

I.

A FURTHER NOTE ON THE ROMAN FORT AT CROY HILL.
BY SIR GEORGE MACDONALD, K.C.B., PRESIDENT.

INTRODUCTORY.

When the outline of this fort was ascertained in 1931, the resulting plan showed that the little kitchen-garden on the hill-top would be the most promising spot in which to search for traces of interior buildings. No attempt was, however, made to find them then. The days of the cottage to which the garden was attached were known to be numbered, and the time could not be far distant when it would be possible to carry out a thorough examination without inconvenience to any one. Early in 1935 Mr Charles Brown, W.S., Secretary of Carron Company, who had kindly promised to keep me informed of developments, wrote to tell me that demolition was to begin almost immediately: he thought I ought to know this, as there was always a chance that the walls which were to be pulled down might contain something of interest. With the willing co-operation of Mr Samuel Smith, our Corresponding Member, it was easy to keep a careful watch on the house-breaking process.

The direct outcome was disappointing. It very soon became apparent that in the course of the nineteenth century the cottage had been completely rebuilt, mainly with modern material. In the process of reconstruction Roman stones had hardly been utilised at all, unless it were in the foundations, and these we never saw, as the lower part of the structure has purposely been left intact. Consequently, apart from what may once have been a hypocaust pillar, we detected very little that was in any way suggestive of the former presence of the *castellum*. The contrast with the adjacent field-dykes, as well as with the ruinous bothy to the north, was striking. In these the *disjecta membra* of Roman masonry are abundant, so abundant indeed as to leave little or no doubt that, not only the principal buildings of the fort, but also its barracks, must have been reared in stone. Barracks of stone have come to light nowhere else on the Antonine Vallum. The exception, however, if it be an exception, admits of a simple explanation. In many places the rock is so close to the surface that it would have been a very laborious business to provide the post-holes or sleeper-trenches required for the support of timber

erectations. In all likelihood, therefore, the barracks at Croy Hill, like the stone walls of Castlecary fort, are a timely reminder of the unwisdom of basing conclusions on the hypothesis that at any given period Roman military architects were bound by a rigid adherence to rule-of-thumb methods. Within reasonable limits they were always ready to adapt themselves to circumstances. As we shall see presently, they even allowed themselves some latitude in the design of a building whose general plan had to conform to a stereotyped pattern.

The disappointment encountered at the cottage was not altogether a surprise, and there was ample compensation, inasmuch as the garden was now set free for exploration. Mr Smith, who was every whit as anxious as I was to probe the secrets of the hill, expressed his willingness to help, and his promise has been redeemed many times over. It is no exaggeration to say that he deserves much of the credit for the degree of success that it is my good fortune to be able to chronicle. Residing within manageable distance, he never lost contact with the work for a day, an ideal which it would have been hopeless for me to aim at. His gift of acute observation, coupled with his appreciation of the possible importance of seemingly trivial appearances, was a guarantee that nothing of moment was being missed, and he never failed to summon me if any new feature emerged. All the while he turned his camera to excellent account, keeping a detailed photographic record which has been invaluable for the leisurely consideration of the various questions that have had to be faced. When I add that the sections reproduced by Mr C. S. T. Calder in Plate III. are his, the extent of my debt to him will be still more manifest.

Despite the entire absence of surface remains, the whole area of the fort has, very properly, been scheduled under the Ancient Monuments Act. The first step was therefore to enlist the benevolent neutrality of H.M. Office of Works. By a happy chance June brought an opportunity of mentioning the matter to Mr Bushe Fox, Chief Inspector of the appropriate Department. As he made no objection, a formal application for permission to excavate was addressed to Carron Company, the owners. They consented at once, but it turned out that further delay was inevitable. It was imperative that the actual digging should be entrusted to thoroughly experienced hands, for the coating of soil was thin, and valuable evidence might easily be lost beyond hope of recovery. Mr Alexander Mann, who had done such excellent work on Croy Hill in 1931-32, was no longer available, having obtained permanent employment elsewhere. It was therefore decided to wait until Mr John Campbell, who had acted as our foreman at Mumrills, should be free from his seasonal

engagements. The autumn was so wet that it was the end of October before he could be released. For five or six weeks thereafter the weather was fairly open. Of its subsequent behaviour the less that is said the better. Frost, fog, and snow combined to make things unpleasant.

During the earlier and more critical stages Mr Campbell did everything himself. Later, when accumulations of earth had to be moved, he was



Fig. 1. View of N. part of the Principia under snow. The two workmen are standing in the entrance and the two other figures on the N. wall of the Outer Court. For the channel in the middle foreground, which lay under the floor of the Ambulatory, see p. 51.

reinforced by one or two labourers. The cost of the undertaking was met by a welcome grant from the Society's Excavation Fund. In addition, I have to thank individual Fellows for assistance rendered in various forms, more particularly Mr A. O. Curle, C.V.O., who frequently accompanied me to the site and gave me the benefit of his opinion on points of special difficulty. The plan (Plate II.) was prepared by Mr G. P. H. Watson, who kindly acted as surveyor, while Mr Smith's series of photographs was usefully supplemented by Mr Curle, Mr D. P. Maclagan, and my son. I had also the advantage of a discussion with Mr I. A. Richmond.

Once the enterprise was fairly started, a day or two sufficed to dispel any doubt as to whether it was likely to be worth while. We struck

the remains of the Principia with our very first trenches in the garden. Following up the trail and passing beyond the north wall of the little enclosure, we were soon in possession of the outline of the building. The foundations had survived almost everywhere, and in quite a number of places they still supported one or two courses of masonry. The space which they enclosed was then cautiously stripped, a sharp look-out being kept for any indications likely to be of service in an endeavour to unravel the tangled skein of successive phases, dimly discernible from the outset. It had been no part of our plan to go farther, but a reconnaissance of the Military Way and its immediate surroundings induced a change of mind. Unattractive as the prospects had seemed to be, the roadway itself belied anticipation by contributing exceptionally interesting evidence, while a clay foundation, which projected into the gutter on the farther side of it, ultimately developed into a granary lying in the western half of the Præentura. A glance at Plate I. will make the region and extent of our activities plain.

When the information gleaned at various points had been brought together and collated, it was seen that Principia, Military Way, and Granary had all the same story to tell, although they told it in different ways. It will conduce to clearness if, to begin with, each of the three is allowed to speak for itself, cross-references being admitted only where absolutely necessary. Thereafter it may be possible to combine their several testimonies so as to produce a trustworthy picture of the fortunes of the fort during the years of its occupation by the Romans. In essaying such tasks one is accustomed to turn to the minor objects found—above all, to the pottery—for guidance or verification. Here, with a single important exception, no help of the kind will be forthcoming. The harvest of relics was almost incredibly meagre.

This must not be taken to mean that the equipment of the garrison or the plenishing of their quarters was below the normal standard. The true and sufficient explanation is that, over the area to which our operations were restricted, there was seldom more than a foot or two of soil, generally very much less, between the modern surface and the hard basaltic mass beneath. A study of the sections (Plate III.) will show that the condition of things must have been very much the same in Roman days.¹ It will also show that the builders of the fort had made no attempt to remove the irregularities that marked the underlying contour. They accepted it as it was, sometimes laying their clay

¹ In examining the sections it should be understood that, where there is a continuous black line above the hatching which indicates rock, the soil was cleared away to ascertain the exact outline. Elsewhere the division between soil and rock is to some extent conjectural.

foundations directly upon the rock, in at least one place dispensing with them altogether. Within the walls, again, the smooth, intractable substratum was even allowed here and there to encroach upon the floor. And another adverse factor has to be reckoned with. The hamlet of Croy Hill Houses, of which the cottage was the last representative, had been continuously in existence since the beginning of the eighteenth century or earlier, so that over a long series of years there had been much trampling of modern feet. In the circumstances there is no need to wonder why so little that is Roman has survived. A certain number of pottery fragments were picked up, but the great majority of them had belonged to vessels of comparatively recent manufacture.

THE PRINCIPIA.

The general plan of the Principia, as revealed when it was first uncovered, is simple enough (fig. 2). In the absence of any compelling

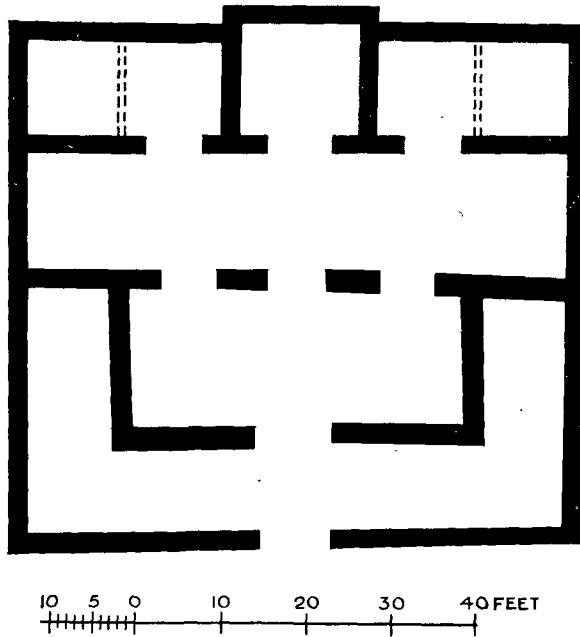
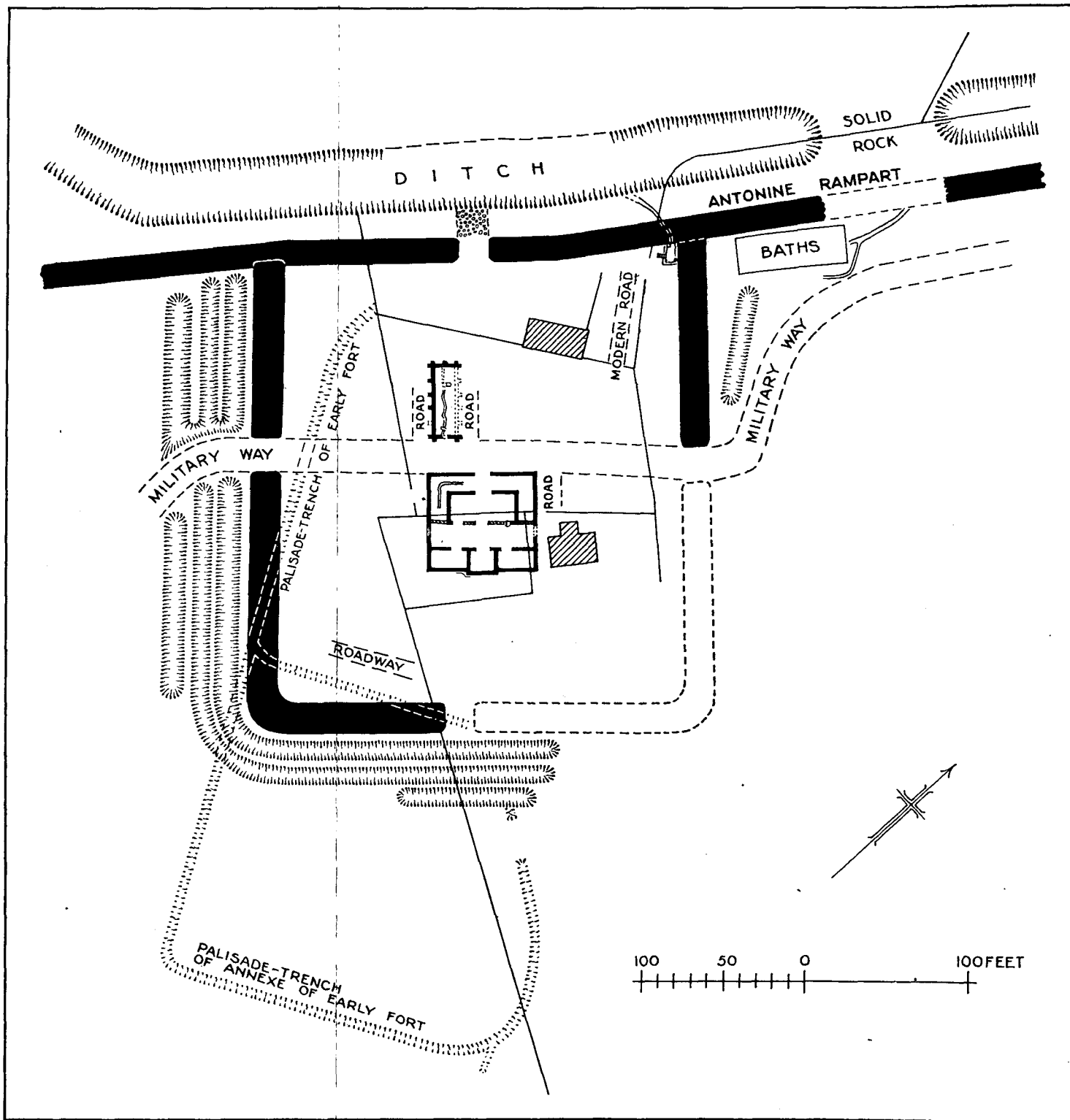


Fig. 2. Plan of the Principia.

reason for a departure from the ordinary practice, such as was noted at Cadder, the building looked out over the land beyond the Vallum. If we turn to Plate II.—which should be consulted throughout the detailed



Plan of Croy Hill Fort.

SIR GEORGE MACDONALD.

PLATE I.

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description that follows—we shall find that, exclusive of a projection of some 2 feet at the back of the Sacellum, it had almost the appearance of a square, with an extreme length of 61 feet from north-west to south-east and an extreme breadth of $67\frac{1}{2}$ feet from north-east to south-west,¹ all three measurements being taken over walls that were on an average 2 feet 1 inch thick. A comparative table of sizes would bring out the fact that, as might have been expected from the dimensions of the area which the commandant had to administer, the building was smaller than the Principia of any of the other known Vallum forts, always excepting Rough Castle. It will be observed that a gutter has run round all four sides, carefully adapting itself to the projecting portion of the Sacellum. As there were no gutters anywhere in the interior, the whole of the rain-water must have dripped outwards. The slope of the roof thus indicated is very unusual. I can recall no similar arrangement elsewhere, although I daresay parallels could be found at home or abroad, if they were searched for.

A gateway, about $8\frac{1}{2}$ feet wide, opened from the Via Principalis on to a cobbled roadway which led direct to the Outer Court. Instead of going straight on, however, one could turn either to right or to left into a paved Ambulatory 9 or 10 feet wide, which enclosed the Court on three sides, its east and west corridors terminating on the south against the partition that separated the outer or northern division of the Principia from the Cross Hall. The enclosure had an interior measurement of 38 feet by 16 feet, and there was no sign of paving or of cobbling. It had undoubtedly been open to the sky. The Ambulatory, on the other hand, would be covered in and, as already stated, its roof must have sloped downwards and outwards to drain into the gutter which ran at the foot of the main walls. Its front or highest part would be supported by columns, resting on the top of the wall whose foundations can be seen upon the plan. This wall was probably not much more than waist high, so that those within the Ambulatory could look through the portico into the Court, from which they would in return receive their light.²

To whatever other purposes the Outer Court may have been put, it certainly served as a vestibule to the Cross Hall, the principal doorway into which, 7 feet wide, was in the middle of the dividing wall. To the west there was a second and slightly narrower entrance. Considerations

¹ The fort therefore actually faces a good deal west of north. In the sequel, however, it will be convenient to disregard this and to use the terms 'north,' 'south,' 'east,' and 'west' as if it faced the north.

² Such an arrangement is not infrequent at Pompeii. For a good example, see R. C. Carrington, *Pompeii*, pl. ix., which shows the peristyle of the Villa dei Misteri.

of symmetry make it practically certain that there has been a corresponding entrance on the east. If so, however, the threshold must have been stepped both inside and outside, for there is no gap upon the plan. At first sight such an expedient seems odd, although there is an analogy for it at the north door of the 'inner court' at Housesteads, the explanation being similar. Section C-D (Plate III.) makes the reason apparent. Just where we should look for the subsidiary entrance on the east, a hump of rock rises for 16 inches above the level of the adjoining foundation. To remove such a formidable obstacle would have been a far more difficult business than to provide a couple of steps. There is one further point relating to access to the Hall. A break in the foundation of its east wall raises the question whether there may not have been an entrance from the side street through a postern. It is very doubtful whether an affirmative answer would be justified. It is true that elsewhere—as, for example, at Housesteads—there have been doors at one or both ends of the corresponding apartment. But at Croy Hill the break was no more than 3 feet wide and, even at that, there was no trace whatever of door-jambs. I believe that wall and foundation had been deliberately torn out here at some much later time.

The Cross Hall itself extended the whole breadth of the building, the internal dimensions being $62\frac{1}{2}$ feet by $13\frac{1}{2}$ feet. The floor had been neither paved nor cobbled. The earth that covered the eastern part of it did little more than conceal the substratum of basalt. Towards the west, on the other hand, where the ground had originally fallen somewhat, recourse had been had to artificial making-up, in order to secure approximate uniformity of level, and there was some evidence of two floors. Careful but fruitless search was made at the western end for any sign of the *tribunal*, the little rectangular platform on which the commandant took up his position when he had occasion to address his staff or to deal with delinquents. Mr Birley's happy identification of this feature at Chesterholm, where the steps had survived,¹ has enabled us to recognise it at the corresponding end² of the Cross Hall of other forts, among which Housesteads and Balmuildy may be mentioned as typical. At Croy Hill, however, there was nothing to bear witness to its former presence. Presumably, therefore, it was of wood. It need not have been high, and any marks which the foundation planks may have left in the made-up soil had been wholly obliterated.

It is now generally accepted that, in British *castella* at all events, such halls were as a rule completely roofed over. But there is more than

¹ *Arch. Ael.*, 4th series, vol. xiii. p. 223.

² That is, the end on the right as one enters from the Outer Court.

a suspicion that, in this as in other respects, Croy Hill was exceptional. Plate II., I think, puts it beyond doubt that from the south end of each of the two side-corridors of the Ambulatory the outward-sloping roof was continued right across the Hall. I see no other plausible way of accounting for the curious manner in which each of the L-shaped foundations of the portico wall returns for a short distance along the line of the partition. It cannot have been to support columns, for at these points there would be no columns. It is more reasonable to believe that above each of the returns the wall instead of being breast- or waist-high, as it was for the greater part of its length, was continued right up to the full height of the portico, in order to provide a substantial base of masonry for the heavy beam which was to carry the front part of the roof over the $13\frac{1}{2}$ feet span that had next to be bridged. The Hall, then, would be covered in at either end. What about the central portion of it?

It is tempting to imagine that there might have been a clerestory. That indeed would have been the simplest solution of the combined problem of lighting and shelter. But the evidence, such as it was, seemed to point in a different direction. On the floor there was much black matter, the consistency of which left no room for doubt that it was carbonised wood. Six or seven lumps of it, selected at random, were therefore submitted to Mr M. Y. Orr, F.R.S.E., of the Royal Botanic Garden, who at once identified all of them, save one, as fragments of oak, the solitary exception being of hazel. The natural inference was that the black matter represented the remains of oaken rafters, which had fallen to the ground when the structure to which they belonged had collapsed, and it is significant that here and there on the surface were red patches, suggestive of conflagration. The black matter, however, was not spread impartially all over the room. It occurred only at the ends—that is, in one or other of the two areas that would lie immediately beneath the outward-sloping roof which is vouched for by the gutter and the returns of the portico wall. This peculiarity of its distribution was observed at a comparatively early stage of our work, when Mr Smith drew my attention to it as a phenomenon that called for explanation. Now that we are attempting to reconstruct a picture of the building, the explanation ‘leaps to the eyes.’ Like the Outer Court, the central part of the Hall has been open to the sky, the ends alone being roofed. The arrangement is surprising. It is true that there was no roof over the central part of the early basilica at Pompeii, as Mr Richmond has reminded me, and the Cross Hall was, of course, the military counterpart of the municipal basilica. But those who have dug on Croy Hill in winter-time would hesitate to affirm that it enjoys a Mediterranean climate.

We come next to the range of rooms which invariably occupied the innermost division of the regimental Headquarters. In this case, as in so many others, there were five, that in the middle being the Sacellum, or Shrine of the Standards, once hallowed by the sculptured relief of Jupiter Dolichenus, two fragments of which were found in one of the ditches in 1931.¹ The short length of gutter still preserved is sufficient to prove that all five had been covered by the same outward-sloping roof as extended round the rest of the building, and here too there were traces of wooden rafters and abundant signs of conflagration.

At the back the Sacellum projected a little way beyond the line of its companions, a feature very commonly found elsewhere, and the extension gave it a north-to-south length of something over 13 feet, while its east-to-west measurement was about 14 feet. The entrance, 8 feet 4 inches wide, was exactly opposite the doorway that led from the Outer Court into the Cross Hall. There will be a good deal to say about the floor presently. Meanwhile the only point that need be mentioned is that there were rescued from it several pieces of window-glass and a few scraps of coal. As there is every likelihood that the wall at the back was reserved for the Dolichenus relief, the lighting was probably from above.

The other members of the range can be dismissed very briefly. To the right and to the left of the entrance to the Sacellum was a narrower door, each of the two admitting to a paved room, the size of which could safely be estimated by the position of the paving-slabs that had escaped destruction. In the room on the west there was but a single survivor. The state of affairs on the other side was luckily very different (fig. 3). The dimensions of these two rooms were almost identical, being, for both, rather more than 10 feet from north to south and rather more than 11 feet from east to west, and on the side of each farthest from the Sacellum, with a partition between, was an inner room, accessible only through the partition, which must have been of wood since no trace of foundations could be discovered. The two inner rooms were of the same size as those from which they were entered. The one on the west had been cobbled, while the floor of the one on the east, which was close to the rock, may have been merely earthen. These four side-rooms had been regimental offices of one kind or another, but only the most easterly of the series yielded any hint of the exact use to which it had been put. From the presence in it of seven *ballista* balls we may infer that it had been the *armamentarium* or arsenal.

It will be understood that up to this point the description has been

¹ *Proceedings*, vol. lxvi. (1931-32), pp. 268 ff.

a description of the building as we first uncovered it—that is, of the Principia which we must suppose to have been in use immediately prior to the final withdrawal of the Romans. But, as we already knew that Croy Hill had shared in the vicissitudes which other forts on the Antonine Vallum had undergone,¹ we were fully prepared to meet with signs of repair or alteration. It was not long before the expected happened. When we were examining the floor of the Sacellum, we



Fig. 3. View of remains of paving in room immediately E. of the Sacellum, looking N.E.

noticed that, as the earth was shovelled away, something resembling a pattern of large checks began gradually to show itself upon the surface. With the completion of the clearance the lines dividing the checks stood revealed as five carefully built channels, arranged after the fashion of a gridiron, three running from north to south and two from east to west (fig. 4). Their depth was fairly uniform at 6 or 7 inches. On the other hand, they varied considerably in breadth, the one in the centre of the north to south series measuring 12 inches across, while the others ranged from 6 inches to 8 inches. All five were filled from end to end with stones of the size of a man's fist or smaller, and the filling had plainly been deliberate, for the stones were systematically

¹ *Proceedings*, vol. lxvi. (1931-32), p. 261.

and tightly packed. Here then was evidence of at least two phases in the life of the fort. In the final phase the channels had been intentionally thrown out of use, which meant that they had ceased to be of any value for the purpose they had served in the phase which had preceded.

What could that purpose have been? Ventilation and drainage were both considered as possibilities—only, however, to be set aside, the



Fig. 4. Floor of the Sacellum, looking N. The channels have been partially cleared of the packing, in order to give an impression of their original appearance.

latter because the bottoms showed no trace of the sediment which would certainly have been deposited if water had ever run over them, the former because the need of anything of the sort was doubtful and also because the gridiron arrangement was wholly unsuitable for the circulation of air. Mr James Curle was the first to provide a clue to the true answer. He reminded me that in some of the *Wachtposten* on the German Limes the wooden tower had been reared upon a framework of timber sleepers, for the accommodation of which there had been dug a set of trenches arranged in exactly the same reticulated manner as the channels on which we had so unexpectedly lighted.¹ The probability that our channels were also sleeper-trenches was immediately apparent. So far as their function was concerned, the fact that they were built, not dug,

¹ See, for instance, *Obergermanisch-raetische Limes*, Bd. vii. Str. 14 (Lief. xlv.), Taf. 6.

was irrelevant, and digging would in any event have been impossible, owing to the proximity of the rock.

At this juncture I appealed to the unrivalled experience of Professor Fabricius, our Honorary Fellow, who had no hesitation in accepting the view that the channels must be sleeper-trenches. While he had never met with any parallel in a Sacellum, he referred me to a most convincing analogy of another kind, an illustration of which he has kindly allowed me to reproduce from his great work on the Limes (fig. 5).

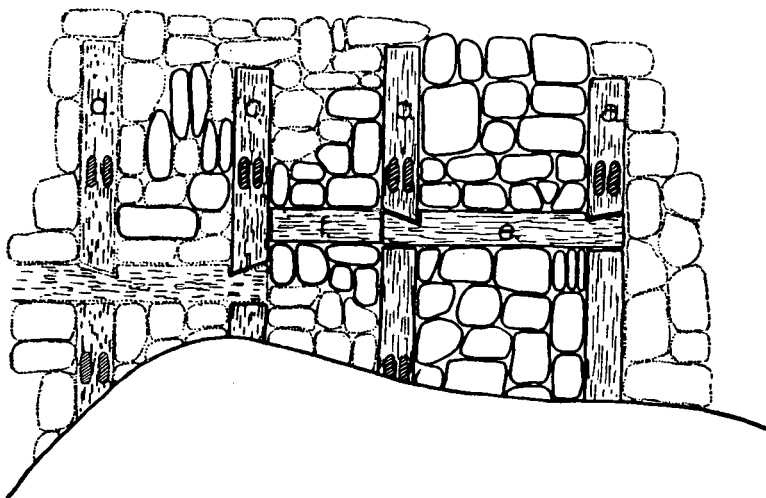


Fig. 5. Foundation for pier of wooden bridge over the river Jagst.

It is the foundation of one of the piers of a wooden bridge which had spanned the river Jagst, close to Kastell Jagsthausen.¹ It was discovered, measured, and sketched during the very dry summer of 1921, when the stream was abnormally low. The preservation of the wood through so many centuries is due to its having been continuously under water. Note how the sleepers are let into one another, so as to knit the whole framework together, and note too the holes into which the uprights of the pier have been mortised. The trenches, it should be added, average a little over 8 inches in breadth, a size that approximates closely to the dimensions given above for the Croy Hill examples.

The purpose of the channels themselves may therefore be taken as established. The purpose of the framework of beams they were designed to contain is more difficult to determine. My own belief is that it was

¹ *Op. cit.*, Bd. iv. A, Str. 7-9 (Lief. xlviii.), p. 120.

intended to support a series of stout posts, on the tops of which there had rested the planking of a raised floor. This would not be more than about 2 feet above the natural surface, and in it there would be one or more trap-doors, opening into the space beneath. The cellar thus formed would constitute the regimental strong-room or safe. The usual way to provide a safe of the kind within a Sacellum was, of course, to sink a pit below ground level and furnish it with a stone lining. At Croy Hill, however, such a plan was impracticable, there being no depth of earth in which to dig, as is clear from section A-B in Plate III. The raising of the floor was a simple alternative.

When I put this suggestion tentatively to Professor Fabricius, he saw two possible objections, both of which, however, can (I think) be effectively answered. In the first place, he asked, what about the opening that would be left beneath the raised floor opposite the entrance? The reply is that there would be no such opening. The gap between the ends of the walls on each side of the doorway would be completely covered by the short flight of one or two wooden steps that would be necessary in order to give admission to the Sanctuary. In the second place, would it not have been much easier to have had a scarcement running round the inside walls at the required height and to have let the ends of the planks rest upon the ledge, a method of providing a raised floor which was familiar enough to the Romans and which would present no difficulties in a room measuring only 13 feet by 14 feet? Here, however, we are not concerned with an ordinary room. The floor of the Sacellum would presumably have to bear the weight of a statue of the Emperor as well as of one or two heavy stone altars, so that a floor supported only at the ends would be in grave danger of sagging. If the planking were laid from east to west, the greatest strain would be on a line running down the centre of the room from north to south, and it can hardly be without significance that the channel which follows that line is calculated to accommodate a sleeper that must have been considerably wider than any of the others. Its breadth of 12 inches, as against from 6 inches to 8 inches, may indicate either that here the posts have been stouter than they were elsewhere, or that there has been a double row of them.

Except for the analogy from the wooden bridge at Jagsthausen, which is not, after all, an exact parallel, these stone-built trenches appear to be unique. Other interpretations of their purpose than that given above could, no doubt, be suggested. Professor Fabricius, for instance, wondered whether the timber framework, attested by their presence, might not have been merely the foundation of an ordinary wooden floor, the planks of which had been nailed directly to the sleepers. In that case,

however, one would have expected to find sleeper-trenches of the usual type in Sacella where there was no rocky bottom. On the whole, therefore, I think my own explanation may be allowed to stand, at all events on a provisional basis. Some future discovery may render a modification of it necessary. In the meantime, from the point of view of the excavation, it is not the purpose of the channels that matters but the inference we were bound to draw from the pains that had been taken to block them: the Sacellum had certainly been reconstructed at the outset of the final phase in the history of the fort. It was natural to suppose that the reconstruction must have extended to the rest of the Principia. What survived of the walls was destined to furnish us with evidence that it had actually done so.

Stones broached on the outer face with a diamond or, alternatively, a herring-bone pattern are of more or less frequent occurrence on Roman sites in Scotland. It is generally believed that they were treated in this fashion in order that they might produce a decorative effect in a façade. One unmistakable instance of their being so employed is on record. At Birrens the stones in the front of the large buttressed building, which ran lengthwise along the south side of the eastern half of the Via Principalis, all showed "diagonal lines forming a reticulated or diamond pattern of half-inch to inch mesh within a chiselled margin." Mr Barbour adds: "This wall is of superior and artistic workmanship, and the great care bestowed upon it is doubtless due to its prominent position in the main street."¹ Here then the broached stones were turned to account exactly in the manner we should have anticipated. As a rule, however, the structures with which they are associated are in a ruinous condition, and they themselves are either lying loose or built into quite modern walls and dykes. In these cases we cannot, of course, be certain how they were originally used. Still, in the light of what undoubtedly happened at Birrens, it is fairly safe to guess.

It follows that, if they appear in isolation in inconspicuous parts of walls of Roman date, there is at least a presumption that they are no longer in the position which they were in the first instance designed to occupy, but that they have been taken from an older building and re-used. At Croy Hill the presumption became a certainty when we found several built into the inside—not the outside—of the Principia walls, and built into them moreover at so low a level that the broaching could not have been noticed by anyone unless it were specially looked for. There were two or three not far from the north-east corner of the Ambulatory, and in the west wall of the most westerly of the range of five rooms at the back

¹ *Proceedings*, vol. xxx. (1895-96), p. 119.

there was another (fig. 6), placed where it can hardly have been visible at all when the room was in use. Doubtless the devil's advocate might suggest that the dressing had been done at the quarry on the chance that such stones would be wanted for a façade, and that, when it turned out that they were not needed, they had been utilised wherever they happened to fit in. The suggestion may be ruled out at once. The stones for the



Fig. 6. Diamond-broached stone, built into lowest course of the inside face of W. wall of the Principia, near S.W. corner.

building were dressed upon the spot. That is proved by section E-F (Plate III.), from which it will be seen that, as the underlying rock tends to rise, the stones of the lowest course of the wall are carefully graduated in thickness in order to provide a flat surface for the course immediately above to rest upon. So nice an adjustment would have been impossible, had the hewing not been done close at hand.

The high quality of the masonry all over may be judged from fig. 7, which gives a view of the section that was best preserved. Specially instructive is the 8-inch scarcement which can be seen in the left foreground. This projection begins at the north-east corner and runs westwards along the outer face of the front wall, gradually narrowing until it disappears completely by the time the entrance is reached. As

there is no trace of any similar scarcement elsewhere, one may wonder why it should have been thought necessary at this particular point. The answer will be found in section E-F (Plate III.), which reveals the fact that just here the rock drops rather suddenly down towards the level of the gutter. Evidently it was felt that, to obviate any risk of collapse, some extra support was required. This, like the nicety of adjustment referred to above, is a clear indication of the general soundness



Fig. 7. Remains of N.E. corner of outer wall of the Principia.

of the workmanship, a feature which it is perhaps permissible to connect with the circumstance that the only troops whom the inscriptions allow us to associate with the fort were legionaries.¹

That, however, is by the way. The more carefully the walls were examined, the more convincing did the proof of reconstruction become. Although there is nothing in fig. 7 to indicate any lack of correspondence between the foundation and the fragment of walling still *in situ* above it, what happened in some other places made it more than doubtful whether foundation and superstructure had formed part of the same design. Thus, in the inner face of the west wall of the Sacellum the projection of the foundation increases from only 10 inches at the northern end to as much as 1 foot 10 inches at the southern one. Similarly, it will be

¹ *Roman Wall in Scotland*, 2nd ed., pp. 401 f. and 423 f.

evident from section E-F (Plate III.) that the north wall of the *armamentarium* has not been built centrally on the foundation. More remarkable still, the north-east corner of the foundation of the low wall surrounding the Outer Court has been laid upon the square, whereas the angle of the superimposed masonry has been rounded (fig. 8). It is natural to presume that the same thing happened at the north-west corner. Further, the clay employed in the foundations was everywhere

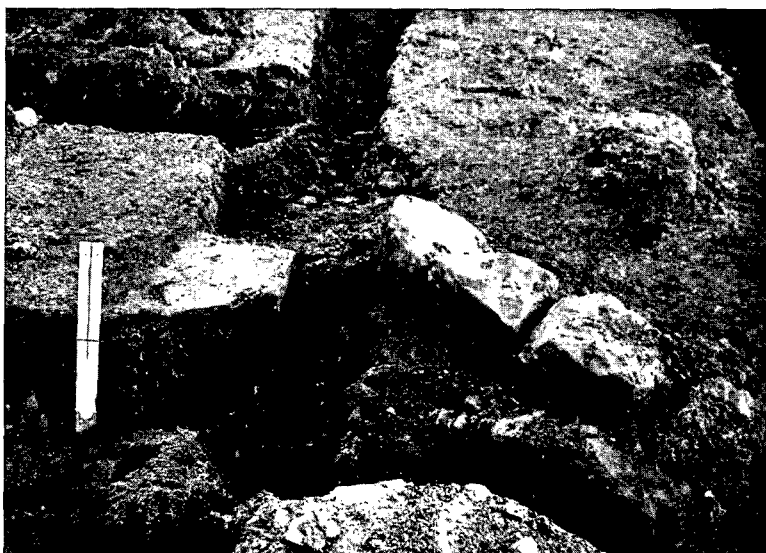


Fig. 8. N.E. corner of wall of Outer Court, showing lack of correspondence between foundation and superstructure.

of a bluish tint, whereas that used higher up for binding the stones together was always of a pronounced yellow, having obviously been taken from a different pit. Though very suggestive, the contrast was not conclusive. Final confirmation was furnished by the partition which divided the Cross Hall from the Ambulatory and the Outer Court. This must be described in some detail.

The masonry of the partition had been 'mortared' throughout with yellow clay. The foundation, on the other hand, was not homogeneous. The only portions of it in which blue clay appeared were the returns of the wall which enclosed the Outer Court. The remainder contained no clay at all, but was simply a bed of smallish stones, unmixed with any cohesive material. As will be seen from Plate II. and section C-D (Plate III.), we must conclude that only in the final phase has the dividing

wall extended all the way from east to west. During what I may venture to call the blue-clay period both ends of the Ambulatory had been open to the Cross Hall. On the evidence available it is not possible to say anything very definite as to what the space between the two returns was then like. The screen was apparently something less substantial than the stone wall of the final phase, and there was certainly a central door. More might have been learned, had we removed the dry-stone foundation, but to do so would have been inconsistent with our policy of interfering as little as possible with the existing remains. Here the question at issue was not of sufficient moment to warrant us in disturbing them unduly.

From the central doorway just referred to we secured a valuable piece of information. The road that passed through it turned out to have two levels, the earlier—the position of which is marked by the two stones that are shown here in section C-D—being 4 or 5 inches lower than the later one. Not only, therefore, had there been two distinct occupations, but a considerable interval of time had elapsed between the beginning of the blue-clay period and the beginning of the yellow-clay period that had followed it. In other words, the blue-clay period had been a long one. Two periods, however, were not enough. On the analogy of other forts on the Vallum we should have expected to meet with three. Moreover, at Croy Hill itself three occupations were vouched for by later discoveries on the Military Way and in the Granary. A fresh scrutiny of the evidence from the Principia seemed to be required, and in due course the scrutiny bore fruit. It should be added that, before beginning it, I had realised that what had to be looked for were vestiges of the first of the three Antonine occupations of the site, for there could be no doubt as to our having already established contact with the last phase of all and also with its immediate predecessor. Here is the result.

When uncovering the remains of the partition represented in the section C-D (Plate III.), we had been somewhat puzzled to account for a posthole near the centre of the passage through the western entrance to the Hall, at the point marked X in Plate II. It was about 15 inches deep and had a packing of stones in the bottom. That there could not have been a post there during the final phase, when the passage was in use, was clear, but it was almost equally clear that it would be difficult to fit the hole into the blue-clay period, since the distance between it and the ragged edge of the foundation to the west was not more than 3 feet, leaving a space which would have been unnecessarily narrow. Farther east, again, immediately to the north of the point marked

Z in Plate II. and on the west face of the projecting hump, a shallow hole had been cut in the rock at an angle and to a depth quite unsuitable for supporting a post that was to stand upright but well adapted for keeping the end of a strut steady. This was not much more than 2 feet west of the face of the foundation of the adjoining return, too close therefore to have formed part of the same construction. Had one not felt confident that there was a period still to be found, one might have hesitated to attach much weight to such faint indications. As it was, it seems justifiable to explain these holes as the scanty remnant of a screen of timber, or of wattle-and-daub, which had belonged to the earliest Antonine Principia. It will be remembered that the corresponding partition at Melandra underwent a similar transformation, as was proved by the finding of the stumps of the oaken posts that had held the original screen together. They were immediately in front of the line of the stone wall that had been substituted for it, and were the only recognisable relic of its predecessor.¹

Gathering up the threads of evidence, so far as they have been disentangled, I would summarise as follows the conclusions that may be more or less safely drawn as to each of the three stages in the history of the Principia.

First Period.—About the building that was first erected we know practically nothing that is certain, except that it must have stood on the same lines as those on which its two successors were reared, and that the screen which divided its Outer Court from its Cross Hall had had a framework of timber. Even as to the character of its main walls we cannot say anything definite, although the difficulty of building in wood on this particular site makes it probable that they were of stone, in which case the blue-clay foundations of the outer walls were possibly original.² The arrangement of the Outer Court is wholly doubtful, as is also that of the Sacellum.

Second Period.—When we come to consider the Granary, we shall see that, whatever may have been the case in the First Period, the use of blue clay was characteristic of the Second. There is some reason to think that it was at the outset of the latter that the low wall enclosing the Outer Court was inserted. The intervals separating the ends of the two returns from the holes for timber supports to which they are respectively adjacent are so short—just

¹ See *Classical Association, Manchester Branch*, 2nd Report (1909), p. 28 and pl. 8.

² Part of the side of an amphora was embedded in the blue-clay foundation of the west wall, close to the point where that wall was joined by the dry-stone foundation of the later cross-wall. Unfortunately it had no characteristic features such as would have given a clue to the date of the vessel to which it had belonged: it might have been either Agricolan or Antonine.

over 3 feet in the one case and just over 2 feet in the other—that wall-returns and timber supports can hardly have belonged to the same system. The idea that the wall belongs to the Second Period is perhaps strengthened by the slight lack of adjustment between it and the outer walls of the building: it does not sit squarely inside of them (Plate II.). For the rest, during this Period there appears to have been direct access from the corridors of the Ambulatory to the Cross Hall, while the sleeper-trenches in the Sacellum, whatever their purpose, were unquestionably in use.

Third Period.—At the opening of the Third Period the main walls and the wall round the Outer Court were rebuilt on the earlier foundations. These walls were 'mortared' with yellow clay. Simultaneously the passages from the Ambulatory to the Cross Hall were blocked by a new wall which was carried right across the building, incorporating the returns of the earlier period. This wall, too, was 'mortared' with yellow clay, and, where a new foundation was needed, it was laid in dry-stone, the material used including broken pieces of building stones and a large flag which had at some time been exposed to fierce heat. The sleeper-trenches in the Sacellum were thrown out of service and filled in, and the low wall round the Outer Court was rebuilt, the two northern angles being rounded. There were certainly two, and almost certainly three, doors between the Outer Court and the Cross Hall.

Mention has still to be made of a curious built channel (Y on Plate II.), which ran along the centre of the Ambulatory, underneath the paving. Though rather less carefully constructed, it bore a general resemblance to the built sleeper-trenches in the Sacellum, differing from them, however, in one important respect. Its width, instead of being approximately constant, displayed remarkable variation. For the greater part of its length it measured 12 inches—or only slightly less—across, but at one point it narrowed quite suddenly to about $2\frac{1}{2}$ inches, the constriction being clearly premeditated (fig. 9). Even if this alone had not been sufficient to rule out the idea that it was a drain, other and more conclusive arguments against such an explanation could be adduced. At the angle Y the bottom of the channel was no more than 1 inch higher than it was at the east end, which abutted on the roadway leading to the Outer Court, and yet the distance traversed in the interval was 19 feet. Again, although the trend from Y in a southerly direction was, on the whole, downwards, the stretch of 17 feet ended abruptly against the face of a boulder.

The constriction and the rounded angle render it almost as difficult to believe that the channel has been a sleeper-trench or, rather, two sleeper-trenches. Yet it is hard to see any other way of accounting for it. And, even if that view be accepted, to what use can the sleepers have been put? The possibility that they might somehow have marked the limit of the Outer Court of the original Principia naturally occurred to us, but the idea lost all plausibility when the most diligent search failed to reveal



Fig. 9. Built channel underneath the floor of the Ambulatory, showing constriction. The stone in the foreground is displaced.

any trace of a corresponding channel in the eastern half of the Ambulatory. The one thing certain is that the sleeper-trenches, if sleeper-trenches they were, had ceased to be of any value when the Third Period opened, seeing that they were buried beneath the paving of the final phase. On the other hand, while the line followed by the channel (fig. 10) conforms fairly closely to that followed by the foundation of the wall enclosing the Outer Court, its rounded angle would have accorded better with the presumably ¹ rounded corner of the superstructure of the Third Period than it does with the square corner of the foundation itself, an accord which tempts one to think that the channel must after all be connected with the final phase in the life of the building. As Mr Richmond has pointed out to me, the apparent contradiction might conceivably be resolved, if one could

¹ See *supra*, p. 48.

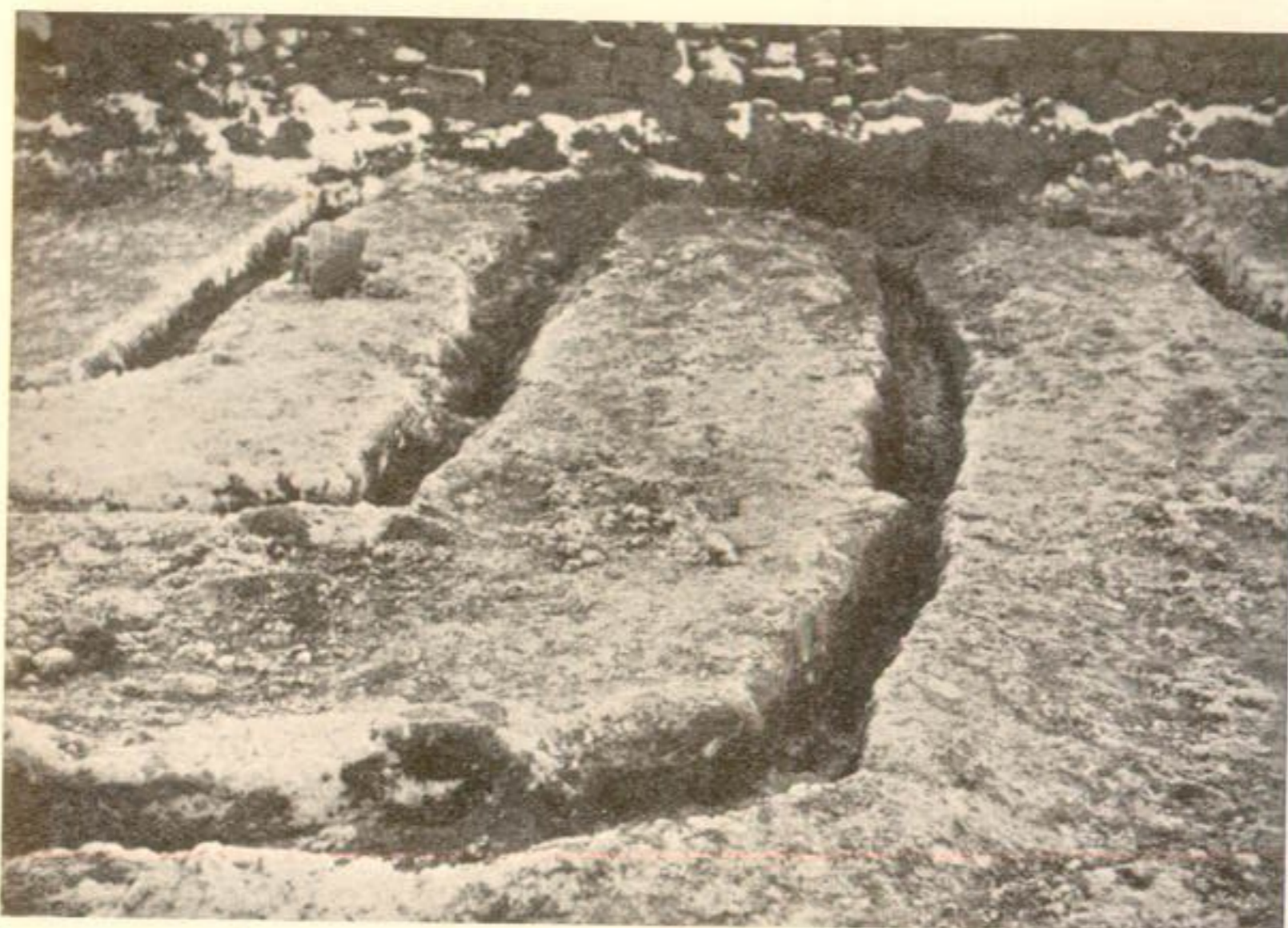


Fig. 10. Rounded angle of built channel underneath the floor of the Ambulatory, contrasted with square N.W. corner of foundation of wall of Outer Court.



Fig. 11. View of the Sacellum, looking S., with stones laid across the entrance.

suppose that the sleeper-trenches, always assuming that that is what they were, had had something to do with a temporary arrangement, such as a shed to shelter the hewers when the Principia of the Third Period was being erected.

Two somewhat equivocal features of the Principia, as it appears on Plate II., call for a word or two of notice before we pass out of the entrance and on to the Military Way. The first is the line of stones, hatched on the plan, which extends almost all the way across the entrance to the Sacellum (fig. 11). These had certainly been shaped by the Romans, but whether the Romans had placed them in the position in which we found them is another question. On the whole, I am disposed to think not. Their setting was neither firm enough nor close enough to admit of the supposition that they represented the remains of a threshold. More probably they had been laid at some later time for a purpose which can no longer be guessed. We shall presently meet with something very similar in the Granary. The second equivocal feature is the 'pit' immediately to the east of the entrance. When we first realised that the ground there had been previously disturbed, there was a momentary flicker of hope that we might have hit upon a well. We were speedily disillusioned. The hole, whose irregular shape is indicated on Plate II., was not more than 1 foot 8 inches deep, and its contents were rubbish, modern pottery and—at the very bottom—a clay tobacco-pipe, made in London.

THE MILITARY WAY.

Although the term 'Military Way' is used for the sake of convenience, it will be evident from Plate I. that our investigations were confined to that part of the thoroughfare which served as the *Via Principalis* of the fort, but that at the same time they extended to three of the streets debouching upon it, including that which led from the north gate. They began with the cutting of a cross-trench immediately opposite the entrance to the Principia. Subsequently, following up lines of inquiry that suggested themselves naturally, we dug a little farther, both towards the east and towards the west. To make the situation clear, it should be mentioned that the ground begins to fall rather steeply just beyond the northern edge of the Way itself. This probably explains the presence of the accumulation of 'large stones' which is marked on Plate II. They form a sort of embankment which would counteract any tendency to subsidence under the pressure of traffic. It will be remembered that at

the north-east corner of the fort the northern margin of the Antonine Rampart was strengthened in very much the same fashion.¹

The gutter proved to be intact all along the front of the Principia, although full of stones. On the other side of the street only a single fragment of it had survived. A measurement taken between the inner edges of the two gutters at this point gave a width for the roadway of 17 feet 4 inches. While there seemed to be only one level within the entrance to the Principia, the trenches cut from north to south across the road revealed the same two levels as had been observed at the entrance to the Cross Hall. But in this case the lower of the two gave us information of great interest. Its surface had been repaired, and some of the stones used for repair had evidently come from a building which had been destroyed. Here then was indisputable evidence of three periods. So much of the lower surface as was original had belonged to the First Period, and so had the building from which the re-used stones had been taken. That the Period had been relatively short was suggested by the fact that no raising of the surface was felt to be necessary when the road was reconditioned at the beginning of the Second Period. Further, that the Second Period had been much longer than the First was manifest from the marks of traffic which the stones, including the building-stones, bore upon their upper sides.

Additional evidence of change was obtained farther east, when an examination of the ground outside the north-east corner of the Principia led to the discovery that for a certain distance beyond that—to be precise for rather more than 14 feet—the gutter had been filled with stones from top to bottom. The filling was buried beneath a stratum of cobbles, the latter on the same level as the upper or Third Period surface of the Military Way. This meant that the street coming from the south (Plate II.) had been reconditioned at the same time as the Military Way, which it joined here. When that was done, it had not been thought worth while to provide a new gutter. Indeed, steps seem to have been taken to put the old one entirely out of action, for the filling of stones extended all along the front of the Principia. We endeavoured to lay bare the original surface of the side street, as it passed outside the east wall of the building, but the attempt was fruitless. The rock rose so high—for a few feet it had actually served as one side of the east-and-west gutter—that all that had been necessary was to 'blind' it by a thin spread of looser material, which had mingled indiscriminately with the new surface when the latter was laid.

I have already mentioned that a solitary fragment of gutter survived

¹ *Proceedings*, vol. lxvi. (1931-32), p. 247.

on the north side of the Military Way. It lay to the west of the entrance to the Principia, and it was destined to play a far more important part in the reconstruction of the story of the fort than we dreamed of when we lighted on it first. What that part was, will appear presently. Meanwhile I must so far anticipate as to say that it guided us to a building with a north-and-south alinement, of whose existence we had previously had no suspicion (Plate II.). Down each side of this building there had originally run a cobbled street, that on the east being the Via Praetoria which led to the north gate of the fort. During the Third Period the whole area within which these two streets lay, including the building

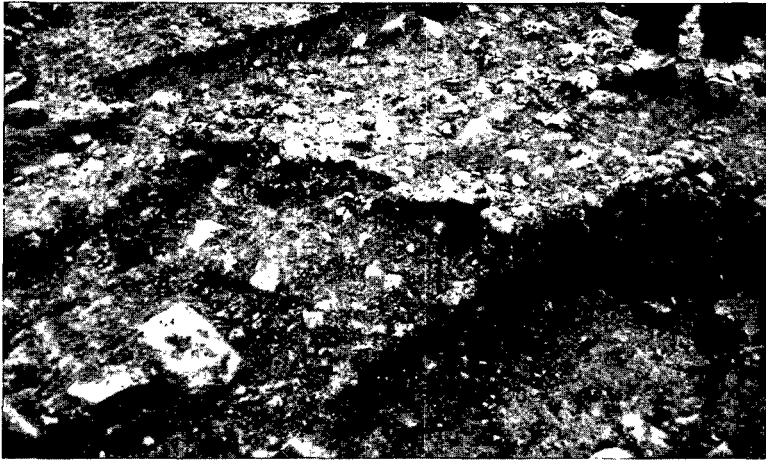


Fig. 12. Cobbling of Via Praetoria, covered by spread of later cobbling, on which rest the feet of the standing figure.

between them, had been covered with a spread of cobbling, and they themselves seemingly obliterated. But by removing a portion of this cobbling we were able to rediscover their surfaces underneath (fig. 12 and section G-H, Plate III.). It will be obvious that the 'large stones' can hardly have been piled against the northern embankment of the Military Way until after the street, whose passage they would have obstructed, had been incorporated in the larger cobbled space. They too, therefore, like the cobbling, must be assigned to the final Period.

THE GRANARY.

I pass now to the solitary fragment of gutter which we found in the Prætentura. It lay at the western angle of the junction between the Military Way and the Via Praetoria. A glance at Plate II. will show that

at some time or other during the Roman occupation the east-and-west section of it has been partially but permanently interrupted by a buttress which projected to the south and which was plainly of later construction (fig. 13), while the north-and-south section was similarly interrupted by a second buttress which jutted out eastwards. It has



Fig. 13. Fragment of gutter on S. side of Granary, partially blocked by foundation of later buttress, looking E.

already been stated that the building to which these buttresses belonged lay under the very same layer of cobbling which concealed the streets during the Third Period. The building so buried must therefore be attributed to the Second Period, and the gutter which it threw out of action to the First. The latter is thus a remnant of the original lay-out of the fort. Further than this I do not venture to go. The gutter is certainly suggestive of an eavesdrop, and, if that be its significance, the structure to which it was related must have stood immediately

behind it. On the other hand, it is just possible that its sole purpose may have been to drain the Military Way.

The Second Period building, to which our First Period gutter had thus guided us, turned out to have been about 41 feet long and 12 feet wide internally, with walls about 2 feet 8 inches thick (Plate II.). There had been three buttresses at the north end and six along each side, but only two at the south end, where a space had been left in the middle for the entrance which, as usual, had been from the main street. Of one of the buttresses on the west side and of the four in the centre of the east side, as of the walls which they had supported, we could find no remains whatsoever. The foundation trenches here must have been very shallow, for the rock was but thinly veiled by the disintegrated material which overlay it. Alternatively, it is perhaps just possible that a foundation may have been dispensed with altogether and the stones laid directly upon the rock, as had happened at one point in the Principia. In any event, the destruction that preceded the condition to which the area was reduced in the Third Period must have been thorough-going in the extreme, since even the smallest trace of clay was sadly to seek. Elsewhere the whole outline could be followed without difficulty, if often only by the aid of the clay foundations, while at the north-west corner, where the ground dips into a pronounced hollow, the masonry was still standing three or even four courses high (fig. 14). The stones were larger than in the Principia, being from 11 inches to 13 inches long and 5 inches deep on the face, and they often lacked the usual tussing at the ends. But the most significant difference was the complete absence of any sign of yellow clay. Alike in the foundations and in the 'mortaring' of the superstructure we encountered only the blue clay with which the foundations of the Principia had already made us familiar. That is, the whole building had been erected in the Second or blue-clay Period, a conclusion already deduced from its position under the Third Period cobbling.

Its plan left no room for doubt as to the purpose for which it had been designed. The buttresses were unmistakable pointers. Two seeming departures from the normal can be readily accounted for. In the first place, a characteristic feature, which we have learned to associate with the granaries of Roman forts in Britain, was lacking: there was no evidence of any provision for ventilation beneath the floor. But, after all, that is hardly matter for surprise. It would be unreasonable to expect that pilasters or dwarf-walls should have escaped when so much that was more substantial had been utterly destroyed, and it may be recalled that at Cadder, where there had been no cobbling spread over the remains, the only indication of a raised floor was supplied by traces of a

single dwarf-wall in the more southerly of the two granaries.¹ Again, the situation appeared to be somewhat unusual. As a rule, such buildings lay in the *latera praetorii* alongside of, or at least parallel to, the Principia. At Birrens, however, there was a very large granary in a position corresponding almost exactly to that occupied by the one we are now



Fig. 14. Remains of W. wall of Granary and of buttress at N.W. corner, looking N.E.

considering, the sole difference being that it was its side, and not its end, that was presented to the Via Principalis.

The analogy of Birrens is helpful in another way. There the granary in the Prætentura was additional to the allowance of two in the *latera praetorii*, which was normal for a fort of the size. That the Croy Hill example was also additional would be a fair inference from the fact that it seems to have been in existence during the Second Period only. Confirmation is furnished by its relatively small dimensions. In other forts on the Antonine Vallum the granaries, besides being in most cases much wider, are generally more than twice as long. Of the exceptions, the two at Cadder, which were 66 feet in length,² were respectively 20 and 22 feet in breadth, and the single granary at Rough Castle measured 67½ feet by

¹ Clarke, *The Roman Fort at Cadder*, p. 42.

² I take this figure from Mr Clarke's text (*op. cit.*, p. 41). According to his plan, the internal length was 70 feet.

15½ feet. Comparing these figures with 41 feet by 14 feet we may conclude that at Croy Hill there had been, in all three Periods, at least one granary in the *latera prætorii*. To judge by the dimensions of the Principia, it (or they) would be rather more than 60 feet long. As to the breadth, we know nothing.

The examination of the interior raised a number of puzzling questions, not all of which perhaps admit of an entirely satisfactory answer. There had been so much interference with the original structure that the data were at once scanty and confused. But it was quite certain that there had been several alterations. I will begin with what was the most obvious and in all likelihood also the earliest of these.

It will not have been forgotten that the entrance had been at the south end. We could see nothing of the doorway nor of the 'loading platform,' which presumably once stood in front. The platform would naturally be removed not later than the beginning of the Third Period, when the Granary was cobbled over and the Military Way reconditioned; as there were no longer any stores to be handled, it would have been a mere obstruction. In the interior, however, starting from the west side of the entrance gap, a built channel, 6 or 7 inches wide, ran northwards down the centre of the building to the opposite end. Many of the flat covering-stones were still *in situ*, and their removal enabled us to see the reason for the curiously sinuous course which the channel had pursued (Plate II.). Its windings had been dictated by a desire to avoid doing more than was absolutely necessary in the way of cutting through the rock, which was, in fact, for some distance utilised as one side of the conduit (fig. 15).

I have called the channel a conduit, because it can only have been intended to convey water. This was not, indeed, immediately apparent, for its upper end abutted directly against the inner face of the clay foundation of the south wall, and it was difficult to guess where the water could have come from. Moreover, it looked like an obvious breach of architectural orthodoxy to lead a drain beneath the floor of a building, especially when that building was a storehouse.¹ On the other hand, there were no marks of fire or of soot, such as a flue would inevitably have borne, while an air-duct would have been meaningless if (as we must suppose) the floor above it was raised for ventilation purposes. What happened at the lower end is illuminating. No provision had in the first

¹ Mr Clarke found a channel running down the centre of the more northerly of the two granaries at Cadder. There was evidence that it had been a drain, but one belonging to an earlier occupation and having no connection whatever with the Antonine buildings (*op. cit.*, p. 42). The analogy, therefore, does not help us here. No similar explanation could account for the Croy Hill example. A much closer parallel is the irregular seepage drain underneath the Cross Hall ('inner court') at Housesteads (see *Arch. Ael.*, n.s. xxv. p. 216). As Mr Richmond pointed out to me, there too the top of the rock is close to the surface, and it would absorb no water.



Fig. 15. Conduit beneath floor of Granary, looking N. towards the 'rough wall.'
Beyond the curve in the middle distance the W. side is formed of solid rock.

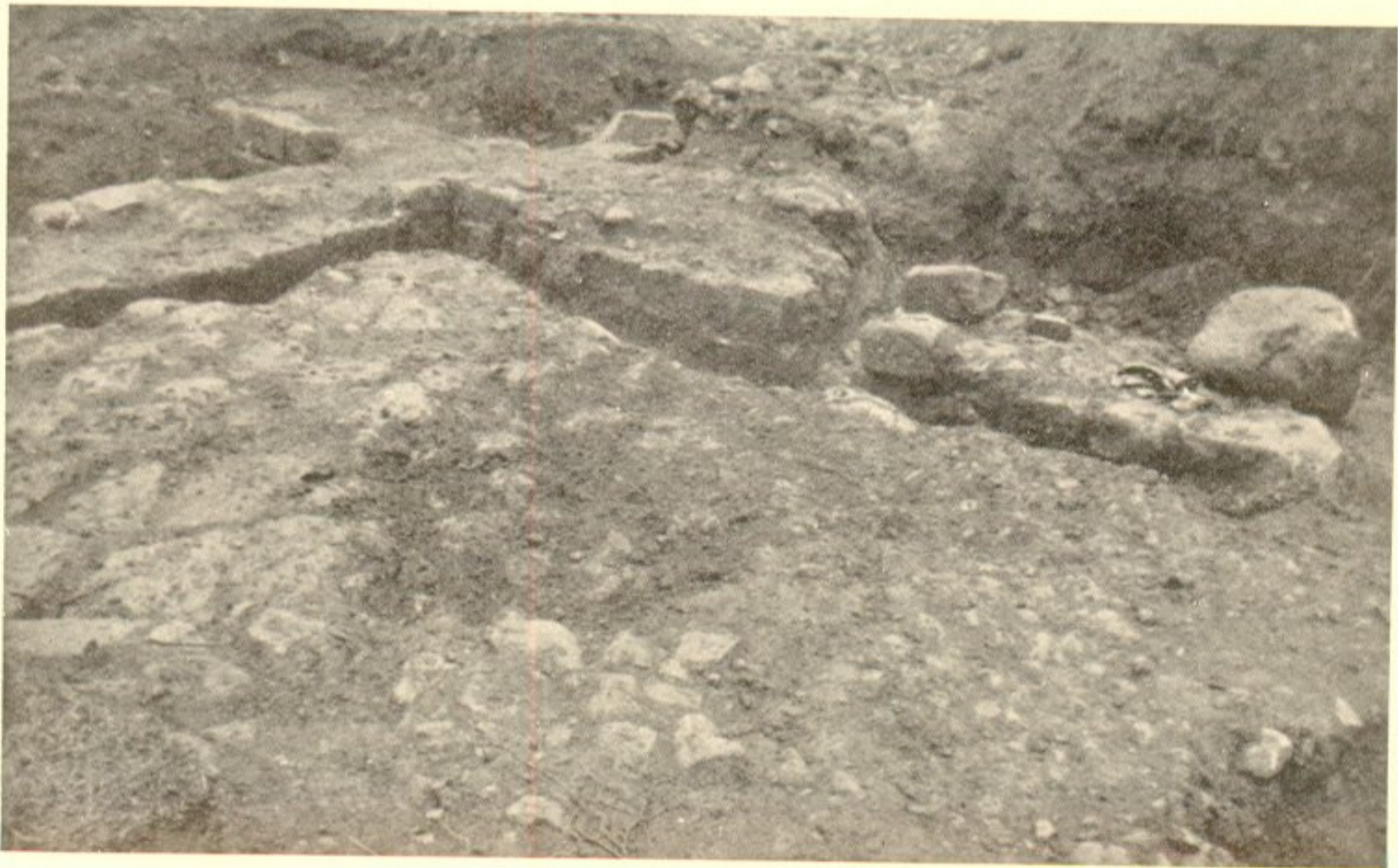


Fig. 16. Looking N.W. towards N.W. corner of Granary. Note passage broken through N. wall
for exit of conduit; the stone to the right of the mouth is diamond-broached. Note also the
two varieties of cobbling, for which see p. 63.

instance been made for an exit there and, after the building was completed, a passage had to be broken through the north wall (fig. 16), its line being deflected in order to avoid the central buttress (Plate II.). We cannot but conclude that the insertion of the conduit was an afterthought.

This helps us to understand it. Its function was obviously to help in keeping the neighbourhood of the entrance and of the loading platform free from damp. But why was that help required? The loading platform would stand exactly on the watershed between east and west, and apparently the original expectation was that, despite the intrusion of the buttresses, there would still be sufficient room (fig. 13) for the gutter on either side to function adequately. It must, however, have been found that water tended to accumulate on the west, and it was therefore decided to get rid of the surplus by leading it through the adjacent wall and then by a drop-pipe down into the upper end of a channel under the floor of the building. The conduit was thus an overflow, and the breach of architectural orthodoxy may be condoned in the light of the knowledge that it was a mere *pis aller*. The risk of damage to the contents of the Granary would be negligible, since it would only be after rain that there was any flow at all and, unless the rain were torrential, the flow would be little more than a trickle. Besides, there would be a clear and well-ventilated space of 10 or 12 inches between the cover-stones of the channel and the bottom of the raised floor. Nevertheless it may be asked why even a negligible risk should have been run, when it would have been a simple enough matter to relay the gutters on a line that would be quite clear of the buttresses. The suggested solution ignores the fact that this would have reduced the width of the two streets to an extent that might have had awkward consequences. What is really surprising is that the full effect of the partial blocking of the gutters was not fully appreciated when the Granary was designed. The insertion of the overflow was the penalty that had to be paid for taking too optimistic a view of the weather conditions on Croy Hill. There was nothing to give a hint as to when the alteration was made. But the Granary can hardly have been very long in use before it was realised that some further provision for street drainage was essential. The windings of the conduit suggest that the raised floor was supported on pilasters rather than on dwarf-walls.

Presently there was to be a much more drastic change. The evidence bearing upon this is not easy to marshal, although its cumulative effect is irresistible. The facts are as follows. After leaving the inner face of the south wall, the conduit was almost intact for a distance of 28 feet, reckoned in a straight line and without taking account of its

sinuosities (Plate II.). At that point its course was interrupted by a block of rude masonry which we called the 'rough wall,' a name which it will be convenient to retain here, even although it is very doubtful whether it had ever been a wall in the ordinary sense of the term. It measured 4 feet from north to south between two more or less finished faces, and about 3 feet from east to west between the broken and ragged edges of a rubble core. The likelihood of the conduit having ever functioned through it is small. The whole construction left the impression of workmanship so poor that it was hard to believe it Roman. It is true that we noticed at the west end a stone which looked rather like a channel stone, but it may have been re-used.

The 'rough wall' was 10 feet distant from the inner face of the wall of the Granary itself. In the interval the ground falls away so quickly that, when the original building was in being, the pilasters or dwarf-walls supporting the floor must here have been higher, sometimes as much as 1 foot higher, than they were farther south. Unless they had been so, the floor, instead of being level, must have been stepped, which seems in the last degree unlikely. As we found it, the whole of the area in question was covered with cobbling. On the west side, and for more than half the distance across, the cobbles were large and included pieces of freestone which had obviously come from a demolished building. Two or three of them were lifted and subsequently replaced. Under one we discovered the remains of the conduit, and under another (section I-J, Plate III.) a hole, some 14 inches deep, which contained, *inter alia*, a scrap of coal. The surface of this heavy cobbling lay level with the top of the surviving portion of the Granary wall, and both cobbles and wall-stones bore marks of wear by traffic. Its southern edge lay under the northern part of the 'rough wall,' a convincing proof that it was earlier in date. I hesitate to offer any explanation of its significance. At one time I was disposed to think that it might have been a new east-to-west thoroughfare. But it is difficult to reconcile that idea with the evidence of section G-H, which shows that it was on a higher level than the original cobbling of the roads on either side. Besides, it was almost too carefully laid to be the surface of a road. It was more like a paved floor.

On the east side of the area the cobbling was of quite a different character. It was composed of smaller stones and was in fact identical with that which has already been spoken of as covering the streets (fig. 12), as well as the whole of the rest of the building to the south. Here it extended northwards over the eastern and more ruinous end of the north wall of the Granary. The contrast between the heavy and

the light cobbling, and also the relation of the former to the Granary wall, is well brought out in fig. 16 and section G-H (Plate III.). In connection with these it should be explained that the space, which appears immediately in front of the wall in the illustration, is the result of some of the cobbling having been cleared away in order to permit of an examination of the wall-face, and that the 'top layer' shown in the section, where it is marked as 'modern,' was thinner and contained an admixture of fragments of pottery not more than two centuries old.

These are the data so far as we were able to ascertain them. Their significance for the history of the quarter of the Præentura concerned, and in particular for the history of the Granary, may be summarised as follows:—

First Period.—It is impossible to speak definitely as to the use, if any, to which this part of the site was put when the fort was originally laid out. It may have been left entirely empty. On the other hand, a suggestion that it may have had on it a building or buildings is implicit in the survival of a portion of a gutter which may quite well have been an eavesdrop.

Second Period.—When the fort was restored at the beginning of the second occupation, a small Granary was erected on the spot. That it was not the principal storehouse may be inferred from its comparatively small size and also from its unusual position, one result of which was that the projecting buttresses partially blocked the gutter that had previously drained the north side of the Military Way. The full effect of this does not seem to have been foreseen, for the inconvenience it produced turned out to be more serious than had been anticipated. To prevent the accumulation of water, an overflow conduit was inserted under the floor of the Granary, starting immediately to the west of the doorway and discharging by a passage that was broken for it through the north wall of the building.

Experience proved that, after all, the extra space for stores was not required, and there may have been other motives prompting a change. At all events, drastic alterations were by and by carried out. What happened at the north end of the Granary seems plain enough up to a point. The wall there was reduced to an average height of about 1 foot 3 inches and utilised as the northern edge of a new surface, the main part of which was constructed over what had been the interior of the building, the natural hollow being filled up and then covered with heavy cobbling at the same level as

the top of the surviving part of the wall. The new surface must have been 15 or 16 feet broad, for to the width of the wall (2 feet 8 inches) and the width of the heavy cobbling as exposed (10 feet) there must be added the fringe of heavy cobbling that lay under the 'rough wall.' The marks of wear which it bore, like those upon the lower level of the Military Way, showed that the new cobbling or paving had been in active use for a very long time. The change must therefore date from the earlier years of the Second Period.

The remaining portion of the interior—that is, the southern and larger half—cannot, of course, have been left exactly as it was before, but one can hardly venture to speculate with any confidence on the nature and extent of the modifications that were introduced. What was left may still have been used as a store, or it may have been transformed into a workshop, or it may have lain derelict as an empty space. The last possibility seems, on general grounds, the least likely, nor can the absence of any sign of a new end-wall having been erected to the south of the new surface be cited as evidence in its favour, so wholesale was the destruction that ensued after the Period had closed. The second has perhaps most to commend it. But there is nothing in the shape of positive proof. All that can be said is that here and there portions of the floor were reddened, as if by fire, and that there were traces of burning on that part of the heavy cobbling which lay underneath the 'rough wall.'

Third Period.—In the final Period the site of the Granary was covered with the same cobbling that was laid over the two streets by which it was flanked and over the Military Way, the whole being merged into one great cobbled area. This explains why it was possible to bank up the Military Way with large stones at a point lying directly in the line of the more easterly of the two streets, which was, in fact, the Via Praetoria: there would now be abundant room to pass to the west of the obstruction. Besides, in view of the character of the ground outside, the traffic to and from the north gate of this particular fort must always have been of small importance.

Incidentally, the cobbling throws some light on the treatment that appears to have been meted out to the Granary, and doubtless to the other buildings within the fort, when the Romans withdrew for the second time. Taken by itself, the levelling of the walls might have been interpreted as an operation preliminary to the laying of the cobbling and so have been attributed to the Romans

themselves. But the testimony of what I have called the 'cobbling or paving' puts that explanation out of court. At the beginning of the Third Period the western portion of it was undamaged and was incorporated with the newer cobbling just as it stood, whereas the eastern portion of it had to be replaced, clearly because it had been deliberately torn out. Such wilful destruction can only have been wrought by enemy hands.

I have already expressed doubts as to the Roman origin of the mass of masonry to which we gave the name of the 'rough wall,' and I have



Fig. 17. Group of re-used stones on site of Granary, looking E.

nothing to add to what was then said. But I must not omit to mention another feature of the Granary which is still more open to suspicion. Above the scanty remains of the west wall, close to where the second buttress from the south should have stood, was a group of stones, obviously re-used, which had been placed end to end in such a way that they give the impression of a threshold (fig. 17). It will be seen from the illustration that they were not covered by the cobbling, while Plate II. shows that they are out of alinement with the wall on which they lie, circumstances from which it might fairly be argued that they have nothing to do with the Granary and even that they are not so early as the last of the Roman periods. On the other hand, they were laid directly on the clay of the foundation, with no cobbles beneath them, and this, combined with the apparent absence of the buttress one naturally looks for here, might suggest that they represent the original entrance. So far as we know,

however, access to such buildings was always had from the end, the bins being ranged on either side of the central passage on to which the door opened. On a balance of considerations I am prepared to class this group of stones with the stones that had been laid across the threshold of the Sacellum, and to regard both sets as a manifestation of post-Roman building activity. On Plate II. they have been distinguished by a special form of hatching.

THE FINDS.

Samian Ware.—Apart from a tiny chip, apparently broken from a platter, Samian ware was represented only by twenty-eight fragments,

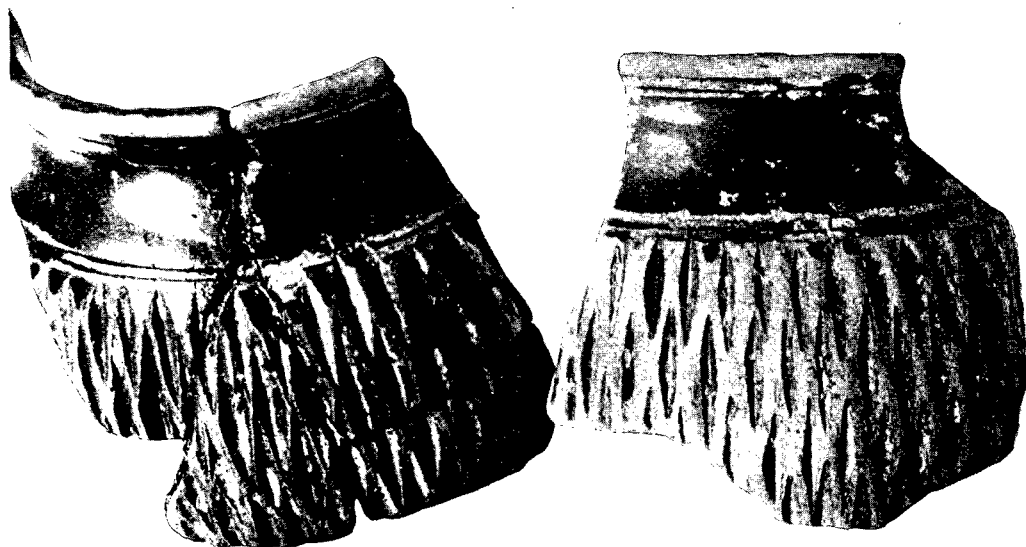


Fig. 18. Fragments of vase of incised Samian ware. Actual size.

which were found lying against the foundations of the west wall of the Granary underneath the Third Period layer of cobbling. All had belonged to a single vessel. Most of them were very small, but those that could be fitted together (fig. 18) showed that the whole had been a vase with incised decoration, having a diameter at the mouth of $2\frac{7}{8}$ inches. Ware of this sort is very rare in Scotland; two pieces of it were picked up at Castlecary,¹ and Mr Curle tells me he remembers noting one at Newstead. It occurs more frequently on Hadrian's Wall, usually in Severan associations. Its emergence north of the Tweed, however, proves that it had begun to find its way to Britain rather earlier. Haverfield,

¹ *Proceedings*, vol. xxxvii. (1902-1903), p. 332, fig. 31.

largely on the strength of the Castlecary evidence, put its appearance "somewhere about A.D. 170."¹ In any event it must be assigned to the late second century, and the circumstances in which the Croy Hill fragments were discovered thus become very significant, inasmuch as they make it certain that the vase reached the fort before the close of the Second Period in its history. If the Second Period lasted until after A.D. 170, it can hardly have ended before the great disaster which Dio describes as having taken place in the early years of Commodus, when "the tribes of the island, having crossed the wall that separated them from the cantonments of the Romans, wrought great havoc and slew a Roman general with the troops under his command."² This goes a long way to confirm the view which I have advanced elsewhere³ as to the chronology of the history of the Vallum.

Coarse Pottery.—Four fragments of amphoræ came from the Principia or its neighbourhood: one portion of a side from the blue-clay foundation of the west wall, another from a spot which is not precisely recorded, a small piece of a second-century handle from the Cross Hall, and part of a bottom from the north-east corner of the wall of the Outer Court. The remaining sherds of coarse pottery were inconsiderable alike in number and in size.

Glass.—There were eight fragments of window-glass, reduced to five by piecing together those of them which fitted. The majority came from the floor of the Sacellum, the others being picked up in the course of filling in. All alike were noticeably thinner than is usual with Roman window-glass. It was not easy to secure exact measurements, for the moulded edge is always thicker than the rest, and sometimes, owing to the irregularity of the casting, the same fragment may vary even at a considerable distance from the edge. But the following comparative table, based on the specimens preserved in the Museum, may be taken as approximately accurate:—

<i>Fort.</i>	<i>Thickness of Window-glass.</i>
Croy Hill	2·5 mm.
Rough Castle	3 mm.
Newstead	3 mm.
Birrens	4 mm.
Lyne	3–5 mm. ⁴

At Bar Hill the average of some thirty pieces was about 3 mm.

¹ *Proc. Soc. Ant. Lond.*, 2nd series, vol. xxiii. p. 119.

² *Dio*, vol. lxxii. 8.

³ *Roman Wall in Scotland* (2nd ed.), p. 479.

⁴ A single specimen, very irregularly cast.

Iron.—There were two objects of iron: (a) The blade of a pointed knife, 6 inches long and $\frac{15}{16}$ inch broad at the top, and (b) a flat ring with an outer diameter of $2\frac{1}{16}$ inches and an inner diameter of $1\frac{1}{16}$ inch.

Stone.—(a) To the seven *ballista* balls from the *armamentarium* five others from different parts of the excavation have to be added. Hardly any two of the twelve were of the same size. It will be remembered that in 1930–31 we found about two dozen, and that in recording them I drew attention to the contrast with Mumrills, which did not produce a single example in the course of three years of digging.¹ (b) A broken whetstone, which had seen much service, was $4\frac{1}{8}$ inches

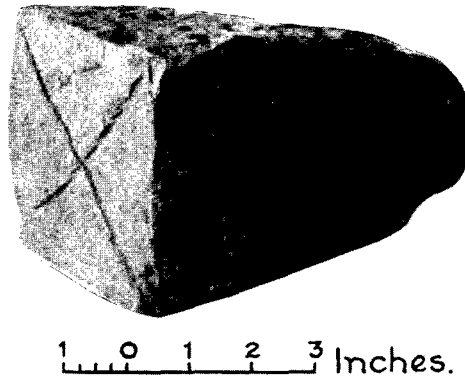


Fig. 19. Building-stone, marked on the face.

long by $1\frac{1}{2}$ inch by $1\frac{1}{4}$ inch. (c) A small building-stone, measuring $3\frac{3}{4}$ inches by $3\frac{5}{8}$ inches on the face and 7 inches from back to front, was marked with diagonals in the form of a St Andrew's cross (fig. 19). (d) A triangular fragment of yellowish sandstone, $5\frac{1}{4}$ inches along the base by 5 inches high, was chiselled with a series of horizontal lines. (e) Another fragment, $4\frac{5}{8}$ inches long by 4 inches high, was only $2\frac{5}{8}$ inches thick. It showed a portion of a beaded moulding and was carefully worked on the back, as if it had formed part of a tablet. (f) A fragment (fig. 20) which represents rather less than half of a cylindrically shaped piece of reddish sandstone, not unlike the felloe of a wheel, is probably a portion of a very much worn grindstone. It is $2\frac{1}{4}$ inches thick and is 4 inches in length, the diameter decreasing gradually from 7 inches to $6\frac{1}{4}$ inches. The inside and the edges are rough, but the outside is highly polished, as if its surface had been subject to constant friction.

¹ *Proceedings*, vol. lxvi. (1931–32), p. 267.

Miscellaneous.—A small round object of red clay, fired, about the size of a child's marble, may or may not be Roman. A small piece of daub, bearing the faint impress of wattle-work, came from the Sacellum, but is perhaps a relic of the screen or partition that at one time divided the Cross Hall from the Outer Court. As already mentioned, a few scraps of coal were found in the same place. There were others lying about the north end of the Granary. One might have been disposed

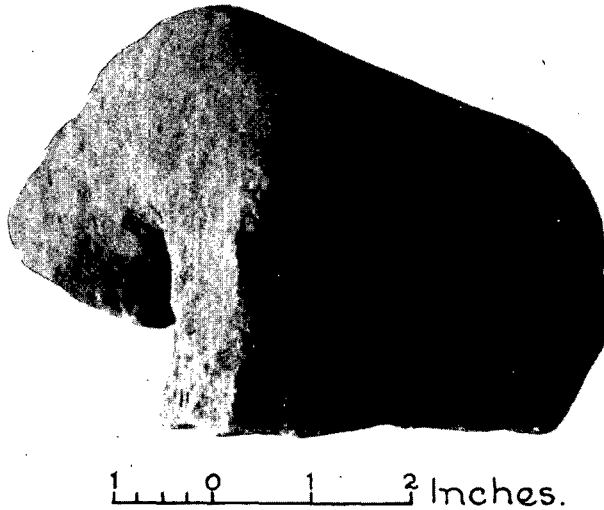


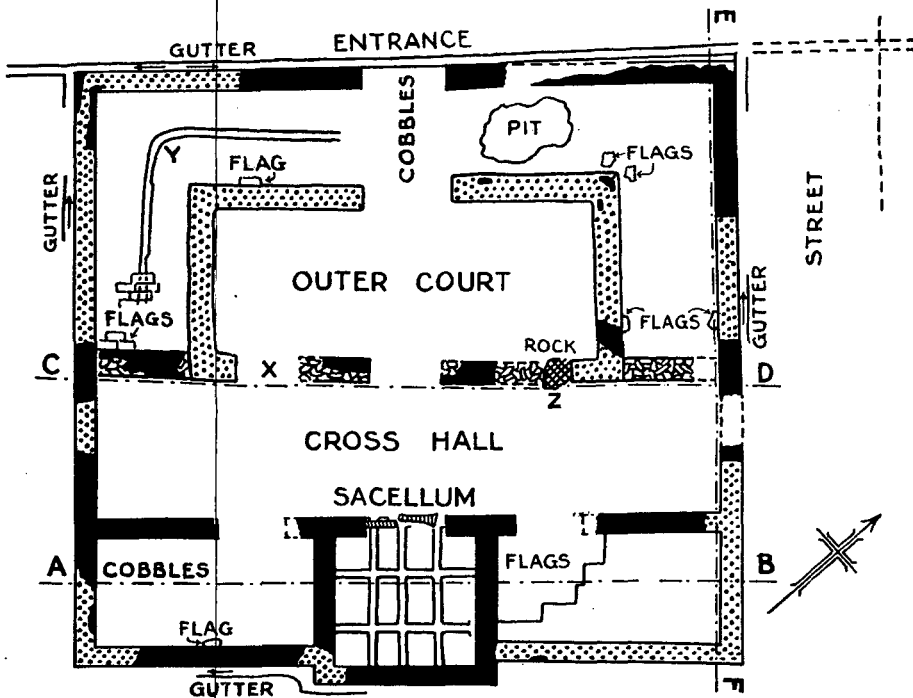
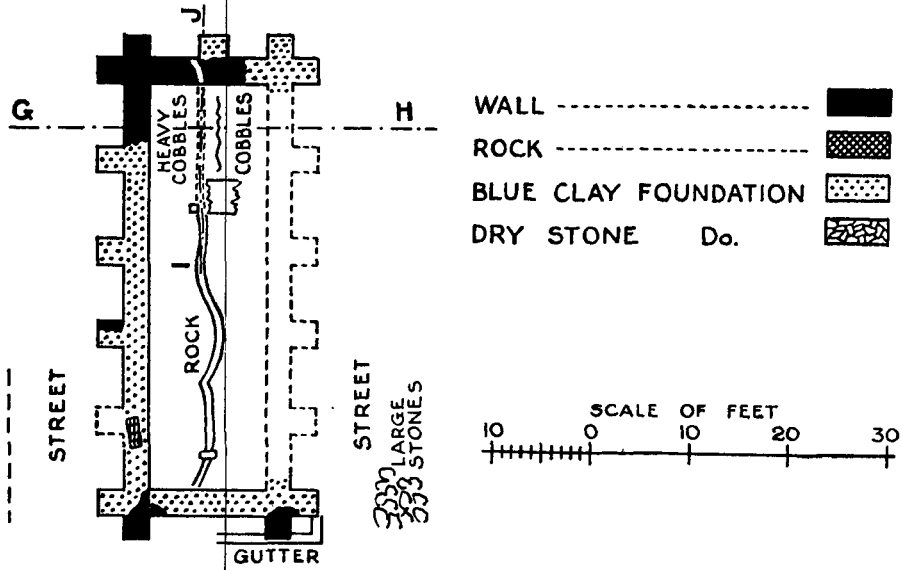
Fig. 20. Fragment of a very much worn grindstone.

to think that the latter were refuse from the days of the hamlet, were it not that one of them was in a hole beneath the heavy cobbling. But they do not justify us in crediting the Romans with coal-mining in the modern sense of the term. Doubtless, as at Bar Hill, they came from an outcrop.¹

HISTORY OF THE FORT.

Although it has been necessary to leave some things obscure and others doubtful, it may be hoped that the foregoing description has conveyed a tolerably clear idea of the results of the excavation. If so, the historical conclusions which seem justifiable may be summed up in a few sentences.

¹ *Roman Forts on the Bar Hill*, p. 62.



Croy Hill Fort Excavations of 1935-36.

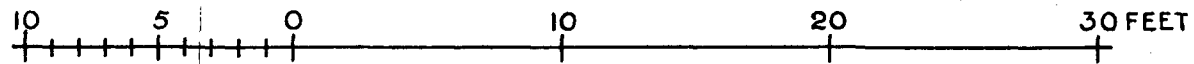
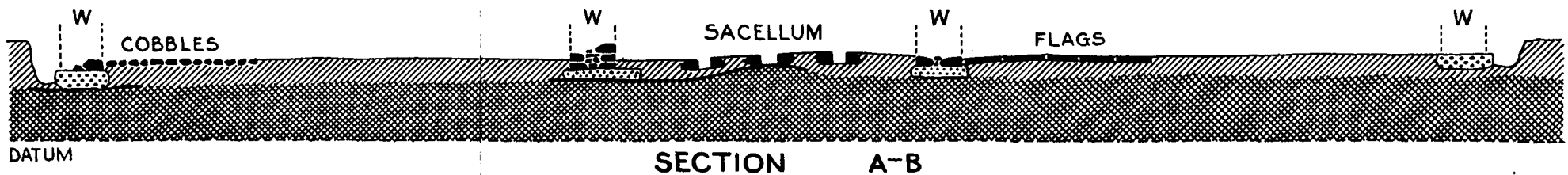
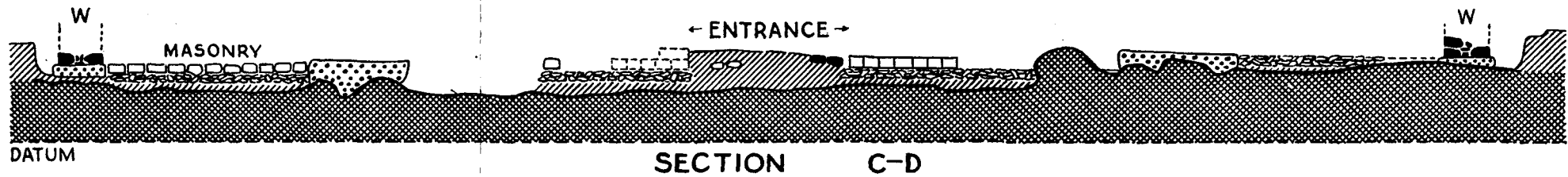
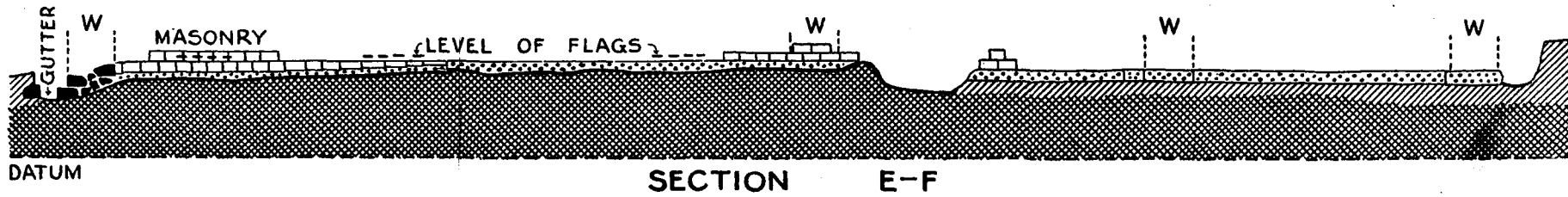
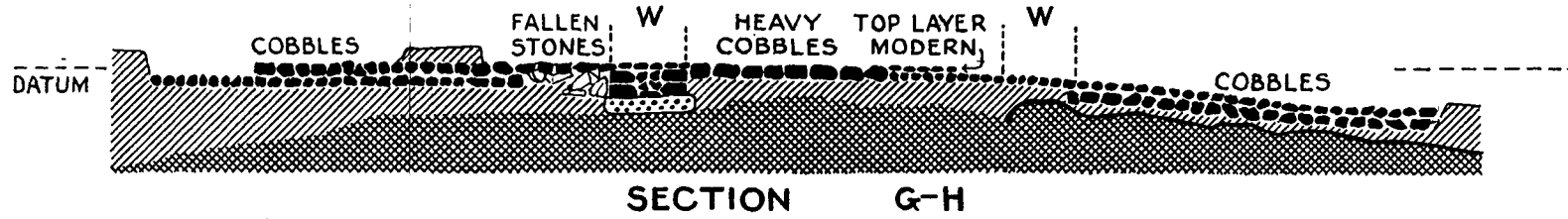
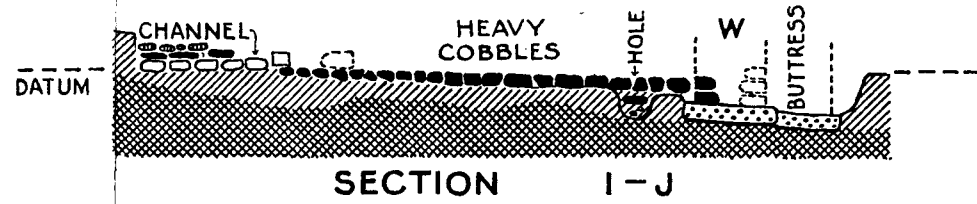
SIR GEORGE MACDONALD.

PLATE II.

[To face page 70.

W = WALL
 ■ STONE
 ▨ ROCK

SOIL ▨
 BLUE CLAY FOUND^N ▨
 DRY STONE Do. ▨



Croy Hill Fort.

SIR GEORGE MACDONALD.

PLATE III.
 [To follow PLATE II.]

The *castellum* was one of the nineteen forts erected by Lollius Urbicus to defend the Vallum which he built from Forth to Clyde. This was about A.D. 142. Some years, but not very many years, later the Vallum and its forts were temporarily abandoned. It is natural to connect the abandonment with the formidable native revolt which was crushed by Julius Verus between A.D. 155 and 158, and that would be entirely consistent with what we have learned from the Military Way as to the comparatively brief duration of the First Period. When Croy Hill was re-occupied, the Principia was rebuilt, the Military Way repaired, and an extra Granary introduced in a somewhat unusual position. The Second Period lasted much longer than the First Period had done, long enough for the stones on the surface of the Military Way and elsewhere to be heavily worn by traffic, even long enough for a similar effect to be produced at the north end of the Granary after that part of the building had been in use for some time and then destroyed. We can hardly allow much less than a generation for all this to happen.

If we assume that the beginning of the second occupation coincided with the successful conclusion of the operations of Julius Verus, an appropriate occasion for its end lies ready to hand in the great war in Britain of which Dio writes. That struggle began some thirty years later or *circa* A.D. 181-184. History has nothing earlier to offer us, and it will be remembered that incised Samian ware, which is characteristic of the last quarter of the second century, was beginning to find its way to Croy Hill before the Second Period closed. This time the man who saved the situation for the Romans was Ulpus Marcellus, and it would therefore be he who was responsible for the rebuilding at the outset of the Third Period. It will not escape notice that the date so obtained for the second restoration fits in admirably with the setting up of a dedication to Jupiter Dolichenus in the Sacellum: it was under the last of the Antonine emperors that the cult of this Syrian Baal became popular in the Roman army.

The excavation did nothing to enlighten us as to the length of the third and concluding phase in the life-story of the fort. On other grounds, however, we are entitled to argue that the final occupation was very brief. Not a single coin later than the beginning of the reign of Commodus has ever been found along the line of the Vallum.