

The foundations of Hadrian's Stone Wall

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SUMMARY

A review of the evidence for the foundations of the stone sector of Hadrian's Wall demonstrates that use of flags was unusual and that the normal foundations throughout its length were cobbles and/or broken stone in the centre, bounded by large, roughly worked stones beneath the wall faces. In some places flagstones were used as the foundation for the faces on both the Broad Wall and the Narrow Wall. It is, therefore, not possible to determine whether any stretch of Wall was built to the broad or to the narrow specification merely on the basis of the type of foundation. On present evidence it seems probable that the use of flagstones in foundations was restricted to one legion. In the stretch of Wall between Wallsend and Newcastle the clay and cobbles were normally retained within a trench between 100 and 420 mm deep. Between Newcastle and Rudchester the flags sometimes sat in a shallower trench, sometimes, it would appear, directly on the surface though ploughing may have destroyed evidence for a trench in places. There is no evidence for a trench in the stretch between the Rivers North Tyne and Irthing but in two instances the Wall sat directly upon the bedrock. The different form of foundations and the depth of the foundation trench would appear to indicate the work of different legions. A plea is made for the use of more detailed recording and more rigorous terminology.

This paper is dedicated to the memory of Brian Dobson, mentor and friend, who always wanted to learn more about Hadrian's Wall.

INTRODUCTION

THE TRADITIONAL VIEW is that the Broad Wall sectors of Hadrian's Wall were erected on foundations consisting of no more than a thin layer of flags set in clay and laid directly on the ground whilst the Narrow Wall was placed on clay and cobble foundations laid in a trench. This is incorrect. Moreover, it has been seen to be wrong for many years, but so deeply embedded was our belief in this statement that variations were ignored. The aim of this paper is to review the evidence relating to the foundations of Hadrian's Stone Wall and consider the implications.

TERMINOLOGY

Archaeologists can be sloppy at characterising masonry, as the second author has pointed out (Hill 1981). They can be equally sloppy in describing foundations. Sometimes foundations appear to be referred to as 'footings'; sometimes the 'footings' appear to be the lowest course(s) of the wall. In many excavation reports, flagstones are often so termed only because the resulting surface resembles a flagged floor rather than reflecting the thickness of the stones. The core of the Wall is not always distinguished from the core of the foundations. 'Cobbles' are, technically, smooth water-rounded stones of fist size, usually obtained from river banks, but any roughly rounded stone is often described as a 'cobble'. Sometimes larger

rounded stones or boulders are found in boulder clay. Stones are described as set in 'puddled clay', sometimes just 'clay'. It is unlikely that puddled clay, as opposed to beaten or trodden clay, was used on Hadrian's Wall (Bidwell and Watson 1996, 19). In future, we recommend that more consideration is given to these aspects with better descriptions offered. We offer the following definitions, roughly in order of importance:

Foundations: the wide, solid base to a wall, the top terminating at or below ground level.

Footings: projecting courses at the foot of a wall to spread the load on the foundations.

Flags or flagstones: thin slabs of stone, either naturally occurring in thin-bedded quarries, or from a very particular type of stone which readily splits into thin slabs; thickness is usually 50–100 mm (2–4 in), with a length several times their height (see fig. 2).

Cobbles: smoothly rounded stones derived from hard, broken stone being carried long distances in a fast flowing stream or river or rolled around on a beach.

Clay: tenacious, very fine-grained material, which becomes plastic when mixed with water.

Puddled clay: clay which has been beaten or trodden down to form a waterproof base to ponds, canals, etc.

EVIDENCE

There is surprisingly less evidence for the foundations of Hadrian's Wall than might be expected, given the amount of investigations on its line. This is because many excavators, and most early excavators, failed to record the nature of the foundations. There are honourable exceptions: Bruce provided a detailed description of the foundations at Walbottle uncovered in 1865: a 'mass of clay puddling, varying in thickness, according to the stone press upon it, of from one to three inches ... Usually the foundation courses of stones is large and flat, but no regularity prevails' (Bruce 1865, 221–2).

In Table 1 (below) no details are given of the foundations of the north walls or wing walls at milecastles and turrets as these are not necessarily the same as the adjacent lengths of Wall which may have been built by different gangs. (Thus, Bruce's account of the foundations at Walbottle is not included in Table 1 as it is likely that he was describing the north wall of MC 10, Walbottle Dene.) The number refers to the Wall foundations in the area of the milecastle or turret or between these structures, and always beyond the wing wall. For detailed information see Hill 2004. BW = Broad Wall; NW = Narrow Wall. The Broad Wall foundations are about 9 ft 10 in imperial/10 Roman ft 1 in wide (3 m); the Narrow Wall foundations are about 8 ft (2.44 m) wide.

Table 1 The Foundations of the Wall from Wallsend to the River Irthing

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|--------------------------------|--|
| Wallsend–Newcastle NW | 'The Wall ... was uniformly built on a foundation layer of rough quarried sandstone fragments with occasional water-worn boulders, bedded in puddled clay, with a layer of puddled clay about it on which the first course was laid' (Spain <i>et al.</i> 1930, 493). |
| Wallsend–oa (Buddle Street) NW | 'Its footings were ... set in a trench with a maximum depth of 0.1 m. Roughly worked blocks of sandstone, some showing pronounced tapers or "tails" behind their front faces, and whin cobbles, also showing some rough working, were used to edge the footings. The core consisted of whin boulders and ironstone set in a matrix of redeposited boulder clay' (Bidwell and Watson 1989, 23). |
| ob (east of St Francis) BW/NW | 'The trench-built Wall footings were of clay-and-cobble and flagstones measuring on average 3.10 m (10 ft 9 in) wide ... At some stage both faces of the Wall |

- had subsided and tilted away from the Wall core, however, fissures up to 250 mm (10 in) wide opening up behind and parallel to the facing stones' (Bennett, 1998, 24). Bidwell (2003, 17) notes that the imperial measurement given is wrong and should be 10 ft 2 in.
- ob (west of St Francis) BW/NW 'The 3.1 m (10 ft 9 in) wide footings were also located in a second trench excavated immediately to the west of the church. A pronounced north-facing camber in the clay-and-cobble foundation suggested that here too the Wall had been subject to subsidence, but here there was clear evidence for re-building, for the primary footings were partially overlain by a second foundation, of sandstone rubble set in clay, faced on both sides with water-rounded boulders, and 3 m (9 ft 9 in) wide' (Bennett 1998, 24).
- 2a-2b (Shields Road, Byker) NW 'The Wall foundation was set in a steep-sided, flat-based trench ... up to 0.42 m (1'4½") in depth ... the foundation was constructed of two distinct layers. The lower layer consisted of water-worn sandstone cobbles ... set in firm yellow clay ... The upper layer consisted of two lines of roughly-dressed sandstone blocks ... brown or yellow in colour ... and were covered by a bed of yellow clay containing occasional sandstone cobbles which was level with the contemporary ground surface. Toward the western end of the site, a straight joint was identified between the clay and cobble layer and a stretch of foundation of different build ... consisting of a level bed of flat green laminated sandstone slabs and fragments set in a yellow clay' (McKelvey and Bidwell 2005, 13).
- 2b-3 (Shields Road, Byker) NW '... tightly packed sandstone rubble set in a firm orange clay. On either side the foundation was defined by lines of larger sandstone fragments laid to provide a firm level foundation for the facing stones of the Wall above. ... The foundation was set in a steep-sided, flat-based construction trench 0.42 m in depth' (McKelvey 2010, 151).
- 3-4 (St Dominic's Priory) NW 'The footings were laid in a 100 mm (4 in) deep trench ... They consisted of clay-bound sandstone rubble, "faced" with large, roughly-tapered sandstone blocks' (Bennett 1998, 22).
- 3-4 (Melbourne Street) NW foundation 2.44 m (8 ft) wide '... consisted of two courses of stonework in the centre of the stream channel, reducing to one course at either end ... of roughly coursed sandstone blocks ... bonded with stiff grey clay ... Smaller stones, less regular in shape, formed the core of the Wall' (Platell 2012, 189-91).
- 3-4 (Grenville Terrace/Blagdon Street) NW '8 feet 5 inches wide' (Spain *et al.* 1930, 497); foundations 'of sandstone pieces set in clay' (Bennett 1998, 22).
- 3-4 (Garth Heads) 'tightly packed angular rubble' (Bidwell 2003, 20).
- Newcastle fort-4 (former Hertz Building) 'flagged foundation, 0.1 m deep directly over natural' (*Britannia* 36 (2005) 404).
- Newcastle fort-4 (Mining Institute) The evidence here is in the form of a photograph taken in March 1952, described by Grace Simpson: 'On the boulder clay at the bottom of the trench there are ... footing slabs ... On these stand the first course of facing stones ... One course survives of the second course with an offset...' (Simpson 1976, 178 and Plate B).
- 7a-7b (Denton) BW 'bedded in clay and composed of flat sandstones slabs 3 inches thick' (Anon 1928, 278).
- 7a-7b (Denton) BW 'a footing of rough flat stones about six inches thick, laid upon clay' (Brewis 1927, 111). 'The Wall stood practically on the surface, the foundation trench being very shallow. The foundation ... consisted of a layer of rough flat flags bedded in puddled clay.' (Spain *et al.* 1930, 528).
- 7a-7b (Denton) BW 'They [the foundations] filled a cut 3.2 m wide and 100 mm deep into the earlier plough-soil and consisted of slabs of local sandstone, packed with a sandy brown clay' (Bennett 1998, 27).
- 7b-8 (Denton) BW 'a single layer of slabs of yellow laminated sandstone up to 0.15 m thick packed around with yellow clay; a single slab of whinstone was noted. ... Large slabs had been laid to form the edges of the footings and the space between had been filled with smaller slabs and sandstone fragments. The surface on which the footings had been built sloped southwards at an angle of about 3.5 degrees to the horizontal. Attempts had been made to compensate for this by terracing the north side of the footings into the underlying soil to a maximum depth of 0.08 m. The south side, however, was built directly on the pre-existing surface' (Bidwell and Watson 1996, 17).

- 10a–10b (Throckley) BW 'A shallow foundation trench had been cut to a maximum of three inches (nine cm) ... certainly cutting through an earlier soil horizon, later shown to be pre-Wall cultivated soil. The foundation trench had been packed with clean clay containing some stone chippings, forming the base for a level setting of irregular sandstone slabs' (Bennett 1983, 30). Note that 3 in is 7.5 cm not 9 cm.
- 11b–12 (Heddon-on-the-Wall) BW 'There was no dark line under the footings, as might be expected had the turf been left. On the other hand, but a slight trench seems to have been dug for the foundation. The Wall stood practically upon the surface, which, as far as can be ascertained, was also the surface level in Roman times. First, for a width of about ten feet, the turf was removed, and the surface levelled up by a thin layer of clay laid upon the two outer margins. Flat footing stones four inches thick were laid upon this clay.' (Brewis 1927, 114).
- 11b–12 (Heddon-on-the-Wall) BW 'The north [and the south] face consisted of a footing of flat slabs of stone four inches thick, laid upon a thin fillet of clay' (Brewis 1927, 120).
- 11b–12 (Heddon-on-the-Wall) BW '... about four to six inches of soft black humus had been left under the foundations. The trench here cut to build the Wall appears to have been very shallow' (Brewis 1927, 119).
- 12b–13 (Rudchester Burn) BW 'a foundation-trench 60cm deep was found below the Wall-line. It was filled with broken freestone and sandy clay' (*Britannia* 7 (1976) 308).
- 18b–19 (Matfen Piers) 'the flag footing-course was exceedingly irregular' (Birley *et al.* 1933, 99).
- 20–20a (Halton Shields) BW 'The lowest course of the Wall ... measured 3.15 m wide and comprised large worked stones on each external face with a rough stone and clay core' (*Britannia* 33 (2002) 294).
- 26–26a (Planetrees) BW and NW The visible BW foundation has a core of large and small broken stone edged with a foundation course of large blocks with flattish tops. The NW has a foundation of flagstones resting on the BW foundation core. Flagstones are also visible on the return to the BW and these rest on the large foundation stones: this feature is probably the result of the NW builders squaring up the end of the BW.
- 26a (High Brunton) BW 'whin boulders, sometimes split, though some of the smaller stones were red and yellow sandstone. Underlying the whin boulders was a smaller rather intermittent thin foundation of smaller stones set in sand and laid on the ... natural subsoil' (Woodfield 1965, 129).
- 26a–26b (Brunton) BW 'a single course of large, clay-bonded stones lying on natural subsoil' (*Britannia* 7 (1976) 309).
- Chesters Bridge East BW 'a single course of sandstone flagstones and whinstone cobbles set in yellow-grey clay' (Bidwell and Holbrook 1989, 8–9).
- Chesters Bridge West BW 'clay-and-cobble foundations' (Bidwell 1999, 119).
- 27a (Chesters) BW 'single layer of clay and massive cobbles' (*Journal of Roman Studies*, 36, 134).
- 29a–30 (Black Carts) BW 'The facing stones comprised blocks of dolerite, which were neither dressed nor deliberately faced ... The core consisted of smaller dolerite fragments, and there was no sign of any bonding material' (Wilmott 2009, 90).
- 33b (Coesike) BW 'clay bonded cobble foundation' (Miket and Maxfield 1972, 149).
- 34a (Grindon West) BW The photographs show the BW edged by large blocks with a core of broken stone (Charlesworth 1973, Plates X, 2 and XI, 2).
- 34a–35 (Sewingshields) BW 'single course of whinstones' (Crow and Jackson 1997, 61).
- 34b–35a (Sewingshields) BW 'the dolerite bedrock had to be smashed down or incorporated into the foundation' (Hagh and Savage 1984, 74).
- Knag Burn BW 'The lowest foundation course was 3.24 m wide and of rough flagging on the north and ashlar on the south side. The flags rested immediately on bedrock, but there was a layer of chippings beneath the ashlar' (*Britannia* 7 (1976) 309).
- 36b–37 (Housesteads) BW 'a small amount of grey clay and cobble' (Charlesworth 1971, 97).
- 38b–39 (Highshields Crag) BW 'local whinstone boulder, with a core of soil and rubble' (Crow 1991, 55).
- Peel Gap Tower BW 'whinstones' (*Britannia* 19 (1988) 434).
- 42–42a (Cawfields) 'a whin foundation' (Simpson *et al.* 1936, 270).

- 43 (Great Chesters) BW 'whin boulders, with a kerbing of whin and freestone on each side' (Hull 1926, 199–200).
- 45a (Walltown) NW 'foundation of flags laid in clay [on the south face]. ... The north face of the Great Wall was laid directly on natural rock without foundation, except for one projecting flag by the north-west corner of the turret' (Woodfield 1965, 164).
- 46 (Longbyre) BW 'bottom course of rubble faced on each side with flags roughly tapered inwards into the core' (Salway 1959, 211).
- 48 (Willowford) BW 'it has a rough face of the usual large flat stones, with smaller stones behind' (Gibson and Simpson 1911, 404).
- Willowford Bridge BW 'cobbles and broken stone' (Shaw 1926 454). '... large water-worn stones and boulders of sandstone and granite, with smaller stones filling the voids' (Bidwell and Holbrook 1989, 56).
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DISCUSSION

The distinction between the foundations formed of flags to the west of Newcastle and those of clay and cobbles between Newcastle and Wallsend was first stated by Simpson and Spain in 1930 primarily as a result of the work undertaken in preparing volume 13 of the *Northumberland County History* (Spain, *et al.* 1930, 493, 529). The Wall from Wallsend to Rudchester Burn, the stream which lies between T 12b (North Lodge) and MC 13 (Rudchester Burn), was recorded and often excavated. The first point to acknowledge therefore is that the distinction was primarily based upon a relatively short length of Wall, less than 12 out of the 49 miles of the stone Wall.

We can see from the evidence cited above that foundations to the Broad Wall formed of flagstones have been recorded between central Newcastle and MC 12 (Heddon-on-the-Wall), but at only eight specified sites, though the implication of the excavators of 1929 is that they found the same style of foundations at the other locations they investigated. Further, it should be noted that the slabs recorded at Denton were 150 mm thick and were therefore not flagstones, whilst those near Heddon-on-the-Wall were broken freestone, and further west at Matfen Piers (18b-19) the flagged footing course was described as 'exceedingly irregular'. Finally, Wall miles 8, 9, 13, 14, 15, 16, and 17 are devoid of information.

Several excavators recorded that the flagstones were bedded in clay. They also stated that the flags were laid on the pre-existing soil surface or were only slightly recessed into it. The investigators of 1929 stated, 'Wherever the stone-filled foundation trench was absent, the removal by stone robbers of the flags below the first course mean the total destruction of the Wall' (Spain *et al.* 1930, 529). The assumption can only be that in the sector from Denton to Rudchester Burn the Broad Foundation was placed in a trench in more areas than are specifically attested. This trench was normally up to 100 mm deep, though a depth of 600 mm was recorded at 12b-13 (Rudchester Burn). It is further possible to suggest that the lack of evidence for a trench may be the result of later ploughing in the vicinity of the Wall. We may also note that Charmian Woodfield at T 18b (Wallhouses East) found it difficult to identify the shallow construction trench in the natural clay (Woodfield 1965, 88), so it is possible that other excavators may have missed the trench.

Between Halton Shields (20-20a) westwards to the River Irthing, the predominant form of the foundations to both Broad Wall and Narrow Wall was broken stone or whinstone, sometimes set in clay. The flagging recorded at the Knag Burn Gate beside Housesteads fort and at T 45a (Walltown) is unusual for the central sector. There are no specific references to the existence or otherwise of a trench in this sector, though in two places it is recorded that

the foundations were placed directly on the bed-rock, which again is not surprising. At Planetrees (26–26a) and T 26b (Brunton) it may be observed that the builders of the Narrow Wall placed a layer of flags over the Broad Wall foundation as a levelling course for the facing stones above.

Between Wallsend and Newcastle the foundations were predominantly of rough sandstone fragments and/or boulders set in clay within a trench which varied in depth from 100 to 420 mm. Flagstones set in clay were recorded at Byker, but elsewhere in this sector the flagstones were used in conjunction with clay and cobbles.

It would appear that the foundations could have been placed in a trench on both the Narrow Wall between Wallsend and Newcastle and the Broad Wall between Newcastle and Rudchester Burn. The foundations were often bounded by flags or large stones. The evidence for the use of flagstones in the foundations of the Wall is not mutually exclusive, there being at least one record of flagstones in the sector from Newcastle to Wallsend. Furthermore, a section of Broad Foundation has been located near T ob (St Francis), though explained away (see below).

The form of the foundations may relate primarily to the availability of material. Flags are either from quarries which naturally yield thin-bedded stone which separates easily, or they are worked from large blocks which have been split down into more or less thin slabs — not many stones will allow this. Flags were probably used when readily available from thin-bedded quarries, but not otherwise because it would have been too much trouble to create 'flags'. The descriptions of the Broad Wall foundations as being composed of flags may not be as accurate as they imply. At some sites (e.g. Byker: McKelvey and Bidwell 2005, fig. 8, and Chesters Bridge: Bidwell and Holbrook 1989, fig. 5) the 'flagstones' would be better described as large roughly worked stones. At the Knag Burn Gate, the north kerbs were described as flags but the south as 'ashlar'; in fact, the 'flags' may have been the 'ashlar' blocks split in half. In short, 'flags' may have been used in the past to mean thin stones, or sometimes just blocks with a flattish top. It was obviously easy to use whinstone in the central sector, and cobbles in the sections close to rivers.

Implications for legionary lengths

It has long been recognised that each legion building the Wall used slightly different plans for its milecastles and turrets and also introduced an offset to the wall at a different point, two legions after the first course and another after the third or fourth (Breeze 2006, 53, 72–3). It is possible therefore that the legions laid different foundations. It seems probable that the first stretch of Stone Wall to be constructed lay between about MC 7 (Benwell Bank) and MC 22 (Portgate), divided into lengths of five miles: 7a-12, 12a-17, 17a-22 (Hooley and Breeze 1968, fig. 2; Breeze and Hill 2001). Within this three-legion block, the only certain flagged foundations that have been recorded lie in the sector 7a-12, that is within one legionary length; the flag-footing course recorded to the east of MC 19 (Matfen Piers) in 1932 was described as 'exceedingly irregular' and is discussed below (Birley *et al.* 1933, 99–100). In the sector 22–27/North Tyne the normal foundations appear to be of broken stone bounded by large roughly dressed stones, as is still visible at Planetrees and to the east of Chesters Bridge.

In 1968, the stretch from 7a to 12 was assigned to the Twentieth Legion (Hooley and Breeze 1968, 103). It is, however, more likely that it was constructed by the Sixth Legion as T 33b (Coesike), which is the same plan as the turrets in the sector 7–12, has produced an inscription

of that legion (Miket and Maxfield 1972; *RIB* 3320). It seems possible therefore that flags were only used in the foundations laid by one legion. In spite of the statement above about the use of available material, it seems possible that each legion strived to be uniform within its allocated length. In order to test this hypothesis, the evidence for the foundations at milecastles and turrets has been collected in Table 2, as follows.

Table 2 The foundations of milecastles and turrets

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| 4 | (Westgate Road) 'Its footings of sandstone flags were laid on the subsoil to a width of c. 2.90 m and bonded in clay' (Harbottle <i>et al.</i> 1988, 153). |
| 10 | (Walbottle Dene) 'a mass of clay puddling, varying in thickness, according to the stone press upon it, of from one to three inches ... Usually the foundation courses of stones is large and flat, but no regularity prevails' (Bruce 1865, 221–2). |
| 22 | (Portgate) 'there are three courses of walling above the footing flag offset' (Simpson 1931, 319). |
| 25b | (St Oswald's) 'one course of flags laid on or just into the natural clay or rock' (Woodfield 1965, 108). |
| 26a | (High Brunton) 'whin and sandstone' (Woodfield 1965, 128). |
| 27 | (Low Brunton) 'consists in part of broken freestone and in part of small whin boulders' (Gillam 1953, 166). The photograph (Plate XVII, fig.1) shows a kerb of whin boulders. |
| 29b | (Limestone Banks) 'whin-cobble and clay foundations' (Newbold 1913, 58). |
| 30a | (Carrawburgh East) 'The usual foundation of large whin cobbles set in clay' (Newbold 1913, 56). |
| 33b | (Coesike) 'river cobbles bonded together with a clean yellow clay' (Miket and Maxfield 1972, 148). |
| 35 | (Sewingshields) 'large blocks of dolerite packed with smaller fragments of stone' (Haigh and Savage 1984, 36). |
| 35a | (Sewingshields Crag) 'rough whin course' (Woodfield 1965, 151). |
| 37 | (Housesteads) 'large flags laid on clay' (Blair 1934, 106). |
| 39 | (Castle Nick) 'whin boulders' (<i>Britannia</i> 14 (1983) 290). |
| 48 | (Poltross Burn) 'Even when the subsoil is sandy, very little "cobble and clay" foundation has been laid at the bottom, and in several places there are no placed stones below the footing course' (Gibson and Simpson 1911, 400). |

The use of flags in the foundations at T 25b (St Oswald's) is not surprising as the legion which built that sector was the same that built the Wall from 7a to 12. Flags were noted elsewhere. In both cases, just east of MC 19 (Matfen Piers) and at MC 22 (Portgate), these observations lay within the same legionary length, and they are the only known recordings within that length. It is possible therefore that a second legion also used flags in the foundation courses. However, another explanation is possible. In both instances, it is highly unlikely that the whole of the foundations were examined as in each case the wall survived above to a height of three courses. The stones are therefore likely to have formed only the outer edge of the foundations and not be representative of the whole width of the foundations. That is certainly the case to the east of Chesters bridge abutment (Bidwell and Holbrook 1989, 8, fig. 5). The Wall at MC 37 (Housesteads), which lies in a third legionary length, is also described as having foundations of 'large slabs laid on clay', yet the photographs of the excavation demonstrate that the walls were not taken down so that the whole of the foundations could be examined. The description therefore can only refer to the kerb stones of the foundations. In short, it is highly likely that references to 'flagged foundations' are often likely to mean 'flat-topped stones of varying depths placed to support the facing stones above'.

The same legion that built sector 7a-12 also erected the structures between MC 33 (Shield-on-the-Wall) and T 36b (Housesteads). Flagstones have not been recorded at any of these structures, but that may merely relate to the availability of materials in that area, or perhaps to the stage in the building programme when they were constructed.

In conclusion, it would appear that only one legion can be shown on present evidence to have used flagstones in the foundations of those stretches of the Wall it constructed. That legion constructed sectors 7a-12 and 22a-27. There is only one record for the sector 12a-17 and it is for broken freestone. 17a-22 produced three records, but two probably of the kerbs only. Consistently from the North Tyne to the Irthing, with but two exceptions as we have already noted, the foundations were of whinstones, boulders or broken stone. It may also be noted that the foundation trench at 12b-13 (Rudchester) was 600mm deep: this also may be indicative of the work of a particular legion.

The sector from Newcastle to Denton

The sector from about MC 7 (Denton) to Newcastle does not fit into any known legionary length and therefore the nature of its foundations is of particular interest. We have three records:

1. Between the site of the later fort at Newcastle and MC 4 (Westgate Road) a stretch of flagged foundations for the Wall was uncovered under the former Hertz Building in 2004, though the whole width of the Wall was not available. Paul Bidwell has kindly informed us that here the flags were protruding below the footing course.
2. The Mining Institute. The published photograph of the excavation in 1952 appears to be the only record of the work. It shows a course of stones with the next course offset. It is not clear whether the lower course forms the edge of the foundation or the first course of the wall.
3. MC 4 (Westgate Road). The Wall was not located here, but the foundations of the milecastle walls were of sandstone flags.

None of these records is completely satisfactory. Although the photograph of the 1952 excavation is purported to show Broad Wall, it shows neither the nature of the foundations nor the width of the Wall. Nor was the width of the wall found a little to the east in 2004, though the discovery of a foundation of flags is indisputable. At MC 4 (Westgate Road) the Wall was not excavated and the flag foundations related to the structure itself. So it is on the basis of one record that the flagged foundations continued as far east as Newcastle. This does not help us determine the building programme for the Wall as, on this basis, there remains a short length of three Roman miles between Newcastle and MC 7 (Denton) not allocated to any of the legions constructing the first block of the Stone Wall.

Implications for the Newcastle-Wallsend stretch

The characterisation of the foundations in 1930 produced a further implication for the construction of the Wall from Newcastle to Wallsend. The recognition that it was of Narrow gauge led to the suggestion that it was later than the rest of the Wall, in effect an extension to the original scheme. The consequence of this was that clay and cobble foundations have subsequently been associated with the Narrow Wall. We have already seen that this is not correct for such foundations are also found on the Broad Wall.

The present authors suggested in 2001 that the original plan had always been to build the Wall as far east as Wallsend but that its execution, apart from perhaps the building of the milecastles and turrets, was delayed (Breeze and Hill 2001). They argued, and still argue, that the first stretch of Stone Wall to be constructed was the 15 Roman miles running eastwards from the Portgate beside MC 22. This left, on the traditional view, three miles between about MC 7 (Denton Bank) and Newcastle which did not fit into this scheme, or, following the authors' view, the seven miles up to Wallsend. All Wall archaeologists are agreed that the Wall from Newcastle to Wallsend was constructed later than the primary sector from about MC 7 (Denton Bank) to MC 22 (Portgate). In that manner, it is in a similar category to the Wall from MC 22 (Portgate) to MC 49 (Harrow's Scar) beside the crossing of the River Irthing. Those 27 Roman miles contain Broad Wall on Broad Foundations, Narrow Wall on Broad Foundations, Narrow Wall on Broad Wall, and Narrow Wall on Narrow Foundations. It seems not unreasonable to suppose that a similar range of possibilities might have existed in the seven Roman miles from Wallsend to MC 7 (Denton Bank).

The prevailing evidence is that from about MC 7 (Denton Bank) to the site of the later fort at Newcastle the Stone Wall had flagged foundations, though this is essentially based on one definitive observation. To the east of Newcastle, wherever the foundation has been examined it is usually about 2.44–2.56 m wide and normally of clay and cobbles. There are two exceptions. The first is a short stretch of foundations at Byker were of 'sandstone slabs and fragments'. The plan (McKelvey and Bidwell 2005, 14, fig. 16) reveals a foundation not unlike the lowest level of the core material 450 m to the west. This was described as 'large sandstone fragments let in a matrix of silty sand' (McKelvey 2010, 151). It is clear from the photographs (figs. 5 and 6) that this is a separate layer, but two layers of foundations were recorded at the eastern site where the sandstone flags were also noted. Flagstones were also recorded to the east of T ob (St Francis). In short, it is possible that there are two areas where flagstones were used in the foundations between Wallsend and Newcastle.

Further east at Wallsend, an excavation by Paul Austen in 1978, to east and west of the site of T ob (St Francis), revealed clay and cobble foundations 3.1 m wide (Bennett 1998, 23–4). Taken by itself, 'this discovery raises the possibility that work began on building an extension of Hadrian's Wall from Newcastle to Wallsend before the Narrow Wall was introduced' (Bidwell and Watson 1989, 26). However, 'fissures' were noted behind the facing stones in the trench east of ob and it was suggested that the wall here had subsided and widened. This interpretation was supported by the evidence for a fissure, measuring about 450 mm, recorded in the same area in 1929 (Spain *et al.* 1930, 493–4: further subsidence was subsequently noted to the east closer to the fort at Wallsend: Bidwell 2003, 17–8). In the western trench, the foundations were 3.1 m wide and subsidence was inferred to account for this width. This conclusion was supported by the interpretation of a secondary layer of 'sandstone rubble set in clay, faced on both sides with water rounded boulders, and 3 m wide' as a section of rebuilt foundation. However, this feature overlay the remains of the wall by up to 800 mm and ran at a slightly different angle. Paul Bidwell has suggested to us that the secondary layer was a track of later Roman or post-Roman date, citing tracks in this area recorded by MacLauchlan (1858, 7).

If we place the secondary foundation to the west of St Francis to one side, we may note two particular points. First, the original width of the wall to the east of St Francis when the fissure is taken into consideration was 2.85 m, wider than the 2.44 m which has been recorded as the normal width hereabout (Spain *et al.* 1930, 493) and only 150 mm less than the normal width

of the foundations of the Broad Wall. To the west of St Francis, the width of the foundation was 3.10 m, with subsidence leading to the greater width assumed on the basis of a 'pronounced north-facing camber in the clay-and-cobble foundation'. In short, there are two places where the foundations of the wall are close to, and in one case possibly, the normal width of the Broad Foundation (the width of the foundations at Denton was 3.20 m, a negligible difference from the 3.10 m at St Francis).

In view of the evidence cited above for other sections of the Wall, it would not be surprising if some Broad Foundation was found in this sector. It is not yet possible to produce a detailed programme for the construction of Hadrian's Wall but it is clear that the disruption created by the decision to build new forts on the Wall was considerable.

There is a further aspect of the Wall where too much can be made of differences between the sections east and west of Newcastle. At Denton (7a-b), the foundation trench was 100 mm deep, the same as at St Dominic's Church (3-4). And whilst the foundation trench was normally deeper on the sector from Newcastle to Wallsend, a depth of 600 mm was recorded at Rudchester Burn (12b-13).

The evidence for the foundations, as it exists at present, certainly does not negate the traditional view that the Wall was first planned to end at Newcastle, but nor does it rule out the proposal that it was always planned to run it down river to Wallsend.

CONCLUSIONS

Perhaps the main lesson to learn from this study is that we should not trust *ex cathedra* statements without referring back to the primary evidence. Also, descriptions of the remains excavated should be provided, and not a statement on the lines that they were 'of the style of Broad Foundations', and we should be wary of offering special explanations when the remains do not fit into the 'school solution'. Specifically, it is clear that the statement that the Broad Wall had foundations of flagstones and the Narrow Wall of clay and cobbles is not true. Foundations of flags appear to have been only used consistently in the sector from about MC 12 (Heddon) to about MC 7 (Benwell Bank), and probably to Newcastle, though at least one short section was recorded further east at Byker. It is, however, likely that the flagstones were mainly used as kerbstones. Elsewhere, stones of different types were used in the foundations. The Narrow Foundations of cobbles and rough stones between Newcastle and Wallsend were placed in a trench. A shallower trench appears to have been normally dug in the sector from Newcastle to Rudchester (T 12a). A little to the west, the foundation trench was 600 mm deep. Evidence for a trench in the sector from the River North Tyne to the River Irthing is generally lacking but it is likely that in many places the foundations were laid directly onto the bedrock, with rough boulders used elsewhere. The use of different materials in the foundations may have related to what was available locally. Nevertheless, it seems likely that flagstones were normally used by one legion, probably the Sixth Legion. The depth of the foundation trench may also indicate the work of different legions. (The geographical sequence is summarised in Table 3.)

This analysis offers no help in explaining why the sector between MC 7 and Newcastle should appear to have the same foundations as that from MC 7 to MC 22, which appears to have been one three-legion block. However, bearing in mind that all are agreed that the sector from Newcastle to Wallsend was completed later in the building programme, the implications of the excavations at T ob (St Francis), that there was something approaching Broad

Table 3 Summary of the evidence for the foundations of Hadrian's Stone Wall.
The numbers in brackets are the number of occurrences

| | FOUNDATIONS | KERBS | DEPTH OF TRENCH |
|-----------|--|----------------------------|-----------------|
| 0-3/4 | rough stones and cobbles (7) boulders/some flagstones (1) | sandstone blocks (4) | 100-420 mm (3) |
| Newcastle | flagstones (1) | | |
| 7a-12 | rough flags/large sandstone fragments (7) | flagstones (1) | 100 mm (3) |
| 12a-17 | broken freestone (1) | | 600 mm (1) |
| 17a-22 | irregular layer of flags/ rough stones (2) | large worked stones (1) | |
| 22a-27 | sandstone fragments and whin boulders (5) | sandstone blocks (2) | |
| 27a-46 | whinstone or cobbles (10) | whinstone or freestone (4) | |
| 46-49 | rubble or boulders (4) | flagstones (3) | |

Foundation in this sector, and the recording of flagstones in the foundations emphasise that we should be cautious in our conclusions.

Two final points may be made. First, to emphasise how little accurately reported evidence there is for the foundations of the wall. Second, we make a plea for the better recording of the remains of these seemingly unimportant aspects of Hadrian's Wall.

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APPENDIX

P. R. Hill

The diagram (fig. 1) summarises the various types of foundation found under both Broad and Narrow walls. Flagstones (flags) are usually 50-100 mm thick, and would normally be at least four or five times longer than their bed height (fig. 2). Large blocks used in the foundation, usually 150 mm or more high, will normally have a flattish top and be no more than twice as long as the bed height. The depth of the cutting of the foundation trench is such as to allow the setting of both flags and blocks with their upper surfaces at or about ground level.

The five types shown may be described briefly as shown in fig. 1. Any future excavation of foundations should expand on these descriptions according to their particular nature.

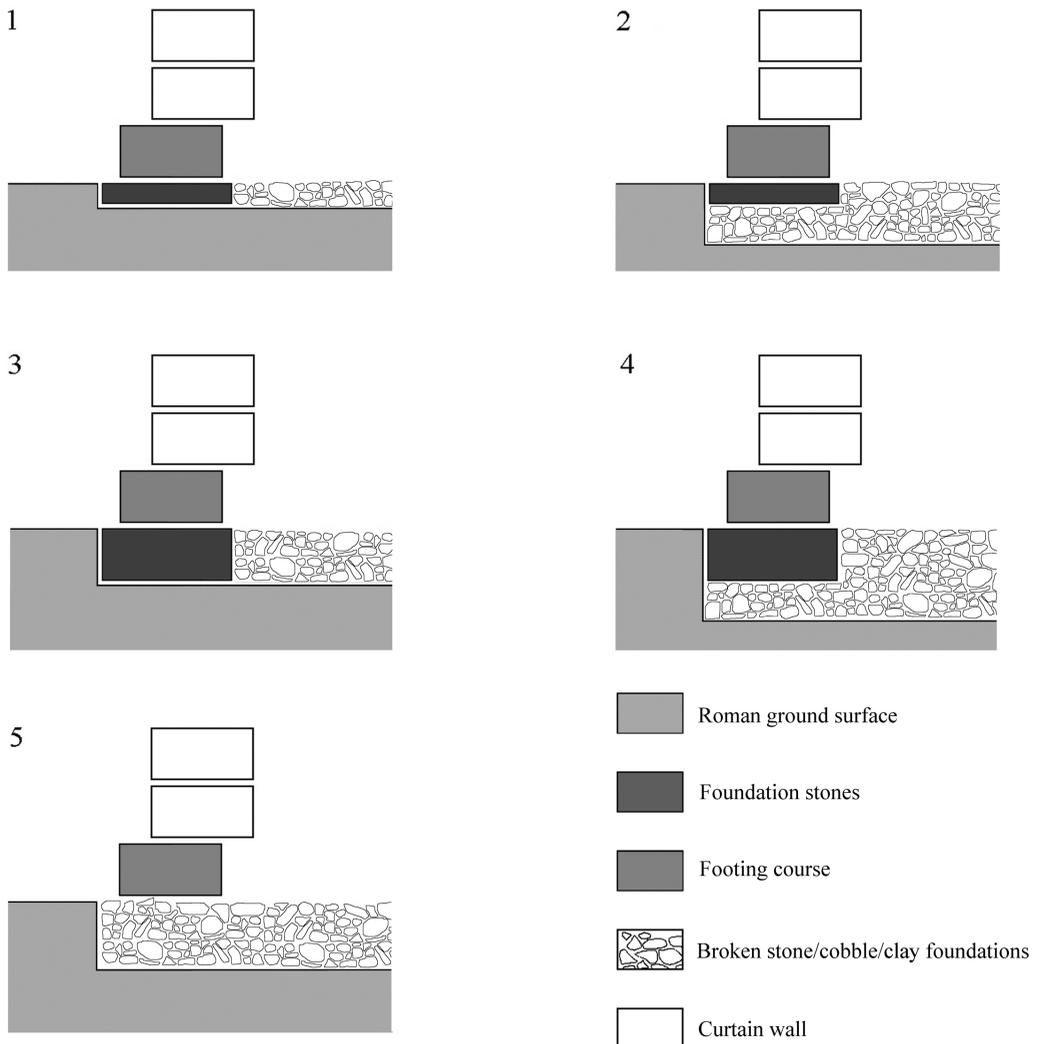


Fig. 1 The various types of foundation beneath both the Broad and Narrow Wall.

1. Flag foundation under the faces of the curtain wall, usually set in clay, with a broken stone/cobble core
2. Flag foundation under the faces of the curtain wall, with a significant (probably at least 50mm thick) layer of broken stone beneath, with or without clay bonding, with a broken stone/cobble core
3. Large block foundation under the faces of the curtain wall with a broken stone/cobble core
4. Large block foundation under the faces of the curtain wall, with a significant (i.e. at least 50mm) layer of broken stone beneath, with a broken stone/cobble core
5. A uniform foundation of broken stone/clay in a trench, with no large stones used in the foundation.



Fig. 2 Flags overlying the Broad Foundation and underpinning the facing stones of the Narrow Wall at Planetrees. Photograph by David J. Breeze.

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