PART II.—DESCRIPTION OF THE PLANS. By MUNGO BUCHANAN, Corr. Mem. S.A. Scot.

It will be seen by reference to the accompanying plan (Plate I.) that the work consists of two parts. The fort itself occupies the higher site; the other part at a lower level is an annex, joining the former on the east.

The plan of the fort is an oblong, having its greater length from east to west.

It has been entirely surrounded by a strongly built stone wall, pierced in each side by a gateway of special construction.

The measurement taken between the inner faces of the opposite walls is from east to west 455 feet, and from north to south 350 feet, giving an enclosed area of fully $3\frac{1}{2}$ acres.

Outside the wall on the north it is defended by the fosse of the Antonine Vallum, and the other three sides, viz., the south, east, and west, are surrounded by two lines of trenches, which run parallel to the walls.

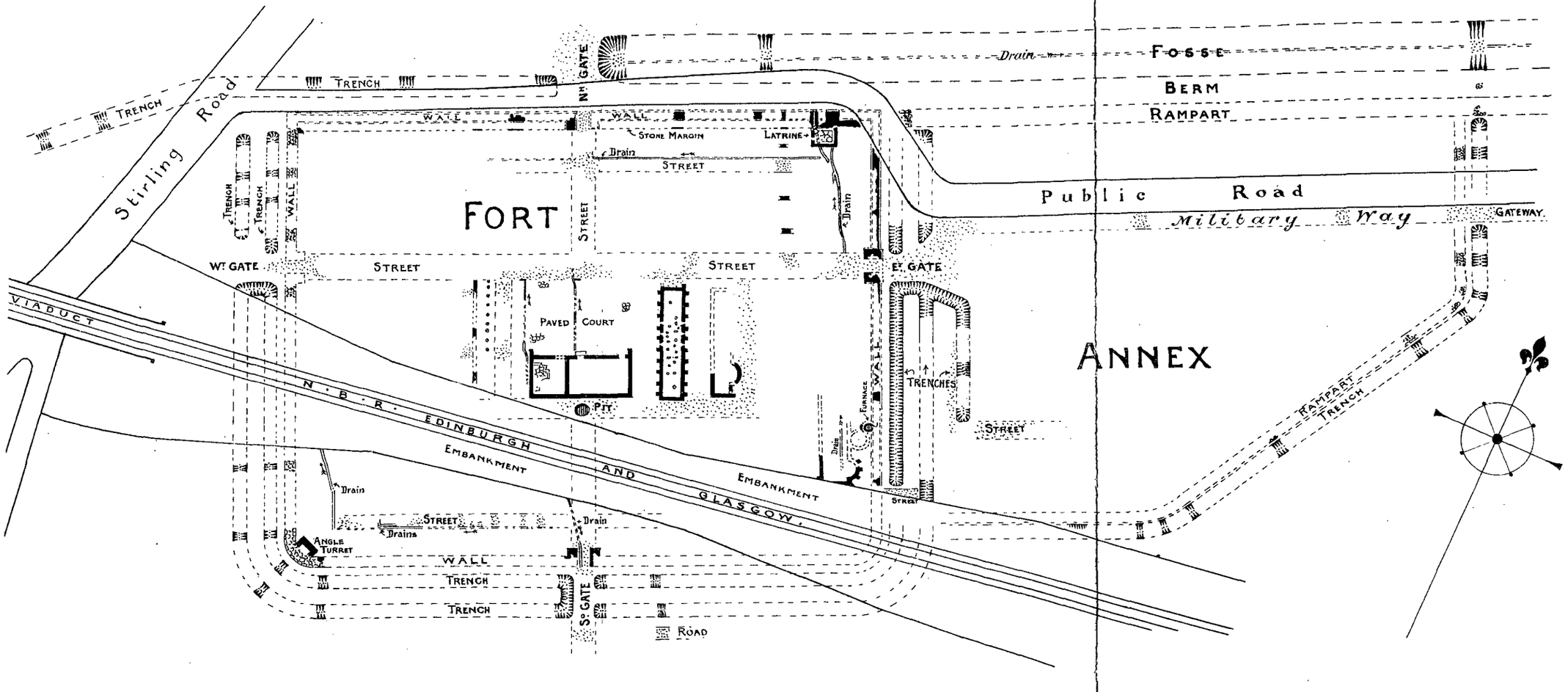
The plan of the annex is an irregular pentagon. On the west it is bounded by the east side of the fort, and on the north by the Antonine Vallum. On the other three free sides the defences consist of an earthen rampart and an accompanying trench.

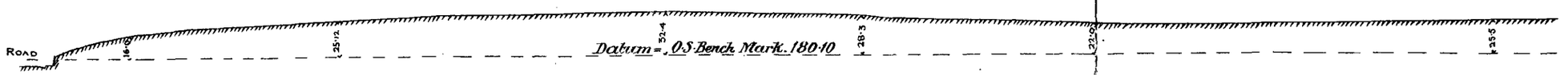
The south defences leave the fort at right angles to it and continue for a distance of over 200 feet in that direction, then quickly bending with a curve inwards form an angle with the previous portions of about 36°. Continuing at this inclination for about 300 feet farther, they meet and join with a rounded corner the defences of the east side.

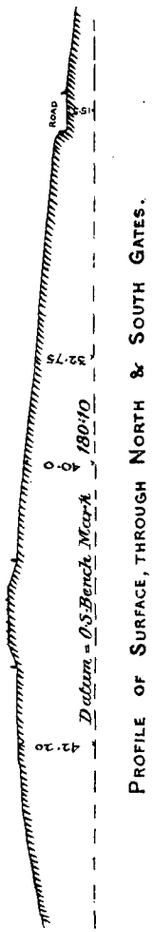
The defences on the east are 150 feet in length, their northern termination being the Antonine Vallum, and in the centre of the stretch is the gateway through which the military way passes.

The internal measurement, taken between walls, is from east to west 450 feet, from north to south where it is widest 310 feet, and where narrowest 150 feet, the area enclosed being fully $2\frac{3}{4}$ acres, which includes

PLAN OF THE ROMAN FORT ON THE ANTONINE VALLUM AT CASTLECARY, STIRLINGSHIRE. 1902







Geo Waterston & Sons, Lith, Edinburgh.

Mungo Buchanan. Del.
FALKIRK.

the trenches on the east of the fort. These latter take up about half an acre; so that the available area enclosed being reduced by that amount, makes the combined areas of fort and annex about 6 acres.

In the following description the various subjects are treated separately.

Antonine Vallum.

The Vallum (Plate I.) is the northern defence of both fort and annex.

The rampart in the vicinity of the fort is 14½ feet wide over the stone foundation. Of its superstructure nothing remains; it is all reduced to a uniform level with the surface of the field through which it has passed.

The berm is 21 feet in width, and the fosse is about 40 feet in width and 10 feet deep.

In all excavations of the fosse, the lower part for a depth of about 3 feet was found to be a mass of decomposed vegetable matter freely mixed with soil, presenting a dark peaty appearance, and of the consistency of stiff clay. Lying on this, there is a stone-built drain about a foot square internally, most of the stones used in its formation being similar in size and workmanship to those still to be seen in the buildings of the fort. It is constructed after the same manner as the large drains of the fort, the bottom and top being of flat narrow stones, the sides mostly square-dressed stones. On both sides of the drain, and overtopping it fully one foot, is a wedge-shaped pile of rough stones. They were, however, more or less separated and mixed with the soil, so that the whole did not remain in position when the adjoining soil was removed from the sides. The drain runs towards the east, the fall being the same as that of the bottom of the fosse, and its outlet may have discharged into the small burn 200 yards beyond the annex. (See Map, fig. 1.)

Hitherto it has been generally accepted that the fosse of the Vallum continues without variation in front of the forts on the line. But the portion of it under consideration proves to be a decided deviation from this system, by reason of the manner in which the fosse ends and changes its character at the north entrance.

No defence other than the Vallum has been adopted along the north front of the annex. The rampart of the Vallum has thus extended westwards until at a somewhat lower level it abutted against the wall of the fort at its north-east corner, both being in alignment, as evidenced by the remaining foundation. The berm and fosse are continued till they meet the roadway that passes out of the north gate. Here the berm joins the roadway by both surfaces coinciding; but as the roadway is carried farther north, and beyond the fosse, it has caused the termination of the latter at this position (Plate I.).

The fosse on the opposite side of the roadway is not continued in the normal manner, but instead, a trench, only 15 feet in width, set back a distance of about 27 feet from the outer edge of the fosse, and thus much closer to the wall of the fort, is carried along the remaining distance till it reaches the burn on the west. Shortly after passing the north-west corner of the fort it takes a bend southward, giving it an inclination up-stream. Of the rampart necessarily accompanying this trench where it extends beyond the fort, no remains exist, nor indeed were such to be expected, because of the altered surroundings.

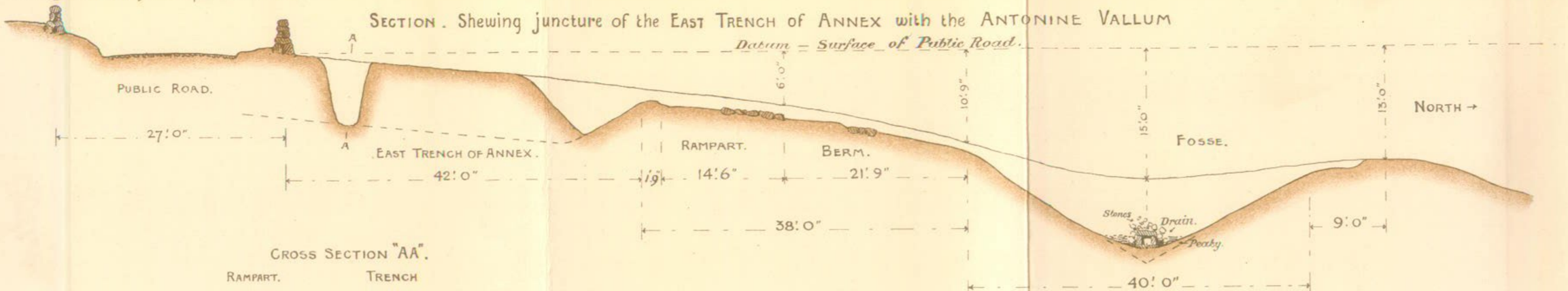
The alteration and setting back of the trench above described leaves a large open space in front of the gate, with a surface of hard compacted gravel, seldom more than 9 inches below the present surface of the ground. Only for a short distance under the line of roadway issuing from the gate were traces of a stone bottoming observed. The ground all around declines quickly to the valley, and a careful search failed to discover any indications of a traverse or defence to the entrance.

Walls of the Fort.

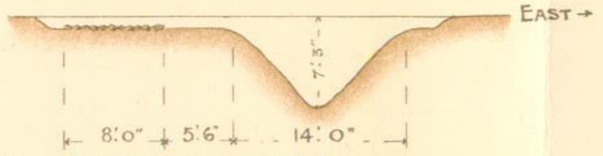
From the existing remains of the wall, which rarely rise above the first course, it would appear to have entirely surrounded the fort.

The lower part is a bottoming 9 feet wide, composed principally of boulders, averaging in size about 9 inches by 6 inches. These are placed close together, bedded with clay, and are sunk into the ground for at least 9 inches. The top is comparatively flat and coincides with the

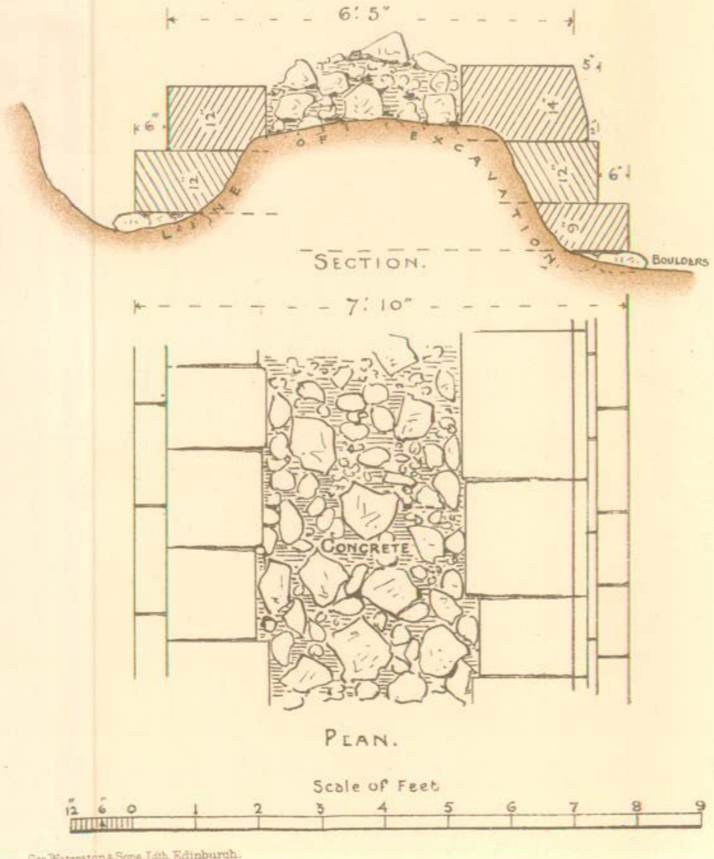
Section. Shewing juncture of the East Trench of Annex with the Antonine Vallum



Cross Section "AA".



Existing Portion of East Wall.



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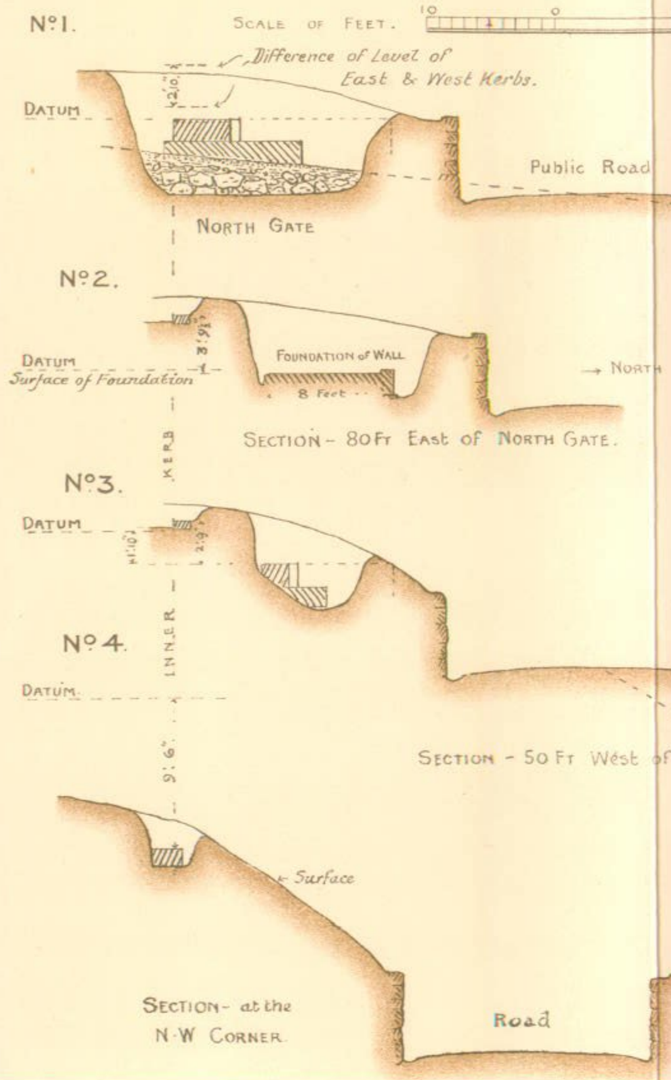
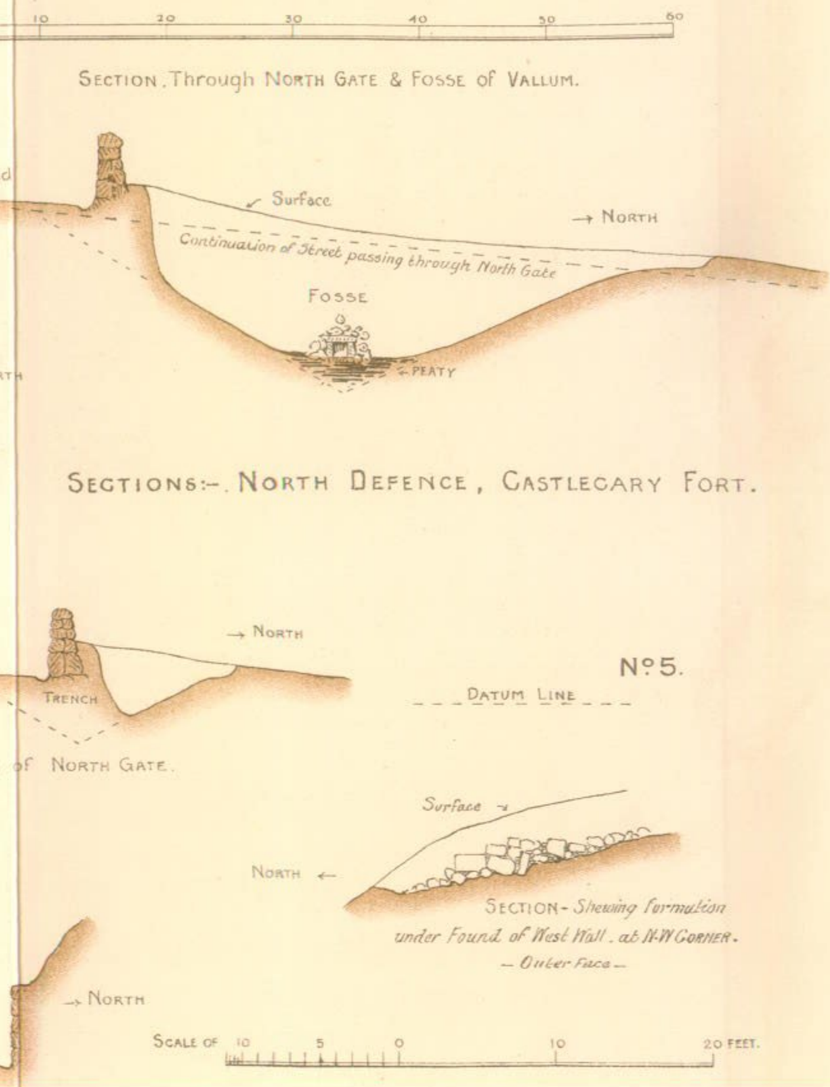




original surface level of the ground. Where the latter is of a sloping nature, the bottoming is made stepped—evidently for the purpose of avoiding excessive cutting—yet sufficient to maintain the footing level.

On top of the bottoming the foundation course of the wall proper is laid, in width 8 feet. The foundation course—particularly of the north wall—is composed of exceptionally large stones, a not uncommon size being 5 feet by 2 feet by 15 inches, calculated to be upwards of 15 cwts. in weight. On the outer face of this course, a margin 9 inches wide is formed along the whole front, by the surface of the inner stonework being recessed an inch below that of the margin. This recessed surface forms a channel into which the course above it is placed, and by this means the wall gains in stability, as the check at front acts as a preventive to its being forced outwards by possible pressure from behind. (See Section No. 2, Plate II.)

In the upper courses this has not been repeated, nor is it anywhere applied to the stonework of the inner face of the wall. Indeed, the system of a rebated course was only distinctly observed in connection with the north wall, where, by reason of the entire absence of the upper stonework, it was exposed to view on the removal of the overlying soil.

The lower course of stonework of the wall is built solid its whole width of 8 feet, but the upper courses are only a lining on the outer and inner faces, the interior being a solid block of concrete composed of sandstone chips and rough boulders of various sizes, all run together with lime. As the inner jointing of the stone facings is left wide, the lime would penetrate into them, and thus make the whole structure a solid mass. On the outer face, where the joints are much closer, the presence of lime could not be detected. (See existing portion of East Wall, Plate II.)

By reason of the outer and inner scarcements, and a bevelled plinth course at the front, the wall at the upspringing is reduced to a width of 6 feet 6 inches, and this apparently indicates the actual size of the wall proper in its upper structure, which it is conjectured may have

been vertical, for the reason that among the débris, where worked stones were plentiful, no stone was found with any indication of batter on it.

The base of the north wall has formed a revetment to the ground behind it, the sloping ground having been cut into to allow of the foundation being level throughout. There is a difference of 3 feet in height from the bottom of the foundation to the natural surface of the ground internally, beyond which the soil remains undisturbed and in its natural condition.

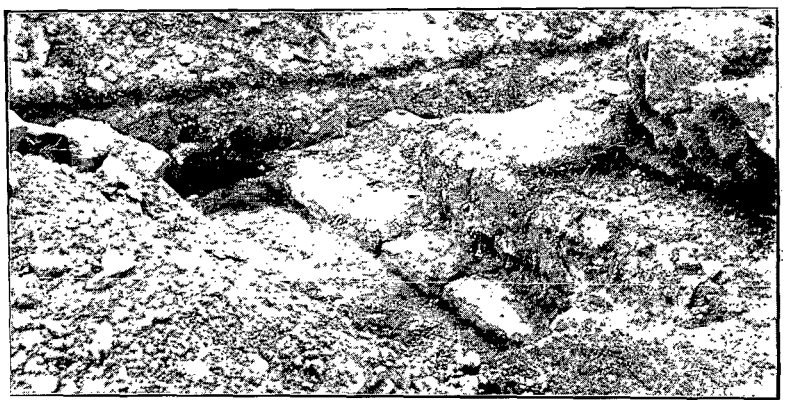


Fig. 6. Inner Stone Kerb; North Wall.

On this inner surface, fully 6 feet from the back of the wall, is a stone kerb running parallel with it. The stones which form it average 12 inches long by 6 inches deep (fig. 6).

The kerb, it will be observed, is over 14 feet from the outer edge of the foundation. As the outer stone margin of the Antonine rampart and the outer face of the fort wall are in alignment, and as the width of the rampart agrees with that of the wall of the fort, plus the space between it and the stone kerb, it follows that the latter is in alignment with the inner margin of the Antonine rampart, and the only difference is in level, the fort kerb being the higher by at least 3 feet where they most nearly approach each other at the junction of the annex.

The inner stone kerb was nowhere traced in connection with any part of the wall other than on the north, where it was conspicuous in several places. Had it been carried round the other sides of the fort, possibly some evidence of it might have been obtained at the corners, where both foundation and surface maintain their relative levels on the same plane for a short distance; but no remains at any of these positions supplied the least evidence that the wall on the south, east, or west had a stone kerb behind it similar to that on the north.

The north wall presents the appearance of having been stepped at intervals along its course. Particularly is this evident in the west half beyond the gate. (Sections Nos. 1 to 4, Plate II.)

The eastern half up to and including the gate is practically of one level, whereas a little to the west of the gate the foundation and also the inner stone kerb—still continuing horizontal—are found to be lowered 2 feet 10 inches, while between this and the extreme west end there is a difference of level of about 10 feet, suggesting the probability of more stepping at intervals, to obviate what would otherwise be undue elevation at the north-west corner if the top of the wall had been kept at a uniform level.

At both ends of the north wall the foundation shows evidence of special construction. This is most distinct at the east, the west end having only a small portion remaining. As previously stated, its normal width is 8 feet, but at both ends it is increased in width. At the east end for a length of 45 feet it is increased to fully 11 feet, and is composed of very massive stones. These may be observed in the foreground of fig. 7. There are a few of the second course of stones still in position—a remaining piece of the inner face of the wall.

The recessed check in the foundation course is here very distinct, its continuous appearance clearly indicating the purpose for which it was intended.

What may have been the nature of the corner erections for which these solid and enlarged foundations were evidently constructed, as

Fig. 7. Latrine, looking south. Foundation of North Wall in foreground.

distinct from what is known of the main structure of the wall, can only now be a matter of conjecture, for the almost entire clearance of the soil from the position allowed no further evidence regarding it, with the exception that the angle of the interior in the corner enclosed by the wall appears to have been a stone paved surface, 2 feet lower than the floor of the adjoining building, the latrine.

North Gate and Roadway.

Excavation along the north wall exposed the remains of a gateway piercing it, an arrangement apparently unsuspected by previous observers of the forts on the Antonine Vallum. The discovery of the gateway suggested a possible roadway across the fosse, which by continued search was fully made out, and will be described along with the gate.

From the evidence of existing remains, it is apparent that the gates are an original part of the wall structure, also that they have been constructed on a uniform plan. The similarity is so obvious, that what is wanting in one may be verified by reference to another. The description of one, therefore, is applicable to all, but each will be referred to separately in its order.

The north gate is placed exactly in the centre of the length of the wall, the two sides being formed by right-angled *returns* of the latter directed inwards, allowing a width of passage for a roadway of 10 feet.

The foundation courses of these *returns* are of the same width as the wall foundation, viz., 8 feet, and are 14 feet in length, measuring from the outer face of it, terminating exactly on the line of the stone kerb that runs parallel with the wall in the interior.

These inward projections of the wall at the gateway seem to signify the erection of a superstructure over the entrance, of which they alone are the remaining evidence.

Of the north gate, the only part preserved is the foundation of the west side of the *return*. On this the recessed check—so much in evidence—is still distinct, and the stones used are of the same massive kind common to the whole of the wall. The *return* on the east side is

entirely removed, but the space it had occupied is well defined, and its area corresponds with that of the neighbouring opposite side, while between them the roadway remains almost entire, showing distinctly the method employed in its formation.

The whole space of ground occupied by the gateway has been completely excavated to a uniform level. On this the foundation is laid, and rises to a height of 2 feet 9 inches, while the roadway at the same place is 1 foot 6 inches above the excavated level, and falls one in ten as it passes through the gate, maintaining the same inclination outside. Where it passes through the gate—because of the level excavation or platform—it has required making up to form its inclined surface. (See Section No. 1, Plate II.) Toward the inner side, where it is highest, there is an arrangement of large boulders and broken stones, averaging 18 inches across. These are followed, as the road descends, by others of a smaller size, and so diminishing till the surface level is reached. Above this there is a layer of sandstone chips, and over all a top dressing of mixed gravel, forming a hard and compact surface, where still remaining.

The West Wall.

Little now remains of the west wall; all stonework has been removed. A few remaining pieces of the bottoming alone enable the site to be distinguished from its surroundings.

The remains of the gateway showed that it had not occupied the central position of the wall, but that it agreed, and was in line with, the gate of the east wall.

A great part of the west defences are covered by the embankment of the railway, and what is left appears to have been subjected to considerable surface paring. There is still remaining a portion of the bottoming at the north-west corner, where it joins the north wall, which, from being on rising ground, and requiring some method to overcome an awkward position for building, may be worth describing. (See Section No. 5, Plate II.)

This portion of the west wall rises directly from the inner edge of

the expansion mentioned as part of the north wall at the corner, and forms a continuation with the bottoming of the latter. The inclination of the angle made in rising is greater than that of the present surface.

To overcome the natural tendency to displacement of the stonework on such a steep incline, several of the stones at the bottom are placed vertically like pillars, and sunk well into the ground, the parts protruding acting as revetments to the stonework placed behind them. Others, again, dip slightly below the horizontal in the direction of the rise, so that pressure upon them would have the tendency to fix them more firmly into the ground. The result is that this portion of the foundation still remains, when not a stone of the wall built upon it is left.

The bottoming of the west wall was traced on both sides of the railway, but it is very indefinite till it approaches the south-west corner of the fort. Here the indications are more distinct, showing the sweep it takes in making the curve to join with the south wall.

The foundation of part of a corner tower is well preserved inside the line of the wall, but the other portion, which evidently has been built on the wall, is completely gone, with the superstructure of the wall itself.

The South Wall.

The south wall, like that on the west, has been almost entirely destroyed. The only portion now remaining is in connection with the south gate, where the evidence consists of a few remains of stonework, in their relative positions to the *returns* on both sides of the entrance (fig. 8).

The gate is exactly in the centre of the length of the wall, being directly in line with, and opposite the corresponding gate in the north wall, with which it agrees in all measurements, and distinctly shows the same method of construction. Strong wings on each side project inwards, enclosing an entrance way, steep and sloping outwardly, in the same manner as that of the north road.

Fig. 8. South Gateway, looking west. East *return* in foreground. Roadway on left, with west *return* at top corner.

A drain about 12 inches square covered with flagstones passes through the gateway, but only a short length of it remains. Small drains about 7 inches square, in the interior of the fort, have their inclination to it, apparently joining before passing through the gateway.

The East Wall.

On the east the wall is now found in the best preservation. A part of it at the north-east corner still exists, which clearly shows all its characteristics—fully described under North Wall. The bottoming, foundation course, and part of an upper course remain *in situ*, and the foundation continues unimpaired as far as the south side of the gate, beyond which it is nearly all removed (fig. 9).

The east gate above its foundation is much destroyed, yet sufficient remained to enable its plan to be clearly made out. The position of the gate—on the outer face—is further distinguished by the foundation course being projected 6 inches beyond the normal line, for a distance on each side of the entrance equal to the width of the returns enclosing it. At none of the other gates was this arrangement traced, because the foundations of the corresponding parts were found to be totally dispersed.

The east gate also has a sloping roadway into the annex, similar to what is so distinct a feature of the north and south gates. The formation of the roadway through the gate being identical with that of the north entrance, all the wall southwards of the gate has been entirely removed: even the bottoming has been quarried to some extent, for the stones still remaining give indication of much disturbance, and large blanks occur in several places. Many of these stones, along with squared stones like those of the upper structure, were found near the bottom in the adjoining trench when it was explored.

At 120 feet south of the gateway there is a small oval chamber built in the wall, which, from its evident connection with an adjoining building, will better be described along with the interior buildings.

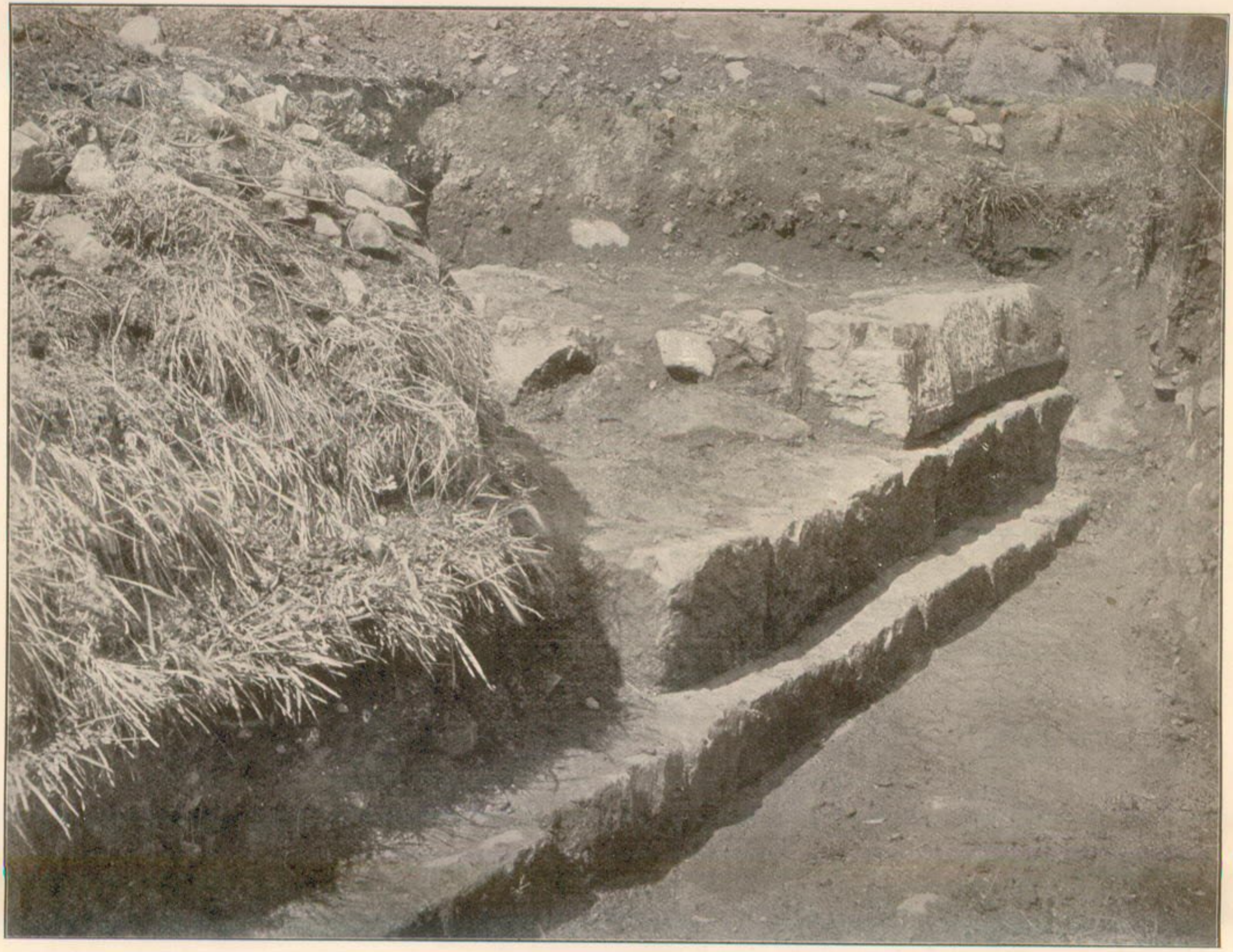


Fig. 9. East Wall, looking north-west.

Trenches of the Fort.

The trenches surrounding the fort wall—other than the north front—are two in number, with an intervening flat-topped mound of the natural soil, 10 feet wide (Plate III.). The soil in which they are cut is boulder clay, and they have been filled up with similar material, but considerably more free in its nature, which enabled the outline of the trenches to be distinguished, by the difference between it and the soil remaining in a natural condition, although correct definition of form in all cases was not obtainable. The berm is 5 feet wide from the outer edge of the bottoming of the wall, and the complete measurement of the defences is 52 feet, from the inner edge of the foundation to the outer edge of the furthest out trench.

Along the west side of the fort the surface presents the appearance of having been greatly disturbed, and probably reduced in height, for, besides the sparse remains of wall foundation, what exists of the trenches are but narrow and shallow depressions, from 3 to 4 feet in depth.

The west trenches begin on the north, exactly on the inner side of the Antonine rampart, where it is extended from the fort westwards. The ends are not connected, but terminate free at this position. As they approach the vicinity of the probable position of the west gate, which is wholly removed, the outer trench stops at 20 feet short of it, while the inner is continued till it reaches the normal position of the gate. The evidence is completed by the reappearance of the trenches further south, the width between being the same as that indicated by the erection of the east gate, with which it is in direct line.

The ends of the trenches on the south side of the west entrance are not free as those on the north side are. They are joined together by a short trench, returned at right angles, and running parallel with the line of roadway, whereby the one is continued into the other unimpeded.

In the cuttings south of the railway the trenches are of their full proportions, which they maintain, and in a uniform manner sweep

round the south-west corner, continuing eastward with the same regularity to the south gate. Here they are connected by a short trench parallel with the roadway issuing from the gate, as in the previous instance. Beginning again on the opposite side of the roadway with the ends free, they continue eastward, but the greater part of this extension is now buried under the embankment of the railway.

As the south-west corner was so well defined, and found to be rounded, it is most likely the south-east corner was treated in the same manner, but for the reason stated above this could not be verified.

On the east the trenches continue in the same uniform manner. There is, however, an extra trench introduced — additional to the ordinary number—which extends from the south side of the east gateway for 100 feet in direction parallel with the others, and of the same width, 14 feet. It terminates on the south against the margin of a paved road crossing in an opposite direction.

Where these three trenches approach the gateway, they are joined to each other by means of a connecting trench, which is parallel with the road issuing from the gate for the inner half of its length, the remaining portion bending southwards to join the outer trench enlarges the area in front of the gate.

The continuation of the east trenches to the north of the gate is arranged in a manner similar to those on the west defence. Both ends are free, and the inner trench comes close up to the roadway, while the outer is kept back 10 feet, which, in conjunction with the angled trench on the opposite side of the road, forms a wide open entrance in front of the east gate. Search was made to find if there had been a traverse at this position, but without result.

It was not possible to obtain complete evidence to correctly define the northern termination of these trenches, as the public road cuts through them, almost obliterating any indications. But from what was still reliable, it is certain that they did not extend beyond the inner margin of the Antonine rampart.

There are several features about these east trenches, not observed in

connection with any of the others, that may be mentioned here. The whole of the inner trench was explored, and from it was collected a lot of the usual Roman ware, also fragments of foot-gear. But what was particularly noticeable was the large quantity of squared stones among the soil, apparently thrown in along with it. Among them was found one with X X incised. The majority of the stones had undoubtedly formed part of the adjacent wall, from their resemblance to

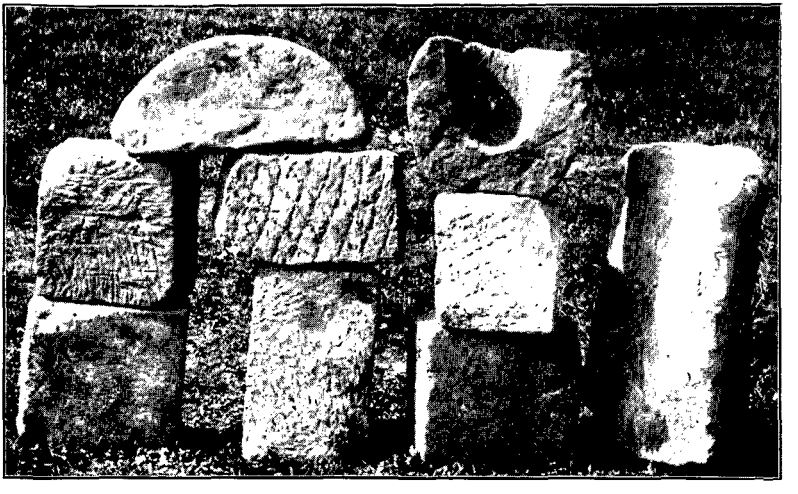


Fig. 10. Stones found in the East Trenches.

existing specimens still in position. They vary in size from 12 to 18 inches, the general average being a cube of 15 inches. Many similar are common in the field dykes of the neighbourhood. (See fig. 10.)

There is a marked contrast to the above in the explored cuttings of the outer trench. Through it several cuttings were made, the excavations being accomplished with difficulty, owing to the hardness of the ground and the quantity of stones hard-pressed into it, especially near the surface. These, however, were principally natural boulders from 6 inches to 9 inches in size. They were met with at 18 inches below

the surface, in the form of a paved road, which, besides being laid over the trench, continued in a regular manner over part of the mound on its inner margin. In the trench itself below the paved work were many of these stones in heaps together. (See fig. 11.) The evidence supports the supposition of this being a roadway, from its presence in each cutting, and it is as evident that the trench over which it is carried had been previously formed.

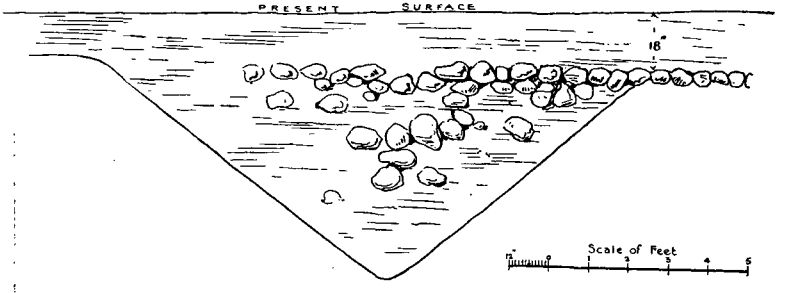


Fig. 11. Section of Eastmost Trench of Fort, with subsequent road formation.

Rampart and Trench of the Annex.

The Antonine Vallum protected the whole north front of the annex; the defences surrounding all the other sides were evidently like each other and consisted of a rampart and trench.

Of the rampart there is no appearance above ground, but excavations exposed a stone foundation 8 feet wide following closely the line of the inner edge of the trenches.

The margins of this foundation were formed of squared stones set regularly and close together, the interval being made up with rough rubble and boulders, somewhat similar to the base of the Antonine rampart. As it appeared the same in all the cuttings, nowhere showing any indications of a built superstructure, it is probable this defence may have been constructed after the manner of the rampart aforesaid.

There is no berm on the south face. The margin stones of the rampart

are within a foot of the edge of the trench, but on the east face the berm is very distinct and is $5\frac{1}{2}$ feet wide.

A void, or blank, occurs in this foundation exactly on the line of the military way, which no doubt indicates the position of the gateway. And as this appears close upon the public road, farther search had to be made in the field on the north side, where the defences were again exposed, continuing their course to join with the Antonine rampart, here very much disturbed.

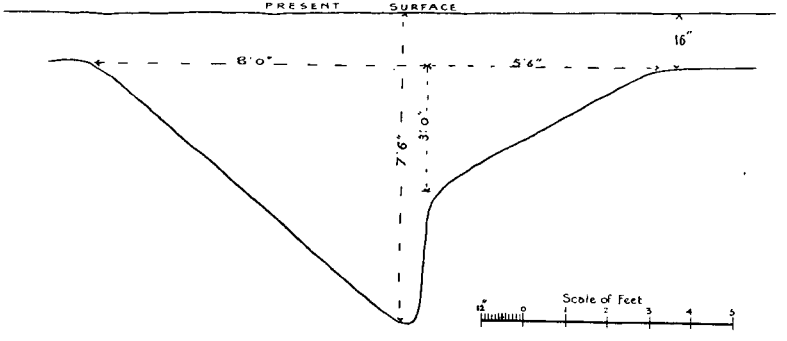


Fig. 12. Section of East Trench of Annex, south of the gate.

The trench of the annex is 14 feet wide and about 7 feet deep. In the general cuttings it is V-shaped, similar to those of the fort; but close to the gate, on the south side of it, the form is of a character not observed anywhere else.

The counterscarp was of the usual slope, but the scarp rose abruptly from the bottom, with very little inclination beyond the vertical for a height of over 3 feet, and thereafter sloped at an acute angle for a length of 5 feet (fig. 12). Farther south along the trench this formation, while still evident, was less marked by the sharp corner being rounded off where the acute angle leaves the vertical, and it had disappeared altogether at the turn of the trench to the west.

The line of trench is continuous all round the annex, from where it

is found at the railway embankment, till it reaches the gateway. Here it stopped against the roadway at the entrance, again being traced in the field north of the public road, where it continued till it approached the Antonine rampart. It ended close to the stone margin of the rampart. (See the Section on Plate II.)

Buildings within the Fort.

Judging by the appearance of remaining portions of buildings within the fort, there is evidence of workmanship of two distinct types, if not of two periods. One is represented by a building constructed with neat little stones, almost like modern bricks, seldom larger than 9 inches long by 6 inches deep and broad, nicely squared and even ornamented on the exposed face with reticulated lines—each stone being equal in height and so carefully set that the joint between even the lower courses is an unbroken horizontal line; the other by a building occupying a prominent position, the stones of which were irregular in size, being $10 \times 8 \times 7$ inches and $12 \times 7 \times 9$ inches, to as much as $12 \times 12 \times 12$ inches, all hammer-dressed and squared, but without any evidence of tooling on the face, the introduction of the unequal-sized stones interrupting the horizontal continuity of the joint of the courses. The whole work, although more massive, presents a coarser appearance than that previously described.

The centre of the fort is occupied by several buildings, all in direct line where they face the south. The central building is placed with its greatest length from east to west, and is flanked at both ends by others lying north and south (fig. 13). As the latter buildings are projected beyond the north face of the former, a space in front of it is thereby enclosed having the appearance of a courtyard open to the main thoroughfare, in which there was exposed in several places remains of flagstone paving.

The central building consists of two chambers, and is 85 feet 6 inches long, and 34 feet wide over all. The chamber on the east is 50 feet long and 29 feet wide, and has two doors in the north wall each 6 feet

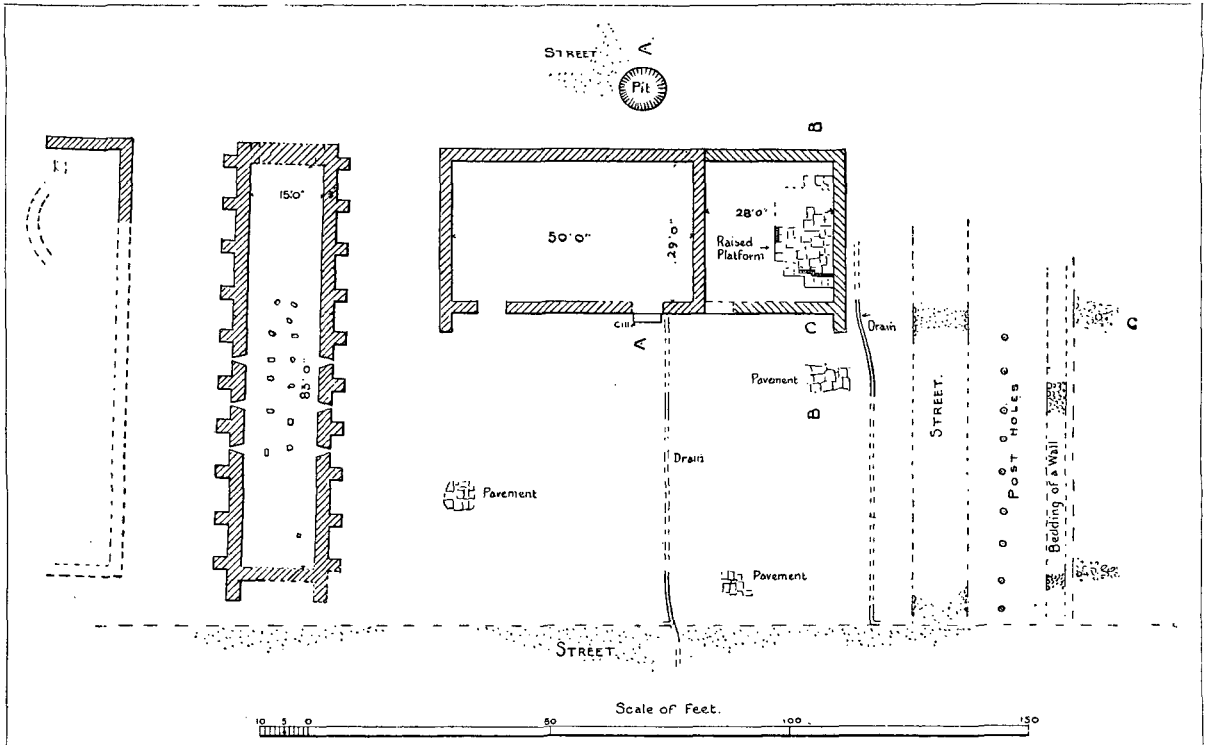


Fig. 13. Plan of Central Buildings.

wide. The adjoining chamber on the west is 28 feet long and 29 feet wide internally, and all the walls have a uniform breadth of 30 inches.

There are indications that the west chamber is a subsequent addition to the larger chamber on the east of it. Where the walls of the former meet those of the latter they are not bonded together, the junction being simply a butt joint. Likewise the courses of the stonework are not on the same plane, and are of a much coarser description. This is specially noticeable at their junction on the north front.

Fig. 14. Stone Sill on north front of Central Building.

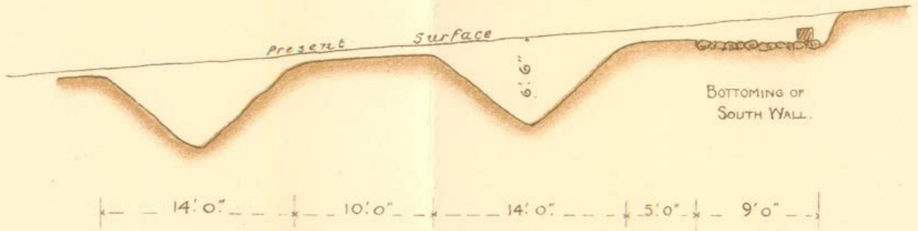
The walling of the east building is finely squared and tooled on the face, and one stone still stands which presents a polished surface. The stone sill of the centre doorway bears evidence of having been some time in use (fig. 14).

The walling of the west is only hammer-dressed and roughly squared, the contrast being very striking where the two abruptly meet.

Both end walls of this building finish with a buttress projecting 4 feet beyond the face of the north wall.

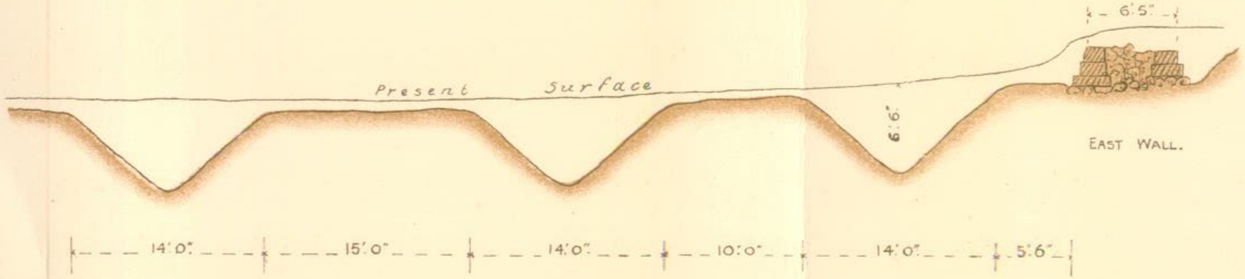
In connection with the site of this building there has been very special preparation.

SECTIONS OF THE FORT DEFENCES.



TRENCHES ON THE SOUTH.

INTERIOR

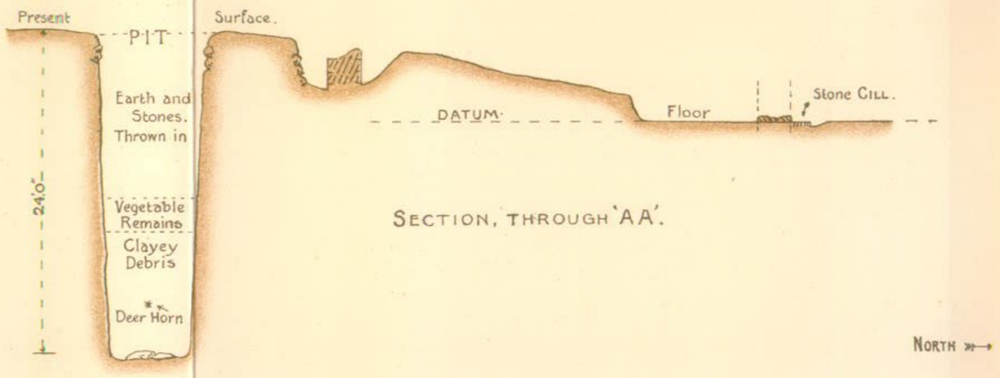


TRENCHES ON THE EAST.

Scale of 10 5 0 10 20 30 40 50 Feet.

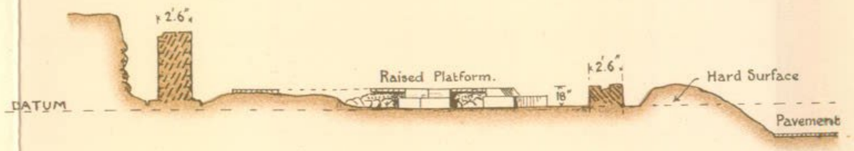
Geo. Waterston & Sons, Lith, Edinburgh.

SECTIONS:- CENTRAL BUILDINGS OF THE FORT.

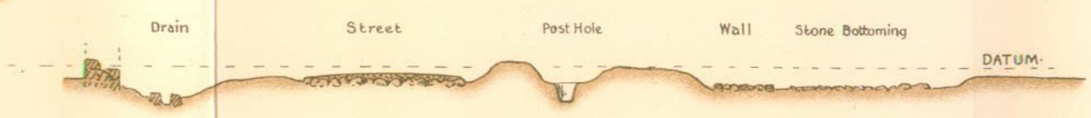


SECTION, THROUGH 'AA'.

NORTH



SECTION, THROUGH 'BB'.



SECTION, THROUGH 'CC'.

Scale of 10 5 0 10 20 30 40 Feet

The ground rapidly slopes to the north in the vicinity; and as the foundations are practically level throughout, extensive excavation has been necessary, but it is noticeable that the excavation is limited to the position occupied by the building (Section A A, Plate III.).

Beginning slightly in front of the north wall of the central building, the ground has been excavated level over the whole site, stopping at 2 feet beyond the south wall, where it reaches a depth of 5 feet from the surface. A 2-feet space that intervenes between wall and cutting has been utilised as a dry area, by the face of the cutting being lined with rough stonework to retain the soil in position, and allowing a free water-course in the bottom, which falling towards the west connects with a drain outside the west wall of the building.

The surface of the eastmost chamber was of the solid nature common in the fort, and level with the stone sill of the west door. There has been great disturbance in this interior, so that it is very probable that what exists is not the original floor, particularly as evidence of flagstone paving is found both in the adjoining chamber and in the courtyard.

In the west chamber there is a raised platform, a foot above the floor level, occupying all of one side and projected well into the apartment. It starts square off the west wall, and the corners are formed by re-curring square *returns* (fig. 13). The platform rises from the floor with a square kerb, above which it is formed into a bevelled plinth course, the surface continuing from the top of this with large pavement flagstones about 2 inches thick laid on a bed of stones and clay (Section B B, Plate III.).

Besides the dry area, this building has been well supplied with drains, as two were opened in close connection. One, as already stated, runs close to the west wall; the other begins at the central door; and both are continued down to the principal street.

The walls, 2 feet 6 inches wide, are laid on a stone foundation which projects 6 inches beyond it on either side, and rests upon the usual boulder and clay bottoming. The clay still remains intact even up into

the first course of walling, but no evidence of lime appears in the upper structure (fig. 15).

The south wall of the building is preserved for a height of 5 feet, and there is no bonding course in it. The system of building adopted is that of an outer and inner casing of squared stone, the centre being filled up with sandstone chips and boulders, after the manner of the

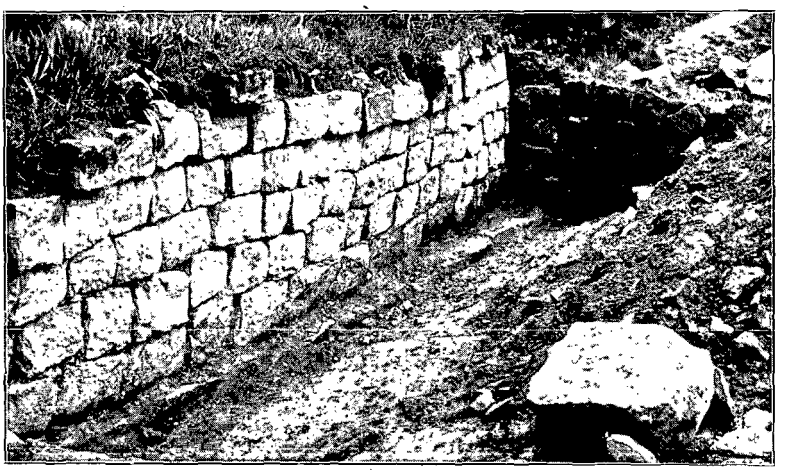


Fig. 15. Inner Face of South Wall, Central Buildings.

fort wall; but all evidence of lime has disappeared through its long burial in the ground.

On the east of the central block of buildings, separated by a street 21 feet wide, is a strongly buttressed building, all one chamber (figs. 16, 17), 83 feet long and 15 feet wide within the walls. The latter are 3 feet broad, and stand at an average height of 3 feet above the inside floor. Twenty buttresses, each $2\frac{1}{2}$ feet square, project from the east and west walls, ten on each side, placed opposite one another. (See the ground plan, fig. 13, and Plate I.)

One buttress on the face of the east wall is built between two large

Fig. 16. Buttressed Building, looking north.

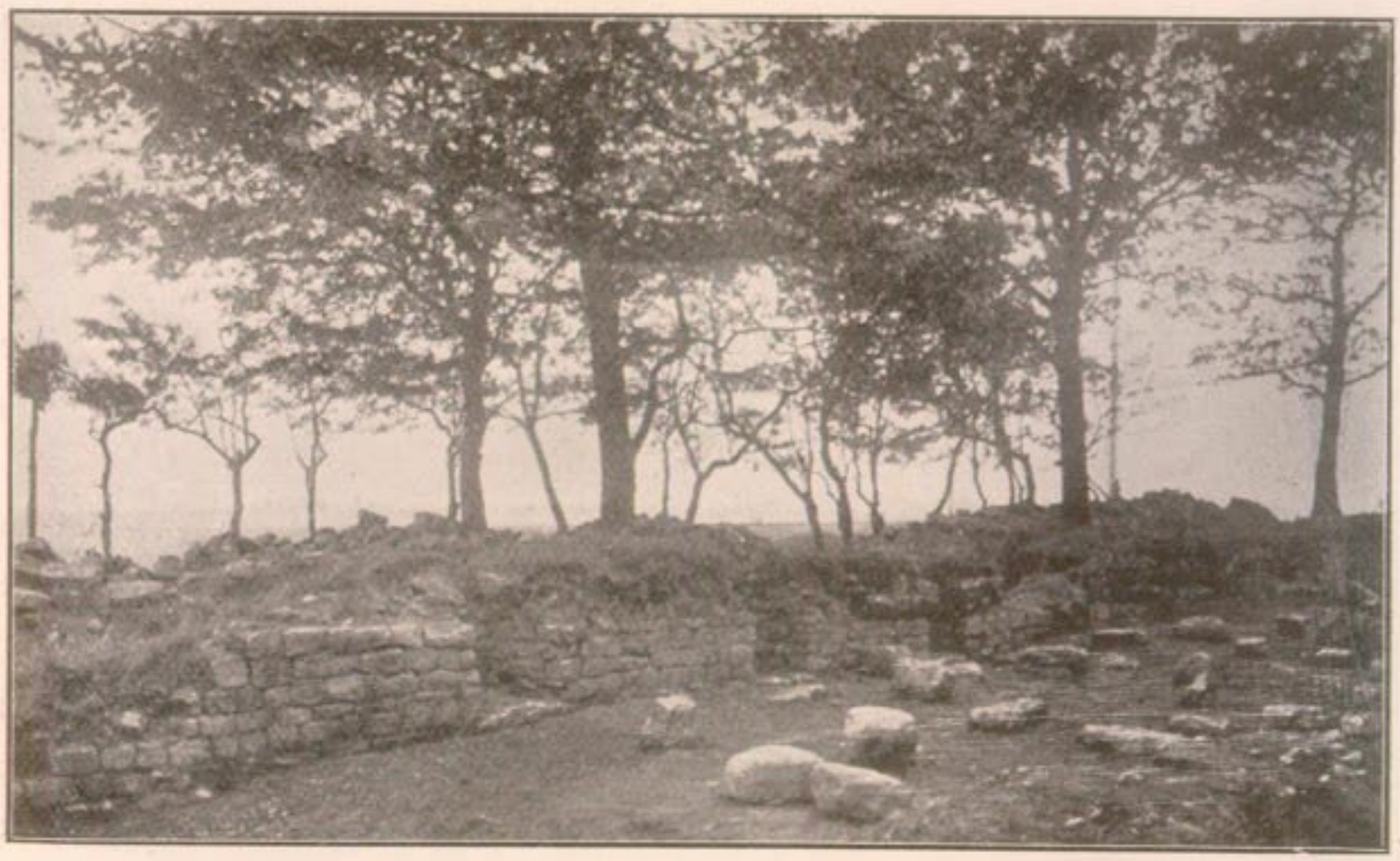


Fig. 17. Interior of Buttressed Building, looking south-east.

boulders, which have been allowed to remain *in situ*. But it appears that the space had proved barely sufficient for it, as the boulders have been slightly chipped to gain the requisite width (fig. 18).

Between the third, fourth, fifth, and sixth buttresses from the north, and about the centre of the building, are three window-like openings in the east and west walls, directly facing one another. They are splayed from an opening of 6 inches on the outside to 30 inches on the inside of the wall, and the sole of each is level with the floor of the interior.

Fig. 18. Outer Face of the East Wall of Buttressed Building, showing buttress built between two large boulders.

They are open for the entire height of the existing wall, about three feet, and when first exposed appeared purposely closed up with stones, but in a very temporary manner (figs. 19 and 20).

As distinct from the central building, this is built on the natural sloping ground, with but a slight levelling in a series of steps for the foundation.

Generally the courses of stonework are horizontal, but in several instances they are depressed below it and follow the slope of the ground. The side walls have evidently terminated with buttresses on the north, as there are the remains of one to the east wall at this

Fig. 19. Interior of Buttressed Building, showing opening in wall. West side.

position. But as regards the opposite wall it has been so destroyed as not to be distinguishable.

Many stones were found lying on the surface of the floor, principally in the rising portion, mostly large boulders 1 foot to 18 inches in size. Several of them on examination were found to be firmly bedded in the

Fig. 20. Interior of Buttressed Building, showing opening in wall. East side.

floor with clay, and having the appearance of being purposely laid in two distinct rows.

Only those which were fixed are indicated on the Plan, fig. 13. It is possible those lying about and free had been set on top of the others. A single instance of this was actually observed. Several of these stones appeared to have been subjected to fire, and on various parts of the flooring clay was discovered which was burnt red as if by the same influence. But perhaps there may be other reasons to account for these

appearances than that of fire, for the evidence obtained was not conclusive.

With reference to the above, it may be stated that on the outside of the east wall, on the original surface of the ground, there occurs a layer of coal dross 1 inch thick stretching along the south half of the building. Near its north end is an additional layer of the same material, $1\frac{1}{2}$ inches thick, above the former, and separated from it by a 4-inch layer of soil.

In a corner formed by a buttress and the wall where the coal dross lay thickest, both the wall and buttress bore distinct evidence of the effects of fire for a height of 18 inches above the foundation. This, however, had no connection in any manner with the interior. The coal dross was very small—none of it exceeded an inch cube; and the depth under the present surface at which the higher layer of dross appeared was not more than 18 inches.

There is evidence of a subsequent alteration of the south wall of this building, both externally and internally. It appears that a wide doorway originally had existed in this end wall, with buttresses on each side of it, prolongations of the side walls. This door and the entire front have been built up flush with the face of the buttresses, increasing the width of wall to about 5 feet (fig. 21).

The method of building is similar to that of the walls proper. There is a lining of squared stones on both faces, and the interval is filled with apparent concrete, which now is only a mass of sandstone chips and other unworked stones—all evidence of lime being gone.

Considering that the method of building is the same as the rest of the building, and that the alteration indicates deliberate intention, there is no reason to suppose it other than Roman work, found necessary after a short interval of time had elapsed.

Running parallel with the above at a distance of 21 feet are the remains of another building exactly the same in length, and apparently the same in width; all that now exists is a few feet of its south wall. After tracing out the foundations, it proved to be a long one-chambered

building similar to the last, without buttresses, but with a large apse at the south end of the east wall. The original surface all round about it was hard-pressed gravel, evidently roadways. Every stone of this great building has been removed except the short piece of the south wall, the bottoming only marking its site.

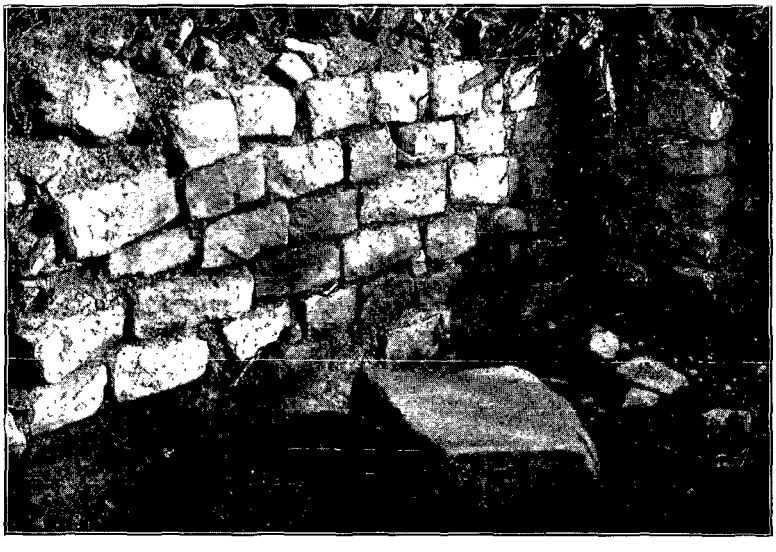


Fig. 21. South-east Corner, interior of Buttressed Building, showing Doorway built up.

Situated near the south-east corner of the fort are the remains of the finest piece of building work exposed by our excavations, and these lie close to the present surface (fig. 22).

Its excellence consists in the neatness of the work, its exact geometrical lines, and the regularity of the stone courses. Although the latter are the very lowest, and likely to have been covered up, they have a finished appearance. The common size of stones used is about 9 inches by 6 inches.

Fig. 22. Apse of Building near south-east corner of Fort.

This building is no doubt the same as that of which General Roy gives a plan entitled "Plan of a Roman House with a warm bath belonging to it, in the east angle of the station of Castlecary," which has been reproduced at p. 281, *ante*. At any rate, no other building of such a size could occupy that position, and the resemblance is almost perfect as regards the single apse chamber, which is the only part now remaining that could be examined. There is no door in the south division wall

Fig. 23. Oval Building in East Wall, looking west.

as shown by Roy, but this may be accounted for by reason of the existing remains being lower than the door-sill. The buttress on the west wall is still very distinct.

The wall on the west is 3 feet broad, while that of the east and apse is only $2\frac{1}{2}$ feet. Indications of the foundation of the round chamber on Roy's plan can be traced, but it is very imperfect, being nearly all destroyed. This same chamber must have been very close to the fort wall. Indeed, if the 14 feet width of wall had been carried along the

east as it was along the north front, the circular chamber would only have cleared it.

Closely adjoining and lower by $3\frac{1}{2}$ feet is a small oval building, like a furnace (fig. 23). Internally it is 6 feet by 3 feet 9 inches on the flagstone floor. It is not on Roy's plan. The walls stand 2 feet high in four courses, and have a batter of $4\frac{1}{2}$ inches in that height. A short length of a flue 14 inches wide runs round part of the west end, in the direction of the circular chamber above mentioned. The flagstone paving is bedded on clay, and when exposed showed indications of the effect of fire, and the soil in the flue was highly charged with soot.

Fig. 24. South-west Corner Tower.

On the east side of it the walls are built in the form of a mouth, or opening, and at the same position the flooring is raised 6 inches, at which level it is continued outward to the face of the fort wall, a distance of $4\frac{1}{2}$ feet. Therefore this oven or furnace is largely built into the body of the wall, and on the inside projects beyond it a little.

At the south-west corner of the fort—the only one of the south defences that it was possible to examine—are the remains of a 15 feet square building (fig. 24), placed diagonally to the south and west walls of the fort. Two courses of the stonework remain of the unusual width of 4 feet, being the internal part. The outer portion of the structure is all gone, perhaps removed along with the wall of which

possibly it had formed part, as the wide foundation of large stones would seem to indicate a strong building of more than usual height.

A little to the east of this building, on the inner edge of the south fort wall, lies the only remaining stone of this defence, except those at the south gate. The depredation is so complete that even it is found to be displaced.

Situated about 30 feet from the inner face of the east wall, and abutting against the north wall, is the remains of a building 16 feet by 12 feet internally, with walls 2 feet broad (Plate IV.). An entrance door 2½ feet wide is formed in the centre of its west wall, and the interior is paved with large flagstones. The north and south edges of the paving have each a square-cut recess 2 inches deep by 7 inches long, evidently prepared for receiving standards. An open channel 1½ feet wide and 2 feet deep runs round three of the sides, and passes underneath the paving on the remaining side, which is that of the entrance. This building (fig. 25) is not truly parallel with the fort wall. In its width it is fully a foot more at the west end than it is at the east end, and the stonework of the walls is very coarse. The level of the door cill is 21 inches above the inner stone margin of the fort wall, and fully 4 feet higher than the wall foundation. Near the west wall of this building begins the expansion of the fort wall from 8 feet to the increased width of 11 feet, which is maintained till its junction with the east wall.

The usual heavy stones of the second course along the inner face of the fort wall are replaced, opposite the space covered by the building, by smaller stones. None are larger than a foot square, and these form the whole northern face of the channel and north wall of the building. In this channel, when exposed, were flagstones placed V-shape, close together at the bottom and wide at top, lying against the sides of the channel. They occurred in nearly the whole length of this channel, but were not found in any other position.

Outside the east end of the building, *i.e.*, in the corner where the east and north walls of the fort meet, on a level with the foundation, is a layer 9 inches deep of sandstone chips mixed with sand. Lying immedi-

Fig. 25. Latrine, looking south-east.

ately on the top of this is a layer 1 inch thick of coal dross similar to that observed at the buttressed building. The remainder of the filling in is of the ordinary soil.

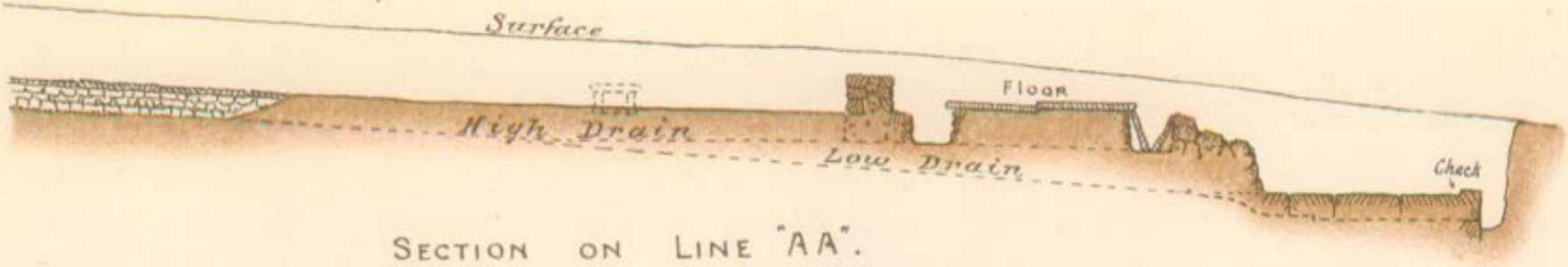
Drains.

Approaching the latrine from the south is a stone-built drain fully 1 foot square covered with large flat stones, which before reaching the south wall of the building separates into two branches and enters it at opposite corners (Plate IV.).

The main drain starts from the north side of the centre street of the fort, appearing to have had connection with a drain along the edge of the street. On leaving the latter it is carried northward till within 30 feet of the building, where it changes its course, inclining more to the west. This inclination leads it in the direction of the west end of the building. The fall is very rapid, so that it passes completely under the foundations. Emerging on the opposite side, it joins the conduit formed in the wall of the fort, and by the direct manner of the connection it is evident both drain and conduit belong to the same original system.

The conduit (fig. 26) is formed in the foundation of the north wall of the fort, and is 2 feet wide and 14 inches deep. The bottom is of solid blocks of stone. The sides are formed by the edges of the foundation-stones, and all upper stonework is removed. In the bottom are three indentations each about 1 foot across; one of them is a square set diagonally. The others are irregular in figure, but all are recessed about $\frac{3}{4}$-inch into the stonework. They are evidently intended for inserting pillars, possibly to obstruct entrance to the fort by this wide outlet.

The drain leading to the conduit is well constructed of squared stones and covered with large flagstones closely laid, and, as already stated, appears to have been the original drain conducted through the wall. But a part of it seems subsequently to have been disconnected, for at 12 feet south of the building a branch from it has been made to come into the building at the south-east corner, at a higher level by fully a



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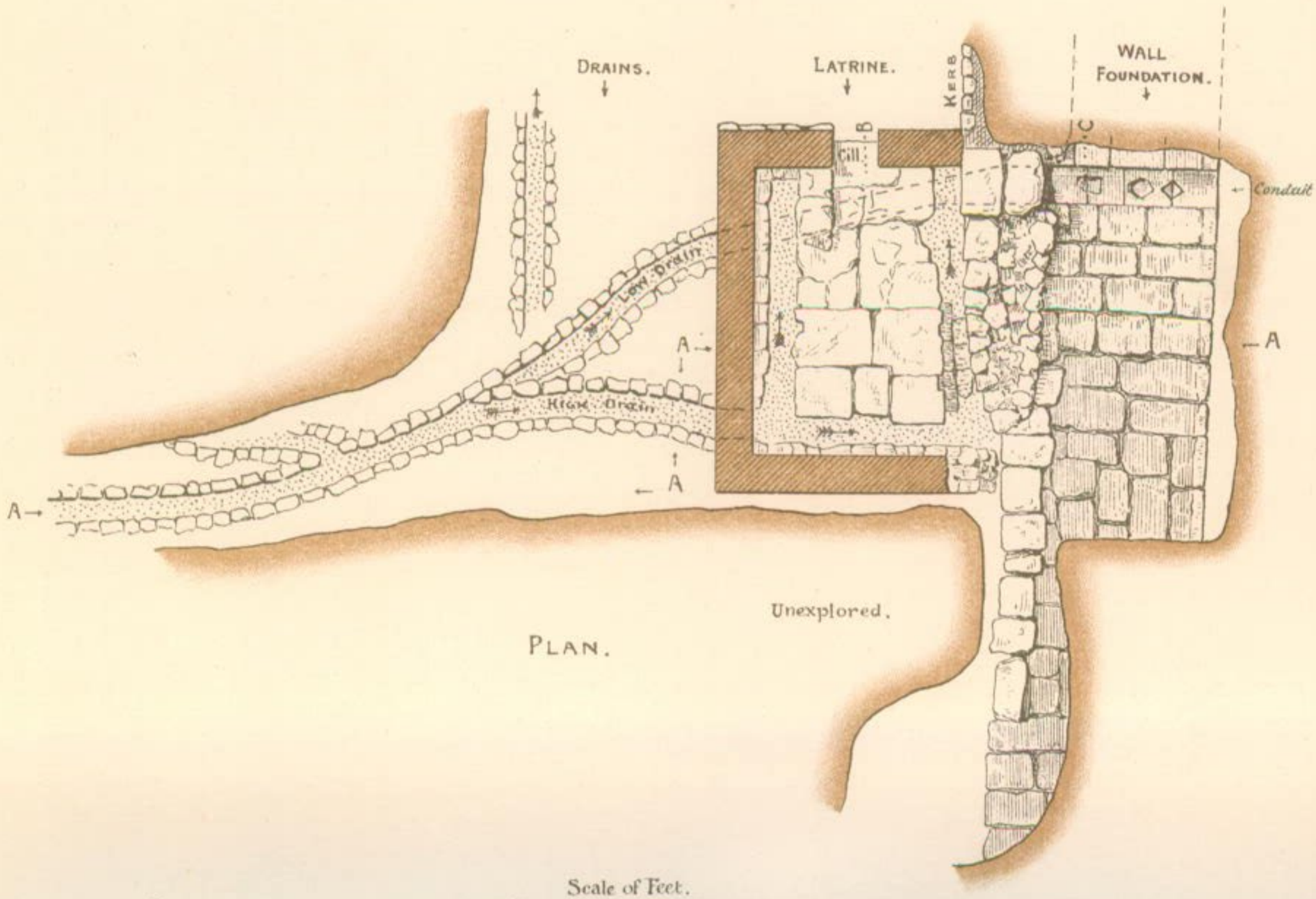

PLAN.

Scale of Feet.

10 0 10 20 30 40 50

Geo. Waterston & Sons, Lith, Edinburgh.

LATRINE, & ADJOINING FOUNDATION OF NORTH WALL.

Fig. 26. Conduit through north wall.

foot than the other. Where the branch-off is effected the connection with the other drain is built up, and the stones interposing are arranged as part of the new branch.

Whether this is a modern arrangement or not, unfortunately cannot now be ascertained; but in the upper portion of the last-mentioned branch, drain tiles of modern make were found in the bottom of it.

The drainer had evidently struck the channel, and, so far as found uncovered with flagstones, had placed his drain tiles along the bottom, and where these ceased it may be assumed he had found the remainder of the drain still in working order, or at least suitable.

This latter, or high drain, enters the building by a square-built aperture near the east end of the south wall, the opening being 15 inches wide and 21 inches high (fig. 27). Of the internal channels, that on the south falls 6 inches to the westwards. The north has a fall of 9 inches in the same direction.

The connection between the channels in the west could not be distinguished owing to the destruction at that part, and there was no outlet to them. Search was therefore made and excavation continued through the débris in the direction of the entrance door. Just before reaching the latter, among a very disturbed lot of tumbled stones, there appeared a possible connection joining the channels with the conduit. Two openings of drains were exposed, the one above the other. (See Section B, Plate IV.) [1]

The lower drain was traced up from the conduit passing under the north channel, here greatly disturbed, and at a foot north of the doorway the first appearance of the upper drain was exposed. The stone covering it looked crushed down, but was not broken, and the whole drain was filled with a black viscous deposit. A thin flat stone separated the two drains, serving as the top of one and the bottom of the other. Where they made junction was at the top of a steep incline to the rear of the conduit.

How the drainage was directed into the channels along the walls of

[1] The arrows indicate the direction in which the drains have their fall.

Fig. 27. Latrine, showing entrance of high drain through south wall.

this building is not clear, but there would of necessity require to be some method adopted to direct the flow, so that both channels would be flushed.

There is evidence that the main drain outside had been connected with other drains. One of these joined it 20 feet south of the buildings appearing to come from the west. But this is not to be confounded with the large east to west drain running parallel with the fort wall. This latter has its fall westwards and takes a turn at the north gate,

Fig. 28. Drain on west of central buildings.

clearly indicating that it passed out of the fort in a manner similar to that of the drain passing through the south gate.

Drains or parts of drains were frequently met with during excavation, those followed up generally ending after a short run, being destroyed. No system could be followed entirely, and there were evident alterations.

On the outside of the west wall of the central building of the fort (fig. 28) is a well-made drain 8 inches square, of stones set on edge without cover stones, which is carried along the west side of the square in front of the building down to the centre street; there it joins

another, evidently on the south edge of the street. Another of the same size starts from the west side of the centre door of the central building, and runs parallel with the former through the middle of the square, joining the same east and west drain on the edge of the street, but it continues as if crossing the street in the direction of the north gate.

The large drain running parallel with the north wall at about 25 feet from the inner kerb has its fall from the east towards the north gate. It is about 1 foot square and is built of squared stones. Part of it is still covered with large flagstones, although most of it is uncovered. It was opened for its whole length, and what is somewhat remarkable is the fact that it begins close upon, and may have overlain, the drains leading to the building at the north-east corner. It could not, however, have connected with them, as where first seen it is fully a foot above the highest, and has a decided fall in the opposite direction, passing out, as stated above, through the passage of the north gate. On the west of the gate there appeared the remains of a similar drain in line with the latter, but it was almost totally destroyed. On the south side of the fort, at the gateway, the passage of a drain to the outside was definitely traced, although the termination was completely gone. It approached the gate in an angular direction from the west, but passed straight through it, almost close to the west side of the roadway. It is of the usual construction, having stone sides, a hard bottom, and covered with flagstones, and is 1 foot square internally.

About midway between the south gate and the corner turret, two drains run close together without having any apparent connection (fig. 29). In both the fall is to the west, but the lower of the two begins as if from the surface and gradually increases in depth as it falls westwards, whereas the other and higher maintains a uniform depth for its whole length, and at its end on the west turns with a sharp corner to the north, beyond which it is destroyed. A few feet farther west there is a large, and what appears to be a general catch drain, inside the west wall of the fort. It is 14 inches square

internally, and is strongly built of large stones, covered with heavy flagstones; commencing at 12 feet north of the corner turret, it was traced for a distance of 90 feet. Its course is parallel with the west wall for 55 feet, then, taking a bend westwards in the direction of the west gate, it continues for other 35 feet, where it enters under the embankment of the railway.

At the south-east corner of the fort, in the interior of the building, there is a drain 7 inches wide and 12 inches deep, stone built and

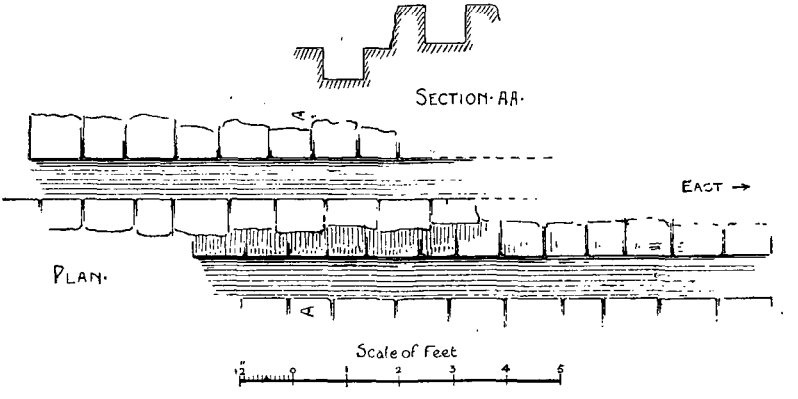

Fig. 29. Parallel Drains near south wall.

covered, which begins in the centre of the apse chamber at $4\frac{1}{2}$ feet from the inside of the east wall. It runs in a northerly direction for 30 feet, and has connection with another drain coming from the direction of the circular chamber. Beyond this it is all destroyed. Possibly this may have been a heating flue.

Refuse Pit.

In front of the south wall of the central building of the fort, at the head of the street leading up from the south gate, there is a pit 9 feet wide at the top, tapering to about 6 feet at the bottom, 24 feet from the present surface (Section A A, Plate III.).

The soil for the first 12 feet of its depth was similar to the surface soil, and evidently thrown in—no remains were got in it. The next three feet was a layer of decayed vegetable matter, and the remainder of the depth was filled with a dark grey viscid mass, clayey in its nature, which on exposure to the air became coated with pale blue vivianite.

In the latter and the layer above it were found fragments of black Roman ware, and sandals or foot-gear, also pieces of decayed wood and a few animal bones.

A small piece of deer-horn was found at a depth of 20 feet, and no other relics were deeper.

The bottom was formed of very large boulders, but the sides gave no evidence of having been stone built. Stones, however, ran round the top, on the surface level of the streets that meet in the vicinity of it.

Streets of the Fort and Annex.

The stone-bottomed streets were of the usual type exposed by our excavations, consisting of a bottoming made of rough stones, principally boulders, the smallest placed on top and filling the interstices.

The surface is rounded, with a distinct elevation in the centre, and is covered with a layer of small pebbles and gravel pressed into a compact mass. The depth of the formation averages 12 inches.

In its width from north to south the fort is divided into three equal parts, each about 117 feet. The central part contains the principal buildings, and on the front and rear of them are streets, the centres of which coincide exactly with the divide mentioned. These streets are 20 feet wide, and cross the fort from east to west. That on the north side connects with the military way at the gates of the east and west walls.

Joining them in the centre, but separated by the central buildings, is another street of the same width. One part of the latter goes direct to the north gate, and the other to the south gate, and being truly central divides the fort lengthwise into two equal portions, the east and west halves being of equal area.

At intervals there are indications of a street going round the entire fort, inside and close to the walls, but little of it remains.

At 14 feet west of the central buildings there is a stone-paved street 12 feet wide running north and south. The crown of the roadway is 7 inches lower than the stone sill at the entrance of the building. Running parallel to the street, and distant from it 8 feet, is a series of holes, 9 in number. They are about 18 inches in diameter and 12 inches deep, and spaced on an average $7\frac{1}{2}$ feet apart. They contained stones and pieces of decayed wood. It is possible the bases of wood posts may have been fixed in these holes, as at 10 feet westwards there is the foundation of a stone wall, 4 feet broad, with which they may have been connected in the form of a verandah, and especially as immediately behind the wall is an extensive stone-paved surface like the floor of an interior. This stone paving begins at 18 inches west of the wall foundation, and extends for a distance of 10 feet, where it finishes in a manner which gives indication that it had continued for a longer distance. The fact that it approaches very close to the present surface at its west end may account for its indefinite finish, for the paved floor is practically level, while the ground slopes very quickly at this part, and appears to have cut through the paved floor in its fall.

In the annex the military way is carried right through, from west to east, parallel to the Antonine rampart. It is not in direct line with the connecting street inside the fort, but is set back from the gate northwards about 20 feet. Its width could not be obtained, as it is only partly in the field, the remainder being part of the public road adjoining.

Parallel with the above, another street, 15 feet wide, crosses the end of the eastmost trench of the fort, which was traced for 37 feet east of the trench.

The only other street exposed in the annex was a short stretch in the south-west corner. It seemed to have connection with the fort, but to follow it was impracticable owing to its position being close to the railway embankment. It is first observed close to the outer face of the fort wall, where there is little of it, but it widens out as it goes eastward.

It crosses over the first trench which terminates against it, and on reaching the edge of the second it stops, but appears to continue southwards under the embankment. It is stone paved and about level with the small oval chamber in the fort wall a little to the north, both being $3\frac{1}{2}$ feet below the floor of the adjoining building in the interior of the fort.

Military Way, South.

This road was clearly traced for about 1000 feet of its length beyond the fort. (See Map, fig. 1.)

Issuing from the south gate, it is carried in a direct line through the morass in front of the south wall. The width across the stone bottoming is 30 feet at this part.

It continues the direct course till it reaches what appears to be an old stone quarry, beyond which it is not traceable.

A branch, 15 feet in width, strikes off the direct line at 200 feet from the wall of the fort, and, with an inclination more to the south than the previous road, rises to the summit of the higher ground, along which it continues. On its approach to the high ground it crosses a small streamlet at an angle to it. Both sides of the streamlet are built with large stones for a length corresponding to the width of the road adjacent to it. The width of the streamlet being under 2 feet, it would be easily stepped, and the level is made high, so as to give dry crossing.

On completion of our work, it is a duty to remember, and a great pleasure to record, the assistance received outside of the executive committee. We therefore acknowledge we are greatly indebted to Mr C. Brown, F.S.A. Scot., factor to the Earl of Zetland, who took a personal interest in, and did his utmost to facilitate, our operations in every possible way. Also to Mr J. Ralston, forester, for much assistance and for his kind consideration in preparing a shelter for the excavators, which proved of great service during a season more inclement than usual.

We would gratefully acknowledge the guidance and help of Mr J. R. MacLuckie, F.S.A. Scot., by whose long experience and knowledge of the district the work was more easily followed.

We have also the satisfaction of recording the unabated enthusiasm of the young friends who assisted at Camelon, who have again taken great interest in our progress, and freely helped on all occasions.

Mr James Strang, jun., architect, made a careful study of the levels, so exhaustive as to be of great service on a site where the surface is of a character so irregular and sloping.

For the valuable assistance of Mr D. Maclay, jun., our warmest thanks are due, who constantly attended at the survey, and with intelligence gained from experience in like work facilitated our labour to a great extent.