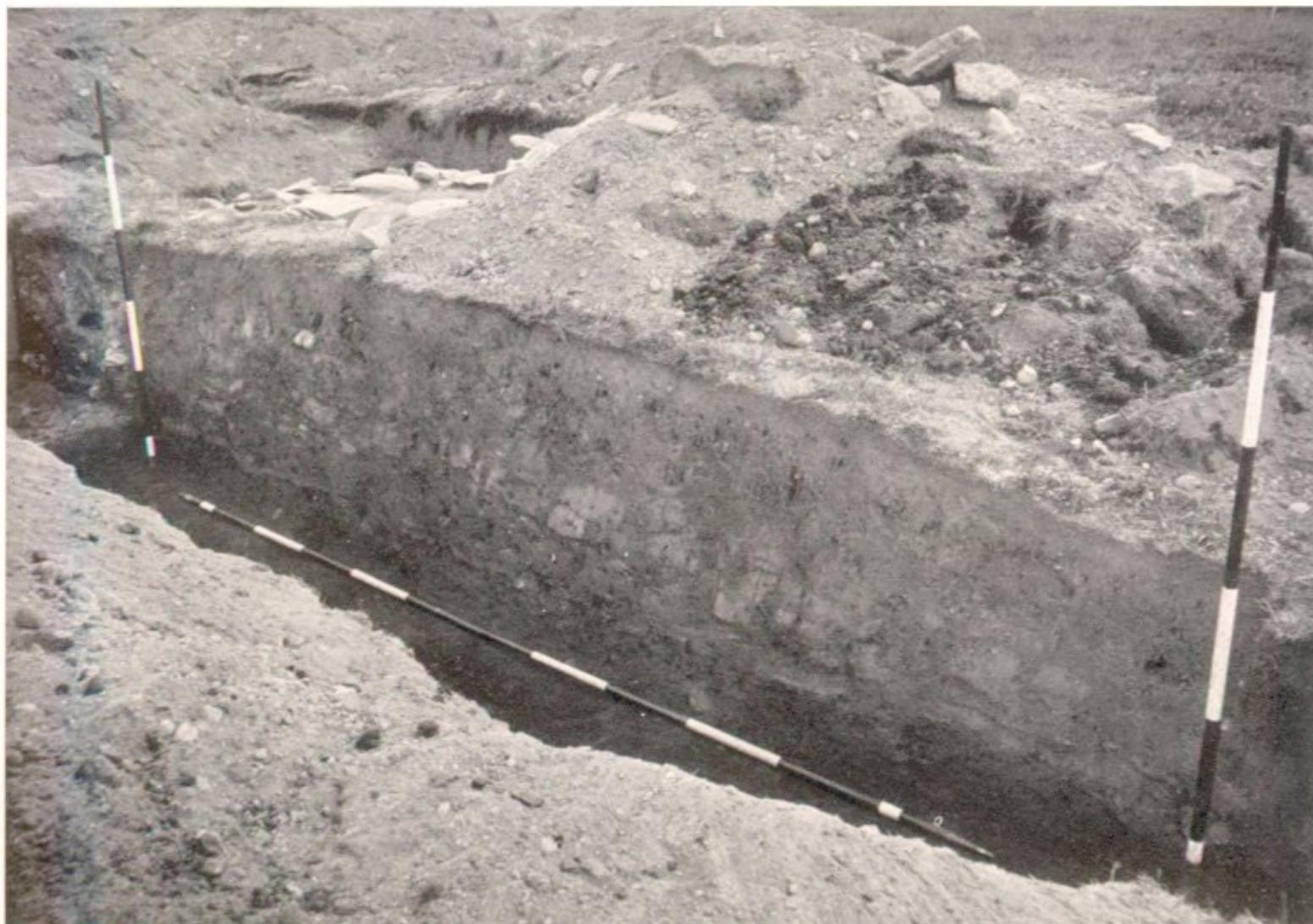
³ *Cf. note 16.*

⁴ *Jahrbuch d. K.D. Inst.*, xxiii. 79 ff; Castleshaw, *Interim Report*, ii. pl. 17.

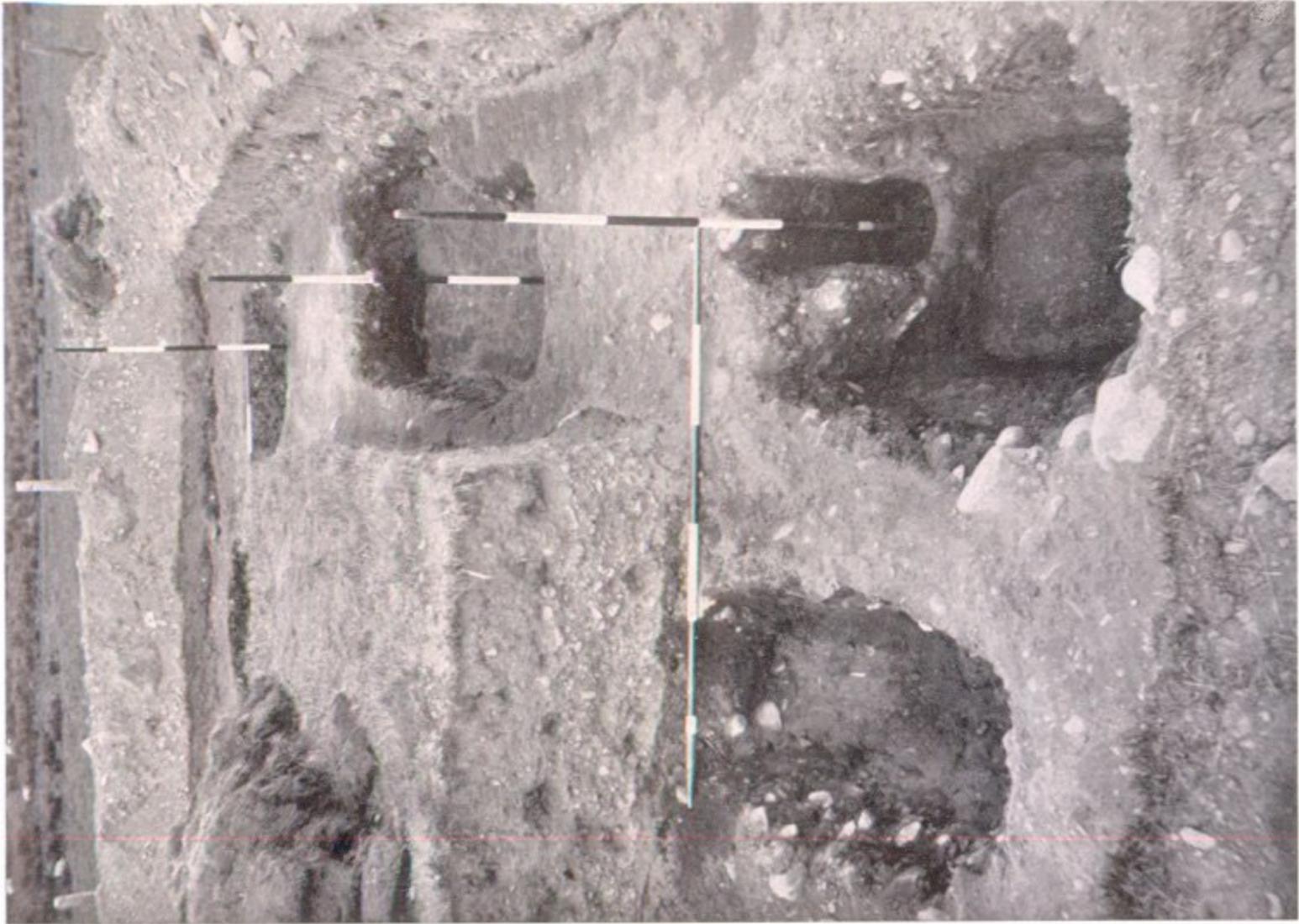
⁵ *AA*⁴, viii. 309, for the three types.



1. Roman Fort at Fendoch. General view showing site, on plateau in foreground, and the Sma' Glen in background.



2. Fendoch. Section of rampart showing turfwork (contained between poles). The steep back of the rampart can be seen in section to right of the left-hand pole.



2. Fendoch, north gate. East post-holes of west tower, with impress of post excavated in foremost post-hole. Note floor in section above supine pole.



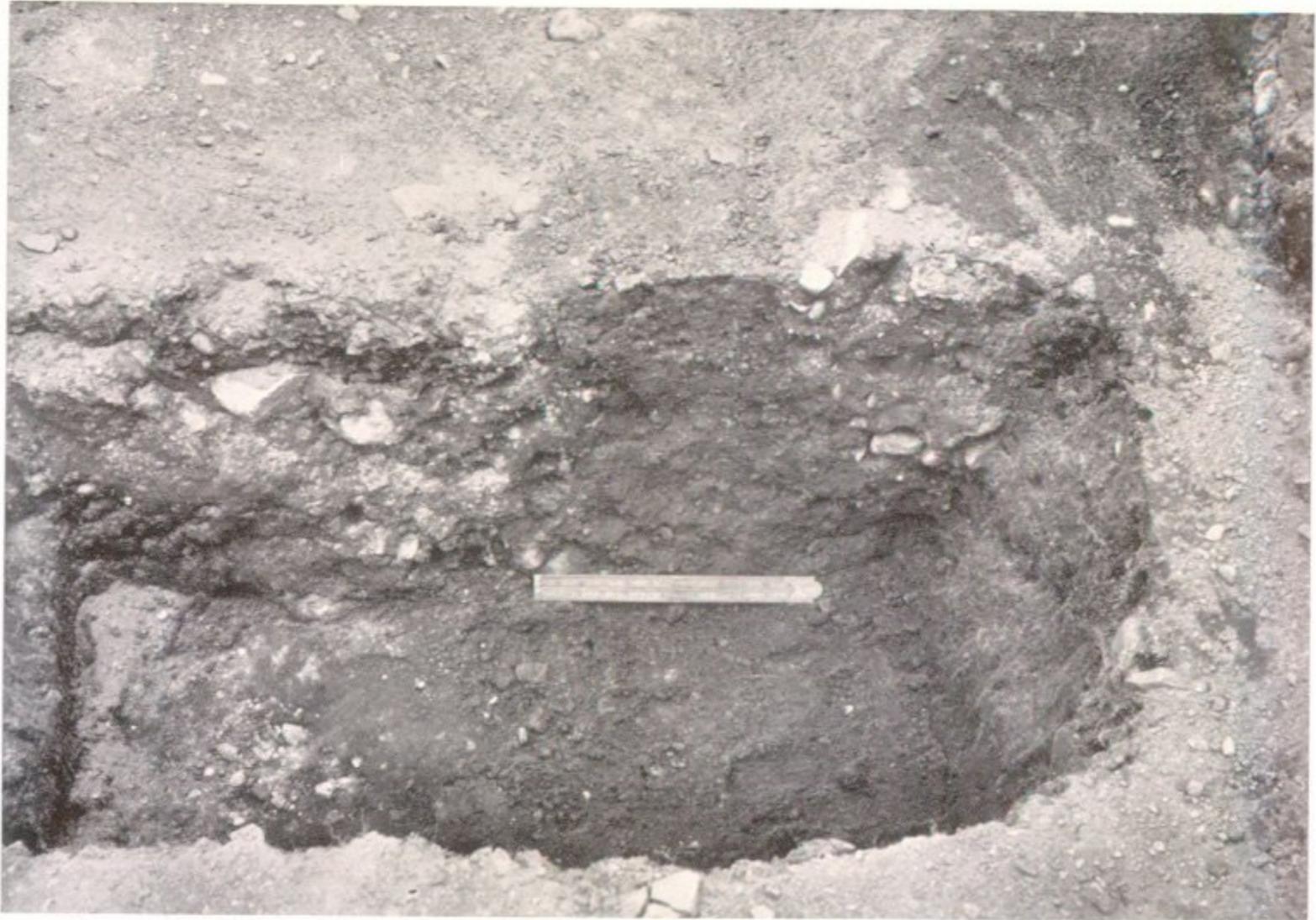
1. Fendoch, north gate. West post-holes of west tower, with water-conduit showing as dark strip to right of poles.



2. Fendoch, south gate. Bed for water-conduit (excavated) and east post-holes of gateway.



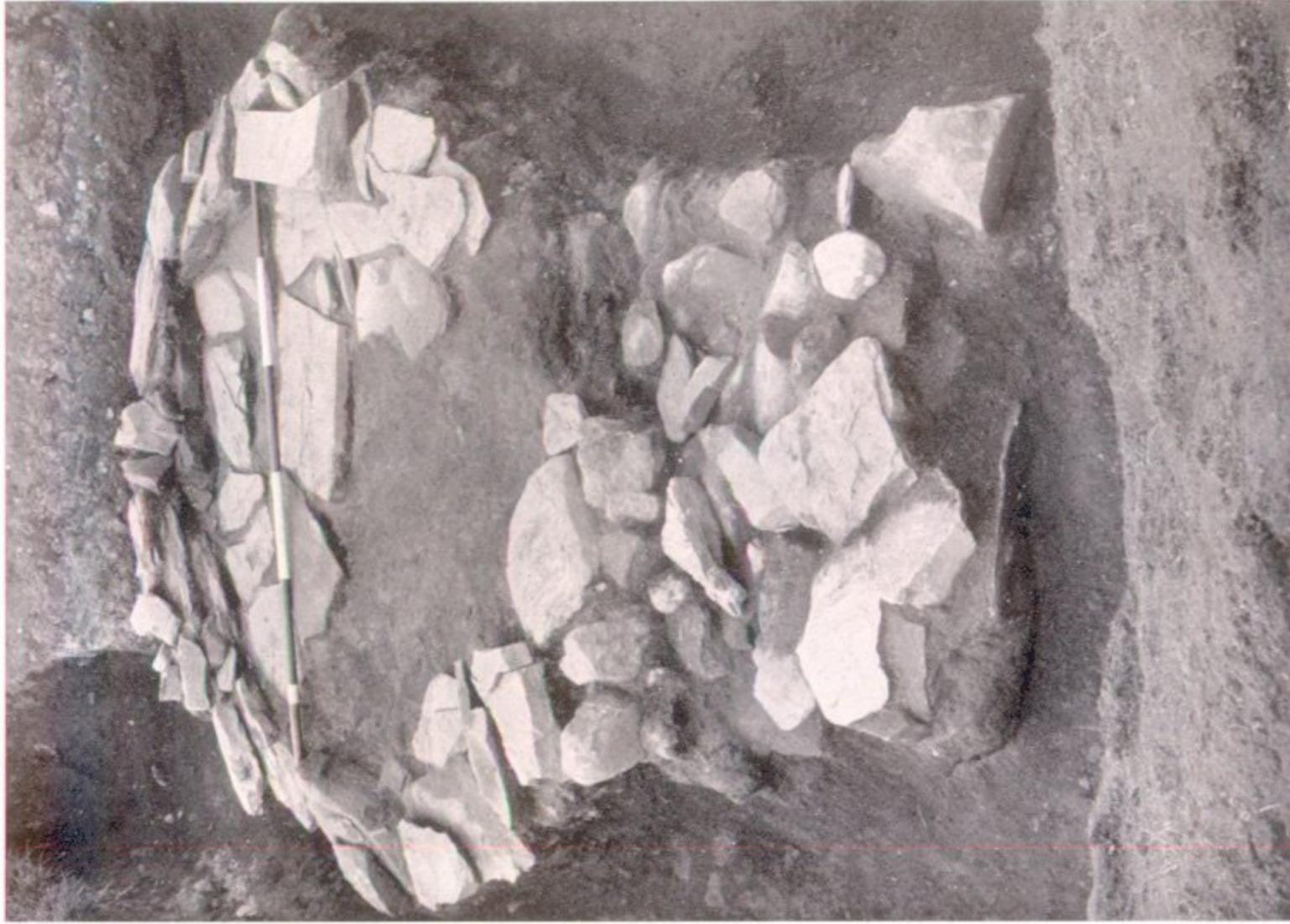
1. Fendoch, north gate; east post-holes of east tower, with irregular hole for staircase in foreground. Note absence of floor in section to left of supine pole.



1. Fendoch, north gate. North-east post-hole of east tower, showing impress of post in packing. A foot-rule lies at the foot of the impress.



2. Fendoch, headquarters. North-west corner of front portico, showing foundation-trench.



2. Fendloch. Oven 1, with hob in foreground.



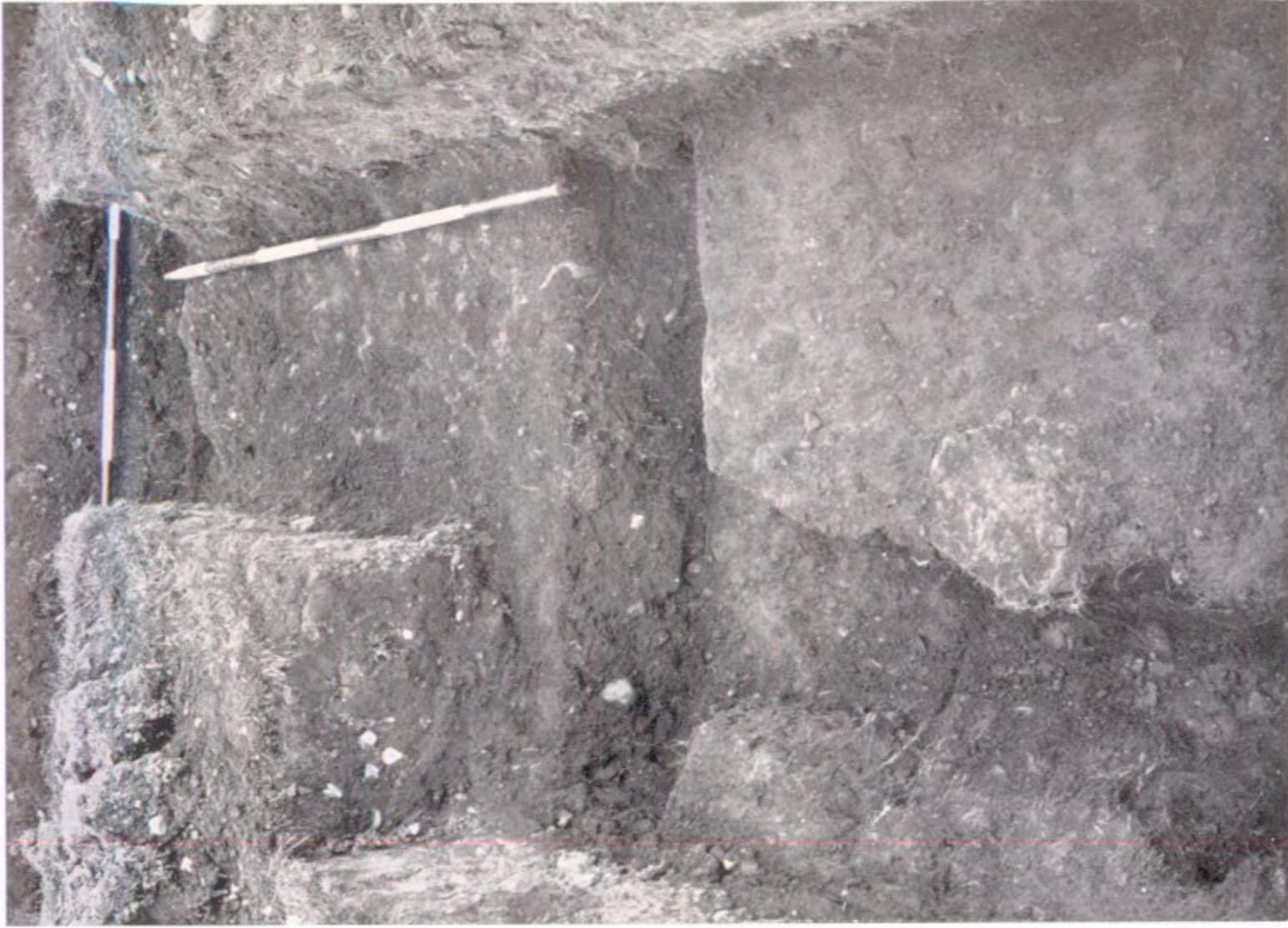
1. Fendloch. Foundation-trenches of the cross-hall in headquarters building looking south.



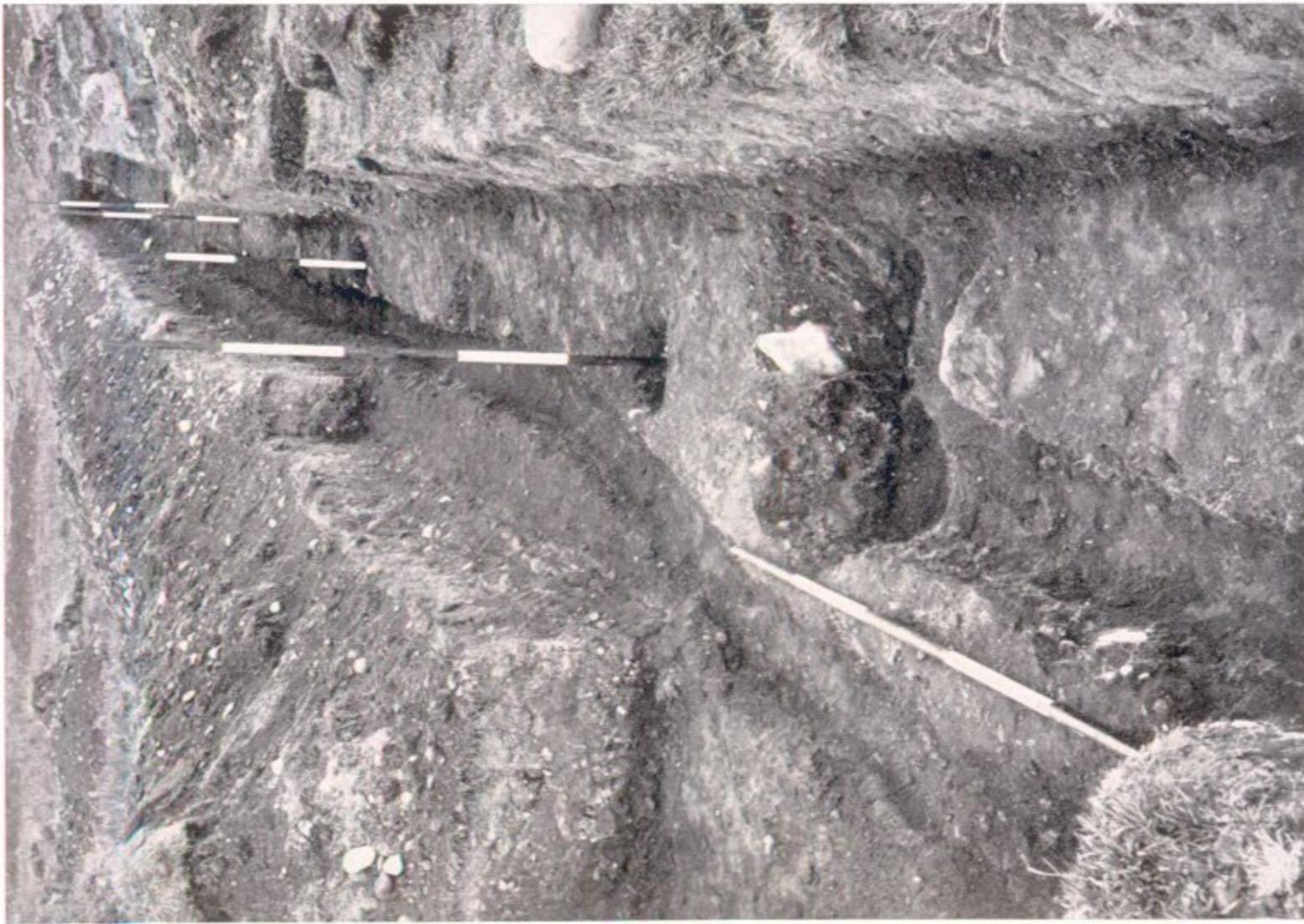
1. Fendoch. North granary, north-west corner showing eaves-drop (in background) and three foundation-trenches with ends cut down and damaged by digging out the timbers on demolition.



2. Fendoch: Oven 3.



2. Fendoch. Barrack 1. Eaves-drop runnel and verandah (in background), and foundation-trenches of front wall and cross-division (in foreground).



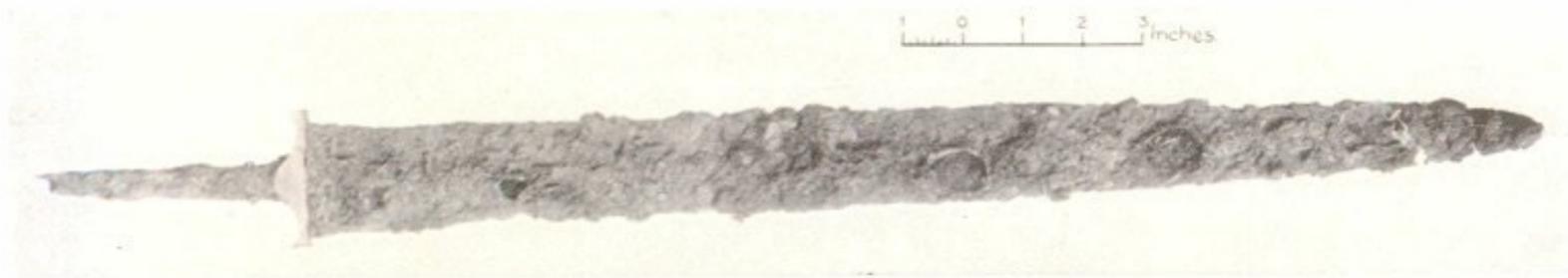
1. Fendoch. Barrack 1, north-east corner of N.C.O. quarters, with post-holes of men's verandah beyond (marked by ranging-poles) and caves-drop runnel to left.



1. Fendoch. Ovens 5 and 4 (in background), first stage.



2. Fendoch. Ovens 5 and 4 (in background); second stage, showing Oven 4 covered with a new base.



1. The auxiliary soldier's sword, Fendoch.



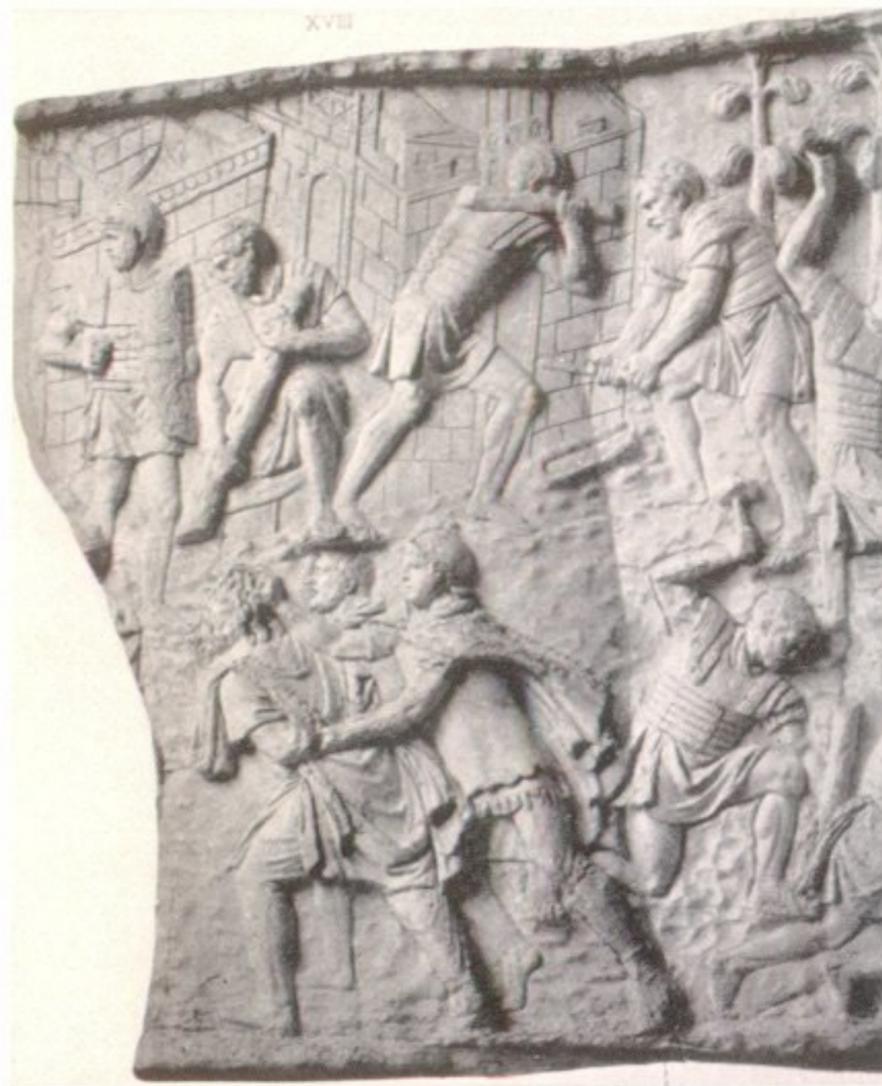
2. Miscellaneous iron objects, Fendoch.



1. Trajan's column: a stone fort with crenellated rampart and towers, defended by men with spears (once supplied in metal) and shields.



2. Trajan's column: a fort with wooden towers in two-storey open framing.



1. Trajan's column: Soldiers' activities with camp (left) and fort (right) in background. The camp exhibits the ends of logs forming a corduroy rampart-walk: the fort has wooden framework towers and wooden internal buildings.



2. Trajan's column: a fort with wooden framework towers, crenellated rampart, and wooden internal buildings. Over the gateway is a tablet for an inscription.

(fig. 5) runs below a single tower, of which the main uprights were held in six large rectangular pits. No impress of an actual timber was noted. Since, however, the pits would contain without difficulty a tower similar to those of the north gate, it may be presumed that the same standard size was used. The tower would then be $12\frac{1}{2}$ feet wide and 17 feet deep.

As at the north gate, a gully (Pl. LIV, 2) made its exit alongside the main posts of the tower. But while the gully at the north gate was so placed as to be accessible for repairs without disturbing the rampart, this one lies on the wrong side of the main uprights and was covered by the tumbled turf of the rampart, visible on both this and the opposite side of the tower. The gully was not lined with stone, nor had woodwork been left in position: yet it is certain that the channel must once have been covered, at this point at least, in order that its contents might pass below the rampart. This point is of significance in a later context (p. 139).

The aspect of this gateway, however, will have differed from the north gate in so far as it combined the tower and gateway-passage which are there distinct structures. The door-frame may be supposed to have been fixed to the outermost uprights, since cover would be offered to assailants by setting it further back, below the tower. The upper storey would occur at rampart-walk height, and would probably have two front windows, flanked by one on each side overlooking the rampart-foot. Since no stair could be supplied at the tower itself, this floor was doubtless reached from the rampart-walk. Hence a ladder would give access to the flat crenellated roof.

Angle-towers are so constant a feature of Roman military architecture, that very careful search for post-holes was made at the south-east angle, on the most vulnerable front. No trace of disturbance of the subsoil was found, though the rampart was standing 3 feet high. It would be rash to conclude from this evidence that no angle-tower existed at Fendoch; but the result was not such as to encourage further search.

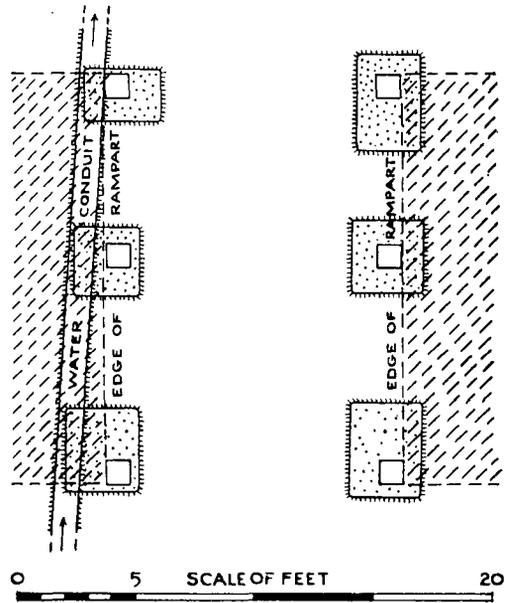


Fig. 5. South Gate at Fendoch. The outside of the gate is at the top.

(iii) INTERNAL BUILDINGS.

(a) *Introductory*.—Before describing the actual buildings, the method of constructing them may be noted. All had been of timber, fixed in the ground by digging in the subsoil vertical-sided trenches wide enough to contain with ease the sills which held the main framing of the buildings. If the plan demanded post-holes rather than sills, a bed for each post was prepared, as at the north gate (p. 115), by digging a large rectangular pit wherein the post was set upright and packed with rammed filling. There is no doubt, however, that the principle of digging the pit much larger than the timber which it was to receive applied also to the trenches for the sills. In all the more elaborate buildings, such as the headquarters, commandant's house, granaries, and hospital, the trenches were not less than 2 feet wide. But the tallest and most massive timbers required on the site and employed to form the main uprights of the gateway-towers, were no more than one Roman foot square, thus setting a limit to the size of beam likely to have been used for the internal buildings. In fact, the posts of the front portico in the headquarters building were 6 inches square (see below). This was probably the scale of the barrack timbers, which had been contained in trenches a foot wide.

Another feature worth note is the general occurrence of shallow runnels, created not by man but by rain-water dripping from the roofs. The gravel subsoil of Fendoch readily absorbed surface moisture, rendering unnecessary the open drains or gutters demanded by the Roman custom¹ of leaving their roofs unprovided with eaves-spouts. Thus, the frequent dripping of water formed a shallow channel in which accumulated some 3 to 4 inches of mud and trampled rubbish. The feature was first recognised at Barrack 1 (Pl. LVIII, 1), on the analogy of a similar runnel observed² at milecastle 50TW on Hadrian's Wall, but examples soon abounded. In these runnels lay much of the pottery found on the site; and it should here be recorded, to avoid further misunderstanding, that the runnel associated with the verandah of Barrack 6, which yielded a fragment (fig. 14) of Dragendorff's Samian shape 29, was in 1936 mistaken for an earlier foundation-trench cut by post-holes (p. 135).

(b) *The headquarters building*, or *principia*, has (fig. 6) a frontage of 80 feet and a depth of 100 feet, the latter including a front portico 10 feet deep with ten uprights. These posts, though set in pits 2 feet square, were themselves just 6 inches square, as shown by an impress in the packing of the fourth pit from the south. At the south end of the portico there was a rectangular pit, 3 feet deep and 8 feet square, with vertical

¹ Compare the implication of *Vitruvius*, ii. 8, 18, *proiectura coronarum reiciet extra perpendicularum stillas*.

² *CW*², xxxv. 226, fig. 9, where the feature is marked by two ranging-poles in the foreground.

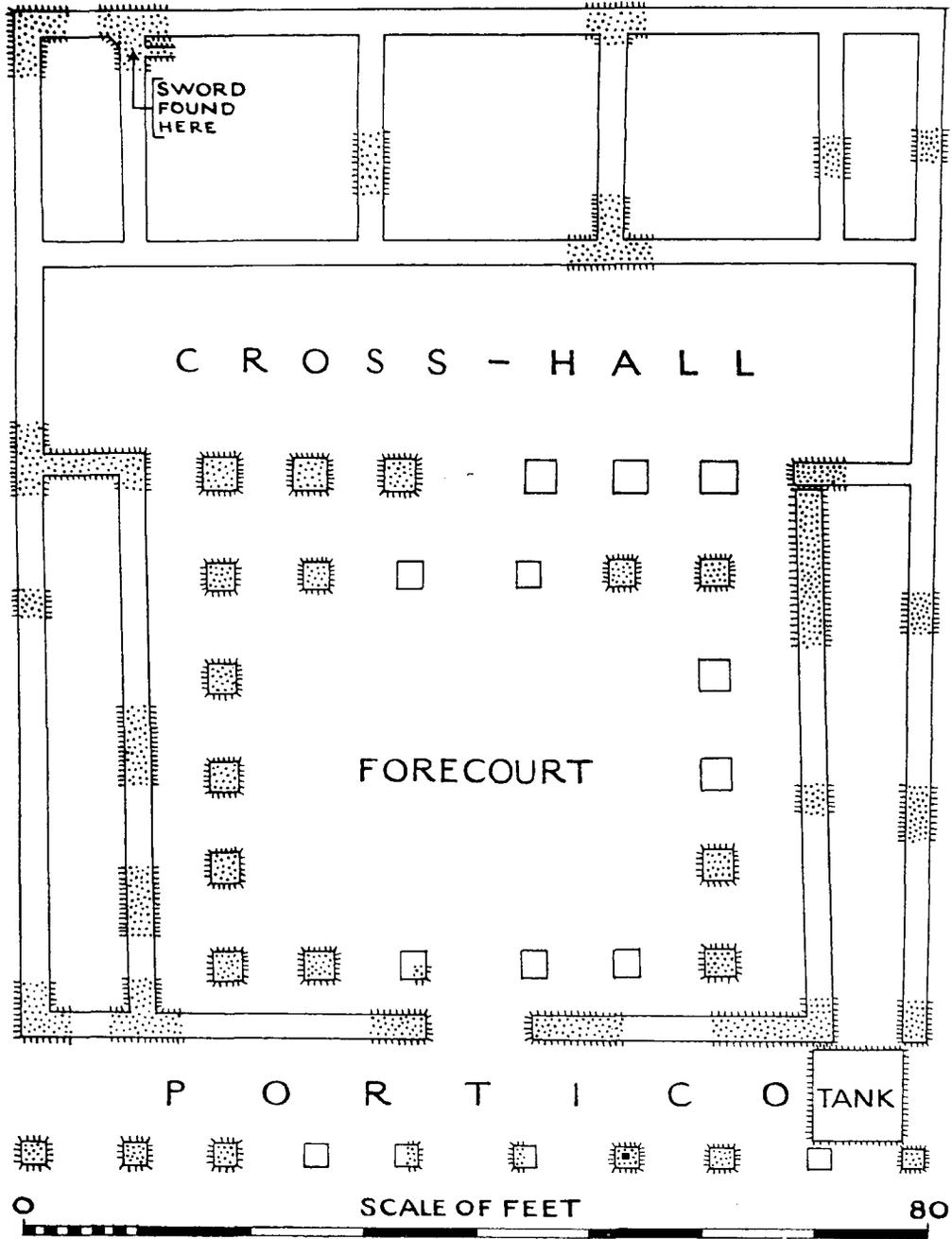


Fig. 6. Headquarters Building at Fendoch.

sides, which in the gravel subsoil must have been lined, presumably with timber, as was a similar pit in the commandant's house (p. 129). Again, since the pit blocks not only one bay of the colonnade but also the open entrance to a lateral room beyond it, we may assume that it was at least partly covered with a wooden top. In so public a position, the pit can hardly have served any other purpose than a water-tank, comparable with that which lined half the frontage of the headquarters building at *Bremenium*.¹ Satisfactory evidence that the portico was frequented by the soldiery when at ease was provided by a gaming-counter of cream-yellow glass paste, marked with two drilled dots, found 20 feet north of the tank.

The main entrance to the building was a central doorway, 10 feet wide. This led into the first division, a forecourt 41 feet wide and 31 feet deep, surrounded by a colonnade of six and five posts on the longer and shorter sides respectively, contained in pits 2 feet square. Within the forecourt is normally found a well. At Fendoch, the water-table lies so deep below the fort, that water must have been obtained in some other way. A hint as to the method actually employed is given by the tank already described: later, a pipe-line was discovered and is described below (p. 138 ff.). The forecourt was flanked by long rooms, apparently not subdivided. That on the south was reached through an open entrance from the front portico: the northern room was closed, and the position of its door, or doors, is uncertain, failing superstructure. No clue was obtained as to the purpose of the rooms, but similar accommodation is elsewhere² explained as *armamentaria*, or armouries, a view which the accessibility of the southern room might be thought to favour.

Behind the colonnade of the forecourt and the lateral rooms lay the second division of the building, covering a space 77 feet wide by 17 feet deep. Its frontage of 57 feet is contained (Pl. LVI, 1) between the ends of the lateral rooms and has been carried by six posts, contained in pits 3 feet square, of which three have been recovered, leaving the rest to be inferred. The notable difference in scale of these pits, a foot bigger each way than those of the forecourt, shows that they were intended to hold posts very much larger, supporting a higher structure comparable with the gateway towers. This was the cross-hall, which ran straight across the building, as is shown by the way in which the north wall of the southern lateral room butts against it (fig. 6). In the life of the fort and its district, it was equivalent to the *basilica*, or judgment-hall, in civil *fora*, for which the same plan³ was used; and here the commandant of

¹ *AA*², i. plan facing p. 68; Bruce, *Roman Wall*, edn. 2, p. 452. A wooden trap-door covering a rectangular pit or tank was noted at Haltern, *Mitt. d. Allertums-Komm. f. Westfalen*, v. 42-43, figs. 7-8.

² S. N. Miller, *Roman Fort at Balmuildy*, p. 24.

³ Cf. *Vetere*, 51, where the parallel with Caerwent is developed; also Ward, *Romano-British Buildings and Earthworks*, pp. 89-91.

the fort held his courts-martial.¹ The recess on the south, formed by the returning end of the lateral room, would accommodate the dais or tribunal for his judgment-seat, the elegant bronze *sella castrensis*² which each commandant possessed.

The third division of the building is formed by the five rooms which lie behind the cross-hall, in conformity with well-known plans.³ The three principal rooms, each some 20 feet square, are flanked by two minor offices, 10 feet wide and 20 feet deep. The central room was the regimental chapel,⁴ where the Emperor's image and the standards of the corps received the veneration inspired by loyalty and discipline. The large rooms to north and south would be used for accounts⁵ and records,⁶ while the smaller rooms take their place as filing-rooms for reserves of information not normally required, and as subsidiary offices. It will be observed that one end of a minor division was uncovered at the back of the room north of the chapel. This may be compared with a division in the centurion's quarters of Barrack 2, but the purpose of both remains obscure. Similar minor divisions in the *principia* at Vetera are explained as cupboard-supports.⁷

The general impression of great precision, so powerfully conveyed by the design of the building, is strongly reinforced by a study of details. This soon reveals that the planning was conceived in units of tens and fives, reflected in the dimensions of the whole building, its rooms and colonnades and the intercolumniations of the cross-hall. The plan is in fact a manifest, drawing-office product, such as the engineers of a *praefectus fabrum* might well have produced. Equally, there is no reason why all the component parts of such a building should not have been made to order and kept in store, ready for use when required. The whole building as here designed could in fact be erected with standard timbers. Such timbers could not have been prepared locally: for a pollen-analysis of the turf from the fort-rampart shows (p. 154) that large timber was not within the horizon of Fendoch. Thus, the material for building would have to be ordered from elsewhere; and whence, if not from the stocks of military saw-yards? The significance of this point will become apparent at a later stage of our report (p. 151).

¹ For police action by a commander, see Hardy, *Pliny's Correspondence with Trajan*, xxix. xxx.

² Cf. Curle, *A Roman Frontier Post*, pp. 286-287, pl. lxiv.

³ Cf. J. Ward, *Romano-British Buildings and Earthworks*, fig. 28, p. 83; also Haverfield and Macdonald, *The Roman Occupation of Britain*, fig. 11, pp. 135-138.

⁴ Von Domaszewski, *Die Religion des römischen Heeres*, 11-19; cf. Statius, *Theb.*, x. 176, *domumque verendam Signorum*; and Tertullian, *Apol.*, 16, *religio Romanorum tota castrensis signa veneratur, signa iurat, signa omnibus deis praeponit*.

⁵ In the hands of the *actarii*, cf. *CIL*, vii. 458, from Ebchester, recording an *actarius* of the *cohors IIII Br(eucorum)*.

⁶ In the hands of the *cornicularii*, cf. *CIL*, vii. 739, from Greatchesters.

⁷ *Vetera*, 50, "würde man . . . die . . . Zwischenmauern als Substructionen für schwere Akten-schränke u. dgl. ansehen."

The aspect of the building (fig. 7) next commands our attention. On the main street a first impression was conveyed by the portico. Its 6-inch posts would suggest the sturdy trim efficiency of the army to which they belonged, and are so frankly utilitarian as to preclude a flat-roofed ornamental structure. Nor is a height greater than 10 feet demanded by the needs of soldiers, even when carrying standards. A pent roof may therefore be assumed at this height, with a ridge 5 feet higher, carried upon the back wall of the portico. The roofing material was probably oak shingles, brought with the rest of the material.¹ If a pent roof is assumed for the portico, it is also appropriate to the lateral rooms, which would receive light from windows placed either in their external walls or in the forecourt, thus obviating a clerestory. The roof of the colonnade in the forecourt would slope in the other direction, giving thus a pleasing and natural roof-line to the forepart of the building. All other arrangements result in waste of material and loss of appearance, without gain in other directions.

The vista in the forecourt was closed by the façade of the cross-hall. Here the main entrance was central and 10 feet wide. But the arrangement of the posts shows that the rest of the façade was open, and minor entrances may thus have faced the lateral colonnades of the courtyard. The function of the openings, however, was rather to admit light, which was much needed not only for the hall itself, but for the rooms behind it. Direct light would, indeed, be cut off by the colonnade of the courtyard, but borrowed light in abundance would stream in through the openings, where grilles or latticed screens would provide the necessary wind-breaks. The main source of direct lighting must have been a clerestory, rising high above the colonnaded forecourt and closing the vista with a patterned line of windows.² The number and size of the windows is governed by the planning of the main uprights, which suggests that there were nine, the central one either larger or differently spaced, emphasising the axis of the building with a touch of variation. It may be regarded as certain that these windows were glazed, to prevent wind from lifting the great roof of the hall.

The height of the hall and the arrangement of its roofing is governed by the treatment of the rooms behind it. In many *principia*, as, for example, Chesters³ or Housesteads,⁴ the hall is so related to these rooms as to suggest that they were covered with pent roofs, like side-chapels in a nave. In almost every respect, this design would appear to be much

¹ Tiles can hardly have left no trace upon the site, while the cutting of the large timbers would provide abundant material for shingles.

² Much window-glass came from the headquarters at Balmuildy, *Balmuildy*, p. 26; for windows themselves, see *Romano-British Buildings and Earthworks*, pp. 271-272; a *speculariarius*, or glazier, counted among *immunes* in the army, *Cod. Theod.*, xiii. 4, 2.

³ *PSAN*³, iv. 137.

⁴ *AA*², xxv. 210, pl. xv.

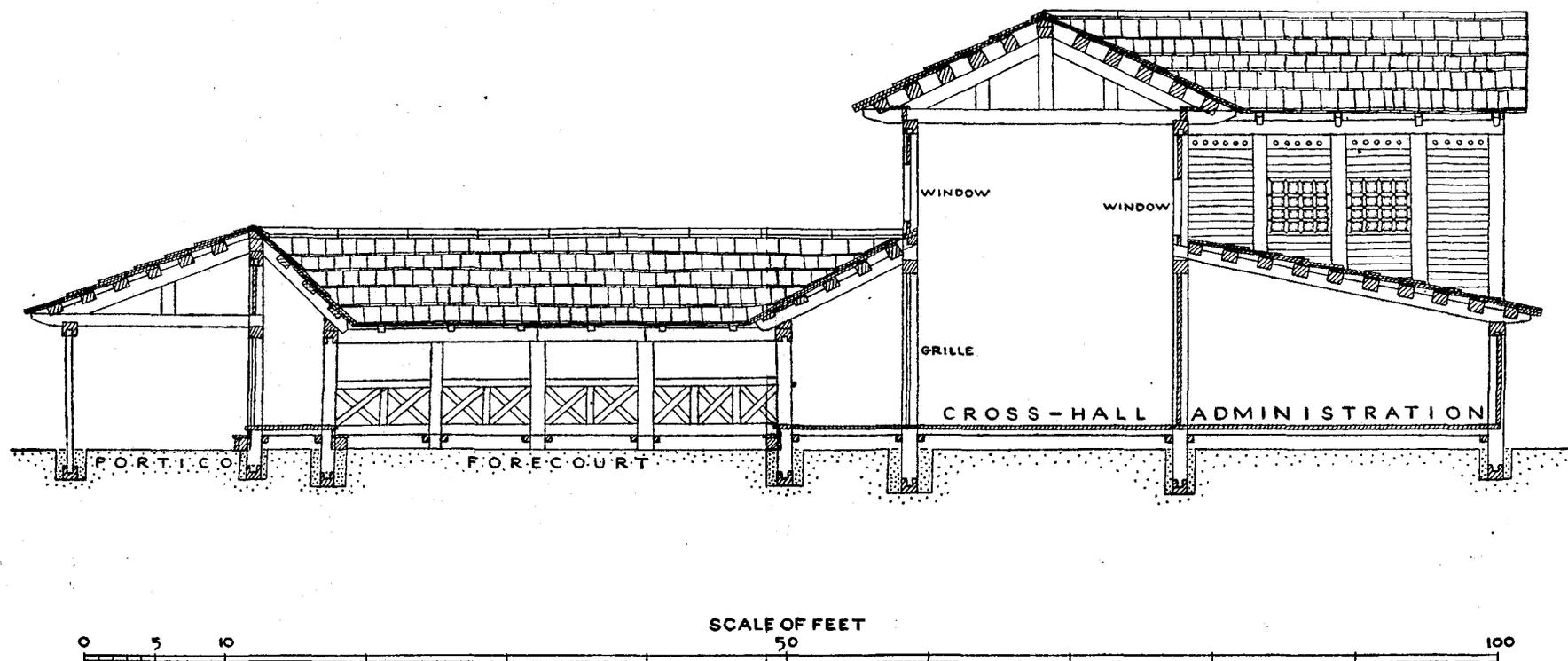


Fig. 7. Conjectural Cross-section of Headquarters Building, Fendoch, from front (left) to back (right).

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the most reasonable for the Fendoch building, resulting in a hall 25 feet high to the roof ridge, with wooden walls 20 feet high. There is, however, one point at which such a scheme seems to fall below the dignity of the ceremonial occasions which enlivened the routine of Roman military life. The decorative standards and Imperial image were kept in the axial chapel, or *sacellum*, of which a glimpse could be obtained from the very front of the building. These revered objects, no doubt raised¹ upon a stand or dais, not only exact more head-room than the 10 feet sufficient elsewhere, but also require cross-lighting to save them from dark obscurity. This would be provided by raising the roof-line of the chapel to the level of the cross-hall roof out of which it would open like the transept of a church. The greater height of this principal feature of the building has sometimes, as at Mumrills,² been deduced from the extra solidity of its foundations. Here no deduction can be made from the size of the foundation-trenches, which are everywhere very wide, and the question depends upon proportion and seamliness.

(c) *The commandant's house*, or *prætorium*, is placed upon the sunniest side of the fort, which is also least exposed to the enemy. It has (fig. 8) a frontage of 68 feet and a depth of 100 feet, matching that of the *principia*. Its front thus lies parallel with the portico of the latter building, but its arrangement is less public in character, suiting the function of the *prætorium* as the private house of a public personage. It is divided into three columned vestibules of unequal size. The south vestibule gave open access to a large hall, the second biggest room in the house, which may be regarded as a reception-room for delegates, official messengers, despatch riders and all who maintained connection between the outer world and the commandant in his non-judicial capacity. Entry from the house to this hall was probably not direct: complete privacy would be ensured for the household by using for this purpose the lobby to north. This passage was served by the central vestibule and is thus marked as the main entrance to the house, doubtless closed by doors at each end. The north vestibule even more evidently leads to the north wing of the house by means of an open screened passage. It is comprehensible as a service-entrance, by which orderlies, sutlers and the like maintained contact with the servants' quarters of the house. In addition, it serves a small room in the south-west corner of the courtyard, suitable in size and position³ for a latrine. Where no sewer was provided, the sanitary service⁴ formed in the Roman army a fatigue, for the performance of which the service-vestibule is the most appropriate means of approach.

The central feature of the house proper was an oblong open court,

¹ Cf. Tac, *Hist.*, i. 36, *in suggestu in quo paulo ante aurea Galbae statua fuerat, medium inter signa Othonem vexillis circumdarent.* ² *Proceedings*, lxiii. 427-428. ³ *AA*⁴, xv. 247, fig. 5, 245.

⁴ For the duty *ad stercus*, see Lesquier, *L'armée romaine d'Égypte*, p. 141.

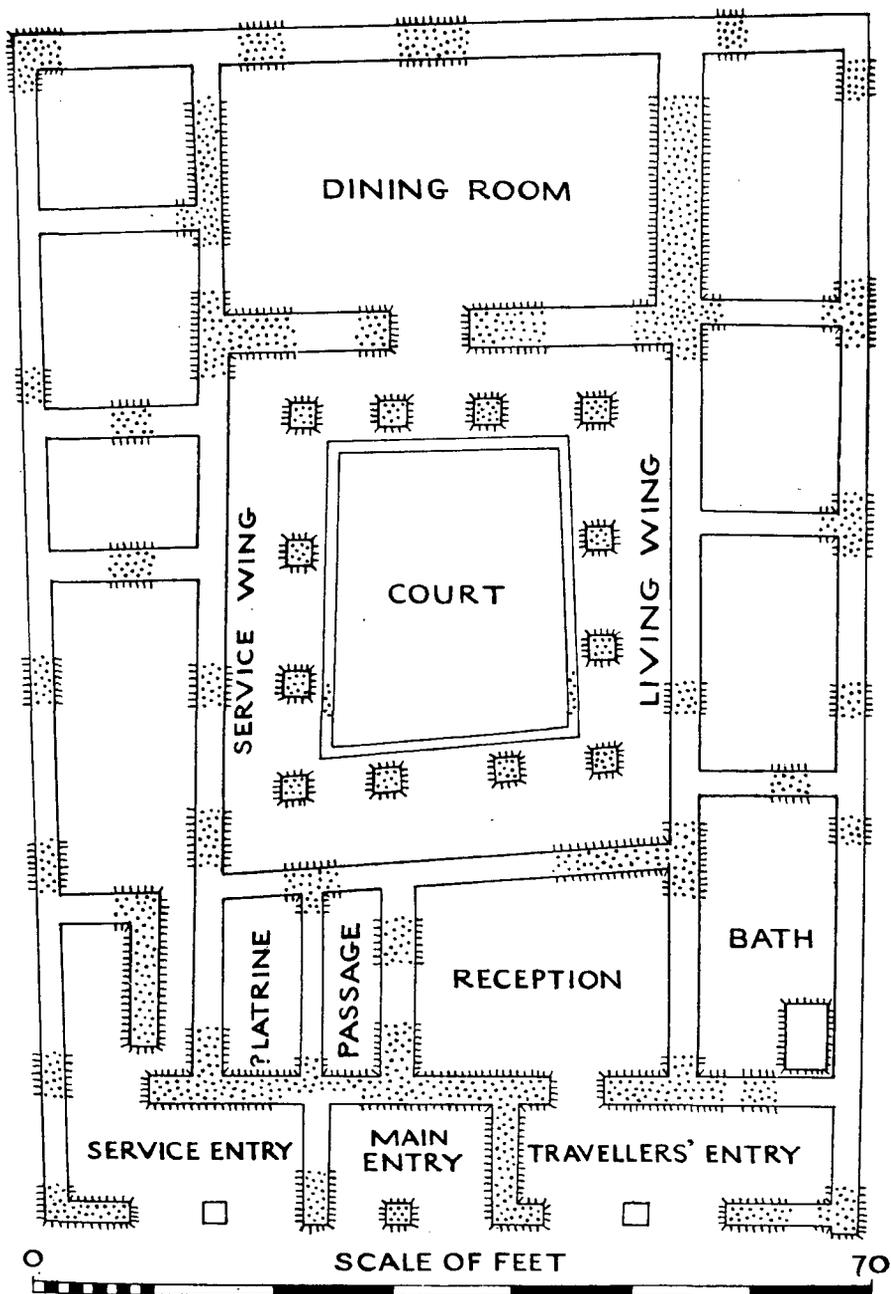


Fig. 8. The Commandant's House, Fendoch.

or light-well, 24 feet wide by 29 feet deep, surrounded by an open covered walk, from which every room could be reached. Apart from the obvious advantages of lighting and circulation thus obtained, the open space afforded a charming oasis of domestic peace amid the clangour of military life. The east end of the court was occupied by a great dining-room, the scene of the evening meal which in the Roman family was the social event of the day. Here the commandant would dine with his staff,¹ sometimes filling the *triclinium* with guests from a neighbouring fort or even with Romanizing British notables, amid a display of silver plate and rich table furnishings, so often forbidden² to officers on campaign but certainly available in their permanent quarters.

Since most of the north wing was evidently occupied by service quarters, while the west wing chiefly comprises reception-rooms, the south wing is left for more intimate rooms, such as bedroom and bathroom. There is no trace of the elaborate heated rooms built in stone, which often form³ part of a commandant's house. But the hint of a water-supply is conveyed by a rectangular tank, 4 feet deep, 7 feet long, and 4 feet wide, in the south-west corner of the front room of the south wing. It had vertical sides once lined with wood, as was indicated by small nails in horizontal rows⁴ sticking at regular intervals to the side. Recreation had its place here, for a second gaming counter, of plain white glass paste, was found in the tank.

The aspect of this timber house no doubt harmonised with that of the *principia*. Its general plan, however, powerfully reflects the Mediterranean design employed by the Roman army for its commandant's houses. Thus, few windows may be expected on the exterior façade, and the rooms would receive their light from the *cortile* round which they were built. This involves the assumption that they were carried up some 15 feet to ceiling level, with a roof-ridge 5 feet higher. The front vestibules, however, would hardly be included in the main roofing scheme, but would receive a pent roof, resembling that of the adjacent portico of the headquarters. The separation of the central vestibule, and its major importance in relation to the plan might be reflected by a different treatment, verging upon the ornamental. This would be most likely to take the form of a gabled porch, formed as a pediment in classic style.

(d) *The granaries*, or *horrea*, occupy the northern flank of the headquarters, being planned as a pair running east and west and separated by a 10-foot alley. Each is 56 feet long and 30 feet wide (fig. 9). In

¹ In a military cohort this would include the *medicus*, see Cheesman, *Auxilia*, 44.

² Cf. Caes, *B.C.*, iii. 95, *magnum argenti pondus expositum*.

³ Cf. Mumrills, *Proceedings*, lxiii. 434-447, where a wooden house was succeeded by a stone one. No trace of furnace-heating was found in the wooden buildings, as here.

⁴ I should not have observed these had my attention not been drawn to them by M. B. Garrow, who was working on this trench. An upholsterer by trade, he had an exceptionally keen eye for minute detail.

stone granaries¹ the most characteristic features are buttresses and ventilators. Wooden buildings require no buttress, because strains in a timber structure are taken by cross-bracing. On the other hand, well-ventilated flooring is even more important than in the stone buildings,

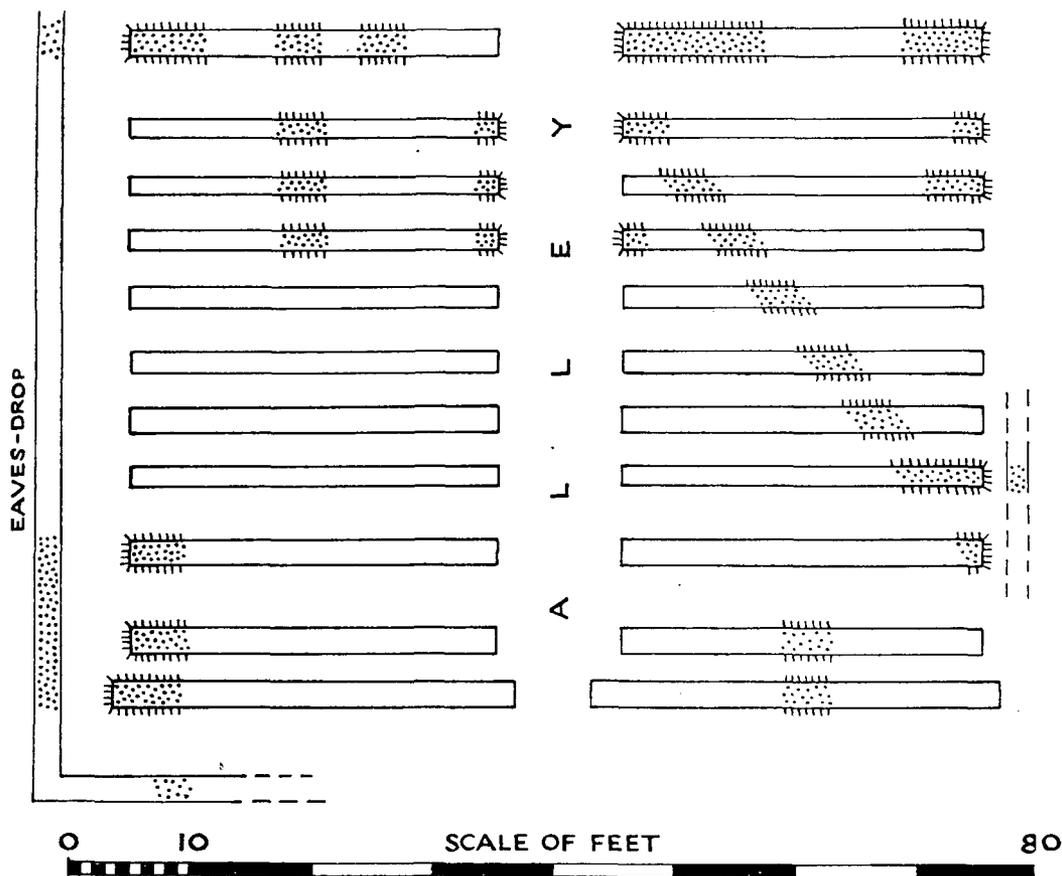


Fig. 9. The Granaries, Fendoch.

because of the greater liability of a timber building to overheat. Thus, the floors are carried upon eleven cross-beams, at intervals of 3 to 5 feet, allowing plentiful space for the free circulation of air. So simple a form of building is not normally employed in the ventilation of stone granaries: but those of the Trajanic fort of Gellygaer,² erected at a time when

¹ J. Ward, *Romano-British Buildings and Earthworks*, fig. 31, pp. 91, 94.

² *Roman fort of Gellygaer*, 104, general plan, buildings, v. viii.; cf. *Romano-British Buildings and Earthworks*, 91, fig. 31, and Haverfield and Macdonald, *The Roman Occupation of Britain*, fig. 16, pp. 144-145.

timber forts were being rebuilt in stone throughout the province, present an interesting hybrid between this type and the normal stone building. Wooden storehouses, indeed, persisted later, as at Old Kilpatrick,¹ where building ix. is built to a pattern in use at Haltern² and Richborough.³

It will be observed that the granaries are set back 10 feet from the line of the headquarters and commandant's house. This might suggest that they also had been provided with porticoes or porches. But the contrary is suggested by the position of the roof-drippings from the building, which turn the corner in association with the ascertained front line. Extra space on the street would, however, be required for turning and backing the corn-waggons into position when stocking the buildings, while steps or a loading-platform would also demand room.

The external aspect of these buildings would depend much upon the arrangement of the interior. In stone granaries, the provision of buttresses denotes that pressure was expected to bear upon the side walls, against which the grain is assumed⁴ to have been stacked in lateral bins. In the wooden building the function of the buttress would be fulfilled by a brace or tie, which at once suggests the division of bins into compartments. Thus, while the plan cannot be said to force a design of superstructure upon us, it nevertheless powerfully suggests the main lines of an arrangement (fig. 10) as follows. The whole building is planned in units of fives and tens. Its width of 30 feet suggests a central passage 10 feet wide, with bins on each side also 10 feet wide. A gabled roof is attested by the mark of its drips, and this would be supported by posts not central but set in two rows so as to form also the corner posts of the bins. While on the exterior of the building these uprights presumably occurred at every 5 feet, there is no reason to postulate more than a 10-foot interval on the internal division, thus allowing five bins to each side, or ten per granary. The effect would be that each of the ten centuries in the garrison would thus have one bin in each building. There is no doubt that the accommodation thus supplied would be ample. Assuming that the bins were filled 5 feet high, 370 cubic yards of storage-room would be available. A year's corn-ration for one man is calculated by Collingwood⁵ to take up half a cubic yard. Thus, it is evident that ten centuries would here possess almost a year's supply. An increase of 6 inches in height would even provide a reserve. Nevertheless, the 5-foot unit would suggest a bin 5 feet high at the back at least, with a wall rising 5 feet more above it, the upper space being occupied by carefully weather-proofed double louvres, to give the abundant circulation of fresh

¹ S. N. Miller, *The Roman Fort at Old Kilpatrick*, building, ix. 22.

² Haltern granary.

³ Richborough granaries, *JRS*, xxiii. 210, pl. xxv.

⁴ *CW*², xx. 139.

⁵ *Loc. cit.* The basis of calculation is 50 feet (internal length of granaries, excluding divisions) multiplied by 10 feet (width of bin), by 5 feet (height of bin), by 2 (double row) by 2 (pair of granaries) = 10,000 cu. feet = 370 cu. yards (approx.).

air which a building of the type would require. The wide overhang of the roof is also explained by the desire to afford a maximum of shelter and shade to a building whose contents were so sensitive¹ to heat and damp. Light would be admitted partly by the louvres, partly by windows at the ends of the gangway and much by the opening of the doors when access was obtained to the building. It is the presence of these doors,

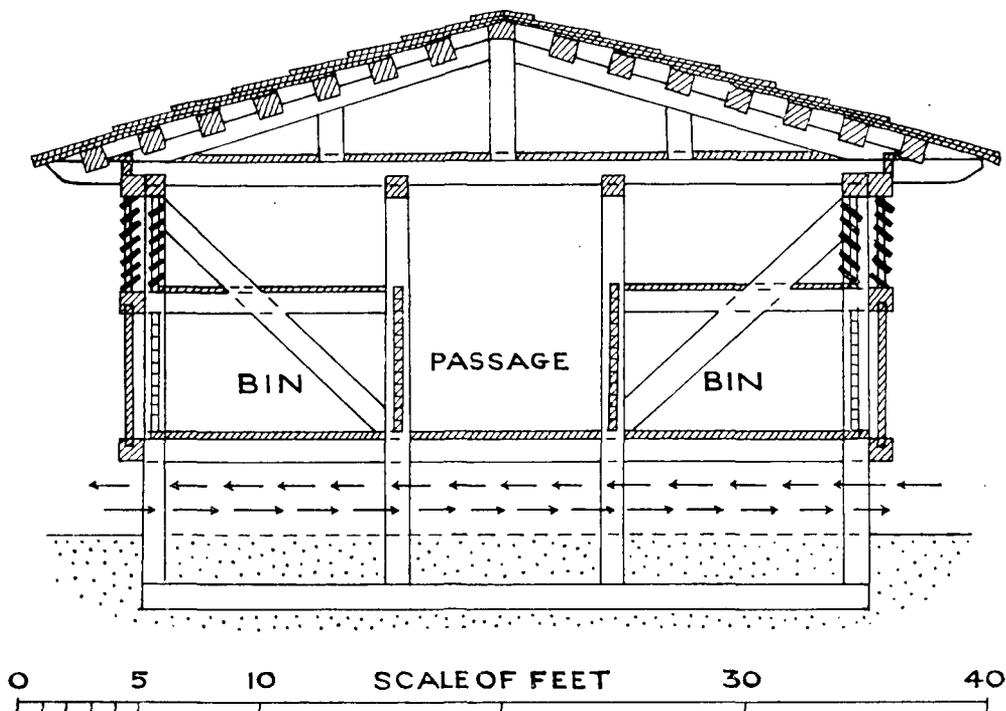


Fig. 10. Conjectural restoration of a section of a Granary, Fendoch.

breaking the continuous wall-space, which seems to have dictated that the front walls should project beyond the rest, no doubt so as to lap cross-beams and uprights firmly at the angles.

(e) *The Hospital*.—A position of relative seclusion, comparable with that chosen for the commandant's house (p. 127) was selected also for a second building (fig. 11), 40 feet wide and 106 feet long; which occupies, behind the commandant's house and the south half of the headquarters building, the space between *intervallum* and *via decumana*. The building consists of three divisions, forming two sets of rooms 15 feet wide, served

¹ Modern millers' practice, as I have learnt by inquiry from Messrs Spillers, of Newcastle-upon-Tyne, is not to allow a heat above 80 degrees Fahrenheit.

by a long central corridor 10 feet wide. Its size and plan show it to be important, yet different from such buildings as barracks (p. 134), stores (p. 136), or stables,¹ with which its length qualifies it to compare. The principal feature of the plan is the self-contained privacy afforded by the central corridor, with direct external access only at either end. If, however, allowance is made for the difference in scale between Fendoch fort and a legionary fortress, it compares very closely with the plan regularly adopted in the fortresses for the wards of the great military hospitals, or *valetudinaria*, as at Haltern, Vetera, Novaesium, Lotschitz, and Carnuntum, recently discussed² by R. Schultze. These very large hospitals are ranged about quadrangles; on three sides of which lie wards planned as a series of side-rooms opening on to a wide axial corridor, while the fourth side is occupied by a great reception-hall for preliminary examination of cases. The quadrangular plan with simple side-wards is echoed at Housesteads, in the building behind the headquarters identified as

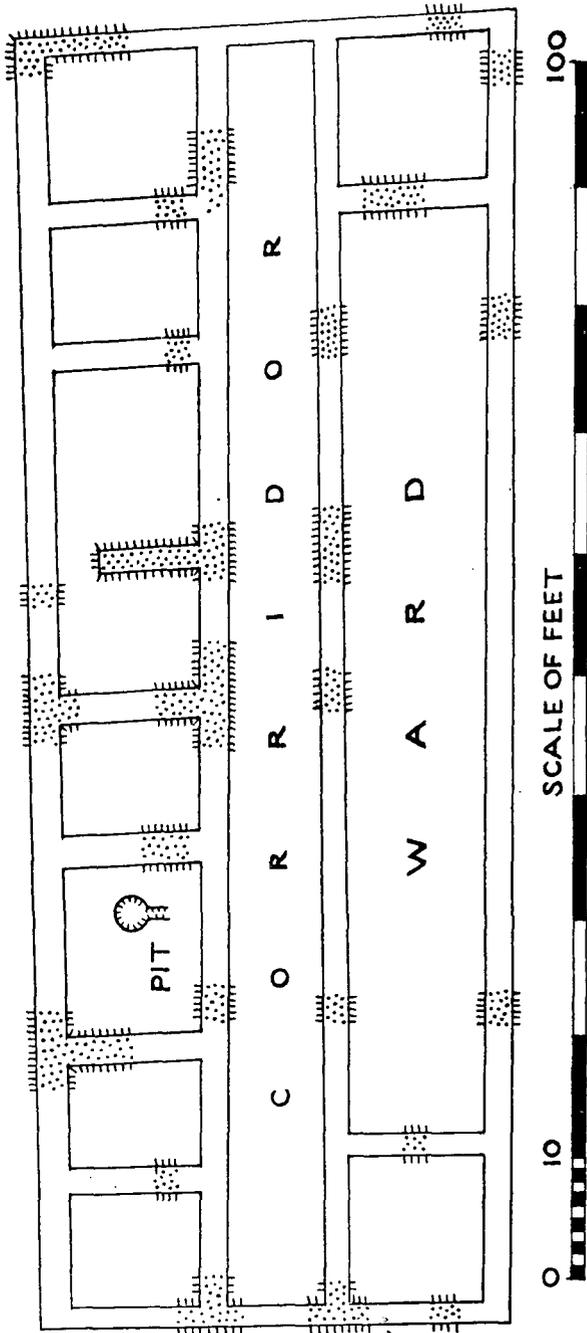


Fig. 11. The Hospital, Fendoch.

¹ A.4⁴, xiv. 165, fig. 5, 164-167.

² *Bonner Jahrbücher*, 1934, cxxxix. 54-63, pls. i.-v.

a hospital¹ by Stuart Jones. At Fendoch, a quadrangle would have occupied too much space, and the plan adopted is of a ward with eight side-rooms to east and a reception-hall, or ward, on the west, flanked by rooms for administration. The administration may, indeed, have encroached upon the eastern rooms, but too little is known of arrangements or requirements to particularise further.

The aspect of the building no doubt closely resembled that of the single ward in the larger continental hospitals. The side-rooms themselves would be lighted with high windows precluding a view into or from the building. The central corridor would carry a clerestory, lighting and ventilating the whole.

(f) *The barracks* of the fort were not completely excavated, but subjected to an examination sufficient to establish their number and plan. Barracks 1, 2, 3, and 4 lay in the *prætentura*, grouped in pairs next to the north and south ramparts. Barracks 5, 6, 7, 8, 9 and 10 occupied the whole of the *retentura*, three on either side of the *via decumana*.

Barrack 1 (fig. 2) was the most thoroughly examined. It had been 154 feet long by 32 feet wide. The whole width of the building had been occupied for 34 feet by centurion's quarters (Pl. LVIII, 1), the remaining 120 feet being devoted to 10 mess-units (*contubernia*), 26 feet deep, fronted by a 6-foot verandah. Nine of these rooms were uniform in size; the tenth, adjoining the centurion's quarters, was larger. A cross-division was examined (Pl. LVIII, 2) opposite the fifth verandah-post from the west, and it may be assumed that these posts fell opposite the dividing walls between each room. The runnels formed by drippings show that the building had possessed a gabled roof. The longitudinal partition, dividing the *contubernia* into vestibules for kit and inner rooms for living-quarters, is to be inferred from the other barracks, soon to be described.

In Barrack 2 the projecting corner of the centurion's quarters, two points on the front wall and one on the back wall were located, giving a building matching Barrack 1, and divided from it by a street 12 feet wide, on to which both verandahs fronted. It was noted that the centurion's quarters had a minor division $3\frac{1}{2}$ feet west of the projecting corner.

Barrack 3 lies north of the *via prætoria*, in the same relative position as Barrack 2. With unexpected good fortune the trial-trench disclosed not only the main long walls of the building, but a complete cross-division with central partition. The dimensions here and in Barrack 4, where a cross-division and longitudinal walls were also found, so evidently corresponded to those of Barrack 1 and 2, that no time was spent in locating the centurion's quarters.

In the *retentura*, the rain-water runnel and front wall of Barrack 5 had been discovered,² but not recognised, in 1936. Two years later, when the

¹ *Companion to Roman History*, p. 255.

² *Proceedings*, lxx. 404; and pl. ii. 406.

systematic examination had reached this part of the fort, trenching located a verandah post-hole, the front wall, vestibule wall and back wall of the building, which were traced again in detail at the west end. In the centurion's quarters the north, south, and east walls, projecting corner and cross-division, were all identified. The length of the building was thus established at 154 feet, exactly matching Barrack 1, while the centurion's block is 35 feet long. The width of the barrack is, however, reduced to 28 feet, with the effect that the vestibules of the *contubernia* are considerably smaller than in the western group. This is the only point at which the narrowness of the site affects the plan adversely: in order to accommodate six barracks in the *retentura* the men's quarters have been made appreciably less roomy than those farther west.

Barrack 6 was also discovered¹ in 1936, when the south wall of the centurion's quarters, together with three post-holes and the rain-water runnel of the verandah, were first observed without being understood (see p. 122). In 1938 the front wall, vestibule wall, and back wall of the men's quarters were added; and also the south angles and back wall of the centurion's room. The building substantially resembles Barrack 5, facing it across a 14-foot street.

Barrack 7, lining the south side of the *via decumana*, lies back to back with Barrack 6, separated from it by an alley 4 feet wide. The back wall, vestibule wall, front wall, west wall, and a verandah post-hole were located in the men's quarters. In the centurion's quarters the back wall and cross-division were found, but the trench for the front wall had been dug in a belt of soft sand and could not be recognised; its position follows, however, from that of the verandah, already described.

Across the 28-foot *via decumana* Barrack 8 was found in good order. The west end of the men's quarters, with west wall, corners, and vestibule wall, was almost entirely uncovered. The same walls were observed once more in the position assigned to the sixth *contubernium* from the west. In the verandah the rain-water runnel was noted and also a pit, the latter being comparable with two pits found in the verandah of Barrack 10 and unproductive of relics. In the centurion's quarters the projecting corner, with rain-water runnel curving round it as in Barrack 1, a cross-division and the back wall were observed.

Barrack 9 lies back to back with Barrack 8, divided from it by a 4-foot alley, and faces Barrack 10 across a 16-foot street. The west end was here also uncovered, revealing men's quarters with vestibule, while the medial cross-trench picked up their continuation, together with the rain-water runnel of the verandah. The back wall, cross-division, and projecting corner of the centurion's quarters exactly matched those of Barrack 8.

¹ *Proceedings*, lxx. 404; and pl. ii. 406.

Finally, in Barrack 10, the whole west end, with vestibules and three men's rooms, was bared, in order to confirm the 12-foot spacing of the *contubernia*. Front wall, vestibule wall, and back wall were identified in the position of the sixth room from the west, together with the rain-water runnel of the verandah. As already mentioned, two pits were found in the verandah. They yielded neither relics nor ashes, and may have been intended to contain an *amphora*¹ for the water supply of the mess-unit. The front wall of the centurion's room, with rain-water runnel, was identified; but the other walls had been founded in soft sand, as in Barrack 7, and the trenches for them had collapsed. It may be observed that this barrack was not quite symmetrically planned. The back wall is not parallel with the front, but has been attracted, to use a grammarian's term, so as to decline towards the north rampart, 34 feet way from it. Had the line of the rampart itself been quite correctly set out, the error of which it is the source would not have occurred. The mistake is, however, particularly interesting, as showing how the trenches for the wooden sills were laid out before the timber itself was assembled. Had the assemblage taken place and the building been partly erected, the mistake could not have occurred.

The aspect of these ten remarkably uniform buildings was very simple. As the disposition of their rain-water runnels shows, they had gabled roofs, which would cover the whole building, including the verandah. How the men's rooms were lighted is not clear. Presumably the vestibules were open-fronted, and would transmit borrowed light through the open door of the inner room, which would be shut only at night, when no light was wanted.

Equally, the uniformity of the buildings leaves no doubt as to the size and type of garrison stationed in the fort. They accommodate the ten centuries of a *cohors milliaria* of auxiliary troops. There is no space remaining in the fort for additional complications, such as a mounted detachment, which would require stabling demanding far beyond the area available. The whole arrangement is strikingly like the fort of Housesteads, where the milliary *cohors I Tungrorum* was quartered in the third century.

(g) When the barracks have been described, few other buildings remain to be recorded. Probably the largest were two *sheds* 18 feet wide, which bordered the *via praetoria*, backing on to the adjacent Barracks 2 and 3. Their outline was not traced in detail, but at the Hadrianic forts² of Housesteads, Halton and Birdswald, store-sheds of similar type occur. It may be observed that the effect of long, plain wall-surfaces at this point,

¹ *AA*⁴, xi. 114, note; cf. *AA*⁴, vii. 157 (milecastle 9).

² Housesteads, *AA*², xxv. 240, pl. xix; Halton, *AA*⁴, xiv. fig. 5, p. 165; Birdswald, *CW*², xxx. 172, fig. 1.

so different from the broken variety of a barrack-verandah, would be to concentrate all attention upon the headquarters building, which closed the vista in the very heart of the fort. The necessity for store-sheds is unquestionable when it is recalled that the men had no room in their vestibules except for kit. All extras, such as tents or reserve stores, would require the accommodation which such buildings would provide.

Behind the granaries lay two *open-ended buildings*, 64 feet long. Their plan was not traced in detail, and as recovered is not self-explicative. They may have served as workshops or cart-sheds, which are not to be recognised elsewhere within the fort. Equally obscure in purpose is a small building behind the headquarters. It is 40 feet long by 30 feet wide, with a central longitudinal division.

(h) The Roman *military oven* is well known to have been a round platform of flat stones, served from a hob, from ground level, or from a stoke-hole, and covered by a dome of rough stones luted with clay. It was operated by filling the interior with flaming brushwood, raked out when consumed. On inserting the food to be cooked the door was closed, and the dishes ¹ were withdrawn at the appropriate moment.

Five such ovens were discovered at Fendoch, comprising examples of all the variant types. Their excavation, begun in 1937, has been carried out by Mr C. M. H. Millar, F.S.A.Scot., of Trinity College, Glenalmond, with his colleagues Messrs Carter, Hawthorn and Hall, and numerous pupils from the college, to whom warmest thanks are due for their enthusiastic interest and pertinacity.

Oven 1, in many ways the best preserved example (Pl. LVI, 1), lay opposite the end of Barrack 1. Its floor was $5\frac{1}{4}$ feet in diameter, surrounded by stonework 8 feet in diameter and fronted with a hob 4 feet wide and $3\frac{1}{4}$ feet deep. Oven 2, observed in 1936, had been much damaged by the plough. Its broken and heavily-burnt stones formed a ring $8\frac{1}{2}$ feet in diameter, but it was impossible to recover further details. Oven 3 (Pl. LVII, 2) paired with Oven 2, had a floor 5 feet in diameter, surrounded by stonework 8 feet in diameter. It was served from a rude pit, into which ashes and some pottery (fig. 15, Nos. 1, 3, 4, 6, 8, 9) had been raked. Oven 4, pairing (Pl. LIX, 2) with Oven 5, has a floor 4 feet 8 inches in diameter, and external stonework $6\frac{1}{2}$ feet in diameter. Its doorway faces west. The stonework is much reduced, because this oven had been demolished and thinly overlaid with clean gravel, upon which had been planted (Pl. LIX, 1) a new oven, reduced by the plough to a platform of rough stones like Oven 2. This is the only example of a complete reconstruction observed, though it must not be forgotten that the domes, like those of a kiln, might be rebuilt

¹ The food cooked was principally *buccellatum*, soldiers' biscuit, as was continued until late times; cf. *Amm. Marc.*, xvii, 8, *frumentum ex eo quod erat in sedibus consumendum, ad usus diuturnitatem excoctum, buccellatum ut vulgo appellant, humeris imposuit libentium militum.*

several times before the action of fire rendered the floor too broken and uneven to be of further use. Oven 5 has a floor of 6 feet in diameter, and stonework $8\frac{1}{4}$ feet in diameter. Its door opens on to a hob $3\frac{1}{2}$ feet wide and 4 feet deep, thus matching very closely Oven 1. Oven 6 was marked by a heavy deposit of ashes and burnt stones, but structural definition was lacking. Finally, a pit to south of the east gate, 4 feet wide, but of unknown length, yielded so much ash as to suggest that an oven otherwise unrecorded lay not far away.

The relation of the ovens to the barracks and their streets is sufficiently well defined to deserve special note (see fig. 2). Oven 1 falls opposite Barrack 1, just as Oven 6 is associated with Barrack 4. Ovens 2 and 3 are situated at the end of the street shared by Barracks 5 and 6, while Ovens 4 and 5 are similarly related to Barracks 9 and 10. Thus, Barracks 2 and 3, opposite which the ruins of Easter Fendoch precluded a search, and Barracks 7 and 8, represent the only *centuriæ* without an ascertained complementary oven; and it will be recalled that an oven had been suspected to lie opposite Barrack 7. There can, in fact, be little doubt that in the original plan each century had one oven, in which it may be supposed that each mess-unit of eight men would bake its daily bread by rota. No examination of military ovens has previously been so extensive as to warrant such a conclusion.

(i) *The water supply* of the fort is conditioned by the fact that the water-table lies at least 100 feet below the moraine upon which the site is placed. This precludes the digging of wells, nor is it easy to suppose that a milliary cohort, even if unmounted, could be conveniently supplied with water from a single well in the forecourt of the headquarters. Again, it will be recalled that, while water-tanks were provided in at least two places, no attempt was made to collect water from the roofs of the buildings. The rain-water from the barrack roofs, the largest catchment area in the fort, was allowed to sink unheeded into the subsoil.

Reference has already been made, however, to gullies passing out of the fort at the gates. When excavated, these were found to be flat-bottomed channels, with sides for the most part rather irregular and weathered. The gully at the south gate, which was more thoroughly explored than the others, had formed part of a system, with a branch, of which the end was not reached, running for at least 140 feet along the *intervallum*. It had been disturbed throughout its course by numerous irregular delvings, getting deeper towards the west end. This was the feature which in 1936 had been mistaken¹ for a palisade-trench, which in parts it closely resembled.

The nature of this system of gullies, of which further traces were found in the *via prætoriana* and on the north and south *intervallum* of the *retentura*,

¹ *Proceedings*, lxx. 403-404.

must now be subjected to further scrutiny. It will be recollected that the outflowing gully at the south gate was so situated that it must have been covered. It may here be added that it must also have been lined; for in the gravel and sand of Fendoch an unlined gully would not stand the passage of water for a week. In fact, such gullies as were uncovered during the excavation disintegrated under our eyes. No stone lining, however, was present; and, since it would have been pointless to dismantle stonework¹ for use again elsewhere, it may be assumed that the lining had been not of stone but of wood, the medium so universally employed for construction in this fort. It is evident also that the channel had been much disturbed, and the numerous irregular delvings along its course are difficult to explain except as made in digging out the woodwork. If, then, a wooden lining was in fact employed it must be further added that the conduit contained in the gully cannot have been a large one. Where it passes below the south rampart, out of reach of inspection, the gully is certainly not more than 18 inches wide at the bottom. Thus, it can hardly be interpreted as a sewer, and the only explanation remaining is that it was a water-pipe. Fortunately, analogies are not far to seek. Britain provides only one, the wooden water-pipes which supplied the cantonal capital² *Calleva Atrebatum*, now Silchester in Hampshire. The German provinces muster thirty-two, collected in a recent study³ by Ernst Samesreuther, and associated chiefly with forts, but also with towns and country estates. All the examples recovered lay below ground,⁴ in trenches or gullies precisely resembling those of Fendoch. It may be added that an interpretation of the gullies as ducts for water-pipes entirely explains the double outflow channels at the north gate, so difficult to understand except upon this assumption.

A system of water-pipes, however, demands as its essential complement an aqueduct to supply them. At 100 yards south of the south-west angle of the fort, an ancient leet, at one point obliterated by an old turf dyke, is seen making its way, along the north bank of the Fendoch Burn, on a narrow natural shelf high above the stream. Towards the west this channel runs as far as the infall of a nameless tributary, whereupon it curves sharply and begins to run up the valley of this stream towards the point where it could tap its supply of water. Its eastward course follows the Fendoch Burn until a gap occurs in the hummocks which overshadow it to the north. Seizing this gap, it turns at once sharply northwards, heading for the west gate of the fort.

A section cut across its course revealed (fig. 12) the heel of a flat-bottomed channel, 2 feet wide, which has clearly been cut down to facilitate

¹ At milecastle 50TW on Hadrian's Wall the drainage system was left intact at the time of demolition, although every other structural feature was dismantled, *CW*², xxxv. 225-226, fig. 7.

² *Archæologia*, lv. 422-424.

³ *Bericht der Römisch-Germanische Kommission*, 1936, xxvi. 24-157.

⁴ Cf. *ibid.*, pl. 11.

the removal of the structure which it once contained. It seems evident that this must have been a wooden pipe-line, joined with stout iron collars, of the well-known Roman type. A closed pipe is demanded because the conduit rises in level as it approaches the fort, implying that the supply was arranged as an inverted siphon, tapping the stream at an intake higher than the level of the fort. This method of gravitational water delivery was, however, so familiar to the Romans¹ that no difficulty is raised by its employment here. On the contrary, its occurrence in this remote glen may be regarded as an assurance of Roman date for the system.

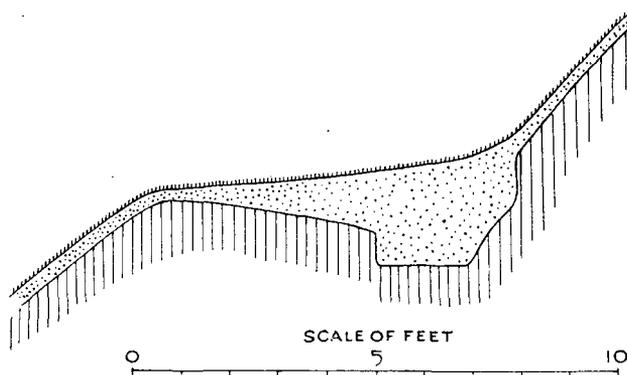


Fig. 12. Section through the Aqueduct Channel, Fendoch.

With the identification of the main line of supply, the function of the gullies in the fort becomes clear. Their purpose was to distribute the water, in open wooden gutters, or, more probably, in pipes, to tanks below ground-level, of which two have been noted above (pp. 122-123, 129). Systems of this type were not uncommon in the Roman forts of Britain, though only of recent recognition. Examples were collected in a recent volume² of these *Proceedings*; but the installation of which traces have now been identified is earlier in date than all,³ and at least equals them in interest.

Before describing the buildings, note was taken of how they were constructed. The description must close with an observation upon their ultimate fate. Evidence which pointed to a purposive dismantling of the fort has been cited here and there in the foregoing description, particularly in connection with the water supply. But this was by no means the only evidence of its kind. At an early stage in tracing the buildings it was seen that the regularity of their foundation-trenches was often disturbed at ends or junctions by rough delvings completely unlike the admirably precise excavation of the trenches themselves. An illustrated example occurs at the projecting corner of the centurion's quarters in Barrack 1 (Pl. LVIII, 1), where trenches in both directions are broken by

¹ Ashby, *The Aqueducts of Ancient Rome*, 34-37.

² *Proceedings*, lxxii. 307.

³ Perhaps the leaden water-pipes of A.D. 79 from Chester, inscribed with Agricola's name, may be regarded as slightly earlier examples of a similar system established in more permanent materials (*EE.*, ix. 1039).

irregular cuts. A comparison may be made with the timber gateways of the dismantled fort ¹ at Old Church, where the irregular pits created by men digging out the posts were clearly to be distinguished from the post-hole and its clay-sealed runway. Even clearer evidence was forthcoming at the granaries (Pl. LVII, 1), where the three north-west foundation trenches of the north granary had been deprived of their vertical ends by slanting cuts, breaking through the end of the broadest trench. The very character of the cuts shows that they could have been effected only with a spade while levering the ends of the beams out of their beds.

As such a method of removal would imply, not all angles or ends were defaced; some remained intact because the beam would be pulled away from them. Thus, in the headquarters building the north-west angle was recovered undamaged (Pl. LV, 2). The north-east angle, on the contrary, had been heavily maltreated by delving, while the antis at the south end of the portico had been reduced to a mere heel of well-cut trench surrounded by a shapeless pit. The junction between the back wall and the south wall of the north administrative room in the same building had been deftly blunted by a bold spade-cut, which completely removed the sharpest part of the angle. While single observations of this kind may count for little, their cumulative effect is to suggest most strongly that at the close of the occupation the buildings had been methodically removed. Systematic dismantling of this kind is not unknown. An example has already been quoted but others may be added, as, for example, the mile-castle 50TW and turrets 50aTW and 50bTW on Hadrian's Wall,² or the fort ³ of Haltwhistle Burn.

Two further heads of evidence, of rather different kind, may be added. First, during the examination of the south gateway, in 1936, the workmen encountered, at the back of the north-east post-hole and to west of the gully, some forty large stones, as heavy as a man could lift, neatly arranged in a pile. When the post-holes were examined no impress of timber was observed in the filling, which was very loose, but one or two of the large stones were found firmly wedged at the bottom of each hole. It seems clear, then, that in this case the posts had been packed tight with large stones, later removed in order to release the posts and arranged in orderly fashion close to the scene of demolition.

Secondly, the tidy work of demolition must have involved, for the convenience of those engaged upon it, some measure of refilling the foundation-trenches, probably by no more complicated process than tipping or shovelling back the filling disturbed by the raising of the sills. If such a measure had not been taken, there is no accounting for the very

¹ *CW*², xxxvi. 174, figs. 10, 12.

² *CW*², xxxv. 226-228, milecastle 50TW; *ibid.*, 233, turret 50bTW; *ibid.*, 234, turret 50aTW.

³ *AA*³, v. 234-236.

perfect preservation of the vertical sides and the occurrence in the filling of extraneous objects, principally broken and twisted nails (Pl. LX, 2). Unexpected confirmation of this view was afforded by the discovery, in a foundation trench of the headquarters building, of an unbroken auxiliary soldier's sword, described in detail below (p. 147). There is no occasion upon which a sword can have been lost in a foundation-trench except when demolition was in progress. It is not difficult to visualise the dangling impediment being laid aside on the edge of the trench as men stooped and strained to raise the foundation-sill from its bed: or, again, how, as the sill came up, the sword either fell into the cavity with the filling which was tipped back immediately from the beam-top, or was unwittingly shovelled into its position, about half-way down the filling of the trench, during tidying. But under what other circumstances is it easy to imagine that the accident can have occurred? If the above interpretation is correct, the fate of the sword is graphic evidence of a demolition which other evidence attests.

(iv) THE POTTERY.

(a) *Decorated Samian Ware.* By J. A. Stanfield.

If styles in ornamentation on Samian ware are chronologically reliable, the two decorated sherds from Fendoch may be dated with confidence to the reign of Vespasian.

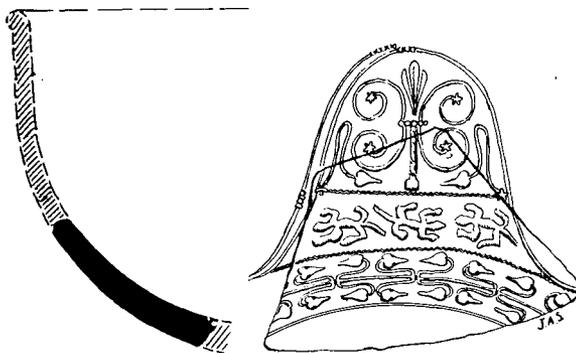


Fig. 13. Fragment of decorated Samian Bowl, of Dragendorff's shape 37, from Fendoch.

1. (Fig. 13) Form 37, fabric of La Graufesenque. The decoration is part of a scroll design which is illustrated in a more complete form by Hermet, *La Graufesenque*, plate 81, 1; the arched concavity of the scroll, most of which is preserved on the Fendoch sherd, has been restored from Hermet's drawing. Above a fine ridge at the base of the design is a border of repeated four-leafed

ornaments of an early type, probably attributable to MACCARVS (Knorr, *Töpfer und Fabriken usw.*, 1919, plate 15, H); one pair of leaves in this ornament is different from the other, but the stamp, when applied to the Fendoch bowl, was worn enough to make this difference negligible. Above this border, and occupying the lower part of the divided concavity, are three quaint reptiles of the lizard kind (Oswald, *Index of*

Figure-Types, Nos. 2150, 2151: they occur also on two bowls in the style of the later Flavian potters BIRAGILLVS and MERCATO, Hermet, *op. cit.*, plate 85, 1, and Knorr, *Rottweil*, 1912, plate XXVII. 4); Hermet's drawing shows that in the alternating lower concavity two little dogs to right take the place of the lizards. Next comes a fine wavy line, and above that a built-up ornament of spiral tendrils and other details, flanked by two buds on turned-back tendrils. The remainder of the design, as given by Hermet, contains large vine-leaves and small birds of an early type, and it is clear that the bowl is transitional in style between the designs of the periods of Nero and Domitian respectively, as Hermet rightly saw. To go a little further, the neatness of execution and the early nature of some of the decorative types assist in indicating for this sherd a date nearer the year 70 rather than 80. From Barrack 10, west end.

2. (Fig. 14) Form 29, fabric of La Graufesenque. The upper frieze and central moulding survive, showing a moulded festoon of Neronian type, with pendant terminating in a large bud and panel of leaf-tips; but the bud itself and the leaf-tips are of a later, Flavian type. Below the central moulding there is a garland of imbricated leaves, similar to one used by GERMANVS on vessels of this form. In this case it is obvious from the roughness of the leaf-tips, the thickness of the bud, and the narrowness of the central moulding, that the fragment is rather later than No. 1, and should be dated nearer to the year 80. From Barrack 6, verandah runnel.

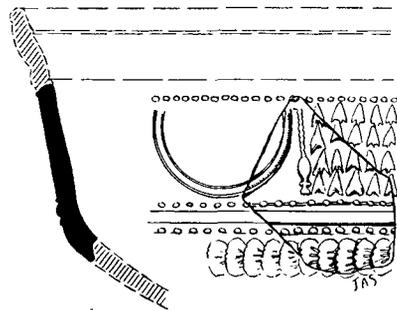


Fig. 14. Fragment of decorated Samian Bowl, of Dragendorff's shape 29, from Fendoch.

(b) *Other Pottery.* By Eric Birley.

The total yield of pottery was small, and fragments of *amphoræ* formed the bulk of it, but there are a number of interesting pieces included; it will be convenient to give a detailed description of the individual pieces before making any comment on the group as a whole.

There were only three fragments of undecorated Samian ware. One of these is part of the side of a small cup, form 27; its glaze, size, and contour combine to show that it is La Graufesenque ware. The other two are rim-fragments from platters of form 35 or, less probably, 36, showing the appliqué stalked leaves characteristic of those forms; these, too, are undoubtedly products of La Graufesenque, and the small size and neatness of the rims show that they do not belong to the latest stages of that centre's activity. The first two came from the *inter-*

vallum, north of oven 3, the third from the runnel of the verandah of barrack 6.

Of the pottery other than Samian ware, only nine vessels are represented by pieces that deserve or admit of illustration (fig. 15):

1. Several fragments from a large mortarium, in light buff ware, with

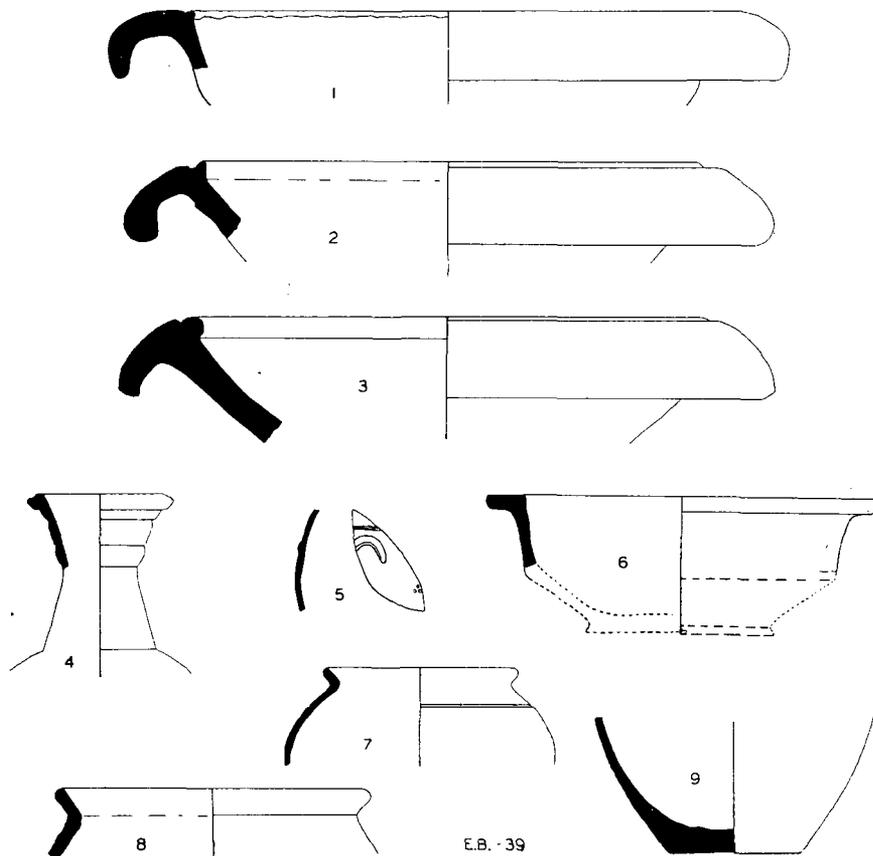


Fig. 15. Fragments of coarse Pottery from Fendoch.

a rather soft surface. The rim-section represents a compromise between the flat-rimmed type 14 and the hook-rim 34 in Mr Bushe-Fox's classification (*Wroxeter*, 1912, p. 77); among the closest parallels which I have noted are two rims bearing the stamp of the Gaulish potter Q VALERIVS VERANIVS, from Colchester (*Museum Catalogue*, No. 325) and Caerleon (*Archæologia Cambrensis*, 1932, No. 254) respectively; the fabric of the Fendoch vessel seems suitable for attribution to that potter, whose

products are represented on many Flavian sites in Britain, among them being Camelon. From Oven 3.

2. Two conjoined fragments from a mortarium; the surface is hard and dirty white in colour, while the core is blue-grey. In section, but not in fabric, the rim has affinities with the mortaria of the Flavian potter SOLLVS; *Newstead*, fig. 34, 5, seems to be a close parallel to the shape. From Barrack 10, west end.

3. More than a quarter of the rim from a mortarium in buff ware, of rather coarse texture, with grit showing on the outer surface of the rim as well as on the interior of the bowl. I cannot quote a parallel to the form, but the fabric is undoubtedly early. From Oven 3.

Another mortarium, in a harder fabric, rather rough to the touch, is represented by a fragment too battered to allow a drawing to be made; it may have been *Wroxeter*, type 22. From Barrack 10, west end.

4. About half the rim of a jug in light buff ware, without any external wash. Parallels might be cited from a number of pre-Hadrianic deposits, for example *Malton*, fig. 15, No. 25. From Oven 3.

5. Fragment from the side of a jar in light buff ware, with appliqué decoration in brown, consisting of a group of dots and a crescent. I have not come across an exact parallel, but the general type is characteristic of Flavian deposits: cf. *Brough, E. Yorks*, 1934, fig. 6, B5-6; *Holt*, fig. 63, Nos. 54-55; *Malton*, fig. 15, Nos. 17-18. From the runnel of the verandah, Barrack 1.

6. Rim-fragment from a carinated bowl; the ware is orange-buff in colour, and rather soft; on the flat rim there are slight traces of a double reeding. For the section, cf. *Newstead*, fig. 26, No. 3. From Oven 3.

7. Over half the circumference at the rim from a cooking-pot; its surface is grey-black, hard and rather rough; in fracture it is a lighter grey. The type is a well-known Flavian one (cf. *Newstead*, fig. 25, No. 7; *Corbridge*, 1911, fig. 7, No. 34; *Holt*, fig. 63, No. 57), which lasted into the early years of Hadrian (*Poltross Burn Milecastle*, pl. iv. No. 39). From Barrack 3.

8. Rim-fragment from a jar in orange-buff ware; I have noted no exact parallel to the rim, but the general type and fabric are not uncommon in Flavian deposits. From Oven 3.

9. The base and part of the side of a wheel-made jar; the outer surface is dark grey, the interior somewhat lighter in colour, while the core is red-brown. The surface is rather rough to the touch, as often happens with Flavian jars, but the absence of a moulding at the base is a feature that would be less unusual in a later deposit. From Oven 3.

The small amount of pottery available for consideration covers a remarkably wide range of types; but it must be owned that, apart from

the Samian ware, none of the types is distinctive enough to permit close dating within the Flavian period. Indeed, it is one of the misfortunes that attend the study of pottery other than Samian ware, that there are hardly any sites in Britain where it is possible to establish stages in the period from Vespasian to the accession of Hadrian, so that pre-Hadrianic pottery must often be lumped together and studied typologically.

It is therefore fortunate that the evidence of structures and Samian ware allows us to identify the other pottery from Fendoch as typical, not merely of the Flavian period, but of the decade A.D. 80-90—a time-lag of a decade from the estimated date of manufacture of the earlier piece of decorated Samian ware discussed by Mr Stanfield above.

(v) A COIN.

No coin was found during the present excavations. The only example recovered from the site is a *denarius*, recorded¹ in the following terms: "A silver coin, evidently Roman, in the possession of Mr James Young, Crieff, which was found in this place. It is of the size of a sixpence, having on one side a head in high relief; and on the obverse three figures, the centre one an eagle; the other two, as well as an inscription on each side, are so much effaced as to be nearly illegible."

This account was written in 1845, and inquiry has not elicited the present whereabouts of the coin. The description, however, is sufficiently detailed to invite an identification, in which I have had the advantage of the life-long experience of Sir George Macdonald. In his opinion the coin is an example of a common Civil War type (*Cohen*, 406 = Mattingly and Sydenham, *Roman Imperial Coinage*, i. p. 187, No. 34), issued in A.D. 69. This has an obverse with a bust of Mars, helmeted, bearded, right, and the legend *Mars Ultor*, while the reverse is an eagle between two standards, and an altar between the eagle and the standard on the right, with the legend *Signa p(opuli) R(omani)*. It will be seen how well this fits the description in the *New Statistical Account*, and it need hardly be remarked that a coin of this date would still be circulating in good condition during Agricola's governorship.

(vi) MISCELLANEOUS OBJECTS.

(a) *A sword*.—The most remarkable of the objects other than coins and pottery is the Fendoch sword (Pl. LX, 1). This was found in the foundation-trench for the south wall of the north administrative room in the *principia* of the fort. It lay lengthwise along the trench, which was over a foot

¹ *New Statistical Account, Perth*, vol. x, p. 262.

deep, and about half-way down in the filling, which was here of firm sand. The meaning of its presence there has been discussed upon another page (p. 142).

The sword is of iron and almost perfect, only a slight break, due to corrosion and now mended by expert hands at the National Museum of Antiquities, occurring at the tip of the blade. The total length of the object is $25\frac{1}{16}$ inches, of which $20\frac{1}{2}$ inches are taken by the blade from tip to guard. The blade is $1\frac{5}{16}$ inch broad at the guard, and tapers very gradually, reducing to $1\frac{3}{16}$ inch at $2\frac{1}{2}$ inches from the point. The surface is much blistered, rendering impossible a quite accurate estimate of thickness. The section has been formed by two shallow convex curves, with a faint suggestion of a central rib, insufficiently marked to deserve the name. Thus, the blade has been double-edged, and the guard now encloses $\frac{5}{16}$ inch of blistered iron at the thickest point; an estimate of $\frac{1}{4}$ inch for the original thickness must therefore be very close to the truth.

The bronze guard is $2\frac{7}{16}$ inches wide and $\frac{1}{2}$ inch in maximum thickness. It ends in two roughly kite-shaped cusps, $\frac{3}{8}$ inch high and $\frac{5}{16}$ inch broad, and rises in a sweeping curve towards the centre, which increases its height from $\frac{1}{8}$ inch to half an inch.

The tang is now $4\frac{9}{16}$ inches long, measuring from the lower edge of the guard. It is $\frac{5}{16}$ inch broad at the farthest extremity, and $\frac{5}{8}$ inch broad and $\frac{1}{4}$ inch thick where it enters the guard. At $\frac{5}{8}$ inch above the top of the guard the tang is encircled by a bronze binding, not more than $\frac{3}{32}$ inch wide.

The sword most closely resembles, in size and shape, the two so-called Celtic weapons¹ found at Newstead, which also retain their not dissimilar bronze guards. It is at least 4 inches shorter than the two swords² identified as *spathæ*, and is only 1 inch longer than the sword³ identified as a legionary's *gladius*. On the other hand, it tapers in the same way as the presumed *spathæ*.

While the circumstances in which the Newstead swords were found permitted a Celtic origin (without, however, excluding another explanation), the Fendoch sword is from a purely Roman environment (p. 142). It is thus preferable to regard it as a second variety of auxiliary's sword, designed for stabbing as well as cutting. The fact that auxiliaries were equipped and trained in both methods of aggression is shown by the Batavian tactics⁴ at the *Mons Graupius*, where slashing and stabbing were the order of the day. The Celtic affinities of the type, which Dr James Curle acutely perceived and rightly emphasised, are explicable by the well-known fact

¹ J. Curle, *A Roman Frontier-post*, pl. xxxiv. 8, 10.

² *Op. cit.*, pl. xxxiv. 6, 7, and p. 184.

³ *Op. cit.*, pl. xxxiv. 11, and p. 183.

⁴ *Agr.*, 36, *Batavi miscere ictus . . . ora fodere*.

that the auxiliaries, so frequently of Celtic blood, commonly employed the weapons of their homeland. It should be remarked, moreover, that only the form of the sword-guard is reminiscent of the decorated Celtic examples¹ with which Mr Curle compares them. Three out of four of the Newstead guards² figured in the detailed study are undecorated. This is a profound difference, best explicable as the effect of harnessing provincial workmen for the mass-production required by the Roman army, as compared with the older devoted craftsmanship of an independent native smith.

(b) *Other Iron Objects*.—These (Pl. LX, 2) comprise a large iron nail or spike) $7\frac{3}{4}$ inches long and $\frac{5}{8}$ inch square at the thickest portion. The head is oval, round $1\frac{3}{4}$ inch wide at its greatest extent. The spike, which has been twisted by use or withdrawal, was found at the north gate in the east tower. As noted above (p. 117), it is valuable evidence for the size of the timbers in use. Seven smaller broken and twisted nails, found in trenches or post-holes on various parts of the site, have also been kept as evidence for demolition (see p. 142).

The north gate also produced five scraps of iron sheathing or binding. The largest measures 5 inches long, $1\frac{1}{2}$ inch wide, and $\frac{3}{8}$ inch thick, and all appear to have formed part of the same long strip. No hole for fastening appears in the surviving pieces, but they are otherwise very like the pieces of iron binding for doors³ from milecastle 52 on Hadrian's Wall.

Finally, a dozen shapeless fragments from the annexe proved on cleaning to be indistinguishable parts of an iron-plated object, small portions of strips, angle-irons, and sheathing being visible among the mass of corrosion, which was too tender for thorough treatment.

(c) *Gaming Counters*.—The first of these is an almost round, flat-bottomed lump of opaque creamy-yellow glass-paste, $\frac{5}{8}$ inch in diameter. On one side of the upper surface two tiny holes, $\frac{1}{32}$ inch wide at the top and $\frac{1}{32}$ inch deep, have been drilled with a pointed drill, marking, it must be supposed, a value for the counter. The counter, which came from the portico of the headquarters, has been made by pouring a blob of molten paste on to a slightly rough surface.

The second and similar counter, from the tank in the commandant's house, was of opaque white paste, without markings. It disappeared, owing to an unfortunate mishap, soon after discovery.

(d) *A Bead*.—A segment of a ribbed melon bead of blue faience, $\frac{9}{16}$ inch high and once about $\frac{7}{8}$ inch in diameter. These beads are common throughout the Roman period.

¹ *A Roman Frontier-post*, 186, fig. 19.

² *Op. cit.*, pl. xxxv. 11, 12.

³ *CW*², xxxv. 253.

(vii) HISTORICAL CONCLUSIONS.

The fort at Fendoch has now been described, together with the relics which it contained. It may then be asked what historical conclusions are warranted by this evidence.

Scanty though the yield of datable pottery proves to have been, the distinctive style of the two decorated Samian sherds (pp. 142-3) proclaims them as Vespasianic products of La Graufesenque; while the plain forms of the same ware (p. 143), though less susceptible of minute classification, show no sign of that degeneration in technique which marks the later phase of the factory's activity, in the closing decades of the century. The coarse pottery (pp. 144-6) is altogether less informative, but in no way conflicts with the date suggested by the Samian ware. This is the decade A.D. 80-90, with the balance weighted, if at all, in favour of the beginning rather than the end (p. 146).

Of these ten years, A.D. 82 was marked by Agricola's annexation¹ of the tribes beyond the Forth. One fort at least was planted² among them, soon to be subjected to an alarming attack. Since, however, it was not Agricola's custom³ to plant isolated *castella* in annexed territory, it may be assumed that others existed. A year later, after the battle of Mons Graupius, *hiberna* were ready⁴ to receive the troops in these lands and in such territory beyond them as it was proposed to retain under Roman control. So much for the literary evidence.

Archæology attests⁵ that unquestionably the most notable of these *hiberna* is the legionary bridge-head fortress of Inchtuthil, which commands the gateway to Athol and Breadalbane and dominates also the Stormont and the northern fringe of Strathmore. The logical complement to Inchtuthil is provided by the fort⁶ and river-port of Bertha, at the waters-meet of Tay and Almond, where a great bridge⁷ across the Tay gave access to the south side of Strathmore and kept the whole system so far described in touch with land-routes to south and west. Of the two sites, however, Inchtuthil is much the more complex, and its structural remains, first examined in 1901, have been analysed⁸ in a masterly study by Sir George Macdonald: they comprise a legionary fortress, succeeded by smaller *castella*. The legionary fortress was equipped with timber buildings strikingly like those of Fendoch; and it is reasonable to suppose that both sites fulfilled the same purpose, for the immediate task of either

¹ *Agr.*, 25, *ceterum æstate, qua sextum officii annum incolabat, amplexus civitates trans Bodotriam sitas.*

² *Ibid.*, *Caledoniam incolentes populi . . . oppugnare ultro castellum adorti.*

³ *Cf. Agr.*, 20, *civitates . . . præsidii castellisque circumdatæ.*

⁴ *Agr.*, 38, *ipse peditem atque equitem . . . in hibernis locavit.*

⁵ *Proceedings*, xxxvi. 182-242.

⁶ *Proceedings*, liii. 145-152.

⁷ Stuart, *Caledonia Romana*, 204, mentions the piles and iron cramps; *cf. Roy, Military Antiquities*, pl. xii., where the bridge is marked 400 yards upstream from Derder's Ford; also Pennant, *Tour of Scotland*, 1772, Appendix xv. p. 451.

⁸ *JRS*, ix. 111-138.

is to command an important Highland pass. While Fendoch, however, is essentially an outpost, Inchtuthil, corresponding to eighteenth-century Perth, occupies the commanding central position, whence troops could reach easily any threatened part of the north-western front. The relationship of the two sites is thus clear. In the face of the Highland massif, a barrier just as formidable as the Rhine or Danube, Inchtuthil, the core of resistance, was set like Xanten, Mainz, or Windisch, in the main pathway of aggression. Fendoch seals an important but less central pass, by means of a large auxiliary cohort dependent upon the legion. The same dependent function is fulfilled by Dealginross, which blocks the head of Strathearn at a point commanding every route to west and north. If, however, the positions of these three crucial sites demonstrate the intentions of those who planted them, it cannot be thought that they complete our knowledge of the system. Other forts must have existed in relation to equally important passes farther south-west and north-east.

It must be remarked, however, that the genius displayed in selecting the known sites seems to imply a most thorough reconnaissance of the whole area. It would not suffice to survey the problem from the plains. For a fleeting moment Roman scouts must have penetrated the mountain barrier, if they were to acquire a clear understanding of the topography which they mastered so well. No very deep penetration is needed. Such views as are obtainable from the not too far distant summits of Ben Lomond, Ben Ledi, Schiehallion, Ben Lawers, or Ben Ericht, would suffice to reveal the difficulties that lay ahead and the best way to surmount them.

The time absorbed by reconnaissance would be small indeed compared with that spent upon equipping the newly chosen sites. To prepare, between campaigning seasons, timbers for a legionary fortress 70 acres in size and a series of satellite forts of the Fendoch type would strain all the resources of the legionary carpenters. No doubt it had been the pressing claims of similar operations farther south which had induced Agricola to intercalate amid campaigns a fourth season spent wholly in consolidation of new territory. Even the sixth season,¹ which saw the occupation of the area now under consideration, included little offensive action on the Roman side, while the seventh summer² was largely spent in minor actions intended to promote the great engagement whose issue ranked with that of Flodden as a disaster for Scotland. At this point, archæology can supply a valuable comment upon the scale of the preparations. Farther south, on the Forth-Clyde isthmus, a temporary³

¹ *Agr.*, 25-26. The bulk of the work was clearly the occupation of new territory and reconnoitring beyond it; a cautious advance by land and sea up the north-east coast.

² *Agr.*, 29.

³ *Agr.*, 23. The temporary nature of the work is quite clear from the outset, *ac si virtus etc. pateretur*.

halting-point had been equipped with *præsidia* during the fourth campaign. Excavation has shown that these, whether large or small, were fortified¹ merely with ditches and stockades, of the kind typical² of semi-permanent works. They were never replaced by true *castella*. Only when the terminus suited to Roman prowess, or Roman convenience, had been reached, were time and labour expended upon such elaborate forts as Fendoch. Thus, the impression of permanence immediately conveyed by the plan of that fort is usefully confirmed by the contrast with works farther south.

If more were known about the sources of supply for the great timbers required by such forts as Fendoch, it would be easier to estimate the amount of labour involved. But it must be remarked that only notable trees, presumably oaks, would supply the timbers for gateway-towers, ascertained to be one foot square in section and estimated as some thirty feet long. For the foundation-beams elm would provide a better material, easy to cut and, to judge from place-names,³ ubiquitous in Celtic Scotland. It must not be forgotten, however, that none of these trees occurred near Fendoch, as the pollen-analysis has shown (p. 154). Thus, all the timber would have to be cut elsewhere and transported to the site. There is no reason why this material, however, should not have been prepared for some time in advance of the work intended, if only to allow for seasoning. Long before the frontier was actually fixed it must have been known that timber forts would presently be required and that preparations for building at least a certain number could be put in hand. In this connection the plan of Fendoch is most suggestive, for it conveys as a whole the strongest impression of standardisation, comparable with that which marks the plan of Housesteads fort on Hadrian's Wall. Further, the design of the individual buildings is so closely related to uniform sizes and dimensions as to suggest that it is derived from a stock plan, based immediately upon supplies of posts and boards cut to standard dimensions in the military timber-yards. Given such conditions, it would be possible at any time to prepare and stock timber for military buildings, as suggested above; so that the material could be treated like parts for sectional huts, drawn from stock, assembled on the site, and erected in foundation-trenches dug to the standard size from working drawings issued with the set. The official organisation for the purpose was provided by the *præfectus fabrorum*⁴ and his staff; while the practical operations involved are so simple, and

¹ *Roman Wall in Scotland*, 2nd ed., p. 196, fig. 10, and p. 212, Mumrills; p. 268, fig. 34, and p. 269, Croy Hill; p. 272, fig. 35 and p. 273, Bar Hill; pp. 311-312, Cadder.

² *Cichorius*, sc. xvii.

³ Watson, *Celtic Place-names of Scotland*, s.v. Lemannonius, Llwyfain, Lomond, etc.

⁴ Vegetius, *de re militari*, ii. 11, *habet præterea legio fabros tignarios, structores, carpentarios, ferrarios, pictores, reliquosque artifices ad hibernorum ædificia fabricanda . . . horum iudex erat proprius præfectus fabrorum.*

the advantage in practice so great, as to render the effort abundantly worth while.

These preliminary considerations enable us to see the fort at Fendoch in a wider perspective. There can be little doubt that the site was chosen in A.D. 82 or 83, and that it was one of the *hiberna* to which the victorious auxiliaries, milliary cohorts of Batavians and Tungrians mentioned by Tacitus, retired after the battle of Mons Graupius. The situation of the fort (Pl. LII, 1) indicates its purpose with telling clarity. It so blocks the Sma' Glen, the gateway of Breadalbane, as to control all commerce with the Highlands and to bar the upland raiders out of Strathearn. Anyone standing upon the site and looking up the pass must feel that nowhere did the disciplined might of Rome come to closer grips with Highland lawlessness. The inaccessible glens and forests, breeding chronic poverty and reckless bravery, were thus sealed off from the Roman world by a cordon of posts in which may be recognised Agricola's scheme for a permanent solution of the question. As an element in this frontier, Fendoch is not unique; it shares with Inchtuthil and Dealginross a claim to illustrate Agricola's sharp eye for a good site—*adnotabant periti non alium ducem opportunitates locorum sapientius legisse*. As attesting, however, his power of logical attention to detail (*ratio curaque*) Fendoch occupies the special place of an example which is not only the first of its kind, but perhaps the most complete that will ever be recovered: for Agricola's forts normally lie deep below later remains which preclude the complete examination that was here possible. The buildings have already been described in detail, and no repetition is required. But it must be observed as a new and important fact in the history of the Roman auxiliary army that by Agricola's time the standard planning of quarters, for which the best evidence in Britain has hitherto been the Hadrianic fort at Housesteads, had already been evolved. The fact itself is not indeed surprising; it is evident that the designers of forts were following only the practice already introduced¹ for legionary fortresses; but no demonstration of the point has hitherto been available on the scale now attained.

Agricola was recalled in the winter following *Mons Graupius: tradiderat . . . successori suo provinciam quietam tutamque*. So far as the northern frontier was concerned, it may be assumed that quiet was produced by the great victory. Safety would undoubtedly be assured by the new forts and legionary fortress. It is thought, however, that the system did not remain for long unrevised. Historians have long known that in A.D. 86–88 the four legions stationed in Britain were reduced to three by the transference² of *Legio II Adiutrix* to the Danube. It may be regarded

¹ *E.g. Vetera*, or *Novaesium*.

² Ritterling, *Jahresheft d. Öst. Arch. Inst.*, vii. *Beiblatt*, 37 f. dates the withdrawal to A.D. 85 (cf. Pauly-Wissowa, s.v. *Legio*); Filow, *Klio*, vi. *Beiheft* pp. 39 f., preferred A.D. 88.

as likely, though the matter stands in need of proof, that this loss of strength was immediately followed by the abandonment of the legionary fortress at Inchtuthil. This did not mean, however, that the Roman hold on Strathmore and Strathearn was forthwith relaxed. Both Inchtuthil and Dealginross have produced ¹ *denarii* of A.D. 86, which are not likely to have been circulated and lost on the north-west frontier until after the withdrawal of the legion; while the coin at Inchtuthil was found ² in a bath-house which has nothing to do with the legionary occupation of the site. No attempt has yet been made, however, to correlate the history of these sites with that of Fendoch, where there is evidence of a systematic and peaceful evacuation. Gateways, principal buildings, barracks and water-conduits were all dug out of their foundation-trenches and their materials returned to stores, leaving traces to which it is peculiarly difficult to attach an estimated length of occupation. We are left with only such facts as an observation that only one oven gave evidence of repairs, or that the streets seemed little worn. There is no evidence from floors; for these, to judge from the lack of paving and hearths, seem to have been everywhere of boards, incorporated in the dismantled buildings and removed with them. Thus, while there is sufficient evidence to show that the occupation was not momentary, it is extremely difficult to attach a term to its duration.

Three facts, however, emerge from these observations. The design of the fort suggests, as strongly as such evidence can, that a permanent occupation was contemplated. Secondly, the buildings were dismantled systematically while still in good condition. Thirdly, the fort was deliberately abandoned according to plan: *nullum ab Agricola positum castellum aut vi hostium expugnatum aut pactione ac fuga desertum*. When the end came at Fendoch, it came as the result of Roman deliberation rather than enemy pressure. The peaceful revision of Agricola's arrangements thus would appear to have come both fairly quickly and perhaps sooner than had been contemplated.

So much concerns Fendoch. It would be altogether rash, however, to argue from this site to all. Of neighbouring sites, Dealginross and Strageath are untouched by the spade; while past work at Inchtuthil and Ardoch disclosed remains so much more complicated than those at Fendoch as to call loudly for a fresh definition of stratification at both places. The signal-towers on the road between Strageath and the Tay occupy an undefined place in the history of the same locality. The present requirement is, therefore, the support for a programme of skilled selective excavation covering all these sites until the relation between them has been defined. Fendoch will then take its place as an illustration not only of Agricola's work, as it now does in most remarkable fashion, but

¹ *JRS*, ix. 136.

² *JRS*, ix. 115; *Proceedings*, lii. 233.

also of the changes instituted by his successors. *Multos veterum velut inglorios et ignobilis oblivio obruit; Agricola posteritati narratus et traditus superstes.*

APPENDIX.

REPORT UPON EARTH SAMPLE FROM FENDOCH.

By Dr A. RAISTRICK.

Sample from Turf-rampart.—This is a real turf-soil material with a very small percentage of pollen, about equally grass-spores and hazel-alder pollen. The sparseness of the pollen suggests at most fairly open scrub in the immediate vicinity, probably mainly grass land with occasional hazel or alder.

It remains to thank all those who have permitted and facilitated the excavation. The relics have been generously presented to the National Museum by Captain J. Drummond-Moray, and for permission to excavate we were indebted to the late Captain William Augustus S. Home Drummond-Moray of Abercairney, and to the occupier of Fendoch, Captain Ian Macrae, whose kindness and hospitality greatly eased the difficulties of work on a remote site: nor must the good offices of Mr H. J. Bell, the estate factor, be forgotten. Mr Booth, Burgh Surveyor of Crieff, very kindly lent surveying tackle on three separate occasions. The help in excavation received from Mr C. M. H. Millar, F.S.A.Scot., and other friends at Trinity College, Glenalmond, has been mentioned in the text. Lastly, Mr Alexander Cameron, Captain Macrae's shepherd, and Mrs Cameron, afforded us shelter and refreshment with unfailing kindness and generosity.

MONDAY, 13th March 1939.

ALEXANDER O. CURLE, C.V.O., LL.D., Vice-President,
in the Chair.

A Ballot having been taken, the following were elected Fellows: Dan Carmichael; James Douglas; Frank Allen Greenhill, M.A.(Oxon.); Walter Philip Mayes; James Graham Paterson; Leslie Ord Pinder; G. Mackenzie Trench, O.B.E.; Brian J. G. Yule.

Donations to the Museum and Library, as per lists at end of volume, were intimated and thanks voted to the Donors.

The following Communications were read:—