

The building of Hadrian's Wall: a reconsideration

Part 2: The central sector

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ABSTRACT

The evidence for the building of the central sector of Hadrian's Wall is examined and a construction sequence proposed. It is suggested that a number of installations seemingly built towards the end of the construction programme display an awareness of the value of exploiting the topography to greater advantage. By adopting a more holistic approach, the builders were effectively distancing themselves from the primary 'blue-print', but also bringing Hadrian's Wall into the mainstream pattern of Roman frontiers.

INTRODUCTION

NEARLY FIFTY YEARS AGO, the second author published with his Durham colleague, Joyce Hooley, a paper on the building of Hadrian's Wall, following on the work of earlier archaeologists (Hooley and Breeze 1968). The basic tenets of this paper still seem to be accepted. These are that the building of the Wall was divided among three legions, the Second, Sixth, and Twentieth, with each erecting five miles of Wall in the first season, that is, from MC 7 / T 7a to a few metres west of MC 22 (Portgate). All of these building gangs were working to what is known as the Broad Gauge, which produced a curtain about 10 Roman feet wide. The legions were then moved westwards, one building from the Portgate to the North Tyne, and the other two from T 36b (Housesteads) to the River Irthing, just east of MC 49 (Harrow's Scar). During this phase of work, the construction teams were redeployed to build forts, perhaps with one legion left to complete the erection of the milecastles, turrets, and curtain wall, the thickness of which was reduced to a Narrow Gauge of about 8 Roman feet or less.

This paper is a 'Part 2' to the 1968 paper, in that it deals with one of the problems not originally addressed: the sequence and completion of work in the central sector, which covers the stretch of Hadrian's Wall between the River North Tyne and the River Irthing (Hooley and Breeze 1968, 108–10). Since 1968, there have been two substantial investigations in the central sector of Hadrian's Wall, in the vicinities of MC 35 (Sewingshields) and MC 39 (Castle Nick) (Haigh and Savage 1984; Crow 1991). In addition, Woolliscroft has analysed the spacing of structures in the central sector and Symonds has considered the construction order of the milecastles, while Hill has discussed the building of the Wall and produced a valuable table of the evidence (Woolliscroft 1989; Symonds 2005 and 2013; Hill 2004). There have also been other discussions relating to the building of the Wall (Bennett 2002; Graafstal 2012), and Foglia (2014) has usefully considered the appearance and surveillance capability of turrets.

THE STRUCTURAL EVIDENCE

Broad Foundation and Narrow Wall

The Broad Foundation has been recorded in the central sector between manned installations at Chesters (27a), 27b–28, 29a–b, 29b–30, 33b–34, 34a–b, 34b–35, 35–35a, 36a–b, 36b–37, 38b–39, 39a–40, 41–41a, 43–43a, 46a–b, 48–bridge, which is nearly everywhere that the Wall has been investigated (Hill 2004, Appendix 1). There are, though, some sections where Broad Foundation is absent, namely on Peel Crags in the vicinity of T 39a and from T 44b (Mucklebank) westwards over Walltown Crags for two miles (3.2 km) to Longbyres (46a–b); this is based upon excavation (Simpson 1976, 68, 99, 109–10; Gibson 1903) and visual observation. No Broad Foundation has been recorded between MC 30 (Limestone Corner) and T 33b (Coesike), but neither has it been sought.

Crow summarised the situation in the following way: 'up to Sycamore Gap [38b/39] this foundation was almost continuous: beyond that to the west there were only isolated lengths on *Mons Fabricius* [the knoll between Sycamore Gap and Castle Nick] and in Castle Nick', and 'the Broad foundation is not known on the Crags west of *Mons Fabricius* and has been found only in the broad gaps in the Whinsill such as Peel Gap and from Great Chesters to Cockmount Hill. West of Carvoran it resumes at Longbyres ...' (Crow 1991, 55, 62). There are also some records of a course or two of Broad Wall having been erected on this foundation, and these all occur in gaps: Peel Gap between turrets 39a and b, and in the Irthing/Tipalt Gap (*Britannia* 19 (1988) 434; Simpson 1976, 109, 114; Salway 1959; Breeze 2006, 287–90; the one or two offsets recorded in Sycamore Gap may also indicate the presence of Broad Wall: *Britannia* 15 (1984) 280).

Stretches of Broad Foundation were sometimes ignored by the builders of the Narrow Wall, as occurs between T 38b (Highshield Crag) and MC 39 (Castle Nick) and between Great Chesters (43) and T 43b (Allolee East) (Crow 1991, 54–5; Breeze 2006, 273, 276–7). This suggests that there was an appreciable hiatus between the laying of the foundation and the construction of the Narrow Wall, a conclusion that is supported by the evidence from Peel Gap. Here, peat and silt had blocked the culvert through the Broad Foundation, while a layer of burning attested to the removal of scrub that had colonised the existing masonry. Similarly, in one place on Highshields Crags, near T 38b, above a single footing course of Broad Wall, 'a 4 cm layer of soil intervened below the superimposed foundations of the Narrow Wall' (Crow 1991, 55; *Britannia* 17 (1986) 378). On the other hand, careful examination of the Narrow Wall set on Broad Foundation in the Gilsland Vicarage Garden in 1928 indicated that the mortared core of both was laid in a single operation, although this could well be a product of a later rebuild (see Breeze 2003, 16, n. 23).

Milecastles and turrets

Only two milecastles in the central sector appear to have been completed according to the Broad Wall specifications: milecastles 47 (Chapel House) and 48 (Poltross Burn). These may well have been prioritised for completion outside the standard legionary work allocations in order to cover the Irthing/Tipalt Gap (Hooley and Breeze 1968, 109; Symonds 2005; Graafstal 2012). Elsewhere, the north milecastle gates were often built to the Broad Wall width, and Graafstal (2012, 131) has argued that this component was frequently prioritised in order to

complete the gate tower and so establish a surveillance capability. Two exceptions to this pattern are MC 39 (Castle Nick), where the Broad Foundation had been built from the west side of the gate eastwards, and MC 40 (Winshields), which has Broad Foundation immediately east of its east wall (Simpson 1976, 85, 114). MC 40 also features a unique kink in its north wall, which was caused by a change in the alignment of the frontier curtain occurring within the walls of the milecastle. So far as we know, the continuation of the Broad Foundation unbroken across the north gate passage at MC 39 is also unique. The only other potential occurrence of this is at MC 35, although here the anomaly can probably be explained by the absence of a north gateway, due to the 30m vertical drop to the north (Haigh and Savage 1984, 36, Woolliscroft 1989, 7; Symonds 2013, 56). This might also explain why MC 35 reverses the usual pattern of milecastle construction, by combining a Broad south rampart with a Narrow north wall. If there was no north gate tower at MC 35, the southern gate tower would have to be prioritised in order to establish an elevated surveillance platform.

We may also note that several milecastles (13, 17, 18, 19, 20, 22) in the eastern sector of the Wall were not completed to Broad Wall specifications, indicating that work on that section was not completed before construction of the central sector commenced (Hunneysett 1980). Symonds (2005, 77) has noted a Middle Gauge at MCs 9, 22, 37, 38, 42, 43. This presumably reflects an intermediate stage in the reduction of the width of the walls from Broad to Narrow, possibly to accelerate the completion of certain milecastles prior to the fort decision. That some turrets were completed or at least advanced to the stage where they provided appreciable shelter before the fort decision is indicated by evidence for occupation at T 27a (Chesters) and T 36b (Housesteads), both of which were demolished to make way for forts (Breeze 2006, 197, 234).

Most Stone Wall turrets were provided with Broad wing walls, indicating that work on them commenced during the lifespan of the Broad Wall, and that they were intended to be bonded into it. The two exceptions to this are T 39a (Peel Crag), and T 44b (Mucklebank). Both of these turrets lie in stretches where Broad Foundation does not occur. It is likely that we can add T 45b (Walltown West), which was destroyed by quarrying shortly after its discovery in 1883, to this list (Bruce 1883; Bruce 1885; figs. 4, 6 and 7). The intervening T 45a (Walltown) also lacks Broad wing walls, although this is usually attributed to the tower starting life as a freestanding installation, which was only later incorporated within the Wall curtain (Breeze 2006, 278–9).

A distinction may be made between those turrets with long wing walls and those with short wing walls, or, in the case of T 41a (Caw Gap), wing walls that do not exist above their Broad Foundations (Hill 2004, 144). C. E. Stevens suggested that those turrets and milecastles with short wing walls were structurally late in the sequence (*JRS* 38 (1948) 84). Peter Hill stated that 'very short wing walls [indicate] that work had only just been started [on the turrets] at the change of gauge' (Hill 2004, 144). If the short wing walls do indicate that the turrets had not been raised to their full height, then work was still in progress at T 34a (Grindon West) and T 35a (Sewingshields Crag), and had yet to commence at T 39a (Peel Crag) and T 44b (Mucklebank).

Hill has also noted that there is evidence for a reduction in the standard of workmanship during the construction of some structures. This can still be seen at both MC 37 (Housesteads) and at MC 42 (Cawfields) where the upper surviving masonry is of markedly lower quality than the lower courses (Hill 2004, 149–50).

Table 1 Broad Foundation and curtain and Narrow Foundation and curtain in the sector between the River Irthing in the west and the North Tyne at Chesters in the east.

Two lines indicate Broad Foundation or Wall and one line denotes Narrow Foundation or Wall; it should be noted that rarely more than two or three courses of Broad Wall were constructed.

This table only relates to the width of the Wall curtain, and does not include the presence of Broad north walls at the milecastles or wing walls at the turrets.

	Bridge-46b/a	45b/a-44b	43b/a-43	42-40	40-Peel Gap	39a-39	38b	37-27a
Foundation	=====	=====	=====	=====	=====	=====	=====	=====
Curtain	=====	=====	=====	=====	=====	=====	=====	=====

Summary

It would appear that the Broad Foundation was laid across much of the central sector, but not the west end of Peel Crag and the stretch from 43b-46b, before the dislocation in the building programme. It seems likely that the north gates of many milecastles were erected and that work had started on the majority of the turrets prior to the fort decision. The priority milecastles in the central sector are 47 and 48, while design anomalies in turrets 48a and b are probably also attributable to very early construction (Hill 1997, 42). Table 1 collates the relevant evidence for Broad and Narrow work on the Wall Foundation and curtain.

Table 1 also illustrates the interesting situation in the vicinity of MC 39 (Castle Nick). As discussed, no Broad Foundation has been noted running west from MC 39 to just west of T 39a (Peel Crag), which is also a Narrow Wall structure. A course of Broad Wall was laid in Peel Gap and this is also recorded to a little west of T 39b (Steel Rigg). East of MC 39, the foundation is Broad and the Wall is generally Narrow, but in Sycamore Gap there also appears to be some Broad Wall. The presence of Broad Wall in the Irthing/Tipalt Gap also points to early work there. This suggests that although the Broad Foundation was not completed along part of the crags, work in the gaps started early. Not all of the installations were under construction by then, including the Narrow Wall milecastles 39 and 40, and T 39a, together with the late (Narrow) Wall 44b-46a. Symonds (2005, 76) and Graafstal (2012, 143) note that milecastles on the crests were not a priority.

In considering the construction sequence, however, a distinction should be drawn between a wish to provide security in major natural corridors, such as the North Tyne valley and the Irthing/Tipalt Gap, and building up curtain in the much smaller gaps in the crags, where a particular human trait might be borne in mind: a propensity to undertake the easy tasks first. Accordingly, the Broad Foundation (and fragments of Broad Wall) in the gaps in the crags might simply reflect that these were the easiest places to start work, as Peter Hill has emphasised to us. On that basis, any curtain and structures that lay in places difficult to access and which were not considered immediately essential to tighten control of the area may have been left until later — for someone else! Alternatively, this quirk in the construction schedule could reflect a desire to reduce incrementally the opportunities for north-south movement across the line of the frontier curtain. Measures such as constructing priority milecastles and building up the curtain to block natural passageways could be seen as complementary ways to help curb unauthorised transit by modestly-sized groups.

THE LOCATION OF TURRETS

It is well known that the spacing between milecastles and turrets along the Wall was related to the Roman mile. The former were intended to be one Roman mile apart (1479 m) and 'the average milecastle spacing is 1 Roman mile and three inches, an inaccuracy rate of only 0.000072%' (Woolliscroft 1989, 8). The intervening spaces between neighbouring structures should be about 493 m, although in practice these distances fluctuate. Foglia has emphasised that from a visual perspective such variation is not significant as this distance is 'very close to the 450 m that is the maximum distance where military uniforms, and therefore friend/foe or civilian/militant, can be recognised' (Foglia 2014, 37). Naturally, such distinctions are more appropriate to the field of battle than border control, but it does seem probable that the proximity of the milecastles and turrets was designed to maximise their garrisons' ability to detect and prevent illicit incursions across the curtain (Symonds 2013, 67).

Woolliscroft has pointed out that in the central sector none of the 17 milecastles for which figures are available occupy their theoretical site, the average milecastle being 64 m out of position (Woolliscroft 1989, 7). His analysis of the spacing of the structures in this sector led him to observe that 'leaving aside ... the ... four miles from MC 30 to MC 34, whose Stanegate sites are unknown, all 72 of the remaining Wall installations are in direct visual contact with a Stanegate site, despite very difficult terrain', with but one exception (Woolliscroft 1989, 11–2). Woolliscroft's conclusion was that the reason why some structures in the central sector were moved away from their 'correct' location was so that they could maintain communication with the troops garrisoned in the military installations along the Stanegate to the south of the Wall (Woolliscroft 1989, 10–4).

Woolliscroft did not undertake a detailed analysis of the location of the turrets, but the distances between the known structures were provided by Collingwood (1930) — probably by measuring off a map — although not all of these measurements are accurate (Hill 2004, 39). The spacing intervals display considerable variation in certain sectors. Some of the gaps between structures are shorter in the sector from T 33b (Coesike) to T 35b (Busy Gap), for instance, and longer between T 39a (Peel Crag) and T 39b (Steel Rigg) and from T 40a (Winshields) to T 40b (Melkridge). Configurations of the ground, or the need to establish visual links back to Stanegate sites, led to some sites being moved away from their measured position.

The intervals between installations in Wall mile 39 are particularly inconsistent. MC 39 (Castle Nick) is 406 m from T 38b (Highshield Crag) and 469 m from T 39a (Peel Crag), while the latter lies 701 m from T 39b (Steel Rigg), which in turn is 481 m from MC 40 (Winshields). It has long been recognised that the combination of a short Wall mile to the east of MC 39 and a long one to its west can be explained by MC 39 being shifted from its measured position on Peel Crag and into an adjacent nick, to improve north–south access (Woolliscroft 1989, 10; fig. 1). It is less clear when this decision was taken. It almost certainly occurred before the construction of T 39a commenced, because otherwise the distances between the installations to the west of MC 39 would clumsily comprise one of the shortest intervals known on the Wall, followed by the longest. The simplest explanation for the built location of T 39a is that it was selected in full knowledge of the ultimate position of MC 39. This raises the possibility that the unprecedented distance of 701 m between the (Broad Wall) T 39b and (Narrow Wall) T 39a was a consequence of work on the former commencing at a time when it was still assumed that MC 39 and, by association, T 39a would lie closer to their theoretical measured



Fig. 1 MC 39, looking north-west. The offsetting of the milecastle from its measured location placed the installation in a position better suited to north-south transit. It also brought a potential crossing point under direct observation.

positions. If T 38b is also a Broad Wall foundation, as is likely to be the case, then the short distance between it and MC 39 would also fit with an early expectation that the milecastle would be built in a different location.

If the change in the position of MC 39 was only decided upon during the Narrow Wall phase, this would explain the unique superimposition of its north gate passage on Broad Foundation standing four courses high. As the neighbouring MC 40 is also an entirely Narrow Wall milecastle, there is no reason to assume that any work commenced on the hypothetical Broad Wall site for MC 39, which presumably lay at or near its measured location. If some construction materials for the north gate had been conveyed to this site, though, it would provide a source for the abnormally large stones comprising part of the late-second-century blocking wall inserted into T 39a when it was demolished (fig. 2). Simpson observed that 'these seem unlikely to have formed any part of the turret' (Simpson 1976, 100). On the strength of the excavation photographs the masonry would correlate with milecastle gate fabric, although this appears to be too substantial to have been recycled from MC 40, where Simpson described the gateway stones as 'little larger than those of the wall face' (Simpson 1976, 88).¹ This similarity could be coincidental, not least because it is clear that the stonework immured in T 39a would not be sufficient for an entire gateway. It might, though, help explain why MC 39 is unusual among the Stone Wall milecastles for predominantly utilising similar sized facing stones throughout its fabric. If the consignment of masonry for a putative early



Fig. 2 T 39a, a Narrow Wall structure on Peel Crag. Excavation revealed that more substantial masonry than is usually encountered at turrets was employed within the blocking wall, which was inserted when the post was demolished. Simpson 1976, fig. 19.

gateway was not complete when the construction hiatus occurred, it could provide a reason why the building material was not simply moved to the new site when work recommenced.

Further west in the central sector, two Narrow Wall turrets were located immediately beside gaps in the crags, T 44b (Mucklebank) and T 45b (Walltown West). The former is well east of its measured position, which lay within the gap to its west. T 45b, on the other hand, was slightly west of its measured position. In both cases the built position brought the turret to a location on the edge of a gap, allowing them to overlook both these natural passages and the wider hinterland (Symonds 2013, 58–59; figs. 3 and 4).

DISCUSSION

Drawing these strands together seemingly reveals an increased willingness to deviate from the frontier 'blue-print' during the Narrow Wall phase of construction. Turrets 44b (Mucklebank) and 45b (Walltown West) illustrate this particularly clearly. These structures are unusual in perching on the edge of steep slopes, which has the practical effect of allowing soldiers within them to maintain close observation over the adjacent gaps. T 44b is also smaller than usual, measuring only 3 m internally instead of the normal 3.67–3.96 m square. The interior dimensions of T 45b are recorded as 3.96 m by 3.6 m, which depart from the usual



Fig. 3 Looking west with T 44b (Mucklebank) in the foreground showing its wide perspective.

square shape by being longer east–west than north–south (Bruce 1885, 57). Deviations from the ‘standard’ templates for the Wall installations are apparent in other Narrow Wall structures (Symonds 2005, 76; Symonds 2013, 59). Adopting greater design pragmatism would also explain the unique kink in the north wall at MC 40 (Winshields), which results in the Wall curtain changing direction at the precise location of the north gate tower, assuming that there was a tower at the angle. Such an arrangement has no known parallel among Broad Wall milecastle gateways, and it is even rare for Broad Wall turrets to coincide with changes in the direction of the Wall curtain. All three Narrow Wall turrets in the central sector occur at such points, though. As this would have improved lines of sight along the curtain, it could be construed as another practical revision during the Narrow Wall phase.

Turret 39a (Peel Crag) also displays two distinctive deviations from ‘standard’ turret design. Most striking is that rather than incorporating a wider north wall, where the turret was recessed into the frontier curtain, the walls of T 39a are uniformly 0.84 m in breadth (Simpson 1976, 99). The internal dimensions of T 39a, amounting to 4.17 m by 3.96 m, are also marginally longer east–west than north–south, providing a parallel for the elongated footprint of T 45b. It should be noted that a third turret, which is not associated with any Broad Wall construction, also shares some of these characteristics: T 45a (Walltown). Its walls range from 0.86 m–0.81 m wide, while its internal dimensions vary from 4.11 m–3.99 m east–west, by 3.86 m–3.78 m north–south (Woodfield 1965, 162). Consequently, the turret combines the east–west elongated footprint displayed by turrets 39a and 45b with the Narrow north wall attested at T 39a. The entrance to T 45a also appears to lack a formal threshold slab or pivot hole, another trait seemingly shared by the central sector Narrow Wall turrets. This might indicate that the doors in Narrow Wall turrets were hung in a different way to their Broad



Fig. 4 T 45b (Walltown West), drawn by C. J. Spence. This illustration emphasises the synergy between the turret and the topography.

Wall predecessors (see Hill 1997, 43). A final point of connectivity is that T 45a also lies at a change in direction of the Wall curtain.

As noted earlier, T 45a is usually interpreted as a freestanding tower, which was associated with the Stanegate system and only later incorporated within the *murus*. This conclusion is founded on the completion of the turret walls before the abutting Narrow Wall was constructed, indicating that the installation fabric was completed before that of the curtain. Crow (1991, 62), however, has argued that T 45a is a Narrow Wall structure on the strength that it broadly fits within the spacing system, and that the turret builders may have ‘integrated’ Narrow Wall foundations. Crow’s statement about the foundations was based upon observations during the consolidation of the tower in 1990. The turret had previously been consolidated 30 years earlier, and at that time was excavated by Charmian Woodfield (1965, 162–5). Studying the extant plans reveals no clear-cut ‘integration’ of the Narrow Wall with the turret,

indeed the reverse appears probable. Further, we may note that none of the other Narrow Wall turrets are known to have been constructed so that the Wall curtain abuts them. Although the excavation photographs of T 39a are not entirely clear on this point, the turret appears to be bonded into the frontier curtain, while Simpson (1976, 107) explicitly states that it was 'built as part of the Narrow Wall'. If T 45a was intended to be a Wall turret, constructing it with freestanding walls would therefore be a significant anomaly. Nevertheless, the apparent consistencies in design displayed by turrets 39a, 45a, and 45b means that the possibility they are all products of the Narrow Wall phase merits consideration.

Considered in sum, the innovations during the Narrow Wall phase are significant. Most milecastles and turrets in the central sector are associated with the Broad Foundation. The absence of this at the milecastles, turrets, and curtain wall in the area of turrets 44b and 45b indicates that no construction work on this stretch had been undertaken before the decision to narrow the curtain gauge, which in turn occurred after the decision to place forts on the Wall (Breeze 2006, 103). The completion of the Wall curtain in this sector therefore came late in the programme. Although turrets (and milecastles) could be shifted from their measured places throughout the construction process, the positioning of turrets 44b and 45b on the very edge of gaps is a step beyond any allowance made for capitalising on the terrain during the Broad Wall phase of work. The small size of T 44b and unusual shape of turrets 39a, 45b, and possibly also 45a, are noteworthy examples of heightened design flexibility following the advent of the Narrow Wall. There may be a specific reason why the structures from T 44b westwards came late in the building programme; the Stanegate fort at Carvoran lay nearby.

The later history of these turrets could also be relevant. T 44b produced a coin of Valens, who reigned from AD 364 to 378 (Gibson 1903, 15), while the walls of T 45b stood eleven courses high when it was discovered and excavated in 1883, suggesting a long occupation (Bruce 1883). To put this in context, turrets 48a and b at Willowford are the only other turrets in the central sector where occupation continuing beyond the second century can be convincingly demonstrated. Significantly, the Willowford turrets appear to have come early in the building programme, presumably because they controlled the Irthing valley (Breeze 1972, 203, n. 121 lists the evidence for the turrets). The continuing occupation of turrets 44b and 45b points to their enduring utility, which is presumably a testament to the care taken to tailor these turrets to their immediate context.²

Despite T 39a seemingly being a late foundation, the opportunity was not taken to relocate this installation so that it overlooked the Peel Gap, 240m to the west. Reconstructing the building schedule for this Wall mile does, though, suggest that steps were repeatedly taken to address weaknesses created by the topography. During the Broad Wall phase the position of T 39b (Steel Rigg) was fixed, and limited work undertaken on building up the curtain in the gaps. The location of turret T 39a was most likely settled upon after the decision was taken to offset MC 39 (Castle Nick) from its measured position and into the nick. This relocation was probably a product of the Narrow Wall phase, as the presence of Broad Foundation beneath the north gate at MC 39 suggests that it was not originally intended to be a passageway. Presumably, work on MC 40 commenced at around the same time as MC 39 and T 39a. Subsequently, after the Narrow Wall was either completed or well advanced in this stretch, a third tower was built to block the natural defile at Peel Gap. If this narrative is correct, then two independent, topographically motivated refinements to the original plan — the relocation of MC 39 and the insertion of the Peel Gap tower — can be asserted within a single Wall mile. Although the desire to place MC 39 in a more accessible position provides a plausible impetus



Fig. 5 T 39b. Lying beyond the western end of the Peel Crag, T 39b commanded a view along the cliff face. Excavation revealed that the turret was a Broad Wall structure, meaning that construction of it commenced before any other installation in Wall mile 39. Simpson 1976, fig. 23.

for its relocation (Woolliscroft 1989, 10), in practise both adaptations to the original plan served to place an otherwise obscured point of potential ingress under close surveillance.

A desire to control access points would also explain why work on the Wall mile 39 installations commenced with T 39b, as it arguably occupied the most auspicious plot among this set. Although the position of T 39b is not perfect, it did command a view east along the face of the Peel and Highshield Crag (fig. 5). The turret also lies adjacent to one of the few modern roads that bisect the line of the crags, highlighting its potential for north–south movement. Identical motivations may explain why MC 38 (Hotbank), which controls a comparable passage at the eastern end of Highshield Crag, is the only milecastle between MC 27 (Low Brunton) and MC 42 (Cawfields) known to have the equivalent of its north rampart (here facing north-west) built to the Broad Gauge for its entire length. This apparent pairing of T 39b and the MC 38 gate tower to control the western and eastern corridors skirting the Peel and Highshield Crag seems to offer compelling support for Graafstal's surveillance screen hypothesis. No milecastles among the crags are known to have been completed to the Broad Wall specifications, but the remainder of the MC 38 rampart was laid out to the Middle Gauge, making it one of only a handful of milecastles in the central sector to receive a complete perimeter prior to the Narrow Wall reduction.

If the strikingly inconsistent intervals between the installations from T 38b to T 39b are attributable to a belated decision to reposition MC 39, then they represent collateral from a collision between the Broad and Narrow solutions to mitigating the difficulties thrown up by superimposing a regular sequence on irregular terrain. Although varying the spacing between installations was a technique employed during both the Broad and Narrow construction phases, in general the preferred Broad Wall approach appears to have been to prioritise those installations that the spacing system *naturally* placed in important areas. Indeed, it is possible to articulate an interpretation of the overall frontier building programme that implies a logical approach to reducing opportunities for unregulated north–south transit as construction work progressed. As the lowland eastern and western sectors were presumably the most populous it would be appropriate to tackle these regions first. At the same time, a set of installations along the entire length of the Stone Wall frontier, including milecastles 47 (Chapel House) and 48 (Poltross Burn), was prioritised for construction because they lay in areas considered particularly susceptible to unregulated movement. Control was then incrementally tightened, with posts such as T 39b probably only fast-tracked within the construction schedule for that particular stretch of frontier.

Following the advent of the Narrow Wall there appears to have been generally more scope to finesse spacing intervals, installation designs, and even the line of the curtain in order to capitalise on the terrain and meet local requirements. The built location of MC 39 is consistent with this ideology. It should also be noted that the eventual position of T 39a is not a bad one. Stretches of the north face of Peel Crag are easier to scramble up than they appear, and so leaving its plateau ungarrisoned would have resulted in a long strip of curtain devoid of immediate surveillance. While much of the Wall curtain on top of Peel Crag is overlooked by T39b and MC 40, their garrisons are poorly positioned to intervene rapidly in order to prevent illicit crossings, or even detect them under cover of darkness.

In conclusion, it is suggested that the location of turrets 44b and 45b controlling significant natural passageways across the line of Hadrian's Wall was not happenstance. Instead, it acknowledged a purposeful decision, which itself related to a relaxing of the 'rules' that earlier governed the location of the smaller structures along the Wall. This enhanced flexibility is reflected in a greater willingness to tailor the structures to the landscape in the final stages of building the frontier. Such an approach would have increased the ability of the turret and milecastle garrisons to detect and prevent clandestine attempts to cross the curtain by small groups. This finessing can be perceived as a more proactive and nuanced expression of the desire that had earlier prioritised the construction of milecastles and turrets occupying critical locations along the projected route of the Wall curtain. It also brought Hadrian's Wall into closer alignment with other frontiers, where fortlets and towers, when present, were generally arranged with a keener eye for the potential of the landscape in which they sat. Skilful engagement with the local physical and — presumably — human geography is, in turn, a hallmark of fortlets more generally (Symonds 2009; Symonds forthcoming). The reduced rigidity of milecastle and turret designs, and greater freedom to exploit the terrain can be seen as practical revisions to the Hadrian's Wall 'blue-print' at a point when construction was well advanced. It is probable that one of the motivations for this was a growing appreciation that the small garrisons manning the milecastles and turrets were most effective at controlling movement when their installations were positioned so that the topography maximised rather than inhibited their impact.

APPENDIX 1: THE EVIDENCE FOR THE BUILDING SEQUENCE

- Broad Foundation laid from MC 4 to the Irthing (T 48b/MC 49), with known exceptions at MC 39–T39a, in the stretch from MC 40 to MC 43, and T 44b to T45a/45b
- All known milecastles and turrets from MC 4 to MC 48 for which information is available started to be built to Broad Wall specifications, with the exceptions of MCs 39 and 40, Ts 39a, 44b and 45a, and probably T 45b
- Priority appears to have been given to guarding natural and possibly, in the case of Dere Street, artificial corridors bisecting the projected course of the frontier curtain
- Broad Wall appears to have been completed only from T 7a/b to MC 22, but started in places further west
- Initial experiment with a reduction to a Middle Gauge as a measure to accelerate completion of some milecastles
- Hiatus, as demonstrated by the fill of Chesters ditch, Peel Gap culvert, and the abandoned Broad Foundation on *Mons Fabricius* and at Great Chesters, presumed to be linked to the fort/Vallum decision
- Work on the Broad Wall could have continued for some time, as indicated by the Broad Foundation west of Chesters fort over the end of the fort ditch
- The Wall narrowed

APPENDIX 2: T 45b (WALLTOWN WEST)

J. Collingwood Bruce published three editions of his *The Roman Wall* and three of *The Walllet* (later *Hand*)-*Book to the Roman Wall* between 1851 and 1886. After his death in 1892, the editing of the *Handbook* was taken over by Robert Blair who lived in South Shields. It is through Blair that Bruce's books and other relevant material came to be lodged in South Shields public library. The material contains two bound scrapbooks created by Bruce, one relating to the publication of the first two editions of *The Roman Wall* and the other to the third edition. In addition, the archive includes photographs.

Two of the photographs still housed in Bruce's bookcase are reproduced here after being seen by DJB since the main text of this paper was written (figs. 6 and 7). They are both of T 45b (Walltown West) destroyed in or shortly after 1885 (Bruce 1885). It has hitherto been believed that the photographs depicted T 44b, and this is the first time that they have been published together as T 45b. Their importance is two-fold. They provide a record of the turret under excavation and they corroborate the drawing of C. J. Spence (reproduced above as fig. 4). The latter aspect is of some significance as some drawings and paintings exhibit a measure of artistic licence. In this case, the Spence drawing is true to the photograph, but by way of comparison, the two existing depictions of T 29a (Black Carts) show some important differences (the fact that Bruce preferred the Mossman painting to the Richardson drawing indicates which depiction is more likely to be correct: Breeze 2016, 20–1).

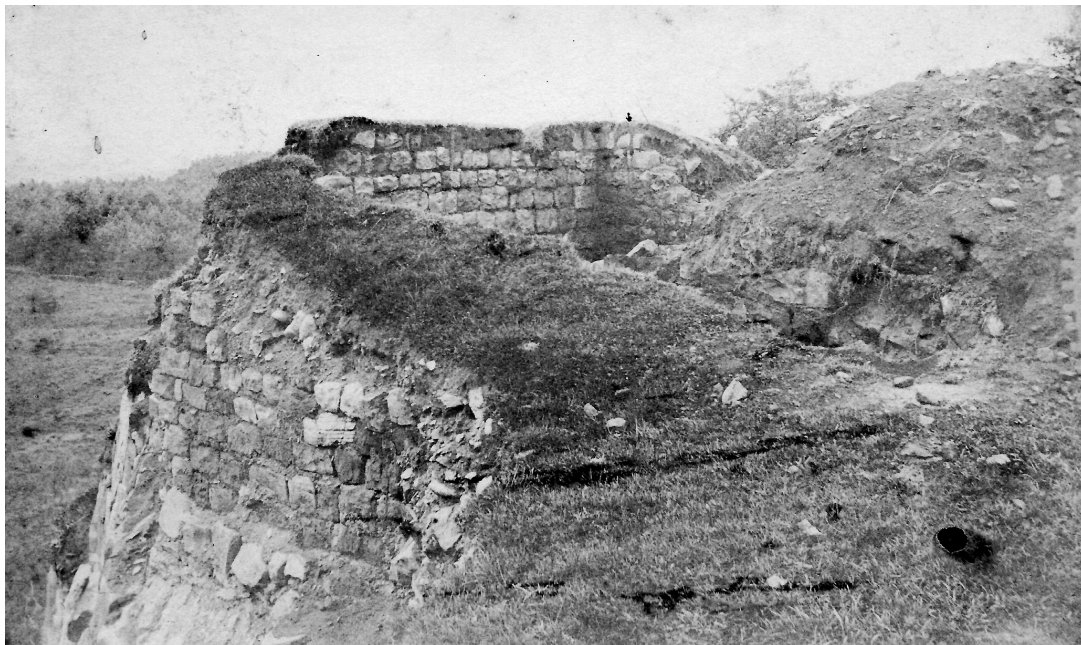


Fig. 6 T 45b (Walltown West). This is photographed from the same location as the drawing by C. J. Spence (see fig. 4) and confirms the accuracy of his work.



Fig. 7 T 45b (Walltown West). This view of the turret reveals more of the interior of the turret, in particular to the inside of the north wall. It also shows the wide views north and east from the turret.

NOTES

¹ After examining the photographs in Simpson 1976, Peter Hill made the following observations: 'Size and method of dressing are just what might be expected for a MC gate, probably, though on no firm evidence, a gate passage like MC 37. Scaling from Simpson 1976 fig. 20 the lowest course is typically 18" long × 10" high (450 × 250 mm), the second course is 24" × 6" (610 × 150 mm). Depth can only be guessed at. The long stone on left of third course is about 5'6" long by 5" thick (1650 × 125 mm), just right for a door jamb.'

² Cf. Foglia 2014, 41, who suggests that the turrets in his Test Group 4, stretching from Great Chesters to MC 47, were retained because they sat in 'a more open landscape, where keeping closer watch was more important'.

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