

CHAPTER II

The Fort and its Defences

Various Occupations

AT a comparatively early stage in the investigation of the fort, it became clear that there were at least two occupations to be reckoned with, and that the fort whose defences were first encountered had been partly built above another fort which was smaller in size, and therefore earlier in date. The evidence regarding the successive periods of occupation will be discussed in detail later. In the meantime it is sufficient to point out that we have really to deal with two forts, somewhat different in outline,—an early fort that probably witnessed only a single period of occupation, and a somewhat larger fort which bears unmistakable marks of having undergone considerable change and alteration from time to time while it was still in Roman hands. Among the forts already excavated in Scotland, Birrens, Camelon, Rough Castle, and Ardoch, as well as possibly others, have yielded evidence that is suggestive of more than one occupation. The plan of Bar Hill alone shows two distinct systems of fortification. One feature which the early forts at Newstead and Bar Hill have in common is a certain irregularity in the plan of their defences. This at once distinguishes them from the type of *castellum* so common on the German Limes, with its long straight ditches following the line of the walls, and its gates with flanking towers. The difference is typical of the change from earthen ramparts to walls of stone. Many of the devices employed by the earlier engineers must have been rendered unnecessary when stone walls with battlements took the place of mere mounds of earth. And so it is that continental parallels to the original *castella* at Newstead and at Bar Hill must be sought in works which are older than the close of the first century of our era. The ditches that guarded the Agricolan fort at Bar Hill recall those that protected the

north gate of Caesar's lines round Alesia.¹ Similarly, the earthen fort of Hofheim,² irregularly nine-sided, was occupied from about A.D. 40 to 60, and Waldmössingen,³ irregularly four-sided, likewise dates from the first century.

Defences of the Early Fort

The early fort at Newstead covers, with its defences, an area of 11.97 acres. It was protected by an earthen rampart and ditches. The sections cut through the line of this rampart gave as a rule little information as to its character. For the most part, it doubtless consisted of the earth from the ditch piled up and beaten into a hard mass. This, however, had been thrown back again, when the later fort was built.

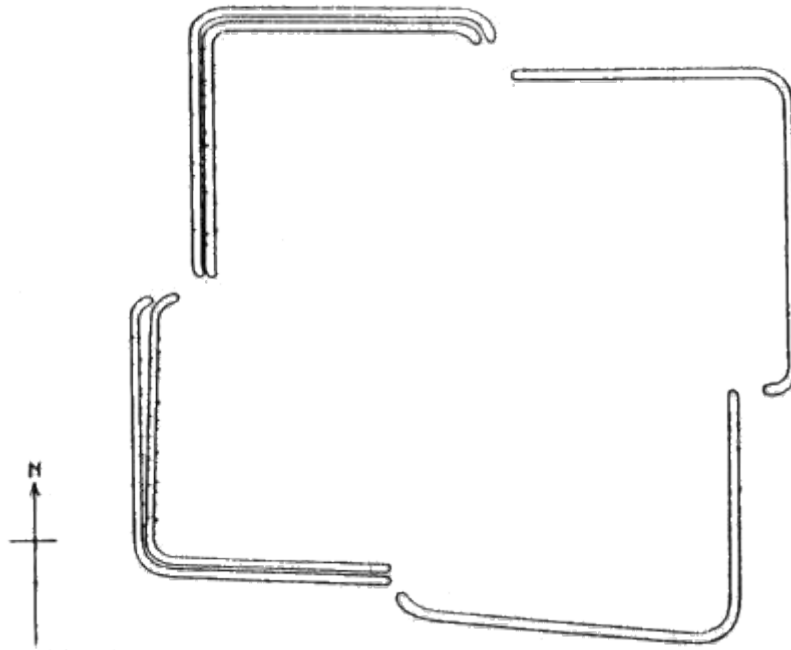


FIG. 1 PLAN OF EARLY FORT

Only on the west front, where probably the ground was softer, was more satisfactory evidence forthcoming. There the sections made towards the south-west corner showed under the later rampart a system of construction which appeared to belong to the earlier one. At a depth of six feet from the modern surface a band of paving five and a half feet wide was found lying on the edge of the inner ditch. It was composed of blocks of red

1 Napoleon III., *Histoire de Jules César*, Atlas, pl. xxviii.

2 Ritterling, *Das frühromische Lager bei Hofheim*, p. 23.

3 *Der Obergermanisch-Raetische Limes*, Lief. 6, Kastell Waldmössingen.

sandstone roughly squared with the hammer. Behind it for a width of seventeen feet were two parallel lines of oak branches laid close together at right angles to the ditch. Eight feet from the front of this layer of branches and eighteen inches above them was a single line lying in the same direction. From the front of the upper line other branches could be noted sloping down to the front of the lower line, but these were not placed so carefully as the horizontal layers. All over, the average thickness of the branches was from two to three inches, and some of them appeared to have been split.

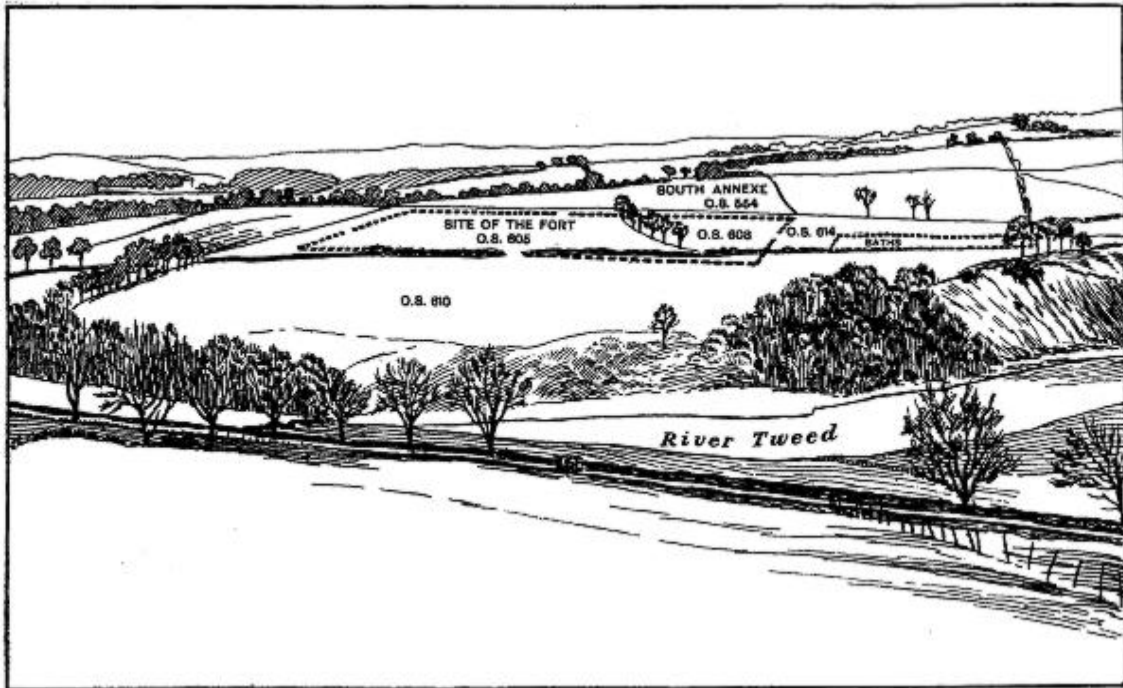
We have here perhaps an example of something akin to the *cervoli*, or tree trunks with branches attached, which Hyginus prescribes for the base of a rampart of turf, where from the nature of the soil the sod breaks because of its excessive softness, and a fosse cannot be made without the sides tumbling in,¹ a method of construction of which we have an example in the Fort at Coelbren, in South Wales, which probably dates from the first century.² The section did not disclose any quite definite distinction between the outline of the earlier rampart and the clay forming part of the rampart of the enlarged fort subsequently placed above it. But on the side towards the ditch a darker band of colour seemed to indicate that the earth from the ditch below had been thrown on the top of the layers of branches. What further defence, if any, was added to the rampart and ditches we cannot tell. On the south side the sockets of large posts were met with in three places on the line of the rampart behind the ditch of the early fort, and it is possible that these may have been foundations of a palisade.

In front of the rampart were the ditches. A double line of them ran round the western half of the fort, but round the eastern half the line was only single. They were from four to five feet in depth, and nine to ten feet in width. All were of the ordinary V-shape, which was commonly used by the Romans. Much the most interesting point connected with them was the evidence they furnished as to the gates. Examination proved that they were not continuous, there being a clear break at each of the four entrances. Moreover, in all four cases, the ditch on one side of the passage was some forty feet in advance of the line of the corresponding ditch which advanced to meet it from the other side, while the extremity of the line that lay furthest out was curved inwards so as partly to cover the

¹ *Liber de Mun. Castr.* c. 51.

² *Archaeologia Cambrensis*, vol. vii. 1907, p. 129.

PLATE V. SITE OF THE FORT



The view is taken from the high ground on the north bank of the Tweed overlooking the Site of the Fort which is indicated as a rectangular enclosure formed by a dotted line. The smaller enclosure also indicated by a dotted line is the Site of the Baths.



opening. This arrangement suggests that the gates themselves were placed at right angles to the ramparts, just as they were in many fortified works of the Middle Ages. In Germany the nearest approach to the contrivance just described is to be seen in the earthen fort at Hofheim.¹ A further distinction between the Newstead gates and those generally found in Roman forts is that they were not placed directly opposite each other, a peculiarity which can be paralleled from the camp of Kneblinghausen in Westphalia. This interesting enclosure, which was excavated in 1902, has the shape of a somewhat irregular parallelogram with rounded corners. None of the entrances are exactly opposite one another, and those on the north and south bear much the same relation to each other as do the corresponding entrances at Newstead.²

Of the early fort as a whole, it may be said that nothing exactly resembling it in plan has yet been found in Scotland, nor, apparently, in Germany either. We are told that Agricola himself used to choose the sites of his camps, and that no general ever showed greater ability in the selection of suitable positions. No fort which he built, we are assured, was ever carried by storm; none was ever surrendered or abandoned by its garrison.³ One cannot help surmising that possibly we have in the Newstead plan an example of his skill in fortification. The protection of the entrances was a problem on which the early builders of towns and forts seem to have lavished much ingenuity. They did what they could to secure that the gate should be safe from the full force of a direct attack; they sought to compel the advancing enemy to expose his right flank, that is, the side unprotected by his shield; and they endeavoured to arrange that the defenders should be able to ply him with missiles in the rear.

In the fortifications of Mantinea in Greece, for instance, dating from about B.C. 320, there were seven gates each constructed on a slightly different plan with overlapping walls, towers, and other devices to make attack difficult. In most of these the entrance was placed at right angles to the line of the wall in the same relative position that the gates of the early fort at Newstead bore to the ramparts.⁴ At Bar Hill the early

1 Ritterling, 'Toranlagen römischer Kastelle,' Fig. 8.

2 Hartmann, 'Das Römerlager bei Kneblinghausen,' *Mitteilungen der Alterthums-Kommission für Westfalen*, Heft iii. p. 101, Taf. xix

3 Tacitus, *Agricola*, c. 22. 2; cf. c. 20. 2.

4 Rochas D'Aiglun, *Principes de la Fortification Antique*, p. 80.

fort had a single gateway; but to reach this it was necessary to penetrate the outer defence at a point further to the north or south, and to pass round behind the double ditch cut in front of it. Thus, no assailant could avoid presenting his uncovered side to the defenders on the rampart. Hyginus prescribes a somewhat simpler, but equally effective, device for the protection of the gates of a camp.¹ It was known as the *clavicula* or 'bolt.' As the wall or rampart approached the entrance from the left side it suddenly curved inwards, as if to form a semicircle with the wall or rampart coming to meet it from the opposite side. But the semicircle was not completed. A gap wide enough to allow of a gateway remained open. The result was that the attacking party were forced to operate in a comparatively narrow space, and to expose their right sides to the concentrated fire of those on the rampart above them. This contrivance was employed by Caesar at all five gates of his camp on the Aisne,² and it is also to be seen at Kneblinghausen, where indeed it is an indication of the early period to which the camp belongs. Something of the same idea underlies the Newstead plan. The effect of the way in which the entrances were arranged was to narrow down the space in which the enemy could operate, and to make the attacking force pass immediately in front of the defenders with its right flank turned towards them.

The Abandonment of the Early Fort

The early fort seems to have been abandoned after a period of occupation which, though perhaps of no very great length, probably covered several years, to judge by the amount of material which had gathered in the ditches. That on the west side contained an accumulation of some four to five feet of black silt, from which a varied collection of broken pottery, metal objects and leather was obtained. A curious feature here was the occurrence of regular black lines in the filling. A typical section was one taken at the south-west angle where the ditch bends to the south, and where it underlies the rampart of the later fort. At this place the total depth from the modern surface was twelve feet two inches. The uppermost five and a half feet consisted of the clay of the later rampart. Within the next three feet, nine parallel black bands, about four inches apart, crossed the deposit horizontally. Below these, for a thickness of three feet eight inches, was the usual brown vegetable silt. The black bands at first gave the impression that they had been caused

¹ *Liber de Mun. Castr.* c. 55.

² Napoleon III., *Histoire de Jules César*, Atlas, pl. ix.

by periodic vegetable growths during the gradual silting up of the ditch after the abandonment of the fort.

In the circumstances expert opinion was obviously desirable. The material was accordingly submitted to Mr. Francis J. Lewis) of the University of Liverpool, and to Mr. Robert Campbell, B.Sc., of the Geological Department of the University of Edinburgh. The results of their examination were unfortunately indecisive. Mr. Lewis came to the conclusion that there was no evidence that the alternations of clay and peat represented annual growths. The regularity and the thickness of the clay between the bands of peat, as well as the frequent occurrence of fragments of pottery, seemed to be against that theory. It looked as if the peaty matter had not been formed *in situ*. On the other hand, the black lines did not appear to represent strata of turf used in filling up the ditch, since they were proved to consist of peaty wash and mosses. The silt was probably rather the sort of deposit which might be found in a ditch flooded by a strong rush of water, at certain intervals, by artificial agencies. If this view be right, there is no alternative but to suppose that the silt and peaty bands were laid down during the actual occupation of the fort. Mr. Campbell, who was fortunately able to examine the deposit on the spot, agreed that the peaty beds had not grown *in situ*. At the same time a careful scrutiny of the material seemed, in his opinion, to negative the idea of sedimentation by stream action, and he was inclined to consider that the ditch must have been filled up by artificial means.

The curious stratification of the west front had no parallel in that portion of the ditch excavated on the east. For the most part, the same is true as regards the south. This was doubtless due to the fact that, owing to the higher level of these ditches, the water from them would gravitate towards the west, which formed the lowest point of the system. Nor was there in the upper part, where it had been filled by the overlying clay of the later rampart, any sign of the growth of hazel and whin along the sides after the abandonment, such as was noted at Bar Hill. The evidence from the ditch, so far as obtainable, thus favours the opinion which subsequent discoveries of pottery suggested, namely, that the abandonment of the early fort was immediately, or at no long interval, followed by the construction of the later one.

The Evolution of Roman Forts

In Germany, along the Roman frontier line or *Limes* that ran from the Rhine to the Danube, there are many forts in which excavation has revealed

more than one distinct system of fortification, and where we can trace an early fort, defended by earthen ramparts, passing through a gradual process of evolution in its defences into something larger and stronger. The Saalburg, for instance, has been more which probably carefully investigated than any other Roman work in Germany, presents evidence of no less than six periods of occupation.¹ Similarly, at Kapersburg² we have three successive forts occupying very nearly the same ground: the earliest a simple earth fort with a single ditch; the second slightly larger but otherwise much the same, except that the rampart, instead of being simply of earth, had consisted of two parallel dry-stone walls with earth packed in between; the third, again somewhat larger, defended by a ditch and a solid stone wall five feet four inches in thickness. So, too, at Zugmantel³ we can follow three stages in the existence of the fort. In the first it was small in size, and had a ditch and an earthen rampart. In the second stage it was considerably enlarged, while round it there ran a stone wall about four feet thick. Finally, it was still further enlarged, and the surrounding wall was made no less than six feet six inches thick. Illustrations of this evolutionary process can be cited from our literary sources. Arrian, in his *Periplus*, written in the time of Hadrian, describes the fort on the Phasis on the south coast of the Black Sea, a little post garrisoned by some four hundred men and surrounded by a rampart and two broad ditches. 'Formerly,' he writes, 'the rampart was of earth, and the towers planted upon it were of wood. Now both ramparts and towers are made of brick.'⁴ Closely analogous is the well known inscription from Bumbesti in Roumania, commemorating the replacement in stone of the turf walls of a dilapidated fort. The alteration took place in the year A.D. 201.⁵

It is this very process of evolution that we have to follow at Newstead—a simple earthen fort, early in date and irregular in its ground-plan, passing into a later stone-walled fort of what was no doubt a standard type. But although the earthen fort here preceded the stone-walled fort, and is usually found to do so elsewhere, an earthen fort is not necessarily an early fort, nor a

1 H. Jacobi, *Führer durch das Römerkastell Saalburg*, p. 16.

2 *Der Obergermanisch-Raetische Limes*, Lief. 17, Kastell Kapersburg.

3 *Ibid.* Lief. 32, Kastell Zugmantel.

4 Macdonald and Park, *Bar Hill*, p. 31, where the passage is quoted.

5 IMP. CAES. L. SEPTIMIUS SEVERUS . . . ET IMP. CAES. M. AVR. ANTONINUS . . . MVROS CESP[IT(ICIOS)] CASTRORUM COH. I. AVRELIAE BRITTONUM (MILLARIAE) ANTONINIANA VETVST(ATE) DILA[PSOS] LAPIDE EOS RESTITUERUNT PER OCTAVIUM IULIANUM LEG IPSO[RUM] PR. PR. C.I.L. vol. iii. 14485a.

fort with stone walls necessarily a late construction. Other considerations must be taken account of—conditions of permanency, the presence close at hand of the necessary materials, the predilections of individual commanders, and the like. The fort at Gellygaer, for instance, with its rampart faced on both sides with masonry, was probably erected in the first or very early in the second century, while the earthen ramparts of Birrens with equal probability date from a period at least some fifty years later. In the general development of defensive works, no doubt the earthen fort preceded the fort defended by stone walls, but we know for certain that the transition did not take place everywhere simultaneously.

The Later Fort

The later fort at Newstead, inclusive of its defences, covered an area of 20.824 acres. The interior space was 15.716 acres. It is thus much the largest Roman fort yet excavated in Scotland. Birrens measures only about four acres, Camelon and Lyne each nearly six acres, Castle Cary three and a half acres, Rough Castle about one and a half acres, and the later fort at Bar Hill just over three acres. Inchtuthil and the great camp at Newstead have of course a much larger area. But they fall into quite a different category, having been constructed, as we saw above, for another purpose altogether. In Germany the same two main classes are to be noted. Besides the great legionary fortresses like Novaesium and Castra Bonnensia there were many small forts corresponding in their general dimensions to Birrens or Camelon, and holding perhaps a cohort of auxiliary troops as a garrison. Newstead, like a small minority of the German castella, is peculiar as coming, in respect of size, between the cohort camps and those intended to accommodate a legion. There is therefore no doubt that it must have been of greater importance in the scheme of advance than the ordinary frontier-post, whose object was merely to guard a ford, or to protect the line of communications.

The Ditches

The fort itself was of the usual rectangular shape, and greater in length than in breadth, measuring from the inner face of the wall 810 feet in the one direction by 720 feet in the other. The corners were rounded, and the four gates, one in each side, were placed opposite each other. The defences consisted of three parallel lines of ditches, a wall, and a rampart. These had to be planned entirely from sections cut across them, as no trace of their outline remained above the surface. On the north, observations were seriously interfered with by the high-road, which covers the greater part of the line of the fortification. At the north-west corner, however, the

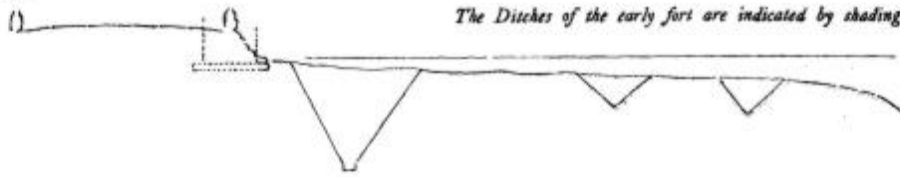
foundations were exposed lying beneath the hedge on the north side, and here the presence of the three ditches underneath the rapidly sloping surface was ascertained. On the other sides nine sections in all were made. In these the black deposit clearly marked the outline of the ditches off from the subsoil in which they had been cut. For the most part they appeared to be V-shaped, scarp and counterscarp lying at the same angle. But in that portion of the inner ditch which was cleared out on the west front, as well as in that which masked the west gate, the sides became perpendicular about eighteen inches or two feet from the bottom, which, again, was about a foot in breadth and quite flat. The same type of ditch was noted at Bar Hill.

In other respects the different sections displayed a considerable want of uniformity. Thus, along the east front the breadth of the berm, or space between the wall and the edge of the innermost of the triple line of ditches, varied from three and a half feet to six feet. To the north of the gate on this side, owing to the deflection of the outermost ditch, the space between the outer face of the wall and the edge of the counterscarp of the outermost ditch measured ninety-three feet, whereas to the south of the gate the corresponding dimension was only sixty-six feet. The normal width of the innermost ditch was here probably about twelve and a half feet, and its depth twelve to fourteen feet, the two outer ditches being smaller and shallower. In the section taken diagonally across the south-east corner, the middle ditch proved to be eleven feet wide by eight feet deep, and the outer ditch thirteen feet wide by nine feet deep. Generally, it may be said that the middle ditch had been less important than either of the other two. Again, the outline of the sections cut upon the south presented one marked point of contrast with those cut upon the east. While the berm remained about the same, the sectional line was much more zigzag in character, a feature which was also noted in some of the ditch sections at Novaesium.¹ It is probable that this was the result of alterations on the original plan.

Lastly, in both of the southern sections, the outer ditch assumed the appearance of two ditches running parallel and separated only by a slight midrib. Whether this is due simply to changes brought about in the course of periodical cleaning, or whether it was part of the original design, is uncertain. Professor Ritterling has explained a somewhat similar arrangement at Hofheim as being intended to facilitate the fixing, in the bottom

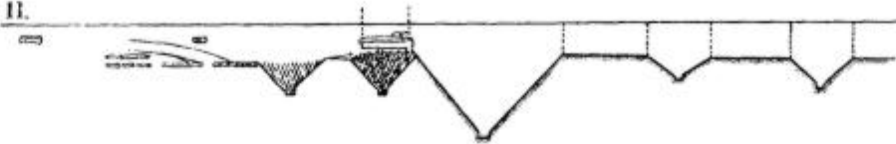
1 Koenen, 'Beschreibung von Novaesium,' *Bonner Jahrbücher*, Heft 111/112, p. 211, Fig. 12.

SECTION I.



The Ditches of the early fort are indicated by shading.

SECTION II.



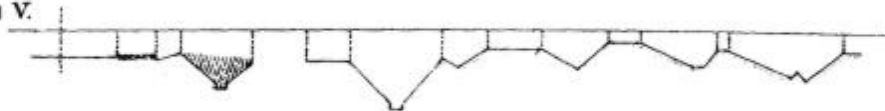
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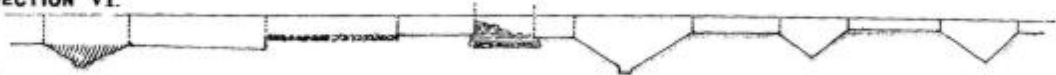
SECTION IV.



SECTION V.



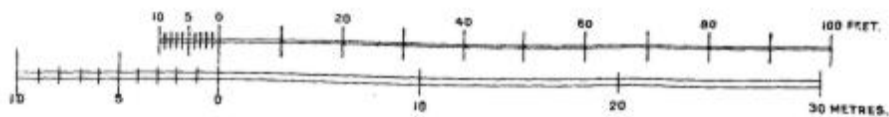
SECTION VI.



SECTION VII.



SECTION VIII.



of the ditch, of a line of branches having their tops pointing outwards, the better to form an obstacle.¹

In front of the east gate—the *Porta Praetoria* of the fort—the roadway passed out on solid ground, but it did not, at least when first constructed, follow a straight line. The inner and middle ditches stopped on either side, leaving a space of about thirty-eight feet between the ends, but the outer ditch on the south side was prolonged so as to cover the gateway, thus deflecting the road to the north, while in its turn the outer ditch coming from the north with its line somewhat bent outward, again altered the course of the road to the south. The space for the track passing between these outer ditches was narrowed down to about twelve feet. On the south side the three lines of ditches were looped together, but this had no parallel on the north side; while running diagonally across the road from the end of the inner ditch on the north to that of the middle ditch on the south, was a narrow foundation trench thirteen inches wide, and carried down to a depth of one foot nine inches in the subsoil, which appeared to have been intended for a palisade or some such wooden barrier. In its complexity the plan recalls that of the east gate at Ardoch, or the earlier phase of the north gate at Lyne. In front of the west gate of the fort and the earlier gates on the north and south, an arm of the inner ditch had originally been carried across the front of the gate, thus forming a barrier closely analogous to the *titulus*, an obstacle whose presence opposite the gates of the great camp further to the east has already been alluded to. According to Hyginus,² the *titulus* was, however, an independent ditch of a length corresponding to the breadth of the gateway, sixty feet in front of which it was to be placed. A typical example from Scotland is the one which guarded the south gate at Bar Hill. In the cases under discussion the obstacle was not a true *titulus*. Although it covered the entrance, much as a *titulus* did, it allowed only a single passage on the left of the exit. Its outline was, in fact, that of an everted *clavicula*.

The portion of the inner ditch extending in front of the west gate was almost entirely cleared out. It proved to be seventy feet in length, seventeen feet wide opposite the gate, and sixteen feet nine inches deep

1 Ritterling, 'Toranlagen römischer Kastelle,' Fig. 10.

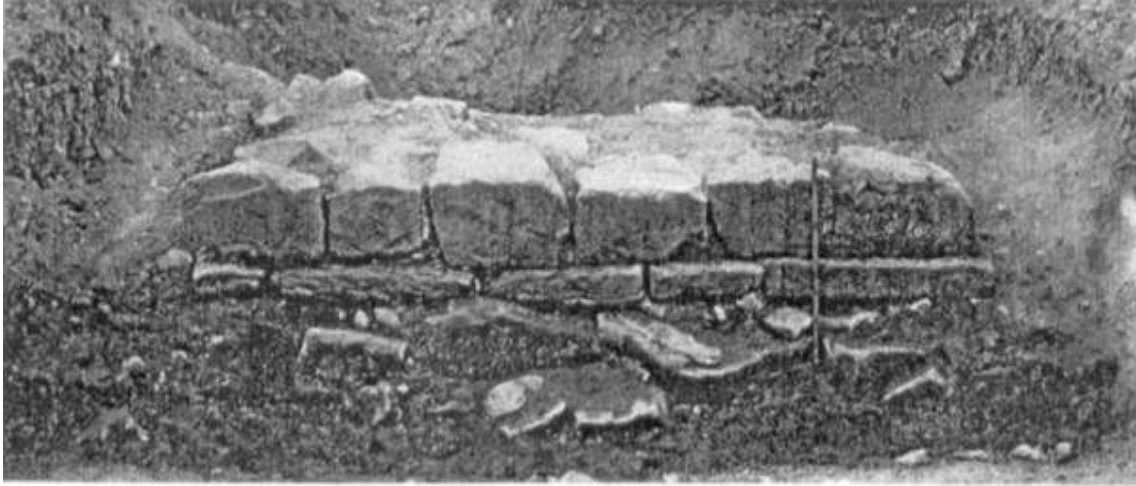
2 *Liber de Mun. Castr.* edn. Domaszewski, § 49. *Regressis pedibus exterius sexaginta per latitudinem portarum similiter fossa fiet, quod propter brevitatem titulum cognominatum est.*

from the present surface. The character of the bottom has already been indicated. The pottery found appeared to be indistinguishable from that recovered from the ditch of the early fort. The quantity, however, was not very large. The corresponding portion of the inner ditch at the north gate was not excavated further than was necessary to determine its position. That opposite the south gate produced almost no relics.

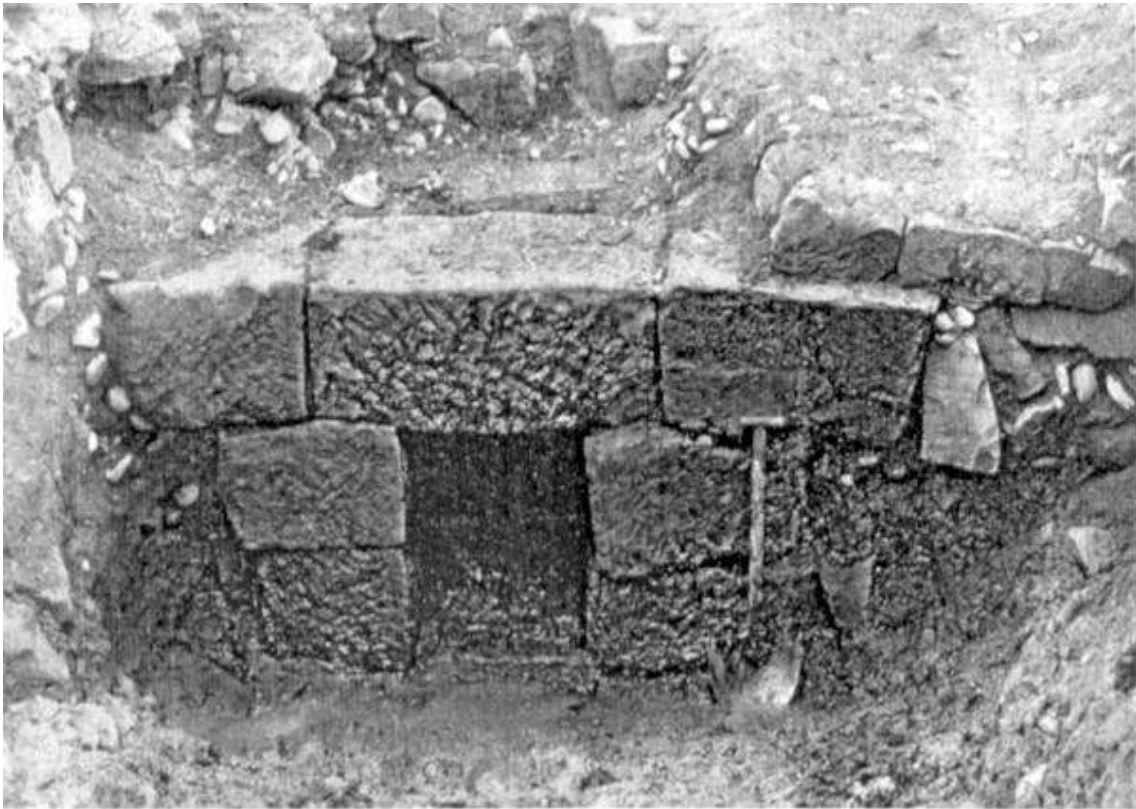
An interesting circumstance connected with these 'clavica-shaped ditches' has still to be recorded. It was definitely ascertained, on evidence which will be produced later, that there had been at some time or other a reorganisation of the defences which had resulted in the filling up of those portions of the inner ditch which projected in front of the north, south, and west gates. That is, the use of this form of obstacle was deliberately abandoned. Nor was recourse had to it again in the subsequent reconstruction, when the area of the fort was so much reduced that the original north and south gates had to be closed and new ones opened some distance further east. Similarly, in the south annexe the early gate was covered by an overlapping ditch, but there was none in front of the later one. Whatever may have been the reason for the difference in the plan of the defences which distinguished the east gate from the gates on the other sides of the fort, it is clear that the method of protecting the gate was in all of them based upon the same principles, and the fact that the protection of the gates, which on the north, south and west was insured by means of an overlapping arm of the inner ditch, was on the east accomplished by the prolongation of the outer ditches, seems to prove that the triple ditches which surround the enlarged fort all belong to its original plan.

The Wall

Behind the inner ditch of the fort lay the berm, a narrow platform, the existence of which was no doubt due to the fact that the heavy wall had to be placed sufficiently far from the ditch to prevent its weight causing subsidence. For the greater part of the circuit all that remained of the wall were the cobbles which had formed the foundation, with here and there a piece of red sandstone among them. Where it had crossed the ditches of the early fort, or where, as was the case on the west front, it was placed above one of them, the cobbles were carried down to the bottom. The superstructure itself had been almost entirely removed. Fortunately, however, on the west side near the south angle of the fort, a portion was discovered showing the lower courses in sufficiently good preservation to



1. Foundations of the wall



2. Mouth of main drain passing beneath the wall on west front
PLATE VI. THE WALL OF THE FORT

enable a fair idea to be formed of the manner in which the whole had been built. An illustration of these remains are given in Plate VI., Fig. 1.¹

The wall, which was seven feet seven inches thick, lay on a base of cobble stones nine inches deep and about eight feet six inches wide. In front of this the foundation projected for nearly a foot. Above it were two scarcement courses of rough blocks of red sandstone. On these was laid a course of long hammer-dressed stones four and a half inches high. In the portion exposed one of these stones had a length of three feet ten inches, the other of three feet seven inches. They were in turn surmounted by a course of hammer-dressed blocks eleven inches high, and from a foot to eighteen inches in length. The latter had a width of about sixteen inches, while the centre of the wall was filled in with rough blocks. In the portion described the inner face was better preserved than the outer, which had lost its upper course. It was quite evident that the defence was a real wall, not merely the *revêtement* of a rampart. Two stones lying on the line of the berm at the south-west corner, eight inches thick, with the typical diamond broaching, possibly indicated the width of the upper courses and the character of dressing which may have been employed upon the exposed face.

The Rampart

Immediately in the rear of the wall was the rampart, which had been about thirty-eight feet in width at the base. It was formed of fine yellow clay, containing few if any stones. Its inner margin was supported on a kerb, which had a base of eighteen inches and was two feet in height. On the side next the rampart the kerb was almost vertical, while on the opposite side its three courses were stepped. The actual structure of the rampart itself seemed to differ slightly in the sections taken, but in most of them there was noted a band of cobble stones eight feet in width, with straight margins, lying seventeen feet from the outer margin of the kerb, and thirteen feet from the inner side of the wall. A somewhat similar rampart base was observed at Birrens,² and again at Ardoch.³ Inside the rampart, and directly behind it, was a road running round the margin.

The Reducing Wall

Allusion has already been made to a reconstruction, which resulted in considerably reducing the size of the later fort. This was effected by building across it from north to south a wall which may be conveniently distinguished as 'the reducing wall.' It cut off an area, lying on the west side, equal to about one-third of the whole

1 The footrule shown in this and succeeding Plates is two feet long.

2 *Proceedings of the Society of Antiquaries of Scotland*, vol. xxx. p. 17.

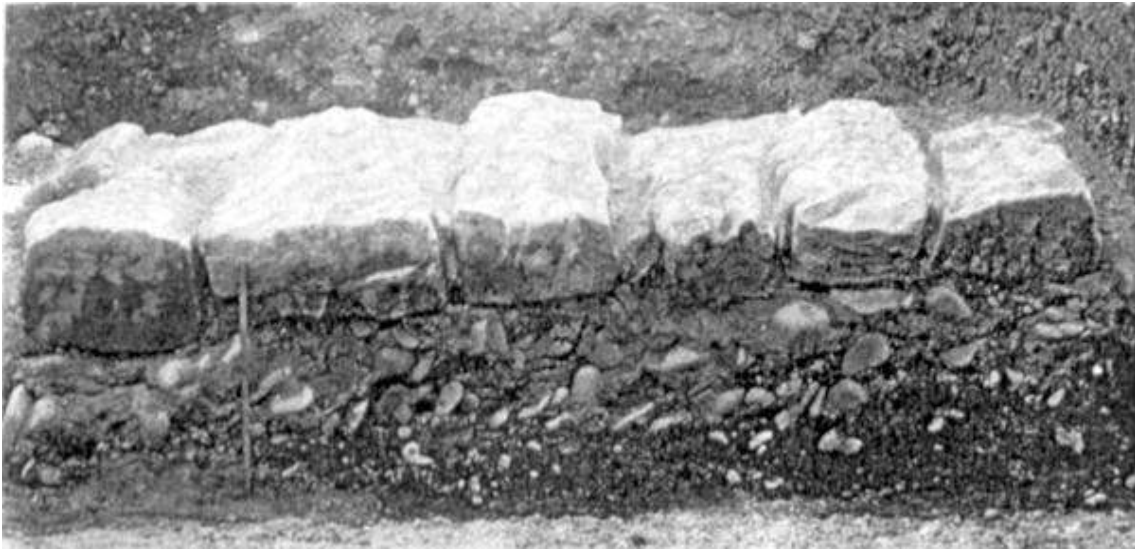
3 *Ibid.* vol. xxxii. p. 439.

interior. No trace was found of a ditch either in front of the reducing wall, nor of any rampart behind it. Further, although the foundations of the reducing wall were followed to within a short distance of where it would actually meet the north and south walls respectively, all efforts to discover the actual junction were fruitless at both extremities. It is possible that its base had rested on the rampart clay at either end, and that all trace of it at these points had been removed in the subsequent destruction of the rampart. Its construction, however, as well as that of its gateway, leave no doubt as to its defensive character. The best preserved portion of it which is shown in Plate VII., Fig. 1, lay some forty feet south of the place where it was pierced by the gateway. There its foundation of cobbles was about one foot nine inches thick and five feet six inches wide. On these were lying heavy blocks of red sandstone. Six of these, *in situ*, on the west side of the wall, varied in width from two feet to fourteen inches, and in length from three feet six inches to two feet. The whole had evidently been about five feet six inches thick. The less substantial character of the new wall and the absence of any ditch in front of it not improbably indicate that the older defences beyond were still in use, though it was perhaps beyond the power of the attenuated garrison to man them fully.

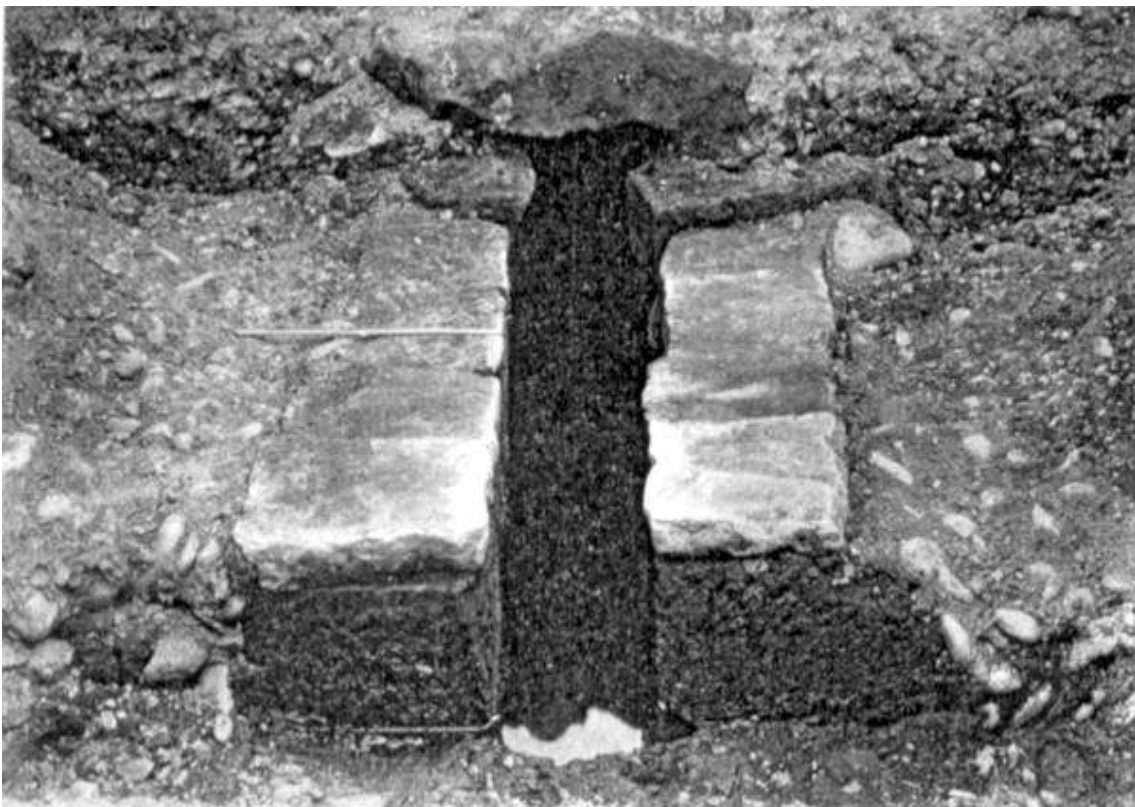
The Gates

The Roman sites hitherto excavated in Scotland have not produced many details that illustrate the construction of gateways. With the exception of Castlecary¹ they have been earthen forts, in which gateways as well as gates must have been of wood, and they have accordingly yielded little that was of any value for the purpose. Even at Castlecary, where the use of stone walls makes it certain that the gateways had been of a similarly substantial character, not much was added to our knowledge. The opening was found to be ten feet wide in each case. There appeared to be no towers nor any projection beyond the line of the outer face of the wall. On the other hand, the wall itself returned at right angles inwards, for a distance of fourteen feet on either side of the entrances, these returns being eight feet thick. The exact position of the gates themselves was not ascertained. At Newstead the entrances were not without interest, but the absence of details was again disappointing. It was no doubt due to the fact that the heavy masonry, which would naturally be employed there, would early disappear, once the deserted fortifications began to be used as a quarry.

1 *Proceedings of the Society of Antiquaries of Scotland*, vol. xxxvii. p. 25.



1. Foundation of the reducing wall



2. Drain passing beneath the reducing wall
PLATE VII. THE REDUCING WALL

The later of the two gates on the south seem to have been constructed on the lines of those of Castle Cary. There was the same return of the ends of the wall, but nothing definite could be ascertained as to the precise position of the gate or the guard chambers. Close to this entrance there were found two sandstone blocks, one on either side, each having a circular depression cut in it at one end. They had evidently been used as pivot stones. The larger of the two was twenty and a half inches long, sixteen inches broad, and eight and a half inches thick. In one of them a harder river-stone had been fixed in the pivot hole, probably to enable it to withstand the wear and tear better. The west gate showed a little more detail; the actual opening was twelve feet wide, and the line of the cobbled roadway, slightly raised in the centre, was quite distinct. On the south side the wall had evidently returned almost at right angles, although only the cobbles of its foundation remained. It had projected four feet in advance of the corresponding wall on the north side of the gate, which was faced with a single course of sandstone blocks and curved inwards.

A rather more definite impression was gained of the east gate of the fort and also of the gate in the reducing wall, albeit not a single stone of the masonry of either had survived. In the latter case the stonework must have been removed when the defences were once again enlarged, for the later road passed over the undisturbed cobble foundation of the disused gateway. It was quite plain that it had been of the type common in the Limes forts. The opening was nine feet wide. On either side had stood a guard-house, which had projected three feet in front of the wall. On the exposed side, the foundations of these guard-houses were nine feet in thickness, indicating walls of at least eight feet. On the sides next the gate they were thinner, —not more than six feet,—while at the back and on the sides that abutted on the reducing wall, they were only three and a half feet thick. Each contained a small chamber eight and a half feet by six feet. The width of the entrance justifies us in inferring that the door was only single, not double. The east gate had the same character. There the outline of the guard-houses could be made out, the floors showing traces of charcoal some fifteen inches below the surface. But here also every fragment of masonry had disappeared, while the cobbles from the road and from the destroyed walls had been thrown out in a confusion which made it difficult to obtain exact measurements.

The Fort as it originally appeared

The mere details of foundations and the dimensions of these long filled

up ditches can have little real meaning unless they convey to us some impression of the appearance of the fort as it existed when tenanted by its Roman garrison. Unfortunately there are many blanks in the evidence, many points in regard to which we are left in doubt. It is only by comparison with the facts obtained from the excavation of similar defensive works elsewhere that we can hope to reconstruct the picture. The triple line of ditches stretching in front of the wall is easy to imagine. But there is nothing at Newstead to tell us how high the wall itself had stood. We only know that it was strongly founded and that it was seven feet seven inches thick.

In Britain, as on the Continent, the walls of other permanent forts have been levelled for so long that they give us little help in the task of reconstruction. To find the nearest parallel we must turn to the walls of towns. The Roman wall of London, recently exposed near Newgate, was eight feet six inches thick,¹ the wall of Cologne from six feet six inches to seven feet four inches. The wall round Nîmes and that round Arles² were just such walls as we find at Newstead; they were sufficiently thick to admit of two men passing each other on the top, and of some considerable height. Possibly the Newstead walls were crenellated. This is a feature which we find in the town wall of Pompeii.³ There the wall was double, with a filling of earth between. The outer wall rose to a height of twenty-six to twenty-eight feet above the ground, and terminated in a breastwork six feet high. Each battlement had a traverse of stonework covering the left side of the soldier as he looked from the wall, and protecting him from being enfiladed. Behind him the inner wall rose some sixteen feet higher, the object of the added elevation being to prevent missiles dropping into the town. Increased power of resistance, especially against battering-rams, was secured by heaping up against the inner wall an embankment of earth forming a rampart. Stairs at the sides of the gate towers gave access to the platform on the top.

Pompeii was of course a city, and its walls dated from a considerably earlier period than those of Newstead. There is no reason to suppose that the feature of the high inner wall was reproduced in the defences of the frontier forts. But dressed copstones for battlements of the same type as those of Pompeii have been found in the ditches of the forts, or associated

1 *Archaeologia*, vol. lix. p. 126.

2 Blanchet, *Les enceintes Romaines de la Gaule*, p. 258.

3 Rochas d'Aiglun, *Principes de la fortification antique*, p. 56, plate ii.

with walls of Roman towns, on the Rhine. They are to be seen, for instance, at the Saalburg,¹ at Böckingen,² and at Trier,³ as well as in many other places. Of the wide rampart lying at the back of the wall we have the remains at Gellygaer in Glamorgan,⁴ where the steps placed at the side of the gate towers to give access to the platform were also found. The height to which the walls were carried no doubt varied very considerably in different places. Here, as in every other detail of Roman fortification, the conditions of the site, the presence of material, the danger of attack must all have counted for much. At Caerleon on Usk the wall at the southern angle still stands some fifteen feet high.⁵ At Holzhausen the remains are considerable, and it has been calculated that the total height with breastwork and battlements was fifteen feet.⁶ In some cases it must have been greater. The late fort of Dâ Gânîya on the Eastern Limes on the borders of Arabia was defended by a wall of seven feet two inches thick with fourteen towers. In 1888 it was still standing in places nearly thirty feet high. The battlements had, however, disappeared.⁷

Of the towers which were not infrequently set on the walls of forts, we have no trace at Newstead except at the gateways. At Castlecary at least two of the angles were probably equipped with this extra defence. Several towers had stood on the walls both at Gellygaer and at Housesteads,⁸ while at Wiesbaden there were no less than twenty-eight.⁹ On the other hand, at the Saalburg, at Zugmantel, and at Holzhausen; the towers were only on the gates, a position in which we almost invariably find them in the stone-walled forts. It is quite possible that the Newstead gate towers may have risen some little height above the platform of the wall, for in the forts of the Eastern Limes the towers on the walls were of more than one story,¹⁰ while at Pompeii they had three floors, and reached a height of about forty-five feet.¹¹

1 Jacobi, *Das Römerkastell Saalburg*, p. 69.

2 *Der Obergermanisch-Raetische Limes*, Lief. 10, Kastell Bockingen, Taf. iii fig. 25.

3 *Westdeutsche Zeitschrift*, vol. xv p. 222.

4 Ward, *The Roman Fort of Gellygaer*, p. 39.

5 Liverpool Committee for Excavations, etc., in Wales and the Marches, *First Annual Report*, p. 56.

6 *Der Obergermanisch-Raetische Limes*, Lief. 22, Kastell Holzhausen.

7 Brunnow and Domaszewski, *Die Provincia Arabia*, vol. ii. p. 8, Taf. xli.

8 *Archaeologia Aeliana*, vol. xxv p. 245.

9 *Der Obergermanisch-Raetische Limes*, Lief. 31, Kastell Wiesbaden.

10 Brunnow and Domaszewski, *Die Provincia Arabia*, vol. i. Odruh, p. 431, Taf. xxii.



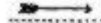








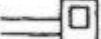


11 Rochas d'Aiglun, *Principes de la fortification antique*, p. 89.

None of the Newstead gates appear to have had more than a single entrance. It is probable that the passage was roofed with a barrel-vault, traces of this vaulting having been discovered at Birdoswald, and again at Housesteads. It made the gateway more secure, and enabled the *chemin de rond* to be carried across above it, so that the defenders could pass directly from one part of the wall to another without descending at the gateways. It can still be seen not only at Pompeii, but also in the gateways of the Aurelian wall at Rome; as well as in the fort of El Kastal on the Eastern Limes, where the remains of a second story above the gate are visible.^[1] Thus bearing in our minds an impression of the exterior aspect of the fort, we may pass to the consideration of its interior plan and buildings.

¹ Brunnow and Domaszewski, *Die Provincia Arabia*, vol ii. p. 95.

Plan IV, The Fort with its Buildings. Key

PLAN OF FORT OF NEWSTEAD

-  walls of buildings in use during final occupation.
-  inferred walls.
-  position of drains.
-  crossing the ditches, indicates position of sections. To the north of Block XVI it is employed to indicate the probable position of a building.
-  passing through north and south walls, indicate position of gates of early fort, and of enlarged fort during its first occupation.
-  in Block XV, indicates foundation of Sacellum vault.
-  position of pillars.
-  in Blocks XVI and XVII, indicate sleeper walls.
-  in Block XIX, indicates remains of an earlier building.
-  post-holes.
-  between the ditches on the north front, indicates remains of a small building.
-  reducing wall and gateway.
- Blue tint* wall of the fort.
-  foundations of buildings, all probably earlier than the fourth period of occupation.
- in red tint*
-  foundations of early ovens.
- in red tint*
- Red lines* are also employed to indicate the ditches of the early fort; the overlapping ditches of the first occupation of the enlarged fort in front of the N., S. and W. gates; and the trench of the palisade in front of the east gate.

THE ROMAN FORT OF NEWSTEAD

