

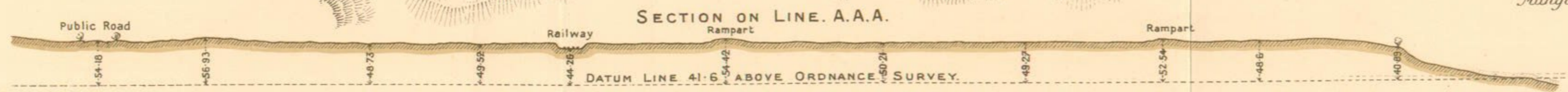
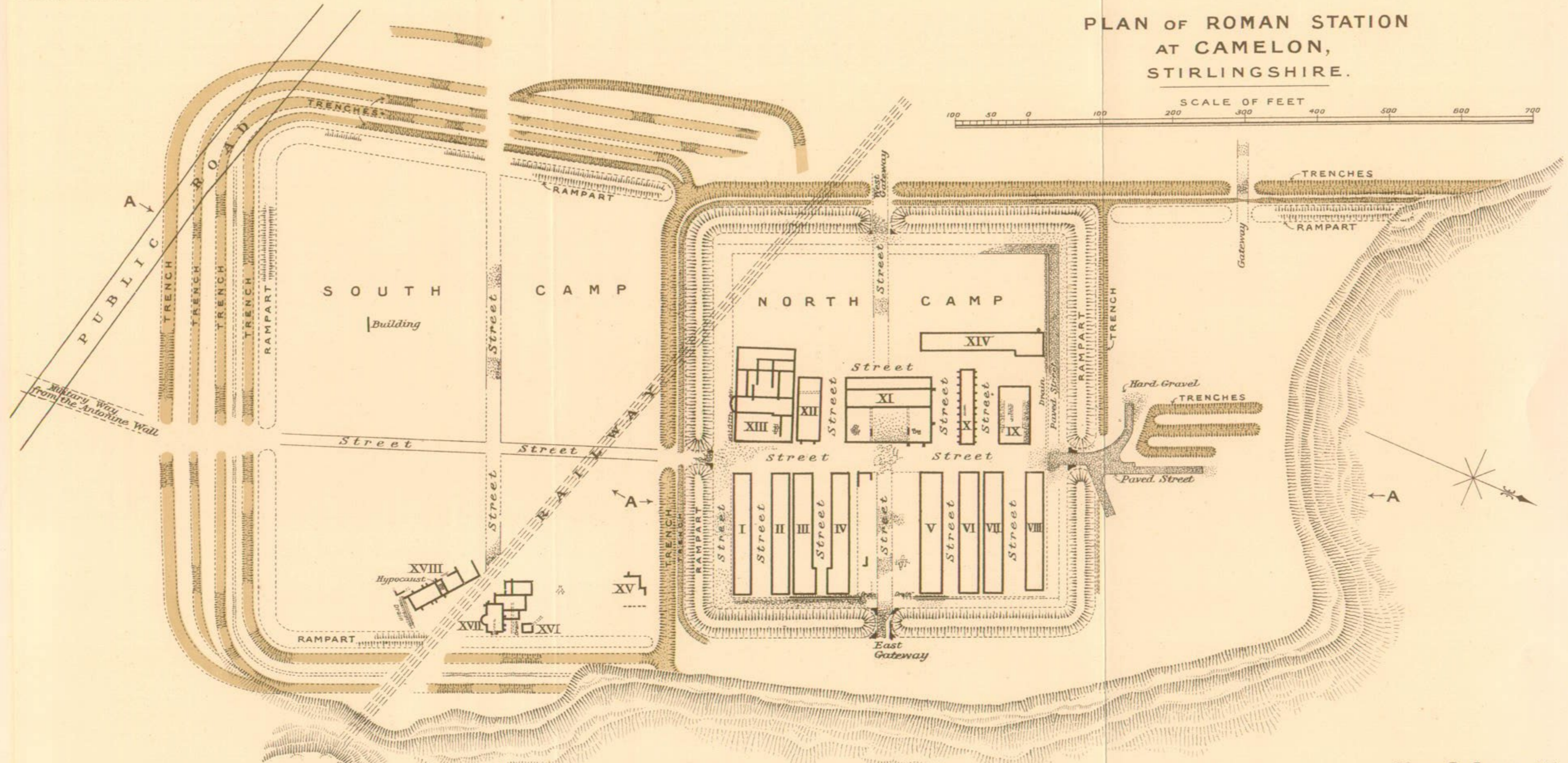
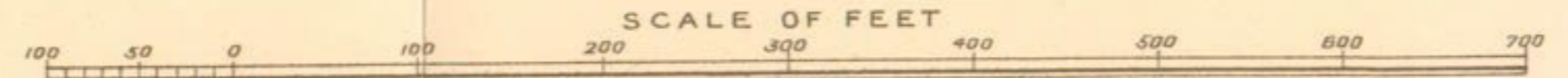
II. DESCRIPTION OF THE PLANS AND SECTIONS. By MUNGO BUCHANAN,  
CORR. MEM. S.A. SCOT., FALKIRK.

A general description of the station having been given in the first part of this paper, I now proceed to describe in detail, with the aid of the accompanying plans and sections, the several works disclosed by the series of excavations.

These excavations were continued down to the natural or undisturbed soil ; were carefully examined as the work progressed ; their distinctive features noted, and accurate measurements taken ; moreover, most of them were left open for a considerable time, so as to afford opportunity for repeated inspection, which proved an important advantage, especially in those cases where it was desirable to make comparisons.

Plate II., in which the trenches are shaded brown, shows the general

# PLAN OF ROMAN STATION AT CAMELON, STIRLINGSHIRE.



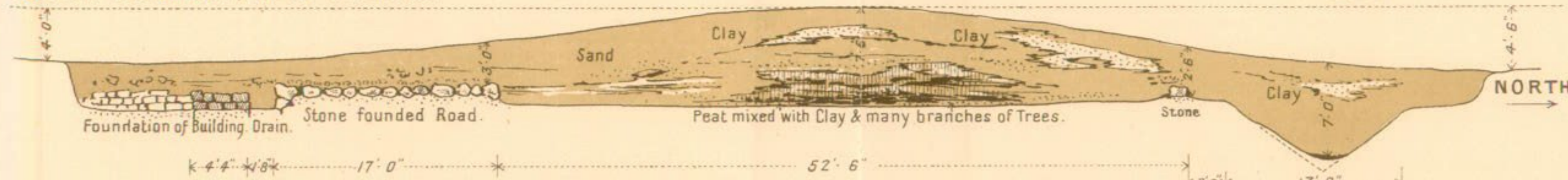
Mungo Buchanan, Del.  
Falkirk.

Waterston & Sons, Lith. Edin.

# FORTIFICATIONS OF THE NORTH STATION.

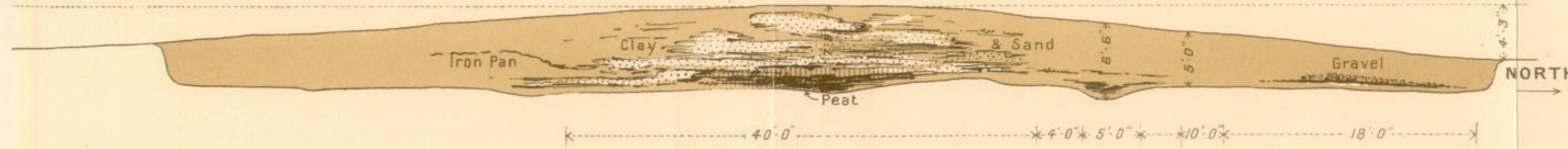
### NORTH RAMPART, WEST SECTION.

### Nº1.



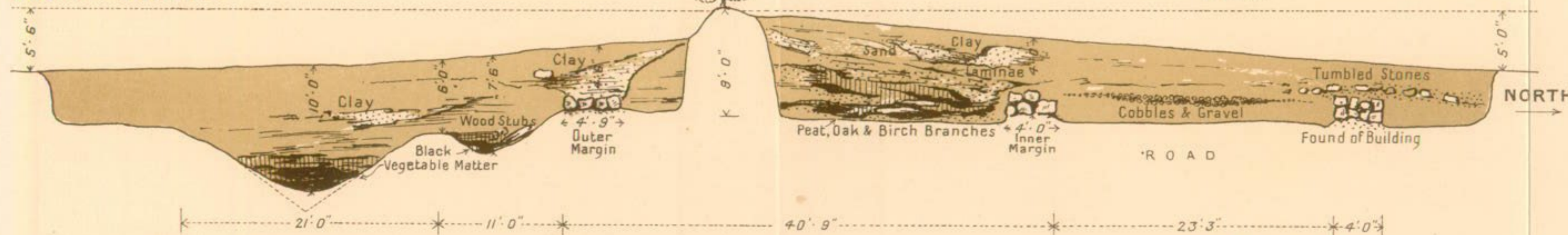
### NORTH RAMPART, EAST SECTION.

### Nº2.



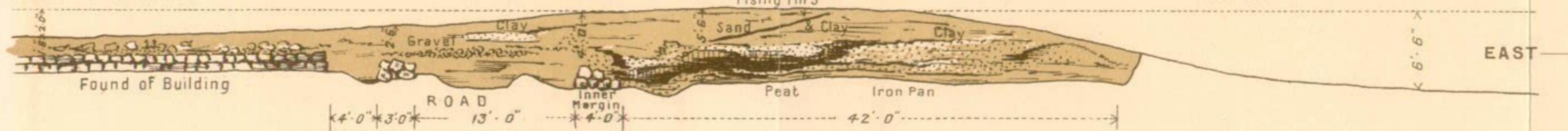
### SOUTH RAMPART.

### Nº3.



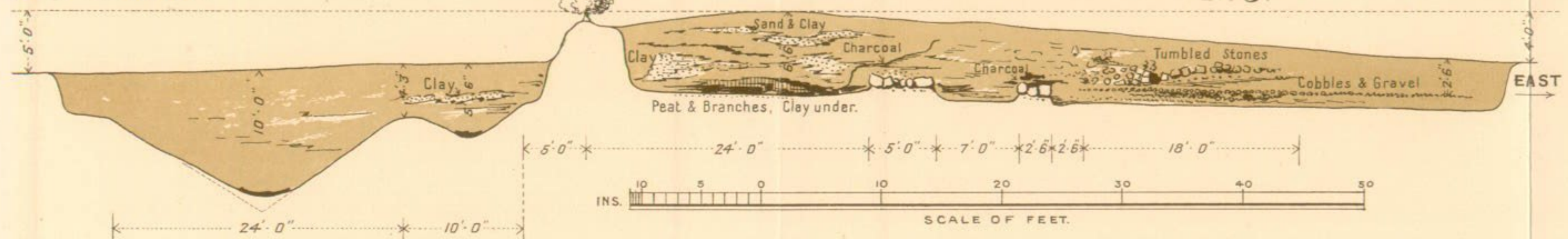
### EAST RAMPART.

### Nº4.



### WEST RAMPART.

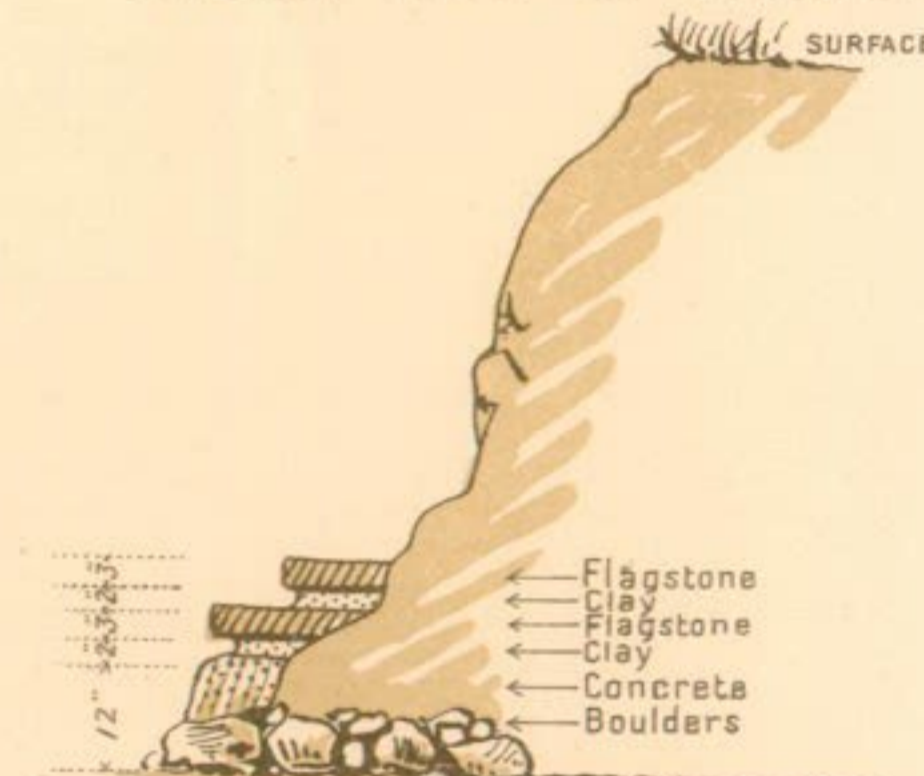
### Nº5.



# SKETCHES SOUTH STATION.



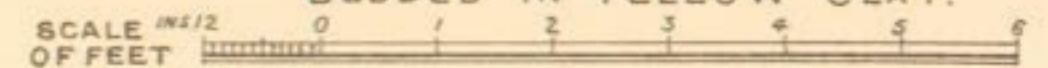
### FRONT VIEW OF FLAGSTONE STEPS.



### PROFILE OF STEPS.



### HYPOCAUST PILLARS, RESTING ON FLAGSTONE PAVEMENT. BEDDED IN YELLOW CLAY.



plan of the station, as we discovered it; and as it consists of two areas, it will be convenient to describe them separately, under the headings—North Camp and South Camp.

*North Camp.*

The north camp is nearly square, and is surrounded by an earthen rampart, with rounded corners. Each side has a passage through it, in the middle, on the east and west sides, but the north and south entrances are much nearer the east than the west side. Exterior trenches follow the rampart only on two sides and a half. On the east side and the east half of the north side there is no trench.

The dimensions of the interior, within the rampart, are from north to south 490 feet, and from east to west 530 feet, giving an area of nearly six acres.

The rampart, Plate III., sections 1 to 5. The line of this defence is still distinct as an eminence, gradually sloping up to a height of from 4 to 5 feet above the level of the adjoining fields, and having its course well defined round the entire camp, except where a railway cutting goes through a part of the south-west angle. This eminence is the principal remaining evidence of the work, now visible on the site.

To ascertain its character, eight sections were cut across it, two on each of the sides, in addition to the excavations necessary in tracing out the gateways.

The superstructure was found to be uniform in composition, but the base showed considerable variation according to the position it occupied.

In the south line of the rampart (Plate III., No. 3) the outer and inner margins are bounded by rough stonework, bedded in yellow clay, and the centre is slightly depressed below the original surface. The outer stonework is 4 feet 9 inches wide and 15 inches high, composed of boulders packed close together, the largest generally lining the edge, and all consolidated with clay. The width, however, is not maintained throughout, but varied in each case where it was exposed. In an opening

10 feet west of the section above mentioned, there was only a single boulder situated on the line of the edge, the surface around it being a hard iron pan. In the opposite direction, 85 feet eastwards, it still maintained a width of 3 feet 6 inches, but within another 15 feet it terminated. In the cutting here, on the same level, was a bed of the hard iron pan, or ferruginous gravel, previously mentioned, 4 to 5 inches thick and 6 feet 9 inches wide.

On this surface lay many large pieces of wood, and overlying them was a mass of grey clay. The position of this cutting is immediately in front of the south-east rounded corner of the rampart.

It may be here noticed that the above-mentioned stonework forms the edge of a small trench, running in front of the rampart.

The inner stonework also varies in width, from 3 feet to 6 feet 6 inches, and is not so carefully constructed. In one of the cuttings the stones are heaped together to the height of two courses, while in another they lie singly and separated, yet all are bedded in yellow clay.

In the north line of the rampart (Plate III.) the stonework is found on the outer margin, at the north-west corner, compact, and of a width of 4 feet. In section No. 1 it consists of a single stone on the edge, and in section No. 2 it is entirely absent. The inner margin here is not clearly defined, and there is no appearance of stonework nearer than a paved street in the interior, which will be subsequently described.

In the east line of the rampart (Plate III., No. 4) there is no indication of stonework on the outer margin. The inner margin has it along its whole length but 3 feet wide, with an average height of 2 feet. Two courses still remain, strongly and regularly built of large stones, principally boulders. Many of the face stones are hammer-dressed and squared, especially in a portion about 40 feet south of the east gateway. From the disturbed appearance of the surroundings, it is probable that the original height of the stonework may have been greater at this part, or there may have been some under-building.

In the west line of the rampart (Plate III., No. 5) the inner stone margin is 2 feet 6 inches wide, and has the appearance of being disturbed

on its inner side. On the top of it was a quantity of charred wood, in layers 6 inches in total depth, with a layer of clay underneath.

In this cutting is a group of stones, 7 feet nearer the centre of the rampart, and 1 foot higher in level than the margin stones (nothing similar to this was found in any of the other cuttings). They are loosely laid together, bedded in clay, and apparently undisturbed.

The outer stone margin of this line of the rampart was not exposed, owing to the presence of a hedge which it was inadvisable to disturb; but occasionally stones were met with that suggested the presence of an outer stone margin under the hedge.

The rampart is uniformly 41 feet wide, measuring over the stone margins. The present height averages about  $4\frac{1}{2}$  feet above the surface level of the inside, the outer surface being about 1 foot lower.

The bottom dips slightly towards the centre, forming a hollow between the margins, 1 foot deep in the south portion, a little less on the other sides, and is of coarse rusty sand, very compact and hard. Lying on this is a mass of peat, together with a mixture of clay and peat, wet and slimy, especially towards the centre, where it is 18 inches thick. Intermingled with it abundantly are the branches of trees, and large pieces of wood, split along the grain. Among them oak was clearly distinguished; the others, judging from the bark, were probably birch or hazel, and all were in a saturated condition, and so soft as to cut easily with the spade. These branches, etc., generally lie in a direction parallel with the rampart, a few small pieces somewhat isolated being the exception.

Overlying the lower mass of peat are several thin layers of the same material, from 2 to 5 inches in thickness, and very irregular in their distribution.

The peat, which occupies such an important part in the base of the structure, is the common moss peat. Many portions showed the fibrous roots of heather in sandy soil, combined into a mass with mosses and

other decayed vegetable matter, but, in general, the mosses greatly predominated.

Excavations for drains connected with the new works clearly demonstrated that peat of a similar kind is to be found under the present surface soil of the adjacent low-lying ground.

In the higher part of the rampart, within about 2 feet of the top, the chief components are consolidated sand and gravel, the proportion of clay being greatly reduced.

Towards the centre the superstructure is very close and hard, and many strips appear in it of the ferruginous hard pan, so frequently referred to, also several thin horizontal layers of a very dark substance, composed largely of carbonised vegetable matter. Among it are many pieces of brushwood, like charcoal. Nowhere do these layers exceed 1 inch in thickness, and in general they taper towards their extremities. They are intermittent, and very irregular in disposition.

The exterior facing of the rampart consisted of a large body of puddled clay. As may be seen in section No. 3, it rests on the whole width of the outer stone margin. As it rises, the inner surface follows the rounded outline of the body of the rampart, but the outer surface shows in profile a straight line, angled from top to bottom, where it stops abruptly without apparent gradation.

This system appears to have been adopted on the inner margin also, but not so persistently throughout.

It is evident that the inner slope of the rampart rises more gradually than the outer, the difference being very marked in some cases.

In this connection may be mentioned the characteristic band of hard pan, 4 inches thick, consisting of ferruginous gravel and large pebbles, in section No. 4 of the east line of rampart. Starting at 2 feet above and 10 feet distant from the inner margin, it inclines upwards in a straight line for 10 feet, at an angle of 1 in 5, the overlying soil, mostly sand, showing a difference from that immediately beneath it, in which there is more clay.

No relics of any kind were found in the rampart.

*The Trenches.*

The trenches of the north camp were not discernible before excavation, being completely filled up, and level with the present surface of the ground.

It will be observed, on comparing the sections Nos. 3 and 5, Plate III., that the trenches on the south are similar to those on the west. Both have a small trench close against the rampart, with a larger one in front. The small trench is about 10 feet wide, and falls about 4 feet below the stone margin. On the opposite edge it rises only 18 inches, where it forms a low ridge, dividing it from the large trench. This latter is 23 feet wide and about 8 feet deep. The exposed faces in each are so indurated as to suggest that they have been subjected to pounding.

On the south side (section No. 3) the bottom of the large trench is occupied by a dense body of decayed vegetation, black and slimy, about 4 feet deep, which, from the fibres observed among it, is evidently the remains of reeds and grasses.

The line of demarcation between this mass and the sand and gravel overlying it is sharply defined, and among the latter isolated boulders and clumps of wrought clay appear, probably part of the rampart, now overturned into the trenches. The inner or small trench also shows dark vegetable remains, but it has more clay among it.

A pale blue powdery phosphate of lime appeared upon the surface of the vegetable remains from the bottom of the trenches, after exposure to the air.

In the small trench near the edge of the stone margin of the rampart, and lying on the slope, were pieces of split wood, principally of oak, from 2 to 4 inches in greatest thickness, and fully 3 feet in length. No mark of any cutting tool could be observed on them.

On the west side the trenches (section No. 5) are a counterpart of those in the south, but there is a decided difference in the soil filling them. No vegetable remains appear on the bottom, nor is the clay in large masses,



the few small clumps being seldom far from the rampart, and the upper soil is of a more free and open nature.

This line of trenches continues in a straight course for 550 feet beyond the north camp, and ends on the brink of the steep northern limit of the ground.

To the rear of this extension of the trenches, at 2 feet below the surface, was discovered the foundation, seemingly, of a rampart 20 feet in width, consisting of a bed of clay about 9 inches in depth lying upon the original surface of hard pan, the over soils being a sandy loam. No stonework was found on the inner edge, and only a few isolated stones marked the outer margin. None of the characteristics of the main rampart were to be seen, with the exception of the clay foundation. There was no evidence of peat or wood being used, and unlike the rampart of the camp, which is still distinct above ground, this, like the trenches, was only discovered by the exploratory cuttings.

About midway between the north rampart and the declivity, this defence is crossed by a roadway 15 feet wide, against which the large trench abuts on either side. The small trench, on the contrary, is carried across the road, but so greatly contracted in width that it appears like a palisade trench or a deep drain.

This extension of the lines of fortification cuts off an area of about  $5\frac{1}{4}$  acres between the main camp and the declivity which surrounds it on the north and east sides,  $4\frac{1}{4}$  acres being on the north and 1 acre on the east side of the main camp. The absence of trenches on the east side of the north camp may be accounted for by the proximity of the steep declivity, forming a strong natural defence. The rampart is set well back from the edge of the declivity, leaving a platform averaging 70 feet in width, the surface of which is of hard-pressed gravel.

There is likewise no trench in front of the north rampart, eastwards from the north gate; but from this gate, in the opposite direction, there is a single trench, 10 feet wide, close against the rampart, and joining the trenches of the west defence.

While following up the street leading from the north gate of the camp,

a series of three parallel trenches were discovered, directed towards the declivity, at right angles to the rampart (Plates II. and IV., section 6).

The centre one is 18 feet wide, the other two 14 feet wide each, which, taken along with the 14 feet width of the dividing ridges, gives a total of 74 feet.

The eastmost of these trenches is 60 feet shorter at the north end than the others, and terminates in line with a paved road close to its inner margin. The ridge between this and the centre trench has a flat top, the other, or west ridge, having the top rounded.

The termination of the two westmost trenches is about 30 feet from the edge of the declivity.

With a length of 170 feet they reach to within 55 feet of the rampart, and they are united by a cross trench, 14 feet wide, which is not parallel with the rampart, but diverges north-westward, the space between them being 18 feet greater at the west than at the east end, the inclination being towards the gateway of the annex.

In the trenches relics of various kinds of pottery were found in great abundance.

#### *Streets and Entrances—North Camp.*

The streets in the interior are composed of a layer of consolidated gravel about 4 inches deep, forming a smooth surface, under which is a rough bottoming of large pebbles, mixed with broken pieces of sandstone, in total depth averaging about 9 inches. Roughly shaped kerbstones, about a foot long and 7 inches square, apparently formed the sides, as a few still remain in position.

In all the streets the centres are raised a few inches above the sides, but there is no evidence of stone gutters.

While the above description applies to most of the streets, particularly in the interior, others have been constructed with a bottoming of boulders for 9 inches in depth, closely packed together and brought to a level with smaller stones, the surface being finished off with small pebbles, so hard and compact as to be almost solid, the total depth being

fully 1 foot. The streets so paved invariably have stone kerbs, and occasionally built stone drains.

Two main streets cross the camp in opposite directions. One of these, 40 feet wide, passes from the north to the south gateway, dividing the camp into two unequal parts, whereby the eastern division is 100 feet less in width than the western.

The other street, 21 feet wide, passes from the east to the west gateway. On each side of it are wide spaces, mostly unoccupied, as few remains of any erections can now be distinguished.

Where it crosses the north to south street it is intercepted by a large building, round which it is carried, continuing its course to the west gate.

The spaces between the blocks of buildings may be considered as subsidiary streets, the surfaces being formed, as in the main thoroughfares, of consolidated gravel.

An important street runs close to the inner margin of the rampart, all round the camp.

The eastern stretch is 16 feet wide over a stone kerb 3 feet in width, which is its inner boundary, built of squared stones, and still rising to a height of about 2 feet above the foundation.

The roadway between the kerb and the rampart is of gravel on stone bottoming, the surface being a foot higher than the present top of the kerb. In a space of 4 feet, between the kerb and the walls of interior buildings, is a well-built stone conduit, 15 inches wide and 12 inches deep, one side of which is formed by the lower part of the kerb, the other is built with stones squared and dressed on the inner face. The bottom is laid with large stones having an even surface, and the top is covered with thick slabs. One of the latter is 30 inches in width, 42 in length, and 4 in thickness. The conduit was followed in search of connections and to find the outlet, but without success, great part of its course being only indicated by the remaining trench.

In the centre of this eastern side of the rampart a passage is made through it, paved with flat stones.

Where it leaves the interior, for a length of 4 feet it preserves the

width of the street leading to it, then it rapidly contracts to half the width about the centre of the rampart, and continues at this width for the remainder of its length. In passing through the rampart it rises about 2 feet above the interior at the centre, and then falls quickly to the exterior.

On each side of the passage is a narrow channel, averaging 3 feet in depth, terminating at the outer extremities in large holes, with stones in the bottom. On the south side, in particular, exactly on the line of the outer margin of the rampart, the stones look like a foundation, and many others appear to have been displaced; possibly they may be a remaining portion of an outer defence.

Over against this, on the opposite side of the road, in the ditch alongside, a layer of charred wood, fully 2 inches thick, lies on the top of a strip of red friable clay, the underlying soil being of a dark brown clayey nature, and the overlying of sand and gravel, with strips of yellow clay, similar to that in the rampart.

Along the north side of the passage the charred wood appears here and there regularly at the same level, and is suggestive of a wooden barricade destroyed by fire.

On the south side of the camp the street is 25 feet wide from the inner margin of the rampart to within 3 feet of the adjoining building, close to the foundation of which a small ditch is apparent, probably the course of a destroyed drain. The kerb again appears on the west side of the gateway, where it forms a channel 18 inches wide between itself and the foundation. Continuing for about 50 feet westwards, it is entirely obliterated by the railway cutting.

The south gateway is 20 feet wide on the inner side—the only portion that remains—showing flat stone paving where crossing the rampart. On each side of it are deep holes, in which many large stones appear, but so disturbed as to preclude the forming of any conclusion regarding their purpose or original position.

Beyond the gap made by the railway cutting, the first indication of the street is about midway along the west side of the station. Here, at

its junction with the inner street, a small portion of the west gateway remains, 20 feet wide, paved like all the others with flat stones. Evidence also remains of the deep holes on each side, but all other indications have disappeared. In this gateway the stones have only about 6 inches of soil covering them.

In the cuttings made north of the gateway, the street, being stone-founded, is in an exceptionally good condition. The paving is 15 feet wide, but there is a space between it and the rampart of 14 feet, with a surface of 4 inches of gravel, very hard pressed, giving a total width of 29 feet on one plane, from the stone kerb to the margin of the rampart. This street is continuous with the street along the north side, which it joins at a right angle, the inner kerbs at their junction forming a square corner.

Following the north side, the stone-founded street is 17 feet wide, and the additional surface of gravel 12 feet, the same total width of 29 feet, as on the west side.

The evidence of our excavations was contrary to the existence of a built drain on the west side, as there had not been any great disturbance, and the paved way was 3 feet beneath the surface.

Where the stone margins meet at the north-west corner, there begins a well-built stone conduit, about 20 inches wide and 14 inches deep, in two courses of squared stonework, discharging to the east, as indicated by a slight difference of the level. Continuing its course with the street for about 200 feet, the track gradually becomes obliterated among the débris of the foundations of a large building near the north gate.

The north gateway, about 22 feet wide, like all the others, is stone paved, and passes the rampart in the same manner. The stone paving terminates on the inside, in line with the edge of the street. On each side of the gateway are deep holes, with stones in the bottom, similar to those at the other gateways.

The drain has apparently been carried across at the junction between the stone paved way and the gravel surface of the interior (Plate IV., section 7), as a well-defined ditch interposes, which is continued along

the face of the building, on the east of the gateway, in the direction of the drain along the east side of the station, but no built stonework remains. Only 9 inches of soil covered this portion of the work, and all evidence of street or drain to the right of the north gateway has been destroyed. In the annex three stone-founded streets approach the gateway of the north rampart from different directions, uniting directly opposite the passage. One of them proceeds in a northerly direction, close behind the eastmost trench of the three previously described (Plate IV., section 6). Its stone foundation terminates at a distance of 150 feet from the rampart, where it joins the ordinary gravel surface of the annex. The width is 10 feet over the kerb stones.

Of the other streets, one goes east and the other west. The latter branches off from the gateway with a bold sweep, and is prolonged parallel with the rampart, till, at a distance of 70 feet from the gateway, it stops abruptly, in line with the outer edge of the westmost trench of the series. The width of the stone foundation is 12 feet.

The street branching eastward is projected outward at an angle of 110° with the gateway, but, unlike the others, is close to it; so close that it encroaches on the base of the rampart to a considerable extent. It has evidently been disturbed at this part, and it is only within a few feet of its termination that the stone foundation appears in condition similar to the adjoining streets. It is 10 feet 6 inches wide, and 76 feet in length from the gateway.

*Buildings in the Interior—North Camp.*

Very little difficulty occurred in tracing the walls of the buildings in the interior. Generally the top of the stonework was only from 9 to 12 inches beneath the surface, and in several instances it was barely 6 inches. In general, only the lowest courses of the foundations remained, and where it was displaced or altogether removed, by means of the clay in which it had been bedded, the connection was traced with perfect certainty.

It was particularly noticed that the top of the remaining stonework and

the gravel surface were on one plane, the latter occasionally showing that it had been disarranged, possibly by agricultural operations. The existing condition of the interior, and of the walls of buildings in particular, is explained, to a certain extent, as the result of a long course of cultivation. Stones would be gradually displaced by and removed beyond the range of the plough as long as any remained near the surface. Hence the reason of so many being seen in the surrounding field dykes. The eastern division of the interior is completely occupied by blocks of buildings, all with streets intervening, except blocks Nos. 2, 3, 6 and 7 (Plate II.). These are so close to each other that they are only separated by eavesdrops, about 3 feet in width.

The buildings stretch east and west, and the end walls face the centre street and the street along the east rampart, respectively. They are all about the length of 170 feet, but vary in width. Nos. 1, 2, 3, 4 and 8 are 26 feet wide, No. 5 is 31 feet, and Nos. 6 and 7, 27 feet over walls.

The blocks Nos. 3 and 4 have a distinctive feature. At 37 feet from the end walls next the rampart the width, by a square "return," is increased to 31 feet, but no continuation of the "return" as a division wall could be traced on the inside.

The walls generally have a thickness of 3 feet, and are only footings, with an occasional scarcement. The upper walling, therefore, did not greatly exceed 2 feet 6 inches in thickness.

No indication of division walls could be ascertained. Internal stonework presented no continuity, was limited in quantity, and pieces noticed here and there gave no hint of their purpose.

The surface of the interior of the buildings, like that of the intervening streets, was of consolidated gravel, and several deep holes had been made, for which no clue was found.

The plan (Plate II.) shows wide vacant spaces bordering each side of the street leading from the east gate. The space on its north side appeared to have a gravel paved surface. If any erections occupied it they must have been of a temporary character, as the surface indicates very little disturbance. In the space on the south side, on the contrary,

the greatest disturbance exists almost everywhere. Pits, 6 to 8 feet deep, filled with dark, sooty soil, still retain here and there pieces of built stonework, the position of which only emphasises the appearance of disarrangement.

About 50 feet west of the east gate one deep hole, with a small portion of a wall remaining near it, contained a large quantity of a red, burnt, friable clay, while in the soil about it charred wood abounded to a great extent. Abutting on the centre street is the largest remains of built work within the area of the space. The stone foundation lies about 6 feet below the original surface, an instance of deep 'seating' not often repeated in this camp. Facing the centre street it has a length of 20 feet, and is returned along the cross street for 10 feet, where it ends with a square 'return,' a continuation to which was not found.

The western division of the interior, although of greater capacity than the eastern, is not so fully occupied by buildings. Adjoining the west rampart a large portion of the area gave no evidence of stone buildings, and the stonework noticed consisted of occasional masses, without definite form.

A series of buildings faces the street between the north and south gateways, of which they form the west side. They are distinctly different from the buildings of the eastern division, but have suffered quite as severely by the ravages of time.

The building, No. 13, is close to the edge of the street along the south rampart, separated from it by a built drain. The length of this side is 133 feet, and the frontage to the centre street is 79 feet. Facing the south rampart at about 40 feet from the centre street, an apse (fig. 3) is projected outwards. The main wall is not interrupted by the apse, but is carried straight across its base. The foundations of this building are principally of stone, bedded in clay, but the apartment adjoining the apse on the west is founded on lime concrete, in which there is a large quantity of broken red tile. The floor here is hard rammed clay, while towards the centre street the flooring of the rooms appears to have been of flagstones. In one of the rooms a piece of flooring remains *in situ*,



formed of flat stones about 18 inches square and  $2\frac{1}{2}$  inches thick. Most of the division walls remain, some with little of their structure left, while others are well preserved, showing a height of two or three courses. No indication, however, of doors could be found.

To the north of this building, and separated by a narrow passage of 5 feet, is a smaller one (No. 12), the street wall of which shows two buttress-like projections still standing the height of the plinth-course,

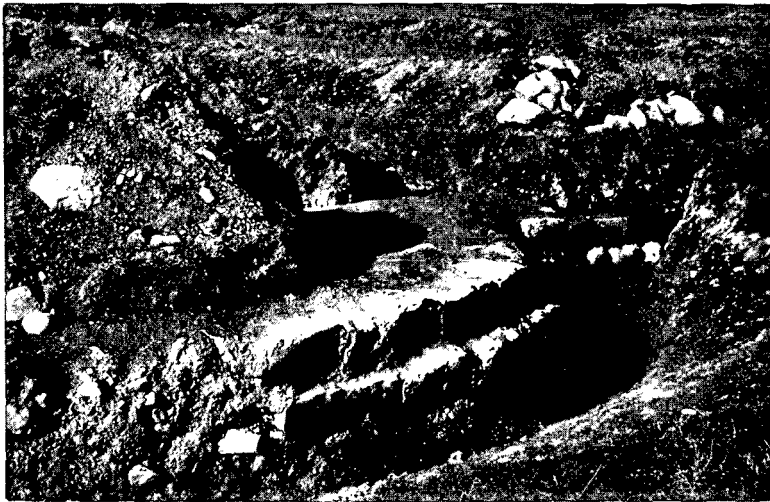


Fig. 3. Apse of building No. 13 at Camelon, viewed from the south.

which is splayed on the top. In the interior a small part of a cross foundation remains, about 3 feet deeper than the outer walls. The frontage is 33 feet, and the length from front to back is 102 feet over walls.

A 30-foot street intervenes between this and the next building to the north (No. 11). The area occupied by it is greater than that of any other, and it has been subjected to more than ordinary demolition.

The plan is oblong, with 120 feet frontage, and 92 feet from front to

back over walls, which are carried all round at a thickness of 3 feet. Outward projections on the walls, although intermittent, suggest the addition of buttresses.

The interior arrangement showed a distinct difference from that of any other building in the station.

The east wall, facing the centre street, has an opening in the middle, directly opposite the cross street from the east to west gate, apparently forming the entrance to a court about 46 feet square, paved with gravel, similar to the street in front of it.

There are no walls to the sides of the court, but small foundations appear at intervals along the boundaries of the gravel. Between these and the outer walls the floors showed paving of flagstones in both of the wings.

At 48 feet from the front or east wall, the foundations of a compartment stretch the whole length—120 feet—between the north and south walls, at a uniform width of 29 feet, and with indistinct indications of internal cross walls.

To the rear of this compartment is another, 12 feet wide, of greater depth than the last. Exploratory cuttings, about 7 feet deep, exposed only masses of tumbled stones, mingled among clay and dark sooty soil, and from the appearances, especially at the north-west corner, the hypocaust may possibly have been located in the vicinity.

Occupying the north side of a street 35 feet wide, separating it from the last mentioned, is a building (No. 10), 106 feet in length, and with a frontage of 20 feet. It has evidently been of great strength, as it has eleven buttresses, each about 3 feet broad, at regular intervals along both side walls. No division wall could be traced, but remains of built flues, at a lower level than the foundations, with the accompanying black, sooty earth, seemed to indicate a system of heating in the interior.

The building (No. 9) furthest north of the row, placed 50 feet back from the north rampart, also seems to have been exceptionally strong. The lower part is a platform of stone, 10 feet wide, projected into the interior beyond the foundations which rest on it. A remaining part of

the footing of the north wall—considerably deeper than is usual—shows seven courses with scarcements, each course being about 7 inches high and 3 inches projection, giving a width of base peculiar to this building.

Tumbled stones were plentifully distributed about the interior, but no division walls could be made out.

The last building in this division (No. 14) lies 40 feet west of the latter, and overlaps the ends of Nos. IX. and X. In form and size it is an exact repetition of the block No. IV. in the eastern division, except a slight increase of the square portion at the top, the end next the rampart, for a length of 41 feet, being increased in width to 34 feet.

This building lay so near the surface that only the outlines could be traced. There was no appearance of interior walls.

#### SOUTH CAMP.

The only remaining evidence of the existence of the south camp on the surface was an undulation of the ground at the south-west corner, known locally as "The South Castle Dyke." Exploratory excavations showed this to be the remains of a rampart, with a series of trenches to the south of it. Persistent endeavours to trace the plan of the fortifications were considerably restricted by the building operations in progress, but full advantage was taken of the opportunities offered, so that the lines of Castrametation were fairly well made out, the terminations only being not satisfactorily defined.

In the plan (Plate II.) the trenches are shaded brown, and the parts actually exposed are hatched. The connecting unhatched parts are so far conjectured, but are doubtless substantially correct.

One great complication was caused by the occasional meeting with a set of trenches having a different direction to that of the recognised lines of the south camp, but it was early noticed that differences in the filling of the trenches would prove of great assistance in distinguishing between them, irrespective of difference in size and direction. The colour in this apparently older set was a warm brown throughout, and the soil was

compact and contained few relics. In the others the colour was generally very dark. The soil was more clayey, and contained a quantity of stones, besides many relics, among which may be mentioned the two small uninscribed altars of stone, one of which (fig. 4) is in the Museum; the other is preserved by Mr Beatson at Camelon.

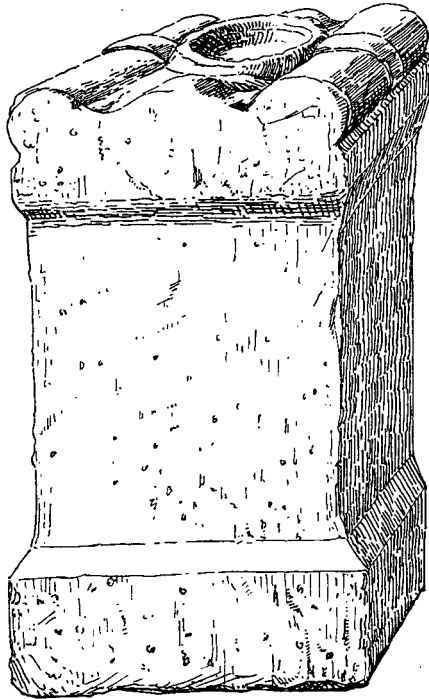


Fig. 4. Small Altar found at Camelon. 4

In a long cutting made by the contractors in excavating for sand, two distinct trenches were observed so contiguous that one appeared alongside of and encroaching on the other, which had been previously filled up. The lines of both were clearly defined by the difference of colour.

*The Defences.*

At the north-east corner the defences approach the south rampart of the north camp, but the connection is destroyed. There are no remains of an inner rampart in the angle formed by the railway and the declivity, but directly opposite, on the south side of the railway, it appears very clearly defined, 20 feet in width.

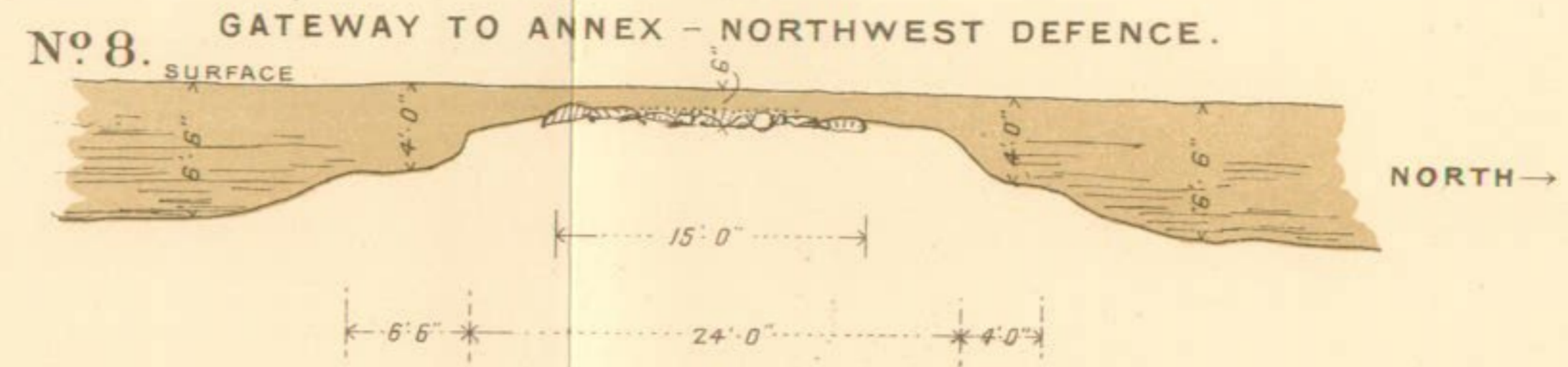
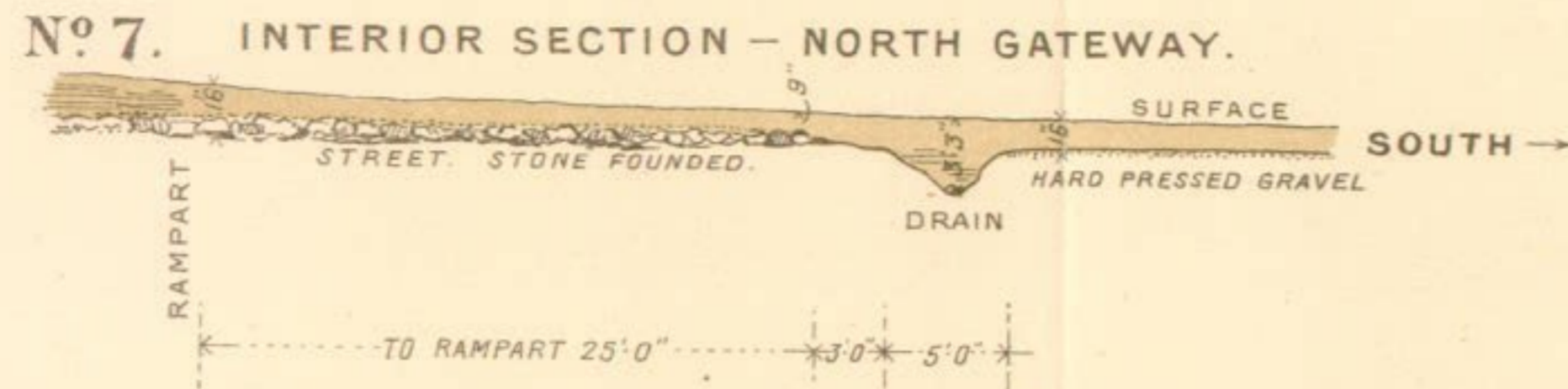
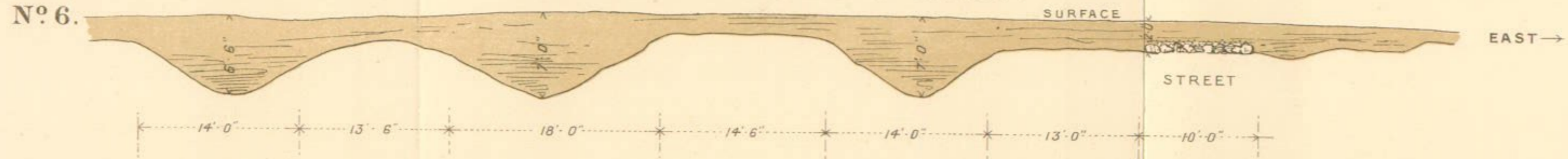
The cutting on the north side of the railway (Plate IV., No. 9) disclosed two trenches, with a wide platform between them, near the centre of which there is a narrow ditch. The inner trench is 18 feet wide, the outer 11 feet. The platform between them is fully 27 feet over. The small ditch, perhaps a palisade trench, is 3 feet wide by 2 feet deep. It is placed about 9 feet beyond the inner edge of the outer trench, leaving a space of  $15\frac{1}{2}$  feet between itself and the inner trench. Southward, on the east side, the steepness of the declivity is greatly reduced; rising with a gradual slope it reaches the level of the camp at the south-east corner. Here the trenches are conspicuously deeper, and they are deepest where they connect with the trenches of the south side.

On the exterior of the rampart, a little to the east of buildings Nos. 17 and 18, a railway cutting for a branch line, made on the south of the original line, exposed a deep hole filled with black, sooty soil, containing broken pottery and collections of animal bones, teeth, and pieces of deer horn. In many cases the bones formed layers, and were much decayed, while the teeth and horn were well preserved. The original railway line probably obliterated further evidence of these remains.

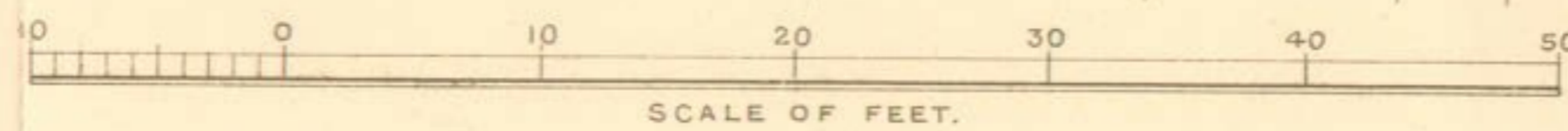
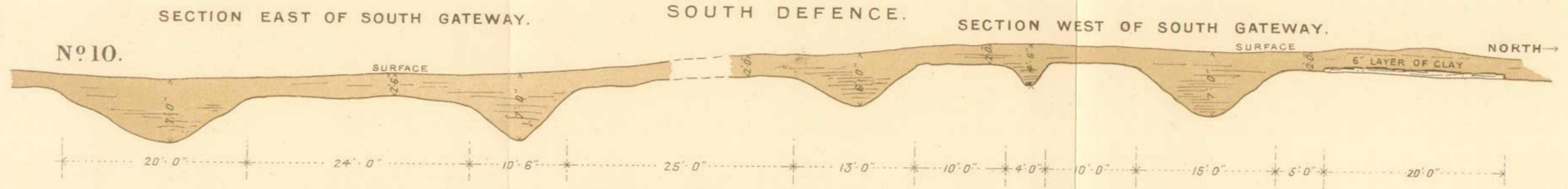
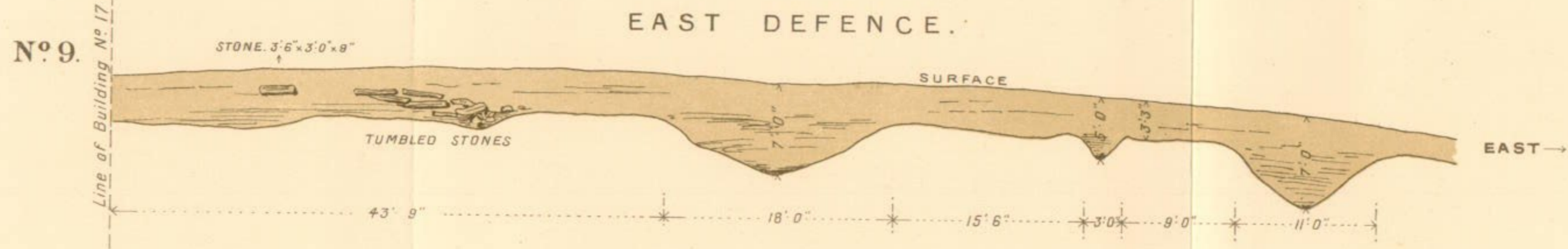
Closer to the rampart lay several large dressed stones, about 2 feet square, and others having sunk channels on two opposite sides, evidently intended for clamping together. One of the latter (fig. 5) had the channels returned round one end for about 4 inches, where they terminated, the remainder of the end being hollowed out into the shape of a segment of a circle. These remains, with the close proximity of a 15-foot stone-paved street, seem to indicate that between the

# NORTH STATION.

## SECTION OF TRENCHES IN ANNEX.



# SOUTH STATION.



buildings 17 and 18 there had been an exit through the defences, the site being now occupied, perhaps, by the railway, and as the position is near the top of the incline leading to the low ground, a gate near this would be the most direct access to the river Carron; such an access seems all the more necessary, as no wells were found within the camps.

On the south and west sides of the camp the trenches are increased to four. On the south (Plate IV., No. 10) the rampart is 20 feet wide. The base is a bed of clay from 6 to 18 inches thick, showing no stone margin. Only about a foot of the superstructure remains, similar to the surrounding soil, but with more large stones among it. At 5 feet from the outer edge of the rampart is a trench 15 feet wide, followed by a

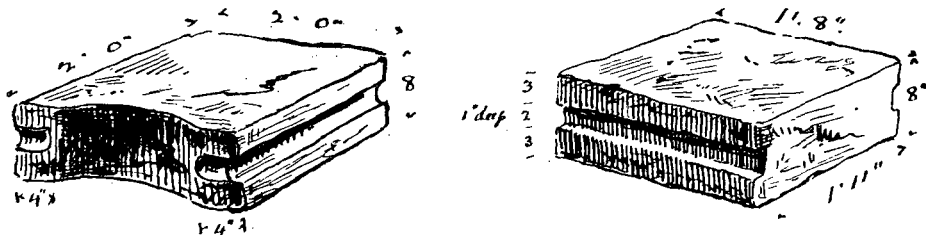


Fig. 5. Channeled or grooved stones from Camelon.

platform 24 feet wide, in the centre of which is a continuation of the "palisade trench." The next trench is 13 feet wide, followed by a platform 25 feet in width. The third trench is  $10\frac{1}{2}$  feet wide, the following platform being 24 feet, and the outer trench is 20 feet wide; the whole series measuring over the rampart 156 feet. It is possible there may be additional defences further out.

On the west side the trenches and intervening platforms are considerably narrower, while the rampart is increased in width to 26 feet, and is bounded on both margins with stonework bedded in clay. This was particularly prominent at the northern end, where it meets the curving corner of the south trench of the north camp, where it stops abruptly.

In the superstructure, sand and gravel predominate, consolidated with clay. The space between the rampart and the first trench is 7 feet, and

the trenches, in consecutive order, measure 11, 13, 12 and 13 feet wide respectively. The intervening platforms similarly measure 8, 8, and 20 feet.

The total width of the defences on this side is, therefore, 118 feet. But to this, perhaps, should be added a fifth trench, 19 feet wide, with a space of 30 feet between it and the fourth trench, which increases the entire width to 167 feet.

This trench (Plate II.) was traced its entire length, as it resembled those possibly belonging to the other series. In position it is the outermost of all, covering the northern half of the west side of the south camp. Leaving the direct line of the other trenches, it curves southward, and gently inward, till it joins with the fourth trench about the centre of the west side. At its north end it turns quickly at right angles, and is soon lost in the railway cutting at this part.

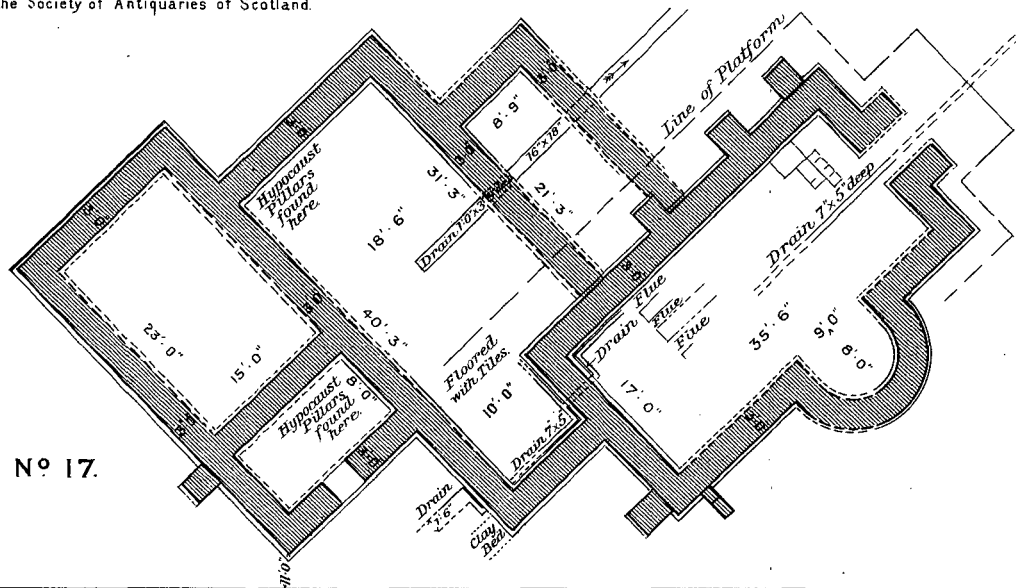
Part of another trench, similar in width, was exposed near where the last terminated on the south, but it could only be followed for a very short distance.

The position of the south gateway is traceable at the junction of the inner street with the military way from the Antonine Wall, the remaining stone foundation being quite distinct. But all the surroundings here are much disturbed, making it impossible to obtain reliable evidence regarding the construction of the gateway.

The position of the west gateway was searched for, in continuation of the cross street of the interior, but all endeavours to locate it were of no avail. The trench nearest to the rampart is carried undisturbed across its supposed position; the second trench terminates a little to one side of the street; of the others, no finish could be traced. Opposite the street and beyond the first trench were many disturbed stones, but they suggested no arrangement, and with these all the evidence ceased.

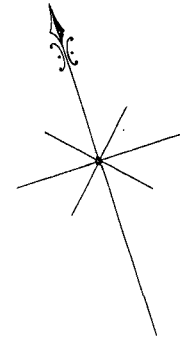
The length of this camp from north to south is 540 feet, the width at the north 610 feet, and at the south 690 feet—internal measurement—giving an enclosed area of  $8\frac{1}{17}$  acres.





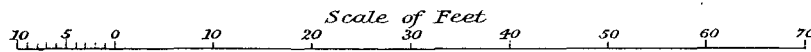
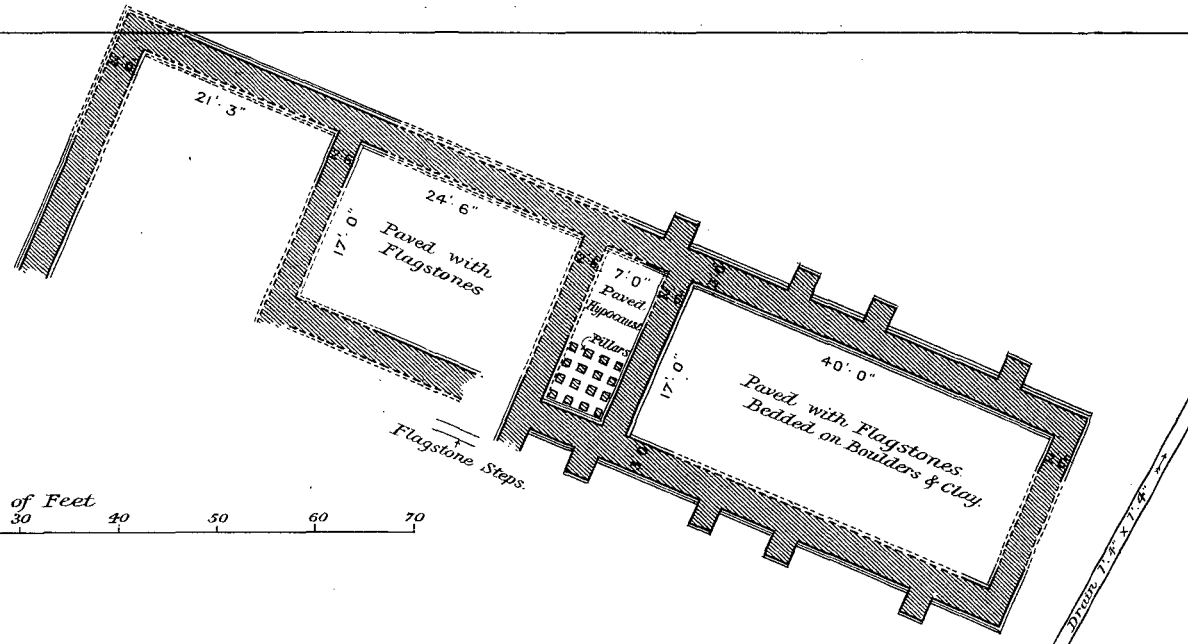
No 17.

SOUTH STATION  
PLAN OF BUILDINGS  
Nos 17 & 18.

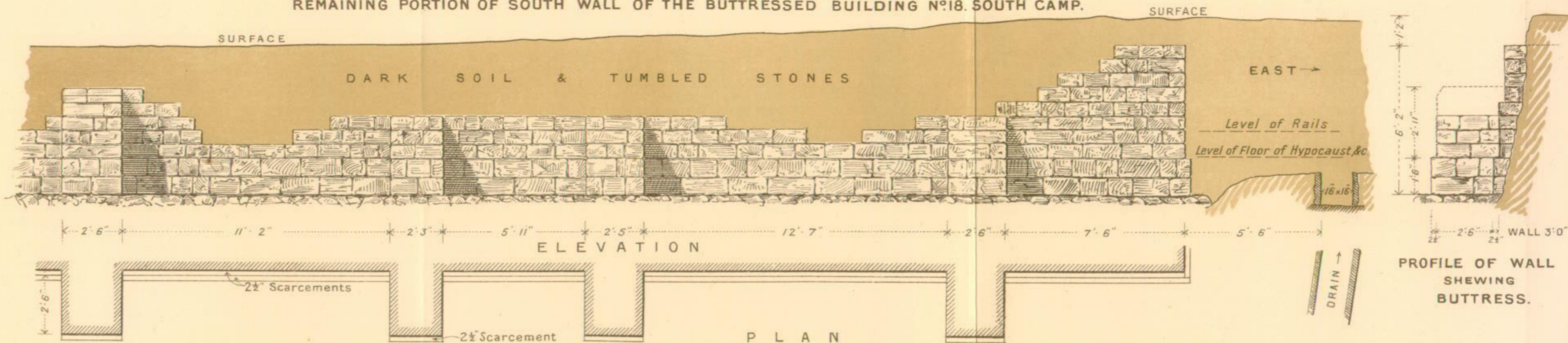


N. B. RAILWAY.

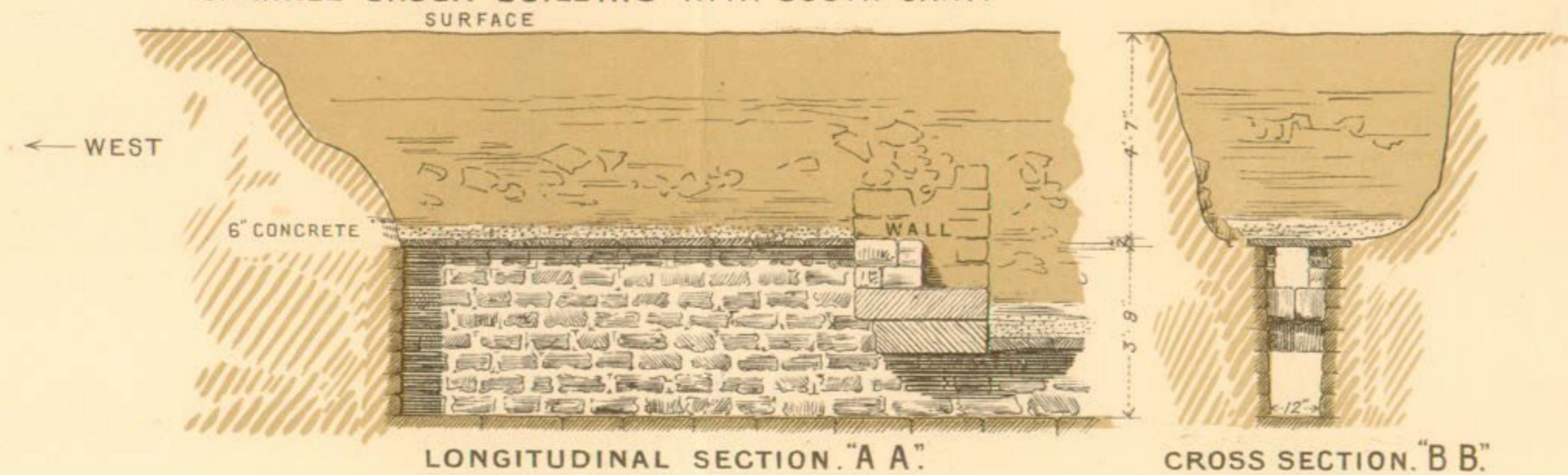
No 18.



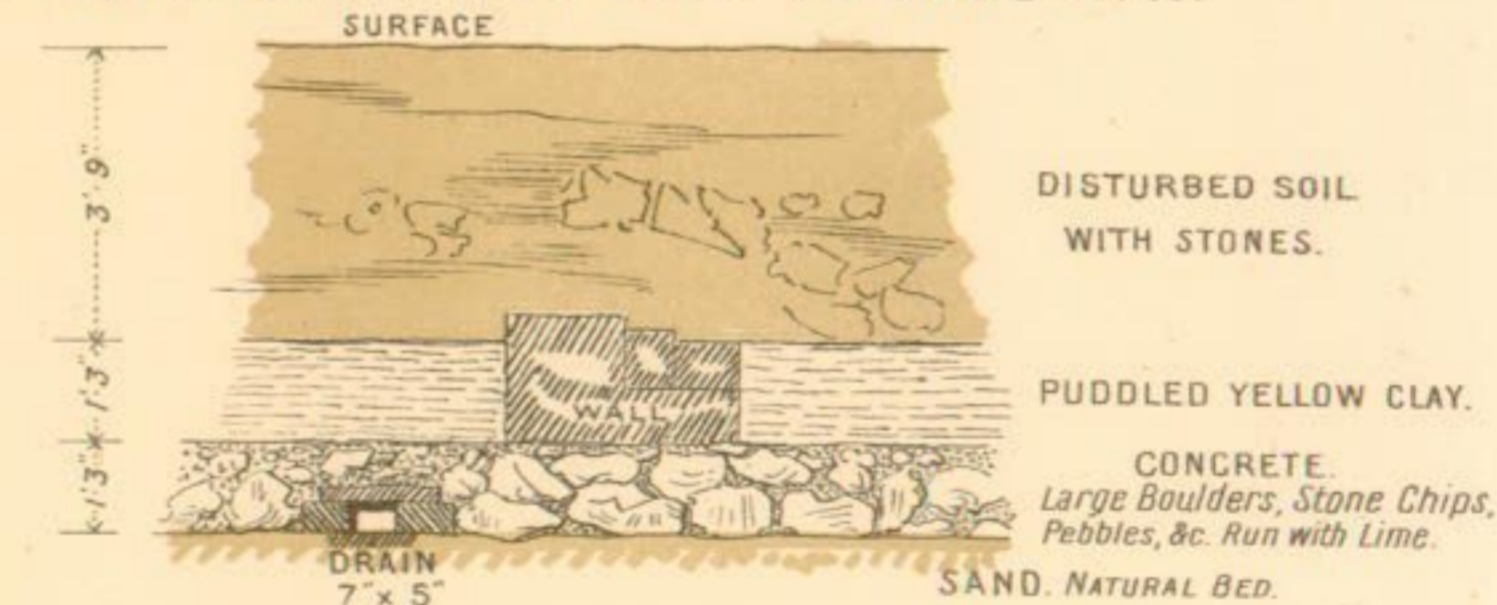
REMAINING PORTION OF SOUTH WALL OF THE BUTTRESSED BUILDING N°18. SOUTH CAMP.



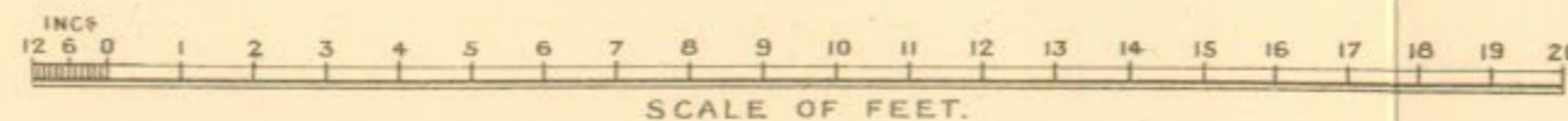
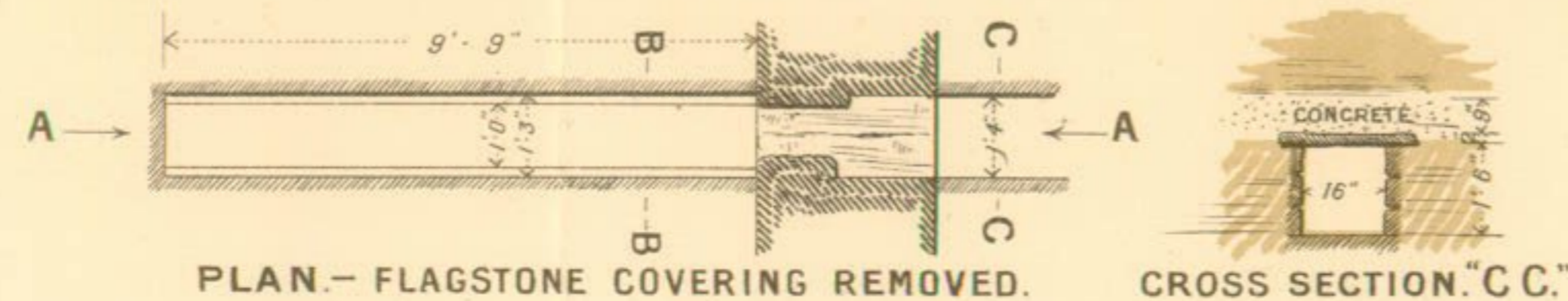
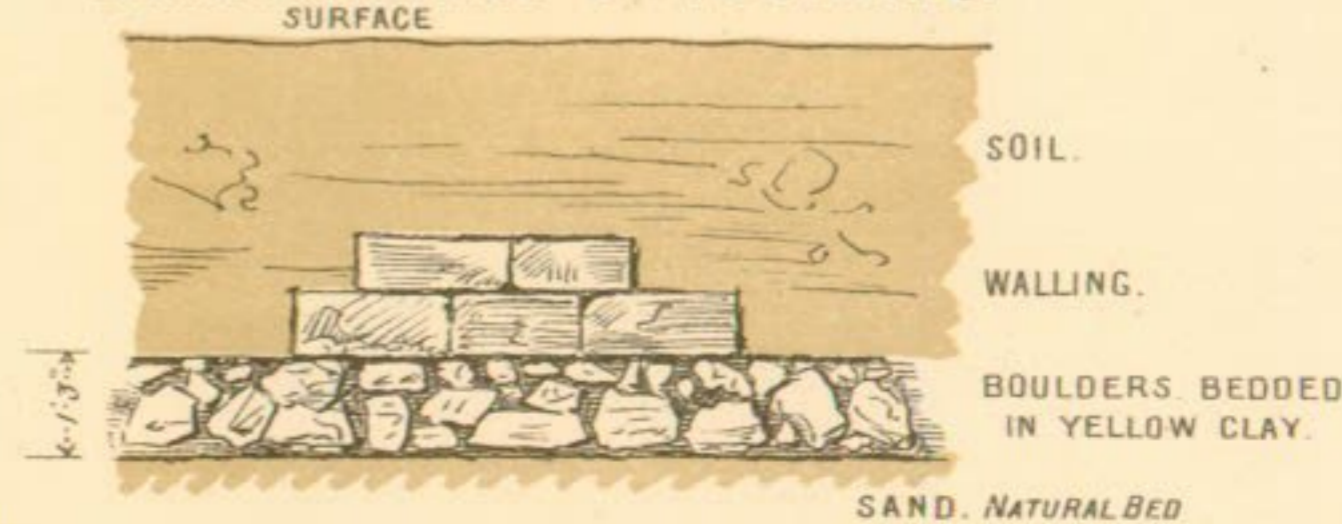
CHANNEL UNDER BUILDING N°17. SOUTH CAMP.



FOUNDATION OF EAST WALL. BUILDING N°17.



COMMON METHOD OF FOUNDING.



*Streets.*

Two well-made stone-founded streets were traced in the interior—one leading north and south, the other crossing it going east and west, both 15 feet wide. The former is a continuation of the main street of the north camp, extending nearly in the same direction to the south gate, where it joins the military way from the Antonine Wall. The latter crosses the camp in the opposite direction, from the vicinity of the building No. 17, till it approaches within a few feet of the west rampart or possible gateway.

*Buildings.*

Evidence of several buildings was found throughout the camp, either in the excavations conducted by the Society, the operations of the Railway Co., or in digging foundations for the new foundries. Only four could be thoroughly examined. A few of the remainder appeared to have been of the same class as these, the stones being squared and bedded as usual in clay. Other buildings, however, were met with, rudely constructed of natural boulders, some among a mass of red friable clay, all in a confused jumble.

One distinguishing feature of the south camp was the depth of the buildings under the surface. In the north camp only the lower part of the foundations existed, and even these lay very near the surface. In this camp, in more than one instance, they were at a depth of 8 feet, and the walling was consequently higher. The stonework was also more carefully finished, and the surface finely marked with diamond, herring-bone, and other patterns. The height of the courses seldom exceeds 7 inches. The length of the stones varies slightly, but in general it is 12 inches.

Building No. 18, Plates V. and VI. The courses of the walling are of the usual height, with frequent use of stones longer than those generally found. Also, the foundation stones are above the normal size, and the setting is more regular.

The joints of the outer walls are filled with sand, moist, and similar in kind to that around them. No lime could be traced. In the lower courses of the division walls the interstices were always found to be closed with puddled clay.

The south wall of this building, Plate VI., is a beautiful piece of masonry, strongly and carefully built, rising at the east corner to a height of 6 feet 2 inches above the boulder and clay footing.

The total length of the block is 106 feet over walls. The eastmost chamber is 40 feet in length and 17 feet wide. The side walls are 3 feet thick, strengthened at intervals by buttresses 2 feet 6 inches square. At the west end, divided off by a wall 2 feet 6 inches wide, is a small chamber, 7 feet wide, in which were exposed a series of hypocaust pillars. They stood in four rows, four pillars in each row, along the south end of the chamber, with broken pieces of several others.

Each pillar (Plate III.) is a solid stone, 30 inches in height, roughly squared to 9 inches on top and bottom, the centre portion being hollowed out 2 to 3 inches, making it rounded at this part. They are placed about a foot apart.

Plentifully distributed among the soil were fragments of flagstones and broken clay tiles — about 2 inches thick — probably remains of the covering.

The adjoining chamber on the west,  $24\frac{1}{2}$  feet long and 17 feet wide, has the flooring on a higher level, but it was in a very disturbed condition.

Close to the hypocaust in the south wall is a door from which a stair, with only two steps remaining, leads outwards and upwards (Plate III.).

The clear tread of the lower step is 12 inches, a further 12 inches being under the one above it, which is 7 feet in length and 2 feet 6 inches in breadth, and appears to be on the wheeling of the stair. The foundation is of concrete, and both steps are laid on a thick bed of clay.

The floors in all the chambers are paved with flagstones 2 to 3 feet square and about 2 inches thick, laid on a bed of clay 2 inches thick, on top of a mass of boulders and clay 12 inches deep. The hypocaust pillars rested on the flagstone pavement.

Beyond the east gable, about 5 feet 6 inches, is a stone-built drain (Plate V.), 16 inches square internally, the sides and bottom of slabs 4 inches thick, without any covering stones.

It angles away from the line of buildings in direction north-east. Near it a block of concrete, fractured in large pieces, lies closely together where it had evidently fallen. It is a mixture of stone chips and pebbles, with pieces of red tile run solid with lime.

In the vicinity of the building many relics were obtained, chiefly pieces of pottery, including Samian ware and Amphoræ.

Coins of Hadrian and Nero, and the front portion of a broken polished stone axe, were taken from the disturbed soil outside the north wall.

The building No. 17 (Plate V.) is adjacent to the last, but at a different angle.

Although deep under the surface, the plan was obtained without much difficulty, as most of the walls still stand 3 to 4 feet high. The foundations of one or two that have been destroyed are still so distinct that the connection is clearly traceable.

The principal compartment faces the south, is  $35\frac{1}{2}$  feet long and 17 feet wide, and the walls 3 feet thick. On the southern front is a bold semicircular apse, projected outward 8 feet, which differs from the apse in the north camp in this, that the main wall is not carried across the base of the apse.

The entrance is in the centre of the east wall, and is flanked on both sides by projections formed of large square stones.

The north wall has three buttresses, each 3 feet square. Two of them, directly opposite the junctions of the apse with the south wall, are original; the third, and two others on the north-west corner of the block, have evidently been applied subsequently, as they are built against, and not attached to, the walls.

Under the whole area, projecting beyond the walls, is a platform of concrete, 15 inches thick, of boulders, sandstone chips, and pebbles, run with lime, under which, near the entrance, was a 7 by 5-inch stone-built drain, directed to the outside through the doorway.

On top of the concrete, and filling almost the whole interior, is a level bed of puddled clay. On it, near the doorway and against the north wall, a few flagstones remained, suggestive of a floor. In a portion at the west end the clay is omitted for a length of 8 feet. The top of the concrete had apparently been utilised as the floor of a separate division, in which are the openings of three stone-built flues, that extend for a few feet in the direction of the length of the compartment, then are obliterated. In the precincts of the openings were several broken hypocaust pillars.

About a foot below the level of the floor, in the north-west corner, is a 7 by 5-inch stone-built drain, which passes through the west wall. There it is joined by another of the same size in an adjoining block. Crossing this it again passes the wall further west, and after taking a quick turn northward for a few feet joins with a large outside drain 18 inches square, stone-built and covered. These drains had no connection with the drain in the first block, and run in the opposite direction.

Connected with the last on the north-west angle is another compartment, the interior size of which is 40 feet 3 inches by 18 feet 6 inches. The small portion at the south end, with the drains in it, had evidently been paved with tiles, but the main portion of the flooring is of flagstones, upon the usual clay and boulder foundation, the top of the pavement being 3 feet 3 inches above the bottom of the found.

Among the débris at the north end were many broken hypocaust pillars, but no evidence of flues was obtained.

About the centre there is a deep stone-built channel (Plate VI.), which, if intended for drainage, had no connection with the compartment in which it appears.

Crossing the building it is carried through the east wall and continued at a reduced size through the adjoining compartment to the outside.

Its after-course was determined by the presence of a lot of disturbed flat stones at the first trench of the east defence. Where it begins in the interior of the building it has a depth of 3 feet 9 inches, and is 7 foot wide at the bottom, tapering to 15 inches at the top, which is

covered with flagstones ; over this there appears to have been a coating of concrete of several inches. Its length in the first compartment is 9 feet 9 inches. As it passes under the east wall it is reduced in height to 18 inches, with a uniform width thereafter of 16 inches.

Beyond the wall the covering stones have a layer of concrete 9 inches thick over them. The deep channel is built in eight courses of small stones, none of them much larger than a present-day clay brick.

Here there was a unique employment in the buildings of Camelon of lime as a mordant—lime, almost pure, very hard and dry, and unaffected by its long subterranean burial. All the joints are carefully pointed, the lime being spread flat, as if with a trowel or some similar tool, but no lines are drawn on it.

It presented, when first opened, a fresh appearance. Only on the bottom was there a thin light-coloured deposit, scarcely detectable, except close to the sides, and likely to have dropped from the lime on the walls.

The walls themselves were clean and white, as if lately built. This was all the more striking, as only in one other instance was there definite evidence of the use of lime in any of the walls remaining, such being inferred from the absence of clay, as clay remained perfectly evident in every situation where it had been applied.

This splendid piece of ancient workmanship apparently owes its good condition to preservation from atmospheric influence and the absence of water, the soil round about it being a fine-grained sand of great depth.

The small compartment on the east, 21 feet 3 inches by 8 feet 9 inches, appeared to be a later addition, but it is almost entirely destroyed.

The westmost compartment is in two divisions, a 3-feet wall separating a chamber 23 feet long by 15 wide from another 8 feet by 15 wide. On the outside, opposite the division wall, a buttress has been added, evidently at a later period, as it has no connection to the wall. In the smaller chamber were broken hypocaust pillars, and in the centre of the south wall a doorway, 3 feet wide, with a flagstone step, not much worn. Very little of the walls remains ; the jambs of the door rest upon the

stone sill, which is projected under them about a foot on either side of the doorway.

In the compartment with the apse was found the stone shown in fig. 6 marked XX.V.V.F., and several others, some flat and some curved, on which a moulding with a bold torus bead was formed, and many of the wall stones were marked with the herring-bone pattern.

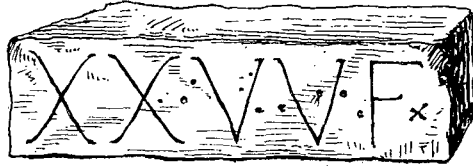


Fig. 6. Stone with title of the twentieth legion found at Camelon.

The building (No. 16, Pl. II.) is 13 feet square internally, with walls 3 feet thick. It is somewhat higher founded than the adjoining buildings, except at the north-west corner, where it appears to have had a connection with a deeper building now destroyed. There is the appearance of a disaster here. A portion of the north wall seems pressed outwards, leaving an opening between it and the remaining west wall, and it lies face downwards at an acute angle, but still retaining connection with the remainder of the wall standing vertical. A deep-sunk pit at the corner may have caused the subsidence, but what the pit is could not be ascertained.

Another stone-built drain, 18 inches square, was crossed about 40 feet north of building No. 17, trending in an easterly direction, but it was not followed up. Further north are the few remaining walls of a building (No. 15, Plate II.), founded in clay and boulders, built with the usual stones, and with an exceptional kind of flooring, consisting, for a surface of fully 10 feet square, of hard pounded clay, of a beautiful red colour, the clay appearing to be mixed with pounded tiles.

In the bottom of the adjacent deep trench several flooring tiles were found, about  $1\frac{1}{4}$  inches thick and fully 10 inches square.



This part of the station furnished the greater part of the relics obtained —lamps, bronzes, enamels, various coins, and different kinds of pottery ; and among stones more or less ornamentally treated, two small altars and the legionary stone ; also many channelled or gutter stones similar to that shown in fig. 7.

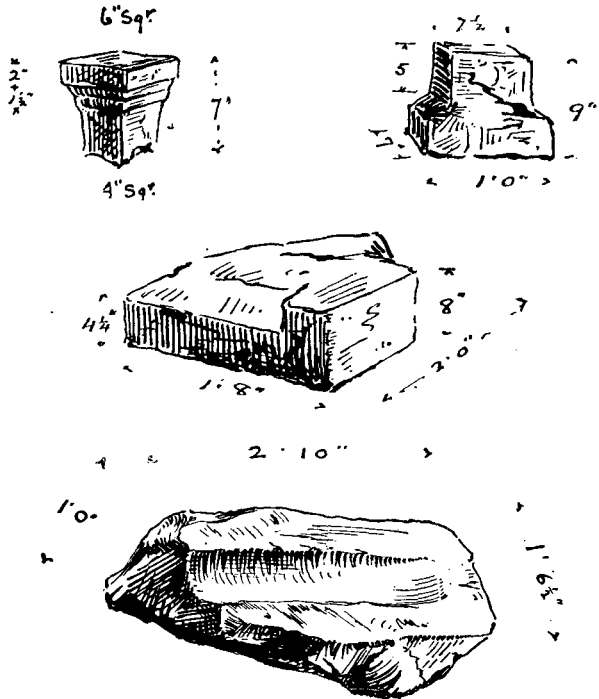


Fig. 7. Stones ornamentally treated and gutter stone found at Camelon.

The evidence gained of the work and relics, as here recorded, mark Camelon as a prominent post, a long-maintained centre of Roman activity.

During the progress of the Society's work at Camelon, one of the oldest buildings in the village was demolished. In the walls were

many of the roughly squared stones with which we were becoming familiar at the station, besides the two carved ones here illustrated. No lime had been used in the building, the substitute being a clayey loam.

This dwelling house was occupied up to the last by descendants of the original owners, who were well aware of the location of the "ornamental" stones, although hid under many coatings of white wash.

It is to these that Nimmo refers in his *General History of Stirlingshire*, 1777 edition, as follows: "A few years ago, two nicely cut and

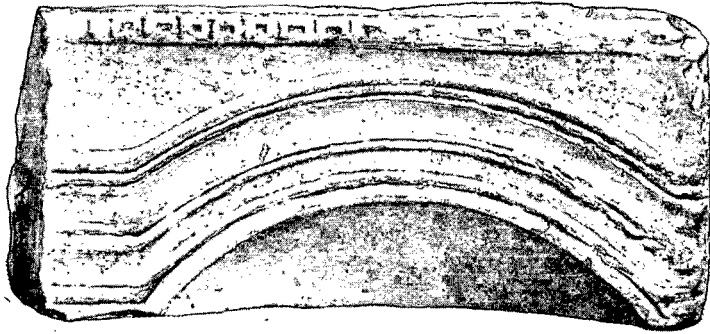


Fig. 8. Stone from a cottage at Camelon. ( $\frac{1}{12}$ .)

carved stones were discovered, which are now built up in the front of a dwelling house, in the village of New Camelon, which hath lately been reared up, a little to the eastward of the old Station."

The stone (fig. 8) has been removed to his new residence by Mr Harrison, the representative of the family who has always taken an interest in its preservation. It is 3 feet 6 inches long, 1 foot 6 inches in height and 1 foot 3 inches deep, and seems to have been the frieze over a niche. The moulding is made to take the shape of an arch, occupying the greater part of the length of the stone, the underside being hollowed out to form a coving.

The stone (fig. 9), 3 feet 0 inches long, 1 foot 6 inches high and 1 foot 2 inches deep, is clearly part of the same structure as that shown in fig. 6. The mouldings are identically the same, and make continuation with each other. It is preserved at Falkirk by Mr J. R. MacLuckie, F.S.A. Scot.

The writer is indebted to a few friends for much valued guidance and assistance, and with the greatest pleasure he acknowledges their help:—

To Mr J. R. MacLuckie, F.S.A. Scot., for practical guidance and

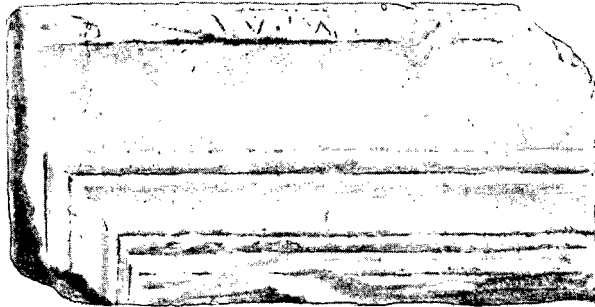


Fig. 9. Stone from a cottage at Camelon. ( $\frac{1}{12}$ .)

direction on the spot, drawn from his store of information acquired by extensive study and a long acquaintance with the subject;

To Mr R. Beatson and Mr D. M'Lay, sen.—long resident in the neighbourhood—whose local knowledge and acquaintance with previous operations in the vicinity were of the greatest assistance;

To Mr James Strang, jun., architect, for carefully plotting the levels and preparing the profile of the camps—a work of primary importance;

And to my young friend, D. M'Lay, jun., who, with enthusiastic ardour, for fifteen months was a constant and helpful assistant, enabling a more complete series of measurements to be obtained than otherwise would have been possible, in the spare time, during which the work had to be done.