

A Roman camp, quarries, and the Vallum at Shield-on-the-Wall (Newbrough)

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SUMMARY

The earthworks of a newly discovered Roman camp, of an adjacent stretch of the Vallum, and of a series of quarries, were recorded and analysed. The results suggest that the line of the Vallum was the first element of Hadrian's frontier to be surveyed in detail in this sector. The camp was for those quarrying the stone for the Wall. While the quarries were still open, the construction of the Vallum was begun; its inception marked by an abrupt terminal to the ditch. When the quarries ceased, the Vallum was ingeniously constructed through the workings. Some parallels are noted, especially at Carrawburgh where the enclosure found below the fort was probably another camp. The Vallum was clearly defensive but was not itself defensible. Its slighting seems to have been symbolic. Some later ploughing took the form of cord rig — the first time that a post-Roman date for this type of cultivation has been established along the Wall. There was post-medieval quarrying, for the Military Road in 1755 and for the nineteenth-century field walls.

INTRODUCTION

IN 2010, THE SLIGHT EARTHWORKS OF A ROMAN CAMP, close to the line of Hadrian's Wall but not previously recorded, were identified by Bryn Gethin on imagery produced by airborne laser scanning¹ (*Britannia*, 42 (2011), 341). The site is about 600 m to the east of the ruined cottage known as Shield-on-the-Wall,² and 350 m to the east of the remains of Milecastle 33. The camp (NY 835706) is on the south side of a sandstone knoll, the summit of which is crossed by the Vallum and is scarred by quarrying. Photographs subsequently taken from the air by Dave MacLeod of English Heritage provided more detail of the site. This paper describes and discusses the results of an analytical field survey of the camp and of its immediate environs (fig. 1). The earthworks were recorded using a plane table and a Sokkia Mini AR electronic auto-reduction alidade.

THE EARTHWORKS

The Roman camp

The camp is on the south side of the Vallum, on the gently sloping southern flank of the sandstone knoll, the summit of which (251 m OD) is the highest point in the immediate vicinity. The line of Hadrian's Wall — under the eighteenth-century 'Military Road', the B6318 — is only 15 to 20 m to the north of the foot of the natural scarp that is crowned by the North Mound of the Vallum.

The defences of the camp enclosed an area measuring about 104 m from north to south by about 137 m transversely — a proportion of 3:4 — giving an area of approximately 1.4 hectares

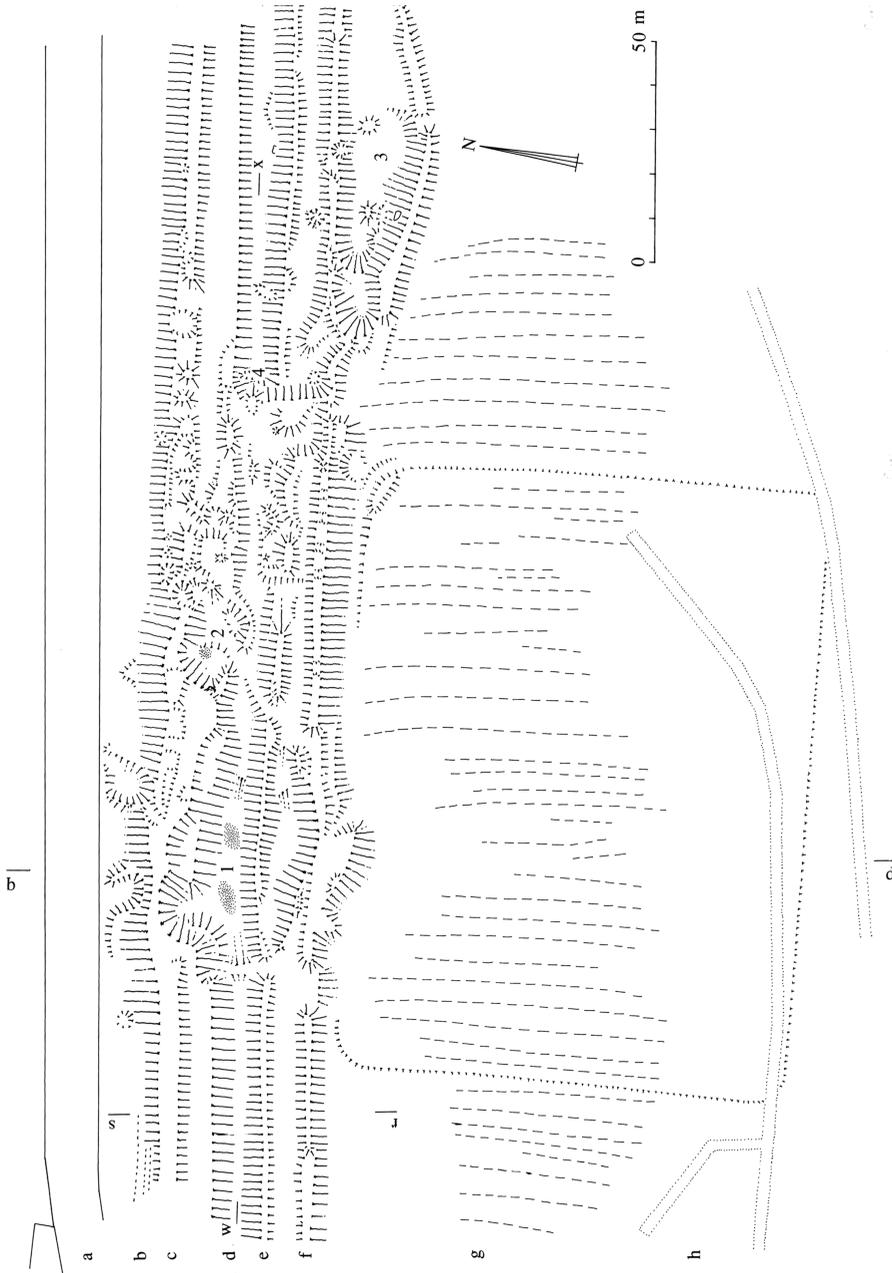


Fig. 1 The analytical survey of the earthworks at Shield-on-the-Wall.

Key:

- a. the course of Hadrian's Wall, under the Military Road of 1755 (the B6318)
- b. cord rig
- c. the North Mound of the Vallum
- d. the ditch of the Vallum
- e. the Marginal Mound
- f. the South Mound of the Vallum
- g. the Roman camp, overlain by plough ridges
- h. field drains
- 1, 2, 3. Roman quarries
- 4. the terminal of the ditch of the Vallum

(3.5 acres). The earthworks have been severely abraded by ploughing which is clearly visible on the aerial photographs as poorly developed ridge-and-furrow; the bank and the external ditch of the camp are so eroded that it is unlikely that they would have been identified without the laser images. Between the northern and the southern ramparts the slope falls for a total of about 9.5 m across the interior of the camp. Because of this slope, and the underlying geology, much of the site is slightly better drained than the immediate surroundings but the lower third of the interior has comparatively poor drainage: here the vegetation changes from grass to coarser species such as rushes (*juncus*) and the ridging is more difficult to identify. Recent open drains (each consisting of a shallow trench with the upcast on the southern side) have been cut across the lower slopes; one of these has damaged and obscured the south-eastern corner of the camp.

The east and west sides of the camp may have determined the alignment of the later ploughing, but as both the ridging and the defences extend at right-angles across the contours, facilitating the drainage, this common alignment may be partly fortuitous. Nevertheless, the result is that on these two sides the earthworks of the camp became incorporated into this arable field; the defences have thus been reduced to plough ridges, between 4 m and 5 m wide, which are marginally higher and subtly different in character from the others. For most of its course the outer scarp of the rampart of the camp is no more than 0.2 m high. The southern side of the camp lies in the damper ground and the outer scarp is evanescent, being no more than 0.1 m high.

On the north the ploughing has over-ridden the line of the defences and it is only at the north-eastern and north-western angles that the defences of the camp are comparatively well preserved. At the north-eastern corner the bank and the ditch are 7.5 m across, overall; the bank is 0.8 m high and the ditch is 0.6 m deep. It may be that these northern angles of the rampart — which would have benefited from the additional upcast available from the slightly longer stretch of associated ditch round the curve of the corner — may originally have stood marginally higher than the rest of the perimeter and thus may have been more than successive ploughmen wished to take on. Due to the very poor preservation of the earthworks, no gates to the camp could be identified, although there were the faintest indications that the external scarp of the bank in the centre of the east and west sides of the camp was in each case fractionally lower; the gates may therefore have been in these positions.

From examples known elsewhere, it was clearly common practice — and common sense — for the Roman surveyors to place one side of a camp on a crest so that any dead ground could be eliminated (Welfare and Swan 1995, 7–8). However, at Shield-on-the-Wall it was immediately noticeable that this was not the case: the natural crest of the knoll was about 40 m to the north, along the line occupied by the North Mound of the Vallum. Thus, although the camp would have had a wide outlook to the south there would have been no view to the north at all.

The Vallum

On either side of the knoll the earthworks of the Vallum are exceptionally well preserved and extremely impressive. John Horsley, who had the advantage of seeing this landscape before the construction of the Military Road, recorded that at this point the Wall and the Vallum 'keep near to each other, and for that space are themselves and all their appurtenances very large and conspicuous ... and the united military way [i.e. the Roman road on the North Mound] is very pompous and grand' (Horsley 1732, 146). This judgement was echoed by John

Collingwood Bruce (1885, 128) in the third edition of the *Handbook to the Roman Wall*, and has been endorsed in all eleven editions since. What has not been noted previously, however, is that the character of the earthworks varies: on the eastern side of the knoll it is markedly different from the western side. The flanks of the knoll will be described first, before the more complex central area.

Overall, the Vallum measures more than 40 m across, rather more than the theoretical width of one *actus* (about 35.5 m) sometimes propounded. The ditch, cut through the underlying sandstone, has suffered minimal erosion; its sides are still sharp and there seems to have been comparatively little silting. To the west of the summit, the ditch is 3.3 m deep, 11 m wide from crest to crest, and about 3 m across its base. To the east it is 12 m wide, although in the last 40 m (moving westwards towards the summit of the knoll), the ditch narrows slightly to a width of 10 m. Across its base it is 4 m wide, narrowing to 2 m. At the western end of this narrower stretch the ditch ceases abruptly where a scarp (4 on fig. 1) cuts across its path. This scarp, extending north-south and 2.9 m high, appears to be a terminal to the ditch, an exceptional survival along the Vallum.

The north berm of the Vallum has an average width of 5 m to the west of the knoll, and is 6 to 8 m wide on the eastern side. To the north is the North Mound, the position of which is occupied by the Military Way. This is a fine example of a Roman road. The raised *agger* is about 10 m across overall and averages 1.2 m in height. The road surface — composed of small stone flags, visible in places — is about 5 m across to the west of the knoll but only 2.5 m across on the eastern side. In this stretch the road would have provided views to the north, over the top of the Wall, the footings of which were probably about 5 m lower (in vertical height) down the slope to the north (fig. 2).

The berm on the southern side of the ditch is comparable to that on the north, being about 4.5 m wide, narrowing to as little as 3 m on the east side of the hill. The South Mound is appreciably narrower than its northern counterpart (which carries the Military Way), measuring no more than 7 to 8 m in width. On the eastern flank of the knoll it is up to 2.4 m high on its north side and 1.6 m high on the south. The comparable figures on the western flank are 1.1 m and 2.2 m respectively. In both cases the height of the southern scarp probably includes part of the natural slope. Where the surface has been eroded it is clear that the mound was composed largely of stone rubble rather than of earth or turf. The South Mound is interrupted (at regular intervals of about 35–40 m) by the so-called ‘crossings’ (Simpson and Shaw 1922) where, for a length of about 12 to 15 m, the Mound has been reduced to about half of its height. (This is particularly evident on the slope to the west.) Close to the north-eastern angle of the camp the crest of the South Mound is interrupted by an atypical series of four or five abrupt indentations, each of which is only about 2 m across and 0.6 m deep.

Along the southern crest of the ditch is the Marginal Mound, the provision of which greatly strengthened the southern scarp. On the western flank of the knoll, where it is very well preserved, this mound stands up to 1.2 m above the level of the berm; the southern scarp of the ditch itself was thus made into a formidable obstacle up to 3.3 m high. On the eastern flank the mound is up to 0.7 m high.

Hadrian's Wall

The course of the Wall lies under the tarmac of the B6318 (‘the Military Road’) which was constructed in the 1750s (Lawson 1966; 1973). The road is bounded by drystone walls which

probably date to the 1820s or soon thereafter. To the north, the Ditch of the Wall is well preserved, measuring 9m in width and 1.8m in depth. There has been comparatively little erosion or silting, and this good state of preservation is again probably due to the Ditch having been cut through the sandstone of the knoll. On its northern side, the upcast from the Ditch (less any stone that could have been used in the construction of the Wall itself) has been spread out for a distance of 8m as a glacis that heightened and strengthened the northern scarp of the Ditch itself (fig. 2; cf. Welfare 2004).

The quarries

It is immediately evident that the knoll has been extensively disturbed by quarrying. The largest of the quarries (1 on fig. 1) has taken away much of the summit; it measures approximately 30m from north to south by 50m from east to west and has a depth of about 5.5m on the north and 4.2m relative to the southern side. The volume of stone removed was probably in excess of 7500 cubic metres. A subsidiary quarry (2 on fig. 1) was opened on the north-eastern flank of the main area of extraction. This smaller quarry seems to have been about 22m by 10m and up to 4.8m deep, probably supplying about 1000 cubic metres of stone. On the eastern edge of the area surveyed there is another substantial quarry (3 on fig. 1), long and narrow, flanking the south side of the Vallum, and with a small ridge of stone (capped with quarry spoil) left unexcavated on its southern side. This third quarry is up to 3.4m deep – declining in depth from west to east — and measures about 55m from east to west by 30m transversely. (It therefore must have yielded about 800 cubic metres of stone.) A large rounded boulder, 2.1m across, lies on the inner southern slope of this quarry. It seems to be of dolerite rather than of sandstone but at some point it has been vigorously addressed with hammers and chisels; the quarrymen only succeeded in detaching three huge flakes before abandoning the attempt. Although horizontally banded sandstone is visible beneath this erratic, the presence of this much harder rock may have contributed to the decision not to quarry any further around this point.

Within the larger quarries and across the whole of the eastern flanks of the knoll is a scatter of small surface quarries. These are usually little more than pits a few metres across; adjacent to some of them lie heaps of rubble which may represent discarded material, or usable stone that had still not been carted away on the day that quarrying finally ceased. The surface of the Military Way has been robbed in many places, presumably for the small flags that formed its surface. Some of these little ‘howks’ are shallow (being only about 0.4m deep) and tend to be rectangular on plan.

Relationships in and around the major quarries

Up to this point the description of the earthworks has not reflected the complexity that is encountered in the central portion of the site, the area that was most affected by the major phase of quarrying. The element that is most immediately obvious — especially when coming from the west — is that the Marginal Mound appears to continue *across the floor* of the largest quarry. Within the area of quarrying, as a whole, its course wanders slightly from the dead straight alignment that is maintained on either side (see below). The whole of the natural summit of the knoll has been dug away, and the ditch of the Vallum, in its normal form, is absent in this section. No ditch has been cut into the floor of the quarry. To compensate, a

massive bank, on the line of the Marginal Mound, was constructed across the floor of the quarry. Measuring up to 8m across, it is largely composed of the rubble that would have been readily available in the aftermath of the quarrying operations. The northern scarp of the Mound is up to 2.8m high and the southern one is not much less, standing to 2.3 m above the level of the quarry floor; these are values that closely replicate the southern scarp of the ditch (in its normal form) elsewhere. This is not an incidental provision but is the product of a very deliberate construction project. The intention was clearly to replicate the ditch by recreating the obstacle that it presented.

Apart from one minor break (at the western end of quarry 3, where there may have been some later extraction), the South Mound of the Vallum is also continuous, although its line does bow slightly to the south, round the crest of the deepest quarry. The existence of this Mound as a discrete bank through this area is underlined by the two short stretches where a trench seems to have been cut through the top of the quarry debris so as to provide the Mound with a northern scarp. (This occurs on either side of the point at which the spoil has spilled over to cover the line of the northern defences of the camp.) It seems that it was important to define the northern scarp of the Mound, even where it crossed the quarry spoil.

A broadly similar picture seems to be presented along the course of the North Mound (occupied by the Military Way). This appears to have taken a short curving diversion around the head of the largest and deepest of the quarries (although the southern edge of this diversion may have been affected by post-medieval quarrying). To the east, the line of the road is badly damaged by many small quarries, most of which are shallow and relatively superficial; this seems to represent a phase of the robbing of the road surface itself.

ANALYSIS

The camp

The discovery of the camp is another illustration of the potential of airborne laser scanning to reveal evanescent earthworks (cf. the camp at Bewcastle: *Britannia* 42 (2011), 343–4), a step change in the rate of the identification of sites which is akin to the one that resulted from the expansion in the use of aerial photography in the 1940s and 1950s.

There are three other camps within the Wall corridor that are of the same size as this one: Greenlee Lough, Markham Cottage 2, and Twice Brewed (Welfare and Swan 1995, 104–5, 113–15, 131–2). Their proportions are, however, rather different, the ratios of their axes being 5:4, 5:4, and 6:4, respectively, whereas the ratio at Shield-on-the-Wall is 3:4.³ In the long-standing theoretical debate about the number of troops that might have been accommodated in a camp (Jones 2012, 47–58), the present writer is inclined to favour the views of William Roy who, as a military engineer in the eighteenth century, had the advantage of direct practical experience of getting an army established and secure under canvas. Roy's hypothesis (1793, 51–3) envisaged there being somewhere in the order of 200 men per acre (about 500 per hectare) in a Roman camp, a figure which would mean that rather over 600 men (perhaps one cohort) would have been accommodated at Shield-on-the-Wall. It may be that a cohort was considered a force of an appropriate size for a quarrying party⁴ and, presumably, in this instance at least, for the building of the Wall itself. (It is intriguing to note that the camp beside Greenlee Lough, 1.5 km to the north-west of Housesteads, was almost certainly established to accommodate the troops detailed to quarry the sandstone outcrops there: Welfare, forthcoming).

The north-east and north-west angles of the camp at Shield-on-the-Wall are not inter-visible, the line of sight being blocked by the substantial spoil-heap that extends to the south of the South Mound of the Vallum. This suggests that the camp preceded the quarrying that the spoil represents, and that before the quarrying ended the defences were no longer considered necessary.

The most telling piece of information provided by the camp lies in the position that was chosen for it. Many camps in England exhibit a common characteristic – that, if necessary, one side of the camp was aligned along a crest so as to eliminate any dead ground in the immediate vicinity (Welfare and Swan 1995, 7–8). This has subsequently been noted in Wales and in Scotland (Davies and Jones 2006, 14–15; Jones 2011, 76). At Shield-on-the-Wall the crest of the natural scarp lay approximately along the line of the North Mound of the Vallum, about 40 m to the north and approximately 3.5 m higher than the north rampart of the camp (see the profile, fig. 2). Being thus overlooked so directly would normally have rendered the camp so vulnerable that it would not have been tenable. This exceptional choice of site strongly suggests that there were extenuating circumstances here. The key factor seems to have been the careful alignment of the northern side of the camp which is exactly parallel to the line of the Vallum. Such a deliberate choice indicates that the course and width of the Vallum must have been determined before the camp was established. The *eventual* extent of the earthworks was already known, and the vulnerability of the site (in being so directly overlooked) was not going to present a problem while quarrying operations, and the building of the Wall, were in full swing.

The Vallum

The area between the northern defences of the camp and the summit of the sandstone knoll is occupied by the earthworks of the Vallum. This huge undertaking has been little studied, comparatively speaking — the major contribution being the thesis by Brenda Swinbank (1954) — and no short surviving section had been considered in detail as an earthwork. The site at Shield-on-the-Wall provided a good opportunity to do this, at a point where (ironically, in view of the presence of the quarries) it generally survives in good condition with very little abrasion or erosion.

It has often been pointed out (Bruce 2006, 86; Wilmott 2008, 121; Wilmott 2009, 75, 134) that the principal element of the Vallum — the ditch — was always provided, irrespective of the hardness of the underlying rock (cf. the situation evident at Limestone Corner, 4 km to the east), and that it was cut to a profile appropriate to the ground conditions (Swinbank 1954, 353; Heywood 1965, 85–6; cf. Welfare 2004, 21, in relation to the Ditch of the Wall itself). Cut through the sandstone of the knoll at Shield-on-the-Wall, the almost rectangular cross-section of the ditch of the Vallum has survived so well on the eastern and western flanks that in this aspect it may be taken as a type-site (even though other aspects of the ditch in this stretch are quite exceptional).

Wherever possible, the line chosen for the Vallum lay close to the Wall, and it was planned in long, straight alignments (Wilmott 2009, 75). Poulter has shown (2009, 47) that the long alignment from Limestone Corner to the western side of the Coesike was surveyed from east to west. If so, an intermediate survey station must have been set up on the intervening summit of this knoll at Shield-on-the-Wall in order to continue and complete the line over its last 1500 m westwards. As fig. 2 makes clear, it must have been the summit itself that was

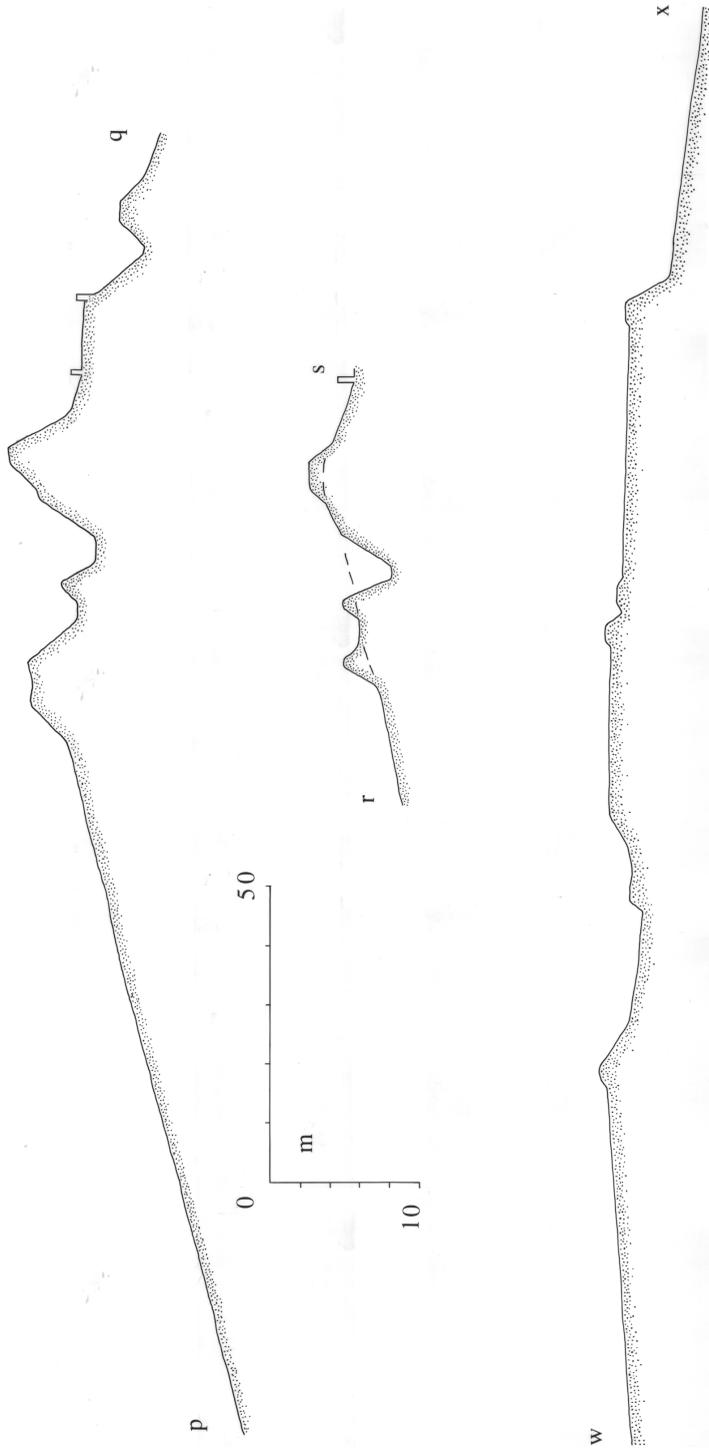


Fig. 2 Profiles: their positions are indicated on fig. 1. The vertical scale is exaggerated $\times 2.5$.

Top (p-q): through the quarried area, extending N to include the Ditch of the Wall and the glacis.

Centre (r-s): through a more typical portion of the Vallum, to the west. The dashed line indicates the probable profile of the original ground surface.

Bottom (w-x): along the base of the ditch of the Vallum, on either side of the knoll, and through the quarries.

chosen for this intermediate station on the line surveyed, a line that was subsequently occupied by the course of the North Mound; everything else (the remainder of the Vallum, and probably the line of the Wall itself) must thus have been determined by a series of offsets from this line — offsets that would have been pegged out or marked by low banks. The Wall at this point diverges from the major alignment so as to follow the slight crest above Fozy Moss; there is a similar divergence at Limestone Corner. It therefore appears that the survey station at Limestone Corner was also on this northern element of the Vallum (the North Mound), and not on the line of the Wall. (The marking-out of the line surveyed might be the explanation for the small banks found under the North Mound at Appletree: Wilmott 2009, 109, 111–12, 119.)

Surveying the line was one thing; the construction of the earthworks was quite another. Observations elsewhere have suggested that there was a significant interval between the construction of the Wall — which was given priority — and that of the Vallum. This is especially clear in the relationship between the Vallum and some of the forts along the line of the Wall (e.g. Benwell, Rudchester, Halton Chesters, Birdoswald, and Castlesteads). At Limestone Corner, Wilmott (2009, 100) considered that the ditch of the Vallum had originally been excavated from west to east. The question therefore arises as to where this eastwards progression began in this particular stretch of the Vallum. The terminal of the ditch at Shield-on-the-Wall suggests that this was that point, and that the digging of the ditch, eastwards along the surveyed alignment, proceeded from here. The differences in the character and dimensions of the earthworks of the Vallum to the east of the terminal (when each element is compared with its appearance on the west flank of the knoll) reinforce the impression that there was a significant change in the specifications for the Vallum on or close to the summit of the knoll. Although the overall width of the Vallum is the same on either flank, to the east the north berm is wider and the south berm is narrower, as are the Military Way and the ditch. (See the measurements cited in the description of the earthworks, above).

The terminal of the ditch of the Vallum is an exceptional survival. Standing 2.9 m high, the scarp (4 on fig. 1) that cuts across and thus forms the end of the ditch is clear and deliberate, and it is not in any way a product of the quarrying. The terminal is between the quarries, so it seems likely that this scarp marks a point where continuing access was required across the intended line of the ditch. Egress from the major quarry (1 on fig. 1) would also have been necessary, and this would normally have been provided at or close to the lowest point in order to obviate any need for the freshly quarried stone to be carried uphill. It is suggested, therefore, that the major quarry (and possibly both quarries) was still open and operational when construction of the Vallum began to the east, and that the terminal represents a recognition that the area of the quarries would have to be left for the time being; the completion of the Vallum here would have to wait. On the west, the level of the bottom of the Vallum ditch was more or less the same as that of the quarry (fig. 2), probably because the latter was already well established by the time that the construction of the Vallum eventually began on that flank of the hill. As it turned out, because the base of this western end of the ditch is 3.5 m above the level of the comparable base at the terminal, a major piece of additional engineering would have been demanded to reconcile the two and to smooth out the junction once quarrying had ceased. Evidently this was not considered worthwhile and, instead, the quarry spoil available was used to replicate the ditch across the floor of the quarry, proud of its surface. This seems to have been the final phase.

It is noticeable that within the area of the quarry — where the pegs or the marker banks of the putative survey offsets had of course been removed — that the reconstructed line of the ditch wobbles out of alignment. Towards the eastern end of the quarry the Marginal Mound has veered over a metre to the south of the general alignment but the line of the ‘ditch’ that has been created within the quarry by the insertion of this massive linear mound still maintains the projected course.

The presence and continuity of the Military Way on the line of the North Mound poses the question of exactly where the point of egress from the main quarries may have been, for there seems to be no obvious route by which the stone was taken the short distance to the line of the Wall itself. One possibility is that the level (or gently graded) cartage line that would be expected was subsequently deliberately filled with rubble to provide an appropriate foundation for the Mound or for the Military Way. Such a move would have preserved the integrity of the Vallum and would have prevented direct access to the bottom of its ditch.

The slighting of the South Mound

The regular reductions in the height of the mounds of the Vallum — usually the South Mound — known as ‘crossings’, have periodically been the subject of attention, most notably by Simpson and Shaw (1922), by Brenda Heywood (1965), and by Tony Wilmott (2008, 124–5), but their nature and purpose are not yet convincingly understood. The conventional explanation is that they represent the slighting of the Vallum when Hadrian’s Wall was abandoned in favour of the Antonine Wall in the 140s (Bruce 2006, 86). At Shield-on-the-Wall the top of the South Mound has been levelled down to half its height in a series of regular lengths, each of about 12 to 15 m, spaced about 35 to 40 m apart. This is evident on the western flank of the hill, and in its form falls within Division 4 as proposed by Simpson and Shaw (1922, 417–19, Fig. 10).⁵ Very little of the material cut out of the Mound was thrown into the ditch; instead it was spread fairly evenly inside and outside the gap created (cf. Heywood 1965, 90). Close examination of the ditch down the western side of the hill, in the winter months when the vegetation was at its lowest, revealed that a minimal amount of spoil had been deposited in the ditch — no more than a few basketfuls. Not all of these minor dumps are aligned with the gaps in the South Mound, and the Marginal Mound was usually continuous, but not in every instance. Nowhere was any access whatever created across the ditch; the term ‘crossings’ is therefore (in this section at least) something of a misnomer. At the extreme western end of the quarrying there is a short stretch that was not fully dug out (fig. 2); superficially this looks like a crossing point within the ditch (and there is a break here in the South Mound) but there is no access to the north and it seems rather to be an unfinished junction — material that was not extracted either for the ditch or for the quarry.

In the area of the quarry itself, the picture is slightly less clear, although it seems that the sequence of gaps continued. Close to the north-east corner of the camp, however, the south mound is not reduced in height although there is a series of small indentations which may be comparable to those recorded by Simpson and Shaw near Cawfields (1922, 404–5, Fig. 5, section CD).

The Military Way

The position of the North Mound is occupied by the fine *agger* of the Military Way. To the west of the quarrying, the road surface is 4.5 to 5 m wide, but to the east it is markedly narrower,

being only about 2.5 m across. This discontinuity suggests that the Mound (or the road) was built in separate sections, on either side of the quarry, as seems to have been the case with the rest of the Vallum, and that its specification was not fixed. The lack of slumping in the road — something that might be expected if it had been constructed on top of an earlier bank, even one containing much stone — might support the idea that the provision of the road was as early as the Vallum itself. Against it is the evidence adduced by Simpson and Shaw (1922, 354n, 417–18) from excavations in 1921 into the North Mound near Carrawburgh, to the effect that gaps ('crossings') had been made in the North Mound before the road was made. However, their interpretation rested on the assumption that the Marginal Mound was a secondary feature — something that has been contested as a result of more recent excavations (Wilmott 2009, 135); it seems that no report was ever published of these interventions.

Standing back from all of this uncertainty, there would clearly have been a need for some form of effective lateral communication, during and after the construction of the Wall. It seems implausible that such a provision — more than a simple 'service track' (below) — was only made when the frontier was re-occupied after the abandonment of the Antonine Wall. (The idea that this sequence was inherently unlikely was partly developed by Brian Dobson in the postscript to his Horsley Lecture in 1985: Dobson 1986, 25). In the early eighteenth century, John Horsley measured the earthworks of the Vallum close to this point, just to the east of Milecastle 33 ('About halfway between Carraw and Threep-fell-house⁶ ...'), and noted that '... there seemed to be some vestiges of the smaller military way, supposed to have gone close by Severus's wall from turret to turret ...', something that he also depicted on the schematic profile that he published (Horsley 1732, 146, 158.11). There is now no trace of this in the area surveyed — it would probably have been destroyed in the 1750s during the construction of the Military Road — and it is difficult to know quite what he saw, although this lesser road might be the same as the 'service track' that has been found in excavation elsewhere (Birley 1961, 123; Bidwell and Watson 1996, 33–5; Bruce 2006, 85; Wilmott 2009, 132–4).

Where the Wall and the Vallum are close together the room available for a fully developed east-west road was limited, so in the long term it made sense to use the line provided by the North Mound. As it is, there have been few observations of the chronological relationships that the Military Way has to other elements of the frontier, but some time-depth is occasionally apparent: this can be seen on the eastern side of the Knag Burn at Housesteads where a road, which may have had a limited life, has been recorded striking north-westwards from the line of the North Mound of the Vallum to meet the (evidently later) line of the Military Way, immediately to the south-east of Housesteads Plantation (Welfare 2009, Fig.10.7).

Much more needs to be done to understand the Military Way. The basic-scale survey of the earthworks of the Wall corridor which was carried out by the Royal Commission on the Historical Monuments of England (now in the English Heritage archives in Swindon) demonstrated that the character of this road could change radically from one area to another (Bidwell 1999, 8; Blood 1999; Bowden 1999). The evidence at Shield-on-the-Wall is another instance of this variability.

The quarries

It seems extraordinary that no antiquary or archaeologist has mentioned the quarries here in any publication. Not even Henry MacLauchlan, that most assiduous surveyor,⁷ made any comment in his *Memoir* (1858, 36), nor in his associated atlas (1857, sheet III). In the fieldwork for

her unpublished thesis, Brenda Swinbank evidently recognised the presence of the quarrying (David Breeze, pers. comm.) but apparently dismissed it as all being relatively modern in date.

In this landscape there have been three distinct occasions when stone would have been quarried. The first was the construction of Hadrian's Wall in the 120s; the second was the building of the Military Road past Shield-on-the-Wall in 1755; and the third was the provision of drystone walls following the Enclosure Award of 1824 (Northumberland Archives, Woodhorn, Q/R/A/10: 'Plan of Brown Moor ...'). On the ground these phases are visible, although — as always with quarrying — the picture is a generalised one and it can be difficult to assign any individual detail to a specific phase. The greatest demand for stone was in the second century, to supply the facing-stones for the curtain, and it is to this initial period that the three largest quarries are assigned; indeed this is demonstrated by the overlying earthworks of the Vallum, and by the way that the quarry (3 on fig. 1) close to the eastern edge of the area surveyed respected the line of the Vallum — a line which had apparently already been surveyed and pegged-out.

The survey of the landscape that was to be traversed by the Military Road, which was produced in 1749 by the military engineers Dugal Campbell and Hugh Debbeig (Northumberland Archives, Woodhorn, SANT/PLA/7/2/1/1A: reproduced in colour in Welfare 2009, 246), makes it clear that the original design for the stretch of 'The New Projected Road' from Walwick to Coesike was to have been the economical one: to use the line of the Military Way (which was presumably still in use) as its foundation. We do not know why this sensible strategy was abandoned in favour of levelling the line of the Wall itself. In either scenario, the Wall would have been the principal source of the stone for the road, but the supply of sandstone on the summit at Shield-on-the-Wall, so close to the line, could not be ignored by the Georgian military. This readily accessible material would have been especially important because the Wall and the line of the new road diverge immediately to the west, where there would not have been a supply of stone in such convenient proximity. It is worth noting that the same sequence — large-scale extraction, followed by small surface quarries — can be clearly seen on the southern crest of the valley at Housesteads, close to the Military Road (Welfare 2009, 248, and Fig. 10.7, item 41).

In some places, where the land was already enclosed, the line of the Military Road was evidently provided with new walls or fences (Lawson, 1973, 181, 183, 187). Elsewhere, the open common — including that at Shield-on-the-Wall — was only enclosed by new drystone walls in the years after the Enclosure Award in 1824. New stone would certainly have been required then, and it is to this period that the various heaps of rubble within the area of the quarries should probably be assigned. This was presumably material that was prepared for carting but which, in the end, was not required.

The ploughing

The gentle south-facing dip slope of the knoll is comparatively well drained and it is not at all surprising that it has been cultivated in the past, as the extensive area of ridge-and-furrow attests. (This spreads farther to the east and to the west than is shown on the plan.)⁸ Most of the furrows are about 5 m apart but the ridges are not well developed. At the upper end of the field they bend slightly to the west, preparatory for the turn of the ploughing team. As well as levelling the defences of the camp, the cultivation also impinged on the western edges of the spoil from the Roman quarry (3 on fig. 1) on the south side of the Vallum.

This is not likely to have been the first phase of ploughing here. On the extreme north-western edge of the area surveyed, between the Vallum and the drystone wall on the south side of the Military Road, there is a small patch of exceptionally narrow cultivation ridges, 1.4 m wide. These extend parallel to the Vallum and appear to have cut into the foot of its most northerly scarp; they must therefore post-date the latter. The working of this relatively marginal area, so exposed to the north, strongly suggests that this type of cultivation also covered the whole of the more favourable southern slopes of the knoll, only to be destroyed by the later ploughing. Whilst it certainly looks like cord rig, it is unclear whether it was set by a spade, a hoe, or a plough. Some cord rig is demonstrably prehistoric in date (Welfare 1986; Topping 1989; Welfare and Swan 1995, 104–5; RCAHMS 1997, 45; cf. also Breeze 1972, 85–7) but at Shield-on-the-Wall the rig cuts into the foot of the North Mound so it is clearly a very rare instance of a post-Roman example within the Wall corridor. A more extensive area of cord rig, covering at least 0.5 ha, has been recorded on Brown Moor, 350 m to the SE, but that, like most cord-rig, is not dateable.⁹ It is worth noting that in the Bowmont valley, on the northern side of the Cheviots, spade-cultivation did not apparently fall out of use until the eighteenth century, and that crops continued to be cultivated at altitudes over 300 m until the early nineteenth century (Tipping 2010, 181, 199, 201; cf. Carter 1995).

The second phase of ploughing (represented by the ridging on the southern slopes) is medieval or post-medieval in character but it cannot be closely or directly dated. At Housesteads, broadly similar ridging was recorded, and seems to have been the penultimate phase of cultivation there; in the final phase, harvests were still being taken off the south-facing terraced slopes below the fort in 1702 (Welfare 2009, 237). The cultivation at Shield-on-the-Wall is liable to have taken place before the Enclosure of this land in or after 1824 (Enclosure Award: Northumberland Archives, Woodhorn, Q/R/A/10).

DISCUSSION AND CONCLUSIONS

The analytical survey of the earthworks has revealed a sequence in this area which can be summarised as follows:

1. The line of the frontier is determined.
2. It is then surveyed in detail, establishing the line that was later taken here by the North Mound and the Military Way. The various other linear elements are positioned by offsets from this line and are pegged out or marked by banks.
3. The camp is established alongside (and respecting) the corridor that has been reserved for the Vallum.
4. The sandstone of the centre of the knoll, and of its south-eastern flank, is quarried to provide the facing-stones of Hadrian's Wall.
5. While the quarry is still open, the Vallum (as evidenced by the ditch and its terminal) is constructed eastwards from the knoll; to the west, this may have been slightly later; in either case it is clear that the earthworks were thrown up by different gangs who were working to slightly different specifications.
6. Spoil from the quarry spills over the northern defences of the camp, indicating that these are no longer necessary, presumably because the Wall is completed or well advanced and already provides security.

7. When the central quarry has gone out of use, rubble is employed to replicate the Vallum ditch across the quarry floor, and the North and South Mounds skirt the quarries. (It is not known whether a North Mound, as such, was constructed here before the Military Way occupied its line.)
8. Ploughing denudes the earthworks of the camp and the tails of the quarry spoil.
9. 1755: the Military Road is driven through; some additional stone is won from small quarries. As a consequence, the Roman Military Way presumably goes finally out of use. Stone-robbing of its surface ensues.
10. 1824: Enclosure Award. The drystone walls are built, using further stone won from small quarries; some piles of rubble remain unused. Quarrying of the knoll for road maintenance ceased.

The building of the Wall was the largest development of any period in this landscape, and it would have required large numbers of men on site every day, both for the quarrying and for the construction phase. There is as yet little information about the construction of the Wall in this sector. Milecastle 33, 350m away, was built as part of the Narrow Wall, so is comparatively late in the sequence, but it has been suggested (Hill 2006, 132) that this may have been on Broad Wall foundations. There were certainly Broad Wall foundations at Turret 33b. Whenever construction started, it is possible to say with some confidence — given the position of the camp and its relationship to the other earthworks — that its function was to accommodate the men that worked the quarries and who also, presumably, built adjacent stretches of the Wall. There are other quarries in the immediate vicinity which are of such size that they can be ascribed to the same episode: a small ridge of metamorphic sandstone (NY 831705) has been almost entirely removed just to the north-east of the reservoir at Shield-on-the-Wall and, 500m away, the northerly flank of Brown Moor is pock-marked by another quarry (NY 841705) exploiting the sandstone. Close by is another Roman camp, that at Brown Dikes (Welfare and Swan 1995, 79–80), which may well have been established to house the quarry-party there. A further unclassified enclosure, 400 m to the ENE, may also be relevant in this context. Other construction camps along the Wall have been considered in another paper (Welfare forthcoming).

There are parallels elsewhere for some of the relationships between the Vallum and the quarrying that has been recorded at Shield-on-the-Wall. At Bleatarn, in Wall-mile 60, a section was cut through the Vallum by William Calverley in 1894. Below the earthworks he found that the underlying sandstone ended abruptly and reappeared in his section some 13 feet (3.9m) farther north. The rock had been cut in steps and bore the marks of quarrymen's tools. Calverley suggested that this was a quarry which had 'supplied the red sandstone of which the Wall was built in this district, and that, when stone enough had been extracted, the Vallum was carried across it' (Haverfield 1895, 464). This was in an area where the Turf Wall would have been constructed initially, so the quarrying for stone would have been rather later in the sequence. Was there any example farther east, where the Wall had been built in stone from the beginning, where another quarry had been found to precede the Vallum? An answer was found within the same series of investigations undertaken by the Cumberland Excavation Committee. In 1897, Francis Haverfield examined the point at which the Vallum would have met the eastern wall of the fort at Carrawburgh. To his surprise he found 'a large and deep layer of large rough stones, the interstices wholly empty of earth . . . 35 feet (10.6 m) from north to south and possibly as much from east to west.' He concluded that this was 'the filling of

some hollow which existed here before the Roman built his fort wall, and which had to be filled up with solid material when that wall was constructed' (Haverfield 1897, 176–7). This was almost certainly a quarry (like the ones still visible within 250 m to the east and north east); it was not the Vallum.

The reason for saying this is that Haverfield's excavations on the east side of the fort in 1896 had revealed that the ditch of the Vallum suddenly stopped 40 feet (12.2 m) from the fort wall, and this was reaffirmed the following year (Haverfield 1896, 417; 1897, 176). These two observations, taken together — and viewed in the knowledge of what can still be seen on the ground at Shield-on-the-Wall — suggest that at Carrawburgh there was another instance of a quarry remaining open and operational when the Vallum was begun immediately adjacent. Haverfield had found the terminal to the ditch on the eastern side; to the west of this lay the quarry, and presumably another terminal farther west again, for the ditch was found under the centre of the fort in the 1960s (Breeze 1972, 89–90, 95). In addition, the discovery of the camp at Shield-on-the-Wall, which preceded the Vallum, makes it much more likely that the rectilinear enclosure revealed below the line of the South Mound at Carrawburgh was also a Roman camp, as David Breeze suggested at the time (1972, 86–8). The components, and their relative stratigraphy, at the two sites, only 2.4 km apart, are strikingly similar.

Turning to the line of the frontier itself, it is usually extremely difficult to determine relationships between linear features that are parallel, but the earthworks at Shield-on-the-Wall provide one such opportunity. It is particularly instructive that it seems to have been the long alignment of the Vallum — rather than the line of the Wall — that was initially surveyed in detail. It is therefore impossible to resist the conclusion that the Vallum was a part of the *initial* concept of the frontier (although it was not necessarily a part of the earliest phase of *construction*). The way that the camp for the quarries and the builders respected the designated corridor set aside for the Vallum reinforces this conclusion. John Poulter (2009, 74, 76, 81, 84) has argued that the Vallum was 'planned outwards from where each of the fort sites were, or were due to be placed,' although he acknowledged that there were problems with this theory and that it did not apply everywhere. It could be argued that the surveying of the Vallum, which took less account of the detail of the landscape than that of the Wall, is appropriate to an early stage when the initial broad determination of the line of the frontier had been completed and when it was clear, in general terms, how the curtain wall might exploit the natural defences available. It is not the intention of this paper to dispute Poulter's theory, but simply to highlight that the evidence on the ground at Shield-on-the-Wall points to an early phase for the inception of the Vallum here rather than to a later one.

Although the model for the sequence at Shield-on-the-Wall was constructed during our survey of the site, when it came to the writing of this report it was sobering to find that this was also the view that had been arrived at by Henry MacLauchlan, a man who looked at the landscape of the Wall with the eyes of a trained and exceptionally observant surveyor. He followed Horsley and Bruce in thinking that the Vallum was a primary feature, and although we would not agree with every aspect of his reasoning today, it is clear that part of his conviction stemmed from the topographical choices that had been made by the Roman surveyors when they laid out the course of the Vallum. It was during his examination of this particular stretch, between Chollerford and Sewingshields, and also immediately to the west of Iron Sign (Turret 14a), that he first became convinced of this (MacLauchlan 1858, 5, 89–90). Although it has long been recognised that the *construction* of the Vallum was secondary to that of some of the forts, this simply reflects the slow rate of progress in the development of the

frontier works, the enormous task of constructing the Vallum, and the relative priority that each element of the frontier was given as work went on. Further, the order in which the various elements of the frontier were built does not demonstrate the order in which they were conceived. In 1954, Brenda Swinbank had noted the possibility that the Vallum had preceded the laying of the Broad Wall Foundation at Limestone Corner but she dismissed the idea as it sat uncomfortably with the theories of the day (Swinbank 1954, 228–9). More recently, Erik Graafstal (2012, 144, 148) has presented a different picture, describing how disjointed the whole enormous project evidently was, and how various segments seem to have been accorded priority according to the vulnerability of each sector in topographical terms.

Although the forts may have been secondary in conception, it appears that (in this sector at least) the Vallum was not. In considering an early context for the Vallum it may be significant that at Carrawburgh — the fort nearest to Shield-on-the-Wall, and within the same long straight alignment from Limestone Corner — the Vallum was completed before the fort was built c. 130–33, in the reign of Hadrian (Birley 1935, 98; Breeze 1972, 89–90; Bruce 2006, 216). It seems, therefore, that the construction of the Vallum began relatively early in this sector. A primary place for the Vallum in the original plan for the Wall may cut across the familiar model that the first plan for the frontier was for the garrison to be based in the forts along the Stanegate, as the Vallum would form a barrier between the curtain wall and the bases in the rear. The difficulty that this obstacle would have swiftly presented may tie in with the realisation that the ‘fort decision’ was an early necessity if the new frontier was to operate efficiently (cf. Graafstal 2012).

The purpose and function of the Vallum remains puzzling. The history of the debate was discussed extensively by Brenda Swinbank (1954, 1–28, 235–69), but even now none of the explanations comfortably fits the evidence, and so much of that evidence — which is all too fragmentary — appears to be contradictory. Simple answers are not assisted by the realisation that the specification for the Vallum was not uniform. This is apparent at Shield-on-the-Wall and may also be indicated by the differing conclusions that have resulted from excavations (e.g. Heywood and Breeze 2008, and Wilmott 2008). Apart from Woolliscroft’s (1999) thoughtful appraisal of the options, there has been little questioning of Richmond’s pre-war and post-war interpretations (1939, 274; 1950, 52–3) of this vast earthwork as defining a prohibited place, analogous to a barbed-wire fence forming the southern boundary of the militarised zone. Richmond’s thinking was a product of its time and may also have been influenced by Mommsen’s view (*PSAN*² 6, 223–5) that the Vallum was the southern boundary of a frontier strip, and by Haverfield’s view (1899) that it marked the civil, legal, or political limit of the province.

Those who know the Vallum on the ground as an earthwork (especially where it is in good condition), or who have seen a section of it excavated, can be under no doubt that it was much more than a demarcation. It was a formidable obstacle. At Shield-on-the-Wall, the care with which the ditch was replicated within the former quarry, and the size of the Marginal Mound, especially on the western slope, encourages a more balanced view of the function intended. From his excavations, Wilmott (2009, 135) has argued persuasively that the Marginal Mound is a primary (‘or near-primary’) feature. The evidence of the earthworks at Shield-on-the-Wall shows that here the effect of the Marginal Mound is to strengthen the *north-facing* scarp of the ditch. This, then, was (in part) an obstacle for those intent on moving south. (There is no comparable mound on the northern lip of the ditch.)

Even though the Vallum evidently provided a strong southern boundary of the military zone, in the way that Richmond described, it seems that more consideration should also be given to seeing the Vallum as a second line of defence for the province against raids from *barbaricum* to the north of the Wall. The Vallum therefore appears to have been defensive (in that it protected the province) but it was not itself a defensible line (in the sense that it could be manned and form a fighting position). This is an important distinction. Should the Wall ever be over-run this defence in depth would buy a little time for the Roman garrison. If there is some truth in this it might betray some initial uncertainty as to whether the curtain wall alone — perforated at each Milecastle — would be a sufficient barrier to those who were sufficiently determined to cross it.

Any response to incursions, and any more peaceable day-to-day control of movement, would have demanded a simple network of roads or tracks. This is obvious enough, but our knowledge of the Military Way and of its relationship to the North Mound of the Vallum is still relatively poor and relies perhaps too much on assumptions based on old excavations.¹⁰ The road, which has been regarded as wholly secondary because it often occupies the line of the North Mound, certainly served some of the Milecastles and Turrets so it must have become established comparatively early in the execution of the whole scheme. It is hard to believe that the need for a lateral road was not foreseen and was not provided for in the initial plan.

In its later stages the Vallum is no less puzzling. A great deal has been written about its slighting but the evidence of the earthworks on the western side of the knoll at Shield-on-the-Wall suggests that here this was no more than symbolic. There is little coherence overall; so there is much more to do. Simpson and Shaw wrote their classic account of the Vallum (focussing on the ‘crossings’) over 90 years ago, and Brenda Swinbank’s doctoral thesis dates from 1954: the whole subject is overdue for re-assessment. Even though cultivation and pasture improvement have eroded the earthworks to a considerable extent in the last century there is still the potential for more detailed examination and analysis. It is not suggested that the work at Shield-on-the-Wall establishes a model that can be universally applied in detail, but it does provide an example of the reservoir of information that could be released and by which we might begin to understand this much neglected leviathan of military engineering.

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NOTES

¹ Also known as Lidar: Crutchley and Crow 2009; Cowley and Ortiz 2012.

² This must be distinguished from the farm of the same name near Caw Gap (Melkridge).

³ Elsewhere, there are probably two camps of this size in lower and upper Annandale — Hillside, Annan, and possibly Trailflat: Jones 2011, 222 and 312. The camp at Woodhead, near Pathhead in Midlothian (Jones 2011, 320), is only slightly larger. Both Hillside and Woodhead have axes in the ratio 3:4, the same as that at Shield-on-the-Wall.

⁴ There are quarries less than 200 m to the north of the camp at Twice Brewed, although some of this certainly post-dates the Vallum.

⁵ For the stretch immediately to the west, see Simpson and Shaw 1922, 406.

⁶ Threep-fell-house seems to have been at or close to the position later occupied by the cottage at Shield-on-the-Wall. Horsley (1732, 158.6) marks 'Tipplehall' in this position, but the much more detailed and more accurately surveyed map (1749) of the proposals for the construction of the Military Road depicts 'Tipple Hill' just to the north of Grindon Lough, and to the west of the Grindon Mill Hills, on the old route between Beggarbog and Settlingstones (Northumberland Archives, Woodhorn, SANT/PLA/7/2/1/1A).

⁷ MacLauchlan had had the finest training that there was, in the Royal Corps of Military Surveyors and Draftsmen, and had nearly fifty years of experience by the time that he came to survey the Wall (Charlton and Day 1984, 6, 20–23).

⁸ The extent of this ploughing is clearly visible on Google Earth, accessed July 2012.

⁹ See *The English Heritage Archaeological Map of Hadrian's Wall* (2010), on which the depiction of this cord rig is based on information supplied by Tim Gates. The ridging is also visible on Google Earth, accessed July 2012.

¹⁰ Brenda Heywood (2009) has published her excavation across the Vallum at Limestone Corner, but although the North Mound and the Military Way were partly examined not enough ground was opened to demonstrate the relationship between the two.

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