

VIII.—CONJECTURAL CONSTRUCTION OF TURRET NO. 18^a ON HADRIAN'S WALL.

BY PARKER BREWIS, M.A., F.S.A., A VICE-PRESIDENT OF
THE SOCIETY.

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Turret No. 18^a (see footnote 1) lies less than a mile east of Maffin Piers and is one of those turrets partly excavated in 1931 by the North of England Excavation Committee.²

There are many problems involved in this reconstruction (plate xxiv), the first being, did the doors open outwards or inwards? Roman doors were not hinged like our modern doors, but were pivot-hung, i.e. they had a long pivot at the top penetrating a hole in the lintel, and a short pivot at the bottom turning in a cup in the threshold; and to facilitate the removal of the door for repairs and renewals there is frequently a trackway across the threshold to the lower pivot-hole, as at Housesteads headquarters (plate xxv, fig. 2). In the forts, baths, and milecastles these trackways all lead from the inside and the doors opened inwards. In the only known examples in turret doorways, at Brunton, Blackcarts and Limestone

¹ The system of numerical references to the structures along the line of Hadrian's Wall approved and adopted by our society is here used—see *Pro. Soc. Ant. Newc.*, 4th ser., vol. IV, p. 179. Place names are not always on the map, and this system simplifies reference; but it would have been better if the turret east of each milecastle had been given the milecastle number + a, and the turret to the west the milecastle number + b, thus giving the turrets the number of the milecastle from which they were manned, which the present system does not do, e.g. 17^b was manned from 18, and should therefore be referred to as 18^a.

² See p. 258.

Bank, the trackways to the pivot-holes all lead from the outside.³

Newbold states⁴ that the threshold at Limestone Bank turret served for two floors, of which one was six inches above the other. In such cases in milecastles, where the door opened inwards, a second pivot stone was necessary. It therefore appears that, contrary to the usual Roman practice, turret doors opened outwards.

The next problem concerns the windows. Were there windows to the ground floor chamber of the turrets? It has been said that such windows would be a military weakness. Windows to the north might be, but to the east and west they seem to have been a necessity, for on the floor was the hearth where cooking was done, and the fire had no flue, so that windows were needed to let out smoke and admit light. The window-glass found in turrets must have belonged to the upper chamber where the men lived, and that the lower windows were not glazed is indicated by the fact that at Denton Hall turret pieces of a pot were found inside the turret and other pieces of the same pot outside the turret by the east wall, as though they had been thrown through an unglazed window.⁵ Though there is no evidence for the partition across the first floor chamber (plate xxiv), it is probable that such a partition was made to protect the chamber from the unglazed windows to the north.

Were the upper storeys of the turrets constructed of stone or timber? The late J. P. Gibson, after excavating Mucklebank turret,⁶ and finding a number of iron nails, concluded that the upper portions of the turrets were constructed of timber; but when he wrote thirty years ago few turrets had been examined, and later excavations have not confirmed his conclusions, but, on the contrary, have afforded additional evidence that wherever permanence was required Roman work was solid and durable; and the

³ *Arch. Ael.*, 3rd ser., vol. IX, plate II.

⁴ *Arch. Ael.*, 3rd ser., vol. IX, p. 58.

⁵ *Arch. Ael.*, 4th ser., vol. VII, p. 150.

⁶ *Arch. Ael.*, 2nd ser., vol. XXIV, p. 15.

remaining portions of the turrets seem to indicate that they were carried up in stone. Lack of stone débris is not, as has been suggested, a disproof of this, because part at least of the turret system went out of use during the Roman occupation of the wall; the Romans razed some turrets to the ground, building up the recesses flush with the south face of the wall, and thus leaving no débris. Would it be argued that lack of stone débris on the Wall itself proves the upper portion to have been constructed of timber?

Another problem concerns the type of roof. Because a ballista ball was found at this turret 18^a and another at turret 8^a it has been suggested that the roofs were flat to form ballista emplacements; but the wall was not designed as a fighting line, and the finding of two ballista balls is but slender evidence from which to deduce flat roofs as emplacements, whereas the finding of Roman roofing slates in several turrets⁷ is very good evidence that they at least were roofed with slates. It is highly probable that all the turrets were originally roofed alike, and there is strong evidence that turrets were more or less what we should call of "standard pattern."

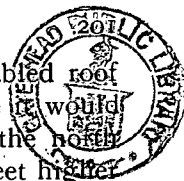
There are several patterns of Roman slates, but, in combination, all form a reticulate pattern and not horizontal lines such as modern slating usually produces. If we eliminate the ridge and eaves courses, there are four common forms of roofing slates (fig. 3). Nos. 1, 2 and 3 have been found at Housesteads. No. 4 is only a modification of no. 3; and has been found in various places. These four forms have one feature in common, they all terminate at the base in two lines meeting at an angle of about 90°, and therefore in combination they all form the same reticulate pattern. It is, of course, not uncommon to find slates with a small portion of the base angle intentionally removed by the slater.

On first consideration, a hipped roof seems better

⁷ *Arch. Ael.*, 3rd ser., vol. IX, p. 60. C. and W., N.S., vol. XIII, p. 301.

TURRET NO. 18^a ON HADRIAN'S WALL

adapted to a tower 20 feet by 20 feet; but a gabled roof seems much more probable on the wall, because it would allow of an attic floor and a small window in the north gable affording the advantage of an eye-line 10 feet higher to the field.



The plan of these turrets can obviously be determined with a very small margin of error; but it is more difficult to estimate the heights. The most important factor in this problem is the height of the parapet walk above ground-level, and this can be determined within narrow limits. In the account of the excavations at Poltross Burn milecastle⁸ it was calculated from the north gateway at

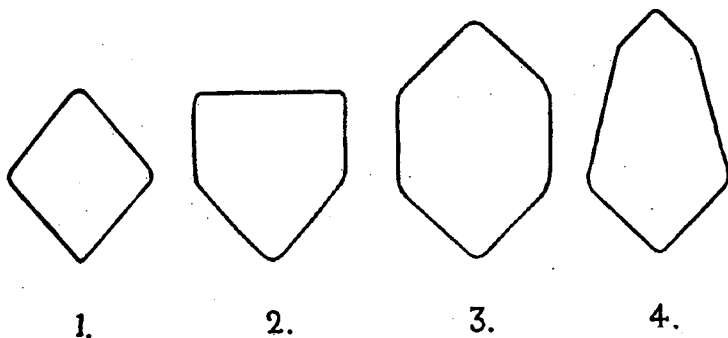


Fig. 3.

Housesteads milecastle as being 13 feet 8 inches, plus the thickness of the flags of the walk and the packing between them and the voussoirs.

Housesteads Milecastle North Gateway

Threshold and floor, say 3 ins. above G.L.	3 ins.
Floor to top of impost	6 ft. 8 ins.
Height of arch	5 ft. 0 ins.
Height of voussoirs	2 ft. 0 ins.
Packing and thickness of flags, say	5 ins.

This giving a minimum height of 14 ft. 4 ins.

⁸ C. and W., N.S., vol. XI, p. 420.

The height of the parapet walk was probably intended to be 15 Roman feet (= 14 feet $6\frac{3}{4}$ inches English, approx.), and the turret as a whole was probably designed to a standard of multiples of a passus or Roman pace (= 4 feet $10\frac{1}{4}$ inches English, approx.) = 5 Roman feet.

The great wall was designed to be 10 Roman feet wide (= 9 feet $6\frac{1}{2}$ inches English, approx.).⁹

	Roman ft.
Wall (width)	10
Parapet walk above G.L.	15
Parapet wall above P. Walk	5
Total height of Great Wall	20
Eyeline above G.L.	20
Ground floor chamber (height)	15
First floor chamber (height)	10
Eaves of turret (height)	25
Outside dimensions of turret	20 by 20

The most perfect remains of steps and landing yet found on the wall are those in turret no. 18^a (plate xxv, fig. 1). There are the remains of five steps, and there probably were never more than five. The workmanship of the steps is always inferior to that of the wall and the turrets, and it is probable that they were built or at least renewed by the garrison. In turret no. 18^a the steps are so irregular that it is impossible to give the exact height of the risers, but the top one is about 6 inches and the remainder were probably about $7\frac{1}{2}$ inches. If a flag landing be added to the top step we get five risers averaging about $7\frac{1}{2}$ inches, giving the flight a height of about 38 inches. Had there been a sixth step the area of the landing would have been so reduced that there would have been scant room for a man to stand in front of the ladder, especially if, as is probable, he was burdened with his kit.

The remains of these steps and landings have been found in a number of turrets and have been a problem,¹⁰ for they are not part of the original structure of the turrets, their walls are not coursed with or bonded into the turret

⁹ *Arch. Ael.*, 4th ser., vol. IV, plates xx and xxia and p. 121.

¹⁰ *Arch. Ael.*, 4th ser., vol. VII, p. 147; vol. VIII, p. 325.

walls; and the original turret floors have been found to run beneath them;¹¹ yet they are believed to have been part of the means of access from floor to floor. Obviously, prior to the introduction of these steps and landings, there must have been some other means of access. It is believed that for this purpose there were originally perpendicular wooden ladders fixed to the walls of the turrets, and it is suggested that soon after the turrets were built it was decided to abolish the fixed ladders and to substitute short movable ladders plus these steps and landings. The question then arises, why were the movable ladders made shorter than the fixed ones had been? Why were the stone steps necessary? The answer is that the movable ladders had to be drawn up and stowed away in the first floor chamber. The height of the first floor above ground level was 15 feet, but 4 inches, being the height of threshold and ground floor above ground level, must be deducted, leaving 14 feet 8 inches. A ladder 14 feet 8 inches long would thus barely reach the first floor level, and for convenience the ladder must have been at least 3 feet higher than this. This extra length could be a separate piece fixed to the east wall of the upper chamber. A ladder 14 feet 8 inches long can be drawn up through a 2 feet 6 inches square trap and got into the upper chamber 10 feet high and stowed on the floor, which was 15 feet from east to west. But it would be an awkward task, needing two or three men, and it was desirable to have something which one man could manipulate. The short ladder would be 14 feet 8 inches less 3 feet 2 inches (the height of the landing), i.e. 11 feet 6 inches, and would be supplemented by the fixed length referred to above.

If the first floor chamber had been sufficiently lofty a rope and pulley would obviously have sufficed to pull the ladder up perpendicularly, but an 11 feet 6 inches ladder will not go perpendicularly into a 10 feet high chamber, yet the ladder is light enough for the man who drew it up to take hold of it and, with ample clearance, to pull the

¹¹ *Arch. Ael.*, 4th ser., vol. VIII, p. 325.

head over towards the west wall and lay the ladder on the floor, with its foot at the trap-door ready to be let down at a moment's notice, the space from the trap-door to the west wall being 11 feet 8 inches.

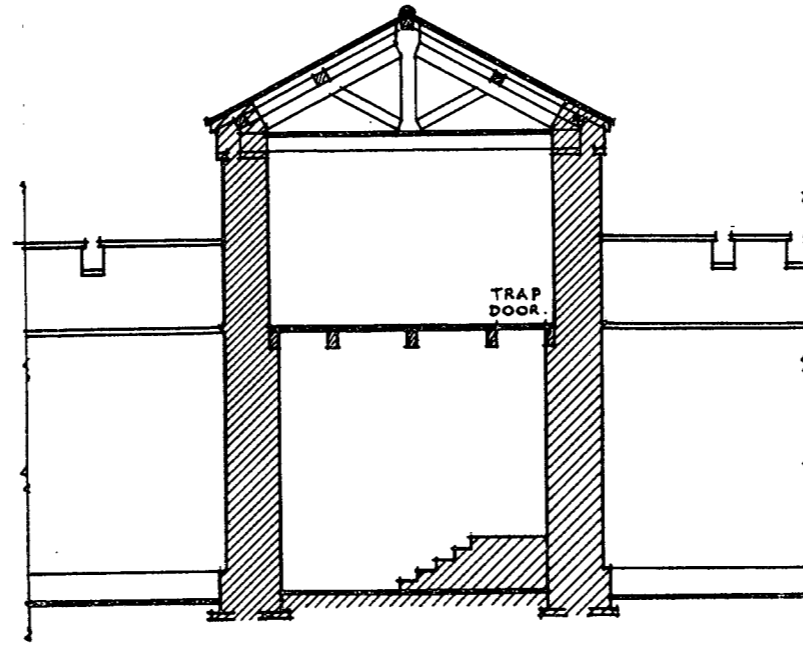
If, as is here shown, the turret had an attic floor and a window in the north gable, the short ladder would be of convenient length for access from the first floor.

These steps and landings should not be confused with platforms such as that at the north-west angle of turret 17^a.¹²

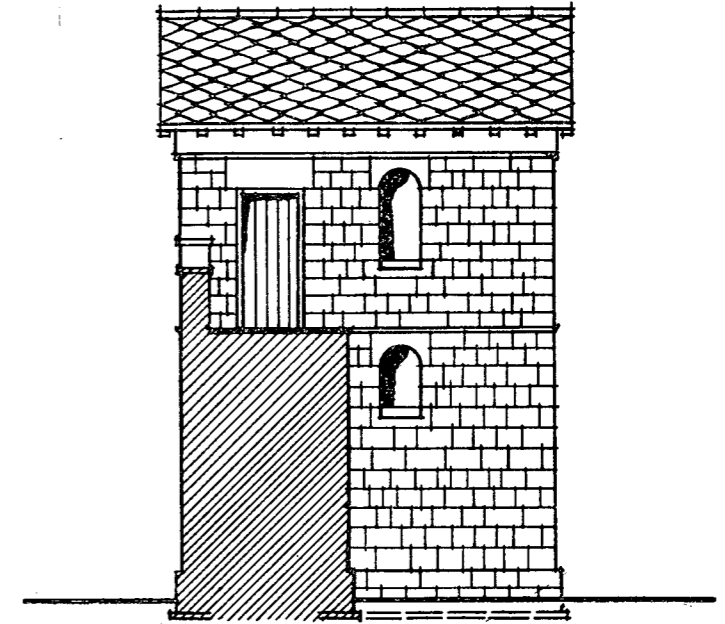
The question remains, why was this change made from fixed to movable ladders? When the Romans lost the initiative and turned from attack to defence, it is well known that they built up many of the fort gateways. Surely the change from fixed to movable ladders has the same significance as the built-up gateways. These seemingly unimportant remains of steps and landings have become for us one more proof that Roman power was on the ebb.

¹² See p. 257 and plate XLV.

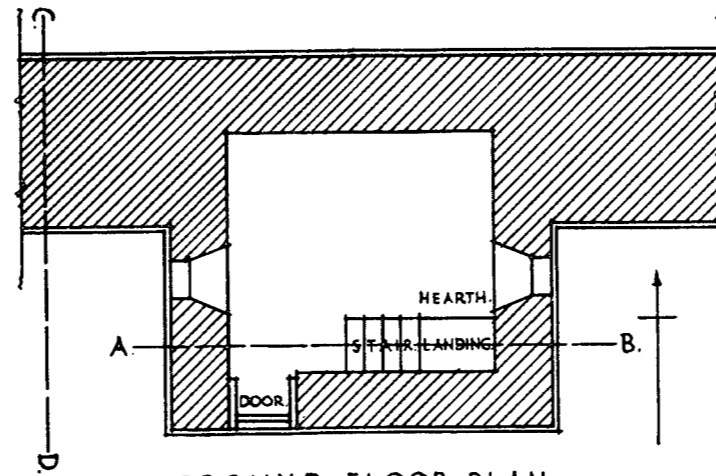
CONJECTURAL DESIGN OF TURRET NO. 18. ON HADRIAN'S WALL.



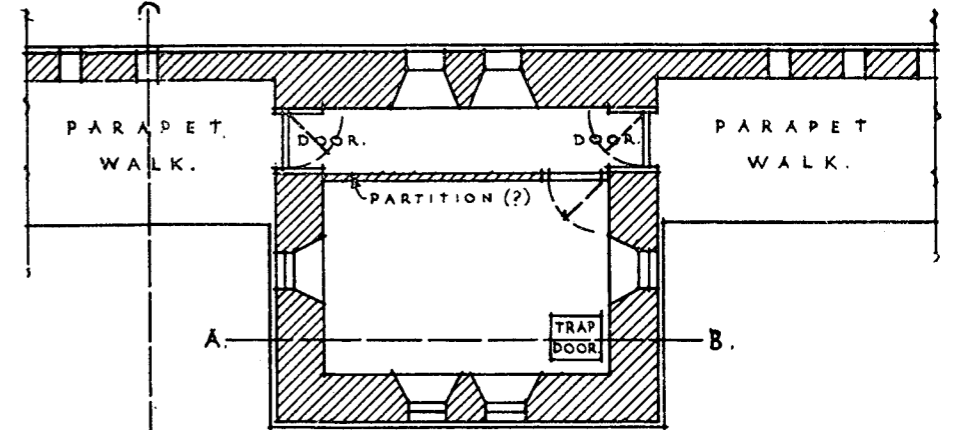
SECTION ON LINE A. B.



SECTION ON LINE C. D.



GROUND FLOOR PLAN.



FIRST FLOOR PLAN.

SCALE OF FEET.

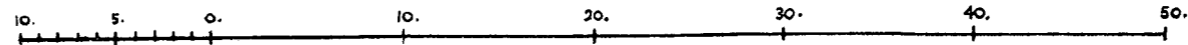






FIG. 1.



FIG. 2.



