

The building of the Antonine Wall: archaeological and epigraphic evidence

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The opening years of the reign of Antoninus Pius witnessed a renewed effort by the Roman army to conquer and occupy Southern Scotland. Preparations were already in hand by AD 139 (*RIB* 1147–1148; cf Jarrett and Mann 1970, 187), if not earlier, and a coin issue of the later part of 142 (or of early 143) has been interpreted as commemorating the successful conclusion of the campaigns (Robertson 1975, 364). Across the isthmus between Forth and Clyde was constructed a continuous barrier, the Antonine Wall. It may be assumed that by the close of 142 the building of the frontier line was well under way, if not completed (Robertson 1973, 1).

The sequence, in which the 'curtain' wall and its attendant structures – a massive ditch to the north, the military way to the south, and the garrison forts – were built, has been much discussed. The traditional approach to the problem has been primarily epigraphic – based on examination of the so-called Distance Slabs, the series of commemorative tablets recovered from the immediate vicinity of the Wall, each recording the completion of a length of the work by a detachment drawn from one of the three legions of the British province. The series is far from complete, and its distribution uneven: all but two of the 18 slabs now known belong to the western half of the line.

By far the most successful and enduring attempt to harness the information provided by the Distance Slabs was made by Sir George Macdonald in a stimulating article published in the *Journal of Roman Studies* (1921, 1 ff)¹; some further refinements were added in the second edition of *The Roman Wall in Scotland* (1934, 392).

Macdonald argued (1921, 20; 1934, 399) that the frontier line was built from east to west, and that the work of constructing the curtain wall was divided into some 15 or 16 sectors, shared out as evenly as possible among the three legions available. That the building of the Antonine Wall, like that of Hadrian's Wall twenty years earlier, was begun at its eastern end has been confirmed by more recent archaeological work, particularly at Duntocher and Mumrills (Robertson 1957, 95; Steer 1961, 86), and is not now disputed. It is with the subdivision of the work of constructing the curtain wall and of digging out the broad ditch which accompanied it that I am primarily concerned with here, and, as the evidence of the Distance Slabs forms an indispensable backcloth to what follows, it seems essential to begin with a brief summary of this part of Macdonald's theory.

Macdonald suggested that it was the Romans' original intention to construct the Wall in nine sectors of *c* 4½ Roman miles in length (1934, 398).² He pointed to the Bridgeness Distance Slab (*RIB* 2139), which records the completion of 4652 paces between Bridgeness (just over 4.6 Roman miles) and Inveravon; this distance was close to one-ninth of the total length of the work. Moreover, a subdivision into nine parts appeared to be linked with the placing of the garrison

forts along the line of the Wall; these were set at intervals of *c* 2 Roman miles. Each building sector thus consisted of a 'double fort interval'.

But this plan was never completed: the construction of the first four sectors, i.e. Bridgeness-Inveravon, Inveravon-Falkirk, Falkirk-Seabegs, and Seabegs-Westerwood, was successfully carried out (see fig 1), but within the fifth sector occurred the precipitous crags of Croy Hill where the ditch had to be excavated from solid dolerite. Dislocation of the carefully thought-out scheme was the inevitable result. No Distance Slabs survive to tell us precisely what happened in this central area, but some four miles further west the thread can be picked up again: a slab from Eastermains informs us that *legio* VI built a length of 1000 paces (*RIB* 2105), evidently from Eastermains to the vicinity of Wester Shirva; such a short length was clearly no part of the original plan. Further west some semblance of regularity was achieved: the 11 Roman miles from Eastermains to the summit of Castlehill was divided into three almost equal parts (of $3666\frac{1}{2}$, $3666\frac{1}{2}$, $3660\frac{2}{3}$ paces), and the $4\frac{1}{2}$ Roman miles between Castlehill and Old Kilpatrick (probably one of the original nine sectors) was split up with some care into six short lengths, presumably to ensure a speedy completion of this final stretch of the work.

How the gap of *c* 5500 Roman paces between Westerwood and Wester Shirva was filled Macdonald did not attempt to show in detail, except to indicate that we must assign to it the single remaining Distance Slab for which no findspot is known: this records the completion of 3000 paces by *legio* XX (*RIB* 2173).

At first sight the intended division of the construction work into nine sectors might seem to have been so ably and convincingly demonstrated that no further discussion could be either necessary or profitable. But it may be salutary to recall that a subdivision based on 'double fort intervals' rests on only a minimum of evidence. The sector from Bridgeness to Inveravon (upon which so much of Macdonald's reasoning depends) may have been assigned to *legio* II merely on geographical grounds—the 4652 paces carried the Wall from its starting point on the promontory at Bridgeness to the bank of the river Avon. Nevertheless, it remains reasonable to suppose that the work was to be completed in approximately equal sectors, and to look for two sectors to the west of Inveravon, each of *c* 4500 paces, which we may provisionally assign to legions VI and XX. But it may be going beyond the available evidence to say that these sectors must have coincided exactly with existing or intended fort sites. The forts at both Falkirk and Seabegs remain unlocated.

Moreover, some modifications of the wall building work as completed seem required. The existence of a short sector of 1000 paces to the east of Eastermains depends upon Macdonald's interpretation of *RIB* 2105 (1921, 8; 1934, 399); on this slab the inscription stops short in the middle of the last line with the letters PER M P, i.e. *per mille passus* (or *per milia passuum*). Macdonald argued that the inscription was complete, and that it recorded the building of *mille passus* (i.e. 1000 paces). But it is much more likely that the inscription is unfinished, with the numerals testifying to the exact distance for which *legio* VI had been responsible never inserted.³

The Eastermains slab was found on the line of the Wall at the E end of a known sector; there is little reason to think that it was merely a 'waster'. Examination of other slabs of *legio* VI brings out the distinct possibility that the number of paces might be left blank when the original inscription was cut, and added later, perhaps when the precise figure became known. Here the numerals were never inserted. Macdonald's case for the existence of a short sector of 1000 paces fails, however reasonable in view of the likely dislocation of the wall-building work. We are left with the information that there existed a sector running E from Eastermains, completed by *legio* VI, but as yet we cannot say how long it was.

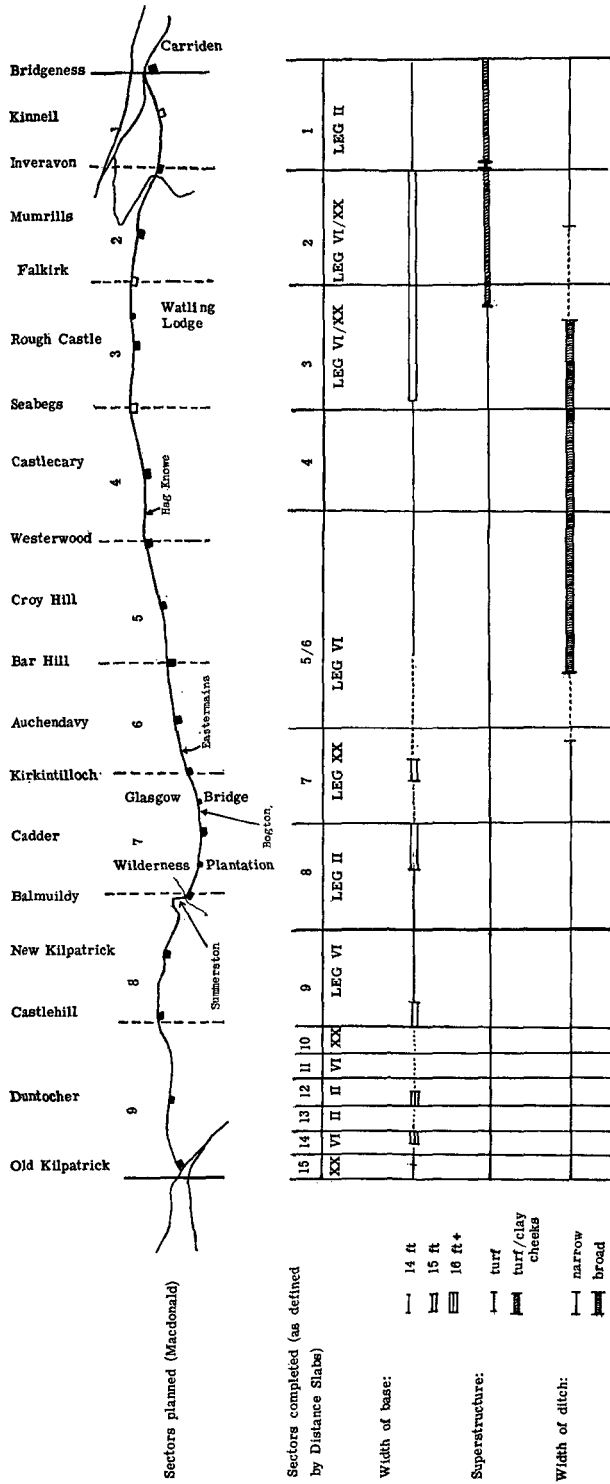


FIG 1 The Antonine Wall: building sectors

It is far from certain that the original scheme was successfully completed as far as the W end of Sector 4 at Westerwood. Macdonald's case here depended on the discovery at Arniebog (*c* 300 m east of Westerwood) of two fragments of a sculptured slab whose dimensions, findspot and decorative motifs combined to identify it with some probability as a Distance Slab (Macdonald 1934, 392 with pl LXXII 6). Macdonald described the fragments as found at Arniebog 'in circumstances which suggest they were not quite *in situ*': the inference is that they had been carried eastwards from Westerwood itself. In fact, the fragments were found on an 'eminence' to the E of Arniebog farm, perhaps that now known as Hag Knowe, fully 900 m E of Westerwood; nothing in the published accounts of their discovery suggests that they had been carried any distance (*Glasgow Herald*, June 15, 1868, and Buchanan 1872, 472). Thus it would seem likely that the original scheme, if indeed based on fort intervals, was already out of joint.

One of the motifs employed on the Hag Knowe fragments is a kneeling captive closely resembling figures on the newly discovered Hutcheson Hill slab of *legio* XX (Steer and Cormack 1969, 122). This might suggest that the Hag Knowe slab also was the work of *legio* XX and commemorates the completion of a sector running either east or west from Hag Knowe. If so it would be difficult to resist the conclusion that *RIB* 2173, the unlocated Distance Slab of *legio* XX, also belongs to this sector, and defines its length as 3000 paces.⁴

It is probable that Macdonald was correct in thinking that the Antonine Wall building plan suffered disruption. The strongest evidence for this is the distinctly odd division of the 11 Roman miles between Eastermains and Castlehill into three sectors of 3666½, 3666½ and 3660¼ paces; equally unexpected is the six-fold division of the Castlehill-Old Kilpatrick stretch. It is not difficult to think of reasons for dislocation, or disruption, or interruption of the work: hostile incursions, the close of a campaigning season and the drawing off of men for fort building are among the most obvious. Perhaps the work was broken off several times.

Fig I gives details of the subdivision of the Wall building work as suggested by the Distance Slabs. For the moment sectors of *c* 4500 paces between Inveravon and Falkirk, and between Falkirk and Seabegs are assumed on the basis of information provided by the Bridgeness slab. Between Seabegs and Eastermains there remain *c* 10,500 paces; of these we know that *legio* XX completed 3000. To allow even distribution among the three legions it is here suggested that the remaining 7500 were divided between legions II and VI. A building sector may have run from Seabegs to Hag Knowe; it will be designated Sector 4, and the remaining distance Sectors 5/6. Legion XX was probably responsible for Sector 4 or Sector 5, and from the evidence provided by the Eastermains slab, it seems likely that Sector 6 was completed by *legio* VI.

Considerable room for manoeuvre remains; in particular the stretch from Seabegs to Eastermains may have been subdivided into more (perhaps far more) than the three sectors envisaged above. But my purpose here is merely to provide something of a framework against which to test the information which can be extracted from other sources relevant to the building of the Wall.

Within the last 25 years there have been observed from the air by Professor J K St Joseph a number of small temporary camps, from 2 to 11 acres in size, whose location in the immediate vicinity of the Wall suggests that they provided accommodation for work squads engaged in the construction or repair of the Wall and its attendant structures (St Joseph 1951, 62; 1955, 86; 1958, 89; 1961, 122; 1965, 80; 1969, 105; Maxwell 1974, 327). It is unlikely on general grounds that *all* these camps belonged to Wall-builders; some may indeed reflect the progress across the isthmus of a task force on campaign in the Flavian or Antonine Periods.⁵

Nevertheless, it cannot escape notice how closely the camps, at least in the E half of the line,

correspond to work sectors envisaged by Macdonald. Two camps of *c* 5 acres have been noted in the vicinity of Bridgeness, two more (of 7 and 8 acres) on the E bank of the Avon above Inveravon. Two further camps lie on the W bank of the Avon at Polmonthill. No traces have survived at Falkirk, but two camps have been observed at Seabegs, the dividing line between Sector 3 (Falkirk-Seabegs) and Sector 4 (Seabegs-Hag Knowe).

West of Seabegs the evidence is less accommodating to known or suspected work sectors. Two large camps (one of *c* 11 acres) lie beside the fort at Castlecary, another (of *c* 5 acres) at Tollpark – close to the dividing line between Sector 4 and Sectors 5/6 at Hag Knowe. West of Tollpark (where fresh evidence would be most welcome) we can point to two camps at Dullatur, and one at Adamslee west of Kirkintilloch. The former seem unlikely to lie near the end of a building sector, the latter is halfway between the ends of a sector whose limits are securely fixed by Distance Slabs.

Undoubtedly many more camps await discovery, and the present picture may in the future appear over-simple. In an article published in 1956, Feachem noted similarities in size and shape among camps then known: those at Tollpark and Milnquarter being rectangular with an area of 5.2 acres, those at Kinglass and Little Kerse square with an area of 5.5 acres (Feachem 1956, 326). It is tempting to think that we have here some evidence for the activities of individual squads at different points on the line.

But difficulties remain: Kinglass and Little Kerse lie in adjacent sectors (i.e. nos 1 and 2) and hence are unlikely on current thinking to be the work of the same legion. It is uncertain to which sector either Milnquarter or Tollpark belong; both may fall within Sector 4 (Seabegs-Hag Knowe), or Tollpark may lie within Sector 5 and Milnquarter within Sector 3. Alternatively, all four camps may reflect the progress along the Wall line of the same work force, perhaps two cohorts strong. It is unfortunate that none of the more recently discovered camps admit of similar classification.

The four camps within the Bridgeness-Inveravon sector fall into two groups: those at the W end (Inveravon 1 and 2) have areas of 7 and 8 acres, those at the E end (Kinglass and Muirhouses) are smaller – Kinglass with an area of 5.5 acres, Muirhouses probably no larger. The initial impression must be of two separate groups working within the same sector, but it is unclear why each should require two camps of roughly the same size; perhaps the division reflects a separation in the tasks to be performed. At any rate the distribution of the camps suggests that the groups began work at the extremities of the sector.

Whatever difficulties subsist, the occurrence of two camps in the Seabegs area, i.e. Milnquarter and Dalnair, provides some confirmation that the Bridgeness Seabegs-length was divided into three sectors of *c* 4.5 Roman miles each. But further west the evidence is as yet insufficient to allow any conclusions to be drawn.

It may be that additional information on the subdivision of the work can be obtained from an examination of the remains themselves on the ground. The Antonine Wall was constructed, at least over the greater part of its length, from squared blocks of turf resting on a single course of stonework, which provided a stable and level foundation for the superstructure. This stone base consists of large cobbles edged by two rows of neatly dressed kerbstones. There is considerable variation in its width, between 14 ft and 16 ft (4.3 m and 4.88 m).⁶ It is perhaps worth considering whether the activities of individual legions or even of individual work squads can be pinpointed from the occurrence of particular wall widths. This is not to deny that there may be other reasons for variation in the width. For example, the need to improve the stability of the superstructure when the Wall was required to ascend/descend a steep slope might have resulted in the base being given extra width. At one point, in Hillfoot Cemetery (Bearsden), the Wall base

was initially laid down with a width of 14 ft, but was later broadened to 16 ft by the addition of an extra line of kerbstones at one side. Perhaps the squad responsible for the piling up of the superstructure considered the base too narrow to bear the weight of the turf. Accordingly the base was broadened, and an artificial step built half way down the slope.

But there are many instances where the variation in the base width cannot be so convincingly explained. Table I gives details of sections cut across the Antonine Wall base; the data is divided according to the work sectors proposed above.

TABLE I

DETAILS OF SECTIONS CUT ACROSS THE ANTONINE WALL AND DITCH
(from east to west)

The following abbreviations are employed in this table:

<i>AWR</i>	<i>The Antonine Wall Report</i> , 1899, Glasgow.
<i>Bar Hill</i>	<i>The Roman Forts on the Bar Hill</i> , G Macdonald and A Park, 1906, Glasgow.
<i>Cadder</i>	<i>The Roman Fort at Cadder</i> , J Clarke, 1933, Glasgow.
<i>DES</i>	<i>Discovery and Excavation in Scotland</i> .
<i>Duntocher</i>	<i>An Antonine Fort, Golden Hill, Duntocher</i> , Anne S Robertson, 1957, Edinburgh and London.
<i>GAJ</i>	<i>Glasgow Archaeological Journal</i> .
<i>GUG</i>	<i>Glasgow University Gazette</i>
<i>MOPBW</i>	Ministry of Public Buildings and Works, <i>Excavations Annual Report</i> .
<i>PSAS</i>	<i>Proceedings of the Society of Antiquaries of Scotland</i> .
<i>RWS</i>	<i>The Roman Wall in Scotland</i> , G Macdonald (ed. 2), 1934, Oxford.

<i>Location</i>	<i>Base Width</i> ft in	<i>Ditch width</i> ft in	<i>Superstructure</i>	<i>Reference</i>
<i>Sector 1</i>				
1 Dean House	—	c 18	—	<i>PSAS</i> 1961, 323
2 Kinneil House	—	c 28	—	<i>GAJ</i> 1971, 107
3 Meadows	—	—	clay cheeks	<i>PSAS</i> 1925, 276
4 Summerhouse Park	—	—	clay cheeks	<i>PSAS</i> 1925, 275
5 Summerhouse Park	14	35	—	<i>GAJ</i> 1971, 105
6 Stey Step	16	—	clay cheeks	<i>PSAS</i> 1925, 274
7 Nether Kinneil	—	—	clay cheeks	<i>PSAS</i> 1925, 274
8 Nether Kinneil	—	32	—	<i>DES</i> 1974, 68
9 Inveravon	14	—	turf	<i>GAJ</i> 1969, 40
<i>Sector 2</i>				
10 Polmonthill	15 6	—	clay?	<i>PSAS</i> 1915, 138
11 Little Kerse	—	—	clay cheeks	<i>PSAS</i> 1915, 137
12 Polmont Church	—	—	clay cheeks	<i>PSAS</i> 1915, 135
13 Polmont Park, E	15	—	'not clay'	<i>PSAS</i> 1961, 322
14 Polmont Park, E	—	—	turf cheeks	<i>PSAS</i> 1961, 322
15 Polmont Park, W	—	—	turf cheeks	<i>PSAS</i> 1961, 322
16 Beancross	—	—	clay cheeks	<i>PSAS</i> 1915, 134
17 Beancross	—	?32	—	<i>DES</i> 1973, 53
18 Mumrills, E of	—	—	clay cheeks	<i>PSAS</i> 1915, 122
19 Mumrills, E of	—	—	clay cheeks	<i>PSAS</i> 1961, 95
20 Mumrills, fort	14 8	24	clay/earth	<i>PSAS</i> 1961, 93
21 Mumrills, W of	—	—	clay cheeks	<i>PSAS</i> 1961, 94
22 Mumrills, W of	16	—	clay cheeks	<i>PSAS</i> 1915, 133
23 Mumrills, W of	14 5	—	turf cheeks	<i>PSAS</i> 1961, 94
24 Northby 1	14 8	—	clay cheeks	<i>PSAS</i> 1915, 133
25 Northby 2	14 8	—	clay cheeks	<i>PSAS</i> 1915, 133
26 Callendar Park, E	—	—	clay cheeks	<i>PSAS</i> 1915, 132

	<i>Location</i>	<i>Base width</i>		<i>Ditch width</i>		<i>Superstructure</i>	<i>Reference</i>
		ft	in	ft	in		
27	Callendar Park, W	—		—		clay cheeks	<i>PSAS</i> 1915, 131
28	Falkirk, Rosehall	15		—		clay cheeks	<i>PSAS</i> 1915, 128
<i>Sector 3</i>							
29	Falkirk, Mayfield	—		—		clay cheeks	<i>PSAS</i> 1925, 284
30	Watling Lodge, E of	—		—		clay cheeks	<i>PSAS</i> 1925, 284
31	Watling Lodge, E of	15		—		—	<i>DES</i> 1961, 55
32	Watling Lodge, W of	—		—		turf	information from Dr D J Breeze; see below p 171
33	Watling Lodge, W of	—		—		turf	<i>PSAS</i> 1925, 284
34	Tayavalla	15		—		—	<i>AWR</i> , 128, n. 2
35	Tentfield	15		42		turf	<i>PSAS</i> 1964, 193
36	Rough Castle, fort	15		40		turf	<i>PSAS</i> 1904, 451
37	Rough Castle, W of	14	9	40		turf	<i>AWR</i> , 116 no. 1
38	Bonnyside no. 3	14	9	41	9	turf	<i>AWR</i> , 111; <i>DES</i> 1970, 48
39	Bonnyside no. 2a	15	4	37	4	turf	<i>AWR</i> , 110
40	Bonnyside E exp.	14	9	—		turf	<i>PSAS</i> 1957, 164
41	Bonnyside no. 2	14	10	41		turf	<i>AWR</i> , 108; <i>DES</i> 1971, 42
42	Bonnyside no. 1	15		40		turf	<i>AWR</i> , 104
43	Bonnybridge	14		42		turf	<i>PSAS</i> 1934, 61
<i>Sector 4</i>							
44	Seabegs Place	14		—		turf	<i>DES</i> 1972, 40
45	Seabegs Place	14		—		turf	<i>DES</i> 1968, 44
46	Seabegs no. 1	14	3	40		turf	<i>AWR</i> , 98
47	Seabegs	—		44		—	<i>RWS</i> , 132
48	Seabegs no. 2	14		40		turf	<i>AWR</i> , 99
49	Castlecary, E of	14	6	40		turf	<i>PSAS</i> 1903, 287
50	Castlecary, W of	—		15		—	<i>PSAS</i> 1903, 288
51	Tollpark	14	6	—		—	Brought to my notice by Dr D J Breeze
52	Hag Knowe	14	6	—		—	<i>MOPBW</i> 1964, 15
<i>Sectors 5/6</i>							
53	Westerwood, fort	14		—		turf	<i>PSAS</i> 1933, 281
54	Croy no. 1	14		40		turf	<i>AWR</i> , 48
55	Croy no. 2	14		40		turf	<i>AWR</i> , 50
56	Croy, Mineral Railway	14		—		—	<i>AWR</i> , 42
57	Croy no. 3	—		40		—	<i>AWR</i> , 53
58	Croy no. 4	16		36–38		turf	<i>AWR</i> , 55
59	Croy no. 5	14		40–41		turf	<i>AWR</i> , 56
60	Croy no. 6	14		38		turf	<i>AWR</i> , 57
61	Croy no. 7	—		14–20		turf	<i>AWR</i> , 63
62	Croy no. 8	14		24		turf	<i>AWR</i> , 65
63	Croy no. 9	—		28–37		—	<i>AWR</i> , 68
64	Croy no. 10	14		—		turf	<i>AWR</i> , 69
65	Croy no. 11 (Exp.)	14		—		turf	<i>AWR</i> , 71; <i>GAJ</i> 1969, 37
66	Croy no. 12a (Exp.)	16		—		turf	<i>AWR</i> , 81
67	Croy no. 12	14		—		turf	<i>AWR</i> , 79
68	Nethercroy	12	8	—		—	<i>RWS</i> , 145
69	Bar Hill no. 1	15	6	38		turf	<i>AWR</i> , 88
70	Bar Hill no. 2	14		—		turf	<i>AWR</i> , 89
71	Bar Hill no. 3	14		40		turf	<i>AWR</i> , 91
72	Bar Hill no. 4	14		(59)		—	<i>AWR</i> , 92
73	Bar Hill no. 5	—		48	6	—	<i>AWR</i> , 93
74	Bar Hill no. 6	—		39		—	<i>AWR</i> , 93
75	Bar Hill, fort	14		40		turf	<i>Bar Hill</i> , 18

	<i>Location</i>	<i>Base width</i>		<i>Ditch width</i>		<i>Superstructure</i>	<i>Reference</i>
		ft	in	ft	in		
<i>Sector 7</i>							
76	Cleddans	—		32		—	<i>DES</i> 1963, 29
77	Kirkintilloch	c 15		c 35		turf	<i>PSAS</i> 1964, 182
78	Kirkintilloch, Sunnyside	c 15		35+		—	<i>PSAS</i> 1964, 188
<i>Sector 8</i>							
79	Cadder, fort	c 15		—		turf	<i>Cadder</i> , fig 2
80	Cawder G.C. 1	15		—		turf	<i>PSAS</i> 1964, 195
81	Cawder G.C. 2	15		—		—	<i>PSAS</i> 1964, 195
82	Cawder G.C. 3	15		—		—	<i>PSAS</i> 1964, 195
83	Cawder G.C. 4	15		—		—	<i>PSAS</i> 1964, 195
84	Wilderness, Quarry face	c 15		—		turf	<i>DES</i> 1974, 44
85	Wilderness 1-2	—		25		—	<i>PSAS</i> 1964, 195
86	Wilderness 3	c 15		—		—	<i>PSAS</i> 1964, 195
87	Wilderness 4	—		25		—	<i>PSAS</i> 1964, 195
88	Wilderness, Quarry faces	—		22-25		—	<i>PSAS</i> 1964, 194
89	Balmuildy Rd	14	2	—		turf	<i>DES</i> 1974, 45
90	Balmuildy, N of fort	13	10	20		turf	<i>DES</i> 1974, 45
91	Balmuildy, river	14	1	—		turf	<i>DES</i> 1971, 28
<i>Sector 9</i>							
92	Crow Hill	14		—		—	<i>GUG</i> June 1961, 6
93	Hillfoot Cemy, E	14		—		—	
94	Hillfoot Cemy, W	14		—		—	
95	New Kilpatrick, fort	14	1	20		—	information from Dr D Breeze
96	Thorn Road	14		—		—	<i>DES</i> 1973, 24
97	Thorn Farm	15		—		turf	<i>GUG</i> June 1963, 6
<i>Sector 10</i>							
<i>Sector 11</i>							
<i>Sector 12</i>							
98	Golden Hill, E side	16		20-21		turf	<i>Duntocher</i> , 7
99	Golden Hill, W side	16		20		turf	<i>Duntocher</i> , 11
100	Golden Hill, W slope	16		30-36		turf	<i>Duntocher</i> , 62-3
<i>Sector 13</i>							
101	Beeches Rd Tr. 7	—		'over 20 ft'		—	<i>PSAS</i> 1964, 191
102	Beeches Rd Tr. 8	—		'over 25 ft'		—	<i>PSAS</i> 1964, 192
<i>Sector 14</i>							
103	Carleith	—		19		—	<i>DES</i> 1969, 22
104	Carleith, E	16	9	—		—	<i>DES</i> 1971, 18
105	Carleith, W	17		—		—	<i>DES</i> 1971, 18
<i>Sector 15</i>							
106	Old Kilpatrick	14		25		—	<i>PSAS</i> 1932, 222

Note: This Table does not attempt to list every section cut across the Antonine Wall and/or Ditch but only those which provide useful details about Wall base, ditch or superstructure.

Sector 1 (Bridgeness-Inveravon)

Excavation at Inveravon in 1967 and at Summerhouse Park in 1961 produced measurements for the wall base of 14 ft but investigation by Macdonald in the early 1920s at the Stey Step indicated a width of 16 ft (Table I, nos 9, 5, 6). It will be recalled that Macdonald did not obtain a complete section across the base but combined the results of two adjacent trenches. The Wall changes direction at the Stey Step; perhaps the extra width reflects a broadening of the base at the angle (as was the case near Mumrills, no. 22). Further investigation of the base in this sector is called for.

Sector 2 (Inveravon-Falkirk) and Sector 3 (Falkirk-Seabegs)

Between Inveravon and Seabegs details are available of 19 complete sections across the base. Only one (at the extreme west end of Sector 3) produced a width of 14 ft (no. 43). In the rest measurements between 14 ft 5 in and 16 ft were recorded (the highest measurement, no. 22, at a change in alignment); between Falkirk (Rosehall) and Rough Castle all the sections cut to date produced a width of 15 ft. It would seem that both sectors were constructed to a broader gauge than that prevailing in Sector 1; unfortunately there is no way in which the dividing line between the two may be established.

Sector 4 (Seabegs-Hag Knowe)

Two widths are recorded in this sector – *c* 14 ft in the vicinity of Seabegs, and 14 ft 6 in further W at Castlecary, Tollpark, and at Hag Knowe itself. In 1936 during the excavation at Bonnybridge of a motte which had utilised the Antonine Ditch as part of its defences, a measurement of 14 ft was obtained for the Wall base (no. 43). Traditionally Bonnybridge has been placed within Sector 3 (Falkirk-Seabegs), but suspicion must now arise that it falls more naturally within Sector 4.

Sectors 5/6 (Hag Knowe-Eastermains)

There is no shortage of data for the seven miles between Hag Knowe and Eastermains, but, as the 14 ft width was in use here in all but a few sections, little opportunity is afforded of establishing the dividing line (or lines) between the work sectors. But several anomalies demand attention: at two points on Croy Hill a width of 16 ft is recorded – once where a ‘turf expansion’ was attached to the rear of the Wall. The other measurement of 16 ft (from the E side of Croy Hill) might have resulted from the presence of a like ‘expansion’ (nos 58, 66). But it may be that the base was broadened at several points due to the steepness of the terrain; from the number of sections cut over Croy Hill it is clear that this broadening was by no means continuous. Over Bar Hill a width of 14 ft was maintained, except that the most easterly of the sections cut here revealed a width of 15 ft 6 in; whether this may likewise indicate the presence of an ‘expansion’, or result from special broadening in response to the increasing declivity of the slope remains unanswered (no. 69).

Macdonald noted (1934, 145) that, as the Wall crossed the dip between Bar Hill and Croy Hill, its stone base was narrower than he had encountered elsewhere on the line, at one point shrinking to 12 ft 8 in (no other measurements are given) (no. 68). He suggested (1934, 145) that the marshiness of the ground could have prompted a narrowing of the base, but this can hardly be taken as certain. If the Hag Knowe-Eastermains stretch was divided into two equal parts, the division between the two sectors would have to be looked for in just this locality.

Sector 7 (Eastermains-Bogton)

Here only two measurements are available, of 15 ft, from the vicinity of Kirkintilloch fort; these need not be typical of the sector as a whole (nos 77-8).

Sector 8 (Bogton-Summerston)

Sections cut across the Wall base in 1963 between Cawder House and Wilderness fortlet produced a uniform width of 15 ft, but those cut further west in 1970-74 in the vicinity of Bal-muilyd fort revealed a base fluctuating between 13 ft 10 in and 14 ft 2 in (nos 79-91).

Sector 9 (Summerston-Castlehill)

Excavation at Thorn Farm at the W end of this sector in 1963-64 suggested that the base had a width of 15 ft, but sections obtained further E in Thorn Road, Roman Road, Hillfoot Cemetery, and on Crow Hill all produced measurements of 14 ft (nos 97, 92-6). Perhaps in both Sector 8 and Sector 9 we have evidence of (at least) two work squads operating within a single sector, to different specifications. But another, rather different, explanation is possible (see below p 163).

Sectors 10-15 (Castlehill-Old Kilpatrick)

Unfortunately on that part of the line where the limits of work sectors are most convincingly and accurately defined by Distance Slabs, there is a dearth of published data. No information is available for Sectors 10, 11 and 13 (see fig 1). For the rest, excavation at Carleith in 1971 (Sector 14) revealed a Wall base of abnormal width - two complete sections were obtained, of 16 ft 9 in and 17 ft (nos 104-5). At Golden Hill, Duntocher (Sector 12), a width of 16 ft was maintained for at least 340 yds (300 m) (nos 98-100). In both cases difficulties of terrain provide one (but not necessarily the correct) explanation: in particular, at Carleith the base was required to negotiate a southwards facing slope and was 'stepped' lengthwise to facilitate this. At the extreme W end of the Wall a width of 14 ft was recorded in the vicinity of Old Kilpatrick fort (Sector 15; no. 106).

From the above it would seem that the variation in base width was by no means haphazard; at many points along the line of the Wall it can be shown to be closely related to the work squads operating in a particular area. Considerable uncertainty remains, and much more excavation is required before any more than tentative conclusions can be drawn; the available evidence is spread very unevenly across the isthmus. It would not seem at first sight that any legion had the monopoly of a particular width, by which its activities may be detected. A width of 14 ft was perhaps in use by legion II in Sector 1, but in Sectors 2 and 3 the legions responsible (presumably VI and XX, though we cannot say as yet which constructed which sector) laid down a base of *c* 15 ft. At the beginning of Sector 4 (which it may now be necessary to place further E than hitherto) a width of 14 ft is again found. Unfortunately for the present study, sections cut across the base between Bonnybridge and Bar Hill suggest that, with a few exceptions, a width of *c* 14 ft was maintained. The most intriguing evidence comes from Sectors 8 and 9; it would seem that in each of these sectors part (perhaps half) of the base was constructed to a width of 14 ft, the rest to a width of 15 ft.

It is natural to enquire what measurement (if any) was initially ordained for the Antonine Wall base. The stone section of Hadrian's Wall was designed to be 10 Roman feet wide, and the turf section 20 ft wide (Richmond 1966, 15; Birley 1961, 81). On the Antonine frontier line, the most frequently attested widths are 14 ft and 15 ft, but neither measurement has a neat Roman equivalent. We might be tempted to conclude that the intended width of the Antonine Wall was

15 Roman feet, i.e. half way between the two widths on Hadrian's Wall – the British equivalent for this is 14 ft 6.5 in. Even making some allowance for polarisation in excavation reports between 14 and 15 ft, very few measurements recorded from the Antonine Wall come near this; the variations seem sufficiently distinct to reflect different work-squads.

The make-up of the Wall superstructure must also be considered. Macdonald observed that in sections cut across the Wall between Watling Lodge and Bridgeness the familiar black lines of the turf layering were not present, but that the superstructure appeared to be built of clay, or (more precisely) of topsoil revetted by clay cheeks (Macdonald 1915, 121; 1925, 231; 1934, 86). It comes as something of a surprise to learn that the initial nine miles of the *murus caespitiarius*, almost one-quarter of the total length, may not have involved the use of turf. However, excavations in Polmont Park and at Mumrills in 1958–60 indicated that some revision of Macdonald's conclusion is called for. A superstructure consisting of topsoil revetted by clay cheeks was confirmed on either side of Mumrills fort itself, but in Polmont Park the superstructure, at one point of topsoil and at another of natural subsoil, was revetted by cheeks of turf (Steer 1961, 94). Professor Anne Robertson has drawn my attention to the possibility that the 'clay' cheeks observed by Macdonald may in many places have consisted of turf cut on a clayey subsoil. It is unfortunate that little information on the make-up of the superstructure has been forthcoming from sections cut in recent years anywhere E of Watling Lodge.

Macdonald argued that turf was not used in the superstructure in the nine miles E of Watling Lodge. Most of his data came from the five miles between Watling Lodge and Inveravon. To the E of Inveravon, 'clay' cheeks had been noted at Summerhouse Park, the Meadows and the Stey Step (Table I, nos 3, 4, 6, 7, 9), but excavation by Professor Robertson at Inveravon in 1967 produced a turf-built superstructure running the full width of the base, perhaps (in part) forming the N rampart of Inveravon fort (Robertson 1969, 37 ff).

A change in the make-up of the superstructure at Watling Lodge⁷ does not correspond to the end of a Wall-building sector. Watling Lodge seems to lie within the E half of Sector 3 (Falkirk-Seabegs), and, while the demarcation line between Sectors 2 and 3 is not known, it is unlikely to have lain as far W as Watling Lodge. Evidently a decision was taken to stop using clay (or turf) cheeks at the site (or intended site) of Watling Lodge fortlet, where the main N-S highway passed through the Wall. The increasing availability of good-quality turf must have been an important factor, but perhaps it is necessary to envisage a change-over of construction squads at this convenient point.

To the N of the Antonine Wall was dug out a V-shaped ditch, varying considerably in width, but often as much as 40 ft (12.2 m) wide and 12 ft (3.66 m) deep. Whether this ditch was excavated by legionaries in sectors which corresponded to Wall building lengths has never been determined. Two Distance Slabs, both from the W end of the Wall and both erected by detachments of *legio VI*, record the completion of lengths of the *opus valli* (RIB 2200, 2205). No mention is made of the ditch, but it would not be difficult to assume its inclusion. Details of sections cut across the ditch are incorporated in Table I, and the data is likewise arranged according to known or hypothetical Wall-building Sectors.

Evidence for Sector 1 is again confusing, but it is at once apparent that the Ditch is much narrower than the 40 ft which is assumed to be its norm. Four measurements are available – 35, 32, *c* 28 and *c* 18 ft. The last-mentioned, from the vicinity of Dean House, seems unduly narrow and may indicate the presence there of the 'lost' Kinneil fort (Table I, nos 5, 8, 2, 1).

From Sector 2 only one certain measurement is available, from the ditch immediately to the N of Mumrills fort; the width here (24 ft) may be atypical of the Sector as a whole (no. 20).⁸ Within the policies of Callendar House the ditch today has a width of over 50 ft; no excavation

has taken place here, but it seems unlikely that the original width was much below 40 ft. The most easterly documented instance of a 40 ft width comes from Sector 3, at Tentfield to the E of Rough Castle (no. 35). Thereafter a width of *c* 40 ft is maintained over a distance of 10 miles, as far as the summit of Bar Hill. Only on the W side of Croy Hill, where the ditch had to be rock-cut, is there any significant variation, and even there it would seem likely that the full 40 ft width was maintained wherever possible. However, the section cut immediately to the N of the Bar Hill fort proves to be the most westerly instance of a 40 ft wide ditch so far found anywhere on the line (no. 75).

In a section cut at Cleddans, east of Kirkintilloch, a width of 32 ft was found, while at Kirkintilloch itself a 35 ft ditch was recorded at two points (nos 76-8). West of Kirkintilloch there is a further decrease, to 22-25 ft at Wilderness Plantation, 20 ft N of Balmuildy, 24 ft at New Kilpatrick fort, and 20 ft on the E side of Golden Hill (though it broadens to 36 ft on the W side of this hill). A complete section obtained at Carleith in 1969 produced a measurement of 19 ft, and at the extreme W end of the Wall a width of 25 ft was recorded to the NE of Old Kilpatrick fort (nos 85, 87-8, 90, 95, 98-100, 103, 106). Macdonald suggested (1932, 222) that in the latter case the narrowness was due to the proximity of the fort, but it can now be seen that this need not be the only explanation.

The reduction in width is first met with to the E of Kirkintilloch; unfortunately no data is available for the 3 miles between Cleddans and Bar Hill, so that we cannot say exactly where this narrowing of the ditch began. What was the reason for the reduction in width? Perhaps we need look no further than Croy Hill where the *fossa* had to be cut from solid rock over a distance of *c* 2 miles; on Bar Hill too rock cutting was required, though on a smaller scale. The ditch-digging squads may have fallen behind on this part of the work, though the construction of the Wall itself need not have been (similarly) delayed. They could most easily catch up by narrowing the width of the ditch still to be cut. It is noticeable that the reduction in ditch width W of Bar Hill is accompanied by an increase in the width of the berm, the level stretch of ground between Wall and ditch. The berm is normally *c* 20 ft wide, but west of Bar Hill it is frequently found to measure at least 30 ft.⁹ One explanation for this may be that a centre line for the ditch had been marked out on the ground *c* 40 ft from the north kerb of the Wall – to allow a berm of 20 ft and a ditch 40 ft across. But when the ditch was not cut to its full 40 ft, the width of the berm was correspondingly increased.

Yet the ditch was not finished off to a uniform width. There was considerable variation, which does suggest that a number of individual squads were at work, but as yet we cannot say whether the variations were geared to Wall-building sectors. The reduction in width at the W end of the Wall comes as a particular surprise; it has justly been remarked that the Wall line is weakest in the west, particularly between Castlehill and Old Kilpatrick, where the Kilpatrick Hills loom dangerously close (Macdonald 1934, 177; Robertson 1973, 88). Meanwhile the narrowing of the ditch at the E end may perhaps be explained by the very strength of the Wall line, here looking out to the Forth and the marshy estuary of the Carron (Steer 1956, 99 ff).

Fig 1 attempts to combine the information gleaned from the above examination of the epigraphic and archaeological evidence. It will be at once apparent that the various strands do not lead harmoniously to a neat and satisfying conclusion; in particular the evidence of base width, ditch width and superstructure does not provide ready confirmation of the picture provided by the Distance Slabs.

Within each building sector we may imagine that there were at least three major tasks to be performed: the laying down of the base, the piling up of the superstructure, and the digging of the ditch. These three activities need not have gone hand in hand; indeed, within a single sector

they might have been in progress in several places at the same time. There could be a lull, perhaps a considerable lull, between the laying out of the base and the assembly of the superstructure; recent excavations at Mumrills have suggested that the fort itself was built in just such an interval (Steer 1961, 95). Presumably the Military Way came early in the sequence, if it was not indeed the earliest element of the frontier complex across the isthmus (Steer 1957, 164). It is natural to assume that when a legionary detachment erected commemorative tablets at either end of a work sector it had been responsible for constructing the Wall base and the superstructure, if not also for the ditch. The stretch from Bridgeness to Inveravon stands out as a self-contained building sector: its limits are defined by temporary camps, its length proclaimed by a Distance Slab; confirmation is provided by the base, which changes to a broader gauge immediately to the west of Inveravon.

But further west the picture is not always so clear. For example, Distance Slabs indicate a change-over in responsibility between legion II and legion VI at Summerston (Sectors 8 and 9), but examination of the stone base alone might suggest that one legion (whatever its identity) began work near Wilderness and continued past Summerston as far as the W outskirts of Bearsden. Perhaps it may be wrong to assume that the same legion was always responsible for both base and superstructure, and that the Distance Slabs need testify to the completion of both.¹⁰ In the central sector of Hadrian's Wall, between the North Tyne and the Irthing, it would appear that, owing to disruption of the work, the Wall foundation and the superstructure were built by different legions, with the 'centurial' stones recording only the latter part of the work (Birley 1951, 251; Hooley and Breeze 1968, 108). But on the Antonine Wall it must be honestly admitted that the evidence is as yet too fragmentary to say whether this separation of tasks might have been commonplace or quite illusory.

The building of the Antonine Wall, like that of Hadrian's Wall, was no simple process. On Hadrian's Wall the survival of 'centurial' and 'cohortal' stones has given some insight into the way in which a legionary building sector might be split up among work squads. On the Antonine Wall no such epigraphic records are available, but we should not assume that no subdivision took place. It may be that careful examination of the remains on the ground will highlight the activities of individual gangs. Certainly no opportunity should be lost of adding to our knowledge of the construction of the Antonine Wall 'curtain'.

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NOTES

- 1 The work of Bates (1898, 105 ff) and Gibb (1901, 123) paved the way for Macdonald.
- 2 For a recent review of this part of the evidence, cf Maxwell 1974, 327.
- 3 Another slab, belonging to one of the short lengths west of Castlehill, is similarly unfinished.
- 4 Measured eastwards from Hag Knowe, 3000 paces would carry legion XX to the west end of Seabegs Wood; the distance from Hag Knowe to the traditional site of Seabegs fort is 3600 paces.
- 5 For example, the camps to the north of the Wall itself at Buchley, ?Brokentower, and Carmuir. Further details about the camps in Stirlingshire may be found in RCAMS 1963, 106-7.

- 6 In the following pages it has seemed appropriate to give measurements for the Wall and ditch in feet and inches; metric equivalents are occasionally provided.
- 7 A turf-built superstructure was noted immediately W of Watling Lodge fortlet in 1972 (information from Dr D J Breeze); see below, p 171).
- 8 There was no certainty over the ditch width in no. 17.
- 9 The following secure measurements are available for the berm west of Bar Hill: 30 ft at Kirkintilloch (no. 77), 25 ft at Cadder fort (no. 79), 28 ft at Wilderness (no. 85), c. 30 ft at Balmuildy Road (*DES* 1974, 45); 30 ft at Balmuildy (no. 90), New Kilpatrick fort (no. 95) and at Golden Hill (no. 98); 30 ft + at Carleith (no. 103) and 20-30 ft at Old Kilpatrick (no. 106). Excavation at Wester Shirva (1 mile W of Bar Hill) has revealed a berm of c 26 ft (*DES* 1974, 33); perhaps the narrowing of the ditch had already begun there. It is as yet not possible to say whether the berm was similiary broadened at the extreme eastern end of the Wall line.
- 10 In this case the phrase *opus valli* on *RIB* 2200, 2205 might be taken to imply a separation of tasks.

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