The Antonine Wall

Papers in honour of Professor Lawrence Keppie

edited by

David J. Breeze and William S. Hanson

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Cover illustrations
Front: The Distance Stone of the Twentieth Legion from Hutcheson Hill (*RIB* III 3507) found in 1969 lying face down in a shallow pit immediately to the south of the Wall (copyright Hunterian, University of Glasgow). **Back**: Restored half-life-sized statue of the Roman god Mars from the annexe of the fort at Balmuildy (*CSIR* 129) (copyright Hunterian, University of Glasgow).

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Lawrence at Westerwood. Photo the late Margaret J. Robb

Dedicated to the memory of Margaret Robb (1952-2017)

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Abbreviations

AE	*L'Année* épigraphique*;* revue des publications *épigraphiques relatives a l'antiquité romaine*. 1888– . Paris: Presses Universitaires de France
CIL	*Corpus Inscriptionum Latinarum*. 1863–. Berlin
CSIR	Keppie, L.J.F. and B. Arnold 1984. *Corpus Signorum Imperii Romani (Corpus of Sculpture of the Roman World). Great Britain. Volume 1 Fascicule 4, Scotland*. Oxford: British Academy
DES	*Discovery and Excavation in Scotland.* Edinburgh: Archaeology Scotland
ILS	Dessau, H. 1892-1916. *Inscriptiones Latinae Selectae*. Berlin: Weidman
ORL	Fabricius, E., F. Hettner and O. Sarwey. 1894-1937. *Der obergermanisch-raetische Limes des Roemerreichs.* Berlin and Leipzig
PIR^2	Groag, E., A. Stein, L. Petersen, *et al.* 1933-2015. *Prosopographia imperii Romani* (2nd edn). Berlin: de Gruyter
RIB I	Collingwood R.G and R.P. Wright 1965. *The Roman inscriptions of Britain. I Inscriptions on stone.* Oxford: Clarendon Press
RIB II	S.S. Frere *et al.,* 1990-1995. *The Roman Inscriptions of Britain II.1-8. Instrumentum Domesticum.* Gloucester: Sutton
RIB III	Tomlin, R.S.O, R.P. Wright and M.W.C. Hassall 2009. *The Roman inscriptions of Britain. III Inscriptions on stone found or notified between 1 January 1955 and 31 December 2006.* Oxford: Oxbow
RIC	*Roman Imperial coinage* vols. 1-10 1923-94. London: Spink
RMD I-III	Roxan, M.M. 1978-94. *Roman Military Diplomas* I-III. London: Institute of Classical Studies
RMD IV	Roxan, M.M. and P.A. Holder 2003. *Roman Military Diplomas* IV. London: Institute of Classical Studies
RMD V	Holder, P.A. 2006. *Roman Military Diplomas* V. London: Institute of Classical Studies

1. Lawrence Keppie: an appreciation

David J. Breeze and William S. Hanson

Lawrence John Forbes Keppie was born at Johnstone in Renfrewshire on 26 December 1947. He attended Coatbridge High School and then studied classics at Glasgow University where he came under the influence of A.R. Burn, who first introduced him to epigraphy. After graduation he transferred to Balliol College, Oxford, where he studied Roman history and archaeology. In 1971, he submitted a dissertation *Veterans in Italian Society under the Early Principate* in part satisfaction of the requirements for the degree of Bachelor of Philosophy in Ancient History under the supervision of A.N. Sherwin White. Lawrence then spent a year, from October 1971 to December 1972, as Rome scholar in Classical Studies at the British School at Rome. Here he began work on a thesis on colonisation and veteran settlement in Italy under the supervision of Professor P.A. Brunt. The thesis was duly submitted to the University of Oxford for a D.Phil. in 1979 and subsequently published by the British School at Rome with the title *Colonisation and Veteran Settlement in Italy 47-14 BC* (Keppie 1983a). *The Making of the Roman Army, From Republic to Empire* was a spin-off from his time in Rome and his doctoral research (Keppie 1984a). Lawrence returned to the British School as Hugh Last Fellow in 1996.

Lawrence started his digging career as a schoolboy on a medieval castle site in Cumbernauld, before moving on to participate in the Scottish Field School of Archaeology excavations at Birrens Roman fort under the directorship of Anne Robertson. The first excavation he directed himself was on a section of the Antonine Wall at Carleith in 1969. While in Rome he participated in the British School at Rome's excavation at the Roman city of Fregellae to the south-east of Rome. His colleague there, Michael Crawford, writes, 'there his tact, modesty and cheerfulness were crucial to maintaining both good relations with our Italian colleagues (as they were also in the case of Anne Robertson) and the morale of the team. He always played up to the reputation of a Scotsman, by initially offering mineral water all round when it was his turn to buy drinks; and during visits to neighbouring archaeological sites it was only Lawrence, on one occasion, who noticed that the wall over which a stile had been built no longer existed and walked round it after everyone else had climbed over it.'

In 1972 Lawrence was appointed as an assistant curator in the Hunterian Museum, University of Glasgow, taking up the post at the beginning of the following year. The museum was then under the directorship of the redoubtable Anne S. Robertson. The following year he was re-introduced to Jim Walker, whom he had first met while digging in Cumbernauld, establishing a fieldwork collaboration and friendship that continues to this day (Walker, this volume). Lawrence stayed at the University of Glasgow for 30 years, becoming Senior Curator of Archaeology, History and Ethnology in the Hunterian Museum and, in 1999, Professor of Roman History and Archaeology. He took early retirement in October 2003, which allowed him to concentrate on research and writing, and is now Emeritus Professor and an Honorary Professorial Research Fellow. He has also been a visiting member of the Institute for Advanced Study at Princeton and a visiting professor at the University of British Columbia.

Lawrence was elected a Fellow of the Society of Antiquaries of Scotland in 1971, of the Society of Antiquaries of London in 1978 and of the Royal Society of Edinburgh in 1995. He served as the Honorary

Figure 1.1. Lawrence receiving the Presidential Award in 2009 from Jim Mearns for his services to Glasgow Archaeological Society (by kind permission of James Walker).

Secretary of the Glasgow Archaeological Society, Vice President and then the 45th President of the Society from 1988 to 1991 (see Keppie 1990a for his presidential address) (Figure 1.1). At the university, Lawrence also participated in some teaching in the Department of Classics, including an honours option on the Provinces of the Roman Empire, with a particular emphasis on Britain, focusing on the literary sources.

Lawrence's commitment to the Hunterian Museum has been demonstrated not just through the publication of its Roman inscriptions and sculptured stones (below). In 1990, the year Glasgow was the City of European Culture, he edited a souvenir guide to the museum and on the occasion of the

Hunterian's bicentenary in 2007 produced *William Hunter and the Hunterian Museum in Glasgow 1807-2007* (Keppie 1990d; 2007). Behind the scenes, Lawrence has participated in the improved display of the collection and in preparing temporary exhibitions.

Lawrence's academic career throughout has been focussed on Roman Scotland, Roman Italy and the Roman army. For Roman archaeologists, he is the ultimate polymath. His books range from historiography (Keppie 2012a), Roman inscriptions and sculptured stones (Keppie 1998a; Keppie and Arnold 1984), the Roman army (Keppie 1983a; 1984; 2000), guide-books to Roman Scotland and the Bay of Naples (Keppie 1986b; 1998b; 2004b; 2009c; 2015) and a history of the Hunterian Museum (Keppie 2007), to the how-to-do-it book, *Understanding Roman Inscriptions* (Keppie 1991b). Unsurprisingly, his editing skills have also been in demand. He edited *Britannia* for the Roman Society from 2000 to 2004, having previously served as review editor from 1994-99 and editor of the Scottish section of the annual round-up of fieldwork on Roman Britain from 1992-2000. Together with Fraser Hunter he edited the centenary celebration of James Curle's famous excavations at Newstead, also contributing a paper to the volume (Hunter and Keppie 2012; Keppie 2012b).

Within Scotland, Lawrence's name is indelibly linked to the Antonine Wall. On his arrival at the Hunterian Museum he was immediately plunged into undertaking rescue work on the Wall. In his first report he noted that because of its linear nature, running across the width of Scotland, it was particularly at risk because 'roads and pipe-lines with a north-south alignment have to cross it somewhere' (Keppie 1976b, 61). In that paper, Lawrence brought together short reports on 12 salvage excavations, setting a precedent which continued for many years (Keppie and Breeze 1981; Keppie and Walker 1989; Keppie *et al.* 1995). Of particular note in that original paper was the account of the excavation of a 44.5m length of the Wall at Bantaskin that resulted in the location of three culverts (Keppie 1976b: 68-73). He has literally undertaken excavations along the entire length of the Wall from Bridgeness to Old Kilpatrick, including more substantial work at Bar Hill, Dullatur and Westerwood (Keppie 1978a; 1985; 1995) and beyond the Wall at Barochan Hill (Keppie 1990b; Keppie and Newall 1997).

Lawrence's interest in the details of the construction of the Wall resulted in a discussion paper in which he presented the archaeological and epigraphic evidence for the building of the Wall and which remains the basic treatment of the subject (Keppie 1974). He also provided an overview of the state of knowledge of the Wall and set about summarising the evidence for some of the more neglected fort sites along it (Keppie 1980b; 1982; Keppie and Walker 1985). Lawrence's interest in the distance slabs, most of which are in the Hunterian Museum, continued through the publication of a booklet and a more detailed treatment in his corpus on the *Roman Inscribed and Sculptured Stones in the Hunterian Museum* (Keppie 1979; 1998a; cf Keppie 1976a) and extended to consideration of other inscriptions and sculpture from Roman Scotland (Keppie 1976c; 1978b; 1983b; 1994; 2019; Keppie *et al* 1981).

The publication in 1976 of a paper by John Gillam on the building of the Antonine Wall contained the suggestion that there had originally been fortlets at distances of about 1.1 miles along the Wall between a series of six primary forts (Gillam 1975). Together with Jim Walker, Lawrence rose to the challenge, discovering fortlets at Kinneil, Seabegs and Cleddans (Keppie and Walker 1981; Walker, this volume). Investigations at a kink in the line of the Wall at Carleith, exactly at the measured distance, revealed an oddity on the base but no clear evidence for a fortlet while work at Nethercroy was also inconclusive (Keppie and Breeze 1981: 242-4; Keppie *et al.* 1995: 643-9).

As befitting a museum curator, Lawrence participated in the re-publication of the 1902-05 excavations at Bar Hill (Robertson, Scott and Keppie 1975). He clearly enjoyed working with Margaret Scott, who drew the finds, and still lauds – and uses - her drawings of the distance slabs (cf Keppie 2015: 33). His contribution to the Bar Hill report led on to his excavation of the headquarters building and bathhouse at the fort from 1978 to 1982 prior to their consolidation and display by the then Scottish Development Department (now Historic Environment Scotland) (Keppie 1985). Parts of these two buildings had been left exposed at the end of the earlier excavations; now all elements are laid out for display and remain the only stone buildings within an Antonine Wall fort to be visible.

Lawrence also has the unique distinction of being the only person to excavate two bathhouses in Scotland as he undertook the complete examination of the bathhouse at Bothwellhaugh in 1975-6 before its flooding by the artificial loch at Strathclyde Country Park (Figure 1.2); the building was lifted and rebuilt at a higher level (Keppie 1981). Indeed, should the hypocausted building at Falkirk prove to have been a bathhouse, he would have another such investigation to his credit (Keppie and Murray 1981). To the tally also has to be added his article bringing into the public domain earlier work on the bathhouse at Duntocher (Keppie 2004a).

Figure 1.2. Excavations starting at Bothwellhaugh in 1975. Lawrence is standing third from the right (by kind permission of James Walker).

In 1960, Anne Robertson published the first edition of *The Antonine Wall, A Handbook to the Roman Wall between Forth and Clyde and a Guide to its surviving remains*, on behalf of the Glasgow Archaeological Society. Two further editions followed in 1973 and 1979. Following her retirement Anne Robertson proposed Lawrence as her successor. His first edition, the fourth in the series, was published in 1990, followed by the fifth in 2001 and the sixth in 2015, modestly continuing to attribute the work to her (Robertson 1990; 2001; 2015). This, Lawrence's final edition (his own choice) is in a larger format, in colour, with an extended bibliography and a section on the World Heritage Site status of the monument awarded in 2008. The guide-book is truly a monument to Lawrence's four decades of work on the Antonine Wall.

Lawrence was also a regular participant in the meetings of the International Congress of Roman Frontier Studies, usually offering a paper (Keppie 1977; 1980a; 1986a; 1990b; 1991a; 1997; 2009a). He was part of the small team that organised the meeting of the Congress at Stirling University in 1979. Thereafter, with Bill Hanson, he edited the conference proceedings, which were published in the record time of 12 months (Hanson and Keppie 1980).

While Lawrence's digging days may be over, his interest in the Antonine Wall has not waned. He has surveyed and reported upon the visible stretches of the Wall base in New Kilpatrick Cemetery (Keppie 2009b), while his interest in the historiography of the Antonine Wall has culminated in the publication of *The Antiquarian Rediscovery of the Antonine Wall*, though near contemporary publications indicate that this seam is probably not yet exhausted (Keppie 2002; 2003; 2006; 2012a; 2014; 2016; 2018).

The Roman army has retained its fascination for Lawrence since his early work in Italy. In 2000 he brought together 21 papers published over a period of 30 years in *Legions and Veterans. Roman Army Papers 1971-2000*, a volume in the MAVORS series edited by Michael Speidel (Keppie 2000). Two papers extended beyond the remit of the title, trespassing into the realms of the Roman navy and the praetorian guard. And, of course, his interest in the Roman army underpins his guide-book to Roman Scotland, *Scotland's Roman Remains* later renamed *The Legacy of Rome*: *Scotland's Roman Remains*, which also reflects his concern to reach out to the wider public (Keppie 1986b; 1990c; 1998b; 2004b; 2015).

Throughout his career, Lawrence has never lost his interest in Roman Italy. In the introduction to his book on colonisation and veteran settlement in Italy, he stated that he had been 'to all but a handful of the fifty or more towns where veteran settlement took place on a substantial scale in this period, and to see most of the inscriptions which fall to be discussed here' (Keppie 1983a, ix). His love of Italy has never ceased and over the last 30 years he continued his visits there with his constant companion, Margaret. They particularly liked the Bay of Naples so it should have been no surprise when *The Romans on the Bay of Naples, An Archaeological Guide* appeared (Keppie 2009c).

The esteem in which Lawrence is held by his colleagues is reflected in the range of contributors and contributions to this Festschrift. So eager were they to participate in the project that the slate of contributors was complete within a week. One colleague, the eminent epigrapher Roger Tomlin, who was unable to contribute a paper, writes, 'I have known and valued Lawrence for many years, ever since we met as students at the British School in Rome. His *Making of the Roman Army* has always been on my bookshelf next to Parker's *Roman Legions*. I am proud too that I suggested his name to Batsford as the author of *Understanding Roman Inscriptions*. At Glasgow he was taught by Robin Burn, who inspired my own more provincial *Britannia Romana*, and this benefited greatly from Lawrence's careful reading of a full draft.'

The editors decided that the volume should focus on the Antonine Wall, the subject of so much investigation by Lawrence, but within that framework practically every aspect of the frontier is represented here and we even get a glimpse of Italy. The circle is complete.

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2. The Antonine Wall: the current state of knowledge

William S. Hanson and David J. Breeze

Earlier Roman occupation

The narrow neck of the Forth-Clyde isthmus followed by the Wall is an obvious potential Roman frontier location. According to Tacitus (*Agricola* 23) 'the isthmus was now firmly held by garrisons (*praesidia*)' during the Flavian conquest of Scotland, when it served as a temporary halt during Agricola's fourth campaign, which was primarily one of consolidation and fort building (Hanson 1991: 107). However, there is surprisingly little supporting structural evidence for a pre-Antonine frontier. Leaving aside forts beyond the eastern and western ends of the Wall at Elginhaugh and Barochan Hill respectively, the latter investigated by Lawrence, the most obvious installation is the fort at Camelon (Maxfield 1980). Full publication of the excavations undertaken in the 1970s is still awaited, but has been augmented by more recent work (Hunter 2012: 285; Kilpatrick 2016). The strategic importance of the site, however, seems to relate more to operations beyond the isthmus, as indicated by its location north of the Wall in the Antonine period, and the large number of camps beside it (Jones 2005: 551). The only other confirmed installation on the isthmus is the fortlet or small fort at Mollins, which encloses 0.4 ha over the ramparts. An aerial photographic discovery, its Flavian date was indicated on the basis of very limited ceramic evidence from small-scale excavations in the 1970s (Hanson and Maxwell 1980).

There is, however, a long tradition of earlier, potentially Flavian, use of Antonine Wall sites. The thesis was most extensively developed by Macdonald (1934: 267-73 and 466-68) and was widely accepted thereafter. The most credible structural elements at that time were the earlier enclosures recorded beneath the forts at Croy Hill and Bar Hill, but these were shown by subsequent excavation to be later in date (Hanson forthcoming a; Keppie 1985: 51-8; Jones, this volume). Various other sites along the Wall have produced a few Flavian finds from early excavations (e.g. Old Kilpatrick, Balmuildy, Cadder, Kirkintilloch, Castlecary and Mumrills), but without any associated structural evidence (Hanson 1980). At none of these sites, however, is the dating evidence sufficiently strong to support Flavian occupation (Brickstock, this volume). Further Flavian installations are to be expected, but there is no reason for them to coincide with Antonine Wall forts, as the criteria for the location of a continuous linear barrier were not necessarily the same as those which determined the positioning of an individual fort.

Landscape and environment (Davies, this volume)

The estuaries of the Forth and Clyde determined the general topographic location of the Antonine Wall. The relative sea level in the Roman period is considered to be broadly similar to current levels, perhaps with extensive mudflats (Tipping and Tisdall 2005: 444-46), which casts some doubt on earlier suggestions that the river Carron was navigable as far as Camelon (Tatton Brown 1980; Bailey 1992).

In general, the Wall traversed some of the better soils in Scotland for arable agriculture, particularly towards its eastern end (Bibby 1991), which may account for the relatively poor turf available for Wall building in this sector. Woodland continues to be evidenced in both the pollen and macroplant record (e.g. Hanson 1996), though this may represent managed rather than wild woods. Rapid and large-scale woodland clearance linked to the expansion and probable intensification of agriculture was a late Iron Age phenomenon, though cereal cultivation is recorded in Scotland some 3000 years earlier (Tipping 1994; Ramsay and Dickson 1997), so the establishment of the Antonine Wall would have taken place within a well-established farmed landscape in which crop-growing was probably important (Tipping and Tisdall 2005: 458-62). Barley is consistently recorded as predominant in the macroplant record from military sites, though the significance of this is debated (below).

Roman Iron Age settlement in the Wall zone

There is no up-to-date, comprehensive survey of the Iron Age settlement pattern in the Wall zone. Overviews covering parts of the area have been limited by modern county boundaries (RCAHMS 1963; 1978) and largely pre-date the data explosion from intensive aerial survey, whose potential impact is perhaps best illustrated by work in East Lothian (e.g. Cowley 2009). As a result there are different interpretations of the likely intensity of settlement across the isthmus (Hanson and Maxwell 1986: 164; Breeze 1985: 225-26). While there is evidence to suggest that there was a persistent cultural difference north and south of the isthmus (Hunter 2007: 288, 290-2), the overlap in the distribution of the different forms of metalwork involved hints at a contested zone between that isthmus and the estuary of the Tay which chimes well with the location of Roman outposts beyond the Antonine Wall (Hanson forthcoming b).

The specific question of the Wall's impact on indigenous society has remained largely unconsidered (but see Macinnes, this volume), though the investigation of Roman finds from non-Roman sites has a long history and has proved informative in a broader context. For example, the Lowland brochs of the Forth Valley are architecturally-exotic sites, often rich in Roman finds, that are generally seen as centres of regional elites (Macinnes 1984), though most of the evidence suggests a Flavian rather than Antonine floruit. The recovery of quantities of Roman material is not restricted to the brochs, but includes important sites such as Traprain Law in East Lothian and Hyndford crannog in Lanarkshire (Hunter 2009a; RCAHMS 1978: 108-09). Where Iron Age sites are attested along the Wall line, as for example at Castle Hill by Bar Hill and on Croy Hill, they seem likely already to have gone out of use by the time of the Roman conquest. The defended settlement at Camelon, however, does appear to have been broadly contemporary with the adjacent fort, though precisely how it related to the Roman occupation remains unclear (Proudfoot 1978: 122-23).

The mural barrier and the Military Way

Recent LiDAR analysis has indicated that the Antonine Wall was 42 Roman miles (some 62 km) long (Hannon *et al.* 2017: 453-55), slightly longer than previous map-based estimates. It runs from Bridgeness on the Firth of Forth to Old Kilpatrick on the River Clyde (Figure 2.1). The discovery of the largest and most elaborate Distance Stone at Bridgeness (Figure 8.7) is still the best indicator of the terminus, although various attempts to locate the ditch immediately to the west of where it was found have failed. Nor has an extension to the fort at Carriden to the east been located.

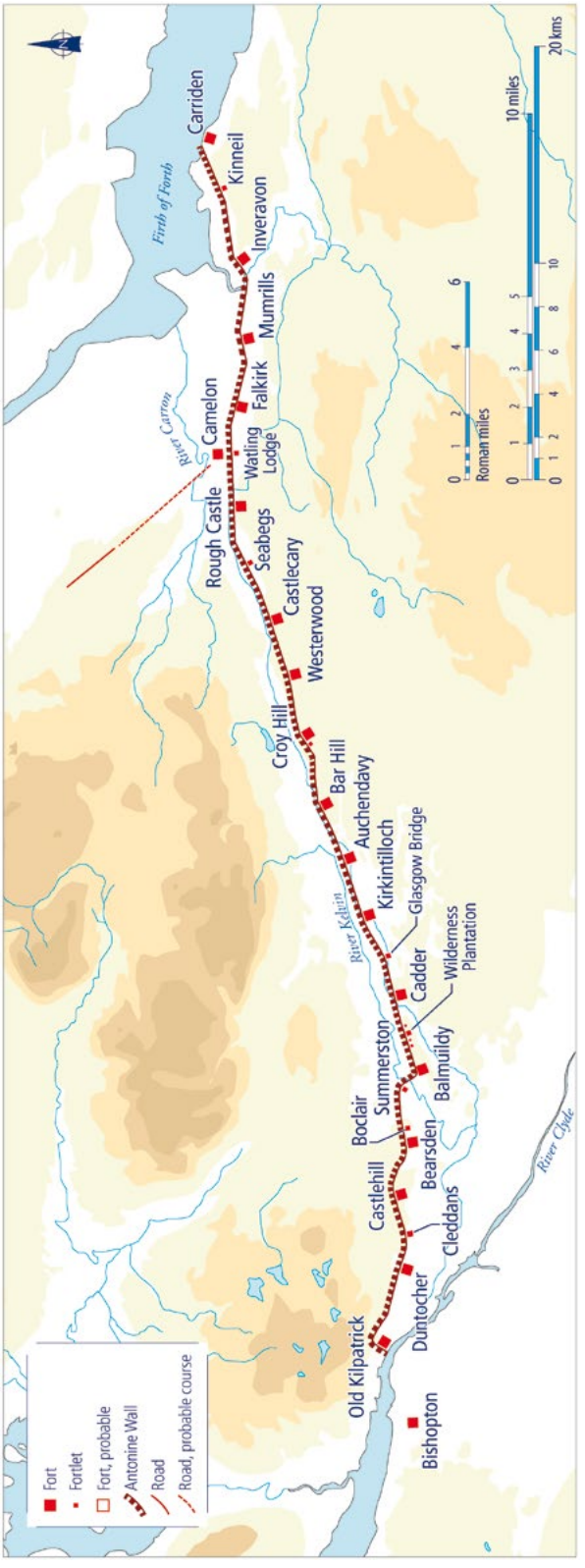

Figure 2.1. Map of the Antonine Wall as completed, based on currently availabe information (copyright D.J. Breeze).

The material used for the rampart varied along its length (Keppie 1974; 1976: 77-8). The preferred construction material was turf blocks (Figure 10.7), but mixed earth or clay, revetted by turf or clay cheeks, was variously used to the east of Watling Lodge (Romankiewicz *et al.*, this volume). The rampart was underpinned by a stone base formed of dressed kerbs retaining rough boulders or cobbles (Figure 10.4). This varied in width from *c.* 4.3-4.9 m, and may have been designed to be 15 Roman feet wide (4.4 m). Culverts through the base, defined by dressed stones with a flagged floor and capping, have been located at quite frequent intervals, as close as 15 m (Keppie 1976: 74-6). These were constructed to facilitate drainage through the Wall. Excavation has occasionally revealed repairs necessitated by damage to the superstructure, possibly from a build-up of water, as at Tollpark and Bantaskin (Keppie 1976: 68-76; Keppie and Breeze 1981: 231 and 245). No evidence exists for the way in which the Wall was carried across rivers, but both large culverts and probable supports for a wooden bridge are attested at stream crossings (Bailey 1996).

Nowhere does the rampart survive to a height of more than 1.8 m and the largest number of turf lines recorded in section is 22 (Steer 1957: Fig 3 – though the associated text suggests only 20). Combined with the fact that a turf or clay-revetted rampart must be battered to maintain structural stability, this would suggest a minimum rampart height of *c.* 3 m (Keppie 1976: 77; Hanson and Maxwell 1986: 81-3). There is no evidence to indicate how the rampart was completed at the top, though most reconstructions assume a walkway and palisade. A single post-hole within the body of the rampart at Mumrills could be interpreted as a support for a palisade (Bailey forthcoming). Allowing for the rampart batter, provision of a walkway five Roman feet (1.48 m) wide would make 3 m the maximum height achievable.

To the north of the rampart lay a wide and deep V-shaped ditch, which is often the most impressively preserved structural element of the Wall (e.g. Figure 12.2). At its consistently greatest size, between Bantaskin and Bar Hill, it was *c.* 12.2 m wide and 3.7 m deep. Both to the west and to the east of this stretch, however, the ditch was smaller, though not falling below *c.* 6 m in width (Keppie 1974; 1976: 76).

The berm between the rampart and ditch varies in width from a norm of *c.* 6 m to as much as 9 m, the increase often mirroring the reduction in ditch width (Keppie 1976: 76). Wider berm widths are recorded in areas, such as Croy Hill, with more complex topography. At various places along the eastern half of the Wall elongated sub-rectangular pits have been located on the berm (e.g. Bailey 1995; Woolliscroft 2008: 142-45 and 162-63). Usually three or four rows have been recorded, set in a quincunx pattern (Figure 2.2). On analogy with more numerous examples from Hadrian's Wall, they are generally considered to have held thorny branches rather than upright, sharpened stakes, creating the Roman equivalent of barbed-wire.

The material from the ditch was tipped out onto the north side, creating a low, outer mound that served to heighten the counterscarp of the ditch (Keppie 1976: 76; Hanson and Maxwell 1986: 77). The upcast was usually spread out to about 150% of the width of the ditch, but where the ground to the north sloped away it was piled up to a crest forming a substantial barrier in its own right. A small marking-out bank and a line of boulders have occasionally been recorded on the north lip of the ditch and it has been noted that the turf was not always first removed from below the mound (GAS 1899: 106 and 108; Breeze 2014a: 22).

Figure 2.2. Defensive pits on the berm at Callendar Park (copyright D.J. Breeze).

Figure 2.3. Section of the Military Way bypass at Croy Hill (© W.S. Hanson)

The final linear feature was a road, the Military Way, which served as a lateral communication link between the installations along the frontier (Keppie 1976: 76-7; Robertson 2015: 22). It has been recorded sporadically from Inveravon to Cadder (e.g. Figure 2.9), and then entering the fort of Old Kilpatrick at the western end of the Wall. It was generally about 5-5.5m wide, constructed of rough stones topped by small stones and gravel, with a distinct camber, flanked by ditches. It lay on average some 36-46 m south of the rampart and was usually connected to the *via principalis* of the attached forts. Quarry pits are still visible between the road and the rampart at Bonnyside, and one was found beneath the expansion at Bonnyside East (Steer 1957). There is evidence from several sites, such as Croy Hill, Bar Hill, Rough Castle, Duntocher and possibly Westerwood, that a bypass road was also provided to avoid the need to pass through each fort (Macdonald 1934: 129; 139; 144-45; 147; 177; 254-56; Hanson forthcoming a) (Figure 2.3). Crossings of the rivers Kelvin and Avon would have been

facilitated by bridges, as confirmed for the former by the discovery of Roman stones in the river to the north-west of Balmuildy (Robertson 1974).

Fortlets

Until John Gillam's seminal paper (1975) prompted a search for more, only four fortlets were known on the Wall at Duntocher (Figure 2.4), Wilderness Plantation, Watling Lodge and Glasgow Bridge. Five further fortlets were then discovered relatively quickly at Kinneil, Seabegs Wood, Cleddans, Croy Hill and Summerston, though the evidence for the latter is quite slight (Keppie and Walker 1981; Hanson and Maxwell 1986: 93-95; Hanson and Maxwell, this volume; Walker, this volume). Four others have been postulated, of which neither Rough Castle nor Laurieston can confidently be sustained on the available evidence; while kinks in the line of the Wall at Girnal Hill and Carleith, thought to indicate the site of two others, failed to be confirmed by excavation. However, resistivity data provides previously unrecognised support for the suggested fortlet at Castlehill (Figure 15.6) and a case has been made for the presence of one at Bar Hill, primarily on the basis of a need to provide access to the other side of the Wall for the garrison of the fort (Keppie 1980; Jones and Hanson, this volume; Hanson

Figure 2.4. Aerial photograph of the fortlet at Duntocher, after exposure of its rampart base in 1978, from the NNW. The line of the Ditch is visible as a slight hollow running diagonally across the lower half of the image. An exposed section of Wall base is arrowed (© W.S. Hanson).

forthcoming b). Most recently a section of the rampart of another fortlet has been uncovered during rescue excavation ahead of a house extension at Boclair several hundred metres to the east of the fort at Bearsden (Hunter 2019: 412). Where it has been possible to test the relationship, all fortlets were either contemporary with or preceded the construction of the mural barrier and so must be seen as part of the original design (Hanson and Maxwell 1986: 93). A challenge to the consistency of this evidence in respect of Wilderness Plantation and Kinneil cannot readily be sustained (Hanson forthcoming b *contra* Bailey and Cannel 1996: 307-08 and Symonds 2017: 139).

Gillam hypothesised that originally the Antonine Wall fortlets were positioned at approximately one-mile intervals, like the milecastles on Hadrian's Wall. He further suggested that they were interspersed between six primary forts, but that during the construction process further forts were added to the Wall on or adjacent to alternate fortlets (Gillam 1975). This model met with general agreement, but various considerations have resulted in recent challenges to Gillam's overall scheme (below).

Some irregularity in the spacing of the known fortlets would seem to indicate that a fixed-spacing system, in which their position in relation to the landscape was essentially arbitrary, is overly prescriptive (but see Hannon *et al.*, this volume). It is clear that the independent fortlets at Lurg Moor and Outerwards were carefully placed within the landscape to oversee the western coastal flank of the Wall. Thus, some on the Wall line, such as Duntocher, may have controlled concealed access routes, while there are indications that the westernmost fortlets may have been sited in order better to oversee the terrain to the south of the Wall (Graafstal *et al.* 2015: 63-64; Symonds 2017: 144-149).

It is widely agreed that the design of the fortlets was heavily influenced by that of the milecastles on Hadrian's Wall (e.g. Hanson and Maxwell 1986: 93-5; Robertson 2015: 27; Breeze 2006: 86) (Figure 14.4). The most celebrated feature of the latter, the presence of paired gateways providing access through the barrier, is also integral to the former. As at MC 50 (High House) on the Turf Wall of Hadrian, more postholes seem to be present at the north gateways of fortlets than at the south, which may indicate the presence of a tower only at the former. A causeway over the Wall ditch opposite a fortlet is known only at Watling Lodge where the main road to the north crossed the frontier line, but excavation at Kinneil revealed tentative traces that a crossing point had originally existed and was subsequently dug out (Breeze 1974: 166; Bailey and Cannel 1996: 337). If the majority of the causeways had been eliminated during the operational lifespan of the fortlets, this may suggest that the Antonine Wall became markedly less porous over time; Welfare (2000: 18-19) has suggested that the removal of causeways on the Antonine Wall influenced the similar action on Hadrian's Wall when the army returned south.

The northern rampart of each fortlet constructed as one with the Wall seems to have been wider than the other three (Figure 14.4 J), presumably to facilitate the seamless integration of the fortlet with the Wall. Concomitantly, this implies that the rampart around the rest of the fortlet would have been lower. The evidence on this issue from the two freestanding fortlets at Duntocher and Cleddans is less clear. The presence of a defensive ditch or ditches, not usually provided outside milecastles, is a significant addition to the design, possibly linked to the absence of an equivalent to the Vallum.

Too little is known about the internal layout of the fortlets to be certain that a standardised approach was adopted. However, in the three where the interiors have been more extensively explored, wooden structures, presumably barracks, have been recorded on both sides of the internal road, while Kinneil also revealed evidence for a lean-to building set against the northern rampart and a well (Robertson

1957: 16-33; Wilkes 1974: 55-57; Bailey and Cannel 1996: 310-14 and 336-41). Slight traces of structures on one side of the central road were also noted at Croy Hill (Hanson forthcoming a). Three sites (Kinneil, Seabegs and Croy Hill) have also provided evidence of associated features just outside the rampart. However, we still lack direct evidence for the nature of the fortlets' garrisons, whence they were derived or what function they were intended to perform.

How and when the fortlets were abandoned is disputed. A secondary layer of cobbling apparently sealing the interiors has been recorded within all the fortlets that were sufficiently well preserved for it to survive (Robertson 1957: 23-27; Wilkes 1974: 57 and Fig. 2; Bailey and Cannel 1996: 315 and 342-4; Hanson forthcoming a). This has generally been interpreted as indicating that the fortlets were decommissioned during the life of the Wall and has been linked with signs that the gateways at Seabegs and Kinneil may have been narrowed or removed. However, attention has been drawn to the pottery from these two sites that could indicate a longer period of occupation (Keppie and Walker 1981: 149; Bailey and Cannel 1996: 329) and it has been suggested that the cobbling may simply have been intended to provide a useful hard surface in damp conditions (Symonds 2017: 142-144).

Forts

There are 17 forts currently known along the line of the Antonine Wall (Figure 2.1), most of them first recorded in antiquarian accounts either as extant earthworks or concentrations of Roman finds. The locations of the latter were later confirmed by excavation, aerial reconnaissance or geophysical survey. Two further fort sites have been postulated on the grounds of spacing, at Seabegs and Kinneil. Neither of these have been confirmed, though fortlets have been identified in the immediate vicinity of both. The disposition of the forts along the line is generally taken to indicate an intention to dispose them some 2-3 Roman miles apart (3-4.4 km). In fact, distances vary between 1.6 and 3.9 Roman miles (2.4-5.8 km), though 80% lie between 1.6 and 2.6 Roman miles (2.4-3.9 km) apart (Figure 11.10). As with the fortlets, applying a standard spacing is almost certainly too prescriptive and other factors, such as the local topography and relationship to north-south routeways (Graafstal *et al.* 2015: 63-4; Graafstal, this volume) (Figure 11.2), should also be taken into account. Indeed, it has been suggested that the forts towards the eastern end of the Wall may have been more widely spaced because the Wall was effectively shielded here by the outpost forts (below) (Breeze and Dobson 1976: 96).

All of the forts but two (Bar Hill and Carriden) are attached to the barrier. However, their structural relationship with it varies. Old Kilpatrick, Balmuildy and Castlecary clearly predate the construction of the rampart, as does Auchendavy on the basis of the geophysical evidence (Jones *et al.* 2006: 13-14; Jones and Leslie 2015: 319-20). The small fort at Duntocher also predates the Wall, though it post-dates a fortlet on the same site. Inveravon, Westerwood, Croy Hill, Cadder and Rough Castle have all produced stratigraphic evidence to suggest that they were constructed after the Wall rampart was laid out, though the latter two also provide indications which seem to contradict this apparent chronological relationship. Despite the implication of the published plan (Robertson 2015: Fig. 40), there is no direct evidence of the relationship between the fort and Wall at Falkirk (Bailey forthcoming). Most forts were, like the Wall, defined by ramparts of turf or clay on a stone base, but two (Balmuildy and Castlecary) had stone walls.

There is considerable variation in the sizes of the known forts (0.12-2.6 ha). In other contexts the two smallest (Inveravon and Duntocher) would be referred to as fortlets (Symonds 2017: 5-12) and several

others (Rough Castle, Westerwood and Croy Hill) were not of sufficient size to house a full auxiliary unit (Breeze, this volume). Indeed, it is difficult in most cases to see how the fort sizes relate to the attested garrisons. At several forts more than one auxiliary unit is recorded epigraphically, though cavalry are poorly attested in comparison to Hadrian's Wall and legionary detachments are thought to have been quite widely used (Breeze 1993: 288-90; Breeze 2006: 81-94 and 189-92; Robertson 2015: 31-34).

All the forts on the line of the Wall are oriented towards it, which usually means north because of the general orientation of the Wall. The one exception is Cadder, which faces east, though it may have originally been designed to face north given the apparent central location of its north gate. There is a wealth of data for the central range of buildings (headquarters building, commanding officer's house and granaries) mainly from sites excavated between 1900 and the 1930s. These were usually stone-built, but several forts (Bearsden, Old Kilpatrick, Cadder) have one or more of the central buildings of timber construction (Figure 2.5), and in some cases (Mumrills and Cadder) there are buildings that appear to have both timber and stone phases. Evidence for the existence of workshops in the central range is slight, while the identification of non-standard buildings is often hampered by the consistent use of post-hole construction (e.g. Breeze 2016: 314-20 and 335-43).

Several of the forts (Old Kilpatrick (possibly), Balmuildy, Cadder, Castlecary, Bar Hill, Westerwood, Mumrills and Bearsden in its primary phase) have internal bathhouses. This is unusual because of the

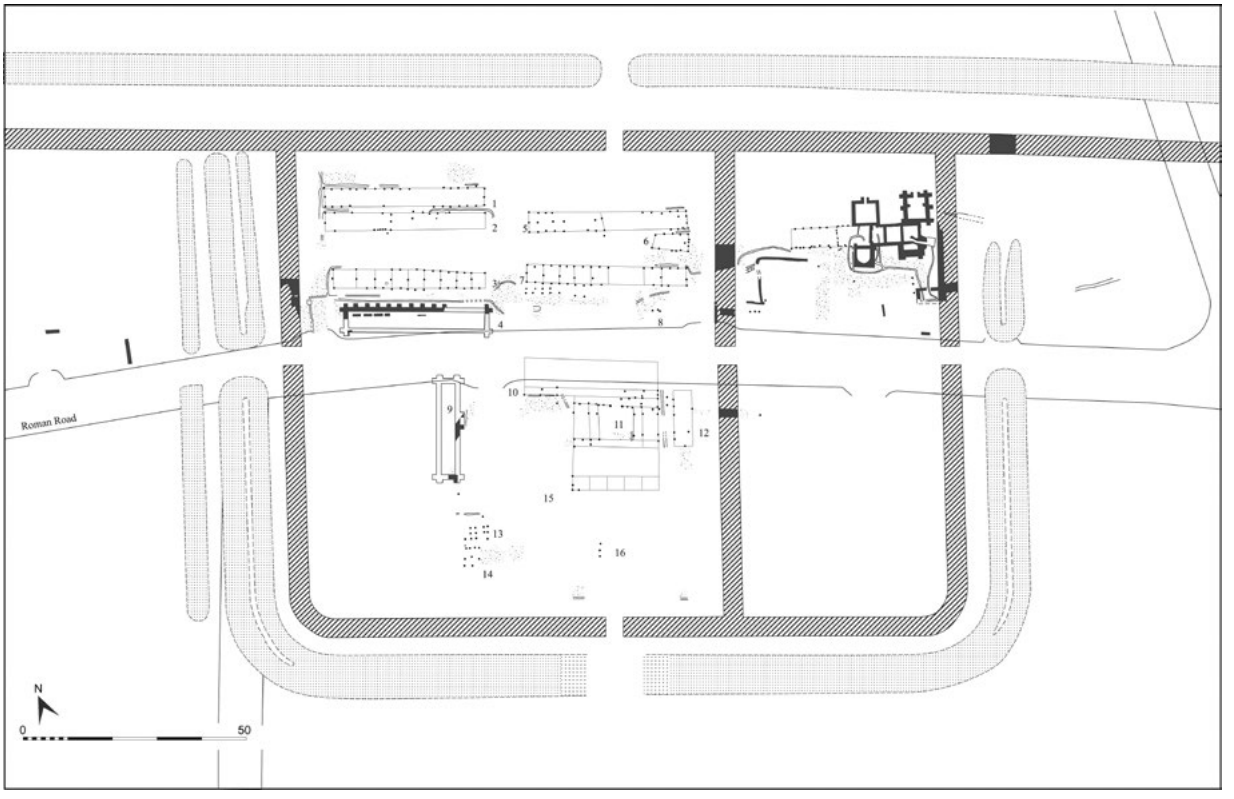

Figure 2.5. Plan of the fort and annexe at Bearsden (after Breeze 2016: Fig. 21.14b)

associated social activities and potential fire risk (cf. *RIB* I 730 recording the rebuilding of the bathhouse at Bowes 'burnt by the violence of fire'). The significance of this arrangement in the Wall forts is debated (Bailey 1994; Keppie 2004: 204-09). However, external bathhouses, sometimes in an annexe, are equally common (Duntocher, Bearsden, Auchendavy, Croy Hill, Rough Castle and Carriden) and the small size of several of the forts makes provision of an internal bathhouse seem unlikely. Currently only Old Kilpatrick, Cadder, Balmuildy and probably Castlecary are known to have both internal and external bathhouses. The sizes of the bathhouses do not seem directly to reflect the size of the fort.

Excavation in the forward and rear parts (*praetentura* and *retentura*) of forts has generally been more limited, but where this has taken place, long, narrow buildings of timber construction are indicated. These are generally interpreted as barracks, though they are not infrequently smaller than the norm (e.g. McIvor *et al.* 1980: 280-81; Breeze 2016: 337) (Figure 2.6). It has been suggested that some forts may never have been fully provided with internal buildings (Keppie 2009: 1138), though this is difficult to demonstrate given the lack of large-scale modern excavation in their interiors (Breeze, this volume). The known plans of accommodation blocks are too fragmentary to contribute meaningfully to any calculation of fort garrisons, which have been postulated on the basis of the epigraphic record (e.g. Hanson and Maxwell 1986: 153-58; Breeze 2006: 91-94; Keppie 2009). Evidence for the extent to which women and children were resident within these barracks continues to accumulate (Allason-Jones *et al.*, this volume), as, for example, at Bar Hill (Figure 23.6).

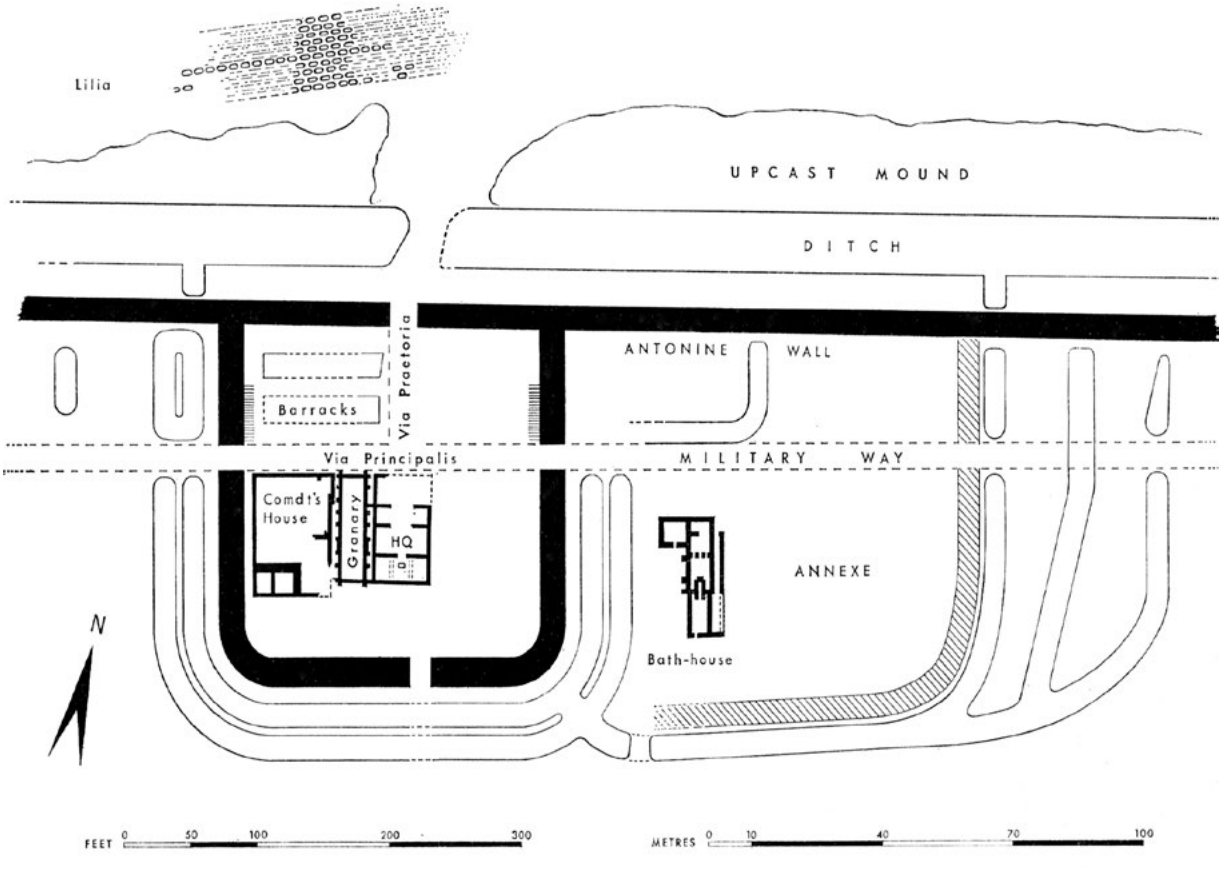

Figure 2.6. Plan of the fort and annexe at Rough Castle (after MacIvor *et al.* 1980: Fig. 1)

Planning and building the Wall

For much of its length the Wall followed the Midland Valley, sitting on its southern slopes overlooking the marshy ground to each side of the Rivers Carron and Kelvin. To the east, it was situated on top of the raised beach overlooking the Forth. To the west, beyond the River Kelvin, the Wall line utilised the drumlins of the Clyde Valley before ending on the north side of the river. With some exceptions, the Wall line follows the most elevated, north-facing ground, resulting in frequent changes of direction, but is not always placed in the most advantageous defensive position thereon (Hanson and Maxwell 1986: 162-3; Poulter 2009: 116). It is now generally agreed that the location of many of the installations was determined first, both forts and fortlets, though there is dispute about whether this applies to all of the former.

Until the 1970s the Wall was thought to have been designed as a unitary monument (Macdonald 1934: 162; Robertson 1960: 27). However, the differing structural relationships between forts, fortlets and Wall led John Gillam to suggest that its original plan had been modelled on Hadrian's Wall in its developed form, with six forts some eight Roman miles (11.8 km) and fortlets approximately every 1.1 Roman miles (1.6 km) apart between each (1975) (Figure 2.7). This hypothesis was tested and, seemingly, supported by a successful search for more fortlets which, where the relationship was examined, were all either contemporary with or preceded the construction of the mural barrier (above).

More recently, however, inconsistencies in the structural relationships between the Wall and some of the supposedly secondary forts (such as the existence of primary causeways at Rough Castle and Cadder, and an apparently primary well or cistern at Croy Hill) (Figure 11.11), the strategic positioning of some supposedly secondary forts and the apparent primacy of fort locations in relation to the planning of the Wall line have resulted in a re-assertion of the view that all the forts were also part of the original design (Poulter 2009: 117-24; Graafstal *et al.* 2015: Symonds 2017: 144-46; Graafstal, this volume). This debate is ongoing, though Gillam's original hypothesis, which remains the basis for our understanding of the building of the Antonine Wall, has been positively re-evaluated, emphasizing the fact that fortlets lie too close to forts at Duntocher, Croy Hill and Castlehill for them easily to be seen as part of the same unitary plan (Hanson forthcoming b).

Various attempts have been made to calculate how the construction of the Wall was organized, utilising a range of archaeological and epigraphic evidence (e.g. Keppie 1974; Hanson and Maxwell 1986: 104-36). Some 20 Distance Stones (traditionally referred to as Distance Slabs) are known that record the erection of the rampart by soldiers from the Second, Sixth and Twentieth legions (Keppie 1998: 72-90). As well as the symbols of the legions, several also feature sculptural scenes depicting sacrificing to the gods, fighting, and victory celebrations (Breeze and Ferris 2016) (e.g. Figures 8.3 and 8.7). They form a unique body of military sculpture and ongoing research is seeking to recreate the original use of colour on the stones (Campbell, this volume).

The fact that the Distance Stones, which were erected at each end of a building sector, detail very precise lengths of Wall constructed by each legion implies careful subdivision of the work (Keppie 1998: 50-56). However, attempts to correlate variations in the dimensions of the elements of the Wall and the changing character of the materials employed in construction of the rampart with these building sectors have not been successful. Nor do the lengths the Distance Stones record appear to be laid out in relation to the installations along the Wall line, but rather they follow their own independent logic (Hannon *et al.* 2017: 460). More Distance Stones are known from the most westerly four-mile sector (Castlehill to Old

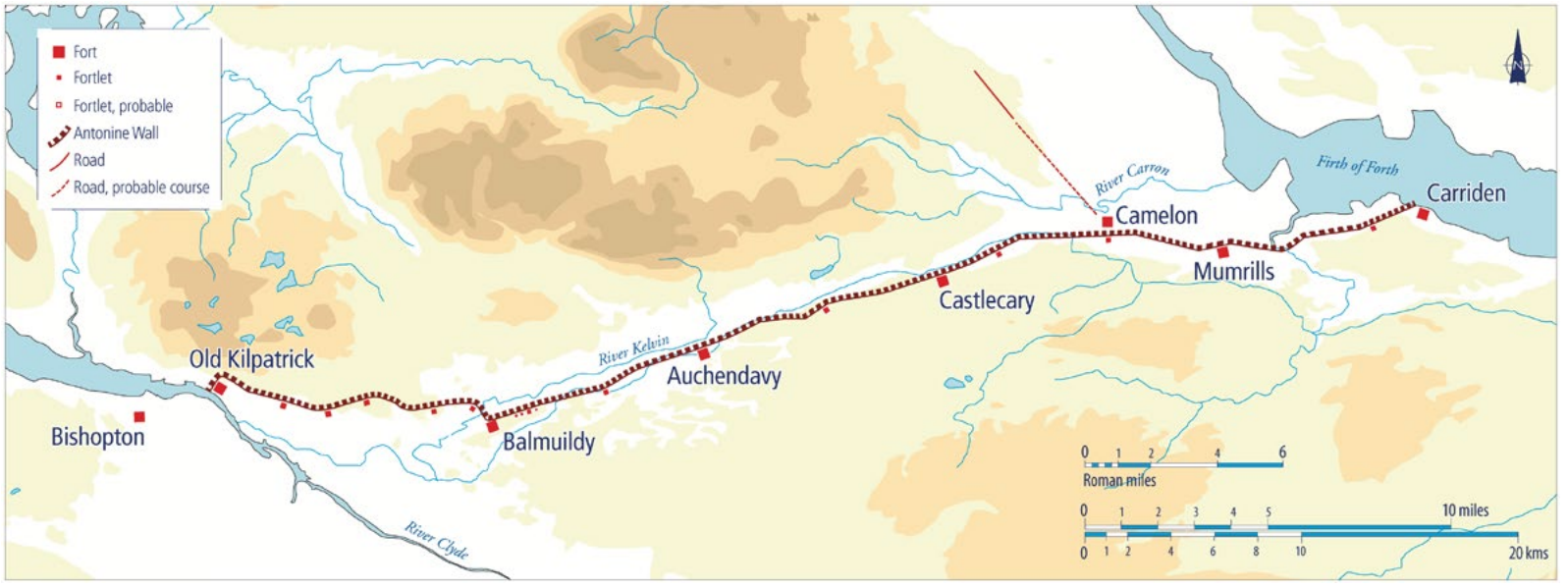

Figure 2.7. Map of the Antonine Wall as planned, based on currently available information (© D.J. Breeze).

Figure 2.8 Map of the Antonine Wall showing the location of Distance Stones and camps (© D.J. Breeze).

Kilpatrick) because it was divided up into six smaller lengths (Figure 2.8), the distances constructed being measured in feet rather than paces. It is generally accepted that this increased subdivision was intended to hasten completion of the construction, indicating that this section was the last to be built (Keppie 1979: 7). It has been proposed that the Wall was built from east to west (e.g. Macdonald 1934: 393-400; Keppie 1974: 151), though once the line had been agreed, there is no inherent reason why the actual building process should necessarily have started at one end and progressed to the other. Indeed, pointing to the odd lengths recorded on the Distance Stones allocated to the three legions in the central sector, Hassall argues that the section from Castlehill to Seabegs, some 20 Roman miles long, almost half the total length of the Wall, was divided equally between them and was the first to have been built (1983). Others have suggested that the sector east of the Avon was a late addition because of the misalignment of the Wall line on opposite banks of that river, or even that the original eastern terminus of the Wall lay at Watling Lodge (Maxwell 1989: 163; Bailey 1995: 595). It is worth noting in general, however, that the subdivision into sections allocated to different legions, combined with considerations of efficient manpower distribution, implies that work may have commenced in at least three sections simultaneously.

Some installations can be shown to have been prioritized in the building process. Thus, the fortlets at Duntocher (Figure 2.4) and Cleddans at the western end of the Wall were originally built as freestanding structures, while that at Seabegs Wood is located on a slight salient (Figures 6.2b and 12.5), suggesting that its location pre-empted the convenience of a straight stretch of Wall. Similarly, the forts at Old Kilpatrick, Balmuildy, Castlecary and Auchendavy clearly predate the construction of the rampart. Building inscriptions from forts indicate both legionary and auxiliary involvement in their construction, in some cases (Castlecary and Bar Hill) at the same site.

Accommodation for the soldiers building the Wall was provided in temporary camps that form a body of evidence unique to the Antonine Wall (e.g. Figure 2.9). Some 20 of these have been recorded along the length of the Wall, most of them relatively small (2-2.5 ha), though two larger camps lie north of the Wall, one each beside the primary forts of Castlecary and Balmuildy (Hanson and Maxwell 1986: 117-21; Jones 2005) (Figure 7.2). In the eastern half of the Wall the camps are found in pairs at each end of a legionary building sector, suggesting a possible division of labour. The pattern is less clear to the west, however, where fewer camps are known (Figure 7.3). The two adjacent construction camps at Little Kerse and Polmonthill near Inveravon were, unusually, provided with annexes, though their function is not known. The way in which the camp at Garnhall II abuts the southern face of the Antonine Wall rampart raises questions about its chronology and function, and the two distinct phases of use of the camp at Dullatur suggest that the building process may have been more complex than is generally assumed (Jones 2005). Two small temporary enclosures that underlie the forts at Bar Hill and Croy Hill presumably also relate to the surveying, planning or possibly construction of the Wall (Jones 2005: 553-54 and this volume) (Figure 7.1).

Minor installations

Six expansions, so-called because they consist of a southern extension of the rampart, were discovered along the line of the Wall in the 1890s (GAS 1899: 77-79, 84-85 and 107). They occur in pairs: one pair on each side of the fort at Rough Castle, referred to as Tentfield East and West and Bonnyside East and West, and one pair on the western slope of Croy Hill. A seventh has been claimed at Inveravon (Dunwell and Ralston 1995: 526-30 and 567-69), but the north-south dimensions of the cobble base recorded there are too large by comparison with the other examples, while the discovery of an associated post-hole would be more appropriate if the cobbling were to be identified as the rampart of a small fort.

Figure 2.9. Aerial photograph of the NW quadrant of the construction camp at Easter Cadder in the left foreground, with the line of the Military Way (revealed primarily as line of quarry pits) and the Antonine Wall Ditch beyond it to the right, bisected by a modern pipeline (© W.S. Hanson).

Each expansion consisted of a turf mound on a cobble base some 5.2m square attached to the rear of the Wall rampart after its construction (GAS 1899: 77-79 and 84-85; Steer 1957). Steer suggested that the superstructure was bonded with the Wall at Bonnyside East, even though the base was not and also overlay a quarry pit for the Military Way; nor is the section drawing through the Wall and expansion, whose integrity is open to challenge, as supportive of that interpretation as the text implies (Hanson forthcoming b). The purpose of the expansions is not certain, though it seems most likely to have been related to long-distance signalling by fire, as quantities of burnt material were recovered from Bonnyside East, though whether that involved lateral signaling is questionable (*contra* Poulter 2018). The two pairs of expansions on either side of Rough Castle may have been intended to signal to the outpost forts in the north, while the pair on Croy Hill may have faced south towards the fort at Bothwellhaugh in Clydesdale.

Only three so-called small enclosures are known along the Wall, all discovered through aerial photography, two to the west and one to the east of the fortlet at Wilderness Plantation, referred to as Buchley, Wilderness West and Wilderness East respectively. The spacing between the enclosures and the fortlet varies between 260-295m, rather less than one-sixth of a Roman mile. Only one example has been excavated, showing that it consisted of a single ditch surrounding a very slight rampart of dumped-earth, internally revetted with turf, enclosing an area *c.* 5.5 m^2 (Hanson and Maxwell 1983) (Figure 2.10). Its construction does not seem to have been integrated with that of the Wall rampart, though the turf had not been stripped from the interior prior to its construction. Neither an entrance nor any internal structure was found, so its purpose remains a mystery.

It has long been argued that towers ought to exist on the Wall, on analogy with linear frontiers elsewhere (e.g. Gillam 1975: 55-56), but they continue to remain elusive. It was thought that the small enclosures near Wilderness Plantation (above) were potential candidates, but excavation failed to find any supporting structural evidence. Two other possible candidates have been suggested, but neither are entirely convincing. A penannular, ditched enclosure 26.5 m in diameter was located on aerial photographs just to the south of the Wall at Garnhall. Excavation identified an internal post-hole structure interpreted as a tower *c.* 4 m square (Woolliscroft 2008: 145-57 and 163-67). However, the post-holes are not sufficiently deep to support such a structure, nor are they regularly laid out or central to the enclosure. Moreover, no Roman pottery was recovered, while the surrounding ditch was partly overlain by the Military Way, so identification as an Iron Age structure seems preferable. A rectangular interruption in the clay cheek at the rear of the Wall in Callendar Park was interpreted as a post-setting for a timber tower (Bailey 1995: 585-86 and Illus. 3), but the structural stability of such a post is questionable, since the batter of the rampart would mean that very little of it would have been supported by rampart material, and no corresponding setting in the body of the rampart was located. However, evidence of occupation was also found immediately to the rear of the Wall some 100 m to the east, where a two-phase hearth and a possible lean-to timber structure were identified indicating some form of Roman activity nearby (Bailey 1995: 580 and 586). Given the consistent failure to find evidence of towers, doubts are beginning to be expressed that they existed at all (Breeze 2019: 96-97; Hanson forthcoming a). Perhaps the placing of the forts on the line of Hadrian's Wall during its construction made the towers/turrets there less relevant, from which a decision flowed not to construct them on the Antonine Wall.

Other occasional enigmatic features have been recorded attached to the Wall. A 12 m long, narrow stone platform added to the back of the Wall at Tollpark was regarded as too massive and regular to constitute a repair (Keppie and Breeze 1981: 239-40). One suggestion is that it served as a means of

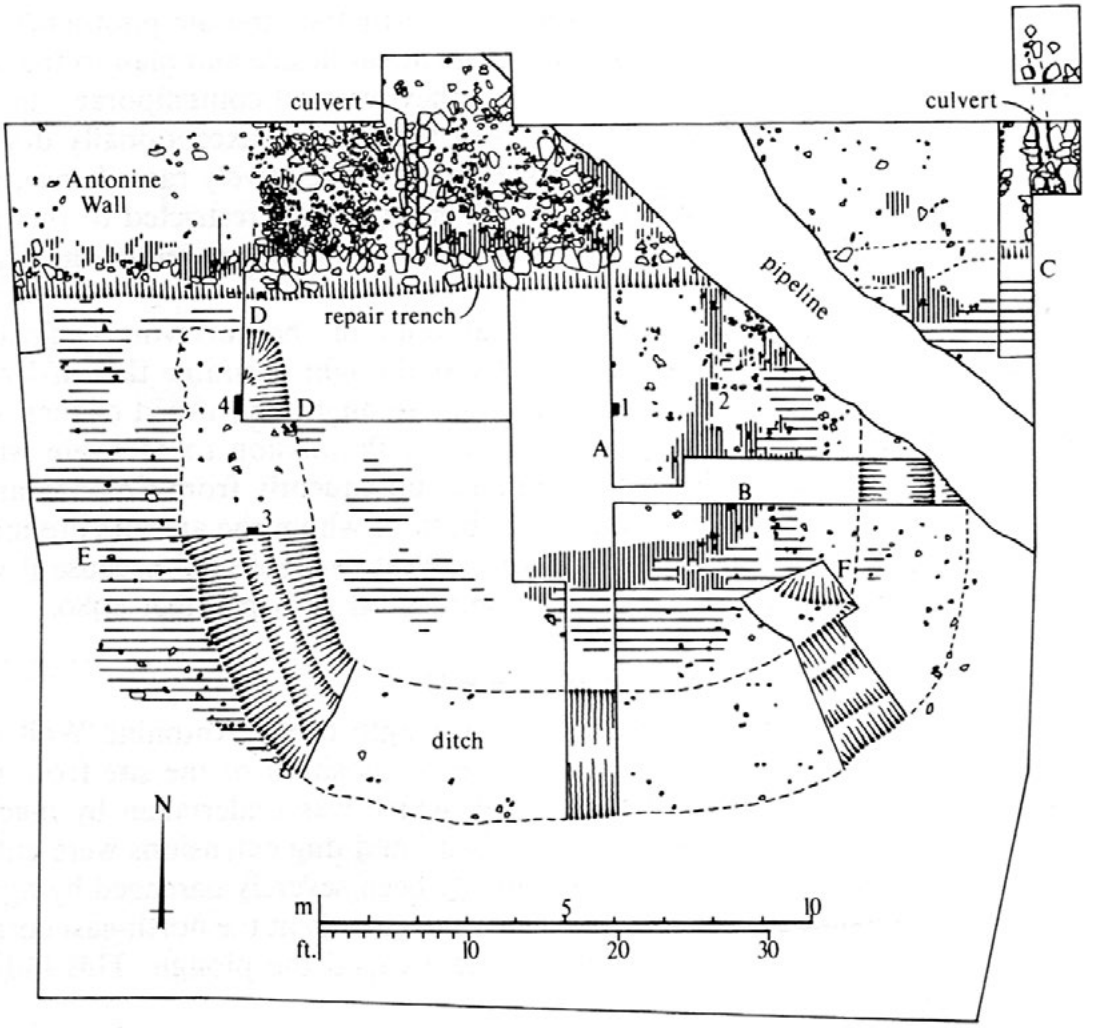

Figure 2.10. Plan of the small enclosure at Buchley (after Hanson and Maxwell 1983: Fig. 2)

access to the Wall top (Robertson 2015: 18), though neither the absence of a turf stack above it nor the presence of extensive burning on its surface would seem to support such an interpretation. A similar discovery was recorded some 874 m to the west at Garnhall (Woolliscroft 2008: 158-62), though its irregular remains and location next to a culvert may hint at an association with repairs.

Annexes

Several of the forts on the Wall were provided with an annexe, that is an enclosure attached to one side of the fort, though Carriden, Mumrills, probably Falkirk and possibly Castlecary have two. Many annexes were encountered between 1900 and the 1930s during the initial investigations into the layouts of the forts themselves, though there was no systematic search for them. Salway suggested that the annexes

were provided because there was no Vallum, which had served as an elongated annexe on Hadrian's Wall (Salway 1965: 158). Bailey, noting that the annexes on the Antonine Wall were an afterthought, suggested that the original intention had been to provide a Vallum and the annexes were created only once that idea had been abandoned (Bailey 1994: 300); though annexes are commonly provided at forts across northern and western Britain from the Flavian period onwards. The annexes vary considerably in internal area (0.3-1.7 ha). Two (Duntocher and Rough Castle) were larger than the forts to which they were attached (Figure 2.6), assuming the identifications of the two enclosures at Duntocher do not need to be interchanged (cf. Swan 1999: 431-33).

The annexes were usually defined, like the forts, by a rampart and one or more ditches, though detailed excavated evidence for their defences is limited. Two ditches are attested in the north-west corner at Mumrills, but no meaningful rampart was detected (Bailey forthcoming). The provision of annexes does not seem to have been part of the original scheme for the Wall, though only at Rough Castle has it been possible to investigate the junction between the Wall and annexe rampart. The latter appears to abut the Wall, but then so does the fort rampart, and further uncertainty is introduced by the positioning of a culvert through the annexe rampart immediately beside its junction with the Wall (Buchanan *et al.* 1905: 466 and Fig. 1). Elsewhere, however, there is other evidence to suggest the annexes were later additions (e.g. Balmuildy, Castlecary and probably Falkirk), such as the infilling of ditches between fort and annexe or differences of construction material used for the ramparts. Though superficially of one build with the fort, the annexe at Bearsden also seems to be secondary as neither the north and south gates nor the headquarters building were centrally located within the fort; rather they were central to the whole fort/annexe enclosure (Figure 2.5). This suggests that the annexe had been created by subdividing what was originally intended as a larger fort during its construction (Breeze 2016: 330-34).

When the decision was made to add annexes to forts and whether it was, indeed, a single decision is a matter of much debate (below). The evidence from both Bearsden and Duntocher indicates it took place there while the Wall was still being built. Arguing for a hiatus in the whole construction process before the decision to add annexes was taken, Swan dated it to the return of a task force from Mauretania in AD 149/50 on the basis of the widespread distribution along the Wall of pottery with strong North African influences (Swan 1999: 445-47). A slightly later date for the return of these troops is now indicated by a diploma from Mauretania, which mentions veterans from *cohors I Baetasiorum* discharged in 152/3 (Eck *et al.* 2016). If this were to provide a *terminus post quem* for all annexes, such a late date would imply a considerable delay before the Wall was completed. However, despite Steer's assertion to the contrary, the southern ditch of the western annexe at Mumrills was clearly earlier than the outer fort ditch, whose infilling has been dated by pottery and coins to the mid-150s AD (Macdonald and Curle 1929: 402; Steer 1961; Bailey forthcoming). This would suggest that the infilling of the fort ditches was not a necessary precursor to the construction of the annexe at Mumrills or, by extension, at any other fort. However, Bailey now postulates, somewhat tendentiously, that the southern annexe ditch at Mumrills must therefore relate to an earlier Antonine fort on the same site (Bailey 2010 and forthcoming).

There has been very little attempt, other than occasional exploratory trenches and some geophysical survey, to elucidate the interiors of annexes. Bathhouses occur in several, in some cases in what is clearly a secondary context (e.g. Balmuildy). Where annexes have been investigated more extensively, notably at Mumrills and Falkirk (assuming the features overlying the infilled ditches to the east of the latter are within an annexe rather than a civilian settlement), they have produced quantities of Roman

material culture and evidence of buildings of varying size and complexity but predominantly timber construction. They also contain traces of cobble surfaces, pits, ovens or furnaces and metalworking, suggesting areas of semi-industrial activity (Bailey 1994: 305-09 and forthcoming). There is insufficient evidence to be certain about the density of that activity, though the fact that at some sites (e.g. Balmuildy and Falkirk) buildings were erected over the infilled ditches of the forts would seem to suggest that space in annexe interiors was at a premium.

There is considerable debate about the function of annexes generally. Some see them as serving entirely military requirements for the production and maintenance of equipment for the Roman army and the provision of secure areas for goods and vehicles in transit, or the protection of livestock, such as cavalry horses (e.g. Breeze 2006, 95; Hanson 2007: 667-69 and this volume). Others prefer to equate them with the provision of protection for civilian occupation (e.g. Sommer 2006: 123).

Outpost forts

While the Antonine Wall followed a geographically well-defined line convenient for the purposes of military control, it did not represent the northern limit of contemporary Roman occupation. This extended as far north as the estuary of the Tay, a distance of over 50 km, with four permanent garrison posts along an arterial road which arched across the base of the Fife peninsula following the general line established in the Flavian period. The road crossed the Wall on an original causeway not, as might have been expected, at a fort, but at the fortlet of Watling Lodge (Breeze 1974; Keppie *et al.* 1995: 622-26 and 664-65). The first fort on the road north lies only 1.2 km beyond the Wall at Camelon. There is then a considerable gap before reaching Ardoch, though this may have been filled by a fort at the crossing of the Forth in the vicinity of Stirling. The equivalent Flavian fort, however, lies further to the west at Doune.

Three of the four outpost forts (Camelon, Ardoch and Bertha) are above average in size (6.2-*c.* 9 acres; 2.5-3.6 ha), and at least three (Camelon, Ardoch and Strageath) had large annexes. All seem to have been provided with strong defences, as might be expected for garrisons outposted beyond the line of the main frontier, best exemplified at Ardoch because of the impressive survival of its ditches. Only the fort at Strageath has been excavated in modern times and has provided clear evidence of two phases of Antonine occupation (Frere and Wilkes 1989: 126-31). Analysis of the complex defences of the fort at Ardoch also suggests two Antonine phases (Breeze 1983), though this has been disputed (Maxwell 1989: 165-68).

Extramural activity (Hanson, this volume)

Given the discovery some 140 m east of the fort at Carriden of an inscription dedicated by *vicani* (*RIB III* 3503), there can be no doubt that there was a settlement (*vicus*) inhabited by non-military personnel outside at least one of the forts on the Wall. However, despite a considerable focus of research effort over more than 20 years, particularly by means of geophysical survey, very little structural evidence of such settlements has been forthcoming.

Only at Croy Hill is there clear evidence of buildings, though very little area excavation has taken place elsewhere (Figure 22.2). A single timber building was recorded to the south-west of the fort, set within a ditched compound adjacent to a trackway which curved down the slope towards the fort bypass road

to the south. However, the wide range and large quantity of finds from the drainage ditches defining that trackway indicated a strong focus of settlement activity on the flat plateau immediately north of the excavated area (Hanson, this volume and forthcoming a). Only very fragmentary structural remains have been recorded elsewhere (e.g. Bearsden, Bar Hill, Westerwood and Mumrills). Those found beyond and overlying the ditches on the east side of the fort at Falkirk are usually regarded as lying within an as yet undefined second annexe to the fort (above), though a rectangular hypocausted building some 500 m further east probably does relate to civilian activity (Keppie and Murray 1981).

A range of other activities is known to have taken place in the immediate vicinity of forts. Rectilinear land divisions of varying character have been recorded adjacent to several forts and in most cases a Roman date has been confirmed. Extensive excavation to the east of the fort at Croy Hill revealed a system of fence lines and short stretches of ditch on both sides of the fort bypass road (Figure 22.2) (Hanson forthcoming a). Similar features have been excavated at Auchendavy, where they lie north of the Wall, with traces found also at Westerwood (Dunwell *et al.* 2002: 274-279; Keppie 1995). At Rough Castle a system of extant small enclosures immediately to the south-east of the fort are aligned on a probable Roman road (Máté 1995); while at Carriden an extensive system of ditch-defined rectilinear fields or plots, recorded as cropmarks, are also clearly aligned on the Roman road leading east from the annexe of the fort (Keppie *et al.* 1995: 602-06) (Figure 22.1).

There are scattered indications of industrial activity taking place outside forts, some of which is likely to have involved civilians. The evidence of local pottery production associated with individual forts is increasing (below), but few actual kilns have been located. In two of the three known cases, Croy Hill (Figure 22.4) and Duntocher (Hanson forthcoming a and this volume; Newall 1998: 25-8), these are located outside the fort/annexe, as is a tile kiln at Mumrills (Macdonald 1915: 123-28 and plates II and III). The presence of broken or incomplete architectural stonework in the backfill of Roman features at Croy Hill may indicate the activities of a stonemason nearby.

The only cemetery known outside any of the Wall forts is at Camelon, though occasional burials have been recorded elsewhere (Breeze *et al.* 1976; Breeze and Rich Gray 1980; Hanson, this volume and forthcoming a; Hunter, this volume). However, tombstones or funerary reliefs are known from several forts (Bar Hill, Croy Hill, Mumrills and Auchendavy), including four that are clearly non-military in character from Auchendavy (Keppie 1998: 113-18) (e.g. Figure 27.1).

Other external religious activity is attested by the recovery of altars, most of which are antiquarian discoveries lacking precise contextual information. Nonetheless, their occasional recovery from apparently primary contexts some slight distance removed from forts, as at Westerwood, Mumrills, Castlecary, Croy Hill and Bar Hill (*RIB III* 3504; *RIB* I 2140; 2149; 2159; 2160; 2167) (Figure 12.1), suggests that the location of small shrines in the immediate vicinity of forts was not uncommon. Altars to the goddesses of the parade ground from outside the forts at Castlehill and Auchendavy may hint at the location of associated parade grounds (Keppie 1998:102-08).

Production and procurement

The Roman army had a voracious appetite and had to be armed, housed, fed, watered and clothed. While the procurement of some items might involve long-distance supply, much of these requirements

would have been met locally (Breeze 1984). The evidence for these activities on the Antonine Wall, however, is patchy, particularly for those involving organic remains.

Apart from the rare discovery of actual kilns at Duntocher, Bar Hill (within the furnace chamber of the bathhouse) and Croy Hill, local pottery production is evident through potters' stamps on mortaria and wasters from several forts, including Balmuildy, Bearsden, Bar Hill, Croy Hill, Duntocher and Mumrills (Swan 1999:452-61; Hartley forthcoming; Bidwell, this volume). Tile production is also evidenced by a kiln at Mumrills, while variations in the style of box flue tiles suggests localised production, each unit being responsible for producing its own (Macdonald 1915: 123-28 and plates II and III; Keppie 2004: 218-19). A survey of wares along the Wall that show strong African influence, some of which were clearly of local manufacture, has provided valuable insights not only into troop movements (below), but into wider ethnic influences on pottery production (Swan 1999; 2009). Sporadic evidence of ironworking has been recovered from the forts at Falkirk, Mumrills and Inveravon (e.g. Dunwell and Ralston 1995: 540 and 561-2). Evidence for local glass manufacture is similarly sparse, though glass-blowing has been suggested at Camelon and recycling may also have taken place at forts along the Wall (Price 2002: 90; 2016: 185).

Amphorae are common finds and provide invaluable information on the procurement and transportation of exotic foodstuffs and liquids, including wine, olive oil and *garum* (e.g. Fitzpatrick 2016), while palaeobotanical evidence from Bearsden has demonstrated the consumption of a wide range of food stuffs including spelt, emmer and durum wheat, barley, lentil, beans, celery, turnip, radish, bilberry, strawberry, blackberry, raspberry, hazel nuts, figs, coriander, dill and opium poppy, the last four probably imported from the continent (Dickson and Dickson 2016: 223-35). The paucity of faunal remains from the Wall, because of the poor survival of bone and other organic evidence in acidic Scottish soils, makes it challenging to pin down wider consumption practices with certainty, though several types of locally available wild fruits, game, fish and shellfish are variously attested (Hanson and Maxwell 1986: 179). The biochemical analysis undertaken at Bearsden hinted that the soldiers had a mainly plant-based diet (Knights *et al.* 1983).

Quernstones confirm the processing of grain, some of which may have been locally produced, though insufficient environmental evidence currently exists to confirm that suggestion. Both macroplant and pollen analyses regularly indicate the presence of barley, though whether this was also consistently used as a human food source, rather than just as a feed for animals, is disputed (cf. Miller and Ramsay 2007: 136-37; Dickson and Dickson 2016: 271). Ovens set into the rampart of Wall forts combined with the ceramic evidence of mortaria, cooking pots, braziers and casserole-type dishes demonstrate cooking traditions.

The Wall in its historical context

Antoninus Pius' decision to reverse his predecessor's policy and advance the frontier in Britain seems to have been taken very soon after his accession. The governor responsible, Q. Lollius Urbicus, is attested building both at Corbridge in AD 139-40 and at Balmuildy (Figure 2.11) presumably shortly thereafter as his victory is confirmed on a diploma issued on 1 August 142 and celebrated on coins which began to be issued late in that year, some directly referencing the province (*Historia Augusta Antoninus Pius* V; *RIB* I 1147; 1148; 2191; 2192; *RMD* IV 164; *RIC* Antoninus Pius, 719, 743-5) (Figure 2.12).

Figure 2.11. Lollius Urbicus inscription from Balmuildy (© Hunterian, University of Glasgow).

Figure 2.12. Sestertius of Antoninus Pius depicting a winged Victory and the title *Imperator II Britan* on the reverse (© Hunterian, University of Glasgow)

There has been some debate about the reasons for this dramatic change of policy. It is now widely agreed that the new emperor, who lacked military experience and reputation, needed the prestige that such a military victory would bring (e.g. Breeze 1976: 76; Hanson and Maxwell 1986: 60-61), though it remains possible that there was some unrest on the frontier at the time to prompt military action. The

reason that the forts on the Antonine Wall are so much more closely spaced than those on Hadrian's Wall or, indeed, on almost any other Roman frontier, requires explanation, regardless of whether this represents the original plan or came about as the result of changes made during the construction process. It does imply a greater concern for border security, and the suggestion that the building of the Wall sparked a local hostile reaction is a potentially attractive explanation (Hanson and Maxwell 1986: 165; Hanson forthcoming b). Alternatively, it has been suggested that the density of military installations represents the end point of a development in frontier control which had started about 60 years earlier (Breeze 1982: 161-4).

There have long been problems understanding the chronology of the northern frontier in the mid-later second century, with disagreements concerning the length of occupation of the Wall and the number of phases involved. For a time a consensus appeared to have been reached on two phases of occupation with the end of the Antonine period in Scotland coming in *c.* AD 164 on the basis of the samian pottery and the latest dated stratified coin from the Wall (Hartley 1972; Haverfield 1899: 160-1; Hanson and Maxwell 1986: 137-51). However, Hodgson put forward a cogent case for dismissing the existence of a second Antonine phase, with the end of the occupation beginning by AD 158, the epigraphically attested date for the refurbishment of the curtain of Hadrian's Wall (Hodgson 1995; 2009; *RIB* I 1389). He noted that hardly any excavated sites have provided unequivocal evidence of a second Antonine occupation following a period of abandonment, and suggested that the minor structural changes attested need be no more than piecemeal alterations and repairs to predominantly timber buildings. He further argued that where two Antonine phases could be demonstrated, they reflected changes of garrison concomitant upon the necessary reassessment following the addition of further forts to the Wall, rather than indicating any later reoccupation. This interpretation of the dating evidence has been widely accepted (e.g. Breeze 2006: 167; Keppie 2009: 1136). However, the timescale for the process of abandonment seems uncomfortably lengthy, so that Hodgson is forced to postulate either a phased withdrawal or occasional use of certain sites as outposts of Hadrian's Wall. Furthermore, if this re-dating is then combined with a return to the concept of the Wall as a unitary design (above), then an alternative explanation must be found for the more persuasive structural indications of two phases of occupation, such as the rebuilding of the headquarters building and commanding officer's house at Mumrills, the abandonment of two barrack blocks at Old Kilpatrick or the rebuilding of the outpost fort at Strageath.

The identification of pottery with strong North African influences from various sites on the Wall (notably Mumrills, Croy Hill, Bar Hill, Bearsden, Duntocher and Old Kilpatrick) indicates the presence of troops, slaves or dependants who originated from or had served in that region (Swan 1999). The most likely historical context for their presence is the return of a task force previously withdrawn to assist in Pius' Mauretanian war that may have started in the late 140s and was certainly in progress in the 150s. Two soldiers from British units were discharged in North Africa in 152/3, one of the units involved being based at Bar Hill (Eck *et al.* 2016). There is currently no independent evidence to support the suggestion that the return of these troops was linked to a hiatus in Wall building and the decision to build annexes, which would imply a lengthy delay in the whole construction programme (above).

The reasons for the abandonment of the Wall are no less uncertain, particularly now that a link with the end of the reign of Pius in AD 161 appears less chronologically sustainable. There is evidence to suggest that the decision was both ordered and controlled, involving the deliberate demolition of forts

followed by careful tidying up, as attested by the infilling of wells at Old Kilpatrick and Bar Hill (Miller 1928: 23; Robertson *et al.* 1975: 14), the paucity of the material left behind (Breeze 2016: 375) and the careful removal and burial of some of the Distance Stones, perhaps reflecting some ritual acts (Keppie 1998: 51-52 and 67; Breeze and Ferris 2016).

Hodgson suggests that the withdrawal from Scotland was a reaction to local opposition that was greater than could be contained by the forces then available because of military demands elsewhere in Europe (Hodgson 1995: 39-43; 2009). It is suggested that the geographical focus of that opposition was south-west Scotland on the basis of a range of evidence: a relative lack of Roman material on Iron Age settlement sites (Wilson 2003: 113-14); the need for closer control reflected in the enhanced disposition of well-defended fortlets throughout the occupation (Symonds 2017: 81-90); and the continued hostile opposition suggested by the apparently disastrous fate of the fort at Birrens (Hanson and Maxwell 1986: 145), the latter further supported by the number of temporary camps in the area that appear to date to this period (Jones 2011: 123). However, alternative explanations for the density of fortlets in the area have been offered, including a need to economise on manpower and a requirement to ensure that nothing undermined the victorious campaign on behalf of the new emperor (Miller 1952: 212-35; Breeze 1976: 73-76); while the destruction of Birrens by hostile forces is disputed (Breeze 1977: 459) and the paucity of Roman material on rural sites can now be seen as part of a wider pattern (Breeze 2014b: 54-55).

The most recent analysis argues that the primary reason for the withdrawal was a shortage of manpower (Hanson and Breeze forthcoming). This had been stretched throughout the Antonine occupation, as indicated by the provision of a number of very small forts on the Antonine Wall, some with legionary garrisons. The final straw, however, may have been the dispatch of troops from all three British legions to Germany in AD 158 to assist with the expansion and complete reconfiguration of the frontier there.

There are slight hints of activity that may post-date the reign of Antoninus Pius. Famously, the latest dated stratified coin from the Wall is of Lucilla (AD 164-69) from the granary at Old Kilpatrick and there is a very small number of unstratified coin finds of Marcus and Commodus from other fort sites (Abdy 2002: 200, 206 and 211). There is also some evidence of the re-use of buildings for such different purposes that continuity of military occupation may be questioned. Thus, iron-working was attested in the dismantled latrine of the bathhouse at Carriden (Hunter 2009b: 228-29); a pottery kiln was inserted into the stokehole of the bathhouse at Bar Hill when it was no longer in use (Keppie 1985: 60 and 72-73; Swan 19:9, 426-27 and 456-57); and a kiln of uncertain purpose was inserted in to the northern end of one of the granaries at Balmuildy (Miller 1922: 27-8 and pl. XB).

However, the abandonment of the Wall and its rapid integration back into the indigenous settlement landscape is suggested by the record of a souterrain being constructed in the Wall ditch at Shirva (Welfare 1984: 314-16). It utilised Roman stonework, some of it inscribed, which probably come from the nearest fort at Auchendavy and its associated cemetery.

The protection of the Antonine Wall

The Antonine Wall was inscribed as a World Heritage Site in 2008, being added to the Frontiers of the Roman Empire World Heritage Site (Weeks, this volume). As part of the process the detailed protection

of the Wall through scheduling was reviewed, a new GIS for the frontier established and a *Map of the Antonine Wall* published (McKeague, this volume). The setting of the Antonine Wall in rural contexts is also protected by the buffer zones associated with the World Heritage Site.

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3. The Landscape at the time of construction of the Antonine Wall

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The last comprehensive review of the landscape context of the Antonine Wall was that of Tipping and Tisdall (2005), who synthesised the literature on landscape, land-use and environmental change before, during and after the Antonine occupation of lowland Scotland, with a large proportion of their study dedicated to the reconstruction of vegetation cover from palynological profiles. The following account summarises our current understanding of the landscape in which later prehistoric communities lived and that which the Antonine troops would have experienced during the occupation.

Geomorphological context

The geomorphological context of central Scotland provides an essential foundation to reconstructing the environment as it would have been experienced by Iron Age inhabitants and the occupying Roman force of the second century AD. The Forth Valley is bisected by the River Forth, which leads to the Firth of Forth, while the River Tay flows from Loch Tay through Strathmore to Perth and out to the Firth of Tay and thence the sea. In the west, the River Clyde bisects Strathclyde and runs to the Firth of Clyde. The central lowlands are part of a rift valley that runs between parallel faults. Their character has been influenced by differential erosion of the underlying rock types. Whilst igneous rocks form the basis of the Ochil Hills, which act as a boundary between Perthshire and the Fife peninsula, the broad plains like Strathmore are underlain by soft, sedimentary rocks. Strathearn and the Carse of Stirling are underlain by Lower and Upper Old Red Sandstone sediments. Modification of these by glaciation has contributed to the variation in soils within the region. Most are of relatively fine sandy clay loam or clay. There are occasional outcrops of sandstone, conglomerates and mudstones (Bown and Shipley 1982). Parts of the lowlands, particularly the area between Crieff and Callander, are relatively high since the basal conglomerates have resisted erosion. Even higher ground is represented by the Sidlaw Hills and the Ochil Hills, craggy deposits of volcanic rock (Walker *et al.* 1982: 13-14) in southern Perthshire and Stirlingshire. South of the Forth, the Gargunnock Hills are made up of basaltic lava flows which form terraces and mounds rising up from the valley floor (Walker *et al.* 1982: 15).

The frontal margin of a major ice limit is represented by a swathe of moraine ridges, which spread from the Port of Menteith to Buchlyvie in the Western Forth Valley (Walker *et al.* 1982: 15). Three phases of glaciation have been recognised in the Central Lowlands. The first resulted in glacial till being deposited as hummocky moraines in the upper Forth and Teith Valleys and as a layer on gentle slopes. The second came from the north-east rather than the south-east and resulted in till from Old Red Sandstone being spread across the landscape. The third glaciation phase was represented by a temporary re-advance of Highland ice, followed by the retreat of glaciers along the Tay and Forth valleys. The main consequence of these glaciation episodes was the deposition of large amounts of fluvioglacial material in the area, forming the hummocky landscape which is evident today (Walker *et al.* 1982: 17). The occupying Roman force made use of these natural landscape features, including

rivers, ridges, drumlins, cliffs and hills in creating an advantageous line (Breeze 2006: 62; e.g. Hanson and Jones, this volume).

Post-glacial fluctuations in land and sea level resulted in the estuarine silts and clays that form the Carses of Stirling and Earn as well as raised shorelines on the southern bank of the River Forth at Bannockburn, Carbrook and further west along the Forth valley at Arnprior. The carseland extends for 3 km north and south of the Forth and peat began to form on it around following the sea's retreat (see below). Raised mosses (morasses or bogs) are restricted to the upper Forth Valley (Smith 1993; Walker *et al.* 1982: 17-18). Brown forest soils cover much of the till deposits in the area while peaty podzols are confined mainly to the higher and wetter areas of the Ochil and Gargunnock Hills, where the acidity of the soil excludes the soil fauna that can digest plant matter (R. Tipping pers. comm.). Non-calcareous gleys are present in some areas but do not dominate; the same can be said of peaty gleys, although there is a significant area of these in the Braes of Doune (Walker *et al.* 1982: 20-21).

Sea level change

The Main Postglacial Shoreline, now dated to *c.* 7600 BP (Smith *et al.* 2010), was thought to have been the highest Holocene raised shoreline in Scotland (Smith *et al.* 2000: 489). At this time Mean High Water Springs (MHWS) – the average height of spring tides – lay at 14.6-16.5 m OD in the western lowland (Smith *et al.* 2010). In the Carse of Gowrie test-pitting at Inchture revealed marine bivalve shells and diatoms, compatible with an estuarine environment, 3 m below the current ground surface at the base of a thick deposit of blue marine clay. Coupled with evidence from elsewhere in Strathearn, this would suggest that sea-level in the Perth vicinity rose to *c.* 9 m OD, culminating at around 6000BP (Cressey *et al.* 2003). Cressey *et al.* suggest that the carse clays would not have attracted later prehistoric settlement (2003), something that is borne out by the settlement pattern discussed by Davies (2006), in which the known sites in the area seem to be clustered on free-draining soils.

However, work by Smith *et al.* on isostatic land uplift during the Holocene indicates that there was also a later period of high relative sea level (the Blairdrummond Shoreline) in the Forth Valley and elsewhere (2000; *pace* Ellis 2000a: 247 & 254; 2000b; Ellis *et al.* 2002; Reid 1993: 3). The Forth Valley was nearer the centre of the uplift on Rannoch Moor and thus demonstrated the highest sea-levels during the period (Smith *et al.* 2000: 492-493). On the basis of the isobase model proposed by Smith *et al.* (2000), the Blairdrummond Shoreline is not quite as high in the Perth area as in the Stirling area. Using these data within archaeological timescales such as that under consideration here requires caution, as shoreline formation in glacio-isostatically affected areas is understood to be diachronous. Thus, measured altitudes along any shoreline do not represent an instant in time, but rather a period of several hundred years (Fretwell *et al.* 2004: 175; Smith *et al.* 2000: 498). In addition, it has been suggested the sea would have withdrawn earlier from shorelines nearer the area of maximum uplift; the Forth Valley may have seen the most dramatically raised sea-levels, but also the earliest retreat. Having said that, Smith *et al.* have noted that the diachronicity of shorelines in the Forth Valley, while possible, is not marked (2010: 2391).

The Blairdrummond Shoreline is identifiable at 94 points in former estuarine mudflats in the Forth Valley, where distinct breaks of slope occur at the inland margin of the carselands. Smith *et al.* dated the Shoreline to *c.* 2000-4200 ^{14}C years on the basis of radiocarbon dates from conformable peat horizons

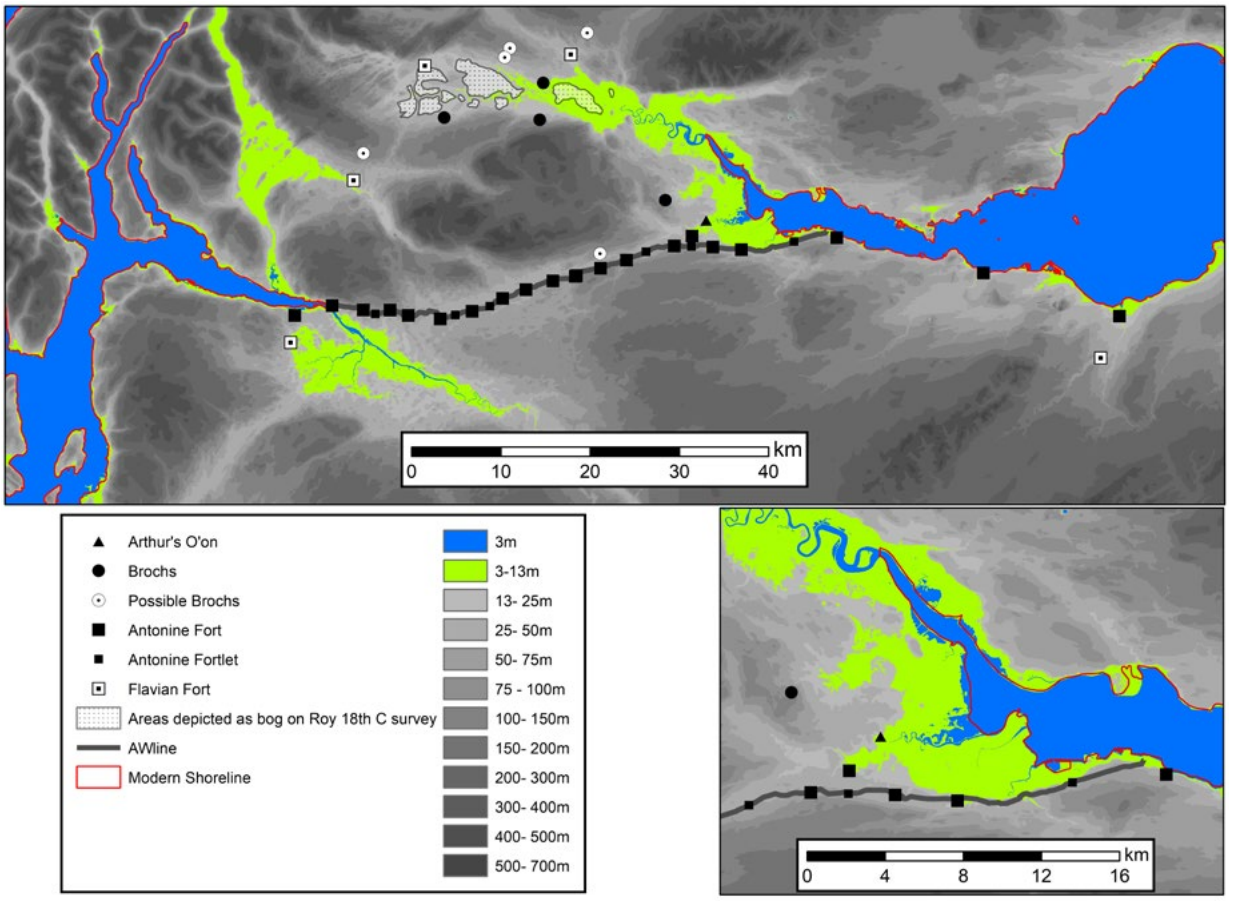

Figure 3.1. The Antonine Wall in context, highlighting coastal areas below 13 m OD. In the Forth Valley, a late period of high relative sea level of up to *c.* 13 m is indicated by the Blairdrummond Shoreline. However, by the time of the Antonine occupation, the sea had retreated significantly. Areas mapped by William Roy as peat bog in the eighteenth century are also shown. The inset shows this area in relation to the eastern end of the Wall, including the fort at Camelon, identified in the past as a possible port (drawn by James Bruhn).

(2000: 497). This suggested that during later prehistory, and possibly even within the very early years of the first millennium AD, the Shoreline might have been at 11.3-13.4 m OD (Figure 3.1), with a MHWS of 8.3-8.4 m. An indication of the possible extent of this in the Forth Valley is given in Figure 3.1. The Blairdrummond Shoreline may also have been identified near Grangemouth, Stirlingshire. The latter site produced evidence of a shoreline at 10.8 m OD, which was radiocarbon dated via shells to *c.* 4200 BP. Data from 59 points in East Fife would suggest that the altitude of the Blairdrummond Shoreline there is at 7.9-8.9 m OD (5.6-6.6 m MHWS) (Smith *et al.* 2000: 497). Together, data from the vicinity of the Antonine Wall and elsewhere in Scotland suggest that relative sea levels in Scotland were up to 6 m above present HWMOST (High water mark of ordinary spring tides) levels as recently as 2000-4200 BP and possibly even later (Smith *et al.* 2000: 498). Consequently, Davies noted that it was possible that during part of the Late Bronze Age and Iron Age, a large area of the Forth and Tay Valleys and Firths could have been unavailable for settlement or even for the activities that would have been possible on carseland (2006).

However, Tipping and Tidsdall suggest that the sea may already have retreated by the Iron Age (2005: 445), something supported by later work of Smith *et al.* (2010; 2012; 2019). The period of high relative sea level is likely to have taken place during the Neolithic or Bronze Age with 27 radiocarbon dates from conformable horizons across Scotland and beyond ranging from 5030+110 to 3505+50 BP (at 1σ) (Smith *et al.* 2012), with significant retreat having occurred by the later prehistoric period and certainly by the arrival of the Romans in the 1st century AD. Tipping and Tisdall suggest the Clyde Estuary was characterised by mudflats and sandbanks at the time of the Antonine occupation (2005: 445-446). Generalised sea level curves indicate a sea level of 3 m OD in the central Forth Valley at the time of the Roman invasion. Mudflats in the Forth Estuary may have been fordable but would also have restricted movement of supply ships. Tatton-Brown notes the possibility of a port at Camelon (1980), where the Roman fort lies at 25 m OD overlooking what is now the River Carron. However, he traces the evidence for this, repeated by several authors since the 17th century, to a single reference in Gibson's edition of Camden's Britannia, published in 1695, to an anchor having been found there. Without knowledge of the date of the anchor or its context, it can hardly be taken as unequivocal support for the existence of a port specifically during the Roman occupation. While Tatton-Brown notes that weirs built in the latter part of the 18th century stopped any flow beyond the Carron Ironworks, Roy's map of the lowlands of 1752-55 shows much of the areas of alluvium along the banks of the River Carron at Camelon already laid out as fields and under cultivation, with the exception of a boggy area immediately below and to the east of Camelon fort, part of which was recorded again as peat by the British Geological Survey in 1997. Tatton-Brown suggests that the river would have been wider and navigable to at least the area below Camelon, and that ships would have been able to see Arthur's O'on, the Roman temple, which he speculates may also have been a lighthouse (1980: 341). While the topography and superficial deposits certainly do not rule out the possibility of a Roman port at Camelon, they do not prove it either. We certainly have more evidence for sea level change in the Forth Valley since Tatton-Brown published his case, but the nature of the evidence means that it is not yet possible unequivocally to pinpoint the sea level at this specific place at such a specific point in time.

Tipping and Tidsall note the practical implications of sea level being above current levels in terms of groundwater supplies and impact on availability of drinking water. With the dating of the Blairdrummond Shoreline now pushed back, the development of the raised peat mosses on the carseland terraces were noted by Smith *et al.* (2010) as having likely restricted movement in the Iron Age. However, lower carseland areas not covered in peat, along with locally better drained areas and watercourses, would have enabled some travel through the area, contrasting with the vision of an 'uninhabitable swamp' imagined by Maclagan (1872) or the virtual 'no-man's land' envisioned by RCAHMS nearly a century later (1963). Whilst boggy areas would not have been suitable for growing crops, they may still have been useful for grazing domestic animals such as sheep or goats.

It should not be assumed that the mosses were used only for the ritual purposes often associated with prehistoric wetlands. The five undated timber trackways (RCAHMS 1979) and LBA wooden wheels (Piggott 1957) found during land reclamation in the 18th century would suggest that the mosses did not represent an insurmountable barrier to the local people. Several sections of apparent timber trackways were noted by antiquaries, preserved within the mosses of the Forth Valley (RCAHMS 1979). In most cases, ignorance of their true date must remain, since they were destroyed during the 18th century Improvements described by Cadell (1929). If some are trackways and are later prehistoric, however, they might be interpreted as offering routes across the mosses or even access to the mosses.

MacKie notes the evidence of previous crossing points surviving in place names such as the Fords of Frew at Gargunnock, which was certainly an important crossing in the mediaeval and Early Modern periods (2016). It is tantalising that the brochs at Leckie, which also provides evidence of interaction between the Romans and local people (MacKie 2016), and Coldoch are located opposite each other and are intervisible. It is possible that they were located to oversee or even control a route or trackway across the moss, something that could have been in place before the Roman arrival (Davies 2006). The Roman road ran from the Roman fort at Camelon to that at Bertha, although its course is uncertain in places, particularly across the Forth Valley. It provided a land route, linking forts, fortlets and watch/signal towers, across the Forth Valley and Strathearn up to Perth and beyond. The earlier system between Glenbank fortlet and Bertha fort is known as the Gask Ridge, and is interpreted by some as an early frontier (e.g. Woolliscroft 2002) and by others as a fortified road (e.g. Dobat 2004).

Climate, forest clearance and land-use

The case for a 'dramatic' climate change in the Late Bronze Age or perhaps Early Iron Age is supported by the pollen core evidence from several sites in the Forth Valley, including Flanders Moss East and West and Darnrig Moss, but not from Black Loch. As throughout northern Britain, there is evidence for extensive forest clearance in the latter half of the first millennium BC, as evidenced in data obtained from Flanders Moss West, Lower Greenyards, Letham Moss, Fannyside Muir and Blairbech Bog. With the exception of those from Rae Loch, all of the radiocarbon dates suggest that this process was underway before the Roman army had even set foot in Britain, as has also been recognised in southern Scotland and northern England (Tipping 1997a). What is also clear is that these clearances took place at different times in different places and on different scales, just as they did in northern England (cf. Dumayne-Peaty 1998a). The overall impression is of mixed and fluctuating land-use in the later prehistoric period in the study area, with deforestation happening well before the Roman invasion in many places and woodland regeneration occurring in most areas in the post-Roman period (cf. Dumayne 1993a; 1993b; 1994; Dumayne and Barber 1994; Dumayne-Peaty 1998a; 1988b; 1999). As in northern England and southern Scotland, the data suggest a marked intensification of agriculture from *c.* 350 BC onwards, leading to dramatic deforestation (Tipping 1997a). Arable and pastoral aspects of the landscape can be recognised, but the relative proportions of these cannot be deduced from the data gathered thus far. As Tipping and Tisdall point out, multiple sources imply a climate during the Antonine occupation that was mild and relatively dry (2005: 447-448).

Analysis of environmental and economic evidence in later prehistory suggests a mosaic of vegetation types (Davies 2006), similar to that suggested by Dumayne-Peaty for the Hadrian's Wall area (1998a). In later prehistory, the region included areas of arable and pastoral land, some of which are likely to have been deliberately cleared for the purpose. It also included land set aside for other purposes or left in an unmanaged state, such as woodland and peat bog. It would seem reasonable to suggest that the fertile lowlands within the study area also had a high agricultural potential in the later prehistoric period. However, it should be borne in mind that woodland is likely to have been more extensive than today and to have supported a wide variety of wild animals and plants suitable for human exploitation. Importantly, it would have provided timber for building projects and for fuel. Tipping argues for maintenance of woodland clearings in southern and eastern Scotland from *c.* 500 BC through to and perhaps beyond the Roman occupation (1997b: 157) and such a clearance is evident in this area between 200 BC and AD 400. As Armit and Ralston have pointed out, Roman legionary

fortresses, forts and camps show that there were large areas of land that was unforested by the Roman period (2003: 192). Whilst the Romans may have cleared land themselves for long-term sites such as forts and fortresses (Hanson 2003), they would have taken advantage of areas cleared already by native people in establishing temporary camps (Armit and Ralston 2003: 192). In contrast to what Dumayne-Peaty has argued for the Hadrian's Wall area (1998a; 1998b; 1999), the evidence from the vicinity of the Antonine Wall indicates indigenous triggers for changes in land-use, and no such major changes in land-use during the Roman period (Tipping 1997b: 157; Tipping and Tisdall 2005: 458).

There is sufficient evidence to refute van der Veen's assertion that the Scottish landscape was not cleared until the Roman period (1992: 153). The evidence here adds weight to Hanson's argument, based on pollen core data from Strathclyde, Durham, Northumbria, Cumbria and Central Scotland, that extensive deforestation was well underway over much of northern Britain by the late pre-Roman Iron Age (1996). Indeed, Hanson's argument that this gradual process had more to do with the expansion of settlement and agricultural activity than the specific timber requirements of the Roman army is convincing. The analysis here provides little support for the contention of Whittington and Edwards, derived from the evidence at Black Loch and the Aberdeenshire lochs of Braerroddoch and Davan, that the dramatic changes in land-use, which took place in the first few centuries AD, were caused by the devastation wrought by the Roman army (1993: 20).

Richard Tipping has argued that the sampling strategy and temporal resolution of pollen diagrams needs to be improved (1994). He also provides a useful cautionary note when he points out that the actual extent of farmed land cannot yet be determined from pollen data derived from point source cores (Tipping 1994: 33-35). A far greater density of securely dated pollen profiles is required before anything but the most generalised picture of landscape development over the later prehistoric period can be given. Of course, the relatively small number of lochs in the area means that potential pollen core sites are limited, and the Forth Valley mosses may hold the most potential for elucidating these issues. Raised mosses and valley peat bogs still survive in Cardross Moss, Gartrenich Moss, Flanders Moss West, Flanders Moss East and Ochtertyre Moss (Soil Survey of Scotland 1982) and these probably present the most potential for enhancing understanding of the later prehistoric environment in the lowlands of the study area. To improve understanding of later prehistoric land-use, the macrofossil and bone evidence from archaeological sites must also be considered, along with the indirect evidence available from artefacts recovered from later prehistoric sites.

Although very little chronological resolution is possible with this data, it would seem reasonable to suggest from the animal bone at later prehistoric sites in the area that in this lowland zone, people were farming cattle, sheep and/or goat and pig. They are likely to have supplemented this with seasonally available game resources such as red deer, bird or hare. The chronological resolution that can be applied to the animal bone evidence from excavated sites is low. There is enough evidence to suggest, however, that farming peoples in this area were rearing a variety of stock, including cattle, sheep/goat and pig and at least some also had access to domestic horses and dogs. The finds of sheep shears at Aldclune (Hingley *et al*. 1997) and Leckie (Mackie 2016: 90) indicate that sheep were being used for wool as well as meat and/or milk. People continued to hunt, adding deer, boar, hare and birds to the menu. It should be borne in mind that there would have been wolves and bears in Scotland during the period. As Morrison has pointed out, bears were not eradicated until *c*. AD 1000 (speculative date) (1985: 64) and wolves not until 1749 (McCormick and Buckland 2003: 87). This would have provided a

very good reason for bringing domestic animals in (whether to a building or defended enclosure) at night, especially in areas near the forests that are the predators' natural habitat. Having said that, if there was still extensive woodland in the area in later prehistory, wolves would likely have stayed in the forest, populated as it would have been with deer and other mammals. Bears would also have stuck to their natural habitat. The resources later prehistoric people needed, such as the hazelnuts evidenced at Leckie, could have been gathered from the edges of the forests, and an antagonistic relationship between people and carnivorous animals need not therefore be envisaged.

At the moment, it is impossible to assess the importance of dairying to the economy. There are not enough well-preserved bones to carry out a study of cattle mortality and there has been no lipid analysis on pottery from this area. It is tempting to argue that souterrains were used for the storage of cheese, but there is no archaeological evidence for this. The discovery of a wooden container of butter at Oakbank crannog, Loch Tay, is, however, tantalising (Dixon 2000: 14), as is a find of bog butter from Cromaske Moss, Perthshire (Macadam 1888: 434). Hingley has suggested that bog butter deposits may represent ritual offerings associated with fertility something that might suggest an economy with a dairy surplus (1992: 24).

Evidence for Iron Age cereal cultivation comes largely from the lowland zone and, where environmental sampling was undertaken, indicates that people were exploiting a wide range of plant resources. At Buiston crannog in Ayrshire, occupation deposits had not survived in the Romano-British phase (Crone 2000: 67), which is frustrating given the evidence for processed barley, oats and flax from the Early Historic phase. Evidence from sites in East Lothian, includes Fishers Road, where bread, club and emmer wheat as well as oats and barley were indicated by the plant macrofossil assemblage (Miller *et al.* 2000). Several sites along the A1, including Phantassie, indicate cultivation of barley and wheat (Lelong and MacGregor 2008: 145, 157, 171 & 175). In the Later Iron Age phases excavated during the Traprain Law Environs Project, barley is present, along with emmer and spelt, with indications of local production, given the presence of chaff (Huntley and O'Brien 2009). An assessment by this author of presence and absence of cereal macrofossils at excavated sites in Perthshire and Stirlingshire indicated the presence of barley, wheat and oats, with barley the most common, and oats the least common, in both areas (Davies 2006: 95-109). While Iron Age people were largely cultivating barley, as seems to be the case all over later prehistoric Scotland north of the Forth, there is some evidence for wheat growing from several sites in the Forth Valley. This included wheat from Myrehead; emmer, club and bread wheat from the destruction layers at Fairy Knowe, Buchlyvie; and emmer and spelt wheat from the roundhouse floor and the fill of an oval cist at East Coldoch. There is also evidence that oats were being grown from Lower Greenyards, Bannockburn, Fairy Knowe, Buchlyvie, and East Coldoch, as well as Badyo in Perthshire. The idea that the northern limit for wheat growing may be in the central belt, however, is belied by the discovery of emmer and spelt wheat at the Early Iron Age crannog site at Oakbank, Loch Tay (Miller 2002: 35). While it is possible that this was imported, it is also possible that the cereal was more widespread than has previously been assumed. A reassessment, however, will have to wait for the retrieval of a larger corpus of palaeoenvironmental data. All the evidence points to a mixed agrarian economy with exploitation of wild plant and game resources where it was deemed appropriate.

Most of the excavated Iron Age sites in the area were domestic, with a minority yielding one or more quern-stones. In a study covering excavated later prehistoric sites in Perthshire and Stirlingshire,

rotary querns were present at slightly more sites than were saddle querns, but there is no obvious chronological correlation (Davies 2006; *pace* Caulfield 1978). Many of these had been reused as post-packing, paving or walling, so their absence from many sites need not imply that they were not widely used. Other coarse stone tools may have had culinary uses, although their exact purpose is impossible to pinpoint and their flexibility may have been their strength.

A thorough analysis of existing data has demonstrated that it is possible to characterise the later prehistoric and Roman environment at the time of construction of the Antonine Wall, and identify periods of major change within it. It has also proved possible to characterise the later prehistoric economy, and populate the landscape with domestic and wild animals, drawing on the evidence from palynological analysis and excavated plant macrofossil and bone assemblages. It is only through reviewing the evidence in this way and properly integrating it with other aspects of material culture and society that a comprehensive understanding of the landscape and environment at the time of the Roman occupation can be developed. An agrarian sociology, as suggested by Haselgrove *et al.* (2001), is perhaps not an unattainable goal.

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4. The impact of the Antonine Wall on Iron Age society

Lesley Macinnes

Introduction

The Berlin Wall was erected more or less overnight and divided a country for almost 30 years with its imposing system of barriers and watchtowers, patrolled by military garrisons. Movement was limited to heavily guarded checkpoints and anyone trying to cross elsewhere risked being shot by the military guard, as many were. There are eyewitness accounts of the impact of the Berlin Wall on the people whose lives were affected by it, including families split apart. These show how traumatic an experience it was and how helpless those caught up in the impact of its construction felt. There are recordings, too, of the relief and joy as occupying forces left and friends and families were reunited when the Wall fell after a generation and was eventually dismantled, aided by those who had been directly affected by it (Taylor 1989).

There are, of course, no equivalent eyewitness accounts of the impact of the construction of the Antonine Wall. It did not appear quite so quickly, nor last quite as long, but its impact must have been similar, with the local population subject to levels of military control and personal restrictions that were not there before, or at least not so overtly, as occasional literary sources testify (Breeze 2011a: 30-33). The Roman army was, of course, already known to tribes in Scotland after the military campaigns of the late 1st and early 2nd centuries AD, but there must have been at least some sense of detachment from direct occupation when the provincial frontier was settled further south across the Tyne-Solway isthmus with the creation of Hadrian's Wall in AD 122. So when the decision was taken to move the frontier north to the Forth-Clyde isthmus around AD 142 after a change of emperor, it must have come as something of a shock to the local inhabitants.

The primary purpose of Roman military frontiers was security (Breeze 2011a: 205), but they were surely designed to shock and awe as well as to deter and control. With its complex and daunting series of ditches, banks, roads and forts, the Antonine Wall created an impenetrable barrier to stop free movement and replace it with a regulated system of control (Breeze 2006b: 72). It is clear from recent research that some of the stonework within the Wall - the Distance Stones that recorded its construction - was painted, reminding us that it was not the relatively uniform, even benign, monument that survives today, but rather an in-your-face statement of imperial power that could not be ignored (Campbell 2018; Campbell, this volume). Among the scenes depicted on the Stones were images of defeated warriors, perhaps serving as a warning or as a reminder of the might of Rome and the futility of resistance (Hanson and Maxwell 1986: 113; Breeze and Ferris 2016). Moreover, as one the most densely garrisoned of any of the Roman frontiers, it must also have seemed noisy and alien as well as obtrusive, crawling with soldiers who no doubt looked exotic, and possibly sounded so as well since recruits could be drawn from across the Empire (Breeze 2006a: 39).

This intrusion must have severely disrupted the lives of those in the vicinity. The Wall ran right across the landscape of central Scotland, and probably bisected tribal lands. It must have led to some loss of homes, possessions, livelihoods, and even lives. It would be surprising if there was no resistance to it, however futile that may ultimately have been. And there must surely have been huge relief when the Wall was abandoned after a generation. The question is whether the impact the Antonine Wall had on local society can be detected archaeologically or deduced from other evidence, including historical sources. The aim of this short paper is to review this issue.

Pre-Antonine contact

The Antonine Wall was not the local population's first encounter with the Roman world. By the time it was constructed in the mid-2nd century AD, the Roman province had been established for over 100 years, and the military had undertaken campaigns in Scotland for around 70 years (Hanson and Maxwell 1986: 33-47). Over that period numerous forts, marching camps and other military installations had been built, representing several seasons of campaigning across Scotland over the late 1st and early 2nd centuries AD, and involving many thousands of military personnel as well as circumnavigation of the island by the Roman fleet (Tacitus *Agricola* 35, 38; Hanson 1991: chs. 5-6). Moreover, before Hadrian's Wall was established as the physical frontier of the province from AD 122, the limits of Roman expansion had been marked, at least temporarily, in Scotland itself by the Flavian series of installations along the Gask Ridge in Perthshire (Breeze 2006b: 59). This line lay to the north of the Forth-Clyde isthmus where the Antonine Wall was later built and did not delimit the edge of the Roman presence which continued further north, as far as the Howe of the Mearns. Consequently by the time the Antonine Wall was created the inhabitants of Scotland had already felt the effects of Roman occupation and expansion, and the Roman army had become familiar with the indigenous tribes.

Moreover, it seems likely that the inhabitants of central Scotland were familiar with the Roman world even before the occupation. In the immediate pre-Roman period the adoption of La Tène styles of metalwork in Scotland suggests links with the wider world, especially Celtic Europe and the Mediterranean, including weaponry and horse gear, as well as personal ornaments such as torcs (Armit 2016: 95-99). Similarly there are hints in the literary sources of early social interaction between local tribes and the world of Rome, with a reference to the Orkneys submitting to Claudius in AD 43 (Eutropius 7.13.2; Fitzpatrick 1989) and in Tacitus' allusion to an Irish minor king sheltering with Agricola's army in southern Scotland in AD 81 (Tacitus *Agricola* 24). While the precise nature of such contact prior to the occupation of north Britain is not at all clear (Erdrich *et al.* 2000: 451), it is perhaps reasonable to assume that the nobility of the tribes of mainland Scotland had some early encounters of their own with the Roman world (see Armit 2016: 127-135).

Direct contact between the Roman forces and local inhabitants in the late 1st and early 2nd centuries AD is confirmed archaeologically by the recovery of Roman material from local settlements, though it is difficult to date assemblages accurately as it is not clear how long such items remained in circulation before deposition (Campbell 2015; Hunter 2007a: 19). Pottery is the most common artefact type, particularly samian, with relatively small amounts of coarseware, possibly indicating that the locals used the pottery more for dining than for cooking. Glassware is also found in the form of cups and bowls, as well as beads, all in small quantities. The vast majority of these finds are located in southern Scotland, with only a smattering further north (Robertson 1970: 203; Macinnes 1989: 110). Most site

assemblages are small, with larger collections unusual and generally associated with distinctive types of site (Macinnes 1984: 241; Hunter 2001: 294-6).

This pattern suggests that the exchange mechanism is likely to have been through the local elite rather than more widespread contact between the Roman army and the local population. This process may have involved the payment of tribute, but there must also have been some degree of exchange or gift-giving to enable Roman material to reach local sites (Breeze 2006b: 120-5). Analysis of the material found on indigenous settlements suggests that there was a deliberate selection of goods that resonated with local social customs, for example relating to feasting or personal ornamentation, rather than merely a collection of exotic trinkets (Ingemark 2014; Campbell 2015), and that this selection seems to have varied to some extent across the country, perhaps indicating different preferences between tribal groups (Hunter 2001: 298-304). However, the limited spread of material suggests that there was no general access to Roman provincial markets *per se* and it seems likely that contact was limited primarily to the periods when Roman forces were in occupation and that consequently they were the main focus of contact (Macinnes 1989: 114; Erdrich *et al* 2000: 452-4).

One significant exception to this general pattern is Traprain Law in East Lothian, which seems to have obtained a greater quantity and range of Roman goods than other settlements throughout the Roman period (Robertson 1970: 200; Hunter 2009: 228; Campbell 2012: 20-21). The richness of its material is generally assumed to indicate that the tribe to which it belonged, most likely the Votadini, enjoyed a favoured, possibly client, status with the Roman province. Such status is, of course, attested elsewhere in Britain, most notably in the territory of the Brigantes and the Iceni (Todd 2004a: 48-9; 56-7), so it should be no surprise to find it in the northern frontier zone where it would provide an added measure of security both to the army on campaign and to the province itself.

It has been argued that the distribution of Roman military sites and of Roman material on local sites demonstrates that the Romans interacted with different tribes in different ways (Hunter 2001: 298). Thus the quantity of Roman material found on Traprain Law and the lack of Roman forts in the Lothians could, indeed, be indicative of friendly relations between Rome and the Votadini. In contrast, a neighbouring centre to the south, Eildon Hill North, has often been considered to have had a more hostile relationship with Rome, as there is a Roman watchtower on its summit and a long-lived military complex close by at Newstead. In fact, though, neither the geographical attribution of tribal names nor the association of local centres with local tribes is at all certain (Mann and Breeze 1987). The presence and date of the Roman material from Eildon Hill North instead indicates that the site continued to be used despite the close Roman presence, even though the nature of its use may have changed (Owen 1992: 69-72), a situation also noted in the complex occupation sequence at Broxmouth hillfort in East Lothian (Armit and McKenzie 2013: 494-9).

Interpretation of the significance of Roman material on local settlements and the disposition of military sites is not at all clear-cut. Alternative views hold that Roman forts were placed at strategic points irrespective of the attitude of the local population (Breeze 2006b: 104), that the army was willing and able to impose Roman rule with or without local support, and that not all local tribes were necessarily interested in obtaining Roman goods (Campbell 2015: 183). It is also clear that there was some serious opposition to Roman rule, as attested by Tacitus in his account of the battle of Mons Graupius, where a confederation of tribes faced the Roman army in pitched battle (Hanson 1991: 137-9). Although the precise location of the

battle is not known, it is likely to have been in northern Scotland, probably in Aberdeenshire (Breeze 2006b: 47). Yet Roman goods have also been found on native settlements in the north of Scotland, underlining the likelihood that the reality of interaction was complex, and probably highly dynamic.

Despite the victory at Mons Graupius around AD 83, pre-Antonine Roman occupation of Scotland was not permanent. Following the Agricolan campaigns, Roman forces seem to have retracted to a line just north of the Cheviots, abandoning direct occupation of much of the country. In the early 2nd century AD this line was moved further south to the Tyne-Solway isthmus where Hadrian's Wall was later built (Breeze 2006b: 102-5). It is difficult to identify certain archaeological evidence of 2nd century but pre-Antonine date on local sites, and in any case such precise dating on the basis of Roman artefacts from indigenous settlements is fraught with difficulty (Hunter 2009; Campbell 2015). Nevertheless, given its proximity to the new frontier of Hadrian's Wall to the south, it is possible that southern Scotland formed part of a wider frontier zone, potentially acting as a buffer between the Roman province to the south and the various tribal territories to the north. This was broadly the situation into which the Antonine Wall was introduced in the mid-2nd century AD.

Understanding the impact of the Antonine Wall

The decision to move the frontier from the Tyne-Solway line to the Forth-Clyde isthmus is generally agreed to have been political, to give the new emperor, Antoninus Pius, some military credibility, as well as to emulate the frontier constructed by his predecessor (Hanson and Maxwell 1986: 59-61). As shown above, the Antonine Wall was not constructed in a vacuum, but rather emerged after a complex relationship between Roman occupying forces and the indigenous population over several generations. Although the area to the south of the Forth-Clyde isthmus may have remained part of the frontier zone with some measure of military control, there must nevertheless have been at least an element of shock when the actual frontier was moved north and a linear barrier was created across the country, perhaps crossing tribal territories and certainly restricting movement. As it ran the full width of the country across the isthmus, it must have interfered with local activities at some point and presumably impacted on existing social relations and trade networks north and south of its line. A series of coin issues of AD 142-4 celebrates the emperor's victory in moving the frontier north (Figure 2.12), but there is seldom much consideration given to whether the decision to move the frontier was based on actual need for military action because of unrest in the frontier zone. There are no literary references to indicate that this was the case, while the depiction of defeated warriors on some of the Distance Stones (e.g. Figures 8.3 and 8.7) may simply be stylised motifs. Nevertheless, there are documented incidents of hostile action against Hadrian's Wall, so it is perhaps possible that there was some unrest further north that led to, or justified, a campaign by the new emperor (Hanson and Maxwell 1986: 61-2). In any event, whether or not there was existing hostility to Roman rule, it seems likely that some would have been created by moving the frontier north to its new line. While it is difficult to demonstrate the nature of any impacts archaeologically, whether positive or negative, the following sections consider the broad picture in central Scotland as it is currently understood.

Tribal groups in central Scotland

It is thought that many of the places mentioned in Ptolemy's Geography, dated to the mid-2nd century AD, locate Roman military sites and natural features rather than native sites, but the source also

includes the names of tribes in whose lands these places are located, as well as additional tribal names (Rivet and Smith 1979: 123-30; Mann and Breeze 1987: 87). For central Scotland where the Antonine Wall was located, the tribal names known from Ptolemy's map appear to be the Damnonii on the west side, stretching across the Forth-Clyde isthmus from Ayrshire and Renfrewshire and possibly into Stirlingshire and southern Perthshire; and the Votadini on the east running from Northumberland to the Lothians (Rivet and Smith 1979: 139-40; Mann and Breeze 1987: 88).

It is, of course, necessary to take care with the classical sources. Ptolemy's Geography is famously inaccurate in mapping Scotland 90 degrees out of place, while other sources, including Tacitus' *Agricola*, were often more concerned with eulogy than historical accuracy (Breeze 1982: 28-32; Hanson 1991: 13-32). Literary device is also known to have played a role, with some stock phrases and generalisations belying local reality: for instance, the description of the forest of Caledon covering much of northern Scotland is similar to descriptions of forests elsewhere in the empire and has been effectively debunked as myth (Breeze 1992). Nonetheless, if, as seems likely, much of the recorded detail came through the military and naval reconnaissance carried out during the early Roman contact with Scotland itself, it is possible that the recorded tribes have some basis in reality. In this context it is interesting that Ptolemy's map shows many more tribal names north of the Forth-Clyde isthmus than to the south. It seems unlikely that more detailed information would be known for the territories that were not under direct Roman control than for those closer to the province itself. Consequently it is conceivable that the recorded tribal names could indeed reflect the broad dispositions of tribal lands.

It has been suggested that the nature of the recorded tribal names may indicate cultural distinctions within Scotland (Armit 2016: 92). One basis for this is that tribal names to the north appear less Celtic in origin than those further south, while the use of animal names is restricted to the northern tribes, perhaps reflecting a cultural difference between north and south. There is some broad support for this in the material culture, with substantive differences apparent in regional metalworking traditions in the late pre-Roman Iron Age between northern and southern Scotland (Hunter 2007b: 290). In addition, it has been argued that the fewer tribal names to the south might mask a more complex reality by giving centre stage to the predominant tribal groupings. If this was the case, there may have been a greater cohesion among tribal groupings in southern Scotland than further north where there is a far greater proliferation of names. Large tribal areas are known further south, with the Brigantes, for example, apparently occupying an extensive area that spanned both sides of the Tyne-Solway isthmus (Mann and Breeze 1987: 89; Mercer 2018: 202), while the Votadini may have spanned the full length of south-eastern Scotland.

Even though there are discernible differences between northern and southern Scotland in tribal names and in material culture, it is still not clear to what extent the Forth-Clyde isthmus itself represented a cultural boundary. Some scholars have suggested that the tribal names are generalisations, citing similarities between those in Scotland and those elsewhere in Britain, and have further postulated that there may be at least one tribal name missing from Ptolemy's list (Mann and Breeze 1987: 89). One potential consequence of this scenario is that the territory of the Damnonii did not run across the Forth-Clyde isthmus at all and that the isthmus may indeed have formed a tribal boundary. However, one supporting argument for this suggestion, namely that the central zone was largely devoid of population, is difficult to sustain (below).

Settlement and society

Like Hadrian's Wall, the Antonine Wall used the local topography to give it vantage points looking north across the major river valleys of the Kelvin and Carron to the hills beyond, and these were presumably factors in site selection (Poulter 2009). In choosing this line for military advantage, it is unlikely that any consideration would have been given to ameliorating the impact on tribal lands or local settlements. Indeed, it has been suggested that the existing population could have been cleared out of the military zone when Hadrian's Wall was constructed (Breeze 2019: 130) and if this is true, then the same would surely also have happened in advance of the construction of the Antonine Wall, with any population within the area chosen for military use being forcibly evicted. It has also been postulated that the Antonine Wall was constructed in an area unsuitable for settlement because of the boggy terrain immediately to the north (Breeze 1985: 225-6). It has similarly been argued that the area immediately beyond the Upper German Limes was also devoid of settlement (Sommer 2015: 51). The environmental evidence, however, would suggest that in Scotland this is true only locally, if at all (Tipping and Tisdall 2005: 447 and 462; see also Davies, this volume), a conclusion potentially supported by the limited archaeological evidence.

A review of the archaeological record in Canmore (canmore.org.uk) and on Pastmap (pastmap.org.uk) indicates numerous sites of potential prehistoric date within the Antonine Wall corridor, both north and south of the Wall line and along its full length. These include several undated but probable later prehistoric sites, such as hillforts at Easter Auchincloch, Bowden, Cockleroy, Meikle Reive, Myot Hill, Sheep Hill, and Wester Carmuirs; and enclosures at Bankhead, Bohard House, Lathallan, Middle Kettlehill, Stacks, Ritchieston and Temple of Boclair. While it is not known how many of these may have been occupied at the time of the construction of the Wall, as few sites can be so precisely dated, they nevertheless serve to indicate that the general area had long been settled. Furthermore, the limited investigations that have taken place suggest that at least some may indeed have been in use during the Roman period. Sites that have produced Roman pottery of 1st century AD date include Braehead enclosure near Glasgow (Ellis 2007: 220-21), while the enclosed settlement with its two-phase round house at Camelon near Falkirk has produced pottery, metalwork and glass of predominantly early 2nd century AD date (Proudfoot 1978: 123-25). In addition two crannogs in the Clyde, Erskine and Dumbuck, have yielded carbon-14 dates that span the immediate pre-Roman period into the 2nd century AD (Hanson forthcoming c). Moreover, there is even evidence of indigenous settlement within the military zone itself, where an unexcavated hillfort, Castle Hill, sits beside the Roman fort at Bar Hill, while a late prehistoric palisaded enclosure was found during excavation outside the fort at Croy Hill (Hanson forthcoming b). It seems clear, therefore, that the Wall was built in a zone of existing settlement, a conclusion that is supported by the environmental evidence for prehistoric use of the area (Tipping and Tisdall 2005). It is less clear on current evidence how these sites relate to the Antonine Wall, and it is certainly possible that at least some were either abandoned or cleared before, or at the time of, its construction. There is evidence elsewhere, however, of settlements co-existing with Roman military sites, most famously at Eildon Hill North, as noted above, but also close to the Antonine Wall itself at Camelon where the second phase of an Iron Age roundhouse overlay a probable Roman feature (Proudfoot 1978: 122).

Recent investigations in the Forth Valley suggest that the local settlement pattern in the wider area was complex and varied. Moreover, the presence or absence of Roman finds on individual sites indicates

that this complexity also applied to their relationship with the occupying forces (Cook *et al.* 2019: 96). Here, only slightly north of the Wall corridor, a range of sites have produced 2nd century AD Roman material (Cook *et al.* 2019: 92), with some of definite Antonine date found in the broch at Leckie (MacKie 2016: 81-88). A similar picture has been argued for the area immediately south of the Wall, most likely within the territory of the Damnonii themselves (Wilson 1997: 10-14). Together this emphasises the likelihood that some settlements in the general vicinity of the Antonine Wall were not only occupied but also had access to Roman goods at the time of the Wall's construction.

This localised picture seems to correspond broadly with that across Scotland as a whole. Roman artefacts of Antonine date have a broader spread than those of earlier date, and occur on a wider range of site types (Robertson 1970: 206; Macinnes 1989; Hunter 2001: 294-8). Samian is fairly widespread, though still in small quantities, with some sherds also being reused for other purposes. More coarseware has been found for this period, including in north-west Scotland where it may have been used for cooking. Similarly, there is more glass and bronze than previously, but mostly in southern and eastern Scotland. Sites with large 1st century AD assemblages usually have 2nd century material as well, but the largest known concentration is again at Traprain Law (Hunter 2009). The nature of the material of this period suggests that there were more personal items, with a wider distribution among the local population, in contrast to the earlier focus on fine wares that may have been used in conspicuous consumption by local elites. But although material is more widely found, there are still a few notable concentrations that could indicate some continued favouring of local elites and/or specific tribes, especially the Votadini in view of the assemblage at Traprain Law, and in architecturally elaborate structures (Macinnes 1984).

Some items recovered from local settlements indicate, as before, the probability of two-way exchange between Roman soldiers and the native population. There is evidence for the production of Roman style dress-fasteners and glass beads on Traprain Law (Hunter 2009: 234), and for locally derived goods on military sites like Newstead (Hunter 2007b: 292-3). Even though Scotland was never fully assimilated into the Roman province or its economy, at least some sections of society appear to have responded to Roman presence with interaction rather than hostility, and made use of Roman material in ways that suited their own customs rather than adopting new Roman ways along with the material culture (Campbell 2015). The greater amounts of material in southern Scotland may simply reflect its closer physical relationship to the Roman province, but could also underline its potential role as a buffer zone between the province proper to the south and the tribes further north whose hostility to Roman rule is periodically attested in literary sources and through coin hoards (Breeze 2006b: 20-22; Hunter 2007a: 23-27).

In the short time that the Antonine Wall was in use, no more than 20 years, some *vici* had become established along or close to its line (Hanson, this volume). Not only does this suggest a level of peace and security, but these could also have played a role in the exchange process during the Antonine period. The exceptionally rich assemblage from Traprain Law raises the possibility that the Votadini continued to enjoy favoured or client kingdom status during the Antonine period despite the close proximity of the large supply base and *vicus* at Inveresk (Hanson 2003: 202). It is even possible that Traprain Law played a comparable role to the *vici*, but the precise nature of its use in this period, though clearly complex, is not certain (Erdrich *et al* 2000: 452-3).

This evidence, though scant for the isthmus itself, would suggest that the area in which the Antonine Wall was built had an established settlement history, and that some elements of society at least obtained Roman goods during the Antonine occupation. It is possible that any settlement within the Wall corridor would have been abandoned or its occupants forcibly evicted, but the evidence also suggests that this was probably quite a localised occurrence, and some sites within reach of the Wall certainly remained occupied.

It is still not clear whether or not the isthmus formed a cultural and social boundary. In addition to the possible tribal divisions discussed earlier, regional distinctiveness has been noted in the nature of the predominant settlement types, artefact styles and metalworking traditions in the areas broadly north and south of the Forth-Clyde isthmus (Armit 2016: 128-35; Hunter 2007b). Differences have similarly been noted in the different types of Roman material preferred by local settlements in different parts of the country (Hunter 2001: 298). However, as yet, the isthmus itself does not stand out as a clear dividing line within these broad distributions. The available evidence certainly suggests, though, that the Antonine Wall was erected within a complex and diverse social situation, and it seems most likely that it would have had an adverse impact on some settlements, while others thrived in its shadow.

Impact on the local landscape

Even if some elements of local society accepted the Roman presence and made use of it to bolster their own position, as we know occurred elsewhere, it is equally likely that others were less willing to accept the demands associated with occupation. In addition to taxation, the requirements of the occupying force must have been significant and the demand for food, fodder, stock, timber, water, military recruits and slaves are all documented consequences of invasion and occupation (Hanson 2003: 203-6). There is evidence of woodland and grassland in the general area, while signs of cultivation around some of the Wall forts may well be broadly contemporary, suggesting that at least some necessary resources could have been grown locally (Hanson 2003: 208; Tipping and Tisdall 2005: 460; Dickson and Dickson 2016: 270-72). Recent assessments have proposed that some settlements further south began to focus on stock rearing to supply the army with meat, leather products and ponies (Mercer 2018: 204-18), a situation also suggested in relation to settlements north of Hadrian's Wall (Breeze 2019: 131-7), though there is no clear evidence for this as yet around the Antonine Wall itself (Tipping and Tisdall 2005: 462). The evidence from Bearsden Roman fort also indicates a range of imported foodstuffs which would have required a secure supply chain: some elements of this are known at, for example, Inveresk, and it may be that there were harbours closer to the Wall itself (Hanson and Maxwell 1986: 190-1).

While the pre-Roman indigenous society of central and southern Scotland was not a monetary economy, there is ample evidence for the organised use of the landscape and exploitation of natural resources. Furthermore, the nature of its architecture, artefacts and exchange networks suggest that it was by no means a backwater, but rather a flourishing part of the Celtic world. The local population had long exploited timber resources for fuel and as building material, cultivated and structured their landscape, and hunted and reared stock for food. All in all there appears to have been a reasonable settled society producing both architectural sophistication and agricultural surplus, at least in some areas (Hingley 1992; Armit 2016: 78-81; Davies, this volume). For example, the souterrain settlements of Angus and Perthshire are suggestive of large-scale storage within predominantly unenclosed settlements, indicative of social order and production surplus. Similarly the material culture assemblage, scale and

setting of Traprain Law might suggest a centre of production at the hub of a settled landscape; as may the nearby pit alignments in the plains of East Lothian (Haselgrove 2009: 230-2). While it is by no means certain that such evidence means that the substantial requirements of the occupying or campaigning forces could be absorbed with complete ease, there is at present no compelling reason to argue that the environment was under severe stress (Tipping and Tisdall 2005: 462). The additional impact of Roman occupation may have been substantial, but it seems not to have been catastrophic (Hanson 2004: 150-1).

Again it is not entirely clear how this general picture relates to the Wall zone itself. As previously noted, it is possible that the occupation of indigenous sites close to the Wall itself was forcibly brought to an end to allow it to be constructed. However, it is also clear that some settlements nearby continued to be occupied and the presence of the military must have had some impact on them. The settlements considered to be producing a surplus generally lie to the east, where the best agricultural land is found, not around the Forth-Clyde isthmus itself, and it is possible that settlements on less fertile soils could have struggled more to meet the requirements of the heavy military occupation along the Wall. If the territory of the Damnonii extended into southern Perthshire, however, they may have been supported by access to the more fertile soils found there. The evidence, albeit limited, for cultivation beneath some Roman forts in the area (for example at Camelon just to the north of the Wall and at Cramond at the south-eastern end of the Wall zone), indicates that the growth of crops had taken place in the vicinity prior to the construction of those forts (Tipping and Tisdall 2005: 460). The suggestion that local settlements in south-west Scotland moved towards a greater emphasis on stock-rearing to furnish the military demands for cattle products and ponies (Mercer 2018: 204-218) is a possibility that presumably also exists for the pasture-lands around the Antonine Wall, though there is currently no known archaeological evidence for the stock corralling enclosures such as those identified in the south-west. On the whole, the evidence from military sites supports the idea that some requirements were met locally while others were imported (Hanson 2003: 207-212) and it seems likely that this was the case during the occupation of the Antonine Wall (Dickson and Dickson 2016: 272).

Overall, though it is almost impossible to demonstrate precise cause and effect archaeologically, it seems that indigenous society in the vicinity of the Antonine Wall was on the whole able to withstand the impacts of the Roman occupation. Some settlements in its wider shadow appear to have successfully interacted with the military and thrived (Cook *et al* 2019), while others may either failed to do so or may even have made the conscious choice not to engage with the occupying force (Campbell 2015).

Pax Romana?

There is evidence, then, for a degree of peaceful interaction between the Roman forces and the local population during the Antonine period. There was certainly enough stability during the duration of the Wall's occupation for *vici* to develop and even thrive; the nearby *vicus* at Inveresk was significant enough to be visited by the Imperial procurator (Hanson and Maxwell 1986: 191), surely a sign of relative peace and security. There are traces, too, of cultivation around some of these civilian settlements, also indicative of a degree of stability (Hanson, this volume). Evidence suggests that some indigenous settlements thrived by providing produce or other goods for the, presumably local, Roman markets, and it has been postulated that when these markets ended, with the Antonine withdrawal from Scotland, there was a significant shift in local social structures that led to some settlements

collapsing or being deliberately closed (Cook *et al* 2019: 96; Armit 1999: 593-4; but see also Davies 2007: 276-8). Whether this was a natural progression, the result of local hostility, linked to Roman activity or some combination of these is less clear (Hanson 2004: 148).

At the same time there is also potential evidence for unrest and resistance in response to the Roman presence. References to warfare in Britain certainly suggest that not all tribes north of the Tyne-Solway line enjoyed a peaceful acceptance of Roman rule, despite their heavy defeat at Mons Graupius (Hanson 2004: 139; Breeze 2006b: 105). It is even possible, though far from certain, that some of the changes made in the course of construction of the Antonine Wall could relate to hostile reaction to the creation of the new frontier (Hanson forthcoming a).

Hanson argues that there was a major change of plan during the building of the Wall that resulted in a significant addition to the number of Wall forts. He suggests that this increase in the garrison may have been in direct response to hostile action from the local population, and considers that the evidence of destruction at Leckie broch, a short distance to the north of the Wall, may have been part of the Roman reaction, as a ballista bolt was found in the destruction layer of the broch (MacKie 2016: 15; Hanson forthcoming a). This could potentially be direct evidence of Roman destruction of a native high-status settlement, supporting the case both for tribal hostility and for military retaliation at the time the Antonine Wall was being built. Local rebellion, as noted above, would be an entirely understandable response to the erection of a physical barrier that restricted free movement. However Hanson's interpretation of the evidence is not universally favoured. Other scholars argue that the Wall was constructed as originally conceived, with any alterations occurring in a planned way as part of the construction process rather than in response to any conflict (Graafstal *et al* 2015; Graafstal, this volume). Nor do they accept that the destruction of Leckie occurred at this time as it seems to have continued in occupation during the Antonine period, given the presence of Antonine pottery in the post-broch round-house (MacKie 2016: 86). However, there is also evidence for destruction later on at least one Roman fort, Birrens in south-west Scotland, which could potentially have a hostile rather than accidental cause (Robertson 1970: 201), so neither interpretation is clear-cut.

There are some additional indications of potential unrest. The large number of Roman forts and fortlets in south-west Scotland might imply that the tribes there were troublesome, and there is a current and contentious debate about whether or not one of its prominent centres, Burnswark Hill, was the site of a military siege, an undoubted indicator of conflict. Once again, though, this interpretation is not universally accepted, as excavation has suggested that the defences around the site were no longer standing by the time of the Roman presence, making it more likely that it could have been taken by Roman forces quickly and easily without the need for a formal siege. An alternative explanation advanced for the evidence is that it may have been a military training ground (see Keppie 2009 and Breeze 2011b for alternative views). A recent reappraisal of the evidence, supported by small-scale excavations and experimental archaeology, makes a strong case for actual conflict and places this at the start of the Antonine advance into Scotland (Reid and Nicholson 2019). Whether that was in response to local hostility or a deliberate demonstration of military strength remains a moot point. On the other hand, Mercer's report on changing settlement patterns in the south-west points to the possibility that the tribes there made changes that accommodated the Roman need for cattle and ponies, perhaps implying a less hostile response to the occupying forces (Mercer 2018: 204-18).

In fact these various interpretations need not be mutually exclusive, but rather emphasise the potential complexity of interactions between Rome and indigenous societies, as well as the possibility that relations continued to develop even after acts of hostility and retribution had occurred; these could, after all, have been localised and short-lived incidents. In any event, the Antonine Wall became the provincial frontier and remained so for a generation. The presence of cultivation and civil settlement around at least some forts suggests that the local conditions were on the whole peaceful while the Wall was in use, with no clear evidence of sustained hostility during its occupation.

After the Wall

Although a withdrawal back to Hadrian's Wall presumably did not mean the end of Roman influence in Scotland, it has been noted above that the end of the military occupation of the Antonine Wall may have led to a shift in local social dynamics. It would hardly be surprising for the withdrawal of the occupying force to precipitate an internal power struggle and change of regime if some sectors of society had benefitted, or perhaps collaborated, more than others. In the short life-span of the Antonine Wall the existence of the frontier may not have become as integrated into local life as happened with the much longer-lived Hadrian's Wall, and its end may have been a source of joy for some and of hardship for others.

In post-Antonine Scotland there is evidence for a periodic rather than continuous relationship with Rome. Some settlements obtained later Roman material, mostly small-scale with the exception once again of Traprain Law, which might suggest that southern Scotland retained some importance as a buffer zone. At the same time there is both archaeological and literary evidence for conflict, particularly from the Caledonians and Maeatae to the north of the Antonine Wall (Cassius Dio 77; Rivet and Smith 1979: 404), while some hoards could well be tangible evidence for the gifts made or bribery given to help maintain peace (Robertson 1970: 210; Hunter 2007a: 23-32).

There is no evidence that the Antonine Wall continued to have any significance. The dismantling of some Roman forts suggests that the Romans took steps to avoid the Wall forts becoming useful for local tribes, but it is less clear that the Wall itself was slighted either by the Roman forces or by hostile tribal action. It does seem, however, that Roman dressed stone was reused in other contexts, as recorded in the now-lost souterrain at Shirva near the Wall fort of Auchendavy, which indicates that use was made of some of the resources embodied in the Wall and its associated structures without any continuation of their military function. Post-Antonine hostility seems to have been aimed at the continued physical presence of Roman forces on Hadrian's Wall rather than the abandoned Antonine Wall (see Breeze 2019: 95-6).

Once abandoned as a frontier the Antonine Wall presumably lost its relevance, much in the way the later Berlin Wall has also quickly faded into history. Yet its presence retained a strong impact in the subsequent history of the area, with later settlements, fortifications and communications networks making use of its line and place-names retaining a memory of its origins as a military site (Maldonado 2015). This is no doubt primarily due to the fact that it ran across the heartland of central Scotland, but we might imagine, perhaps fancifully, that it also reflects a hint of the time when a global power came and saw, but never fully conquered.

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5. Pre-Antonine coins from the Antonine Wall

Richard J. Brickstock

One of the constantly-recurring questions relating to the Antonine Wall is 'Was there a Flavian predecessor?', with perhaps the most detailed discussion to date by Hanson (1980). The numismatic evidence, with coin mint-dates providing a series of absolute *termini post quem*, provides an important and potentially crucial contribution to this debate.

A first glance at the fewer than 200 coins found along the line of the Antonine Wall might suggest that there was indeed an earlier period of occupation, since roughly 20% of the coinage is Flavian or earlier, much the same percentage as was minted in the reign of Antoninus Pius himself (with the remainder, nearly 60%, belonging to the reigns of Pius' two predecessors, Trajan and Hadrian). A second look, however, appears to suggest otherwise. In a recent paper (Brickstock forthcoming, employing a technique outlined in Brickstock 2017), I demonstrated, to my own satisfaction at least, that the circulation wear exhibited by the coins of all dates was, almost without exception, consistent with deposition in the period between *c.* AD 140 and the early 160s, i.e. almost exclusively within the reign of Antoninus Pius though extending into the very early years of his successor Marcus Aurelius, precisely the years in which the Antonine Wall is thought to have been occupied (Figure 5.1).

The most significant coin finds, to my mind, are those that are found in virtually unworn condition, since these are the coins that demonstrate, fairly unequivocally, contemporary or at least near-contemporary activity. On the Antonine Wall we have in this category a percentage of the coins minted in the reign of Pius, but no coins issued earlier than that, though a few coins of the last years of Hadrian (i.e. AD 134-38) appear only slightly worn. Coins earlier than that (together with some of the Antonine coins) without exception exhibit wear consistent with longer, sometimes much longer,

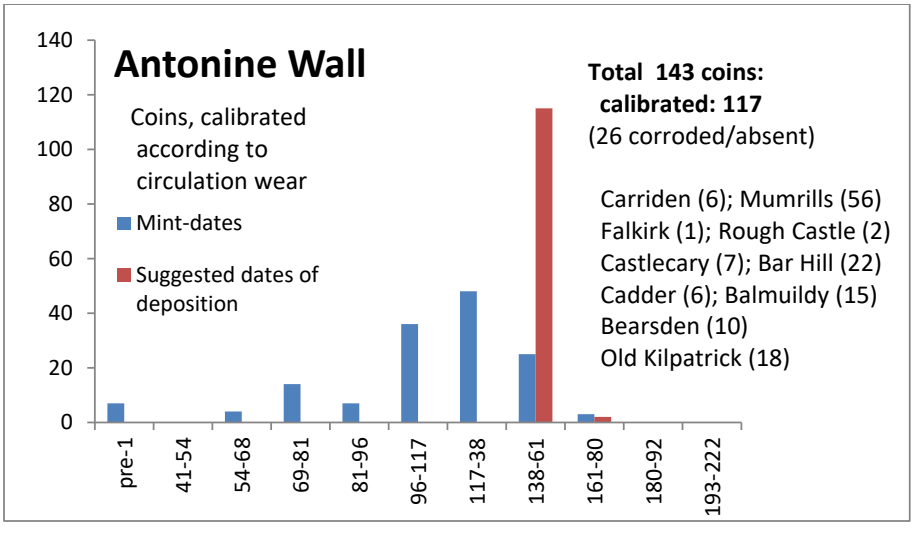

Figure 5.1. Coins from the Antonine Wall, with suggested dates of deposition based upon an assessment of circulation wear.

Figure 5.2. Examples of coins from the Antonine Wall: a. a very worn *denarius* of Vespasian from Carriden (AD 71; Brickstock forthcoming, coin no. 27); b. a worn *denarius* of Hadrian from Mumrills (AD 118; Brickstock forthcoming, coin no. 5); c. a virtually unworn *denarius* of Antoninus Pius from Mumrills (AD 140-43; Brickstock forthcoming, coin no. 14)

periods of circulation before deposition – and, as a general rule, the older the coin the more worn it appears (Figure 5.2).

For virtually unworn coins of earlier reigns than that of Pius in the vicinity of the Antonine Wall we can look to Camelon, on the western outskirts of Falkirk, some 1.2 km (0.75 miles) to the north of the Wall. Anne Robertson's catalogue of the 65 coins excavated there between 1975 and 1981 (Robertson forthcoming) includes, amongst 33 Flavian issues, two slightly-worn bronze issues of AD 77-78 and five unworn or slightly-worn bronze coins of AD 86 or 85-86. A further virtually-unworn coin of AD 86 was recovered in 1988 from the northern ditch of what appears to be another fort that pre-dates the nearby Antonine one (Figure 5.3; Brickstock forthcoming, coin no. 33).

Camelon, together with Mollins and Barochan and perhaps others beside (Hanson 1980; Breeze, 2006: 63) are thought to have been Agricolan foundations forming a line of garrison posts across the Forth-

Figure 5.3. A virtually unworn *dupondius* of Domitian as COS XII, AD 86 from Camelon (a. obverse; b. reverse)

Clyde isthmus, sixty years before the building of the Antonine Wall. Robertson also records a little-worn bronze coin, probably of AD 86, from Barochan (1983: 409).

On the basis of the coin evidence Robertston concluded that 'the Flavian occupation at Camelon lasted from a date in or after AD 77-8, until AD 86 at the earliest' and that 'after a probable interval of 50-55 years, there followed an Antonine occupation which lasted until at least AD 154-5' (forthcoming). There are, however, a couple of aspects of the coin assemblage that might cause us to modify these conclusions somewhat.

Since the publication of David Walker's highly influential study of the coinage of Roman Bath (1988), numismatists and archaeologists generally have been aware of a number of peaks in supply of coinage (and bronze coinage in particular) to Roman Britain in the first century AD, and have used them as significant staging posts in the dating of the sites. These peaks occurred in AD 64-67, 71-73, 77-78 and 86-87. A lesser peak is apparent for AD 95-96, at the very end of Domitian's reign, followed by a period of rather more regular supply but, as Walker pointed out 'the fact that a coin series ends with coins of 87 merely indicates that occupation probably ceased by about 96, not that it ended in 87 or 88' (1988: 287). I would add to this the observation that in the north, by which I mean sites north of the Humber, coins of AD 86 appear generally much more common than those of AD 87 (at Corbridge, for example, the ratio of AD 86 to 87 is 6:1): this might be argued to be an indication of an exceptional phase of activity in AD 86 in the militarized north, but it is perhaps rather more likely to be a function of coin supply to the north - in which case the presence or absence of issues of AD 87, especially from a small assemblage, should not automatically be taken as a reflection of occupation or abandonment of a particular site in AD 86 or 87 (contrary to the argument presented in Hobley 1989).

To return then to Camelon: the earliest little-worn coins are those of AD 77-78, which ought to place the foundation soon after that, *c.* AD 80, which would tie in very well with the policy of consolidation on the Forth-Clyde line that is outlined in Tacitus' account of Agricola's fourth campaign season (Tacitus, *Agricola* 23).

However, to muddy the waters somewhat, coins of AD 71-73 outnumber those of 77-78 in both lists by a ratio of more than three to one. This comparison is one of a number of numismatic criteria that can be used to recognise early Flavian sites (even though many of the coins may be worn and relate to later phases of occupation; see Table 5.1). I am not quite sure how to interpret this circumstance, but, given that other criteria are either not satisfied or only imperfectly so (Claudian copies, for instance, being entirely absent), the greater significance should probably be given to the observation that the earliest *little-worn* coinage is that of AD 77-78 rather than that of 71-73.

Beyond that, the little-worn coins of AD 86 attest occupation to at least that date; but coins of AD 87 are absent, both from the 1975-81 finds and from the fuller site list recorded by Richard Abdy (2002). According to one's take on my comments above, that should date the end of the Flavian phase of occupation of Camelon either to late AD 86/87 specifically or (my preference) to sometime in the decade between late AD 86 and 96.

The same argument can, of course, be applied to other sites, including, for instance, the uncompleted legionary fortress at Inchtuthil, where the small assemblage ends with six little-worn coins of AD 86. Having re-examined them twice in recent years, all appear to me to be unworn or virtually so,

The presence of some pre-Flavian coin, especially bronze, but also republican *denarii*
The presence of Claudian copies, driven from circulation early in the Flavian period
Flavian coins of AD 71-3 outnumbering those of AD 77-78
A predominance of lower denominations, especially *asses*, in the assemblage as a whole
The presence of some little-worn coin (SW/SW = slightly worn)

Table 5.1. Numismatic criteria for recognising early Flavian sites

consistent with abandonment of the fort in late AD 86/87, but the absence of coins of AD 87 should perhaps not be taken to be of absolute significance, which leaves open the possibility (though not, I think, the probability) of a slightly longer occupational phase.

Incidentally, Robertson alleges (forthcoming) that 'no undisputed examples of bronze coins of either of these two Flavian groups – Vespasianic of AD 71-3, or 77-8, minted in Gaul, and Domitianic of AD 86, or of AD 85-6, or later – have so far been recorded from sites on the Antonine Wall'. This is not quite true, since a *dupondius* of AD 86 was excavated from the southern end of the fort bathhouse at Balmuildy (Abdy 2002: 207, no. 3). That coin, however, is very worn (according to my classification) and thus almost certainly represents an Antonine deposit. Likewise, although the Antonine Wall assemblage has a 'tail' reaching back to the late republic (i.e. *denarii* of Mark Antony, which are commonly found on second- or even early-third-century sites), it does not really satisfy any of the criteria outlined above (Table 5.1): there are, unsurprisingly, no Claudian copies; later Flavian deposits outnumber earlier Flavian; higher denominations outnumber lower (e.g. some 20 *denarii* and *sestertii* from Mumrills as opposed to 14 *dupondii* and *asses*); and, as has already been noted, no little-worn first-century coinage at all.

Beyond the Flavian period, Robertson envisages abandonment of Camelon for half a century, prior to a second phase of occupation in the Antonine period. It seems to me, however, that there are strong grounds for suggesting that the first phase of occupation continued, albeit perhaps on a limited scale, until well into the second century. There are two reasons for suggesting this. Firstly, there are a small number of little-worn issues of later years, including both a *denarius* and a *sestertius* of Trajan, both dating to AD 103-11, which cannot belong to a Flavian phase and are unlikely to have survived in such unworn condition into the Antonine period. Secondly, there are a number of earlier issues which are sufficiently worn to suggest deposition in the reign of Trajan rather than that of Domitian, but hardly so worn that they are likely to be Antonine deposits. This can be illustrated using the same (admittedly subjective) technique of calibration according to circulation wear applied above to the coins from the Antonine Wall (Figure 5.4).

It will be observed that almost as many coins are assigned by this technique to the period AD 96-117 (the reigns of Nerva and Trajan) as to that of Domitian (AD 81-96), followed by a complete gap for the reign of Hadrian (AD 117-38). Without wanting to push the limits of the technique too far, it is perhaps possible to refine the level of detail a little further since, for the Trajanic period, most of the suggested deposition dates lie in the first decade of the second century rather than the second.

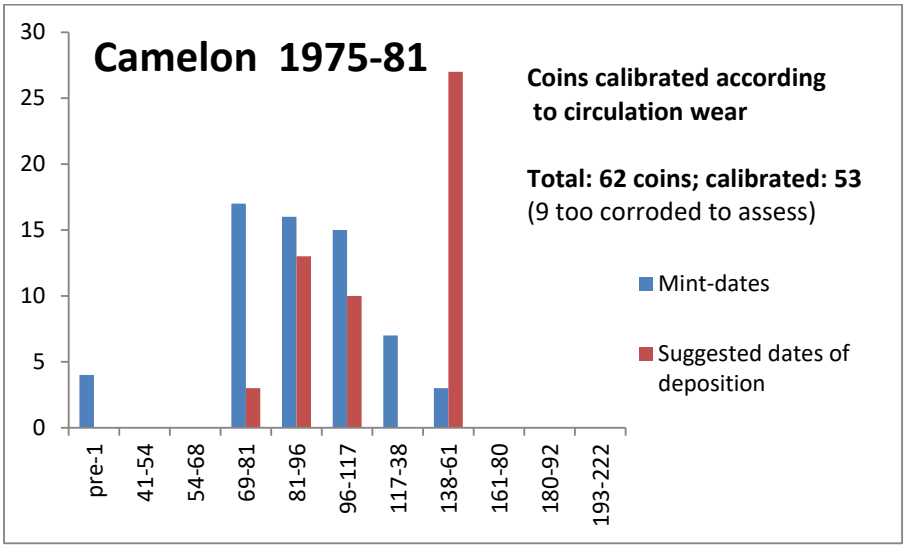

Figure 5.4. Bar graph of coins from Camelon 1975-81, with suggested dates of deposition based upon an assessment of circulation wear.

That circumstance, taken together with the little-worn coins of the same period, might allow one to postulate continued occupation, at least on a limited scale, until *c.* AD 110, followed by a complete break until *c.* AD 140, a gap of some three decades rather than Robertson's five. Conversely, however, in honesty it should be admitted that the limits of accuracy of the technique are such that, although there is certainly a gap in the Hadrianic period, a proportion (perhaps 20%) of the deposits assigned to the Antonine period could arguably be late Hadrianic (though, on balance, I think this unlikely).

Here a comparison with the site of Newstead, some 85 km (53 miles) to the south-east on Dere Street, is instructive, since it is another site where both Flavian and Antonine periods of occupation are attested. At Newstead, however, it is accepted (on wider archaeological grounds, not least the rebuilding of the fort in the late Flavian period) that occupation continued into the Trajanic period (Hanson 2012) – but there is currently no other evidence that this was the case at Camelon and the suggestion therefore represents a new departure.

The coin assemblage from Newstead has recently been discussed in detail (Holmes 2012) but a few further remarks may be permissible here, based on my recent re-examination of the coins with an eye to circulation wear (Figure 5.5). Here the picture suggested is of a primary, Flavian, phase but with some level of occupation continuing into the second century (again indicated both by suggested deposition dates and also, significantly, by several little-worn *denarii* of Trajan). As with Camelon, there would appear to have been a gap in deposition from sometime in the mid-late Trajanic period through to late in the reign of Hadrian or, more likely, early in the reign of Antonius Pius since, given the limitations of the technique, much of the peak for AD 117-38 that distinguishes the Newstead histogram from that of the Camelon could well belong not to the later years of Hadrian but to the early years of Pius.

Where Newstead differs from both Camelon and the Antonine Wall forts, however, is in its clear continuation through the reign of Marcus Aurelius and into the early 180s, with a very few coins also suggesting some continued presence in the Severan period (the latter, however, in all probability linked to Severus' Scottish campaigns rather than to any continuous occupation).

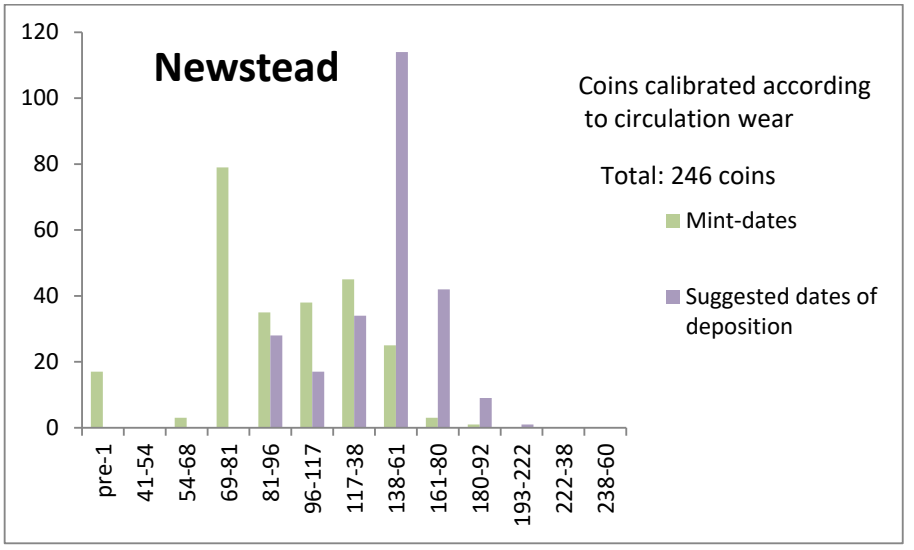

Figure 5.5. Bar graph of coins from Newstead, with suggested dates of deposition based upon an assessment of circulation wear.

From there we come back to the main point of this short paper, that is the realisation that although the coin profile of the Antonine Wall forts is superficially similar to both Camelon and Newstead from the late republic up to and including the reign of Pius himself, the pre-Antonine coinage of the Wall is all demonstrably residual in comparison to both Camelon and Newstead, for which we are able to demonstrate periods of earlier occupation or activity.

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6. Planning the Antonine Wall: an archaeometric reassessment of installation spacing

Nick Hannon, Lyn Wilson, Darrell J. Rohl

Introduction

In a previous paper analysing the Antonine Wall Distance Stones, the need to reassess the issue of spacing of the installations along the frontier was highlighted (Hannon *et al.* 2017). The primary reason necessitating this reassessment is the enhanced metric framework now available for the frontier's linear components derived from the recent LiDAR survey of the World Heritage Site commissioned by Historic Environment Scotland (Wilson *et al.* 2013); data which formed the basis of the first author's PhD thesis. These improved measurements for the first time accurately account for the changes in elevation encountered along the Wall's course, resulting in the measured length of the rampart increasing from 60.24 km to 62.03 km; an increase of 1.79 km (Hannon *et al.* forthcoming). It was argued that this three dimensional measurement approach reflected the techniques used by the Roman surveyors, who originally set out the frontier's installations, more closely than a two dimensional map-based approach could. The following paper serves two purposes: it will explicitly publish the three-dimensional distances between the known installations along the Antonine frontier and will also reconsider the issue of installation spacing.

In 1975 John Gillam hypothesised a model to describe the constructional sequence for the Antonine Wall (Gillam 1975). This model suggested that the Wall was originally planned to have six forts constructed at around eight Roman mile intervals (known as primary forts). Between the forts, fortlets were built, at intervals of around 1.1 miles, in a pattern similar to that observed with Hadrian's Wall's milecastles, which were usually built at one-mile intervals (Breeze 2006a: 64). Gillam further suggested that a change was enacted before this initial plan was completed, leading to the intervals between forts being reduced to around two miles (a fort spacing first proposed by Horsley 1732: 173) resulting in the addition of at least 11 forts to the frontier (known as secondary forts). At the time of Gillam's proposal the existence of four fortlets had been established, but renewed interest in the Wall generated by his hypothesis led to the discovery of additional fortlets at Seabegs Wood in 1977, Kinneil in 1978, Cleddans in 1979 (Keppie and Walker 1981), Croy Hill in 1977 (Goodburn 1978: 413-15) and Summerston in 1980 (Grew *et al* 1981: 32; Maxwell and Hanson, this volume). These discoveries added weight to Gillam's argument supporting the view that a chain of regularly spaced fortlets once existed between the Forth and Clyde, as the locations of these newly discovered fortlets fit within the model's framework. However, the newly discovered fortlets did not complete the proposed sequence, leaving around three-quarters of the hypothesised series still undiscovered.

A number of hypothetical reconstructions of the series, building on Gillam's work, have proposed specific locations for the frontier's missing fortlets (notably, Keppie and Walker 1981; Hanson and Maxwell 1986; Woolliscroft 1996). These reconstructions are similar in that they all use a two dimensional map based approach to establish the distances between the known fortlets and, thus, the positions of those

that are merely hypothesised. These models also struggle to fit the proposed fortlets neatly within a regular spatial pattern, requiring in a number of cases for the intervals to be lengthened or shortened to accommodate the proposed number of fortlets. Now that an enhanced metric framework is available for the frontier with an updated overall length, both Gillam's hypothesis and the fortlet models can be reassessed in order to test their validity. Two conclusions pertinent to the issue of the Wall's installation spacing were reached in the aforementioned analysis of the Distance Stones: firstly, that the standard of measurement referred to on the inscriptions was probably based on the *pes Drusianus* and, secondly, that the inscribed measurements anticipated or acknowledged the existence of not just the forts considered primary but also those deemed secondary (Hannon *et al.* 2017).

The decimal equivalent of a Roman mile is normally quoted as 1.48 km, however this oversimplifies the situation. While a Roman mile (*mille passus*) was always a thousand paces (*passus*) and a pace was five feet (*pedes*), the standard used for the Roman foot was variable. Analysis of Roman structures in Britain has shown that two standard Roman feet were used: the first was the *pes Monetalis,* which has a decimal conversion of 0.296 m and the second was the *pes Drusianus* with a decimal conversion of 0.332 m (Walthew 1978: 335). In the northwest of the empire on some occasions the contemporary use of both standards has been attested within the same fort, such as at Corbridge (Walthew 1981: 15). If a mile is calculated based upon 5000 *pedes Monetales*, we reach the commonly quoted 1.48 km. However, if this calculation is repeated with the *pes Drusianus*, a length of 1.66 km is achieved. Millett (1982) has raised valid concerns that in reality it is difficult to distinguish between these two standards on the ground, due to the subtle difference between each Roman foot. However, due to the Antonine Wall's considerable length, the differences between a system based on a mile derived from either the *pes Monetalis* or *pes Drusianus* would be exaggerated, and this larger scale makes identification of

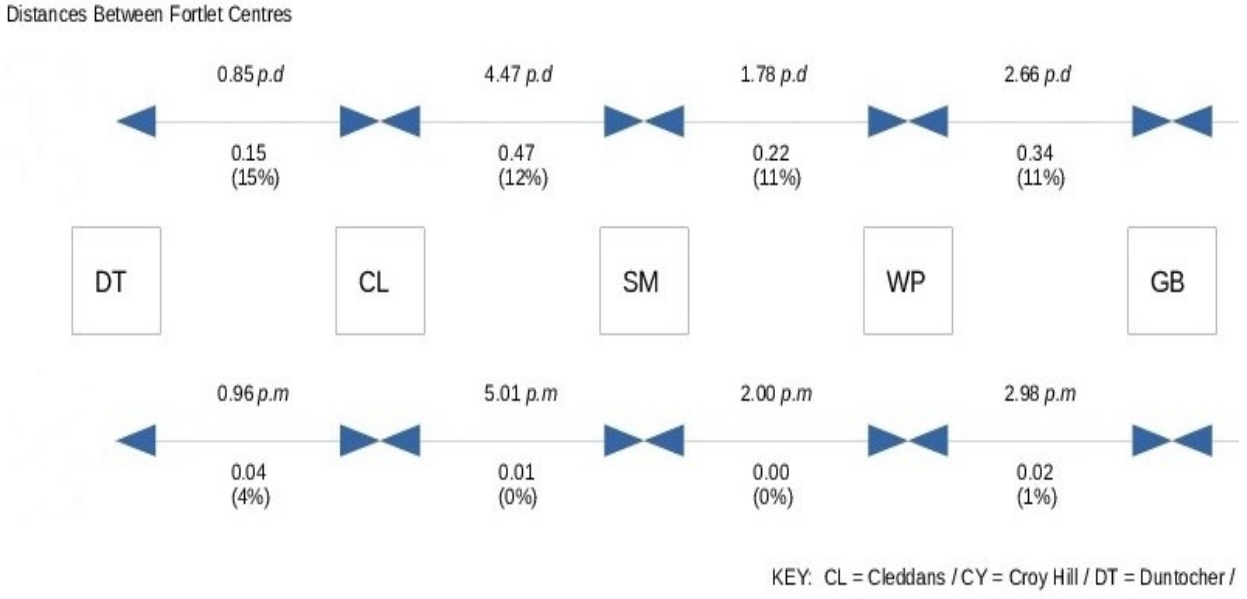
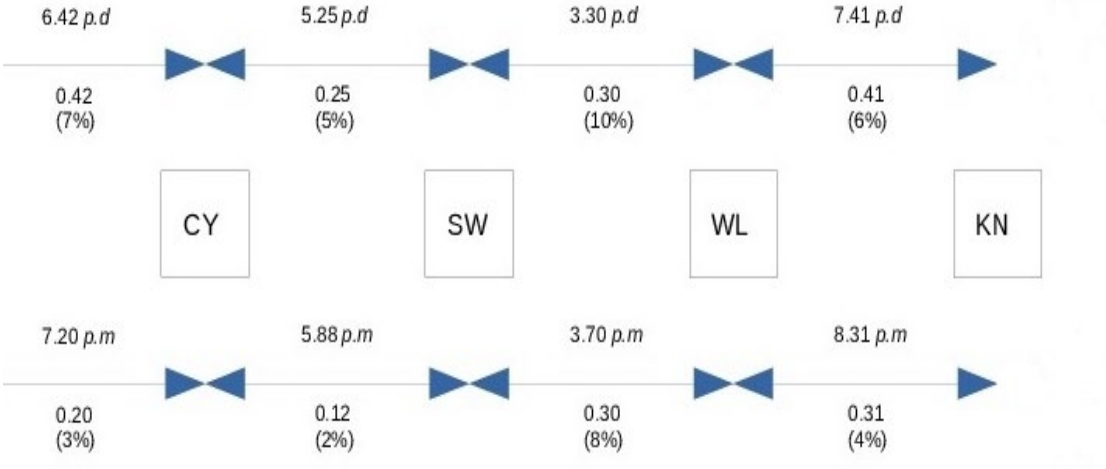


Figure 6.1. Fortlet sequence showing distances between fortlet centres shown as miles derived from both the *pes Drusianus* and *pes Monetalis* measurement standards

the standard used easier to ascertain. Both units of measurement have also been identified for the setting out of town plans, with the *pes Monetalis* being suggested at Silchester and Baginton and the *pes Drusianus* at Verulamium and Longthorpe (Duncan-Jones 1980: 132). Reference to the Antonine Itinerary shows miles equating to metric distances of around 1.665 km, implying the *pes Drusianus* may have been adopted as the standard by the authors of this document (Bishop 2014: 26). These examples support the view that different standards of measurement coexisted in Roman Britain.

Fortlet spacing

Previous reconstructions of the Antonine Wall's fortlet sequence have been based upon the assumptions that each fort was spaced at intervals of one Roman mile and that this mile is based upon the *pes Monetalis* standard (Keppie and Walker 1981: 161; Hanson and Maxwell 1986: 122; Woolliscroft 1996: 160). While this reassessment will respect the first assumption, as it has been identified that the *pes Drusianus* standard was used for the Distance Stones (Hannon *et al.* 2017), both measurement standards will be tested for the fortlet intervals. For the purpose of this paper, intervals have been calculated based upon the centres of the northern gate of each fortlet. Measurements making adjustments for each fortlet's east-west dimensions were also considered, but due to the small dimensions of the fortlets the widths had little effect on the results, so for brevity have not been included here. If we accept that fortlets were spaced at regular intervals, it is clear that a significant number of the fortlets remain undiscovered, thus we are dealing with a partial dataset. In an attempt to account for the gaps in the data, the variance quoted in Figure 6.1 is calculated from the closest whole mile, e.g. the variance for an interval of 2.42 miles is 0.42 miles as the measurement is closest to a two whole mile interval and the variance for an interval of 0.85 miles is 0.15 miles as the measurement is closest to a one whole



GB = Glasgow Bridge / KN = Kinneil / SW = Seabegs Wood / SM = Summerston / WL = Watling Lodge / WP = Wilderness Plantation

mile interval. This approach was adopted in order to compensate for the variable number of missing fortlets between the documented installations.

Figure 6.1 initially shows the intervals between the known fortlets based upon the *pes Drusianus* standard, mirroring that used for the Distance Stones' inscriptions. If the top row of figures is referenced, they show that the intervals between the known fortlets are not based on whole Roman miles. However, if the *pes Monetalis* standard detailed on the bottom row is considered, the results show intervals with extremely small variations from whole Roman miles. There are, however, four intervals that show a variance from a Roman mile; these are due to two fortlets (Croy Hill and Watling Lodge) being slightly out of position. The actual position of Croy Hill fortlet is 0.20 miles to the east of a whole mile and Watling Lodge is 0.30 miles to the west of a whole mile. These exceptions disagree with Woolliscroft's argument that Wilderness Plantation, Watling Lodge and Seabegs Wood are out of position (1996: 158), and with Hanson and Maxwell who determined that six fortlets had non-standard intervals (1986: 122), although these determinations were based upon measurements between both known fortlet positions and those hypothesised in each of the respective models. If the site of Croy Hill is examined (Figure 6.2a), then it appears that the decision to move this a short distance east achieved an enhanced position over that offered by the measured mile, which is on the western slope of the hill. As for Watling Lodge, Woolliscroft's explanation is supported, explaining this variation from the whole mile as linked to the need for an installation at the point where the pre-existing road north to Camelon crosses the frontier. Although the possibility cannot be ruled out that Watling Lodge represents a structure additional to the sequence, comparable to the Portgate, a fortified gateway on Hadrian's Wall situated at the point where Dere Street crosses the Hadrianic frontier (Breeze 2006a: 184).

Despite recognising that two of the known fortlets are slightly out of their modelled positions, if an r-square statistical test is conducted, a result of 0.99908 is generated. This test mathematically assesses how closely real world data fits a hypothesis (Wright 1921): in this case if the known fortlets are within

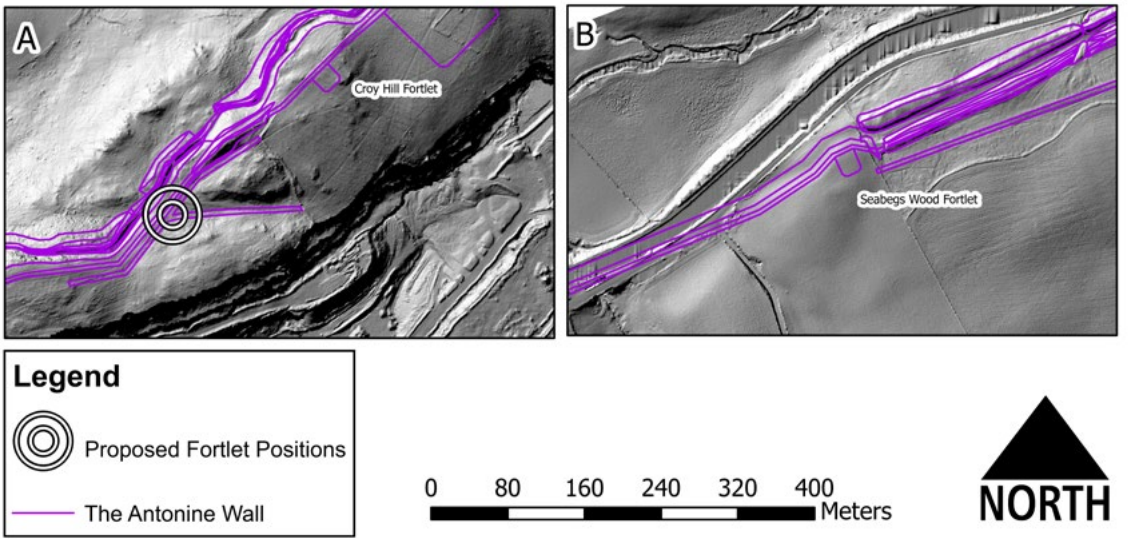


Figure 6.2. (a) Plan of Croy Hill showing the fortlets deviation from a whole Roman mile, (b) the change in the Wall's course at Seabegs Wood

a system based upon the *pes Monetalis* mile. A result of zero would show no correlation and a result of one would show a perfect correlation, so the result indicates that the positions of the known fortlets very closely correlate to a model based upon the *pes Monetalis.* Thus, from the evidence we have from the known fortlets, it is fair to state that the fortlet intervals are based upon the *pes Monetalis*. However, the datum (i.e. the point from which the Roman surveyors took their measurements) is unlikely to be Watling Lodge or Croy Hill as these are both out of position; the latter has previously been suggested as the datum for the frontier due to its proximity to its centre (Hanson and Maxwell 1986: 121). Watling Lodge was suggested as the starting point for the construction of the Wall and thus the first fortlet in the sequence due to the change in construction method of the rampart superstructure (Bailey 1995: 595), however this appears not to be the case and is discussed below.

Now that a robust fortlet model has been proposed, this can be used to hypothesise the positions of undiscovered fortlets (Table 6.1). This model creates a system containing 41 fortlet positions, 32 of which are hypothetical installations. Each fortlet is spaced precisely one Roman mile from its neighbours apart from the following exceptions that were discussed above:

- Girnal Hill (No. 20) to Croy Hill (No. 21) 1.20 miles
- Croy Hill (No. 21) to Dullatur (No. 22) 0.88 miles
- Tentfield (No. 30) to Watling Lodge (No. 31) 0.70 miles
- Watling Lodge (No. 31) to Arnothill (No. 32) 1.31 miles

At the east and west of the frontier the locations generated by this model are similar to the positions suggested in both of Woolliscroft's models (1996: 160 and 167), however towards the centre of the frontier their locations increasingly differ. It is difficult to carry out a similar comparison with the models suggested by Keppie and Walker or Hanson and Maxwell as neither publishes specific locations (with coordinates or grid references) for the fortlets in their suggested sequences. However the new model does agree with Hanson and Maxwell's view that the sequence contains 41 fortlets (1986: 122 table 6.4). Without substantial levels of fieldwork, assessment of the validity of these positions is difficult to assess, especially as nine of the positions are in areas that have seen modern development and are now built upon. A notable observation is that the proposed position for Inveravon (no. 37) is in the centre of the river Avon, adjacent to the location of Inveravon fort. This could suggest that the fragmentary information gathered through excavation at Inveravon relates to a fortlet and not a small fort, disagreeing with the site's initial interpretation (Robertson 1969: 42). This option was acknowledged in a later investigation, although the possibility of a fortlet was dismissed as the excavated remains were too extensive to be those of a fortlet, and were thus interpreted as a small fort (Dunwell and Ralston 1995: 569). Alternatively, it could imply that no fortlet was constructed at this locale due to the existence of, or intention to build, a fort. Or a similar situation may exist to that at Duntocher, where an original fortlet was superseded by a later fort (Robertson 1957: 14). A further consideration could be that the Avon was used as the datum for the fortlet system, although this seems unlikely based on the conclusions of the investigation of the Distance Stones and Poulter's work relating to the planning of the Antonine frontier, both of which suggested that elevated positions and not rivers were used as the datum (Hannon *et al.* 2017; Poulter 2009: 121-24).

An alternative approach to assessing the validity of the hypothesised fortlet positions is to consider their association with changes in direction of the frontier. It has been previously suggested that

Sequence	Name	Easting	Northing	Distance to Closest Change of Direction
1	Mount Pleasant	246688	673198	65m
2	Carleith	248143	672970	42m
3	**DUNTOCHER**	249541	672680	80m
4	**CLEDDANS**	250826	672261	33m
5	Castlehill	252226	672590	23m
6	Thorn	253553	672438	66m
7	Manse Burn	254860	672041	26m
8	Douglas Park	256134	672387	7m
9	**SUMMERSTON**	257445	672492	124m
10	Easter Balmuildy	258416	671766	197m
11	**WILDERNESS PLANTATION**	259806	672132	130m
12	Cawder	261087	672557	89m
13	Hungryside Bridge	262376	672797	158m
14	**GLASGOW BRIDGE**	263662	673119	0m
15	Kirkintilloch	264858	673879	215m
16	Hillhead	266212	674303	25m
17	Auchendavy	267476	674946	53m
18	Shirva	268865	675378	167m
19	Bar Hill	270215	675902	195m
20	Girnal Hill	271585	676192	395m
21	**CROY HILL**	273227	676475	47m
22	Dullatur	274319	677077	178m
23	Westerwood	275743	677350	816m
24	Hag Knowe	277125	677792	78m
25	Castlecary	278495	678247	4m
26	Allandale	279810	678676	282m
27	**SEABEGS WOOD**	281158	679220	0m
28	Milnquarter	282489	679794	19m
29	Rough Castle	283916	679812	20m
30	Tentfield	285257	679795	9m
31	**WATLING LODGE**	286257	679807	22m
32	Arnothill	288153	679972	80m
33	Callendar Wood	289450	679652	4m
34	Laurieston	290905	679536	271m
35	Beancross	292326	679575	153m
36	Old Polmont	293753	679328	28m
37	Inveravon	295034	679622	0m
38	Nether Kinneil	296374	679879	4m
39	**KINNEIL**	297734	680384	99m
40	Deanfield	299136	680813	899m
41	Kinglass	300551	681192	150m
			Average	**128m**

Table 6.1. Proposed fortlet locations based upon the *pes Monetalis* model (names in capitals denote known fortlets)

the existence of significant course changes could be indicative of the occurrence of installations (Woolliscroft 2008: 129), an obvious example of which can be observed as at Seabegs Wood fortlet (Keppie and Walker 1981: 143) (Figure 6.2b), although Cleddans fortlet occurs on a straight section of the frontier demonstrating that a change in direction is not a necessity. Of the nine known fortlets, eight are at or close to a change in direction, but this alone should not be relied upon to verify fortlet positions even though it may be a good indication. Out of the 32 hypothesised positions, eight stand out as being positioned particularly close to significant deviations in the course of the Wall, suggesting that it could be deviating in order to meet a planned or existing installation (Figure 6.3). Of these, three are particularly noteworthy. The first is 90 m west of Cawder, position 12 (Figure 6.3a), where there are changes in direction that could easily accommodate a fortlet that are not explained by the local topography. The second is 110 m west of Hag Knowe, position 24 (Figure 6.3b), where a change in direction coincides with the summit of Hag Knowe; here the course of the Military Way also deviates to the south increasing the gap between the road and the Wall rampart, suggesting that it may be avoiding an installation similar to the situation at the putative Garnhall watchtower (Woolliscroft 2008: 132). Hag Knowe is incidentally the probable find spot for Distance Stone 19 (Buchanan 1872: 472). The third is position 25 (Figure 6.3c), where the course of the Wall rampart appears to deviate north to accommodate an existing installation before heading south again to cross the Red Burn; this is very similar to the situation at Cawder, proposed position 12, and reminiscent of Seabegs Wood.

In 2018 remains were discovered which potentially represent the site of a previously unknown fortlet near Boclair. This possible fortlet is located between Bearsden fort and Summerston fortlet (Hunter 2019: 412). The authors are aware of the precise location of the possible fortlet, and the measurements to neighbouring fortlets have been calculated. However, at the time of writing the precise location of the site is under embargo so these details have not been published, although it can be confirmed that it does not coincide with a measured mile, which occurs close to the point where Roman Road crosses the railway line to the east of Bearsden fort. Instead the possible site occupies a superior position to the east of the measured mile, in a fashion similar to that seen at Croy Hill fortlet. Despite not coinciding with the position of a measured mile, if the r-square statistical test is reassessed to include the possible fortlet's position, a result of 0.965434 is achieved, still demonstrating the known fortlets strongly conform to a model based upon one mile intervals.

Further fieldwork will be required to test this hypothesis, but we can conclude that the fortlet system was based upon whole Roman miles derived from the *pes Monetalis*; however, local logistical or topographic circumstances could influence the actual fortlet position. If the measured position for a fortlet occurs in an area of fairly regular topography then this would be the actual position of the fortlet. This arrangement can be seen at Cleddans and Kinneil where no significant benefit would be gained by adjusting the position east or west. However, if the measured position is near to a location providing a superior site for a fortlet, then the fortlet location would be adjusted in order to take advantage of the local topography. This arrangement can be seen at Croy Hill where a move to the east provides a significantly better position than that of the measured mile.

Fort spacing

If the question of fort spacing is now considered, a two-stage approach is required. Initially forts that are considered primary under the Gillam hypothesis (1975) need to be examined in isolation, this is

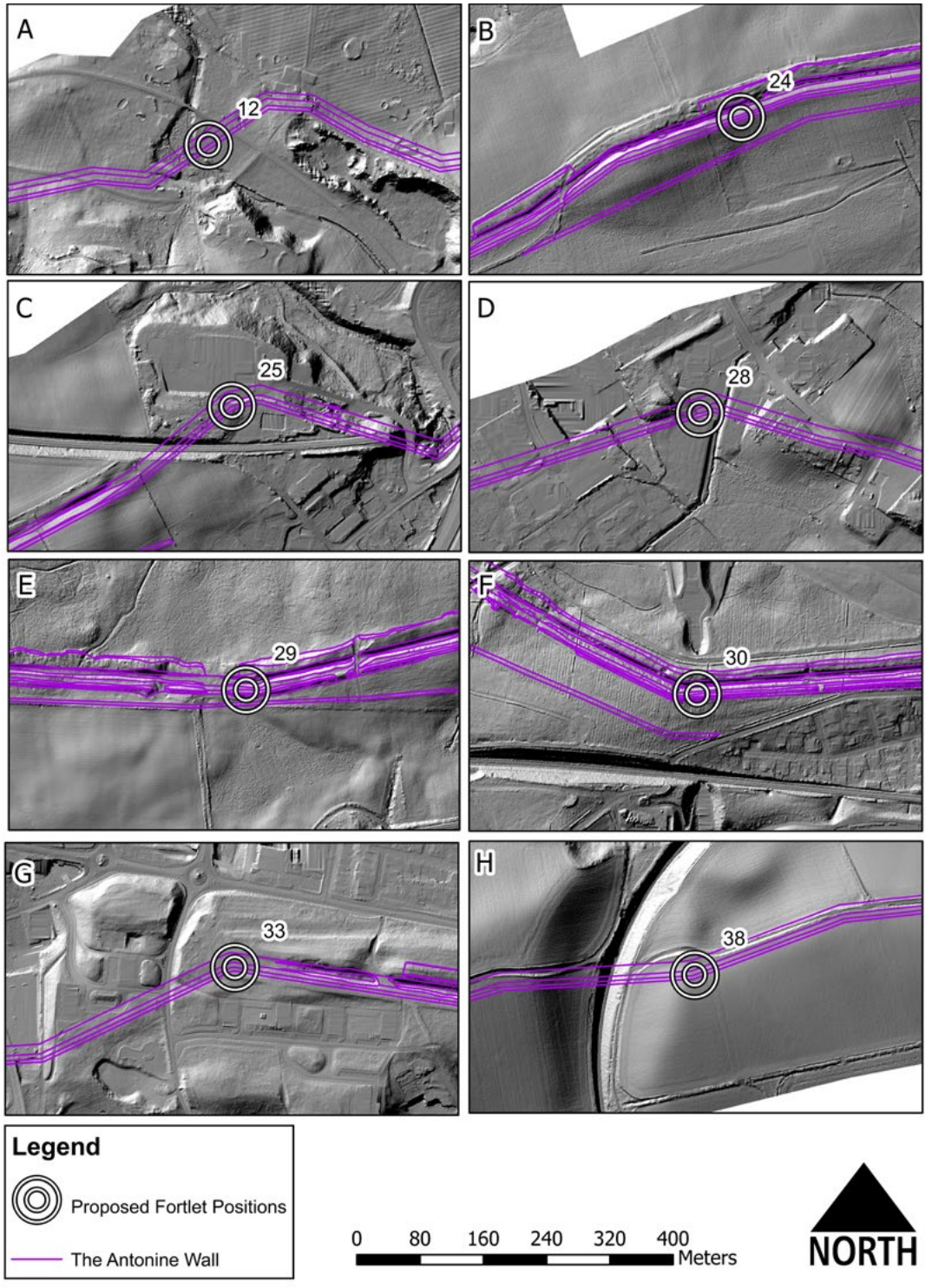


Figure 6.3. Proposed fortlet positions that correspond with changes in direction of the Wall's Rampart

then followed by a second analysis that incorporates all the known forts. For both analyses two different sets of distances were calculated. Firstly, measurements between the positions where each fort's gate is presumed to pass through the frontier, usually occurring at the centre of the rampart shared with the frontier: normally the fort's northern rampart. Secondly, distances excluding the length of this shared rampart are calculated; this is normally measured from the points where the eastern and western ramparts of neighbouring forts intersect with the frontier. The reason both possibilities need to be considered as the basis for spacing is that, unlike the fortlets, the greater dimensions of forts have a significant effect on the measured intervals. Both measurement standards were also considered, along with the alternative views that Auchendavy and Bar Hill were primary forts; although for the purposes of this discussion the authors favour neither argument.

The view that the primary phase of forts was placed at intervals of between seven and nine Roman miles (Hanson and Maxwell 1986: 112) mirrors the observation that the phase of Hadrian's Wall immediately preceding the construction of the Antonine Wall displayed similar regularly spaced forts. However, in the case of Hadrian's Wall these intervals are at either 7⅛ or 7⅜ miles (Swinbank and Spaul 1951: 228); although these measurements were based upon the length of Hadrian's Wall between Newcastle upon Tyne and Bowness-on-Solway being divided by ten to represent the intervals between eleven originally planned forts. Reference to Figure 6.4 shows that, regardless of the measurement

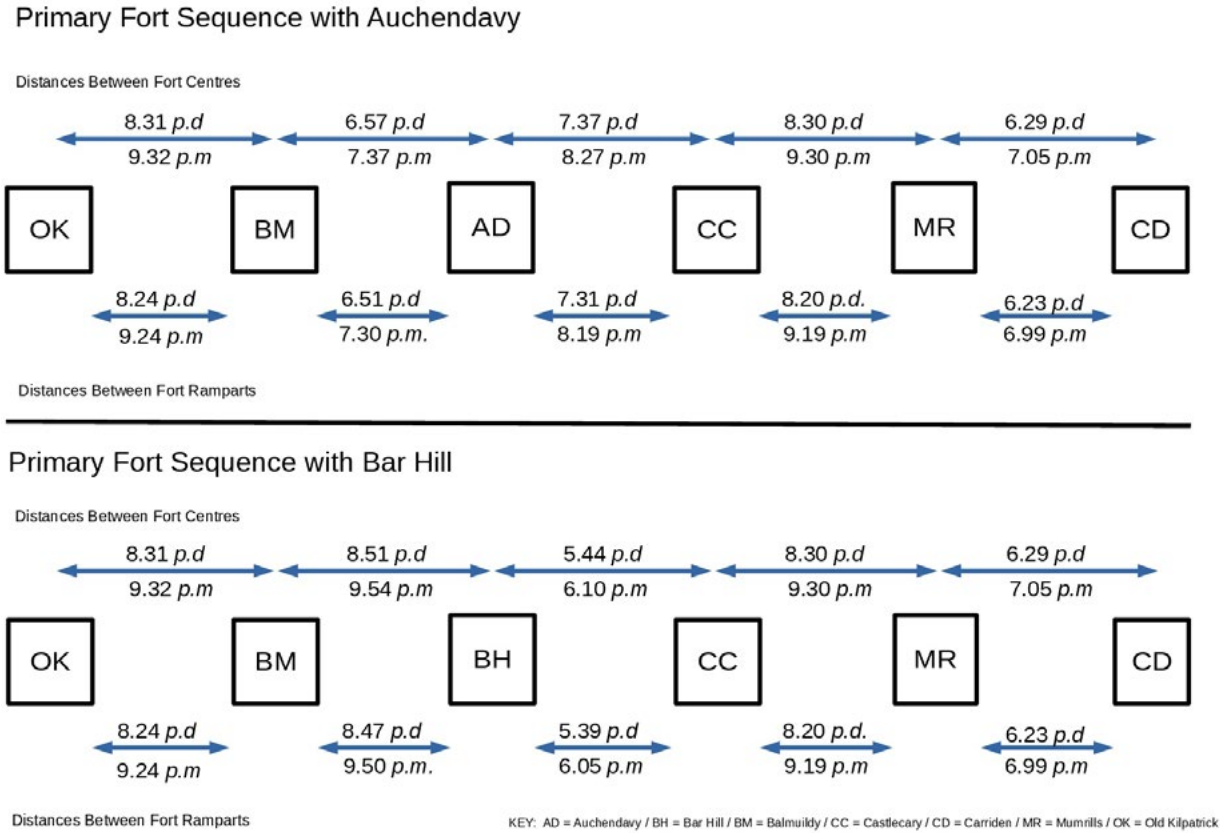


Figure 6.4. Spacing between forts considered primary shown as miles derived from both the *pes Drusianus* and *pes Monetalis* measurement standards

system employed or the choice of primary forts included, the spacing between the forts suggested as primary vary significantly. For example, when measurements accounting for fort dimensions using Auchendavy as primary are considered, intervals ranging from 6.23 miles to 8.24 miles are displayed for the *pes Drusianus*, and 6.99 to 9.24 miles for the *pes Monetalis,* mirroring the earlier observations. This inconsistency in spacings should not prove surprising if we consider the locations of the six forts in question. As Carriden and Old Kilpatrick are terminal forts their positions were determined by the locations of the Forth and Clyde respectively. Balmuildy is located at the position where the frontier intersects with the river Kelvin, whose valley forms a natural north-south route through the region. It has been tentatively suggested that there were two forts at Mumrills, with the earlier fort located beneath the annexe of the later one. Macdonald (1934: 212) originally interpreted the postulated earlier fort as one of Agricola's *praesidia* situated across the Forth-Clyde isthmus (Tacitus *Agricola* 23), but an interpretation based on more recent fieldwork now argues that both forts are Antonine in date with the earlier pre-dating the construction of the Antonine Wall rampart and the later post-dating it (Bailey 2010). The position of the later fort demonstrated a tactical adjustment in order to maximise the control of movement and communications in both east/west and north/south directions. This leaves only the earliest Antonine fort at Mumrills and the forts at Auchendavy/Bar Hill and Castlecary that could potentially have been located according to any regular spacing plan. If average spacings are considered, the *pes Drusianus* displays an average of 7.30 miles and the *pes Monetalis* averages at 8.18 miles. It should be noted that under the *pes Drusianus* system the average spacing is similar to that observed on Hadrian's Wall, while the *pes Monetalis* is closer to the intervals suggested in the Gillam hypothesis.

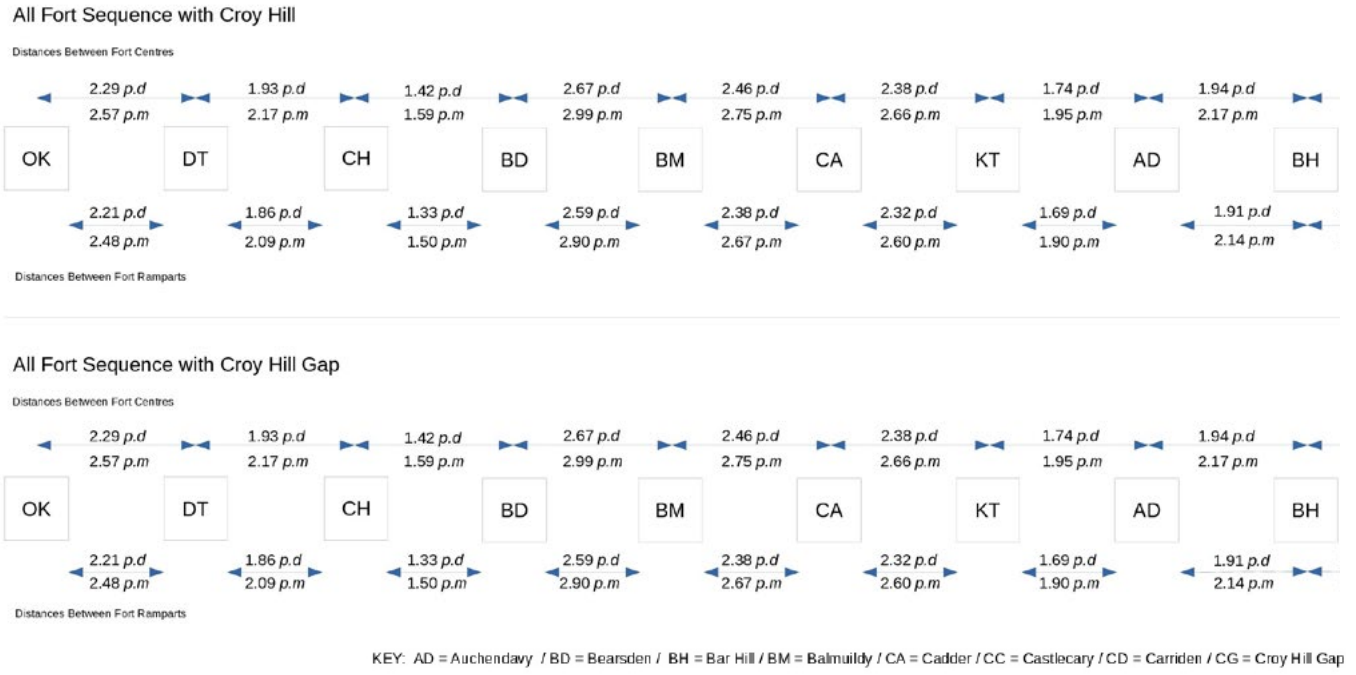
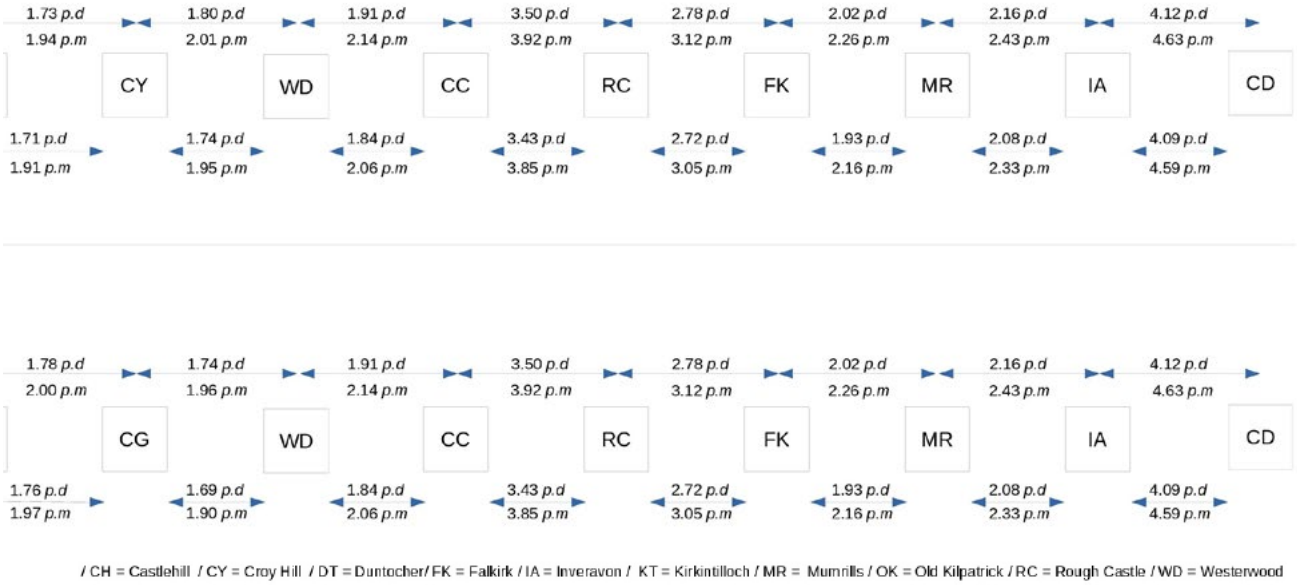


Figure 6.5. Spacing between all forts shown as miles derived from both the *pes Drusianus* and *pes Monetalis* measurement standards

Following the examination of distances between the forts suggested as primary, those deemed secondary can now be included in the investigation to look at the fort sequence as a whole. If all forts are included their intervals are normally described as being between two and three miles (Hanson and Maxwell 1986: 86). The distances discussed again represent both those between the centres of the forts' shared ramparts and those discounting the dimensions of these shared ramparts. At Bar Hill, due to the fact the fort is not attached to the Wall rampart, measurements have been taken from a point on the rampart opposite the fort's northern gateway; no adjustment has been made for Bar Hill's northern rampart, as this is not shared with the Wall. For all forts, annexe dimensions have not been considered following the view that annexes were later additions to the frontier and thus not in the original plan (Bailey 1994: 300). There are, however, two exceptions to this rule. Firstly, at Bearsden it appears that the area originally designated as a fort was subdivided during the construction process, creating a smaller fort with an annexe (Breeze 2016: 320); here the dimensions of the original fort have been considered and not the reduced dimensions created by the later subdivision. Secondly, at Duntocher where an arrangement similar to Bearsden can be observed, the installation's maximum dimensions are again used, although here an early fortlet was subsumed within the footprint of a fort that was itself later subdivided into a smaller fort and annexe (Swan 1999: 432); a view differing from the site's original interpretation that saw the annexe as a later addition (Robertson 1957: 14).

The results for both measurement standards are shown in Figure 6.5. The lower half of the illustrations considers a further alternative where the actual position of Croy Hill fort is substituted with the location of the causeway 86 m to its east; this has been suggested as the originally planned location of this fort instead of its actual position, which sits awkwardly over a change in the course of the Wall rampart (Graafstal *et al* 2015: 57). This tests the view that the causeway marks the site where the



/ CH = Castlehill / CY = Croy Hill / DT = Duntocher/ FK = Falkirk / IA = Inveravon / KT = Kirkintilloch / MR = Mumrills / OK = Old Kilpatrick / RC = Rough Castle / WD = Westerwood

planners originally intended to construct a fort, but after the fort's location had been chosen and the Wall ditch dug (leaving a causeway to allow north-south movement), the fort was constructed further west on a slightly elevated position. This amended position overlies the location of an earlier Antonine enclosure that may have been in use when the frontier was being set out and thus not available as a fort site (Hanson and Maxwell 1986: 120).

Once again when the measurements are examined in a search for regularity, it is apparent that although the absolute distances in most cases appear to fall within the two to three mile range proposed, the absolute distances vary markedly. For the upper sequence the average intervals for the *pes Drusianus* mile are 2.23 miles and for the *pes Monetalis* mile are 2.51 miles; however, the adoption of a simple average approach is flawed in two respects. In the Castlecary to Rough Castle interval the occurrence of a missing fort has long been suspected at a location close to Seabegs Place (Smith 1934; *DES* 1968: 44; Keppie *et al.* 1995: 629; Walker, this volume). If this suspicion is founded, the measured interval relates to the spacing between three forts and not two, and thus should be halved to account for an additional fort. The second area for concern is the interval between Inveravon to Carriden: in this area, again, there is the suspicion that there is a missing fort or forts (Gillam 1975: 55; Rohl 2014: 198). This, combined with the fact that the eastern terminus of the frontier remains disputed (Bailey and Devereux 1987; Breeze 2006: 80-81), makes it difficult to assess this area accurately. To account for these concerns the Inveravon to Carriden section was removed from the average calculation and the Castlecary to Rough Castle section halved to consider it as two separate intervals. The effect of these adjustments is to produce a *pes Drusianus* average of 2.022 miles and a *pes Monetalis* average of 2.372 miles.

Despite compensating for a missing installation between Castlecary and Rough Castle, no clear pattern is discernable for either measurement standard. On the face of it this suggests that the locations of

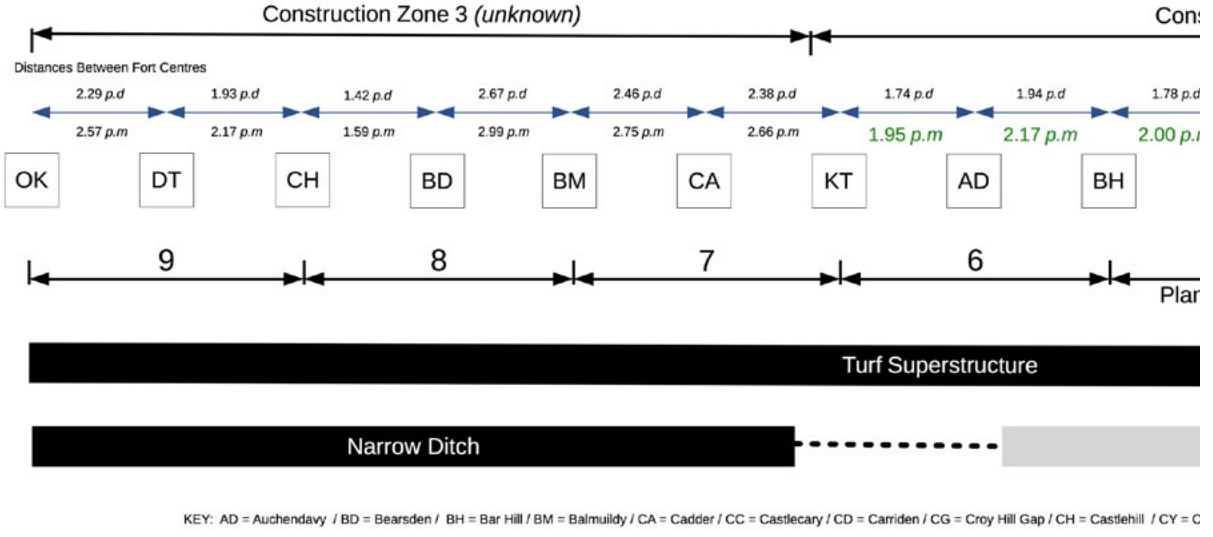
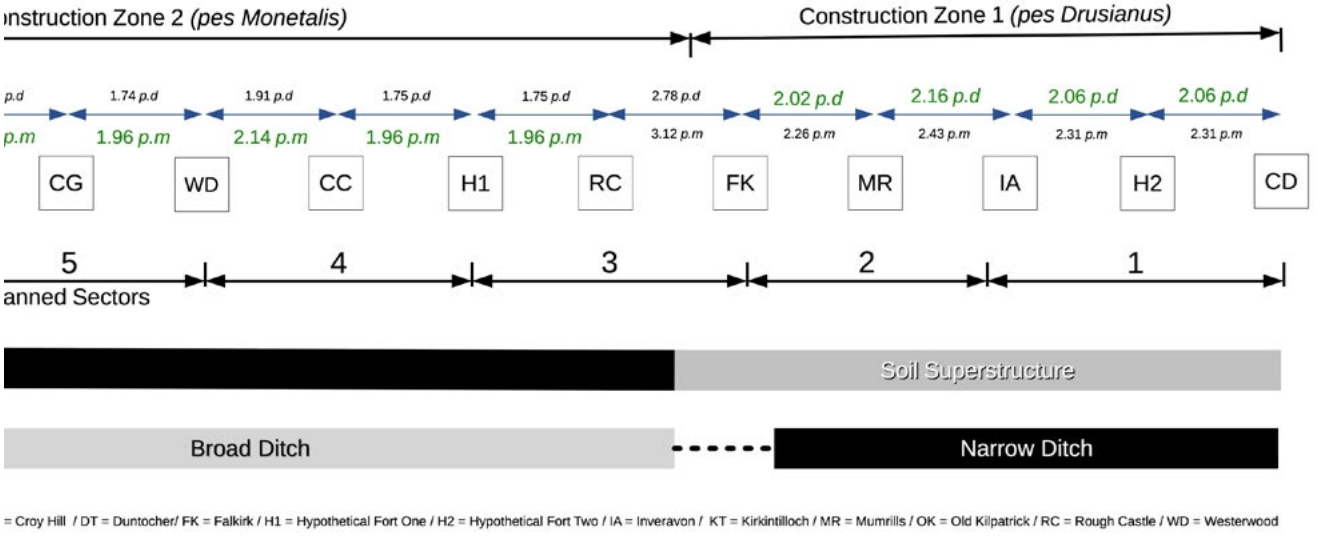


Figure 6.6. Fort spacing demonstrating a system where different measurement standards were used in different areas alongside the frontiers constructional sectors (after Keppie 1982: 99 figure 4)

the forts were not based on a regular spacing régime, although from this evidence the view could be supported that the intention of the planners of the Antonine Wall was to place forts at roughly two or 2.5 mile intervals, depending on whether the *pes Drusianus* or *pes Monetalis* standard was in use. However, it must be recognised that the actual locations were principally determined by local logistical or topographic considerations with only a general concern for the actual interval lengths.

If these measurements are considered alongside Keppie's (1974) work studying the construction phases of the Wall, an alternative approach can be adopted, resulting in a discernable pattern. Figure 6.6 shows the intervals between the centres of each fort, including provision for a hypothetical fort between Castlecary and Rough Castle and a second hypothetical fort between Inveravon and Carriden; these hypothetical forts are placed equidistantly between the known installations. The position of the Croy Hill causeway is also displayed over the actual location of Croy Hill fort, this is based upon the view discussed above that this was the position originally intended for the fort; although this view is hypothetical as there is no archaeological evidence supporting it. Measurements excluding the dimensions of the fort ramparts shared with the Wall along with those using Croy Hill's actual location were also considered, however for brevity those presented in Figure 6.6 are those found to better fit the proposed theory, forming the more consistent pattern.

Macdonald proposed that the initial plan for the construction of the Wall was to divide it into nine sectors with the intention that three sectors would be completed per year over three consecutive years working from east to west (Macdonald 1934: 397); a theory further developed by Keppie (1974). This interpretation was based upon an amalgamation of the different construction techniques observed along the line of the frontier, combined with the evidence of the Distance Stones (Keppie 1982: 99, fig. 4). Macdonald, however, further suggested that this plan was never finished with only the first four sectors completed on schedule, the fifth, that crossing Croy Hill, proved difficult to construct with the course of the ditch needing to be



cut through solid basalt causing delays in the plan (Macdonald 1934: 399). This resulted in the remaining stretches of the Wall being reallocated, resulting in the frontier being constructed in 15 sectors over at least four years, with major revisions to the planned sectors occurring west of Castlehill (Keppie 1974: 154). When the structural differences observed along the Wall ditch and rampart are compared to the measured intervals in Figure 6.6, a degree of correlation can be observed, notably in the section described by Keppie as having a 'broad ditch' stretching roughly between Kirkintilloch and Falkirk (planned sectors 3, 4, 5 and 6) and in the section described as having 'soil superstructure' stretching roughly between Falkirk and Carriden (planned sectors 1 and 2) (Keppie 1974: 159).

If the most easterly section of the Wall is examined first, that is the section characterised as having a 'narrow ditch' and 'soil superstructure' stretching roughly from Carriden to Falkirk (Figure 6.6 - Construction Zone 1), it can be seen that the forts contained in this section appear to be separated by figures close to two miles if the *pes Drusianus* standard is used. However, if the central section of the Wall is examined, that is the section characterised by a 'broad ditch' and 'turf superstructure' stretching between Kirkintilloch and Falkirk (Figure 6.6 - Construction Zone 2), then the forts also appear to be separated by a distance of two miles, but in this instance if the *pes Monetalis* standard is used. As for the westernmost section, that is characterised as having a 'narrow ditch' and 'turf superstructure' stretching between Old Kilpatrick and Kirkintilloch (Figure 6.6 - Construction Zone 3), the intervals between forts appear not to result in figures close to whole miles for either standard, with considerable variation observed. Construction Zone 3 coincides with the area where it has been suggested that the original plan for the frontier's construction was disrupted, resulting in the creation of six additional construction sectors in Macdonald's model, manifesting as the Distance Stones displaying figures in feet and not paces (Keppie 1974: 159).

The fortlet at Watling Lodge has been previously suggested as marking the original starting point for the construction of the Antonine Wall (Bailey 1995: 595) and, hence, a prime candidate for the frontier's datum (the position which all other measurements are based). However, as previously discussed, Watling Lodge is an anomaly occurring not at its predicted position and, thus, it is not a tenable datum for the fortlet system. The fortlet lies 2.523 km (1.52 *pes Drusianus* miles or1.70 *pes Monetalis miles*) from Falkirk, the closest fort to the east, and 2.095 km (1.26 *pes Drusianus* miles or 1.42 *pes Monetalis* miles) from Rough Castle, the closest fort to the west; considering these distances it is unlikely that Watling Lodge acted as a datum for the fort system either. Nonetheless, it does lie in the transitional zone between Construction Zones 1 and 2, so could support the view that the original intention was to place the frontier's eastern terminus at Watling Lodge and thus the road north to Camelon; this could lead to the conclusion that the zone to the east of Watling Lodge was an addition to the original plan (Bailey 1995: 593-95).

Minor enclosure spacing

The association between the Wilderness Plantation minor enclosures and the surrounding installations was also examined, with the centres of each enclosure used as the point of measurement. Following their discovery, it was noted that the enclosures appeared to be regularly spaced and, despite the discovery of only three, parallels were drawn between them and Hadrian's Wall's turrets (Hanson and Maxwell 1983: 228). The Hadrian's Wall turrets are recognised as being a third of a Roman mile apart, forming a pattern with two turrets occurring between each pair of milecastles (Breeze 2006a: 68).

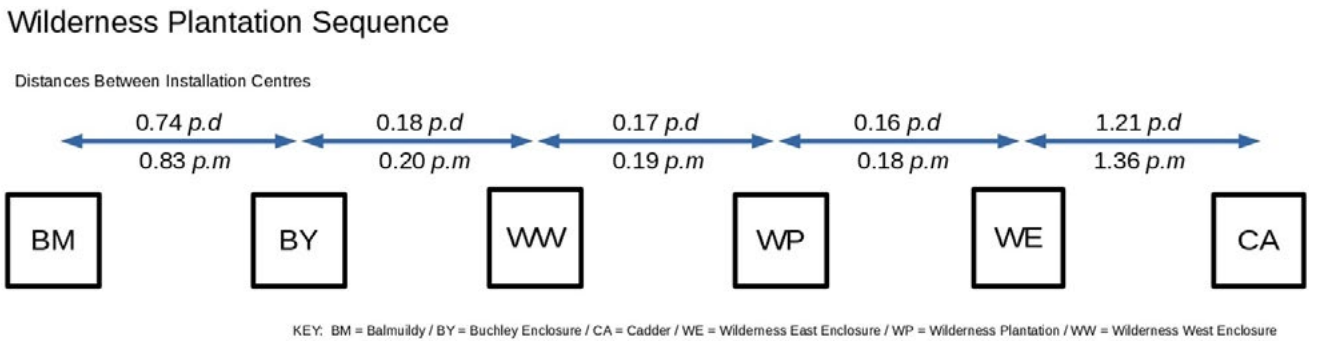


Figure 6.7. Spacing between the Wilderness Plantation minor enclosures shown as miles derived from both the *pes Drusianus* and *pes Monetalis* measurement standards

When the enclosure spacings are examined (Figure 6.7) it can be seen that the three minor enclosures are relatively evenly spaced around Wilderness Plantation fortlet. If they form a combined system with the fortlets, sharing the *pes Monetalis* as a common measurement standard, they are then separated by an interval of a fifth of a Roman mile. This would imply that, if they were once evenly spaced between every fortlet, then each pair of fortlets would be separated by four minor enclosures: double the concentration observed on Hadrian's Wall. Extrapolating this arrangement for the entire frontier, using the theoretical fortlet positions detailed in Table 6.1 would create a system containing 170 minor enclosures, assuming that none coincided with the location of a fort and so were not built. When the relationship of the enclosures with the surrounding forts is considered, there is no obvious pattern. This is, however, difficult to consider with the small amount of data available. Nonetheless, it is plausible that the minor enclosures share a measurement standard with the fortlet system and that their positions were thus established at the same time as the fortlets. Again, however, with the limited dataset it is impossible to know if the enclosures once formed a frontier wide system or one local to Wilderness Plantation.

Expansion spacing

In the interest of completeness, the spacing of the expansions surrounding Rough Castle fort and on Croy Hill have also been studied. Again, for the purposes of this analysis measurements between the centres of each installation have been presented in Figure 6.8. In total, six expansions have been discovered which are found in three pairs: two of which occur on either side of Rough Castle and the third pair to the west of Croy Hill fort. If the gap between the elements of each pair is considered, then there is no consistency seen in their spacing, with the Tentfield expansions being 0.41 *pes Monetalis* miles apart, the Bonnyside expansions 0.22 *pes Monetalis* miles apart and the Croy Hill expansions 0.09 *pes Monetalis* miles apart. A similar spread of distances can be seen if the measurements between the expansions and their closest forts are considered.

From this evidence alone, it would have to be concluded that the positions of the expansions are not based on a regular spacing framework but on topographical considerations, albeit a conclusion drawn from little evidence. This fits with the theory that the expansions formed part of a north-south signalling system (Woolliscroft 1996: 168) and, thus, their positions in the landscape were the primary factor in deciding their locations and not the constraints of a regular framework. That said, if we return to the hypothesised fortlet model in Table 6.1, and more precisely the proposed fortlet position 30, it should be noted that

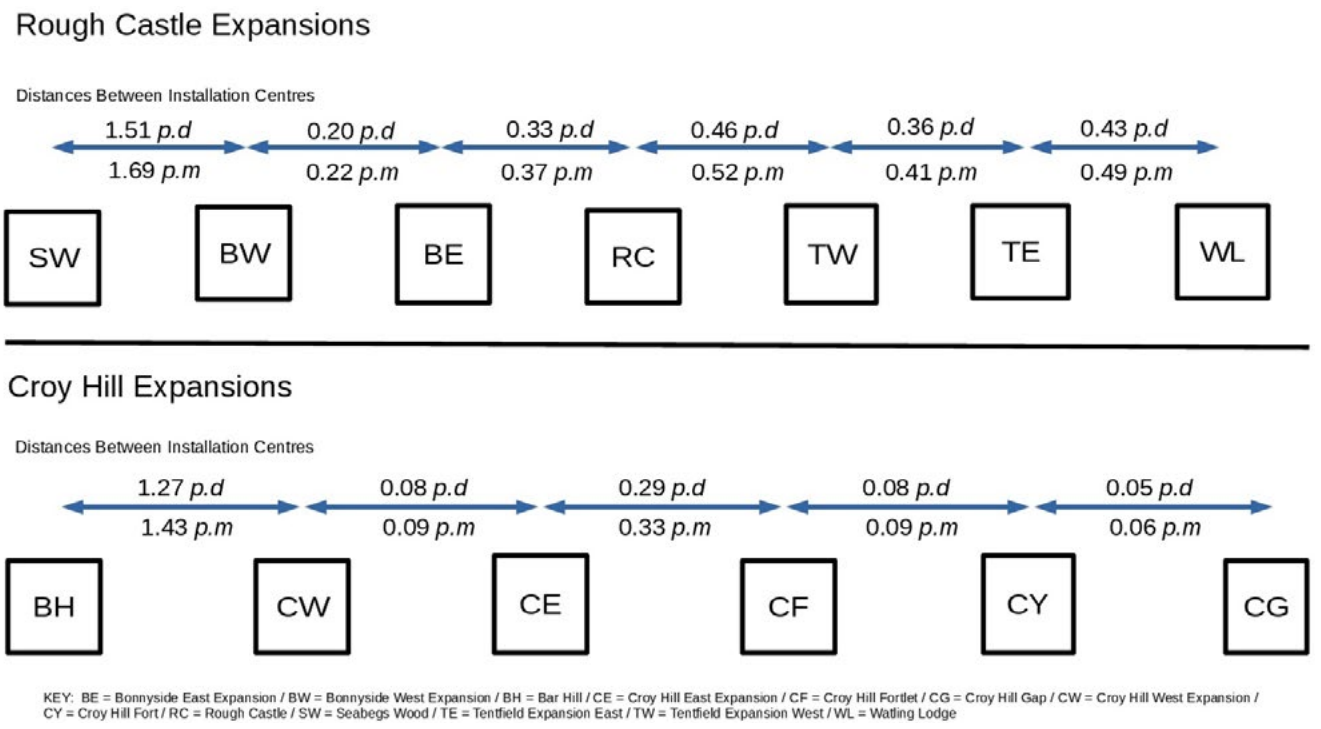


Figure 6.8. Spacing between the expansions shown as miles derived from both the *pes Drusianus* and *pes Monetalis* measurement standards

it is located midway between Tentfield East and Tentfield West expansions. The Tentfield expansions are positioned 0.41 *pes Monetalis* miles apart, so if the hypothesised fortlet is considered midway in the arrangement there is a 0.20 *pes Monetalis* mile interval between each. Reference to Figure 6.8 shows that a similar interval of 0.22 *pes Monetalis* miles was observed between the Bonnyside expansions, so in these examples a spacing of a fifth of a Roman mile is displayed. If this is then compared with the investigation of the above minor enclosures, an interval of a fifth of a Roman mile was also observed separating the installations around Wilderness Plantation fortlet. This may simply be a coincidence, but may suggest that the expansions and minor enclosures performed a similar function as has previously been suggested (Hanson and Maxwell 1983: 238), although, the same cannot be said for the Croy Hill expansions where no such relationship is displayed between the pair or with adjacent fortlet.

Conclusions

The reassessment of the spacing systems on the Antonine Wall has been a useful exercise and has led to a number of noteworthy observations as follows:

1. Fortlets adhere strongly to a one-mile interval system, although their exact location may be adjusted for local logistical reasons, or if a superior position is adjacent to their measured position.
2. The fortlet system was set out using the *pes Monetalis* standard.
3. The fortlet system was not set out from either terminal but from a point within the system.

4. The primary fort interval measurements are between seven and nine mile intervals, with no regularity observed.
5. The fort interval measurements could support the view that at least three distinct fort construction zones existed and that these correlate to the noted structural differences.
6. Fort Construction Zones 1 and 2 used different measurement standards. Construction Zone 1 mirrored the fortlet system and used the *pes Monetalis* standard and Fort Construction Zone 2 mirrored the Distance Stones system, using the *pes Drusianus* standard.
7. Construction Zones 1 and 2 were set out independently from one another and from points within each zone.
8. Further work is required in Construction Zone 3 to understand the rationale for the location of forts in this area.
9. The Distance Stone, fortlet and fort systems were all set out independently from one another to three distinct plans.
10. Watling Lodge and Croy Hill fortlets were not used as a survey datum for any part of the system.

The implications of these observations are interesting and lead to a more complex constructional story for the frontier than previously understood.

The recognition that the fort and fortlet systems were set out independently from one another may be significant, although this should not be surprising considering the earlier pattern observed on Hadrian's Wall where the original plan for the frontier was for a linear barrier with interspersed milecastles and turrets accompanied by a line of forts situated along the Stanegate to the south. During the construction process these forts were relocated further north and attached to Hadrian's Wall itself (Breeze 2006a: 74), in some places being superimposed on the sites of recently constructed installations such as at Chesters, which overlies the location of Turret 27a, and Housesteads, which overlies Turret 36b (Breeze 2006a: 197 and 234). The construction of the forts on Hadrian's Wall followed their own pattern and did not relate to the positions of milecastles or turrets (Breeze 2006a: 75). It is also noteworthy that the divisions between legionary construction lengths did not coincide with the positions of structures but occurred between them (Breeze 2006a: 174). For Hadrian's Wall the relationship between forts and milecastles has been interpreted as indicating that forts served a distinctly different function than the turrets and milecastles: the former providing personnel to patrol to the north of the frontier and defend the empire in the event of a large-scale attack and the latter serving to supervise the Wall, controlling authorised movement across the frontier and deal with small scale raiding (Breeze and Dobson 1972: 185). This raises the possibility that a similar distinction was in operation on the Antonine Wall, with the apparent close adherence to a regular spacing system for the fortlets representing the supervisory requirement. The less regimented spacing observed between the forts would meet the patrol and defensive roles, demonstrating the preference for logistical requirements, such as a consistent water supply, over strict observance of a regular spaced system, and may explain why at Bar Hill and Camelon it was not deemed necessary for the forts to be attached to the rampart.

No regularity in spacing between forts deemed 'primary' can be observed, suggesting that, if this is a valid distinction, placing the forts with strict regularity was not a concern. However, if all the forts are included, the suggestion of regularity can be considered. The lack of any identifiable regularity

in the spacing of forts to the west of Castlehill is also evident. This is an area previously associated with disruption during the construction process (Keppie 1974: 154) and this disruption may have manifested itself in the observed irregularity. This irregularity is in stark contrast with the regularity of the fortlets in this area. This disparity could suggest that the fortlet positions were established early in the building sequence, prior to the suggested disruption and thus earlier than the establishment of the fort sequence; a suggestion underlined by the first incarnation of Duntocher, which saw a freestanding fortlet constructed ahead of the arrival of the Antonine Wall rampart (Robertson 1957: 14). This potential time depth in the construction process may be further highlighted by the correlation of the causeway at Croy Hill with the proposed spacing instead of the actual location of the fort, and the occurrence of a primary causeways at Rough Castle and Cadder, forts usually considered 'secondary' to the frontier due to their stratigraphic relationship with its rampart (Graafstal *et al.* 2015: 57).

The independence of the fort and fortlet systems combined with the possibility that different measurement standards were employed across the frontier may help to identify the work of distinct groups at different times, and correlation between the two measurement standards and variations in the frontier's anatomy supports the view that these changes mark work undertaken at different times during the construction process. Further research may associate these different standards and construction methods with identifiable groups, preferences that may ultimately be traced back to the origins of each legion. Further fieldwork will be required to test the validity of the ideas discussed within this section and the discovery of further installations will require a re-evaluation of the various spacing theories.

Acknowledgements

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7. The curious incident of the structure at Bar Hill and its implications

Rebecca H. Jones

Introduction

Lawrence Keppie's magisterial publication on *The Antiquarian Rediscovery of the Antonine Wall* appropriately ends with the excavations of the forts along the Wall in the late 19th and early 20th centuries (2012: 127-137). Concluding with Sir George Macdonald, Keppie notes the important excavations at Bar Hill from 1902-5 in which Macdonald was involved. These excavations uncovered a curious structure under the fort which has received various interpretations over the years, but, together with other structures along its length, may have played a critical role in the initial planning, surveying and building of the Wall.

The Bar Hill Structure

The initial excavations at Bar Hill were directed by Alexander Park, factor on the Gartshore estate, and funded by Gartshore's owner, Alexander Whitelaw. Together with Macdonald, Park swiftly wrote up and published the results of these excavations (Macdonald and Park 1906; Keppie 2012: 133-4).

An unexpected discovery during the excavations was of a structure lying at an angle beneath the Antonine fort (Figure 7.1). This discovery led the excavators to suggest that this was an 'Early Fort' underlying its Antonine successor. The provision of an annexe and elaborate drainage arrangements, seemingly linked to what became the fort ditch to the south-west, were used to argue that it was something more substantial than a temporary camp and therefore the permanent home of a small garrison. This, they suggested, meant that it was one of the garrisons placed on the isthmus by the Governor Agricola in his Flavian campaigns in the AD 80s (Macdonald and Park 1906: 11-15).

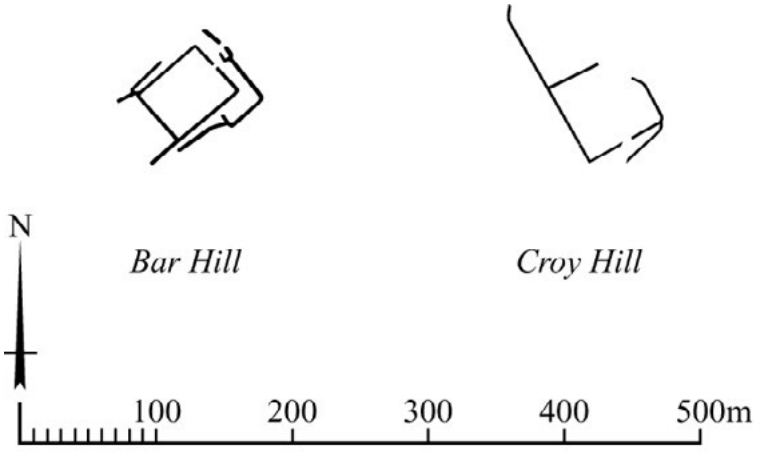

Figure 7.1 Outline drawings of the two structures under Bar Hill and Croy Hill

This view was later challenged by Steer, who argued that the enclosure was Antonine or proto-Antonine, shortly afterwards replaced by the fort (1960: 88). The recovery of turf blocks in a 'wonderful state of preservation' (Macdonald and Park 1906: 14) could have been from the rampart which were placed in the ditch when it was dismantled, the excellent preservation being due to them not being in the rampart for very long, therefore indicating a short-lived Antonine structure. A later suggestion was made interpreting it and its neighbour at Croy Hill (see below; Figure 7.1) as Iron Age homesteads (Feachem 1968). Re-excavation of the ditch in 1978-82 by Keppie recovered more well-preserved turf blocks, mixed in with twigs and small hawthorn branches, neatly cut and still with their bark and thorns. Finds from the subsoil below the fortlet included some of Iron Age date, but no traces of circular houses were recovered. None of the finds dated to the Flavian period, but Antonine pottery was recovered from an associated hearth (Keppie 1986: 51-8).

Croy Hill

Excavations by Macdonald in 1920 and 1931 identified the ditch of a structure under the Roman fort on Croy Hill, to which he drew parallels with that found previously under Bar Hill, continuing his interpretation to propose that both were Agricolan forts on the isthmus (Macdonald 1932: 262-6). Further excavations in 1975-77 provided more detail: the structure is in two parts, the northern part beneath the Antonine Wall fort, with a possible annexe to the south. However, these excavations concluded that this structure was not Agricolan in date. The spatial relationship between the ditch of the enclosure's southern annexe and fort road demonstrated that the two were in use contemporaneously (Hanson 1977: 6-7); this was also confirmed by pottery found in the enclosure ditch (Hanson forthcoming). It, therefore, seemed likely that both structures (on Croy Hill and Bar Hill) were Antonine, but early in the sequence for the Wall. That at Croy Hill is about a third larger than its neighbour at Bar Hill. In addition, the rampart material in the ditch of Bar Hill suggests a short-lived occupation at that site, with its ditches deliberately filled in. At Croy, Macdonald recorded a small stretch of roadway some 18 m (60 feet) long thought to be contemporary with the enclosure rather than the overlying fort (1932: 265). This would suggest that it may have been in use for a reasonable period. Its ditches appear to have lain open to the elements for some time prior to the construction of the later fort, unlike at Bar Hill. This may suggest that the fort at Bar Hill was built before that at Croy; indeed, the likelihood that the Croy fort is later is suggested by its neighbouring fortlet (Hanson forthcoming).

Purpose

Now that an Antonine date seems likely, there has been a general assumption that both enclosures housed troops involved in the construction of the Wall or its associated forts and fortlets (e.g. Hanson and Maxwell 1986: 120). Largely due to aerial survey, some 20 or so camps are recorded along the Wall (Figures 7.2 and 7.3) and various discussions have attempted to link them to its building programme (Feachem 1958; Maxwell 1974; Hanson and Maxwell 1986; Jones 2005). The two structures under Bar Hill and Croy Hill do not fit into the general typology of camps (Figure 7.2) and are significantly smaller; therefore, it cannot be assumed that they performed the same function. Bar Hill enclosed only some 0.28 ha and Croy Hill 0.32 ha (with annexes increasing the holding capacity of both); the majority of camps are around 2 ha. I have argued elsewhere that one plausible explanation for the structures under the forts at Bar Hill and Croy Hill is that they functioned as surveying camps for the Wall (Jones 2005; Jones 2011: 330).

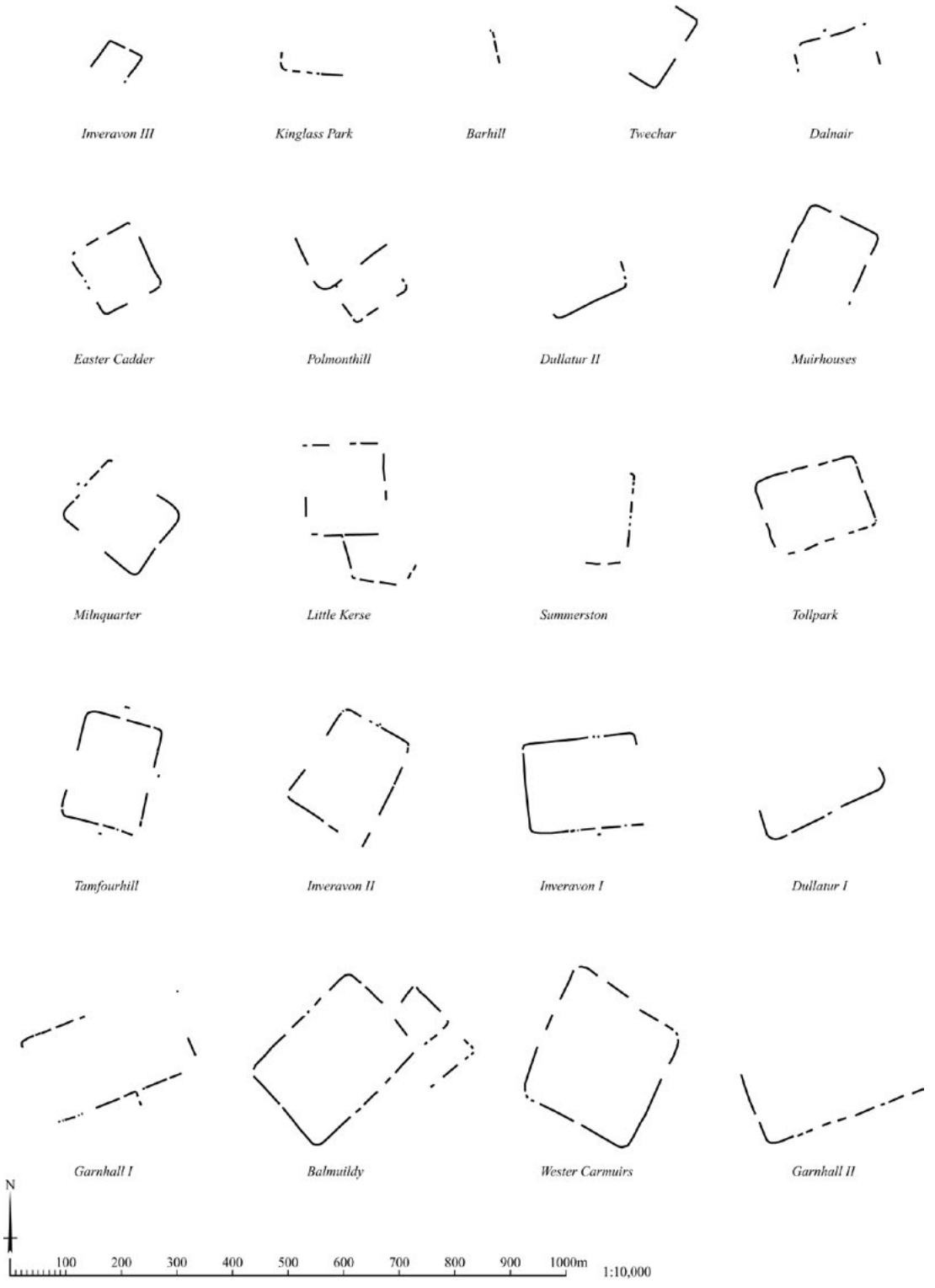

Figure 7.2 Outline drawings of all the temporary camps known along the Wall.

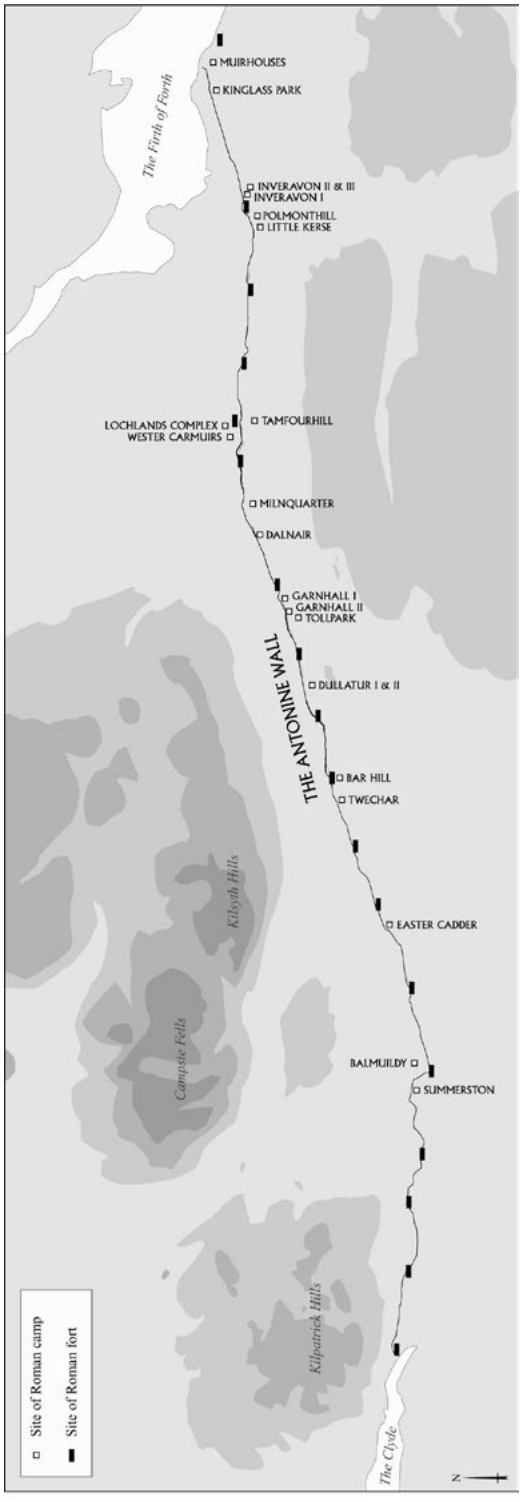

Figure 7.3 Map of the Wall showing the locations of the camps.

There can be no argument that the two occupy significant strategic locations on the Wall. Bar Hill is the highest fort on the Wall and a central point between the firths of Clyde and Forth, with excellent views in all directions (Figure 7.4). Next to the fort of Bar Hill is a 'rocky peak' known as Castle Hill with denuded fortifications believed to be of Iron Age date. This is the highest point on the isthmus, but is too small to have housed a Roman detachment. The site of the later fort, its immediate neighbour at Bar Hill, was the next best place, which is why it is likely to have been selected at an early stage to house the surveyors and planners for the Wall. To quote Macdonald and Park, 'even the uninstructed feels instinctively that this would be a position of vital importance to any military force attempting to hold the isthmus from the south' (1906: 2). Croy Hill lies close to the highest point on that hill, with good views along the line of the Wall including across to Bar Hill. If both enclosures were involved in the early surveying and planning of the frontier, then there must be other sites waiting to be discovered across the isthmus.

Immediately to the east of the fort of Mumrills, a small enclosure (at least 0.12 ha in area), potentially not dissimilar in size to the inner part of the enclosure at Bar Hill, has been discovered, although only one side and parts of the adjacent two have been recorded, the remainder destroyed by erosion of the scarp on which it is sited. Excavations by Anne Robertson suggested that it was Antonine but short-lived, and the suggestion was made that it may have held stores rather than troops (Steer 1961: 96); unlike Bar Hill and Croy Hill, it is not sited in a commanding position. At Inveravon, a curious small probable camp (Inveravon III) enclosing some 0.4 ha is recorded down the slope from the Wall, but again not in a strong position. It overlaps another camp possibly involved in the construction of the Wall although the chronological relationship between the two is unknown (Jones 2011: 232-3). Neither of these two candidates appear comparable with Bar Hill and Croy Hill.

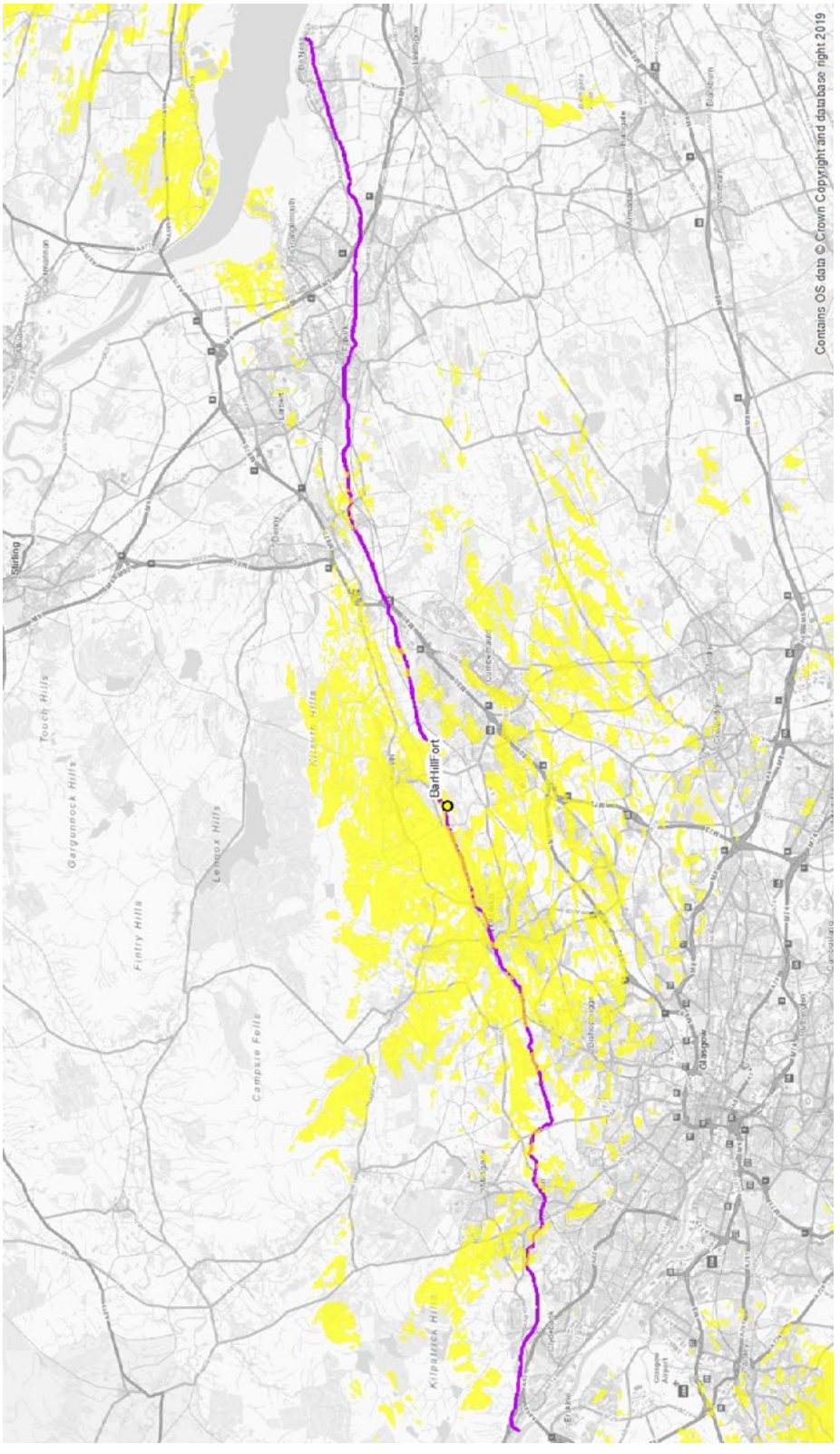

Figure 7.4 Viewshed analysis showing areas visible from the Bar Hill structure.

Castlehill, Bearsden

Some 11.5 miles (18.5 km) west of Bar Hill, the fort of Castlehill occupies a commanding position close to the western end of the Wall, around 118 m above sea level and noted as a 'conspicuous landmark' by Keppie (1980: 80). The existence of a Roman *castellum* of some sort on the plateau was recorded by antiquarians, but it was not until 1947 that its perimeter defences were recorded from the air (St Joseph 1951: 61). That there was also a fortlet here was suggested, particularly after John Gillam started the great fortlet hunt in the 1970s (Gillam 1975), with suggestions that a fortlet was located on the north-western side, immediately next to the fort (Keppie 1980), potentially echoing a similar situation at Duntocher to the west (Robertson 1957).

Detailed topographic and geophysical survey of the area in 2008 with further work in 2011 and 2019, has provided some details of the fort including a possible small ditched enclosure, just over 0.1 ha in area, in its north-west corner (see Hanson and Jones, this volume). The interpretation by the initial survey team was that this feature was not that of a fortlet, but they noted its similarities to the structures under Bar Hill and Croy Hill (Jones *et al.* 2009). Though the survey data has recently been reinterpreted as evidence for a Roman fortlet, questions remain regarding this interpretation and the suggestion of an enclosure similar to Bar Hill and Croy Hill needs more exploration.

Like Bar Hill and Croy Hill, Castlehill occupies a key position on the Wall. As the second highest fort on the line (after Bar Hill), it has an excellent outlook across the Clyde estuary to the west as well as good views north and along the Wall to the east (Figure 7.5). As well as being a key topographic location, it also marks a change in the building programme for the Wall, which has been recorded on the Distance Stones.

Distance Stones and the building of the Wall

The series of Distance Stones known from the Antonine Wall are unparalleled in the Roman World (Keppie 1998: 50-6). Recording how much of the frontier was built by each legion, Castlehill marks a change in how the lengths were subdivided and recorded. To the east of Castlehill, distances are recorded in *passus* (paces); to the west, in *pes* (feet) (cf. *RIB* I 2196 and 2197). Indeed, this western sector may run from just to the west of the Castlehill fort (Hanson and Maxwell 1986: 123; Macdonald 1934: 382), and therefore just to the west of the Castlehill structure.

Following earlier discussions by Macdonald (1934) and Keppie (1975), Hassall proposed that the Wall was constructed in three phases: the central section from Castlehill to somewhere just east of Castlecary; the short western section from Castlehill to the Clyde; and the eastern section from near Castlecary to the eastern end at Bridgeness (1983). The curious distances in the central section, with its 'distinctly odd division' (Keppie 1975: 154) of around 3666 paces on each Distance Stone was explained by Hassall as being a fairly even division of labour in the central sector between the three legions (II, VI and XX) deployed (1983: 263). He further suggested that this central sector may have been laid out and constructed first. If this were correct, then it places additional emphasis on any ancillary structures recorded between Castlehill and Castlecary. Given that Castlehill was clearly important in the measuring and building of the Wall, this places additional emphasis on the significance of the structure revealed through geophysics.

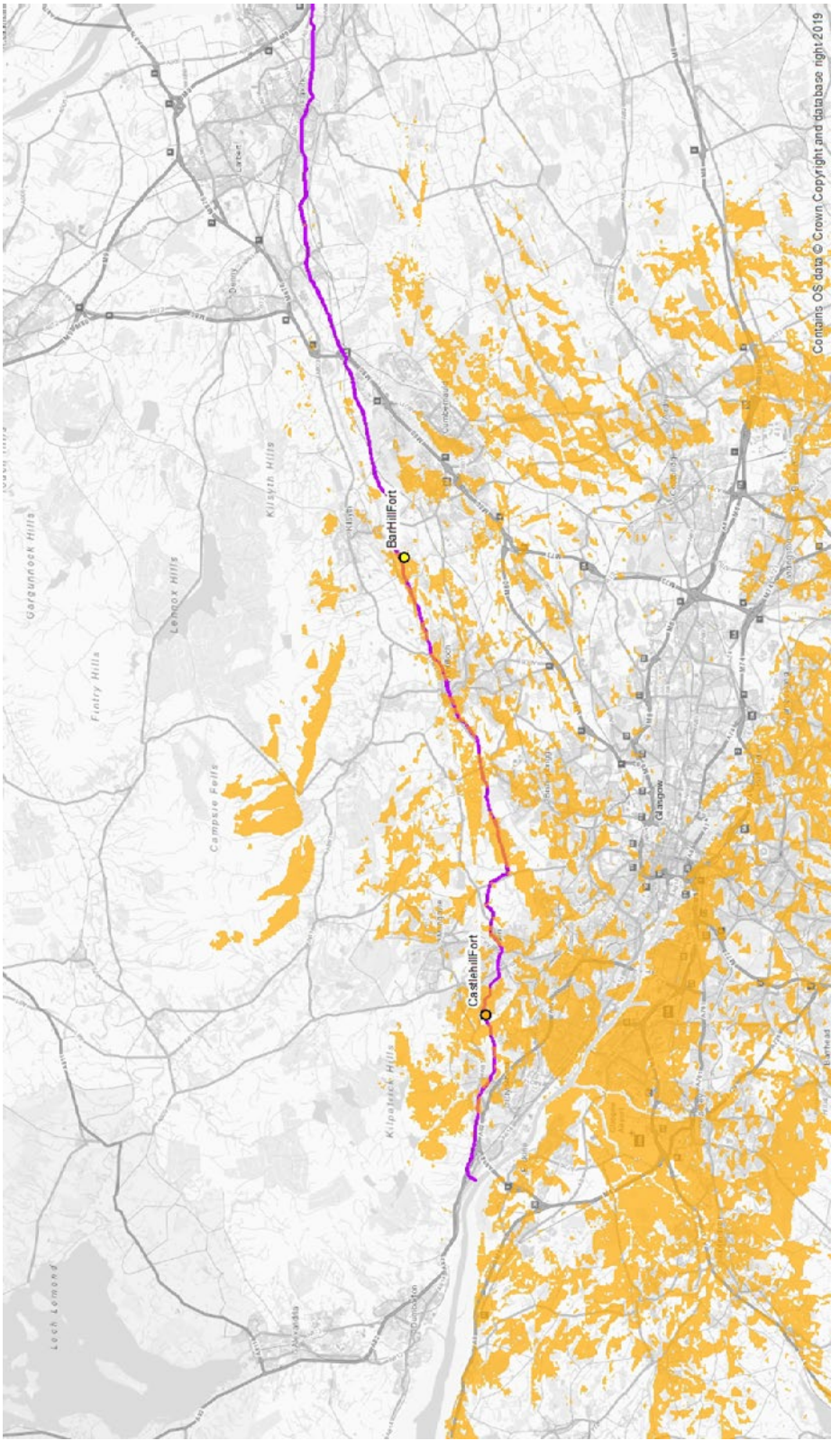

Figure 7.5 Viewshed analysis showing areas visible from Castlehill.

Regardless of which sectors were built in which order, it is likely that the route of the Wall and its structures was established before construction began. Poulter has argued that the location of all the forts on the Wall was established at an early stage (2009: 123), regardless of the speed with which they were built. Gillam's thesis (1975) that there was a change in the plan of the Wall, with 'primary' and 'secondary' forts, rather than modifications and sequencing in fort construction, has been challenged recently (Graafstal *et al.* 2015; Graafstal, this volume), and metrical analysis of the Distance Stones based on LiDAR survey has raised further doubts about it (Hannon *et al*. 2017). What these discussions serve to underline is the importance of understanding the curious structures at Bar Hill, Croy Hill and Castlehill.

Construction camps

In addition to these possible surveying camps, the suite of camps along the Wall has already been noted (Figures 7.2 and 7.3). The majority are around 2 to 2.5 ha in size but there is one group of four camps which are over 4 ha in size, around double the size of the rest. The location of these four is of interest: Dullatur I, Garnhall I, Balmuildy and Wester Carmuirs (note that Garnhall II on Figure 7.2 may post-date the Wall (Woolliscroft 2008: 167-8; Jones 2005)). Two (Balmuildy and Wester Carmuirs) lie to the north of the Wall. Had the Wall been in an advanced stage of construction, the act of crossing it from the north could have proved an obstacle. It is therefore assumed that these two, if they do indeed relate to the construction of the Wall, are early in the building sequence. In addition, that at Balmuildy lies only a short distance from the fort of the same name, itself considered to be early in the building sequence due to the provision of stone wing-walls constructed before the Antonine Wall rampart reached the fort (Miller 1922). Therefore, it is perhaps no surprise to propose an early camp at this location. Wester Carmuirs, also to the north of the Wall, lies close to the cluster of camps at Lochlands, an existing gathering ground where some of the camps are likely to be of first century date (Jones 2011: 257-62). It is a key nodal point on the Wall for a number of reasons, including proximity both to the road through the Wall at Watling Lodge and to the River Carron. The camp at Garnhall I, whilst situated south of the Wall, lies close to the fort of Castlecary, another fort with stone walls constructed prior to the arrival of the linear barrier (Christison *et al.* 1903). It is noteworthy that Balmuildy and Garnhall lie close to forts (Balmuildy and Castlecary) that have been proposed as very early in the building sequence for the Wall (Graafstal, this volume). Located south of the Wall midway between the forts of Croy Hill and Westerwood, the reason why the camp at Dullatur should relate to an early stage in the construction process is less obvious.

Conclusions

When considering the construction sequence for the Wall, all the evidence available should be deployed to tell the story, including the Distance Stones, camps, evidence for sequencing, topography and varied structures. Whilst it is not currently possible to prove that the curious incident of the structure at Bar Hill is a surveying camp, I hope to have demonstrated that it, together with its relatives on Croy Hill and possibly Castlehill, have a significant role in our understanding of the Wall and deserve further analysis. Whilst the enclosures at Mumrills and Inveravon III do not appear comparable, they may yet relate to the building and occupation of the Wall.

The evidence from Bar Hill, Croy Hill, possibly Castlehill and the likely early camps, supports Hassall's suggestion of an emphasis on the central sector (1983) and Graafstal's proposal of the importance of Balmuildy and Castlecary early in the building sequence (this volume). Taken together, these aid our interpretations of the planning and building sequence for the Antonine Wall.

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8. Monuments on the margins of Empire: the Antonine Wall sculptures

Louisa Campbell

Introduction

Monumental inscriptions recovered from along the line of the Antonine Wall are an exquisite body of evidence that provide invaluable insights into the Roman frontier. Referred to as Distance Stones, these sculptures are ripe for the testing of emerging non-destructive analytical techniques that cast new, and colourful, light onto sculptural reliefs. This work presents new dimensions that enhance our engagement with them and understanding of their material, cultural and strategic significance.

Non-destructive technologies have had a transformative effect on the analysis and recreation of colours from the Classical world to the extent that ancient statuary can now be digitally and physically re-imagined in authentic polychromy. These techniques are particularly attractive for exploiting the latent research potential of museum collections since they ensure the integrity of the objects under study. Portable X-ray Fluorescence (pXRF) and Raman Spectrometry have been used to undertake *in-situ* analysis to identify and recreate the pigments that would have originally brought life to the Distance Stones.

Polychromy on Roman relief sculpture

Colour plays a pivotal role in our modern perception of and engagement with the world around us. We experience colour in our every-day lives, in our landscapes, on our clothes, objects we interact with and jewellery we wear, in subtle shades of our hair and eyes or on the imagery we are exposed to through artwork, television screens or digital technologies. Thus, we do not live our lives in monochrome, we are immersed in colour as a sensory experience and subconsciously expect to see it wherever we look. This engagement with colour and the cultural significance associated with specific colours is evidenced since before the Upper Palaeolithic (Gage 1999). Yet, despite this, one can still open scholarly books or articles exploring the topic of colour and encounter only black-and-white images, if there are any images at all (Jones and Bradley 1999). If colour is mentioned in relation to ancient statuary, it is often treated as a fleeting footnote or cursory comment (Bradley 2009) without further extrapolation or consideration of either the cultural significance of the colours applied or the transformative effect they would have had on the viewers' engagement with objects.

And yet, colour is subjective (Jones and MacGregor 2002) and culturally defined. It has a transformative effect on the things to which it is applied and carries with it intrinsic symbolic and metaphoric significance and ways of being that transcend the purely visual as it connects to other senses such as sound, smell and touch (Young 2006: 174). Colour can also, for example, act as a medium through which people construct and express identities (Chapman 2002) or it can illicit an emotional response to representations of people, deities, scenes or things (Bradley 2009). Colour can define the social use of

Figure 8.1. Traces of pigment on the Parthenon Marbles, British Museum (© Louisa Campbell).

space, for example the reserving of specific colours for frescoes painted onto the walls of public spaces in Pompeiian homes, psychologically signalling the perception of a wealthy household (Allison 1992). Of course, individuals can also perceive colours differently, as those who are nowadays categorised as 'colour blind' will attest. We are most fortunate that historical accounts by Pliny (*Natural History* XXXV) and Vitruvius (*De Architectura* VII) survive as a rich resource for understanding the techniques used by Roman artists to prepare and apply pigments.

The practice of adorning sculptures with realistic colours did not originate from Rome, as evidenced from surviving pigments on the exquisite marble sculptures that once graced the pediments of the Athenian Parthenon (Jenkins and Middleton 1988; Jenkins 2001), now on display in the British Museum (Figure 8.1). Polychromy on Roman marble statuary is similarly well attested (Østergaard 2011; Happa *et al.* 2009; Siotto *et al.* 2015) and artistic representations of artisans applying pigments to sculptures confirm the practice (Abbe 2015: 177), though attention has focussed predominantly on marble and bronze sculptures (Liverani 2010; Formigli 2013). More recently, approaches that combine archaeological investigation and non-destructive techniques are providing a vehicle to re-imagine authentically how ancient sculptures would have appeared adorned in the vibrant colours of their original polychromy (Verri *et al.* 2010; Abbe *et al.* 2012; Brinkmann *et al.* 2017). Pigment identification techniques are well established (Siddall 2006; Eastaugh *et al.* 2008) and non-destructive analytical technologies are becoming more widely applied, such as on exquisitely preserved Pompeian frescoes (Piovesan *et al.* 2011; Merello *et al.* 2016).

Figure 8.2. Polychromy on marble relief from Nicomedia (reproduced by kind consent of the author: Sare Ağtürk 2015).

Polychromy on Roman marble relief sculpture is gaining attention (Del Monte *et al.* 1998), such as the exquisite marble frieze from Nicomedia (Figure 8.2) depicting Roma and Victory at the *adventus* procession with co-Emperors Diocletian and Maximian (Sare Ağtürk 2015; 2018). It is, however, rare for pigments to survive save for tantalising traces that hint at the original impact such scenes would have evoked in full realistic colour. Post-depositional processes, including acidic soils, environmental conditions and well-intentioned conservation and cleaning episodes by museum staff can have a detrimental impact on the survival of original surface treatments making their authentic reconstruction challenging (Abbe 2015: 174; Campbell forthcoming).

Despite it being the predominant raw material for Roman sculptures on the Empire's north-western frontiers, the practice of applying pigments to sandstone relief sculpture is not well understood. It is against this background that the monumental inscriptions recovered from the environs of the Antonine Wall serve as an excellent resource for investigating polychromy on Roman sandstone relief sculpture.

Antonine Wall monumental sculptures

The Antonine Wall (Figure 2.1) was commissioned shortly before AD 142 by the Emperor Antoninus Pius to define Rome's north-west frontier (Hanson and Maxwell 1986; Robertson 2015; Breeze 2006). The mural barrier is a turf rampart set on a stone base that stretches across central Scotland through the Forth-Clyde isthmus for for some 62 km (38 miles) and separated the Roman-controlled region to the south from the non-Roman north. Monumental inscriptions were recovered from along the line of the Wall and its environs (Keppie 1979; 1998) and many combine inscriptions and sculptural relief. They have been described as the most impressive and visually impactful body of epigraphic evidence recovered from any Roman frontier (Ferris 2000: 110-3; Breeze 2006: 69).

Carved from local sandstone, these monumental inscriptions are a rich textual resource and provide a graphic account of this frontier region (Ferris 2000: 111-13; Breeze and Ferris 2016) commemorating and memorialising actions and reputations of the Emperor and the dedicators in perpetuity (Woolf 1996: 26). They contain recognisable patterns of Roman epigraphic practice with dedications to the Emperor in prescriptive abbreviated Latin. The inscriptions also record the distance of the Wall constructed by each of the three legions stationed on the frontier (*Legio II Augusta, Legio VI Victrix and Legio XX Valeria Victrix*). Many also contain compelling iconography in relief, including depictions of Roman deities or graphic scenes of the Roman invasion and conquest of southern Scotland as well as the subjugation of indigenous northern warriors (Figure 8.3) that were accessible to anyone with Roman affiliation (Kampen 2016: 132) and to local non-Romans alike. It has been suggested that each sector was marked by four stones, two on the north side and two on the south side of the rampart (Steer and Cormack 1969: 125), but this would severely restrict the capacity for engagement with

Figure 8.3. Distance Stone from Summerston Farm (*RIB* I 2193; *CSIR* 137) (© Hunterian, University of Glasgow).

them. Perhaps more feasibly, they were mounted onto stone frames facing south at areas with high footfall for maximum audience exposure (MacMullen 1982; Woolf 1996; Keppie 1998: 53; Hannon *et al.* 2017: 14), possibly even along the Military Way (Campbell in preparation). With their combination of propagandist iconography reinforcing Roman dominance over the region (Keppie 1979: 4-5) and inscriptions memorialising events, the sculptures are powerfully evocative monuments that provide cultural context to mythological, religious or historical events (Strong 1961) from a tightly dated period around *c.* AD 142 (Bruun and Edmondson 2015: 19).

The application of colour would have enhanced the performance of these objects, providing a platform for transmitting and transforming complex information in different cultural contexts through an additional layer of meaning that transcends material properties (Miller 2005; Gosden 2006; Ingold 2007). It would have imbued them with vitality and significance in the interface of symmetrical entanglements between things and people (Hodder 2012; Conneller 2011). The intrinsic cultural value of the Antonine Wall sculptures should be considered in the context of their technological, material, conceptual, sensory, emotional and historical properties and their impact on the contemporary audience in original condition (Campbell forthcoming).

The Antonine Wall sculptures from Summerston Farm and Bridgeness (Figures 8.3 and 8.7) serve as exemplars for considering operational sequences, the *chaîne opératoire* (Leroi-Gourhan 1993), as well as the inherent properties of raw materials being modified to achieve desired results through the development or transmission of technological skills and traditions (Phillips 1972; Roux 2016). The apparently prescriptive application of colours to specific sculpted features would have complied with culturally ascribed traditions on raw material that Mediterranian artisans were less familiar with. The material properties of local sandstone vary greatly from those of marble that Roman sculptors were accustomed to carving and pigments would have afforded a better finish to the work with the added benefit of concealing imperfections (Bradley 2009).

Snapshots of colour have revealed themselves to curators and conservators cleaning the Antonine Wall sculptures, including when they were washed with distilled water, detergent or steam cleaned ahead of installation in new exhibitions (Phillips 1972; Close-Brooks 1981; Keppie 1998: 34 and 45). This practice evidently had a detrimental impact on the survival of pigments and other surface treatments which have become challenging to identify using sensitive non-destructive techniques, though it has been possible to extrapolate sufficient data to confirm these exquisite sandstone sculptures were originally adorned in vibrant polychromy (Campbell forthcoming).

pXRF and Raman spectroscopic analysis of the Distance Stones

A recently completed project, generously funded by Historic Environment Scotland (Campbell 2018), explored the applicability of *in-situ* non-destructive analytical techniques. The primary objectives were to determine whether any traces of pigments originally applied to the monumental inscriptions from the Antonine Wall are detectable and to facilitate their physical and digital reconstruction. Nine stones in the Hunterian Museum and one in the National Museum of Scotland were analysed to provide a comprehensive comparative dataset. Altar stones and a statue from locations on or near Hadrian's Wall, now in the Great North Museum: Hancock in Newcastle and Yorkshire Museum in York, known to have retained traces of pigment were also included for comparative purposes.

The pXRF analysis was undertaken with a Niton XL3t 900 SHE GOLDD Alloy Analyser, with a 50kV Ag X-ray tube, 80MHz real time digital signal processing and two processors for computation and data storage respectively. The material properties of the sandstone were challenging to mitigate since the surfaces were not flat and textures as well as colours naturally present in the sandstone were reflected chemically in some background levels of some elements, for example, iron. This technique has been widely used in the fields of archaeology and conservation science (Liritzis and Zacharias 2010; Chaplin *et al.* 2016) to provide non-destructive elemental analysis of pigments used in Antiquity. PXRF can classify pigments that are, for example, rich in iron or copper, but cannot identify the complete compound such as haematite (iron III and oxide) and azurite (copper carbonate mineral) or organic-based pigments such as madder (*rubia tinctorum).*

As with pXRF, portable Raman spectroscopic analysis is also becoming increasingly utilised in materials science (Castro *et al.* 2005; Bell *et al.* 2010; Bersani and Lottici 2016; Marucci *et al.* 2018). Using a handheld SciAps Inspector 500 with a 1030 nm laser, this technique enables progression from pXRF-determined elemental characterisation of samples to the provision of compound identification and identification of organic-based pigments such as madder. Raman has additional challenges to mitigate, such as some pigments absorbing source laser wavelengths causing large fluorescence backgrounds that obscure Raman signals or some materials being challenging to detect and 'fingerprint', such as diluted pigments on quartz-rich or heterogeneity of sandstone influencing results (Von Eynatten *et al.* 2003; Everett and Gillespie 2016). The applicability of the kit has not been widely tested in the cultural heritage sphere; for this reason, this project is both exploratory and revolutionary in terms of the analysis of Roman sandstone statuary since the technique has only previously been applied to Roman marble sculptures (Cosano *et al.* 2017: 191).

Summary of results

There is not the space to document fully the results of this research here (c.f. Campbell forthcoming), but in summary they confirm that a palette of pigments dominated by reds and yellows was originally applied to the Antonine Wall sculptures (Figure 8.4). A prescriptive formula for colours expected to appear in specific contexts on these Roman frontier relief sculptures is evident from work elsewhere (Jones and Bradley 1999; Bradley 2009) and desired shades have been achieved through mixing of materials, though it is not clear whether this is the result of selectivity or availability of some pigments. For example, traces of red in letters are relatively widespread on various types of Roman inscriptions, but the work reported here suggests pigments can derive from locally sourced ingredients. This is confirmed by the presence of madder and realgar reds in the lettering of the Antonine Wall sculptures as opposed to the deeper and richer red of vermilion confirmed in letters on Hadrian's Wall sculptures (Figure 8.5). This is not an unusual practice as evidenced by the mixing of organic dyes such as madder and indigo to produce a purple pigment (Clarke *et al.* 2005) or cinnabar and haematite extending the valuable and rarer cinnabar (Rozenberg 1997; Kakoulli 1997).

The results correspond with recent analysis of altars to Sol and Mithras at Inveresk where traces of red oxide and red ochre with yellow clay ochre were identified by light microscopy (Siddall 2016: 148). There a single particle of pink madder was also detected and considered to be unintended as a pigment, more possibly a contaminant from the artisan's workshop. Madder is an organic pigment undetectable by pXRF, but the visible reddish tint on many Antonine Wall sculpture letters suggests

Sample	Colour	Areas on Antonine Wall Distance Stones
	Minium (Red Lead)	Summerston - captives' chests, head, beard, thigh and cheek to depict blood; eagle beak Bridgeness - neck of decapitated warrior, fallen captive's shield; top frame and right pediment
	Red ochre	Summerston – rider's standard; N of Antonino; Bridgeness – rider's cloak;
	Madder Red	Summerston - letters
	Realgar	Eastermains – Letters; pelta rosette
	White Lead	Summerston – Victory's dress trim
	Orpiment	Summerston – Victory's dress (main body)
	Yellow ochre	Bridgeness – cheeks of rider and soldier

Figure 8.4. Colour palette for Antonine Wall sculptures

Sample	Colour	Areas on Hadrian's Wall Stone Altars
	Vermillion	Mithras altar I - name of dedicator (Lucius Antoninus Proculus) Mithras altar II – Mithras cloak; circular symbol on column
	Red ochre	Mithras altar II – left column Altar to The Matres – side column
	Azurite	Mithras altar I – inscription letters, except for dedicator's name
	Orpiment	Mithras altar II – background to Mithras' head; creases of Mithras' cloak

Figure 8.5. Colour palette for Hadrian's Wall sculptures.

a high probability for its use. It may have served as a more easily sourced alternative to vermilion reds expected to be seen in the inscribed letters, and has also been used as a red colourant in Pompeii (Eastaugh *et al.* 2008: 499). The Raman results on several letters on an Antonine Wall sculpture from Eastermains (*RIB* I 2185) supports this hypothesis.

As expected due to the lack of intervention from conservators or from cleaning, some of the results from Newcastle and York are clearer. Indeed, the Hadrian's Wall sculptures produced unexpected results. One of the Carrawburgh altars to Mithras (*RIB* I 1544) from Newcastle (Figure 8.6a) composed of arenaceous limestone, has high mercury in several letters and high copper in others combined with higher than average zinc and low levels of iron. This suggests the name of the dedicator, *Lucius Antoninus Proculus*, was depicted in a bright scarlet vermilion while blue pigment, most likely azurite, as opposed to Egyptian blue, *Caeruleum,* which is also copper-based, was used to paint the letters on the top and bottom rows (and presumably the other letters).

The second Carrawburgh altar (Figure 8.6b) (*RIB* I 1546) depicting a relief sculpture of Mithras also confirms the application of vermilion to the god's cloak as well as probably lead white background

Figure 8.6. Altars to Mithras from Carrawburgh, Great North Museum: Hancock. a. *RIB* I 1544 b. *RIB* I 1546 (© Louisa Campbell).

and a bright golden yellow background framing Mithras' head where hollowed-out sun rays would have reflected candlelight in the darkened spaces where this cult was practiced. High calcium and sulphur also confirm that a layer of gesso (calcium sulphate) was applied to the sculpture prior to painting. Some of these elements of colour were recognised at the time of excavation (Richmond and Gillam 1951: 37-38). No corresponding evidence was found for a similar practice on the Antonine Wall sculptures, though ongoing work will explore this further.

This significant finding confirms the negative impact of modern cleaning and conservation practices on ancient statuary, since the two Carrawburgh altars have not been subjected to intensive cleaning and show considerably better preservation of original pigments. This may also suggest the lettering of Antonine sculptures may have been painted solely in red, as has been noticed during cleaning of

the Summerston Farm sculpture (Keppie 1998: 34 and 45), perhaps elevating the status of legions charged with securing the Roman Empire's furthermost boundaries as the Emperor's designated representatives. Bold red lettering throughout would certainly have made these inscriptions easily legible in drawing the reader's eye and high lead in the A of Antoninus Pius' name AELIO on the Bridgeness stone (*RIB* I 2139) indicates the presence of bright red minium. This may have been used to embolden the emperor's name against a different red for the dedicators (Second Legion) – though it is equally possible that minium was used for all the lettering on this stone as no other clear evidence for pigments was recovered from inscribed letters.

A preference for shades of red pigment is further evidenced on iconographic features. Bright red minium (red lead) is present on the chests, beard, head, thigh and cheek of captives on the Summerston Farm relief sculpture (*CSIR* 137), probably to depict splashes of blood on warriors fresh from a battle with the Roman legions. This corresponds with similar features on the Bridgeness sculpture, where minium is evident on the shield of a fallen warrior as well as the decapitated neck of another. The latter remains visible, as does the red from iron oxide pigment applied to the rider's cloak and that of the individual on the far right of the sculpture (right panel). Intriguingly, minium is also present on the beak of the eagle on the right panel of the Summerston Farm sculpture, perhaps symbolising Rome feasting on the blood of her captive enemies (Figure 8.3). Minium is described by Pliny (*Natural History* XXXIII, 40) the 'brilliant colour of the kermes berry'. It was used by Roman artists to create splendour, light and luminosity (Bradley 2011: 97) and specifically for the depiction of blood and carnage (Pliny *Natural History* XXXIII, 36).

Yellow ochre is present on skin-coloured areas such as the cheeks of the rider, soldier and fallen northern warrior on the Bridgeness sculpture (*CSIR* 68), potentially confirming layering of colours to achieve realistic skin tones. It is likely that layers of ochres were applied to gesso here (now washed off after episodic cleaning) to give skin a life-like appearance, similar to the techniques used on the Copenhagen head of Caligula where layers of brown, red and yellow ochre with chalk were painted onto an undercoat of black burnt bone (Brinkmann *et al.* 2017: 50). This practice is further evidenced by the apparent presence of lead white, iron oxide (red ochre) and carbon black confirmed on the bare leg of the life-sized statue of Mars from York during this research.

The lustrous, golden-like yellow of orpiment has been applied to adorn the dress of the winged goddess Victory on the Summerston Farm sculpture, trimmed with lead white and possibly with splashes of red blood from the nearby indigenous captives fresh from battle. This is in line with Victory's depiction on Pompeiian frescoes, or the skirts of the goddess Roma and winged Victory on the Nicomedia relief (Figure 8.2) where colours are exceptionally well preserved due the sculpture's placement in the interior of an imperial cult building (Sare Ağtürk 2018: 416).

The primary material foci of this research, the Antonine Wall monumental inscriptions, have been challenging to analyse using non-destructive techniques that work more effectively on 'clean' heritage materials that retain visible pigments. It has, however, been possible physically and digitally to reconstruct colours that would originally have adorned these unique Roman sculptures. Despite the variety of pigments catalogued by Pliny (*Natural History* XXXV) and Vitruvius (*De Architectura* VII), it is not surprising to confirm that a restricted palette of reds and yellows dominated the repertoire of Roman artisans who painted these inscriptions and relief sculptures, with occasional hints of

Figure 8.7. Digital reconstruction of the Bridgeness Distance Stone (*RIB* I 2139; *CSIR* 68) by Lars Hummelshoj.

blue, white and black on the examples from northern England that will be published separately. This is not an uncommon practice and more exotic, less readily available, pigments defined by Pliny as 'florid', would have been restricted, which explains the Roman artisans' practice of mixing cinnabar with other minerals to extend its use. That Pliny's 'austere' category of pigments were commonly available and accessible across the Empire, including red and yellow ochres, carbon black, *terres vertes*, chalk-based whites and mixtures of these colours (Siddall 2006: 28) is, therefore, unsurprising in this context on the edge of Empire. The palette of colours on the Antonine Wall and other frontier sculptures can, therefore, be designated predominantly into Pliny's 'austere' categorisation that were capable of being locally sourced. The others, including orpiment and realgar, are rarely used and not locally available. These can be categorised as 'florid' and were most likely imported from other provinces.

It has been possible to reconstruct digitally an iconic scene from the Bridgeness sculpture using authentic colours identified from this research (Figure 8.7). The realistic representation of this sculptured scene was achieved by matching the pigments with pantone codes and taking account of experimental work confirming how the original pigments would have worked with the sandstone. Authenticity is preserved through the various shades of reds on the cloak and tunic of the rider, and bright minium red depicting blood on the fallen northern warrior's decapitated body and neck. Slight artistic licence has been taken with the colour of the cuirass which is depicted in bronze in line with representations of the Praetorian Guard on Musée du Louvre (Russell Robinson 1975: 147) and those recovered from a shipwreck near Cuea del Jarro dating from first-third century (D'Amato 2009: 42) or the striking digital reconstruction of a cuirass from the Athenian Acropolis (Brinkmann *et al.* 2017: 129). The bonze terminals of the rider's *pteruges* (defensive skirt made of strips of leather) have been similarly extrapolated from other evidence (D'Amato 2009: 102) such as a life-size sandstone representation of Mars at the Yorkshire Museum. The result is a realistic, and terrifying, image of warfare that served as a powerful propagandist tool simultaneously striking fear into the hearts of the indigenous population while evoking a sense of dominance for a more Romanised audience.

Despite the inherent challenges, it has been most rewarding to confirm that non-destructive in situ analytical technologies are incredibly useful in the field of materials science, particularly for the analysis of curated museum collections. Taking this a step further to reconstruct the original pigments applied to Roman sandstone statuary has been a valuable contribution to understanding and recreating how these sculptures would originally have been perceived and received by contemporary audiences. Such integrated and interdisciplinary approaches to the investigation of archaeological materials offer innovative routes for material culture studies which will be progressed during the next four years of a Fellowship funded by Historic Environment Scotland and the Lord Kelvin / Adam Smith Fellowship, University of Glasgow.

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9. Building an image: soldiers' labour and the Antonine Wall Distance Slabs

Iain M. Ferris

An academic legacy

As David Breeze and Bill Hanson have made clear in their introduction to this volume, all scholars studying the Antonine Wall and the remarkable series of 20 legionary distance slabs from the frontier owe a huge debt to Lawrence Keppie for his meticulous cataloguing of the slabs and their contexts of discovery (Keppie 1979; 1998; *CSIR*) and for his numerous insights into their meaning and significance (e.g. Keppie 1976). The sympathetic and clear display and interpretation of those distance slabs in the collections of the Hunterian Museum at the University of Glasgow was also down to his careful curatorship there.

Over the last 25 years I have referred to the slabs in a number of my books and papers: first concerning myself with the images of barbarians on some of the slabs and the role of such images in a process of Roman self-identification and self-representation (Ferris 2000); subsequently I have considered the unsettling beheading scene on the Bridgeness slab in the broader context of the aestheticisation of pain in Antonine art (Ferris 2006); I have also considered the significance of the depiction of classical-style buildings and structures on the Column of Marcus Aurelius, Trajan's Column and on some of the Antonine Wall distance slabs; and I have also made mention of the female figures, including victories, on some of the slabs and of the animal symbols of the different legions. The viewers and viewing of the distance slabs have always been considered in these studies. With David Breeze I have considered the significance of the unusual, perhaps unique, over-emphasis on military endeavour and achievement recorded on the slabs (Breeze and Ferris 2015). At present I am working on a book about work and identity in the Roman world and had been thinking about the Antonine Wall slabs in relation to this theme (Ferris forthcoming a). A future research project for me is likely to involve looking at the use of images more generally in the Roman northern military zone in Britain and, of course, discussion of the slabs will feature heavily in that study (Ferris forthcoming b). It might be thought that indeed there is now nothing left for me to say about the inscriptions and images on the distance slabs until perhaps more are discovered, but this is certainly not the case. Like a Graham Sutherland or Giorgio Morandi painting or sketch, the more you look, and the longer and more intensely you look, it seems to me that the more you will see.

Recording paces

In this present paper I intend to concentrate on the significance of the texts of the inscriptions on the distance slabs referring to work and labour, to physical things achieved, and will argue that the idea of work as an ideological concept was presented here along with the repetitious formula on the slabs as part of a strategy for conceptualising hostile space, demonstrating control of the frontier line and understanding conquered territory. I will refer to some of the artistic images on the slabs in passing, particularly on the large Bridgeness slab, but on this occasion images will not be the main focus of this study.

It was standard practice for the Roman army to commemorate its building work at forts with simple inscriptions on building stones, centurial stones, or dedication slabs. However, the three legions involved in the construction of the Antonine Wall frontier works, the Second, Sixth, and Twentieth legions, for some reason were given leave to commemorate their building work on the frontier in a much more elaborate way, with a serial programme of inscribed stones known to archaeologists today as legionary distance slabs. Twenty commemorative legionary distance slabs, mostly complete but a few fragmentary, have been recovered from the frontier so far to date. It is estimated that there were likely to have been sixty slabs in total (Keppie 1998, 53) making a unique concerted artistic expression of Roman conquest and military might. A pair of slabs is thought to have been placed at each end of each commemorated stretch of frontier works, one on the north face and one on the south. The construction of no other Roman frontier elsewhere in the empire is known to have been commemorated in this way.

The distance slabs are of a number of types. They are either plain, sparsely decorated, moderately-highly decorated, or highly-decorated, but each bears the same, almost identical and somewhat formulaic inscription, introduced by the names of the emperor 'Caesar Titus Aelius Hadrianus Antoninus Augustus Pius' and the title '*patri patriae*'-'Father of the Country', a formula followed on most of the slabs. The legion's name then follows with a record of their building work. The recorded lengths of built wall/frontier works vary. Again and again we see reference to '*per pedum.....fecit*' or '*fecit...per pedum*', that is 'completed..over a distance of....feet' (on ten slabs) or the distance is given in '*passuum*' or 'paces' (on seven slabs). The Twentieth Legion slab from Eastermains carries measurements in both '*passuum*' and '*pedum*'. Another exception in phrasing can be found on the Braidfield Farm Sixth

Figure 9.1. Antonine Wall legionary distance slab of the VIth Legion from Braidfield, Duntocher (© Hunterian, University of Glasgow).

Legion slab (Figure 9.1) and the Old Kilpatrick Sixth Legion slab which introduce the otherwise unique formula '*opus valli pedum*', that is it was specifically 'the rampart-work' measurement being presented here. Legionary symbols appear as decoration on many of the slabs and seven bear sculptural scenes of different sorts.

Distance slabs set up by the Second Legion which include precise details of lengths of rampart constructed (and possibly the ditch excavated) come from Bridgeness (*RIB* I 2139), the largest and most elaborately decorated of all the legionary distance slabs, recording the legion having built '4652 paces' of the Antonine Wall, from Carleith (*RIB* I 2204), recording a distance of '3271 feet', Summerston (*RIB* I 2193), recording 'a distance of 3666 ½ paces', Cawder (*RIB* I 2186), recording 'a distance of 3666 ½ paces', and Duntocher (*RIB* I 2203) '4140 feet'.

Of those set up by the Sixth Legion a slab from Old Kilpatrick (*RIB* I 2205) records '4141 feet', another from Castlehill (*RIB* I 2196) records 'a distance of 3666 ½ paces', as does a slab from East Millichen (*RIB* I 2194), a slab from Braidfield (*RIB* I 2200) 'a distance of 3240 feet', and the inscription on a slab from Eastermains (*RIB* I 2185) refers to '...thousand feet', with the actual number of thousand feet not having been carved on the stone.

Of the slabs set up by the Twentieth Legion two distance slabs from Old Kilpatrick (*RIB* I 2206 and 2208) each record the building of '4411 feet' (Figure 9.2), a third from Eastermains (*RIB* I 2184) records the soldiers building '3000 paces (and) 3304 feet', a slab from Castlehill (*RIB* I 2197) makes reference to 'over a distance of 3000 feet', as do two separate slabs from Hutcheson Hill (*RIB* I 2198 and III 3507), while an unprovenanced slab (*RIB* I 2173) records a detachment built frontier works 'over a distance of 3000 paces'. Another unprovenanced Twentieth Legion slab bears an inscription mentioning 'feet' but without the precise number having been inserted in the blank space on the stone (*RIB* I 2199). A now-lost slab seen at Ferrydyke, Old Kilpatrick (*RIB* I 2207) in the late 18th century was too worn for an inscription to be discerned, but it may have been another Twentieth Legion slab. To these can be added a stone from Arniebog (*CSIR* 84; Keppie 1998: 89-90) which is fragmentary and bears images but does not include the section which would have carried a panel bearing the inscription.

The kind of competition between the legions referenced in the slab inscriptions was probably a reflection of pride in one's own individual unit and not necessarily pride above and beyond being part of a larger organisation, the Roman army.

Thus 16 of the 20 legionary distance slabs known record precise building lengths, two are curiously incomplete, without the distances inscribed in the blank spaces on the stones. The two distance slabs on which the number of feet or paces had not been inscribed perhaps require some brief discussion. It has been suggested that either these slabs were never used, that they were duplicates surplus to requirements or that they were set up in position ready to have the lengths of building work added but that this was somehow forgotten. The latter explanation seems completely unlikely, as indeed does another suggestion that they were wasters. That the numbers could have been simply painted on remains a possibility (pers. comm. D. J. Breeze).

That the idea of work as an ideological concept with value was presented here for viewers is without doubt. Equally certain is the way that the repetitious formula for recording lengths of wall built on the slabs was also part of a strategy for conceptualising the frontier and coming to terms with

Figure 9.2. Antonine Wall legionary distance slab of the XXth Legion from Old Kilpatrick (© Hunterian, University of Glasgow).

understanding the newly-conquered territory. Of the 16 slabs recording lengths of building work the overall inscription has pre-eminence on 11 of them, while on the other five it might be thought that the presence of accompanying complex images in tandem with the inscriptions might have had the effect of relegating the importance of the formulaic inscription or even negating it. Far from it, it would appear.

Though the slabs undoubtedly formed a series they were not stylistically consistent. Each pair of slabs was very much site specific, physically placed on the wall on both sides of the same stretch of the built frontier referred to in the inscription. It would appear that four slabs marked each legionary length, two at each end, one on the south and the other on the north side of the rampart (Keppie 1998, 53). They marked points in a tamed landscape, the art and inscriptions together providing a way for the Romans and others to conceptualise the frontier as a whole entity and not as a collection of discrete places in a broad untamed landscape.

Conceptualising the Frontier

If we turn briefly to the Bridgeness distance slab (Figure 8.7), the largest and most highly-decorated of all the slabs, it would be of interest to sketch out what messages were being presented to viewers both through the images employed and the text of the inscription, assuming a visually-literate, Latin-reading viewer was involved. Of the twenty known slabs the Bridgeness stone is unique in another way, in that it would appear to have been intended to mark the eastern terminus of the Antonine Wall and thus might be thought to have been subject to a different ideological programme and purpose. Even if the images on the slab are associated with the universality of the Roman conquest here and the building of the frontier, the inscription is again legion specific.

The two main images consist of a scene of battle on one side of the slab juxtaposed with a scene of a religious rite being carried out on the other. The battle scene is particularly memorable in that it involves a beheading of a barbarian enemy. It could have represented a specific battle in the conquest or the war of conquest in general. It could have represented Roman imperial power and military might in general or specifically the might of the Roman army or of the Second Legion. It could have been intended to mean all of these in combination. The defeated and dejected barbarian was a common trope in Roman imperial art and here could have represented local tribesmen or the north-western barbarian enemies of Rome in general. The religious rite of animal sacrifice portrayed on the other side of the Bridgeness slab serves to contrast the blood sacrifice of barbarian foes with that of sacrificial animals. It is an image either of a sacrifice made at the start of the Scottish campaign or to mark its end. It could also possibly have been a portrayal of the closing rite for the formal dedication of the Antonine frontier itself. Generically, scenes of sacrifice in Roman art could also be used as signifiers of the piety of the emperor. In both the scene of battle and the scene of sacrifice representations of classical buildings appear, stressing both the materiality and superiority of Roman civilisation and once more probably the building prowess of the Roman legions. Pelta decorations, referencing metal fittings on Roman military equipment, flank the central panel bearing the detailed inscription in which the emperor is referenced and praised, and the Second Legion records its specific building achievement. Thus, even on the largest and most ideologically complex distance slab where universal Roman imperial tropes about power, piety, imperial achievement and Roman cultural hegemony might have been thought to take preference, the site-specific building of '4652 paces' of frontier wall was prominently announced as a conceptual prompt.

There would also seem to have been some element of geographical and spatial conceptualisation involved in the design of two of the three so-called enamelled copper alloy souvenir 'pans' or small bowls linked to Hadrian's Wall. These vessels, the Rudge Cup (Figure 9.3), the Amiens Patera, and the Ilam Pan are all considered by archaeologists either to have been 'the first souvenirs' of the frontier taken home by soldiers stationed there or by civilian visitors to the Wall (Breeze 2012) or to have been religious or votive items (Henig 2011). All of these 'pans' bear names of forts along the western part of Hadrian's Wall from Bowness on Solway to Great Chesters, their incision or scratching on the Ilam Pan being secondary to the vessel's manufacture: it must therefore be seen as a personalised item. Noteworthy though is an additional inscribed reference to *VALI AELI* - *vallum Aelium* or Hadrian's Wall - and to *DRACONIS*, presumably Draco, its commissioner and owner. However, on both the Rudge Cup and the Amiens Patera the letters forming the names of the forts are raised and therefore had been cast as an integral part of the vessel. On the Amiens Patera six forts on Hadrian's Wall are named in red enamel (Bowness-on-Solway, Burgh-by-Sands, Stanwix, Castlesteads, Birdoswald, and Great Chesters), each name on a simple diagrammatic representation of the fort as a square of coloured enamelling.

Figure 9.3. The Rudge Cup, Alnwick Castle (© Tullie House Museum, Carlisle).

Most interestingly the frontier is represented below by a red crenellated line for the Wall itself and for watchtowers. A similar crenellated line can be seen on the Rudge Cup where five forts are named, the same as on the Amiens Patera, with the omission of Great Chesters.

Thus the two cups used a small number of inscribed place-names to prompt the viewer to link up these site-specific individual fort names and the schematic depiction of forts and the crenellated wall, and thus conceptualise the whole frontier and its material enormity from otherwise fragmentary information. It is possible that there could have been some additional element of cosmological significance to the circularity of the design on the bowl, a specifically chosen field for images because of its link to metaphors for the passage of time. Whether or not this was the case, each of the 'pans' undoubtedly represented a map to be held in the hand and viewed for whatever purpose.

These examples of precise quantification of distance on the Antonine Wall slabs and sequential naming of places on the enamelled cups would appear to have been deliberate and significant in both cases. Being able to measure distance, to quantify the distance between one point and another, one place from another, particularly in a wild frontier zone, was crucial for the Roman army. The deployment of military surveyors using the *groma* reflected the need to record precisely in order to facilitate the creation of the frontier and an infrastructure to support it. Once the nature of space and distance could be measured it could then be understood and conquered.

To digress for a moment, I would like to consider some of the theoretical underpinnings of the work of the contemporary British artist Richard Long, perhaps the best-known exponent of what is known as Land Art. Long's art, not to my taste but interesting nonetheless from a conceptual perspective, has been likened to a kind of Nature Art by some academic commentators, conducted outside and concerned with natural materials. This tends to ignore the later gallery presentation of the works,

often present only in the form of documentation-photographs, maps, or text-or reconstructed gallery versions of outdoor works. Long's preoccupations with movement through landscape in straight lines or in circles and his trademark obsessions with distance and time mean that many of his works are created to commemorate arduous endeavour - long walks or hikes - in a way that situates this commemoration in the very landscape setting in which his movements took place. Art and setting are here one and the same. When he builds or sculpts outdoors, as in 'A Line in Ireland' of 1974, or brings natural materials indoors, as in 'Madrid Circle' of 1986, he is using his knowledge of local materials, stone in both these cases, a knowledge gained by walking and traversing the land to try to understand its natural properties and essence, to turn Nature into Culture. It is conceptual and theoretical, sometimes didactic, and sometimes ideological. The work would still exist without the busy, pedantic documentation but it would not resonate or engage. Many of Long's preoccupations and tropes were grounded in the same thinking behind the 1970s 'discovery' or rather fashionability of Australian Aboriginal art as manifested in the Papunya Tula Art Movement.

Long makes a conscious effort to commemorate his chosen places physically in some way, though it could be argued that they have not been chosen at random but rather with a view to being suitable for memorable commemoration. Nevertheless, he merges ideas about landscape, understanding, time, movement and distance in a way that can provide inspiration for interpreting past instances of the commemoration of specific historical interactions with landscape. The Roman legionary soldiers who conquered the territory that was to become the line of the Antonine frontier understood the natural characteristics of the land by moving across it, engaging in fighting there or in reconnaissance missions, surveying the line of the frontier and setting it out, and in building the frontier works. The local natural materials, soil, turf, timber and stone were utilised to build the wall, ramparts and forts: the very materiality of the frontier reflected its setting and its imposition on and disruption of natural space and traditional routes. The need to then fully and meticulously document and commemorate the creation of the frontier through a serial programme of sculptural and epigraphic works in the form of the legionary distance slabs was an unprecedented and unusual decision. The elegance and effectiveness of this strategy is clear; it was a tussle between the urge to reveal and the instinct to suppress. So deep was the shading of motive and consequence that it brought a sense of resolution, a feeling of closure. There was surely a kind of artistic inter-relationship at play here.

In all these cases - the Antonine Wall distance slabs, the Hadrian's Wall cups, Land Art, and Australian Aboriginal art - there is an element of the celebration of itineraries between fixed points, creating links, creating certainties and reassurance, defining spaces and boundaries within which ideologies could and did flourish. As Marcel Proust wrote in 1921 'distances are only the relation of space to time and vary with it.'

While Roman military building record stones are quite common in Roman Britain and throughout the empire, nothing strictly comparable to the Antonine Wall distance slabs is known. Most standard building records comprise an otherwise undecorated stone bearing a central inscription stating that such and such a legion or such and such a cohort or auxiliary unit built this. The need to provide any kind of precise quantification of just what was built is absent. The Antonine distance slabs record physical exertion on a precise scale whose end result was reflected in the completion of the frontier works. Other less specific references to the built environment on the Antonine Wall occur in the form of depictions of Roman-style buildings on three of the distance slabs, from Bridgeness, Hutcheson Hill, and Old Kilpatrick.

Figure 9.4. Soldiers engaged in construction work. Scenes XI and XII, Trajan's Column, Rome (© Iain Ferris).

In a Roman military context we can find a parallel to the lauding of Roman military building work, and then only in images rather than text, only on the decorated helical frieze depicting the Dacian Wars of AD 101-102 and 105-106 around Trajan's Column in Rome, built to honour the emperor after his death and to house his ashes. The number of scenes in which Trajan's troops chop down trees for building timber, build bridges, dig defensive ditches, cut turf and throw up ramparts, and build camps and fortifications is marked (e.g. Figure 9.4). Such scenes have been considered to act in contrast to those scenes involving light skirmishes with the enemy, full-pitched battles and extended sieges of Dacian fortifications. In other words the juxtaposition of scenes of *con*struction with those of *de*struction is a fully-formed part of the narrative political and ideological programme of the monument, just as it is argued that the precision quantification of military building works acts in a similar role on the Antonine Wall series of legionary distance slabs.

In a recent paper David Breeze and I have suggested that certain aspects of the decorative programme on the distance slabs and certain parts of the texts of the inscriptions stress, indeed almost overstress, the victory and successes of the emperor Antoninus Pius, the celebration of the army as a unit, of individual legions, and finally of the individual legionary soldiers (Breeze and Ferris 2017). As we suggested, the soldiers perhaps felt a need to 'see themselves' in these artworks and we looked for comparative evidence among some of the well-documented war memorials of the First World War.

The dignity of labour

In a world in which much of the hard labour was expected to be undertaken either by slaves or by animals it is difficult to get to grips with Roman views on the meaning of the concept of work, of work as a manifestation of an idea. A number of rather dismissive comments by Cicero in his *De Officiis* -

'On Moral Duties' - suggest that certainly among the elite in late Republican Rome there was a strict hierarchical view of the degrees of honour, of moral worth, among the professions and workers more generally. It is hardly surprising that Cicero viewed elite landowners and gentlemen farmers as being at the centre of moral superiority, while perhaps rather idiosyncratically he placed perfumers and dancers at the margins. Others railed against the taint of profit in trade and commerce in the same way that 19th-century aristocrats looked down on those without inherited money.

The inscription on the first-century BC funerary monument of Horatius Balbus, an elite citizen of the town of Sarsina in northern Italy, now in the *Museo Archeologico Nazionale Sarsinate*, suggests that personal prejudices against certain categories of workers ran side by side with class prejudices (Bond 2016). It reads:

> Horatius Balbus...gives burial places, at his own expense, to his municipal townsmen and other residents, except for those who have hired themselves out as gladiators, committed suicide, or pursued a polluted craft for profit...

A textual source which through repetition stresses the moral value of building things is the emperor Augustus' *Res Gestae*. The *Res Gestae* probably owed its form to the tradition of funeral *elogia*, orations and later more permanent memorial inscriptions detailing the dead man's virtues and achievements. If at times routine and monotonous in its listing of detail, the *Res Gestae* text surely reflected the spoken origins of the form and the hypnotic power of repetition. The three principal sections listing the buildings Augustus either built, completed after having been started by others, or restored demonstrate the Roman drive towards commemoration in posterity through architectural benefaction. That many of these buildings were temples also testified to the religious piety of the first emperor, a virtue that later was to become synonymous with the person of the emperor as a matter of course. Perhaps such a link could account for the mundanity of the recording of 'paces built' on the Bridgeness distance slab which otherwise displays images of Roman might and victory and sombre religious obeisance.

My forthcoming study of images of Roman artisans, workers, and other professionals centres on issues of identity and self-representation (Ferris forthcoming a), on pride in professional status as manifested in the creation and deployment of images of work and inscriptions naming jobs and professions. Despite some elite snobbery of the kind referred to above, Roman freedmen and women were able to celebrate their lives and work mainly, though not exclusively, through the medium of funerary commemoration, on stele and funerary altars in particular. This was a phenomenon in particular in Rome but also markedly so in the Roman towns of northern Italy and in Gaul and Germany. Shop signs depicting the product being sold or its production must have been common and at Pompeii we can see that these included signs in the form of paintings on the outside of the shop or workshop premises.

One of the most iconic freedmen funerary monuments in Rome is the huge tomb of the baker Marcus Virgilius Eurysaces outside the Porta Maggiore. Dating to *c.* 30-20 BC it is built in a form that incorporated representations of bread dough bins, the very form of the tomb announcing his profession to its viewers, as did the decorated friezes depicting workers inside a bakery. In the inscription on the tomb Eurysaces proudly and openly refers to himself as '*..pistoris redemptoris...*', that is 'baker, contractor.'

Another freedman entrepreneurial family who left behind a magnificent funerary monument incorporating scenes of work again reflecting their professional life was the Roman building contractors

the Haterii family. The reliefs from the early second century AD Tomb of the Haterii from the Via Labicana in Rome, now in the *Museo Gregoriano Profano* in the larger *Musei Vaticani* complex, are quite literal in their depiction of the work of the large and evidently very successful construction company run by the family. One panel depicts a huge crane engaged in building work, while on another we see a number of significant buildings which it must be presumed were built as commercial projects by the Haterii firm.

But outside of freedmen funerary contexts images referencing work, labour and physical endeavour are rare. Certainly in imperial art one can only suggest the decorative frieze on the entablature of the Forum Transitorium or Forum of Nerva in Rome, bearing scenes of women engaged in cloth production. Rather than being somehow straightforward in appearance or intent, this depiction of the story of Arachne and Minerva was specifically didactic, sending a clear message to any women of Rome who might view the frieze that transgression, whether against the gods or mortal authority, would most likely bring down some terrible punishment on the offender. In other words, this was a moral message linked to the imagery of work.

Ghosts in the present

I am very much taken with the concept of 'hauntology', as put forward by the French literary theorist Jacques Derrida in his 1993 book 'Spectres of Marx'. Obviously a portmanteau word, a funny play on words with regard to the idea of 'ontology' and 'haunting', hauntology is a term for describing temporal disjunction and harnessing nostalgia for a lost future. In the context of the Antonine Wall legionary distance slabs, we have nothing but traces as the full set of slabs is incomplete, but the patterns that emerge from following those traces suggest that the imperial programme that underwrote the text and images on the integrated series of distance slabs was primarily concerned with lauding the achievements of the emperor as commander in chief of the army, but that it had also chosen to valorise and heroise the legions and legionary soldiers themselves for the sake of ideological positions. Therefore the spirits of those soldiers were called forth in inscriptions, giving form to their future absence, the *elogia*-style repetition also suggesting the linking of those present (the viewers) to those from the past (absent and perhaps long dead).

The afterlife of the slabs, once the expansionist project represented by the Antonine frontier came apart, somehow accentuates and then distorts any reading of their meaning. In this afterlife they seem to deal with issues of family (the army), fracture, memory and grief, and a curious strangeness infuses the seemingly real, normal and banal message that they were originally intended to convey.

That 16 out of the 20 known legionary distance slabs from the Antonine Wall should have carried quantified details of the building work carried out by the legionary work parties of the different units involved in the project initially might not appear particularly worthy of note. However, as has been suggested above, the depiction of work in the Roman world and allusion to it in inscriptions should be considered as a social and cultural phenomenon and such a sustained programme of the precise recording of physical work undertaken to build the frontier works both situates the stones precisely in their contemporary present yet at the same time instantly places them in past time. This temporal disjunction, this playing with time, image, symbol and text, makes the distance slabs perhaps the most enigmatic and interesting artworks from the northern frontier zones of Roman Britain. The notion

of work as a political and ideological concept was starkly presented here in the form of a deliberately repetitious formula on the slabs for recording built lengths of wall as part of the imperial strategy for demonstrating absolute control of the frontier through an understanding of the psychogeography of the conquered territory. There will always be more to write about the distance slabs. One must simply seek and find cracks of possibility in the seemingly impregnable wall of the deadlocked academic present.

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10. New perspectives on the structure of the Antonine Wall

Tanja Romankiewicz, Karen Milek, Chris Beckett,
Ben Russell and J. Riley Snyder

Every edition of the Antonine Wall handbook by Anne Robertson, and more recently edited by Lawrence Keppie, starts with this intriguing quote from the biography of Antoninus Pius in the *Historia Augusta* (Robertson 2015: 13). It is worth considering the Latin quote and its direct translation here (*Historia Augusta*, *Antoninus Pius* 5.4):

> '*... per legatos suos plurima bella gessit. nam et Britannos per Lollium Urbicum vicit legatum alio muro caespiticio summotis barbaris ducto ...*'
>
> ('... through his legates, he waged multiple wars. For he defeated the Britons through the legate Lollius Urbicus, building another wall of turf, after driving away the barbarians ...' transl. T. Romankiewicz and F. Guidetti).

How this *murus caespiticius*, or turf (Latin *caespes*) wall, was made has long interested scholars of the Antonine Wall. Some of the very first scientific archaeological excavations undertaken on the Wall – those by the Glasgow Archaeological Society in the 1890s – were designed specifically to assess its materials and construction. These were published comprehensively and with an eye for constructional details in *The Antonine Wall Report* (GAS 1899). Since then, numerous excavations have been undertaken across and along the line of the Wall, recording various observations about its materials and building techniques but varying in detail depending on the nature of their enquiry. Piecing together the data from these various interventions is a difficult task but in 1974 Keppie published an important paper that still represents a milestone in Antonine Wall scholarship (1974). In 'The building of the Antonine Wall: archaeological and epigraphic evidence', Keppie assessed individual Wall stretches and recorded basic data for the stone base (i.e. the stone course under the earthen superstructure) and the ditch width, where they had been exposed. He also collated all information then available on the materials of the Wall's superstructure, whether of turf or clay (Keppie 1974: Table 1, 156-158). Keppie's work, and the observations made by the Glasgow Archaeological Society, underpinned what remains one of the most thorough discussions of the Wall's construction, that provided in William Hanson and Gordon Maxwell's volume of 1983 (1983a: 75-83). New data on the eastern part of the Antonine Wall was then added by Geoff Bailey in his data compilation in 1995 (1995: 596, 598). What all of this work shows is that the Antonine Wall was not simply another turf wall. Turf was certainly, in terms of volume, the most significant material employed – enough to justify the Wall's description as a *murus caespiticius* (Figure 10.1) – but the entire monument comprising all its architectural elements is better considered an earthen structure, with a key component of it also built in stone (Figures 10.2 and 10.3).

This paper, a tribute to Keppie's work on the construction of the Wall, is intended as a follow-up to his 1974 article, and takes a more architectural and geotechnical approach to the structure. In particular, we will focus on one key issue that the designers, builders, and those responsible for the upkeep of the

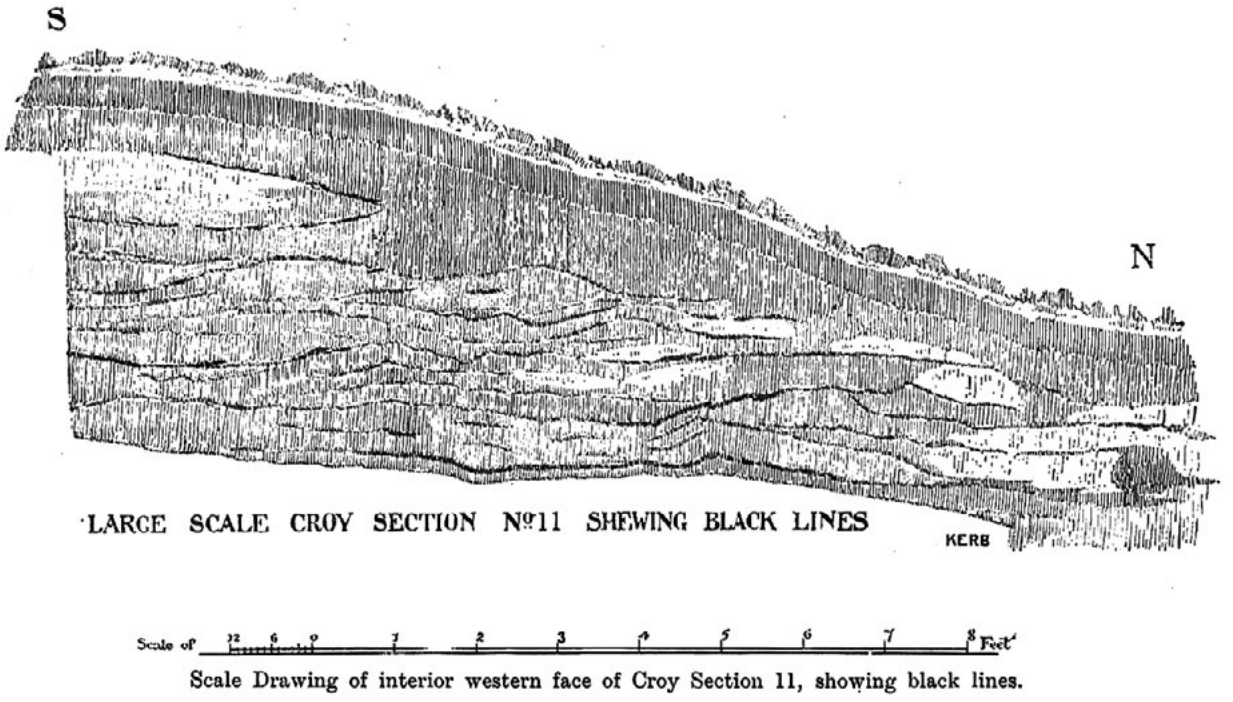

Figure 10.1. Section through Antonine Wall at Croy No. 11, central part, sector 5/6. Drawing shows turf layers continuing from facing (annotated "KERB") through to core and extending beyond southern trench edge; in the north these spread out beyond stone kerb (GAS 1899: 73).

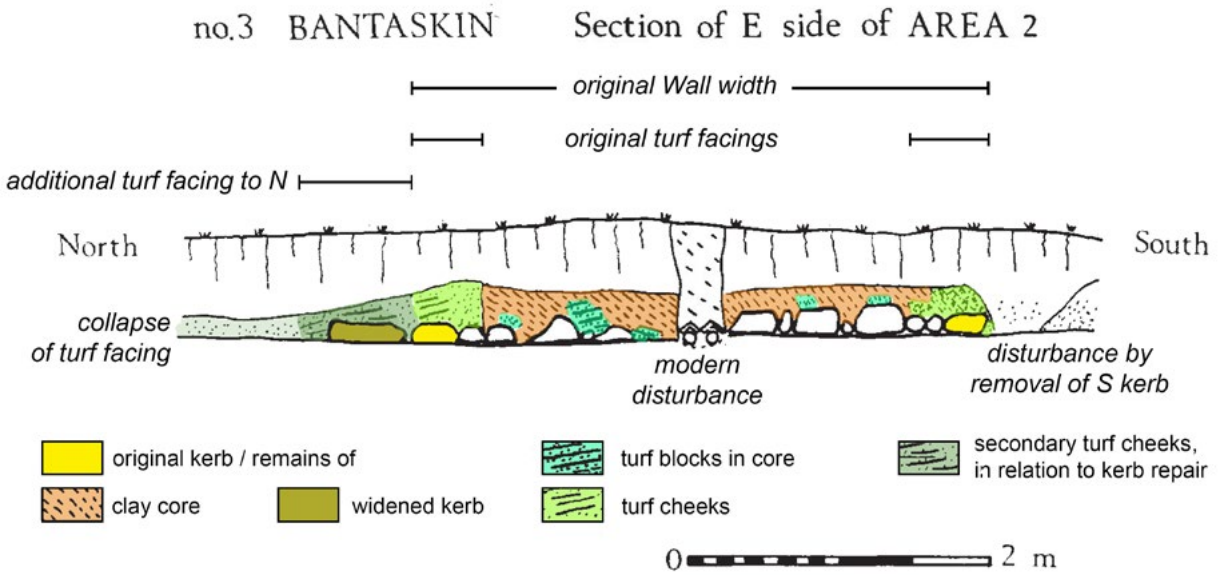

Figure 10.2. Section through Antonine Wall at Bantaskin, eastern part, sector 3. Earthen core of orangey buffy clayey soil, with original wall cheeks of grey lumpy clayish turves; later widened to north (drawn by T. Romankiewicz after Keppie 1976: 71, Fig 7).

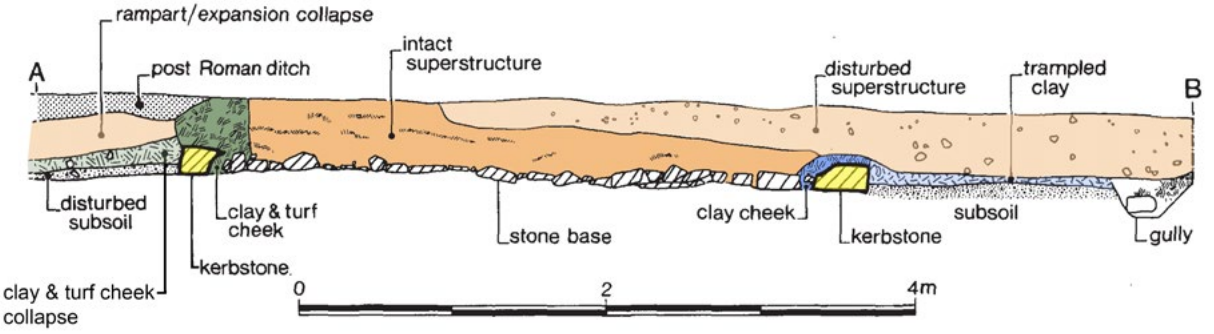

Figure 10.3. Section through Antonine Wall at Inveravon fort, eastern part, sector 1. Earthen core with clay and turf cheek to north and clay cheek to south (drawn by T. Romankiewicz after Hicks in Dunwell and Ralston 1995: Figure 5).

Antonine Wall must have wrestled with: how to manage moisture in an earthen structure the scale of the Antonine Wall in a region as wet as lowland Scotland. Moisture management is a vital aspect of building in earthen materials as water ingress will quickly lead to deterioration and collapse (Jaquin *et al.* 2009; on this point with regard to the Wall, see Hanson and Maxwell 1983a: 80). Even if well managed, earthen structures require regular maintenance to ensure their performance. In what follows, we will argue that the stone base of the Antonine Wall was specifically designed with moisture management in mind; we will then consider how the different materials of the superstructure would have responded to wet conditions, and what the evidence for repairs to the Wall reveal about its performance.

The stone base

The discovery of the 'two parallel lines of squared kerbs [...] with rough bottoming in between' by the Glasgow Archaeological Society near Dullatur (GAS 1899: 42) made it clear that the Antonine Wall had been built on a 'freestone base'. This base is an integral element of the Wall and is more consistent in its construction than much of the superstructure. It comprised dressed kerbs on either edge with a more irregularly-laid rubble fill (Figure 10.4). Built culverts, covered by large slabs, crossed this base at frequent, though not apparently regular, intervals. This general arrangement continues from the Forth to the Clyde, although there are differences in the types and sizes of stones employed: rubble or large cobbles, for example, at Hillfoot cemetery (Figure 10.4); smaller water-worn cobbles and pebbles at Inveravon and Bantaskin; sharply angular material at Bonnyside section No. 3 (Dunwell and Ralston 1995: 526; Keppie 1976: 69; GAS 1899: 111). These differences have been related to material availability but also to the practices of different work-squads (Keppie 1974: 155-156, 161; Keppie in Keppie and Breeze 1981: 238). Changeovers in work parties have also been cited to explain the varying width of the base, ranging between 3.9 m and 5.2 m, with 4.3-4.6 m being the standard (*DES* 1971: 18; Keppie and Walker in Keppie and Breeze 1981: 242; Bailey in Keppie *et al.* 1995: 610). A key point is that changes in the construction of the stone base do not coincide with changes in the superstructure and vice versa. Indeed Keppie proposed that there could have been 'a considerable lull, between laying out of the base and the assembly of the superstructure' (1974: 163).

It is worth revisiting what we know of the composition of the stone base. In terms of materials, the stone for the kerb was sometimes brought from beyond the local area. The Millstone grit used

Figure 10.4. Hillfoot cemetery, New Kilpatrick, western part, sector 9. Stone base of Antonine Wall with angular, dressed kerbstones and rubble core. Arrows mark position of stone drain, i.e. the culverts recorded at intervals (© T. Romankiewicz).

at Inveravon, for instance, or the coarse-grained (amygdaloidal) basalt lava at Seabegs No. 1 do not outcrop immediately adjacent to the Wall but a good kilometre or two away[1] (GAS 1899: 97; Dunwell and Ralston 1995: 526; compare Bailey 1995: 585). In general, however, those materials that were most easily sourced were used: directly available sandstones or derivatives ('whinstone' or 'freestone') (e.g. at Croy Hill No. 11, No. 12a and No. 12; GAS 1899: 72, 79 and 81). Occasional uses of locally available limestone, dolerite, or porphyry[2] are also recorded, for example at St Flannan's Church, Kirkintilloch, or Croy Hill sections No. 10 and No. 12 (GAS 1899: 69, 79; Speller and Leslie in Dunwell *et al.* 2002: 281). The kerbstones were apparently dressed on site, as chippings of the same material were found underneath the Wall core, for example at Inveravon (Dunwell and Ralston 1995: 526; compare Keppie 1976: 65), or for propping and levelling the kerbstones as at Callendar Park, Cadder, or Beancross (Bailey 1995: 585). The core materials of the stone base were either rounded cobbles or only roughly split but otherwise unworked stones.

The stone base was typically built as a single course only (Bailey in Keppie *et al.* 1995: 608), and excavators often comment on the carefully levelled cross-section, as for example at Bar Hill No. 2,

[1] British Geological Survey: http://mapapps.bgs.ac.uk/geologyofbritain/home.html; accessed 09/09/2019
[2] British Geological Survey: http://mapapps.bgs.ac.uk/geologyofbritain/home.html; accessed 09/09/2019

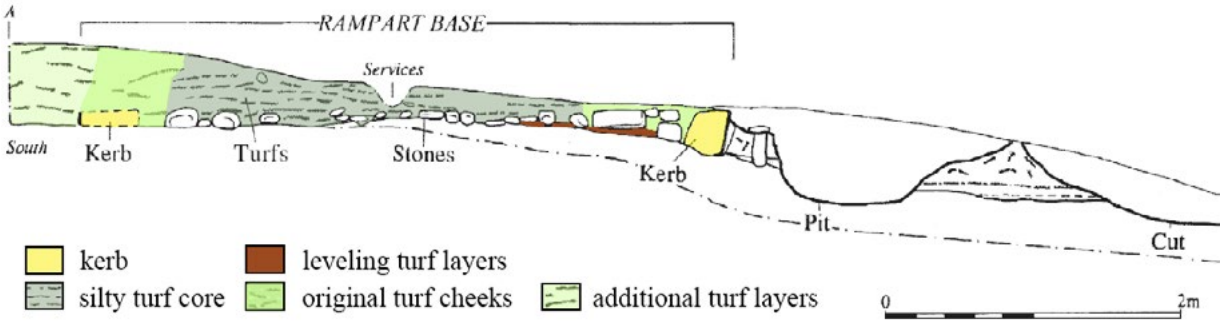

Figure 10.5. Section through Antonine Wall at St Flannan's Church, Kirkintilloch, central part, sector 7. Ground was levelled by turf layers underneath northern stone base (brown), demarcated by kerbs (yellow). Superstructure seems to consist of compressed turf core with narrow vegetation lines (grey), flanked by two less well-layered and potentially slumping faces to north and south (green). Additional stack of layered turf was placed in front of south kerb (light green) and has been interpreted as buttress to retain failing south turf cheek (drawn by T. Romankiewicz after Speller and Leslie in Dunwell *et al.* 2002: 283, Figure 17 (east facing section, Trench C)).

although individual stones also protrude upwards (GAS 1899: 43, 72; compare 92). At Balmuildy Road, however, such 'inequalities of the core [were] levelled off with a layer of yellow clay' (Keppie 1976: 66). Where two stone courses survive, Keppie proposes they relate to vertical steps built to negotiate slopes and to mitigate against slippage of the superstructure, as at St Flannan's Church, Kirkintilloch (Speller and Leslie in Dunwell *et al.* 2002: 281). At Carleith, the slope may explain the atypically wide stone base of up to 5.2 m (compare Keppie 1974: 155). The base in Douglas Park, Bearsden, was also widened to 4.5 m from the average of 4.3 m but the topographical location is complicated by modern landscaping (Keppie 1976: 74). Wider wall bases spread loads across a larger area and mitigate slippage or subsidence. Terracing underneath the stone base is known from Garnhall Farm, Area 1 (Keppie in Keppie and Breeze 1981: 238). Alternatively, like at St Flannan's, sloping ground was raised up by retaining the natural vegetation-covered ground surface in places, and adding further turf layers to create a level platform (Figure 10.5, in brown) (Speller and Leslie in Dunwell *et al.* 2002: 281). A 'grey sticky silt' was used at Balmuildy Road to replace the original ground surface (Henderson in Keppie 1976: 66), though this might itself represent the remains of a levelling turf course. Likewise, kerbstones protruding about 0.3 m above the level of the stone base core at Croy Hill section No. 8 would have helped to retain the superstructure material and bracketed the turf wall against bulging at its foot (GAS 1899: 65). Individually protruding stones would have had a comparable effect, increasing the friction and stability between superstructure and stone base. In this context the levelling clay at Balmuildy mentioned above may have been counterproductive. In these ways, the Wall construction could follow the undulating ground and soundly negotiate slopes along both its longitudinal and perpendicular axes. The picture that emerges is that considerable efforts were made to provide level cross-sections to counteract potential slippage or subsidence of the superstructure (Hanson and Maxwell 1983a: 81).

Base or foundation?

The stone base in itself was a massive logistical undertaking – but what was its primary function? The discovery of the stone base of the Antonine Wall in the nineteenth century coincided with the recognition of the turf component of Hadrian's Wall at Appletree, near Birdoswald (GAS 1899: 170-171; Breeze 2019a: 40, 45). In contrast to the Antonine Wall, the original turf and clay section of Hadrian's Wall, stretching

for 45 km west of the River Irthing to Bowness-on-Solway was only sporadically built upon a stone base (Simpson and Richmond 1935; Crow 2004: 120; Breeze 2019b: 12). Roughly built of cobbles, gravel, and some 'large freestones', which seemingly formed only a rough kerb, these were not laid as neatly as the stone base of the Antonine Wall (GAS 1899: 171). Cobbles or even timber strapping have also been found beneath fort ramparts in Britain, though these are again usually quite ephemeral and sometimes run under only part of the structure (Jones 1975: 74; Hanson and Maxwell 1983a: 80). Why the stone base was included in the plan of the Antonine Wall when it had not been used systematically for the turf sections of Hadrian's Wall remains a point of discussion (Breeze and Dobson 1972: 199; Breeze 1982; Hanson and Maxwell 1983a: 109-111; Breeze 2006: 71-74; Graafstal 2012; Breeze 2009; Breeze 2019a: 45, 48 and 64; compare Gillam 1975). Had the planners of the Wall learnt from Hadrian's Wall? Or had they learnt from other Roman fortifications in Britain, such as Slack, Templeborough, Old Church (Brampton), Throp, and Castleshaw II (see discussion in Richmond 1936: 191-192)? What benefits did the stone base provide for a turf wall? Structural and geotechnical analyses can provide some insights here.

From a structural point of view, the levelling function of stone bases is no doubt beneficial to reduce or eliminate lateral or overturning forces which cause sliding or slumping and possible cracking in the superstructure; what applies to modern brick walls with cement mortar applies even more so to a less rigid turf wall (British Standards Institute 2005). Even if the yielding properties of a turf superstructure result in uneven compression and hence amplify unevenness during its lifetime, maintaining a high construction quality in the early stages could have enabled improved performance in maturity. Levelling of the kerbstones for the Antonine Wall, however, would not have produced any additional retaining function: it is unlikely that kerbstones more or less level with the core could have braced the turf superstructure and thus resisted its thrusting forces at its base, especially since only a single, low and unbonded course was built. Only a vertically protruding kerb as evident at Croy Hill section No. 8, discussed above, could have achieved such retaining properties, but this construction detail was not applied systematically. The stone base does occasionally project beyond the edge of the superstructure, as on Croy Hill (GAS 1899: 78; Hanson and Maxwell 1983a: 108-110, pl. 6.1) or possibly at Tentfield (Robertson 1964: Fig. 5; see discussion below), but in general the kerbs of the stone base were flush with the faces of the superstructure and since the stone base only comprises one course of stones, it is unlikely to have been designed to function as a structural foundation, that is to spread a load over an area larger than its superstructure. The term 'stone base' should therefore continue to be used preferably to 'stone foundation'.

Drainage

While the stone base probably facilitated construction across topographically awkward areas, the fact that it was used for the entire length of the Wall indicates that it had a different primary function.

In 1983, Hanson and Maxwell argued that a principal purpose of it was to allow for the provision of built culverts, which would have prevented the build-up of water in zones where the Wall blocked natural drainage (Hanson and Maxwell 1983a: 80). This is a key observation. Pooling water seeping into the superstructure would certainly have weakened the turf material and promoted slumping. The culverts would have helped direct large quantities of water through and under the Wall's vulnerable superstructure. Indeed it is striking that when the turf and clay section of Hadrian's Wall was rebuilt in stone, culverts were inserted at regular intervals, a feature not found on the original stone section of the same structure (Breeze 2019b: 26).

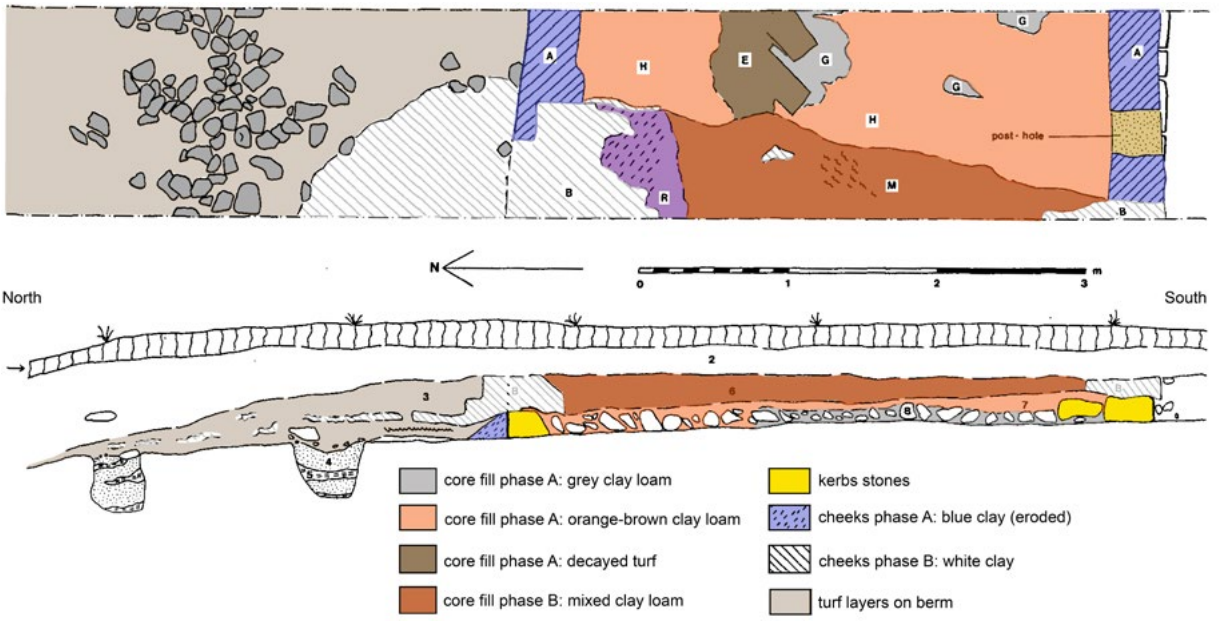

Figure 10.6. Plan and section through Antonine Wall at Callendar Park, eastern part, sector 2. Bailey's excavation in 1989 revealed a change in construction between an earlier (to east) and later phase (to west). White areas ('B') within the Wall were recorded as V-shaped spreads of white clay, possibly representing how these later cheeks were keyed into bulk material of later core ('R' and 'M'). This subsequently collapsed and spread to the north beyond Wall (drawn by T. Romankiewicz after Bailey 1995: Figure 3).

This argument can be taken further, however, for it was not simply the culverts that would have facilitated drainage. The drystone (i.e. unbonded) kerb and rubble base of the Antonine Wall would also have allowed ground water to drain through it without seeping into the superstructure above. This was a point that the 1890s excavators made, but one which has not been echoed since (GAS 1899: 127). This would have been particularly effective when the stone base was built on top of the ground surface and not cut into it, which appears to have been the normal situation. Even when the base was laid on surfaces stripped of their turf, the areas either side of it also seem to have been stripped, as at St Mary's (Bo'ness), Croy Hill section no. 11, Tentfield and Wilderness West (Bailey in Keppie *et al.* 1995: 608; Robertson 1969: 39; 1964: 193; Hanson and Maxwell 1983b: 229). Small details, as recorded in Bailey's section at Callendar Park (Figure 10.6), suggest that the kerbs in effect protruded above ground (1995: 583, 585 and 587; compare Figure 10.3 for Inveravon, Dunwell and Ralston 1995: 531). Bailey's section drawing shows a triangle of clay material (Figure 10.6, in blue), which had eroded from the earlier clay cheeks, demonstrating that the stone face had been exposed in the original construction. Even if the stone base was cut into the hillside along its rear side, the fact that it was unbonded would still have increased drainage, assuming the front kerb stood proud of the ground surface.

Rising damp and freezing

The slight elevation that the stone base gave the superstructure of the Wall would have had two additional benefits: it would have militated against erosion arising from splashing as rain struck the surrounding ground and it would have prevented moisture ingress through capillary rise. Modern

earth buildings address this issue by providing earthen walls with low-permeability stem walls (or stem walls with a damp-proof course), roughly 200 mm high (Easton 2007). Although this may seem a superior solution compared to a permeable base, an impermeable base can be detrimental if water is allowed to gather within the material above it. This is a crucial point for the Antonine Wall, which is rarely discussed. While the stone base certainly facilitated drainage of water from one side of the Wall to the other, it also increased drainage of water from inside the superstructure itself (see GAS 1899: 127). Indeed, this is the approach taken for large modern earthen structures, for example dams; a high-permeability base layer of gravel or sand is used to control water levels within the structure (Fell *et al.* 2005).

Dampness within a turf wall can lead to gradual degradation and eventual failure, as well as the more rapid slumping mechanisms discussed above. If not controlled, dampness in turf walls accelerates the rate of decomposition of the turves' organic matter by fungi and bacteria, causing the turf blocks to shrink, crack and lose structural integrity (Sigurðardóttir 2008: 13; Johansson *et al.* 2012). Moreover, water within turf walls can lead to freeze-thaw cracking and crumbling, resulting in structural instability and, ultimately, damage that requires repair (Vésteinsson 2010: 21; Sigurðardóttir 2008: 13). The reason for this is not simply the 9% volumetric expansion of pore water upon freezing. As air temperatures dip below freezing, the freezing front moves from the outer edges of a turf wall into its core and ice lenses form parallel to this front. If a turf wall is part of an open system, connected to the soils below where water is available to rise into the structure, and/or if unprotected so that water can enter the wall core from above, the temperature and cryosuction gradients (a water pressure gradient established between water and non-wetting ice bodies in the soil pore spaces) will draw available water towards the freezing areas. This will cause ice crystals to grow larger and the ice lenses to expand (Rempel and Rempel 2019). Upon thawing, these ice lenses leave cracks parallel to the wall surface, which cause fragments of soil to spall off, eroding the outer surface of the wall (Taber 1929; 1930; Walder and Hallet 1986; Hallet 2006). Factors that exacerbate ice lens formation, frost heave and frost weathering in soils include its particle-size, especially the quantity of small soil particles and voids like those found in clays, and the abundance of water, including water deeper down in an open soil system. Soils containing abundant organic matter, such as turves, also cool more slowly than more mineral-dominated soils. A slower rate of cooling, in which temperatures remain close to freezing for longer rather than rapidly dipping far below, exaggerates ice and frost damage, as do multiple cycles of freezing and thawing (Taber 1929; 1930; Rempel and Rempel 2019). The physical geography of the Antonine Wall in the cool Atlantic climate of southern Scotland, the use of clay and clayey turves, the abundant precipitation and the frequent freeze-thaw cycles typical of winters in the region, are all aspects conducive to ice lens formation, disturbance by frost heave, and hence the weathering and erosion of the Wall. The stone base, with its extremely coarse 'particle' size (i.e. its stones) and larger voids, would have acted as a moisture barrier, keeping the wall turves drier and protecting them from the damaging effects of both organic decay and frost.

Ethnographic evidence supports these modern geotechnical conclusions, but even in northern regions with long turf-building traditions, the practice of placing stone foundations or bases under turf walls developed only over time, as the understanding of why turf deteriorates improved. In the ninth and tenth centuries, turf was the dominant structural material for both buildings and boundary walls in Iceland and Norse Greenland, for example. Stones were commonly (though not always) used as a base, but for the outer turf facings of house walls only. This base did not span the entire width of

the walls (Ágústsson 1987; Ólafsson and Ágústsson 2004; Stefánsson 2013). Likewise, the numerous sections that have been excavated through Viking-Age and Medieval turf-built farm boundary walls and earthworks in Iceland have occasionally revealed stones within the wall cores, but no use of stone foundations or stone bases (e.g. Einarsson 1995: 87; Lucas 2009: 155-159; Einarsson and Aldred 2011; Milek 2011). Although many Old Norse written sources refer to turf wall-building in Iceland, none mention the use of stone bases. The earliest known written reference advocating the construction of stone bases for turf houses in Iceland is a paper from 1790 by Guðlaugur Sveisson, which suggested that stones should be used under the inner and outer turf faces of walls, and that the inner soil and turf core should be underlain by sand, gravel and/or stones. Regardless of this recommendation, walls continued to be constructed without full-width stone bases until the mid-twentieth century, although it became increasingly common to use multiple courses of stones, up to a metre high, under the inner and outer turf facings of house walls (Milek 2012; Edwald and Milek 2013; Stefánsson 2019). In 1904, Jón Þórlaksson published a newspaper article (cited in Stefánsson 2019: 48-50) arguing that the most important improvement needed for Icelandic turf houses were solid stone bases bound by mortar at the top. Today, turf-building practitioners and instructors, including employees of the Icelandic museums responsible for restoring or rebuilding old turf walls, commonly lay one or two courses of stones under the entire width of turf walls – even if the core of the walls being repaired did not originally have full-width stone foundations (Sigurðardóttir 2008; Hjörleifur Stefánsson, pers. comm.). Therefore, although full-width stone bases are not a traditional feature of Icelandic turf wall-building, they are now considered best practice. Based on the structural evidence discussed above, we can safely assume that the builders of the Antonine Wall considered the stone base to be best practice as well.

In summary, the stone base of the Antonine Wall seems to have been used to provide a level surface, to mitigate slippage, to provide a solid framework through which culverts could be threaded and to reduce moisture in the superstructure, which in turn slowed the rate of organic decay and limited frost damage and erosion. What it did not provide was the structural advantage of a foundation, since it could not distribute the load of the superstructure over a wider area.

Variations in the superstructure and their impact

The discussion above has focused on the stone base and its role in protecting the superstructure from the detrimental effects of excessive dampness. As noted already, however, the superstructure itself was not constructed in the same way throughout its length. East of Watling Lodge, in particular, various excavations have suggested the Wall was not made of layered turves but of an earthen core faced by turf or even clay cheeks (see Macdonald 1921: 22; Keppie 1974: 71, 78). We should not assume that these construction techniques were limited to this sector: there is, in fact, evidence for turf cheeks in the central and western sectors (a topic that will be explored in a future publication). Further investigation along the line of the Wall is needed to confirm the extent of this variation but from what is already known, it is evident that the builders of the Wall were provided with considerable flexibility in how they achieved the desired end results (compare Hanson and Maxwell 1983a: 111) – that is, a superstructure that was probably intended to have a particular profile along its whole length; indeed they had to have had this flexibility since the Wall traversed such a range of landscapes, with different soils and vegetation coverage (Robertson 2015: 17; Tipping and Tisdall 2005; compare Macdonald 1925; 1934: 86-87). This variation in building materials and techniques was not unique to the Antonine Wall: the builders of the original western section of Hadrian's Wall were also forced to adapt their approach, in most cases using

turf, in other instances compacted or 'beaten' clay (Simpson and Richmond 1935: 14); again, this would appear to be a response to the varied terrain through which the structure was built.

Regardless of the extent of these different modes of construction, and the actual structure of the Wall along its length, what can we say about their impact on its performance, particularly with regard to issues of drainage and erosion? While the variously constructed sections of the superstructure might have looked the same, would they have behaved differently long-term? Here we need to consider the building material properties of turf and clay.

i. Turf

In cool and wet northern regions, turves can be acquired from the tough, dense, tangled root mat that binds the topsoil together (referred to as the A-horizon). This renders it relatively easy to dig blocks or strips out of the ground with a spade and to custom-shape them with a blade (Sigurðardóttir 2008; Milek 2012; Huisman and Milek 2017). The high percentage of organic matter and air (voids) in turf also makes it light and relatively easy to handle – an important factor when building large structures (Steinberg 2004). Clay might have been easier to move over longer distances once loaded in baskets, but loading and unloading this heavy material would have put strain on the workforce (Shirley 2000: 97-98). Once stacked and buried within a wall, turf and clay also undergo different post-constructional changes. Turf is subject to desiccation, decomposition by fungi and bacteria, shrinkage of its roots and the upper 'litter' horizon of plant fragments, the loss of organic carbon and the compression of its abundant void spaces (Macphail *et al.* 2003; Macphail and Goldberg 2018: 99-125). To minimize post-constructional shrinkage, which can be substantial, it is common practice in northern regions to dry turves for buildings for at least two weeks (Sigurðardóttir 2008) and to ensure these are well trodden during construction. In other regions, however, turf is used 'fresh', i.e. within a day of being cut; indeed Vegetius suggests using turf for temporary camps, which would have been erected within a day (*De re militari* III.8; Welsch 1969: 14). Shrinkage through drying may have been less of an issue for temporary structures, or for such open systems as turf ramparts, compared to thinner, roofed-over house walls, but their turves will also shrink over time due to organic decomposition and further compression. This creates spaces within and between turf blocks that render them prone to cracking, crumbling, slippage and, ultimately, sagging, erosion and structural collapse (Vésteinsson 2010: 19; Milek 2012; Edwald and Milek 2013: 13-19). To promote the longevity of a turf structure, therefore, it is necessary routinely to monitor the coherence and integrity of the turf, and to replace rotten, crumbling or slipping turves frequently and quickly. In Iceland, where turf was the most common building material from the ninth to the twentieth centuries, and where it is still sometimes used for animal buildings today, turf in walls needs to be replaced at least every ten to 20 years, and turf structures need to be completely rebuilt every 50 to 60 years (Milek 2012; Vésteinsson 2010: 21 and footnote 1 for numerous historical references).

The geotechnical behaviour of turf is also relevant here. Turf is soil bonded by grass rhizomes and humic substances containing the voids described above. Placed near the bottom of a wall, these will become moderately compressed, whereas turves nearer the top may retain more voids. It is therefore reasonable to assume, but as yet unproven, that those turves near the bottom of the wall will be less permeable to water than those nearer the top, because the voids in the soil, especially channels created by roots and soil fauna, will be smaller. As it would be easier for water to pass through the upper material, it is also reasonable to suggest that water would collect in the lower turves, with higher

water contents nearer the core (as water can evaporate from the outer surfaces). This compression model is supported by the record at Croy section No. 2, where the horizontal dark vegetation lines (the A-horizon, see above) 'have a tendency to converge towards the centre, and curve upwards from the centre to the outside of the vallum' (GAS 1899: 50). The compression in the centre has been so dramatic that they 'unite in a dense mass' (GAS 1899: 50-51). At Bonnyside No. 3, a 'depression of the layers in the centre, from which they curve upwards towards the external face of the vallum' was noted, which was most pronounced on the south face (GAS 1899: 111-112). Higher water contents would reduce the load-bearing strength of the material, helping to explain why the stone base was so key. As noted above, the 1890s excavators already observed this: 'this base course of stone made the footing of the wall firmer, drier, less liable to subsidence and bulges ... [and] served to allow the water in the vallum to pass down through it ..., but it must also have prevented the vallum from gathering damp from below by direct contact with the soil.' (GAS 1899: 127).

ii. Clay

Clay, compared to turf, comprises nanoscopic particles whose structure is dominated by material electrostatic and hydrodynamic properties (Hillel 1998: 75-97). This means for natural clayey soils, which comprise aggregations of clay and other (larger) particles, it is important how these structures are arranged because this affects how easily water can move through them. One way to reduce the hydraulic conductivity of clayey soils is to break down these structures, significantly narrowing what pore spaces remain, through the process of puddling. Bailey proposes that the clay used in the cheeks he identified during the Callendar Park excavations was extracted locally, thrown between wooden shuttering and 'puddled *in situ* by soldiers tramping up and down on the encased material' (Bailey 1995: 586). However, puddled clay is mixed and kneaded with water into a plastic state and needs to be kept wet; once it dries out it is highly susceptible to cracking (Hillel 1998: 366). Puddled clay, therefore, could not have been used to build load-bearing elements. It is usually used to line basins or canals, as it was in nineteenth-century Britain, and to form the cores of earthen embankments (Brandt *et al.* 2016: 165). If the clay used in the Antonine Wall was puddled, then it would have to have been applied in a plastic state, patted onto the exterior of the core rather than built up in the form of cheeks. In this context, Bidwell and Watson have made an important observation on Hadrian's Wall (1996: 19), where the clay material found in the core of certain sections of the stone wall is often described as 'puddled' (e.g. Daniels 1978: 16). This is a terminological error. In fact, as they note, the clay found at Denton was not puddled; instead it retained some brown silt material suggesting that it had not been processed following extraction and had simply been compacted by treading (Bidwell and Watson 1996: 19). In the turf and clay section of Hadrian's Wall, Simpson and Richmond also only ever refer to 'beaten clay', and not 'puddled' clay (1935: 14). In fact the clay used in the cheeks at Callendar Park on the Antonine Wall was probably also simply compressed and not actually puddled (see Bailey 1995: 586). This clay could have been mixed with fibres to create a form of cob, packed in place between temporary shuttering – a technique referred to as shuttered cob or *bauge coffrée* in French scholarship (Cammas 2018: 170-171). Alternatively, a moist (though not wet) clay-rich subsoil could have been packed between shuttering in the same way as the brickearth walls of Roman London (Perring and Roskams 1991: 67, 78-80). However, too little survives at Callendar Park to be sure about the exact materials and construction technique used. It is also not clear how a construction of a mixed earthen core, presumably compacted, with clay cheeks on either side would have fared structurally (see Figure 10.6). This is a question that will require further analytical testing to answer fully.

If the clay used on the exterior of the Antonine Wall was genuinely puddled, and not simply compacted to form cheeks, as seems more likely, then it might actually have had a detrimental effect on the superstructure itself. Building upon the assumptions that turf permeability reduces with compression and puddled clay materials have even lower permeability values than the turves, then applying puddled cheeks to the superstructure of the Antonine Wall would have made the overall construction more resilient to water ingress from outside. Their low permeability would have protected a more absorbent turf core from rainfall and splashing water. However, such a clay layer with low permeability would also have prevented any water already inside the wall core from escaping. Water trapped inside the core or which entered via rising damp or from above would potentially have built up within the superstructure and caused damage to the cheeks and the turves in the core, such as the spalling off discussed above for frost damage. Compressed clay cheeks, in contrast, would have allowed some permeability for evaporation while also providing limited protection from external water; it would not have sealed the core of the superstructure, but this would not have been desirable.

Despite the ability of clay cheeks to protect a more absorbent core from rainwater, their surface would nonetheless gradually deteriorate under direct rainfall, which would remove loose particles from the wall face. Such fine erosion of clay cheek surfaces has been recorded at the southern rampart of the small fort at Inveravon in the form of a very fine clay deposit (Dunwell and Ralston 1995: 547). Similar evidence can be seen in the material eroded against the northern kerb at Callendar Park (Figure 10.6, blue triangle). Exposing the cheeks to wetting and drying cycles would additionally degrade the material due to differential shrinkage and swelling (particularly if combined with freezing and thawing cycles, as previously discussed). Exposed clay cheeks would not therefore have had a particularly long service life and on any structure designed with faces of this sort, a regular programme of repair and replacement would have to have been planned. Those sections of the superstructure of the Wall built in solid turf or out of turf cheeks and a turf core had a clear advantage here. A living grass cover on the top of the superstructure would have provided some protection from rainwater ingress. Likewise, turves at the outer surfaces of the cheeks could have continued to grow, providing further protection. Re-growth is not guaranteed – in Iceland, where turves are still used for construction, it is often patchy, especially on the sides exposed to the prevailing wind – but any additional grass coverage would have provided some defence against erosion. The only way that clay cheeks could have been made more durable against moisture impact would have been by providing them with a covering of some sort. Clay-based building materials, when – and this is a key point – protected from rain and rising damp by stone plinths and overhanging roofs, dry very hard and need little maintenance for decades (Minke 2006). Even Vitruvius, who rarely mentions earthen materials, notes that mudbrick walls perform well if properly roofed (*De architectura* II.8.16). Suitably protected clay cheeks, therefore, could have lasted well beyond the ten to 20 years noted above as typical for turf structures. It is difficult to see how these clay cheeks could have been protected except with some form of built cover on top. However, we know little about arrangements along the top of the Wall and indeed some argue there was no walkway along it (Hanson and Maxwell 1983a: 83; Breeze 2006; compare Bailey 1995; Robertson 2015: 18). Whether the Wall head was accessible or had a construction on top would also have had structural implications, and the stability of such a reconstruction remains to be tested.

In summary, the turf sections of the Antonine Wall would have been vulnerable to dampness, but since slightly raised on the stone base, which provided drainage and militated against rising damp and frost damage, these could have had a lifespan of 50 to 60 years, as noted above, if regularly maintained.

Cheeks, in either clay-rich turves or clay, might have had some benefits in terms of water management, potentially protecting the core from direct and indirect rainfall. However, they are also likely to have slowed moisture loss from the core, especially when made in compacted clay. Clay cheeks, in particular, would have been vulnerable to erosion themselves and would have needed regular repair unless they were in some way covered. So either these cheeks were left open to the elements and had to be regularly repaired, which is perhaps the most plausible option, especially in light of evidence for collapse and repair (discussed below), or they were protected in some way and so would have had a much longer lifespan. It is interesting to note that clay cheeks are not found in other large-scale Roman structures post-dating the Antonine Wall, which may suggest that this construction was not quite the ideal solution.

Maintaining the Wall

The above observations highlight a key aspect of the construction of the Antonine Wall of which we need to be aware: that sections of it would frequently have been taken down and rebuilt, when and where alterations or repairs were necessary. As building materials, turf, clay and other earthen mixtures are extremely vulnerable to erosion and decay, but at the same time extremely versatile because they are easily shaped and, unlike stone or wood constructions, do not require individual components to be tied together (Minke 2006; Sigurðardóttir 2008; Friesem *et al.* 2017). This means that repairs or alterations can be done more frequently and in a piecemeal fashion. It would take little time or effort to remove sections in need of repair, to rebuild or add sections, to create or block passageways through the Wall, or to add an additional facing to support a slipping or eroding front (for discussions of turf constructions, see Vésteinsson 2010: 31; Edwald and Milek 2013: 13-19; for discussions of mud and clay constructions, see Minke 2006). At various points along its length, there is evidence that the faces of the Antonine Wall did require continual attention and, in some cases, substantial repairs (see Macdonald 1911: 398; compare Keppie 1976: 75-76 in relation to the widening of the stone base).

In the turf sections of the Wall, individual turves bulging beyond the line of the kerb of the stone base were noted already by the Glasgow Archaeology Society and attributed to distortion caused by the pressure of earth above and military movements (GAS 1899: 127). A re-assessment of section No. 11 at Croy corroborates this observation, linking the protruding turves to accidental slippage rather than to a deliberately built extension (see Figure 10.1). At St Flannan's Church, the material in front of the southern turf cheek (Figure 10.5, light green), seemingly much better layered than the turf cheek above the kerb, could well represent turf laid against a failing original face. At Tentfield, Robertson inferred repairs or slippage seen in the form of regular turfs stacks recorded in front of the original cheeks (Figure 10.7). She admitted that it was hard to discern whether these were deliberately layered and thus constructed as cheeks or simply slipped from the superstructure above. While the first cheeks had their footpoints bracketed by the kerb, i.e. the kerb would have protruded, Robertson's record drawings suggest that the second cheek was carefully built on top of the kerb stones and against those original turf cheeks, presumably to counteract their sagging outwards at the front and rear of the Wall (Figure 10.7) (see Robertson 1964: 193, Fig. 5).

Some of these repairs necessitated alterations to the stone base, as noted in section No. 11 at Croy Hill. Robertson's re-opening of this section revealed an earlier stone base at about 0.3 m below the exposed main stone base and projecting *c.* 0.6 m beyond the northern face of the Wall. This lower

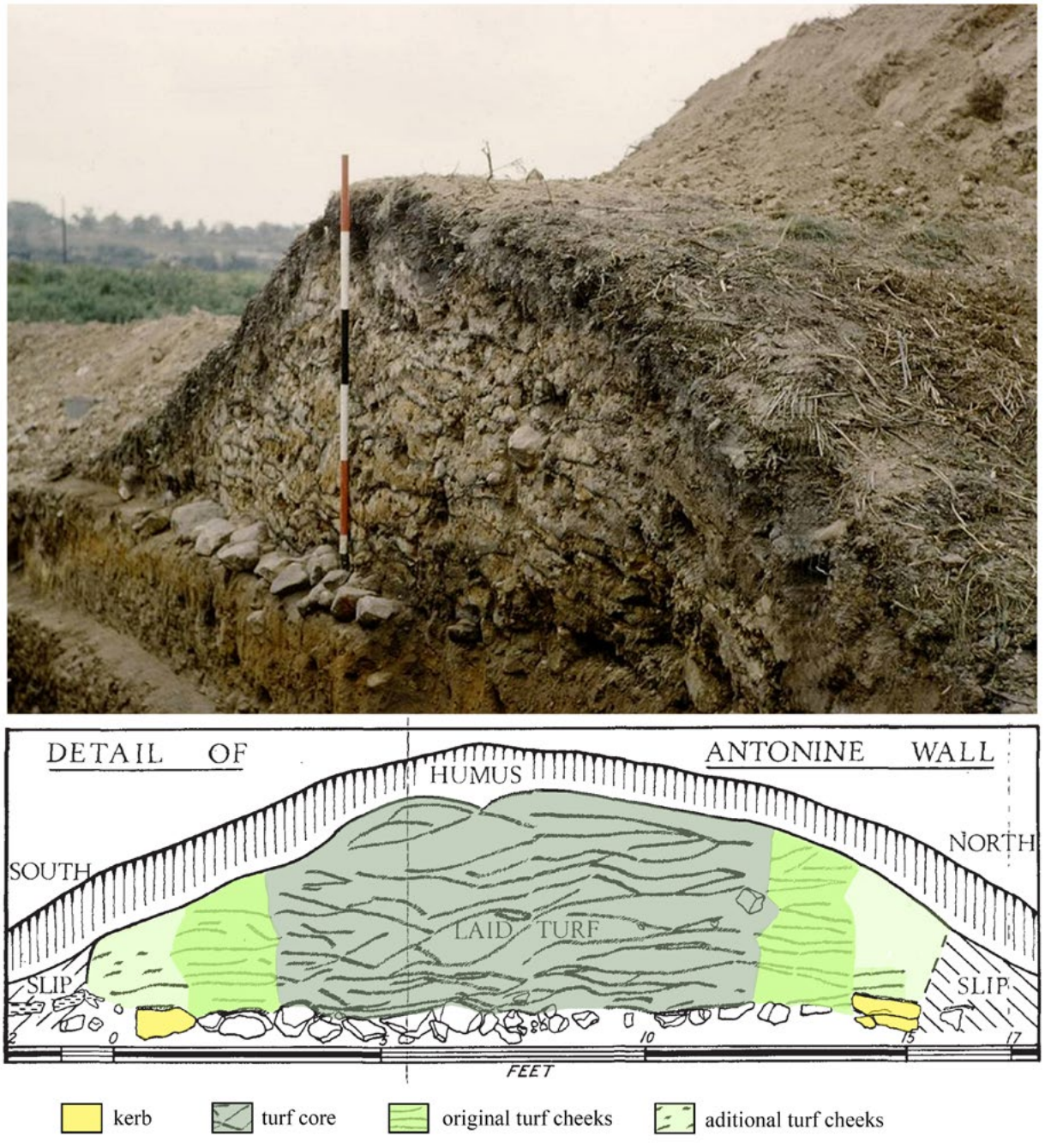

Figure 10.7. Section through Antonine Wall at Tentfield, central part, sector 3 (photograph and drawing). Turf core (grey-green) flanked by original turf faces to north and south (mid-green), these were contained by kerbstones (yellow). An additional turf face was added to north and south, on top of kerbstones, with potentially some later slumping to south (Photograph by A. Robertson, ©Crown copyright Historic Environment Scotland; drawn by T. Romankiewicz after Robertson 1964: Fig 5).

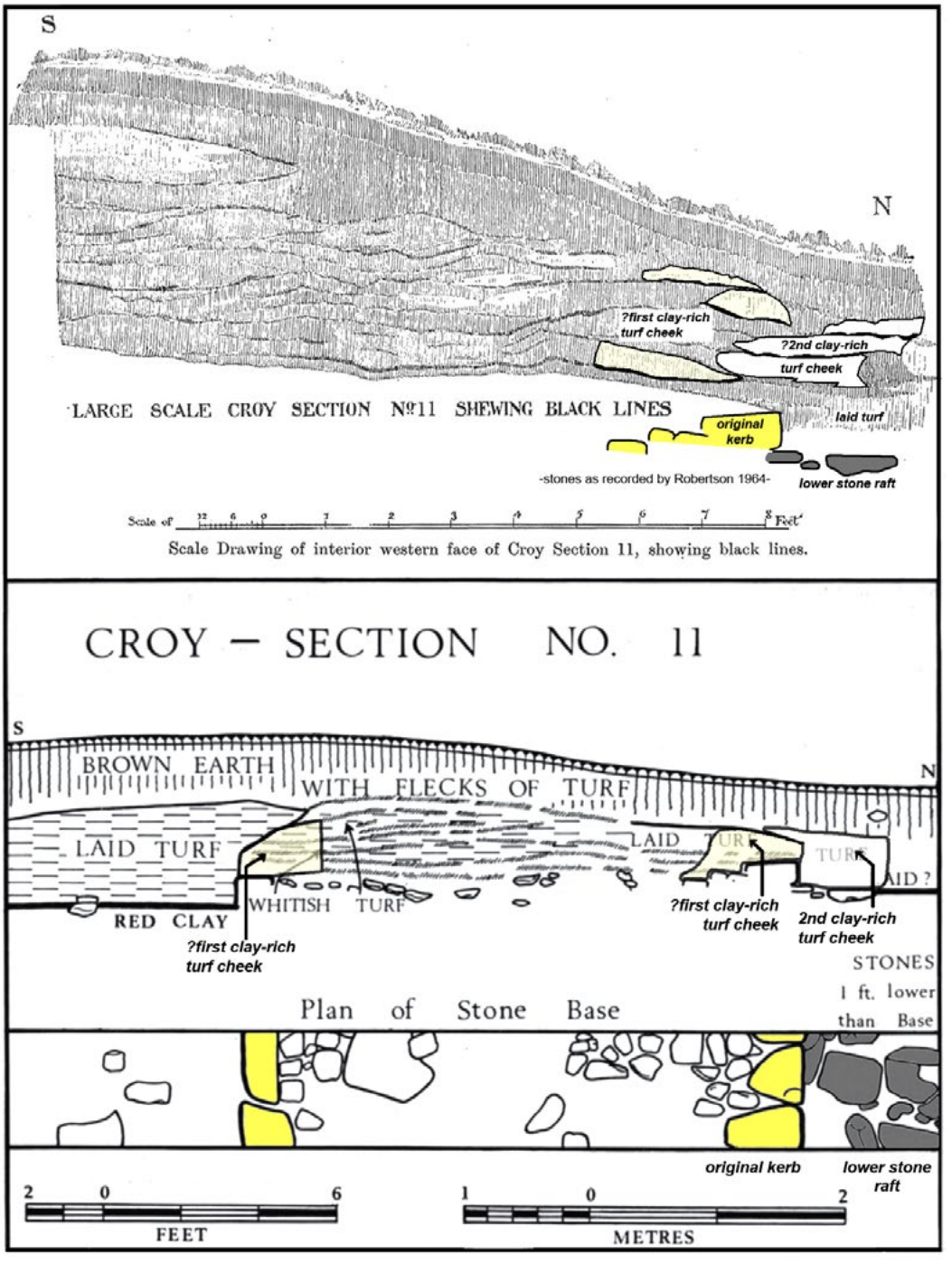

Figure 10.8. Sections and plan through Antonine Wall at Croy No. 11, central part, sector 5/6. 1890's section by GAS above, section and plan by A. Robertson 1967 below. Whitish clay blocks of northern and southern faces emphasized. Two narrow turf cheeks in north face interpreted as original cheek (yellow) coinciding with original kerb position, later cheek (white) built on top of added lower stone raft against slumping of earlier cheeks. Reopening of 1890s section by Robertson in 1967 showed laid turf in front of northern stone kerb, placed on stone raft *c.* 0.3 m foot than original base (drawn by T. Romankiewicz after GAS 1899: 73 and Robertson 1969: Fig 1).

stone base had 'laid turf' surviving on top (Figure 10.8) (Robertson 1969: 39). Instead of being earlier, could this raft have been wedged under the front edge of the existing kerb at a lower level to stop the kerb from subsiding (Figure 10.8, raft in grey)? Could the laid turf beyond the original kerb represent a later buttress against the original bulging north face as proposed for St Flannan's Church above and at Tentfield (Figure 10.7)? If so, the original clay-rich turf cheek at Croy No. 11, *c.* 0.6 m wide, had been built either flush with the outer kerbstone, or was bounded by it, as the lowest course sits inwards from the kerb's outer face, similar to the observations made at Tentfield (Figure 10.7). When this original cheek at Croy No. 11 started to slump, a new stone base was inserted at a lower level, propping up the original kerbstones and providing support for a secondary cheek, again built of clay-rich white turves. These were keyed into the failing original face to buttress it.

Evidence for the widening of the stone base to add new cheeks as part of more wholesale repairs has also been recorded at Balmuildy Road, where a line of cobbles had been placed in front of the eastern wall face of a stone base as narrow as 3.96 m. This may represent a later repair, or, as Keppie speculated, a widening of the base assessed as too narrow by the squad who were to construct the superstructure (1976: 67). At Hag Knowe, the expanded stone base was definitely a repair, because it rested on 'tumbled turfwork', and the excavator records a 'drastic rebuilding' due to either 'destruction or at least collapse' (see MacIvor in Keppie and Breeze 1981: 231). For the evidence at Bantaskin, Keppie argued that the repair on the northern side, resulting in a widening of the Wall base by about 0.5 m, was due to sagging of the superstructure, made of an orange clayey core 'with some turf blocks thrown in'. This was faced on the north by 'greyish lumpy' clay, which he interprets as a turf cheek, and another turf cheek on the south identified by the red-brown lines of turf vegetation layers (Keppie 1976: 71-72). He sees the failing as related to water management problems exaggerated by the presence of a culvert in this area (Keppie 1976: 69). The dressed kerbstones of the new projection were carefully tied back into the existing kerb, not dissimilar to the interpretation made for Croy No. 11 above; again, this repair added the benefits of an underlying stone base for the new cheeks. The Bantaskin repair blocked the original culvert, and a few of its capstones were seemingly reused in the final resetting of the northern kerb. Similar evidence that repairs sometimes compromised the drainage function of the stone base were also seen at Wilderness West (Hanson and Maxwell 1983b: 232) or indeed in the obscured kerbstones described for Callendar Park above (Figure 10.6), as well as at Inveravon (Dunwell and Ralston 1995: 531, 535).

There is also good evidence for repairs to, and multiple phases of, clay cheeks. At Inveravon, in the area of the possible expansion to the Wall and the small fort, clay cheeks were used for all these structures, seemingly built at different phases, despite evidence for their failure (Dunwell and Ralston 1995: 532, 535 and 545). For the Wall, two cheeks about 0.3-0.4 m in thickness originally flanked an earthen core (Dunwell and Ralston 1995: 526). The southern cheek, which had a surviving width up to 0.3 m, was composed of a series of interleaved turf blocks, clay blocks and bands of yellow clay (Figure 10.3). In front of this, a thick deposit of 0.45 m depth extended southwards for about 7.5 m from the Wall cheek. The excavators interpret this as an 'episode of collapse, with the clay cheek shearing off from the earthen core' of the expansion structure(s), which was then covered by 'a quantity of destabilized core material' possibly also from the expansion (Dunwell and Ralston 1995: 530-531). Whether this collapse was due to structural failure or because of purposeful downtakings ('deliberate slighting') could not be established in the field. However, from a geotechnical engineering perspective, such a pattern of collapse is not surprising. The multiple layers and interleaving of the original cheeks, under wet conditions, could have made the Wall vulnerable to shearing. Bailey's trench in Callendar Park is another key piece of evidence for the different

uses and repairs of clay cheeks, and the repeated remodelling of the Wall faces (Figure 10.6) (1995: 580). His trench happened upon a total construction break. In the eastern half, the facings ('A') are described as 'blue' clay and have a width of 0.30 m. In the western half, the facings ('B') were made of 'white clay' up to 0.7 m wide; both are associated with different core material. The eastern core comprised orange silty-clay loam, grey clay loam, and a concentration of turves towards its centre, while the western core fill was made up of both orange and grey clay loam mixed together ('M'). Bailey used this evidence to argue that the stretch of Wall exposed in the western side of his trench was a complete repair in which not only the cheeks but the entire core had to be replaced (1995: 588).[3] The stratigraphic relationships between the different core materials suggests that 'B' and 'M' were the later repairs, in which case the mixed later core could be interpreted as containing recycled material from the disassembled earlier superstructure. Evidence for a time lapse between these two construction phases has been found in a 0.2 m high build-up of clay material in front of the northern kerb, which had eroded off the earlier clay cheek 'A' (Figure 10.6, in blue). This residue was later sealed by laid turves, which obscured the kerb; it was also sealed by the northern clay cheek 'B' and by the eventual collapse of these cheeks (Bailey 1995: 587). The 0.7 m wide cheeks labelled 'B' were keyed into the north face of 'A' and into its core, evidenced by the wedge-shaped spreads of 'B' into the core recorded in plan (Figure 10.6). This keying and the greater depth of the clay cheeks labelled 'B' could represent improvements on structural stability to counteract the tendencies of the clay cheeks to shear off from the core (compare Bailey 1995: 588).

New approaches to an old wall

The Antonine Wall, in terms of its materials and construction techniques, was not a unified monument; it varied considerably along its length. Likewise, this was a structure that was continually patched up, altered and in some cases seemingly substantially rebuilt. There is a danger, therefore, of assuming that all the variations identifiable in the structure of the Wall were part of the first phase of construction and can be credited to the original builders at the time – what we now see is a patchwork of multiple phases of intervention, most of which cannot be dated, and some of which are likely to have been undertaken by units different from the original building squads.

In what has been outlined above, three key points emerge:

1. The stone base appears to have been intended to help manage drainage across the line of the Wall and also moisture within the earthen superstructure; without it the structure may well have been unstable; this is a lesson that might well have been learnt elsewhere, such as on the western sector of Hadrian's Wall. The stone base, however, did not act as a load-spreading foundation.
2. Along the length of the Wall, the builders adapted the materials they used and the techniques employed. In those sections of the Wall with clay and turf cheeks, these features may well have assisted in the management of moisture within the structure and protected its core from erosion. However, clay cheeks would have been vulnerable to collapse unless they were keyed into the core and had some form of covering, which is not easy to reconstruct.

[3] For details of this and the full interpretation, see Bailey's original report (1995); this analysis concentrates only on the materials and construction of the superstructure. A wider assessment of the site will be published elsewhere.

3. The various sections of the Wall would have to have been regularly maintained and replaced. They would also have deteriorated at different rates. The repairs listed above show that this was a continually evolving monument.

These observations have significant implications for our understanding of the planning of the Antonine Wall, its appearance, and even its function. Such further discussion, however, lies well beyond the scope of the present paper and would benefit from more research, and more scientific analyses of the surviving materials.

The material presented here comprises the first steps of a larger project to analyse the construction of the Antonine Wall against the broader background of earth and turf building in the Roman north-western provinces more generally. This wider project will combine geotechnical with geoarchaeological analyses to include methods such as soil micromorphological analysis to examine the details of the soil properties, microscopic traces of now-decomposed vegetation horizons in the turves, and the *chaîne opératoire* of earth building (e.g. Cammas 2018). This research also aims to test the wider structural performance of the different materials and to reconstruct potential environmental settings where the turf blocks might have been sourced (compare Kunyong and Frederick 2017).

What the analysis so far has confirmed matches Graafstal's conclusion for Hadrian's Wall, that we should rethink these monuments not as vast and inherently logically progressing building projects, but as segmented and prioritised (Graafstal 2012: 148-149) – and reactive to both localised changes in landscape, as well as processes of decay and maintenance. Keppie's conclusion in 1974 certainly remains true: 'The building of the Antonine Wall ... was no simple process' (1974: 163). The glimpses offered by the small trenches excavated so far all seem to have complicated rather than simplified the long-standing questions about the building of the Antonine Wall. No doubt, the more complicated the evidence and in turn our conclusions, the closer to the real circumstances our explanations will be.

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11. Wing-walls and waterworks. On the planning and purpose of the Antonine Wall

Erik Graafstal

Introduction

On 1 March 1975, at the 7th meeting of the Scottish Archaeological Forum, John Gillam delivered a game-changing paper entitled 'Conception and afterthought on the Antonine Wall'.[1] It was published the next year as 'Possible changes in plan in the course of the construction of the Antonine Wall'. 'Until within the last decade', Gillam opened, 'the Antonine Wall tended to be thought of as having been planned and executed according to a single concept' (Gillam 1975: 51) – a concept, to be sure, that had always seemed very different from the one underlying the just abandoned frontier across the Tyne-Solway isthmus. For one thing, the Antonine Wall appeared to lack a regular cordon of small installations equivalent to Hadrian's Wall's turrets and milecastles. Instead, the new frontier in Scotland boasted a total of at least 17 forts, many of which were significantly under full-regiment size. For a frontier only half the length of Hadrian's Wall, this resulted in an average spacing of just over two Roman miles. The Antonine frontier in Scotland, in short, had always seemed a different animal.

In a radically new departure, Gillam argued that the original plan for Pius' new frontier had provided for six normal-size forts only, identified as Carriden, Mumrills, Castlecary, Bar Hill or Auchendavy, Balmuildy and Old Kilpatrick, four of which could be shown, or argued, to be earlier than the adjoining sections of the Antonine Wall. With intervals between them in the range of *c.* 7-9 miles, the initial arrangement would in fact be remarkably similar to the preceding disposition on Hadrian's Wall. What the new frontier also replicated from its predecessor, Gillam suggested, was fortlets acting as fortified gateways. Sites like Watling Lodge, Wilderness Plantation and Duntocher were clearly part of the original plan and obviously akin to Hadrian's Wall's milecastles. At Duntocher, the fortlet was succeeded by a small fort, while the possibility of a similar juxtaposition, and implied succession, was noted at Rough Castle and Castlehill. On this basis and working with a limited set of distances, Gillam hypothesized a regular series of fortlets, at average intervals of 1.1 Roman miles. About half of these, his thesis implied, would in time have been replaced by the other known forts. Five of these 'secondary' installations, Gillam stated, could be shown to be structurally later than the Antonine Wall Rampart that formed their north face.

[1] Sincere thanks are due to David Breeze, Michal Dyčka, Nick Hannon, Bill Hanson, Rebecca Jones, John Poulter, Sebastian Sommer, Matt Symonds and Andrew Tibbs for sharing thoughts and information. For the final version, I was able to see the submitted text of Nick Hannon's PhD research (2018), for which I feel deeply indebted to him. Regrettably, Bill Hanson's reply (forthcoming) to Graafstal *et al.* 2015 came too late for a response. In this paper, distances are normally given in metric style, while unspecified miles are always Roman (1.48 km). The shorthand terms 'Ditch', 'Berm' and 'Rampart' (with a capital) refer to these components of the Antonine Wall.

A singularly influential thesis was born – and what is more, a thesis that could be put to the test. Gillam's proposal catalysed the big fortlet 'hunt' of the late 70s: within five years, a handful new fortlets were discovered at Kinneil, Seabegs Wood, Croy Hill, Summerston and Cleddans (Hanson 1979; Keppie and Walker 1981; Maxwell and Hanson, this volume). The new harvest also boosted confidence in the fortlets that were suspected to be hiding in the 'arm-pits' west and east of Castlehill and Rough Castle, respectively, which now appeared to be indicated by pertinent terrain features (Keppie 1980: 83-4 with fig. 1; Hanson and Maxwell 1986: 107-8).[2] At Croy Hill, the local sequence seemed to provide robust support for Gillam's model, with the fortlet firmly bonded with the Antonine Wall Rampart and the fort, some 80m to the east, clearly coming later, as demonstrated by its east rampart overriding a well-like structure with an overflow that passed through the base of the Antonine Wall Rampart (Macdonald 1932: 257-59).

With the support of all this new evidence, Gillam's hypothesis conquered the field in the early 80s. It was favourably discussed in several influential reviews (e.g. Keppie 1980; 1982) and embraced in the new standard work on the Antonine Wall by Hanson and Maxwell first published in 1983 (1986: 105-12). The version that has become established since, in both *academia* and public outreach, is of an Antonine Wall undergoing an incisive change of plan, while still under construction, by the addition of a dozen or so 'secondary' forts. It is interesting to see how the logic of the two successive plans has since tended to structure scholarly debate by making it focus on remaining problems, like whether Bar Hill or Auchendavy had the best credentials for being 'primary' (e.g. Keppie and Walker 1985: 32-3), or by prompting the suggestion that the two stages of the Antonine Wall might account for the fact that multiple units are attested at some of the 'primary' sites (Hodgson 1995: 34).

But the Antonine Wall landscape of evidence is varied and ambiguous. To stay with the sites where multiple units are attested, this group also includes Bar Hill which Hanson and Maxwell had good reasons to label as 'secondary' (1986: 106). Their discussion of the Gillam hypothesis was duly nuanced. It contained the crucial observation that the primary/secondary divide does not coincide with the 'complete regiment' versus 'vexillation' size classes of forts, 'secondary' Cadder and Castlehill falling in the former category (Hanson and Maxwell 1986: 105). Hanson and Maxwell also noted that the change of plan apparently came very early in the sequence, seeing that the linear works in one of the early legionary lengths anticipated the causeway and bonded with the fort rampart of Rough Castle (1986: 107, 134-35). Finally, the important reservation was made that the different structural relationships between the forts and the linear works could be down, in large part, to varying progress between the different work squads (Hanson and Maxwell 1986: 109) – a point, it may be noted, that had earlier been used to underpin the 'single concept' version of the Antonine Wall (Robertson 1979: 30-1).

Looking back on four decades of dissemination of the Gillam hypothesis, it is striking to see how relatively subordinate the place of terrain and topography has been in most discussions, whether on a site or a systemic level. Only in the last decade has the landscape finally come to the fore. A signal contribution has been John Poulter's analysis of the planning principles underlying the sinuous course of the Antonine Wall which, he argued, implied knowledge of all the major installations, including most 'secondary' forts (2009: 90-130). Poulter's study also serves to underline the necessity of a systems-analysis approach to Roman artificial frontiers. Most *limites* were highly complex systems, the constituent building blocks of

[2] But see Macdonald 1933: 260, for the enclosure at Rough Castle as 'an integral part of the Antonine fort' and, for Castlehill, Hanson and Jones, this volume.

which could be dependent on several other factors, like planning order, alignment, spacing, operational requisites and, not least, intervisibility – a property curiously ignored in most Antonine Wall studies (*pace* Woolliscroft 1996). The resulting web of structural, spatial and logical dependencies can become a strand of evidence and insight in its own right, much like a real archaeological stratigraphy. For the Antonine Wall, the potential of this 'sequential stratigraphy' is still largely unexplored.

The basis for this paper was laid during a study tour of the Antonine Wall, in October 2014, in the company of David Breeze, Rebecca Jones and Matt Symonds. With all this energy and knowledge on board, our excursion started with paying homage to the dedicatee of this volume at Old Kilpatrick, Carleith and Cleddans – and then still managed to cover most of the other fort and fortlet sites in just two days, typically continuing in the evenings with lively discussion of the thoughts and observations collected on the way. From the first, our focus was on the system's topography and terrain settings. With three of the participants heavily imbued with Hadrianic rigidity, perhaps what impressed us most was the Antonine Wall's subtle dialogue with the landscape. Dialogues can be revealing of underlying concerns. To name just one example, in the more broken terrain west of Balmuildy, we were struck by the system's dominant south-facing orientation, with the installations often set to control a maze of valleys that opened up to the Clyde basin.

The direct outcome of the 2014 excursion was a paper that questioned some of the traditional supports of the Gillam hypothesis, while highlighting the Antonine Wall's topographical sensitivity and consistency of planning, 'secondary' forts included (Graafstal *et al.* 2015). The main arguments of the article, cheerfully titled 'Sacred cows in the landscape', were discussed at a themed session of the Roman Northern Frontiers Seminar at Edinburgh in May 2016. The present article is an expanded version of the paper read by the author on that occasion. Up to that point, the underlying terrain analysis had been based on low-resolution elevation data provided by ESRI. The situation was greatly improved when, in the summer of 2017, the Environment Agency released a series of LiDAR datasets for lowland Scotland at resolutions up to 0.5 m^2 which covered most of the Antonine Wall. For their analysis, the author has used the tools for Digital Elevation Models provided in the QGIS package.

Structures or system?

One of the points of the 'Sacred cows' paper was that the structural relationships between the forts and the linear works are far from consistent (Graafstal *et al.* 2015: 56-9). A case in point are fort causeways. At Castlecary and Balmuildy, generally ranked among the first installations to be built on account of their stone ramparts, the causeways over the Ditch consisted of undug earth, confirming the early planning of these forts. However, original causeways also occur at both Cadder and Rough Castle – forts of 'secondary' status (Buchanan 1905: 455; Clarke 1933: 16). In an editorial comment, David Breeze reminded me that the digging of the Ditch, as a potential source of building materials, would usually have kept pace with, or slightly preceded, the construction of the Rampart (cf. Bidwell and Watson 1996: 33, for Hadrian's Wall). Immediately west of Rough Castle, across the Rowantree Burn, the natural turf appears to have been sealed by the upcast mound, which is a strong pointer to the Ditch coming first in the local sequence (GAS 1899: 106: 112-13). Seeing that Rough Castle and Cadder were part of what is broadly believed to be the first construction sector taken in hand, it was always acknowledged that the 'secondary' plan must have come very early in the sequence (Hanson and Maxwell 1986: 134-35).

At Rough Castle, it is true, and probably at Cadder too, the stone foundation for the fort wall was found to abut the base of the Rampart (Buchanan 1905: 459 with fig. 7; Clarke 1933: 9-10), but a similar structural sequence is in evidence at the 'primary' fort of Mumrills (Steer 1961: 95). This is not surprising. The Antonine Wall tends to follow the edge of higher ground, so that it often sits on a slight slope to the north. This inclination is even stronger at fort sites, where space requirements or defensive considerations tended to push the north face to such edges. As a consequence, the rearside of the *c.* 5 m wide Rampart foundation often had to be terraced into a slope in order to have a secure and level bed, as Macdonald observed at Westerwood (1933: 281; cf. 1934: 220, 243 and 261 for Rough Castle, Castlecary and Croy Hill; Steer 1961: fig. 3, section C, for Mumrills). Now, with the rear kerb terraced into the slope, between 0.6 m and 0.9 m deep in places, there is a certain logic, structurally, to build up at least part of the superstructure before one starts constructing the fort ramparts which, at Westerwood, rested 'on the natural surface' (Macdonald 1933: 282). The result would be fort walls often sitting considerably higher than, and lapping up against, the base of the Antonine Wall Rampart – which is what we see at both 'primary' and 'secondary' forts (e.g. Mumrills and Westerwood).

At the northeast corner of Cadder the situation was more extreme, the ground level falling away 'rather more than 1 in 5' (Macdonald 1934: 302). Whether space limitations had pushed the fort corner to this steep slope, or a wish to have the latrine well-flushed, the consequence was a substruction unparalleled on the Antonine Wall. For the first 12 feet inside the fort corner, more or less coinciding with the latrine channel south of it, the Rampart had been terraced into the slope and built up with five courses of masonry on both faces and solid rubble in between; for the next 50 feet a unique hybrid solution had been adopted to overcome the slope (Clarke 1933: 10 with fig. 2). To Macdonald the situation was clear: at Cadder the Rampart had been built, and the causeway left undug, 'with the needs of the fort in full view' (1934: 302).[3]

This all rather detracts from the relevance of the documented junctions at Rough Castle. First of all, if Ditch-digging normally went hand in hand with Rampart-building, the implication of the causeway is that the builders of the length of Rampart that was to become the north wall of the fort knew about this installation. Unsurprisingly, the turf superstructure of Rampart and fort wall at the northeast corner, where the stone rafts of both lay level, appears to be continuous, to judge from the published photograph (Buchanan 1905: fig. 7; cf. Hanson and Maxwell 1986: 107). The picture of the northwest corner (Buchanan 1905: fig. 12), on the other hand, seems to show a somewhat irregular joint rather than a neat butt against a slightly inclined Rampart face like the few well-preserved ones on record (Macdonald 1934: pl. IX, XI.1 and fig. 21).

Such differences are no cause for great concern. The Roman army was used to breaking up, and delivering, linear works in short centurial segments, fort ramparts included (cf. *RIB* I 1818 and 1820 for

[3] To Clarke, whose standard of excavation and reporting leave much to be desired, the latrine culvert through the Rampart 'seemed to be definitely later' (1933: 12). No substantiation is given other than that the cover-slabs included a perforated stone with signs of long use, which Clarke associated with an earlier Antonine occupation (although it is more likely to be prehistoric: Bill Hanson, pers. comm.). Clarke's description of a second culvert through the fort's north wall (1933: 11) leaves no doubt as to its secondary nature. This is unproblematic, as the fort's drainage system was adjusted after the installation had been turned through 90 degrees while under construction, with construction of the north wall well underway (see below). The culvert of the inner east ditch was also clearly secondary (Clarke 1933: 14 with pl. V). Such outlets were not a standard feature of Antonine Wall forts. The culvert may have been inserted to fix a problem that had become apparent in a corner that must have been prone to stagnating water.

the building of Carvoran in 112-feet stints, just a few years before; and Hodgson 2017: 58, for a snapshot of discontinuous work on Hadrian's Wall). A striking example of modular building is provided by Stone Wall milecastles 50-54, west of Birdoswald, which were constructed with their ramparts abutting the curtain wall, but clearly as part of one and the same building operation (Simpson and Richmond 1934: 144). Similar modularity is in evidence at Westerwood, where the work squads built two south corners of very different plan and happily varied between 4.3 m to 4.9 m when laying the foundation for the fort rampart (Macdonald 1933: 282). What we should be prepared for, then, is a potentially messy picture of centurial work crews doing and delivering their assigned jobs independently. At Rough Castle, the situation is further complicated by evidence for extensive reconstruction of the ramparts at a later stage, notably including the northwest corner (Macdonald 1933: 264-65).

Even small structures like fortlets can reveal modular building sequences. It is true that the stone bases of the ones explored are consistently bonded with the Rampart (Hanson and Maxwell 1986: 109). However, the last excavated fortlet, at Kinneil, illustrates just how disjointed the building process could be. At the northeast corner a line of kerb stones was found running part way across the stone raft for the Antonine Wall – apparently the end-point of a work stint (Bailey and Cannel 1996: 310 and 337 with figs. 3-4). From the published photograph it would appear that the western (rather than eastern) part, i.e. the north face of the fortlet, was built first, echoing milecastle 42 on Hadrian's Wall. However, the line of kerbs does not align with the east face of the fortlet (as the butt joints of the curtain wall on both sides of Milecastle 42 do), but is sitting an awkward 1.5 m west of it. Moreover, the kerbed line strikingly coincides with a sudden narrowing of the Ditch from 11 to 6 m. So perhaps the more likely interpretation is to see this as the meeting-point of two work sectors, with the fortlet possibly shifted to this junction at a slightly later stage. Whichever scenario is preferred, the point is that the fortlet's side wall may have been bonded with the Rampart/north wall *subsequently* (Bailey and Cannel 1996: 337). Evidence of this seems to be the curious discontinuity of the line of kerbs, the southern half apparently having been removed when the structure was bonded into existing Rampart fabric, whatever its state of completion at that point. All of this would probably have escaped the excavators had there not been the partially surviving line of kerbs across the stone base of the Antonine Wall. No such pointer was found at Wilderness Plantation, but here, although the turf superstructure at the junctions appeared to be of one build, the kerbs of the fortlet rampart were found to be markedly different, and inferior, to those of the Antonine Wall (Wilkes 1974: 53), 'a curious distinction if this masonry was dressed and laid in one go' (Symonds 2018: 139).

We will later see that the picture of structural relations is further complicated by the overlooked phenomenon of fort wing-walls. For now it seems sufficient to cite the caveat given by Hanson and Maxwell: 'Since it is unlikely that all the elements of the building process – the laying down of the Wall base, the construction of the turf superstructure, the digging of the ditch, the building of the Military Way – would have managed, or were even intended, to keep pace with each other, it is inevitable that some forts should demonstrate different relationships with different elements of the system' (1986: 109). This, however, is to remove one of the cornerstones of the Gillam hypothesis and brings us actually very close to the traditional explanation of the 'different relationships' (Robertson 1979: 30-31).

The way forward, it is here proposed, is to analyse the Antonine Wall on a *systemic* level. Roman artificial frontiers (for an overview: Breeze 2011: 55-91) were highly complex systems combining

functions related to the control of movement, observation, alarm and military response. To this end, they typically employed running barriers, cordons of observation facilities, garrisons attuned to the local security situation, and frontier roads for lateral communication and scaling-up response. Together these elements served as integrated infrastructures designed to support the army in its day-to-day security work along the edges of the Roman world. Some *limites* grew stagewise, with new developments determined by what was in place already, like in Upper Germany, Raetia or on the Tyne-Solway isthmus; others were 'greenfield' creations more directly reflective of the state of the art, like the *Limes Porolissensis* in Dacia or the Antonine Wall in Scotland. By the time the latter was built, Roman artificial frontiers had come of age. Functional requirements had been defined, the basic components had taken shape, provincial particularities had started to manifest themselves.

Roman frontier systems were not built overnight, although one sometimes gets that impression. For some reason, British Wall students have always been keen to make detailed man-day calculations of how fast, realistically speaking, the Hadrianic and Antonine frontiers could have been built assuming that all factors and available resources were optimally allocated (for an extreme example see Hartis 2009). For Hadrian's Wall, the most recent exercise has managed to get the job done in just four work seasons, including the Turf Wall and Cumberland Coast installations (Hodgson 2017: 60-6, 192-203). Similar calculations have suggested that three seasons may have sufficed to build the entire military infrastructure of Antonine Scotland – hinterland, isthmus, firths and foreland included (Hanson and Maxwell 1986: 132-6). The question is: did the provincial army manage, or even care, to complete these giant building projects at top paper capacity, neglecting most of the other work that normally kept the British garrison well occupied through the year?

In practice, the building of artificial frontier systems may have taken appreciably more time. For one thing, the army, and certainly the legionary personnel, would have been routinely involved in a wide range of activities, running large parts of the provincial economy and administration. Egyptian papyri illustrate just how extensively the available legionary workforce was bound up in various duties and commitments, often far afield (Davies 1989: 33-68) – not to mention disconcerting figures about the actual strength of units (Alston 1995: 46ff). There is no reason to believe that things were much different in Britain. Of the numbers that the British legions managed to free from current commitments and detach to the north, many would still have ended up in food and fodder supply, fuel collection, various transport and message duties, administrative and mundane jobs, security work, etc. Especially in Scotland the workforce may have been stretched even more, with longer logistic lines than usual to cater for all the various needs. The dimensions of construction camps have been used to assess the size of the work force (Hanson and Maxwell 1986: 120-1), but it is not known how large a part of them was taken up by carts, equipment, supplies, stacks of fuel, timber and other materials. We also tend to forget about realities like the vagaries of weather, planning mistakes and changes of plan, security incidents and other setbacks. The net result may be that the average number of workable days and hands at the spade may have been far lower than modern calculations suggest.

Available dating evidence suggests rather longer timescales, even for imperial *grands travaux*. The construction of the tower cordon and palisade in Raetia, which may figure on the initial scene of the column of Marcus Aurelius, lasted from *c.* AD 158 to – at least – AD 165 (Sommer 2011: 151, 157-64). A similar duration, *c.* AD 107-114, is implied for the construction of the *Via nova Traiana*, quite apart from the installations along it (Becker 2009: 939, with P Michigan 466). The apparent start peaks of the coin

assemblages of forts suggest that building and garrisoning the successive sectors of the Upper German *limes* took the best part of the decade (AD 105-115) (Kortüm 1998: 29ff.). The building of Hadrian's Wall, preparations for which probably started around AD 120 (Graafstal 2018), apparently continued well into the 130s and may not have been finished in AD 138 (Breeze 2012: 74-6). In the central sector a long hiatus occurred in the construction of the stone curtain after the Wall forts and the Vallum had been added to the already colossal workload of what may have become a stop-gap project for the British army (Graafstal in prep.). In a rather neglected paper, Roger Kendal has arrived at figures in the order of *c.* 15 years for the entire Wall project based on what must soon have proved to be one of its major bottlenecks, that is transport capacity (1996). The 45 kms (!) of straight scaffolding poles needed to deploy the work force such that it would meet modern calculations may also serve to sober our expectations (Hill 2006: 76).

Two crucial implications follow. First, if major frontier building projects like the Wetterau *limes* or Hadrian's Wall were expected to take not just – say – three to five years, but rather double that, it would have made all the more sense for the army to consider which sectors or components it wished to have in place first in order to gain quick benefits from the anticipated security effects. In Raetia, for example, it would appear that the observation screen took precedence over the running frontier obstacle. On Hadrian's Wall, likewise, the structural evidence points to a decision to prioritise the construction of turrets and milecastles (or their north faces only) in the central sector, perhaps because the Wall itself had been shelved for the time being following the fort and Vallum decisions (Graafstal in prep.). Second, when analysing the sequence of work we need to make a rigorous distinction between planning, surveying and setting out on the one hand, and actual building on the other. The operational requirements of visual affordance (Hannon 2018: 394-8), signalling, lateral connectivity, etc. all required careful planning and marking out in the field, and this had to be done in a certain order, depending on functional priorities. The actual *building* order was independent from this and could be completely different (Poulter 2009: *passim*).

The interesting thing about the Antonine Wall is that it was a greenfield implantation of an established concept. It carefully copied certain elements of Hadrian's Wall, but it also introduced radical novelties like the close spacing of the main installations. This step, it is here argued, was taken at a very early stage, before the planning of the linear works started in earnest. It is hoped that this new starting-point may bring us closer to the purpose and radically innovative character of the Antonine Wall. To this end, we must first look into a number of basic requirements.

Functional requirements

The fort sites

The handbook Roman fort would be sitting on a relatively level plateau, ideally with edges, sloping ground or watercourses offering natural protection on one or more sides. Most 'primary' fort sites on the Antonine Wall duly meet the first requirement and several also tick the second box. There is, in itself, no need to be surprised that many 'secondary' sites, like Falkirk, Rough Castle, Cadder, Kirkintilloch or Castlehill, also measure up to the norm. What does call for attention, though, is that some of the selected plateaus show a marked tilt to the south, making the north face of the installation stand out, like at Kirkintilloch, Bearsden and Castlehill. 'Broken' sites also occur, like Bar Hill where the fort sat on an awkward whaleback (Figure 11.1). At Bearsden, the terrain rose sharply in the northwest

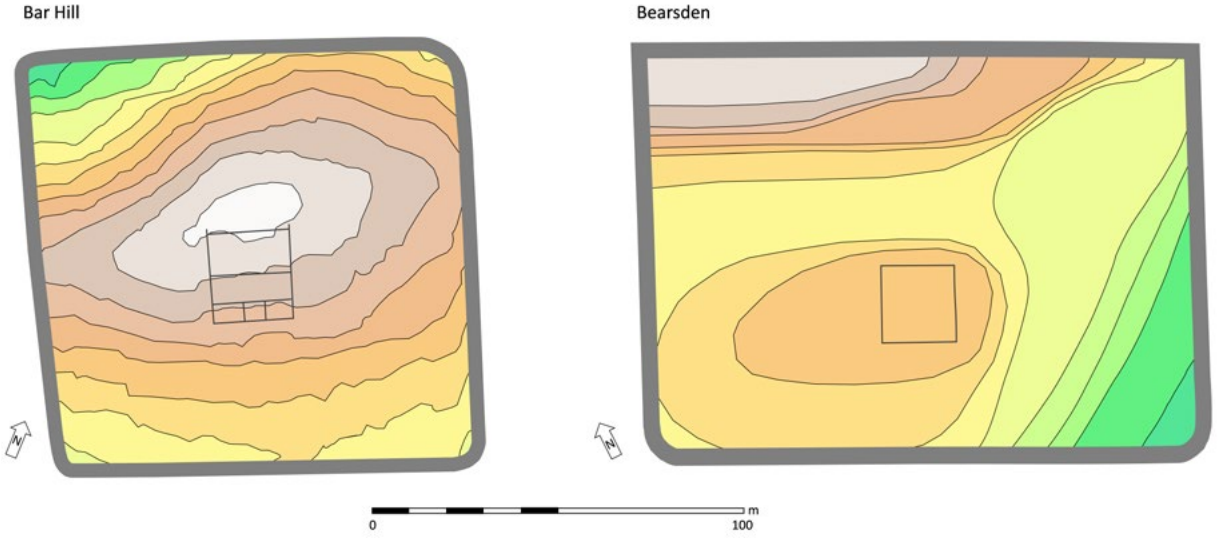

Figure 11.1. Contour maps of Bar Hill and Bearsden highlighting the extreme unevenness of the terrain inside the fort walls. Contour lines at 1 m intervals vectorised from a survey map provided by Historic Environment Scotland and Breeze 2016: fig. 3.1.1, respectively.

corner of the fort, resulting in a marked hollow which had to be intensively drained (Breeze 2016: 9-10, 28). The south corner of Old Kilpatrick, which falls away 6 m, was also clearly sub-optimal. The strong impression is that the planners of the Antonine Wall were prepared to compromise with the handbook criterion of a relatively level plateau, possibly to meet other objectives.

A desktop survey immediately reveals that many forts were situated next to valleys that penetrated the hinterland and would have offered natural, and concealed, routes of incursion (Figure 11.2) – a familiar phenomenon to Roman frontier students (Breeze 2011: *passim*). This, again, includes both 'primary' (Mumrills, Castlecary, Balmuildy) and 'secondary' sites (Rough Castle, Croy Hill, Cadder, Kirkintilloch, Bearsden). At Mumrills, Hanson and Maxwell observed, 'the need to site the southern defences of the fort on the edge of the scarp overlooking the Westquarter Burn was seen as paramount, and in consequence the barrier was compelled to describe a sudden re-entrant on gaining the summit of the Mumrills Braes' (1986: 106). In some cases, water-supply probably played a role, but there may be more to this. Macdonald noted that the great majority of forts that were situated close to rivers or streams occupied their *east* banks (1925: 278-9). What this means is uncertain. Non-practical factors may be at play, the east – and water – apparently holding a special place in Roman fort planning (information from Andrew Tibbs). Whatever, another non-random pattern appears to be there and this, again, includes both 'primary' and 'secondary' sites (cf. Table 11.1).

Some of the known fortlets reproduce the above properties on a micro-scale. The LiDAR imagery shows Watling Lodge sitting right next to a little burn to its east. Seabegs Wood (Figure 11.3) was situated on a slight knoll of just about the right size, while Duntocher, of course, crowned Golden Hill. Other fortlet sites, however, seem almost to be indifferent, topographically. At Kinneil, Glasgow Bridge, Wilderness Plantation, Summerston and Cleddans, there are no marked knolls, valleys or other terrain features that might readily explain the positions of the fortlets at the appropriate resolution level (for patterns on artificial frontiers cf. Symonds 2018: chs 4-6).

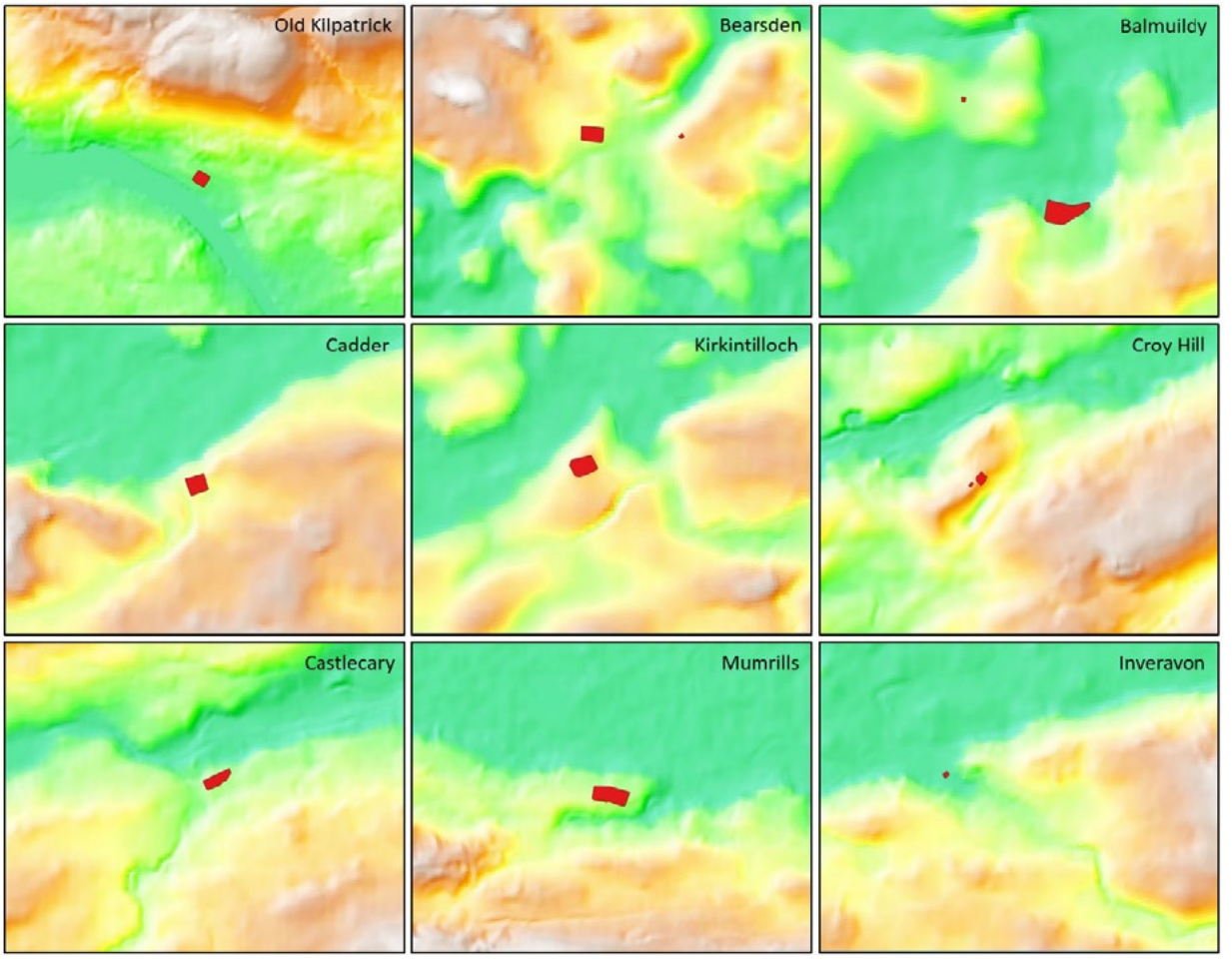

Figure 11.2. Elevation maps of selected fort sites (and occasional fortlets) from west to east, showing their spatial relation to valleys penetrating the hinterland from the north. The colour ramp varies relative to the range of altitude values in each window. Elevation map generated from SRTM/Aster data (EU-DEM) augmented with OS Terrain 50 contour lines and watercourses. Shapefiles of installations with annexes provided by Historic Environment Scotland.

The comparison of fort and fortlet sites raises an issue that will surface again and again in the coming pages. Gillam hinted at the possibility that several 'secondary' forts occupied the sites of, or outflanked, earlier fortlets (1975: 54; cf. Hanson and Maxwell 1986: 109). However, the rather different dimensions and properties of the fortlet sites mean that most of these could not simply have been upgraded to 'secondary' forts and suddenly meet the specifications of the higher league of installations. This is quite apart from the rather sobering observation that nowhere has an undisputable fortlet been found underlying a fort, like milecastle 43 on Hadrian's Wall (pers. comm. David Breeze), with the exception of Duntocher where the fortlet was supplanted by an installation more aptly described as a large fortlet with its annexe (cf. Symonds 2018: 140), and only at a relatively late stage in the overall sequence (see below).

Intervisibility

The notion that intervisibility and visual affordance played an important role in the design of Roman artificial frontiers has gained wide currency through the pioneering work of David Woolliscroft

(1996; 2001). Recent case studies using digital terrain models include Hadrian's Wall (Foglia 2014), the Odenwald (Dyčka forthcoming) and Raetian *limites* (Krieger 2019), as well as the Antonine Wall (Dyčka 2016; Hannon 2018). Most of these focus on intervisibility between the tower cordon and the forts that supported it. What remains understudied, however, is visual connectivity along the frontier's baseline of 'response centres', to borrow a term from David Woolliscroft. The Trajanic Stanegate provided for a near-continuous chain of direct links between neighbouring forts and fortlets (Woolliscroft 2001: 55-7). A recent viewshed analysis of the Odenwald *limes* has shown that its planners managed to create a robust similar chain, sometimes linking the main installations directly, sometimes offering a choice of single relay towers, several of which were placed on the edge of a fort(let)'s field of view, suggesting intentional planning (Dyčka forthcoming). On the Wetterau *limes*, one of the functions of the fortlets (*Kleinkastelle*) appears to have been to serve as fortified signal relays between neighbouring forts that would otherwise not have been connected (Woolliscroft 2001: 115-7 with fig. 52).

For the Roman Northern Frontier Seminar session at Edinburgh in 2016, the author analysed intervisibility between the main installations of the Antonine Wall using altitude data and simple analytics provided in Google Earth. These have later been checked, and slightly modified, with the help of the LiDAR data released in 2017. The results closely match the table of intervisibilities recently published by Poulter (2018: suppl. table 1), which also takes the north gate of each installations as the point of reference, but is based on the OS Terrain 50 data. For present purposes, a 5 m offset at both ends is used instead of Poulter's 7.6 m, assuming that the planners would have worked with tripod ladders, flags on poles and similar devices. The same offset, equating wall-top height, is assumed in Michal Dyčka's recent viewshed analysis of the Antonine Wall, with all four fort-gates potentially qualifying (2016: 44-52, 64-5).

Figure 11.3. LiDAR image of the Seabegs Wood area showing the Military Way clearly aligned to the fortlet's south gate. Composite DTM-1m released by the Environment Agency combined with HES shapefile of linear works.

The strong suggestion of the intervisibility data is that the planners of the Antonine Wall sought to create an unbroken chain between the main installations. In Dyčka's summarizing table, *c*. 50% of the links are on the edge which suggests a high level of intentionality (2016: 51, 64-5). But his list admittedly includes many remote connections that were probably fortuitous – and of little use, as they exceeded the limit of reliable observation and signalling. The problems and practicalities thereof, quite apart from the prevailing weather in northern Britain, would have prevented Roman frontiers from relying on complex signalling networks. Experts have emphasized the limited range of visual communication (certainly if this depended on fire or smoke signals), the risk of information being garbled in transmission, and the difficulty of countermanding mistakes (Donaldson 1988; Woolliscroft 1996: 170; 2001: ch. 1). This rather challenges the two-level, long-range alarm system recently proposed by Poulter (2018). It is here assumed that signalling on the northern frontiers for the most part did not go beyond the level of short-range, crude alarm calls or perhaps a simple set of coded messages for end-to-end use. It would have avoided complex transmission chains and certainly back-relaying, as this would easily confuse the source of trouble.

For the present analysis, all potential links longer than *c*. 6 km as well as all multiple and reverse relays have been ignored. Even with these restrictions, the result is an admirable chain of intervisibility between the main installations at approximate wall-top level (Figure 11.5). Within this reduced set of links, the proportion of threshold connections requiring a double elevation (eyeball height) between 2-5 m remains very high (48%), strongly suggesting intentionality. What appears to have been aimed at, and largely achieved, is a fairly straightforward system of neighbour-to-neighbour intervisibility usually based on the north faces of the forts. Interestingly, some fortlets, like Glasgow Bridge and Cleddans, appear to be redundant in such a scheme (cf. Dyčka 2016: 49-50), although an intended duplication of links cannot be ruled out. Several of the 'secondary' forts, on the other hand, would seem to be crucial as links, like Rough Castle and Westerwood – not to mention the skyline site of Castlehill.

The wish to link up the main installations may explain several anomalies of the Antonine Wall, like the uncoupling of Bar Hill fort from the Rampart. Bar Hill was the visual watershed of the Antonine Wall. If it is right that intervisibility played an important role in the planning of the system, and forts were to be the main links, this site certainly was pivotal. Bar Hill's centrality may help explain why a start-up installation of sorts was planted on the summit. Judging the relative complexity of the enclosure and evidence for internal structures (Keppie 1985: 51-8, with discussion of a possible native origin), it was retained for some time, possibly occupying the site for a planned fort – not all forts appear to have been built straight away (cf. Bearsden and probably Auchendavy, below). It has been argued that Bar Hill was a 'secondary' fort based on the fact that it overlies this enclosure and it is detached from the Antonine Wall (Hanson and Maxwell 1986: 106). However, this anomaly could be down to the planners of the linear works deciding to incorporate the prominent knoll of Castle Hill, some 250 m northeast of the summit of Bar Hill, and avoid a sharp re-entrant uphill to meet the fort's northeast corner (Woolliscroft 1996: 155). They would have been familiar with Hadrian's Wall where the forts at Carvoran and Castlesteads were also detached from the frontier barrier (cf. Gillam 1975: 51-2). A crossing in the close environs is implied, but this need not have taken the form of a fortlet, as the undefended Knag Burn gate at Housesteads and the causeway east of Croy Hill fort (see below) remind us.

Another interesting case is Rough Castle. It enjoyed an impressive set of visual connections to the west, including all known forts and fortlets up to Bar Hill. Most of these links are on the edge, suggesting that this fort may have been pushed to the eastern limit of the combined fields of view of Seabegs Wood

fortlet, Castlecary and possibly others (Dyčka 2016: 45-6). Surprisingly, the chain of intervisibility breaks at Rough Castle as far as the known installations east of it go. However, it may be noted that Camelon, 1 km north of the Antonine Wall, admirably serves to connect Rough Castle with Falkirk as if it were a regular link in the chain (cf. Woolliscroft 1996: 173, 175). A close operational relation between Camelon and the Antonine Wall system is suggested by a road that is clearly visible on the LiDAR images of Rough Castle, heading from the fort's north gate in the direction of Camelon (Figure 11.4). This new discovery not only explains the strange skewness of Rough Castle's causeway, but also points to Camelon being an integral part of the design of the Antonine Wall.

Intriguingly, Balmuildy and Castlecary, the two early stone forts, were both difficult to link in, as these installations occupied relatively lowly positions in the valleys they monitored. At Castlecary, the western connection was particularly difficult. There are two sites on the line of the Wall where a minor installation might have provided a one-stage link with Westerwood. One is at Garnhall, where a ring ditch visible at the back of the Rampart on an aerial photograph was partially excavated in 1994 (Woolliscroft 2008). However, the internal post-setting is off-centre, very irregular and too shallow to have supported a tower. Moreover, upcast from the ring ditch was seen to continue under the Rampart, separated from it by a substantial stratum of soil formation (Woolliscroft 2008:149 with fig. 17), while the Military Way appears to have terraced away part of the ring ditch. Garnhall, then, is more likely to be a Roman Iron Age enclosure (pers. comm. Bill Hanson). An alternative link between Castlecary and Westerwood would be the crest of the marked knoll of Hag Knowe (NGR NS770777). Excavations in 1979 and previously failed to locate a fortlet there (Breeze and Keppie 1981: 231-2, 239-40), although John Buchanan had mentioned 'faint traces (...) of what seemed a small *castellum,* or watch-tower' a century earlier (1872: 473). The site also happens to be very close to the measured position of the spacing system to which most known fortlets now appear to adhere (Hannon 2018: table 7.1).

Balmuildy could not see either of its neighbours, Cadder and Bearsden, directly and would have been dependent on fortlets as satellite 'eyes' and relays. Again, the western connection proved to be the more difficult one. The strange diversion of the Antonine Wall over the drumlins to the northwest of Balmuildy is likely to do with lateral connectivity as much as a wish to monitor the approaches of the pass between the Campsie Fells and Kilpatrick Hills. However, the fortlet at Summerston alone was not able to provide a link with the next fort to the west. 'Bearsden remains an enigma, since it was not intervisible with any other installation on the Wall' (Dyčka 2016: 48). What the fort did enjoy, though, was a broad visual coverage of the local node of routes it controlled (Breeze 2016: 377 with fig. 21.38). Be that as it may, Bearsden seems to break away from what appears to be one of the basic planning principles underlying the Antonine Wall. Perhaps there is something missing in this area. We will return to Bearsden and to the problem of 'blind' Balmuildy and Castlecary later.

Baseline communication

Another important aspect of Roman frontiers is easy communication between the 'response centres' that formed their backbone. Well-engineered frontier roads consistently appear to come early in the life of newly created *limites.* When the Nabataean kingdom of Arabia was annexed in AD 106, work on the new province's defense system started with work on the *Via nova Traiana*, as we saw earlier. In Raetia, the eastern Alb *limes* road must belong to the founding years of the system as it clearly predates the storage building constructed at Munningen in AD 112 (Schaflitzl 2016: 84 with fig. 1; Sommer 2011:

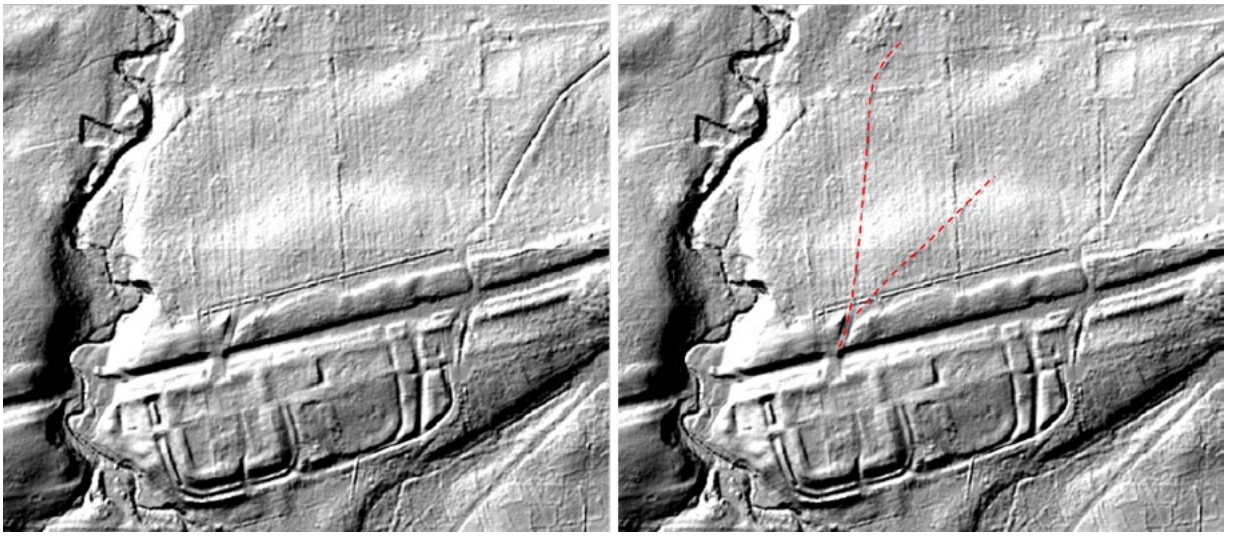

Figure 11.4. LiDAR images of Rough Figure 11.4. LiDAR images of Rough Castle and surroundings showing two apparent road tracks starting at the causeway over the Ditch and leading to the northeast
showing road tracks leading to the northeast

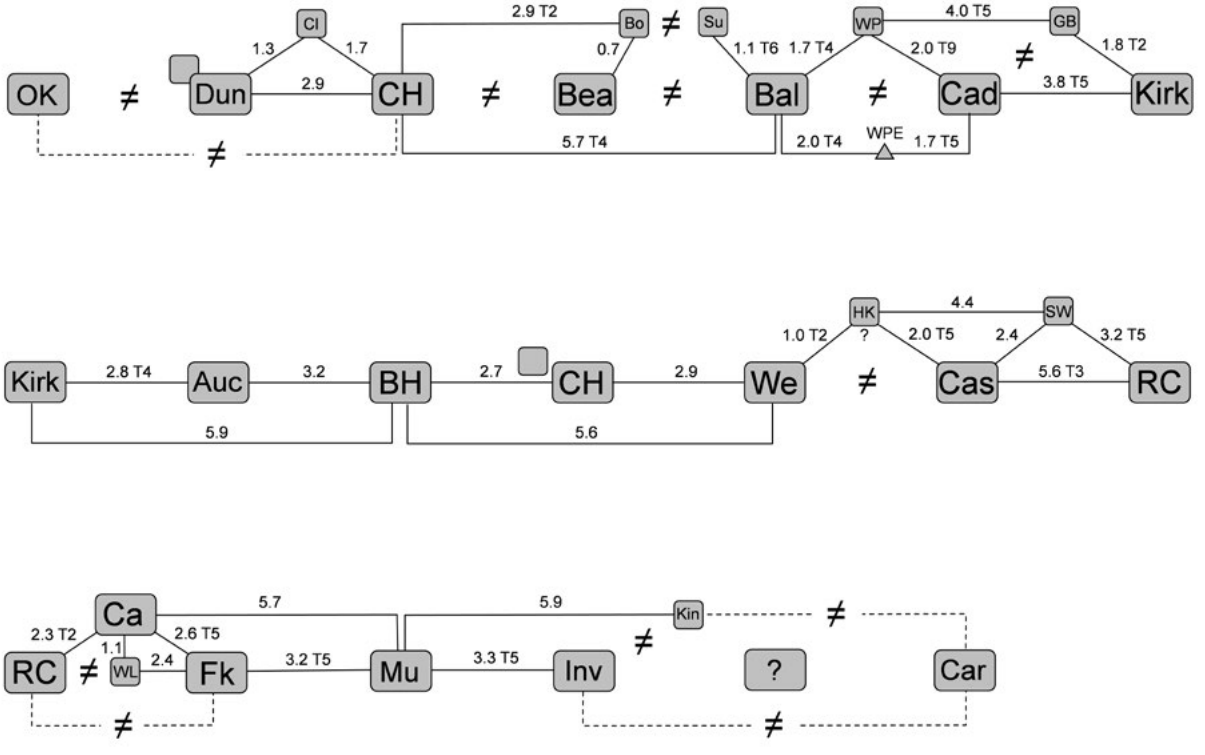

Figure 11.5: Intervisibilities between the main installations of the Antonine Wall. The numbers give distances in kilometers as the crow flies. Threshold values (T = eye height) are added when an artificial elevation is required. For Summerston the south gate of Balmuildy is used as point of reference; for Bar Hill, the summit. For Cadder, the combined LiDAR data and OS One-inch 'Hills' map of 1885-1903 indicate an original fort plateau at 54 m OD at least. As a link between Castlecary and Westerwood, the suspected fortlet on Hag Knowe (NS 770777) is preferred over Garnhall.

153 with fig. 22). In the challenging setting of the Odenwald *limes*, likewise, the frontier road would have been an obvious precondition for the functioning of the system (Thiel 2009). At Walheim, on the adjacent Neckar *limes*, the alignment of the frontier road suggests that it was planned in close conjunction with the twin forts around AD 110/15 (Kortüm and Lauber 2004: 163ff., 191, 215). Closer to home, on the Stanegate, it has been noted that the line of the road implies knowledge of the fortlets at Haltwhistle Burn and Throp (Poulter 1998). Inversely, the curious disposition of their gates suggests a connection with the road. This mutual foreknowledge must mean that the road was planned in conjunction with the new fortlets, the hallmark of this frontier. Finally, whatever the reason for the late construction of the Military Way on Hadrian's Wall, the provision of an additional set of minor gates at the 'projecting' forts suggests that a new baseline was anticipated from the moment the Wall forts were built (Hodgson 2017: 68).

For the Antonine Wall, the Military Way was a crucial condition, not just as an operational baseline but also for the transport of food supplies, raw materials, equipment and no doubt some of the building materials, especially in the founding years when the large work force would have strained supply logistics. Much of this would have been conveyed from new harbour facilities placed at the two ends of the system, almost certainly including Camelon (Tatton-Brown 1980). It bears reminding that, unlike Hadrian's Wall, there was no pre-existing equivalent of the Stanegate running across the Clyde-Forth isthmus: the infrastructure had to be created *ex nihilo* – and it was needed right from the start.

Unsurprisingly, what little relative dating evidence we have points to the road coming early in the building sequence. A few hundred metres west of Rough Castle, a gravel pit, likely dug to extract (or explore for) road-metaling material, was found under the Bonnyside East expansion which itself appears to have been constructed with the Rampart, judging from the continuous turf laminations in the published north-south section (Steer 1957: 164 with fig. 2). It might be objected that some turf lines seem to end around the south kerb of the Rampart. However, this is probably due only to the fact that Steer documented his section in two halves at different times (Bill Hanson, pers. comm.). Even so, several turf lines appear to continue on both sides of the break. However, this break, it bears emphasising, does not represent the south face of the Rampart as it would have stood had it been built before the expansion. Whether we prefer a battered line at a 60-80° angle or a profile like 'the best surviving recorded example on Croy Hill' (Hanson and Maxwell 1986, 81; Macdonald 1934, pl. XI.1), the turf superstructure in Steer's section appears to continue past any notional south face of the Rampart. More straightforward is the sequence at Garnhall where the alignment of construction camp I to the road implies the priority of the latter (Jones 2011: 210-1). These observations would seem to place the building of the Military Way *before* the linear works in what is generally seen as the earliest construction sector of the Antonine Wall. The same order is hinted at by the presence of a probable gravel pit on the north side of, and partly filled with upcast from, the Ditch at Callender Park, Falkirk (Bailey 1995: 585).

The early place of the road in the overall sequence potentially makes it a crucial indicator of the order of planning. Hanson and Maxwell have observed that the road 'seems to have formed the *via principalis* of all the forts bar three (Duntocher, Cadder and Bar Hill)' (1986: 84). A number of interesting observations follow from this. At Mumrills, Castlecary and Balmuildy, all traditional 'primary' installations, the configuration of fort, road and annexe, unsurprisingly, points to the forts coming first in the local sequences (Hanson and Maxwell 1986: fig. 5.3). The positions of at least some of the fortlets also appear to have been known to the planners of the Military Way. A clear case is Seabegs

Wood, where a long stretch of the road was aligned with the installation's south gate (Figure 11.3). This opens up the possibility of anomalies in the course of the road thereby allowing us to predict new fortlet sites. An obvious candidate is the kink in the Rampart at Tamfourhill Road, south of the Falkirk Wheel, where a corresponding bend in the Military Way seems to respect a space of fortlet size.

Where long legs of the Military Way can be seen to align with the *portae principales* of forts, this *may* indicate that the installations' defensive circuits were set out before the line of the road. This could be the case at Rough Castle, where a long stretch neatly lines up with the east gate of the original fort. At Westerwood, the 'spatial stratigraphy' seems ambiguous. At first sight, the curious dogleg in the line of the road as it passes the three western fort ditches might be taken to indicate that the road came first. However, similar skewed ditch crossings occur at several other sites, 'primary' ones included, some unrelated to the Military Way (cf. the rear gate of Old Kilpatrick). If the dogleg is taken to indicate that more space was needed in the *praetentura* than the (planned) line of the road afforded, such adjustments may only have been made when the garrison size and exact fort dimensions had been determined and actual building commenced. So perhaps we must step back from local tinkering and zoom out to the level of main bends and alignments on which the Military Way was set out. Two long legs of the road can be seen approaching Westerwood from the east and west, but the two lengths do not align exactly, the fort apparently being the cause of a slight kink in the general line of the road (Figure 11.6). Now, if the fort site was fixed before the course of the Military Way, and road building preceded the linear works in this area, the implication would seem to be that the north face of Westerwood was constructed separate from the adjoining stretches of the Rampart.

Interesting evidence for the *construction* order is provided by Cadder. Here, exceptionally, the Military Way passed south of the fort instead of continuing as its *via principalis*. This anomaly is probably to do with the fact that Cadder's headquarters, uniquely along the Antonine Wall, faced east, blocking the normal thoroughfare (cf. Macdonald 1934: 155). Interestingly, the fort's north gate and causeway over the Ditch, uniquely in the wider world of Roman frontiers, do not align with the fort's main north-south road. This 'appears to indicate a change in the orientation of the fort while it was being built. The implication ... is that the local sequence started with the construction of the stretch of Rampart and ditch that was to form the fort's northern defences, followed by the rest of the fort (now facing east) and the diverted Military Way' (Graafstal *et al.* 2015: 61). This would seem to be confirmed by Clarke's discovery of two early drain courses north of the *principia*, one underlying the granary, which were probably the equivalent of the eventual side drains of the *via principalis* (1933: 12 and plan). The least that can be concluded from this case is that construction work at Cadder had started with the north side of the defences and that, when the change of fort orientation happened, enough had been built to prevent adaptation. The planners of the Military Way apparently knew about the change, as the road started to diverge from the Rampart in a straight line at least 300 m east of the fort rather than by-passing it with a dogleg typical of local tinkering. This would seem to place Cadder early in the Antonine Wall sequence.

Planning the Antonine Wall

Wing-walls: pointers to priority

The north faces of the forts merit our attention for another reason. The best starting point is Balmuildy where the fort's north wall was extended with so-called wing-walls. This phenomenon is well known

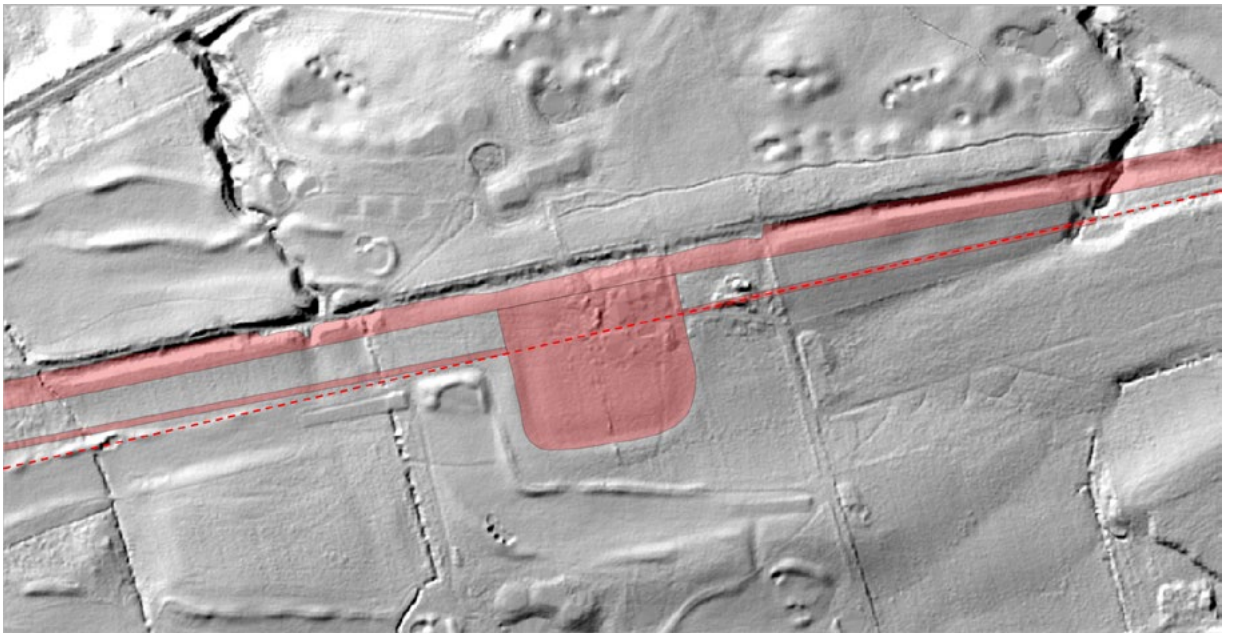

Figure 11.6. LiDAR image of the Westerwood area. The alignment of the Military Way coming from the east is continued as a dotted red line, emphasising that the road west of the fort has a different alignment (it actually meets the fort defences *c.* 5 m more to the north than the HES shapefile indicates).

from Hadrian's Wall where such extensions are found at several turrets as well as milecastle 48. With a length usually in the order of 3.7 m to 4.6 m, and their ends originally left raking at an angle of *c.* 60°, wing-walls would have prepared structurally for a seamless bonding of the Wall at a later stage (Graafstal 2012: 130-31; 2018: 96). However, Balmuildy's wing-walls were considerably longer, which may point to different concerns.

At Castlecary, Balmuildy's twin, a kink in the Ditch, about 20 m west of the fort, may indicate similar extensions (Buchanan 1903: pl. 1). Of the other 'primary' forts, Mumrills has the best evidence for wing-walls, the Rampart taking a sharp turn at their notional ends, especially on the east side, with the reported construction styles possibly hinting at separate building stages (Macdonald and Curle 1929: 407; Steer 1961: 93-5). The placement of the fort on the south edge of the Mumrills Braes (Hanson and Maxwell 1986: 106), its north wall extended with wing-walls, caused the Antonine Wall to describe a curious zigzag that was quite uncalled for by the local topography – confirming the priority of the fort over the Rampart. A similar zigzag, for which 'there seems no compelling local topographical reason', was noted at Auchendavy by Keppie and Walker (1985: 32; Jones and Leslie 2015: fig. 22.2).

So far, this might all be taken to confirm the advance construction of the 'primary' forts, whatever the credentials of Auchendavy as one of these (Keppie and Walker 1985: 32-3). However, a wing-wall of similar length to those found at 'primary' forts may be reconstructed on the east side of Cadder (Figure 11.7). It bears emphasising that this wing-wall would have been an extension of the north wall that we have just seen to have taken a head-start in the local building sequence. Interestingly, the wing-walls at Mumrills, Castlecary and Cadder were of sufficient length (*c.* 15-20 m or more) to cover the butt ends

of a double fort ditch. As a provisional working hypothesis, then, it is here proposed that wing-walls were provided at (some) fort sites so that the defences could be delivered more or less in their end state. The implication of the kinks and zigzags is that the north faces of the forts were at least marked out, and possibly (part-?)built, before the rest of the Rampart was planned.

With this mindset, we can now take a fresh look at Castlehill, the north face of which continues west of the fort's north rampart for another 20 m or so before bending sharply to the southwest. It has been suggested that a fortlet may have occupied this little niche before the fort was built against its east side, and perhaps survived as the 'small raised plateau' noted by Lawrence (Keppie 1980: 83 with fig. 1). However, the new LiDAR imagery convincingly shows the plateau *overlying* the western fort defences (Hannon 2018: 143 with fig. 3.33). Magnetometry survey in 2008 produced 'no compelling evidence for the presence of a fortlet' around the northwest corner of the fort (Jones *et al.* 2009: 13). However, resistivity survey did find, inside the fort, an 'irregularly-shaped enclosure', or at least the southwest corner thereof, defined by a boomerang-shaped ditch (?) with legs standing at an approximate 120° angle and not well aligned at all with the fort grid. While there are 'hints of entrances' at several points, the ditch appears to continue where the causeway for a putative fortlet should have been (Figure 11.8).[4] Instead, the authors attractively put in mind the 'broadly similar, apparently pre-fort structures at both Bar Hill and Croy Hill' (Jones *et al.* 2009: 14) which functioned in the start-up stage of the Wall, possibly in relation to surveying work (Jones 2011: 330). Like these sites (and Rough Castle), Castlehill was a watershed in the crucial chain of intervisibility. On the Antonine Wall, as we saw, such watersheds tend to be occupied by forts. The model of an original fort with wing-walls also best explains the behaviour of the Rampart. For a fortlet to cause the sharp kink at Castlehill, it really should have been sitting in the 'arm-pit' west of the fort. This distinctive extension of the north front is now easily recognised, on the analogy of Mumrills, Castlecary, Balmuildy and perhaps Cadder, as another instance of a fort wing-wall.

Elsewhere, wing-walls may be (almost) imperceptible because there were no marked bends in the line of the Rampart at their ends. A very slight bend just east of Bearsden could be indicative of another instance (cf. Breeze 2016: fig. 3.2.1). Where the Rampart continues in a straight line, like at Rough Castle and Westerwood, wing-walls may only reveal themselves in excavation. However, not all forts were constructed with such extensions, even if they were built well in advance of the Rampart. At Kirkintilloch, the line of the Rampart appears to leave no room for a wing-wall on the west side of the fort. For the rest, the site is remarkably similar to Castlehill, with the Rampart taking a sharp turn immediately west of the fort (or its suspected wing-wall in the case of Castlehill).

Three things are suggested by sites like Castlehill and Kirkintilloch. First, that the fort was the primary element in the local planning sequence. Second, that the local hill or ridge was the reason for putting the installation there. And third, that it was the *north* face of the fort that mattered, as this was carefully placed on the summit (Castlehill) or crest (Kirkintilloch), with the rest of the fort left to occupy the sloping ground to the south. Accordingly, both forts occupied key positions in the chain of intervisibility (Figure 11.5).

Forts first

The generally accepted explanation for the stone defences of Balmuildy and Castlecary is that these forts were built before it was decided, or realised, that the basic building materials for the Antonine

[4] For a detailed re-examination of the evidence from Castlehill, see Hanson and Jones, this volume (eds).

Figure 11.7. Ordnance Survey 25 inch map of the Cadder area, revised in 1896, with the position of the fort walls, headquarters building and north-east ditches shown in overlay. East of the dotted red line, the course of the Ditch is certain (and confirmed by LiDAR data: transparent blue). West of it, the canal works appear to have largely eroded the Ditch. Whatever its precise course in this area, a kink in the Rampart immediately east of the section excavated by Clarke is implied (transparent versus solid black). Macdonald (1934: Pl. XXXVIIA) and the current RCAHMS map both follow a more northerly line, resulting in a slightly sharper kink at the end of the possible wing wall.

Wall were going to be turf and earth (Breeze and Dobson 1976: 85-7; Hanson and Maxwell 1986: 105). Balmuildy's stone wing-walls have another interesting story to tell. Like elsewhere, these extensions were built flush with the fort's north face. However, the adjoining Rampart meets the western wing-wall at an awkward 65° angle. This meant that it was easier to have it simply butt up against the wing-wall's north face instead of the normal way of bonding. The natural explanation for this curious state of affairs is that the fort had been planned, and built, before the wide detour of the Rampart over Summerston was planned. Elsewhere, the wing-walls that are implied by the zigzags and turns in the Rampart at Mumrills, Auchendavy, Cadder and Castlehill suggest that the locations of those forts too were established first, and at least set out in the field, wing-walls included, *before* the line of the Antonine Wall proper was planned.

The same order is hinted at by John Poulter's recent work. To analyse the methods and objectives followed by the teams who set out the line of the Antonine Wall, in 2008 Poulter visited all the accessible points where the Rampart makes a turn, each time noting which directions had the 'best field of view' – a basic principle of short-range Roman surveying. One of his findings was that 'the course of the Antonine Wall is much more sinuous than that of Hadrian's Wall.' In places, 'the line seems almost seems to delight in curving around the countryside', whereas the chain of installations steers a much straighter course (Poulter 2009: 90, 115 map 3.33). In a follow-up study, Poulter has shown that, between Inveravon and Balmuildy, 12 out of 17 forts and fortlets as well as most enclosures and expansions appear to fall in with just three long-distance alignments (2018: fig. 2-5). Even if there is some room for playing with the end-points and members of the alignments (and for coincidences, as various corners of forts are used to make them fall in line), and although one can question the feasibility of Poulter's proposed 'two-level alarm system', the strong linear pattern remains – whatever

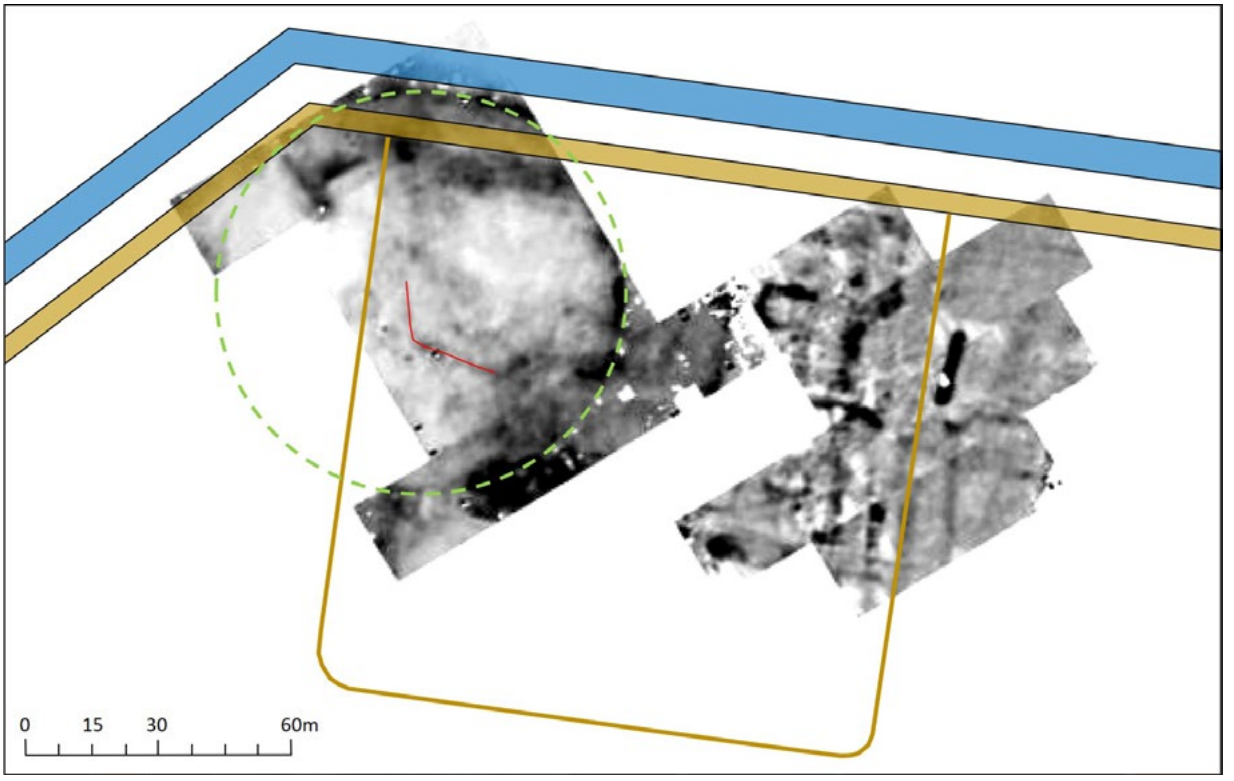

Figure 11.8. Resistivity survey of Castlehill (Jones *et al.* 2009: fig. 5a) with the lines of the Ditch (blue) and the Rampart and fort (brown). The inner contour of the ring of trees that crowns the hilltop (green) is clearly visible in the survey results. The southwest corner of the 'irregularly-shaped enclosure' is picked out by the red line.

its background. What also remains is Poulter's conclusion drawn a decade ago: 'the smooth line that this chain of installations makes on the map compared to the jagged course taken by the Wall' strongly hints at the fort locations coming first in the planning process (2009: 118).

A similar pattern emerges when the Antonine Wall is analysed in elevation. Although the profile of the landscape between the installations is very irregular, the chain manages to bridge the jagged contour line almost unbroken thanks to the placement of forts and fortlets on relative peaks in the profile, with the notable exception of Castlecary and Balmuildy (Poulter 2009: fig. 3.1). It is, again, the line of the Rampart that sometimes breaks away from the general elevation trend, descending to the valley floor west of Bonnyside and again between Bar Hill and Cadder, where it is often running at or below the level of the Forth and Clyde Canal (Poulter 2009: 116). Such diversions and descents prompt the question whether the course of the Rampart may have been set out, and allowed to deviate, with a view to monitoring the linear works from – say – the north gates of the installations (cf. Graafstal *et al.* 2015: 64). The recent viewshed analyses by Dyčka (2016) and Hannon (2018) leave this aspect largely unexplored.

With regard to the planning sequence there is another problem with the Gillam hypothesis. The model always implied that the Rampart had been planned, and the first construction sector taken in hand, when the decision came to add a dozen forts. We have seen that the ideal Antonine Wall site would be: suitable/acceptable as a fort plateau; placed on the line of the Rampart; overlooking possible points

of intrusion; intervisible with its neighbours; serviced by the Military Way; and, for 'secondary' sites, fitting into a 2-3 mile spacing pattern. Now, given the terrain setting, it is extremely unlikely that a dozen 'secondary' fort sites could have been found that ticked all those boxes had the line of the Rampart been fixed first. With such a set of requirements it has to be the other way around: first the sites of all the installations were chosen and fixed, next the line of the Rampart was set out (cf. Poulter 2009: 118-19).

In the foregoing we have discussed sites (Kirkintilloch, Castlehill), sequences (Cadder) and structures (wing-walls) that consistently point to the *north face* of the installations being the leading element. With the linear works, likewise, it appears to have been the north face of the Rampart that served as the line of reference (Poulter 2009: 91, 110). Presumably, then, the north faces of the installations, wing-walls included, were marked out in the field as one of the first steps, being the basis upon which the whole chain of planning and future operation depended. It is uncertain whether the future garrison sizes and precise space requirements would have been known for all forts when their sites were selected. Such arrangements may have followed later. Occasionally, changes may even have been made after the north side of the installation had been built, as is suggested at Cadder. This may explain why some forts have little space for wing-walls or sit rather awkwardly behind their pre-established north faces.

A particularly interesting example is Auchendavy where the geophysical data suggest that the fort, when it came to be built, was pushed towards the eastern limit of its pre-determined north face and deformed into a curious lozenge shape, probably in order to have the central and rear ranges of the fort occupy the higher ground to the southeast (Jones and Leslie 2015: fig. 22.2). This suggests that, like at Cadder, the front side had been built, or otherwise become fixed, before the rest of the installation. The 2006-7 geophysical campaigns have provided crucial new evidence on the planning of the Antonine Wall in this area. Rather than describing a simple 'zigzag', the linear works seem to follow the contour of a shelf of slightly higher ground over a series of quite distinct short lengths. One such leg more or less coincides with the fort's north face (Figure 11.9). About 20 m beyond the western fort ditch, there is a marked kink and slight change of alignment in the course of the Ditch. It all looks as though a *c.* 135 m length had originally been planned and marked out as the future front of the fort, likely with a provision for wing-walls. When the installation came to be built, all components, causeway included, seem to have been pushed to the eastern limit, forfeiting the eastern wing-wall. The strong impression left is that the fort, as planned, was as firmly within the 'secondary' size range as the installation that was actually built. This would rather erode one of the central supports of the Gillam hypothesis, that is the 7-9 mile spacing norm for a first series of full-regiment forts, for which Auchendavy always was the favourite local candidate (Gillam 1975: 52; Hanson and Maxwell 1986: 112).

Spacing

One of the results of the 'Hidden landscape of a Roman frontier' project carried out by Canterbury University commissioned by Historic Environment Scotland from 2015 to 2018 is a set of improved interval measurements for all classes of installations as well as the Distance Stones (Hannon 2018: ch. 7; Hannon *et al.* 2017; Hannon *et al.*, this volume). One of the beauties of a digital 3D-environment is that it is possible to reproduce Roman surveying methods as they would have been employed in the field, such as distance measurements using specially prepared lengths of ropes (Dilke 1971: 73). When the Antonine Wall was virtually re-measured following the contours, it appeared that its length is actually 3% longer than the conventional two-dimensional map-based method indicates (Hannon *et al.* 2017:

455; Hannon 2018: 343). This is a significant increase which could have a bearing on earlier findings, like the observation that several fortlet intervals are very close to exact multiples of 1 Roman mile (Woolliscroft 1996: 158ff.; Poulter 2009: 121-2). With 1,000 paces (*passus*) equating to 5,000 feet (*pedes*), and both units used on the Distance Stones, it is worth remembering that two different measuring standards were in common use in the Roman world, and apparently in Britain too (Walthew 1981; Hannon 2018: 345): the *pes monetalis* (0.296m) and the *pes Drusianus* (0.332m). As it happens, the latter is also *c.* 3% longer than the former, which leaves room for playing with the data.

Nick Hannon's dissertation that resulted from the 'Hidden landscape' project offers an in-depth analysis of the spacing of forts and fortlets (2018: 323-78). For the former, the author explores different variables, like the point of reference (north gate or east/west ramparts), the two Roman measurement standards and the range and average of the intervals. The hypothetical 'primary' stage of the Antonine Wall, including Auchendavy, is tested separately. With a range of 6.99 to 9.24 miles (based on the *pes monetalis* and measured between the fort ramparts), Hannon concludes that the new measurements 'do not support the theory of a system of regularly spaced primary forts. (...) The inconsistency in spacing between forts deemed 'primary' suggests that this distinction may be unfounded, with the suggestion of regularity only occurring when all forts are considered' (2018: 343, 358, 360).

However, with the 'secondary' stage, the range relative to average value is actually even greater, the majority of the intervals coming at around or between 2 and 3 Roman miles (Figure 11.10). The forts do not appear to fall in with a spacing system based on whole miles like most fortlets do. Hannon tries different variables and finds that the deviation from integral miles is least when the *pes monetalis* is used for the central sector and the *pes Drusianus* for the eastern (2018: 347ff.). However, the implied indifference to measurement standards seems incongruous in a project where work stints were set out to fractions of paces, to judge from the Distance Stones. Two comments seem in place here. First, it is questionable whether measurements along the Rampart make much sense in the case of the forts, as our exercises so far suggest that there would have been no established line for the barrier at the stage when the fort sites were selected. Second, with several other boxes to tick (suitable fort plateaus, natural points of intrusion, intervisibility), some freedom must have been allowed to the surveyors. It would appear that, in practice, a 2-3 mile bandwidth was observed, with a preference, it seems, for the lower value.

With the fortlets things are different. Perhaps the most striking result of the 'Hidden landscape' project is that the intervals between the known fortlets (measured along the Rampart) appear to conform to a system of integral Roman miles based on the *pes monetalis*. The statistical r-square test produces a very robust score of 0.99908 (Hannon 2018: 349). The conclusion must be that the positions of the fortlets were set out independently from the spacing system of the forts, and at a later stage, after or along with the planning of the line of the Rampart. Two fortlets break away from the mile pattern. It has been suggested that the location of Watling Lodge was influenced by the crossing of Dere Street (Hannon 2018: 346-47), while the fortlet of Croy Hill, for some reason, appears to have been moved from its measured position, *c.* 0.2 mile to the west, to the marked knoll it actually occupies. Whatever caused these two deviations, the shortfall or extension of one interval was apparently compensated for in the next so that the overall principle of mile divisions was not disrupted. On statistical grounds, the mile-based spacing system of the fortlets seems an inescapable new fact of the Antonine Wall.

In some cases, like Kinneil, Wilderness Plantation and Cleddans, there seems to be little in the way of local topography that might explain the choice of site. All three fortlets are situated somewhere

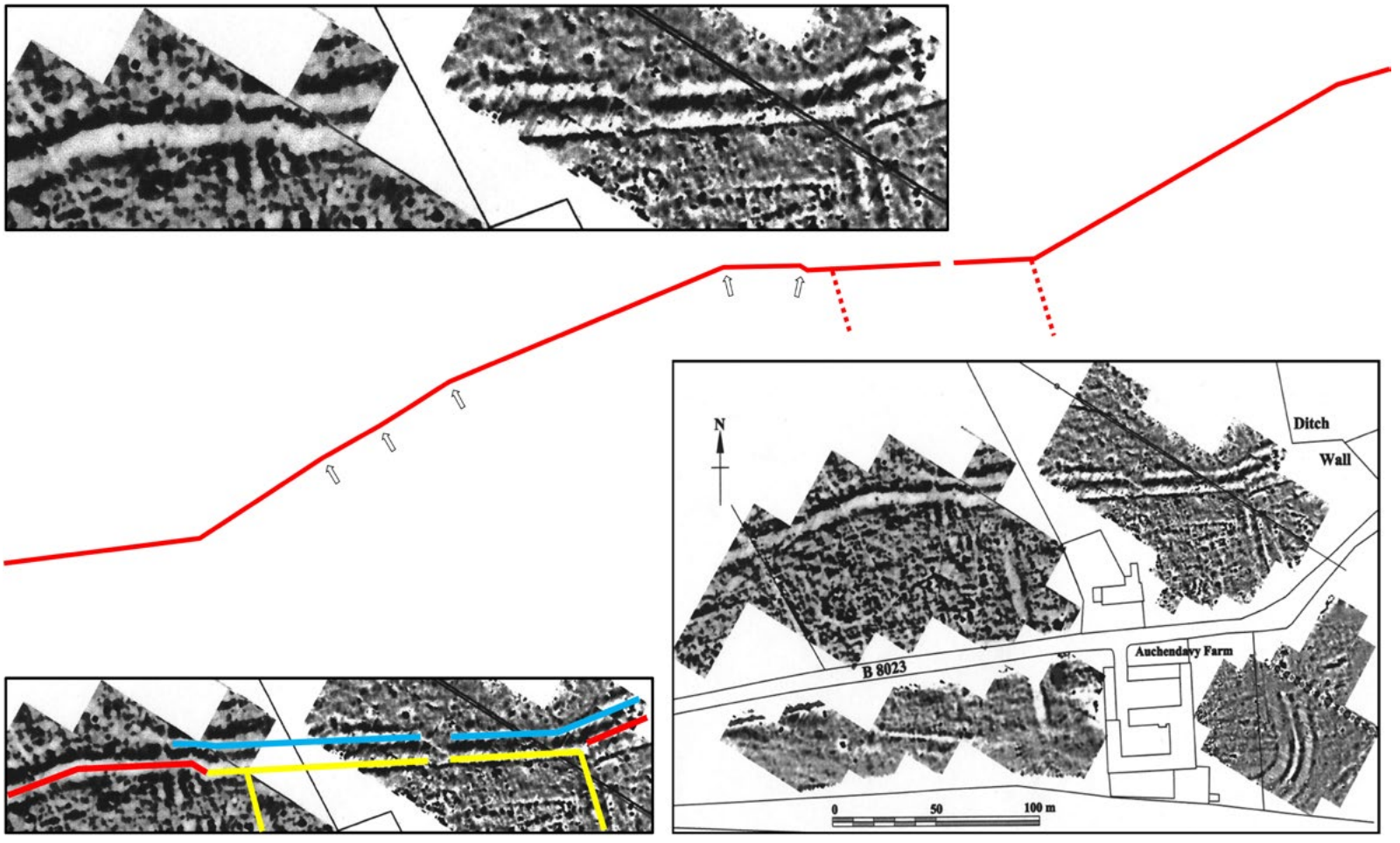

Figure 11.9. The course of the Ditch (red line) in the Auchendavy area based on the HES shapefile of the Antonine Wall, but slightly adapted to accommodate a few minor changes of direction (arrows) apparent in the magnetic survey (Jones and Leslie 2015: fig. 22.2). The bottom left box picks out what appears to be the north face of the fort with its side walls (yellow), the slightly misaligned Ditch sections east and west of it (red) and an extra defensive ditch in front of the fort (blue) (by courtesy of R.E. Jones, University of Glasgow).

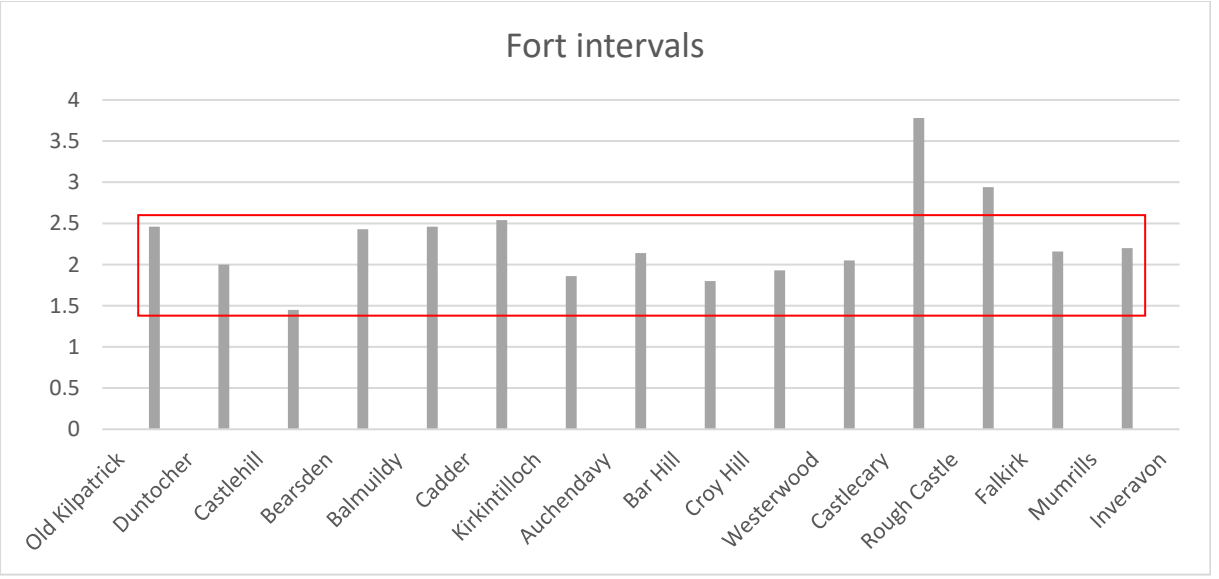

Figure 11.10. Intervals between the main installations of the Antonine Wall in Roman miles, measured between the north gates (or centre point, in the case of Bar Hill) as the crow flies.

midway along straight sections of the Rampart. Interestingly, the trio also appears to adhere closest to the 1-mile spacing pattern. As it happened, all three locations were able to serve as a link in the chain of intervisibility, if that was a criterion (cf. Figure 11.5). So with no sensitive or advantageous terrain features present in near proximity, the planners appear to have settled for the measured position. Elsewhere, minor deviations may have been allowed if the near vicinity offered topographical opportunities or challenges. Seabegs Wood was placed on a small knoll which slightly protruded into the Bonny Water valley and happened to be close to the fortlet's measured position. As said, the extreme outlier of Watling Lodge may be to do with the wish to have Dere Street monitored at close range. The precise positioning of the fortlet, however, may have been determined by a small valley east of it that is apparent on the LiDAR imagery amidst the scars of the modern landscape.

To end this section on a more speculative note. In search of the missing fortlets, Hannon observes that 'out of the thirty-two hypothesised positions, eight stand out as being positioned particularly close to significant deviations in the Wall's course, suggesting that the Wall could be deviating in order to meet planned or existing installations' (2018: 353). As said, it is possible that some fortlet positions were pre-determined, whether as signal links or because of local security concerns, and tailored into the linear works with the mile system continuing uninterrupted. A less complicated explanation would be that the surveyors, when setting out the course of the Rampart, likely putting down markers every so many paces, may have kept track of the mileage covered so that fortlet positions could be made to coincide with significant turns in the Rampart or other vantage points.

This could suggest a close functional relationship between the Rampart and the fortlets. Viewshed analysis confirms that, from their north gates, most known fortlets would have been able to monitor long stretches of the Rampart (cf. Dyčka 2016: fig. 7, 9-10, 17; Hannon 2018: fig. 8.6-7, 8.9-11, 8.16). Hypothetical fortlets situated at major turns of Rampart would also be eminently placed for surveilling

long stretches of the linear works and, particularly, the Wall-top. A particularly fine example could be the proposed Tamfourhill Road fortlet, sitting at the junction of two long legs of the Rampart. In this connection, one is reminded of one of Poulter's unexplained survey results. Both the Antonine Wall and Hadrian's Wall are 'composed of generally short lengths with, typically, *equally good views in either direction at the turning points* in between' (2009: 117, my italics). From an operational viewpoint – one might think of surveillance, inspection, patrolling, whether along the base or on top of the Wall – such an arrangement would seem to make total sense.

What remains puzzling is the adherence of most fortlets to the 1-mile spacing pattern inherited from Hadrian's Wall. John Poulter has suggested that 'the only practical reason for such rigid marking-out would have been to divide the stretches to be patrolled along the Wall to be in equal lengths' (pers. comm.). However, the occasional – and wide – deviations from the 1-mile mark seem to speak against this explanation. What may be relevant here is an increased role for dispatch riders as a partial replacement of the complex, tower-based signalling arrangements of Hadrian's Wall (Symonds 2018: 145). It has been suggested that the subsequent cobbling of the fortlets' interiors may point to a change in their use (Keppie 1980: 110). However, such measures need not reflect more than 'an acknowledgement of the necessity to protect the soldiers from mud', certainly if these confined and ill-drained spaces were regularly trampled by horses (Graafstal *et al.* 2015: 61; Symonds 2018: 144). At Seabegs Wood, the Military Way serviced the fortlet's south gate like its successor on Hadrian's Wall would do with the milecastles. One function of the fortified frontier gates, then, may have been to serve as additional points of egress to the foreland. If so, this may have been a regressive element: most fortlets appear to have lost their causeways over the Ditch and some had their gateways narrowed or blocked at some point (Bailey and Cannel 1996: 344; Symonds 2018: 144), prefiguring later developments on Hadrian's Wall.

If it is true that most fortlets were planned at a later stage in the planning process and with reference to a continuous system of Wall miles, this may resolve the old problem that the majority of the known fortlets are not situated somewhere midway between the two nearest forts, some of them not even nearly so, like Summerston. It would also imply the possibility of more than one fortlet ending up between two neighbouring forts. We have noted earlier that the chain of intervisibility requires an additional installation east of Bearsden – a potential twin of Summerston. In the long stretch from Falkirk to Rough Castle there is room for at least two fortlets, Watling Lodge and the proposed Tamfourhill Road site, with a possible third in the Bantaskin area.

The ultimate consequence of the two-tiered planning of the Antonine Wall is that the norm positions for fortlets could come into near collision with designated fort sites. Such a close encounter happened on Croy Hill, where the measured position of the fortlet was about 400m west of the main installation. As it happened, the two ended up much closer than that. This is just one of many anomalies that justify a special section on this key site.

The Croy conundrum

On Croy Hill we are facing the following challenges, from east to west: a causeway over the Ditch without an appurtenant installation; a small fort (0.6 ha) *c.* 70 m to the west of incontestable secondary construction; the fort's east wall overriding a carefully constructed water feature with an overflow channel that passes under the Rampart; and, finally, *c.* 80 m west of the fort, a fortlet that was unquestionably built in

conjunction with the Rampart. With this state of affairs, Croy Hill has, understandably, become one of the cornerstones of the Gillam hypothesis since the discovery of the fortlet in 1977.

With regard to fort-fortlet combinations, three preliminary observations seem in place. Firstly, it may be noted that a fortlet has long been suspected in close proximity to Bar Hill, as this detached fort would have required its own guarded crossing through the linear works (Hanson and Maxwell 1986: 106). Secondly, we have just seen that close encounters between forts and fortlets could result from their different spacing systems. Thirdly, other Roman frontiers offer various examples of two types of installation in close proximity (cf. Breeze 2011: 201). In Upper Germany, there are several instances of a normal fort with an associated installation of *numerus* size, like Neckarburken and Walheim. At Stockstadt on the river Main, a fort was paired with two successive fortlets. The early *numerus* fort at the Saalburg now also appears to have had a fortlet (*Schanze* B) and an enclosure (*Schanze* A) next to it, possibly because of the local frontier crossing (Kortüm 1999: 200-2). In the Rhine estuary, Valkenburg had a fort and a fortlet guarding the two ends of the elongated military compound in the early Flavian period (van Dierendonck 1997: 549). In the Roman world, then, the juxtaposition of a fort and a fortlet may have been less cause for offence than in ours. Perhaps, teasing out the sequence at Croy Hill may help us overcome our intellectual resistance. We will start this exercise with a short digression on a rather overlooked essential.

Waterworks

Before work on fort defences could start there had to be a clear picture of the future flows of rain- and meltwater and, especially, sewage from the bath and latrine suite. On the Antonine Wall, bathhouses appear to have been planned initially inside the forts (Bailey 1994: 300), with the latrines usually attached to them and flushed with their waste water. For the discharge of all these water flows, channels had to be led through the stone base of the fort walls at the appropriate places. Unsurprisingly, the sanitary suites were typically planned in one of the fort corners, making good use of the lie of the land to channel all the sewage and waste water into one of the fort ditches or, even better, the Antonine Wall Ditch. For eight forts bar Croy Hill, we know the position of the primary bathhouses (Bailey 1994: 300 with fig. 1). They were typically built close to the fort walls, either as a long row of rooms lying up against the fort rampart (Bar Hill, Westerwood, Balmuildy) or as a self-contained block typically relegated to one of the fort corners (Mumrills, Castlecary, Cadder, Old Kilpatrick). Six had their sanitary suites placed in the *praetentura*, five of which would have been able to discharge their sewage into the Antonine Wall Ditch, usually close to the corners of the fort. The same was true for Castlecary which had its bathhouse in the southeast corner, but a latrine in the corresponding north corner, again attached to the fort wall.

At Falkirk, careful arrangements for sewage disposal were made at the southwest corner of the fort. Here, Geoff Bailey found a channel emerging from under the rampart, apparently crossing the two ditches over a small aqueduct before draining into the Goat Burn. At a later stage, a large settling tank was inserted on the berm of the fort wall, the sewer now forming an overflow (Hunter 2003: 303). It all bears witness of the great care given to the disposal of sewage and the efforts to carry it away from the fort as far as possible. An interesting parallel is Ribchester where a channel passed under the southwest corner of the fort and crossed the berm and ditch before heading for a large stone-lined pit (Hopkinson 1928: 13 and plan; for aqueducts on Hadrian's Wall: Bidwell 2018: 53-6). The phenomenon of settling tanks as part of sewage works could make sense of the reputedly Roman 'well' shown on

the Ordnance Survey sheet of 1859 in the northeast corner of Auchendavy close to the lip of the Ditch (Keppie and Walker 1985: 31). In the corresponding fort quadrant, the 2006 geophysical survey shows a linear negative anomaly that could represent the south wall of a sanitary suite placed along the Rampart, like at Bar Hill (Jones and Leslie 2015: fig. 22.2; Richard Jones, pers. comm.).

What is clear in most cases is that the waterworks and sewage arrangements were an integral part of the construction of the fort. This care for good sanitation is apparent from the very start of the Antonine Wall project. Balmuildy had its sanitary suite prepared for by a channel that passed through the base of its stone north wall (Miller 1922: 41). At Castlecary, likewise, an impressive system of drains was planned and at least partly built before the north wall of the fort (Buchanan 1903: 320-25 with pl. IV and fig. 26). The internal reorganisation of Bearsden while the fort was under construction shows that the sanitary suite was one of the first buildings taken in hand (Breeze 2016: 323, 345-46), likely involving specialist construction teams.

Croy Hill revisited

In the winter of 1931-32, Macdonald had small-scale excavation work carried out at Croy Hill to elucidate points about the fort he had discovered, or rather confirmed, there in 1920. Sir George was looking for corner towers, but what he found instead, just inside the northeast corner of the fort, effectively undermining it, was a rectangular pit lined with 'first-rate' masonry (Figure 11.11). It measured 3.3 m (north to south) by 1.8 m at the top and 2.1 m by 1.2 m at the bottom, 2.1 m below, where a circular hole had been cut into the bedrock for another 0.9 m. The east side of the structure appeared to have been demolished (rather than simply collapsed, as most of the corresponding masonry was missing). On the west side of the pit, a flight of steps descended almost to the base of the structure, while a pivot stone indicated the door of a former cover building. An appurtenant culvert, clearly of one build with the stone lining of the pit, passed under the stone base of the Antonine Wall at a depth of 1.25-1.4 m. Strangely, the channel, which had been constructed with great labour, part rock-cut, part paved, lined and capped with stones, did not cross the berm in the shortest possible way, but at an angle of about 45° (Macdonald 1932: 251-57 with figs 7-12).

To Macdonald it was clear that the pit had been constructed prior to the fort, likely in connection with the bathhouse that was situated just outside the east wall. The reverse order is unlikely. The east side of the construction pit for the 'well' would have dangerously undermined the fort wall. Moreover, Macdonald reported that the ground under the fort rampart had been dug and 'made up' afterwards. 'In a length of little more than 4 feet there was a central depression a foot and a half deep'. Immediately east of the fort wall, the ground was found to have been excavated to a depth of at least 3.6 m below the modern surface. 'The cavity contained much black and red matter, resembling the waste products of a furnace', tentatively interpreted as 'refuse from the hypocausts' of the adjacent bathhouse (Macdonald 1932: 251 with fig. 12 section B-B). Interestingly, the 'stone-lined pit' also contained various layers of 'black burnt' and 'red burnt matter' as well as 'a 6-inch layer of coal ashes' (Macdonald 1932: 252). The strong impression gained from Macdonald's report is that the eastern fort wall had been constructed over an earlier structural complex or sequence which comprised not just the pit with its cover building but also a deep channel or cavity immediately east of it, the fill of which had slumped under the load of the later fort rampart.

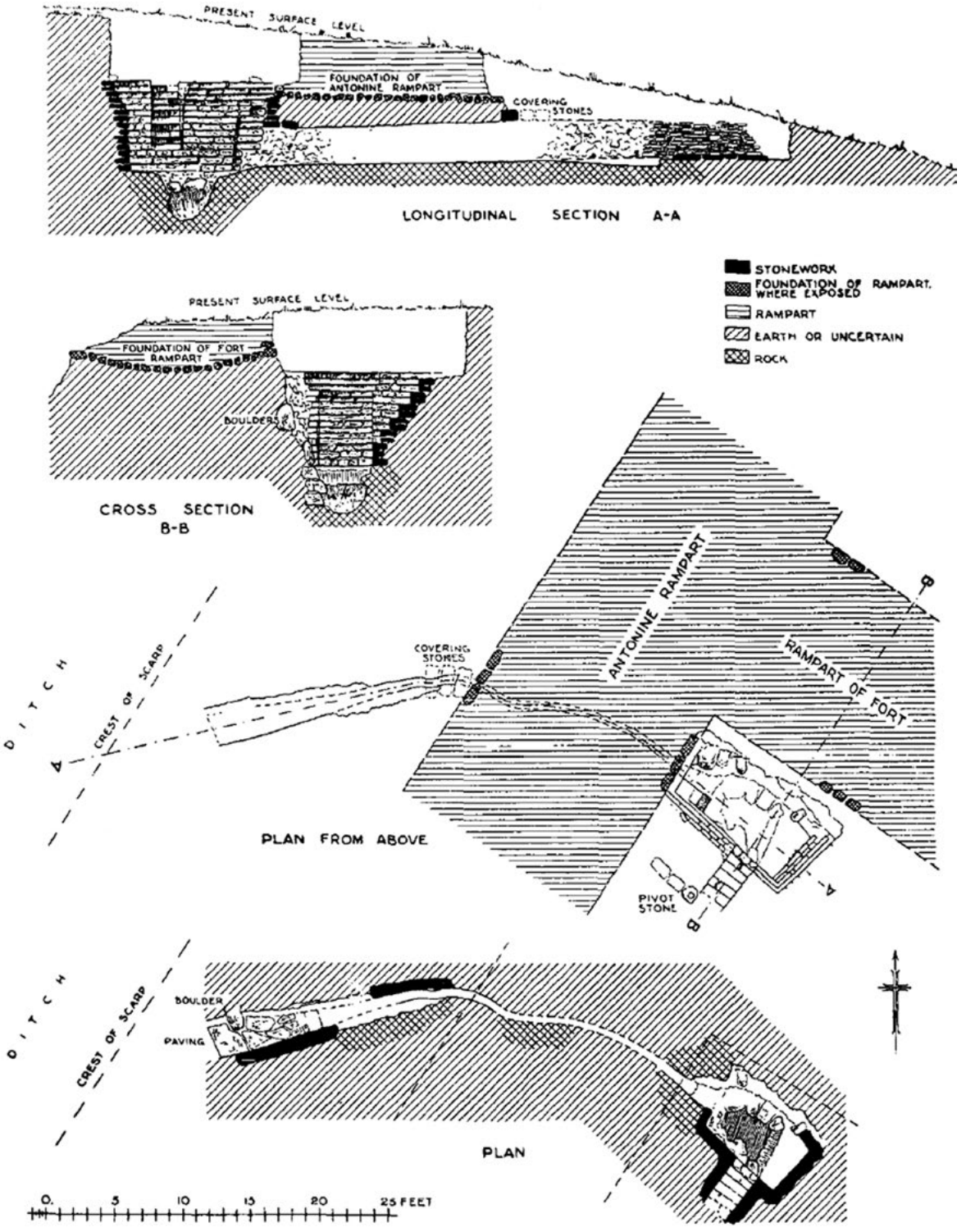

Figure 11.11. Plans and sections of stone-lined pit beneath the north-east angle-tower of fort at Croy Hill (after Macdonald 1932: fig. 12).

The 'stone-lined pit' may either be a combined cistern/sump accessing a natural spring or a settling tank/maintenance pit as part of a sewage system connected to a latrine. The OS 25 inch map surveyed in 1896 shows a 'well' southeast of the fort, while the ponds in front of it must have been fed from a local source (Macdonald 1934: 266-67). However, if so much effort and investment had been done to secure a water supply, why was this demolished when the fort was constructed, possibly within a year or two, as the Gillam hypothesis would imply? They could have saved this vital piece of infrastructure by moving the fort rampart just 1 m to the east – quite apart from the structural problems of constructing a fort rampart over an active spring. Strangely, also, the depth at which the culvert had been built would have largely emptied the reservoir – rather than an 'overflow' this element looks like the end-piece of a main drain. The narrow cover building implied by the pivot-stone, too, would seem more readily explicable in a context of sanitary service and maintenance than 'public' distribution of water.

The quality of the masonry, and the use of stone generally (especially in an Antonine Wall context), would normally point to one of a fort's main buildings, a bath-latrine suite being the obvious candidate. Whether it held water or sewage, the stone-lined pit with its service facilities would be well-placed in relation to the adjacent bathhouse, with the cover-building leaning onto a larger structural complex to the east. If a well, the destruction, or at least separation, of this element by the fort rampart may have led to the search for an alternative immediately east of it, where Macdonald found the ground to have been dug to a depth of at least 3.6 m. Interestingly, both cavities were found to contain waste products that one would normally associate with the adjacent bathhouse. Whatever the exact sequence, the crucial point is that the stone-lined pit with its laboriously constructed conduit predates the eastern fort wall and was apparently built in conjunction with (or in anticipation of) the local section of the Antonine Wall Rampart.

The secondary construction of the known fort is in no doubt. Apart from the stratigraphic evidence at the north corners (Macdonald 1932: 247), we have the enclosure with its associated annexe that preceded the fort. It is of proven Antonine date and appears to have existed for some time, to judge the accumulation of silt in its ditches (Jones, this volume). It has been suggested that this camp may have serviced the surveying of the Antonine Wall, along with the early 'enclosure' on Bar Hill (Jones 2011: 330). Interestingly, a gully coming from the enclosure's southeast corner merges with the ditch for a Roman road track that appears to have by-passed the designated fort site. This may indicate that the enclosure on Croy Hill remained in operation for some time after the fort site had been planned.

The fort on Croy Hill fell in with the two-mile spacing guideline, it enjoyed extensive views to the north and east, it lay close to a penetrating valley, and it was intervisible with its two neighbours. Although inevitable as a link in the chain of installations, the fort as documented by Macdonald is clearly not in its original position. We have just seen that the east wall overrode structures of a nature and sophistication that one would normally associate with a fort. The north gate of the fort was 'not in the middle, as one might have expected, but decidedly nearer the west' (Macdonald 1932: 247). This eccentricity was probably caused by the kink in the fort's north face. This is without parallel on the Antonine Wall, but reminiscent of milecastle 40 on Hadrian's Wall which may have been moved from its original position like milecastle 39 (Symonds and Breeze 2016: 3-4).

There is, of course, a possible pointer to an alternative fort location on Croy Hill and that is the causeway over the Ditch, some 70 m east of the gate of the known fort. Macdonald praised the visual affordance

of this 'bridge'. 'Standing on the "flattish top" one cannot but feel that it would have made an ideal signalling station: the view is most extensive in almost every direction' (1925: 290). It has been noted that the Ditch terminals on both sides of the causeway do not align, perhaps marking 'the change-over between two construction parties' (Hanson and Maxwell 1986: 108). Interestingly, the Ditch also changes in width at the north gate of Castlecary and across the front of Balmuildy (Graafstal *et al.* 2015: 62). So this may be another instance of a purported 'secondary' site mirroring phenomena seen at 'primary' forts (cf. Table 11.1). As Hanson and Maxwell observed, the causeway at Croy Hill 'suggests foreknowledge of the existence of the fort on the part of the Ditch-diggers' (1986: 108). Macdonald also concluded that 'its existence must somehow or other be connected with the proximity of the *castellum*' (1934: 262-63).

An abortive fort?

This invites a simple test: what happens if a hypothetical fort about the size of Croy Hill is aligned with the causeway? The result is a surprising fit of various bits of evidence (Figure 11.12). The baths and the stone-lined pit with its cover building would admirably go together as the east and west ends, respectively, of a sanitary suite of the familiar row-type. Like at Westerwood and Bar Hill, Croy's direct neighbours, this suite would land in the notional fort's northwest corner. The curious course of the conduit, crossing the Berm at a 45° angle, would make perfect sense as part of the sanitary suite's waterworks or sewage system, typically turning away from the northwest corner of the putative fort to carry its contents as far off as possible, like at Falkirk and Ribchester. Finally, what suddenly becomes apparent west of the notional fort corner is a potential wing-wall of similar length to Mumrills, Cadder and Castlehill. The way all these elements (causeway, sanitary suite, conduit, wing-wall) add up to a perfectly acceptable Antonine Wall fort-front is almost too good be coincidental.

In this mental exercise, the implication of the structural sequence at the 'stone-lined pit' would be that, before plans changed, a start had been made with a few essentials for the sanitary suite. At the very least, the part of the channel that was to pass under the Rampart had been built. Like Bearsden, it is conceivable that the bathhouse had been given priority, perhaps because it would take more time and required specialist skills. It even seems possible that construction of the north face of the fort, wing-walls included, had started. At Cadder, it looks as though the north side had taken a head-start, with the *porta praetoria* sufficiently progressed to leave it where it was when the change of the fort's orientation occurred. Interestingly, Macdonald noted that south of the causeway on Croy Hill, 'there were unmistakable signs of disturbance and occupation – intrusive clay, black matter, two sherds of pottery, and some appearance of post-holes' (1932: 245).

If this makes any sense at all, there must have been a change of plan very early in the process. Perhaps it was realised that the terrain was too problematic: the west half of a fort centered on the 'bridge' would have ended up on an awkward slope. It is true that the complexities of British frontier design, with the choice of fort sites limited by the course of the barrier wall and subject to various other norms (spacing, intervisibility, visual affordance, control of potential incursion routes, etc.), sometimes resulted in rather extreme compromises with the local terrain. Bearsden had a 12 m (!) drop from the northwest to the southeast corner (Figure 11.1), while Birdoswald saw its central range end up in a 'pronounced hollow' where 'morass peat had accumulated in damp ... woodland' (Wilmott 1997: 28-29 with fig. 13). At Croy Hill, the choice eventually fell on a more comfortable plateau about 100 m to the west, formerly occupied by the enclosure. Why the installation was not planned there in the first place may be to do with visual

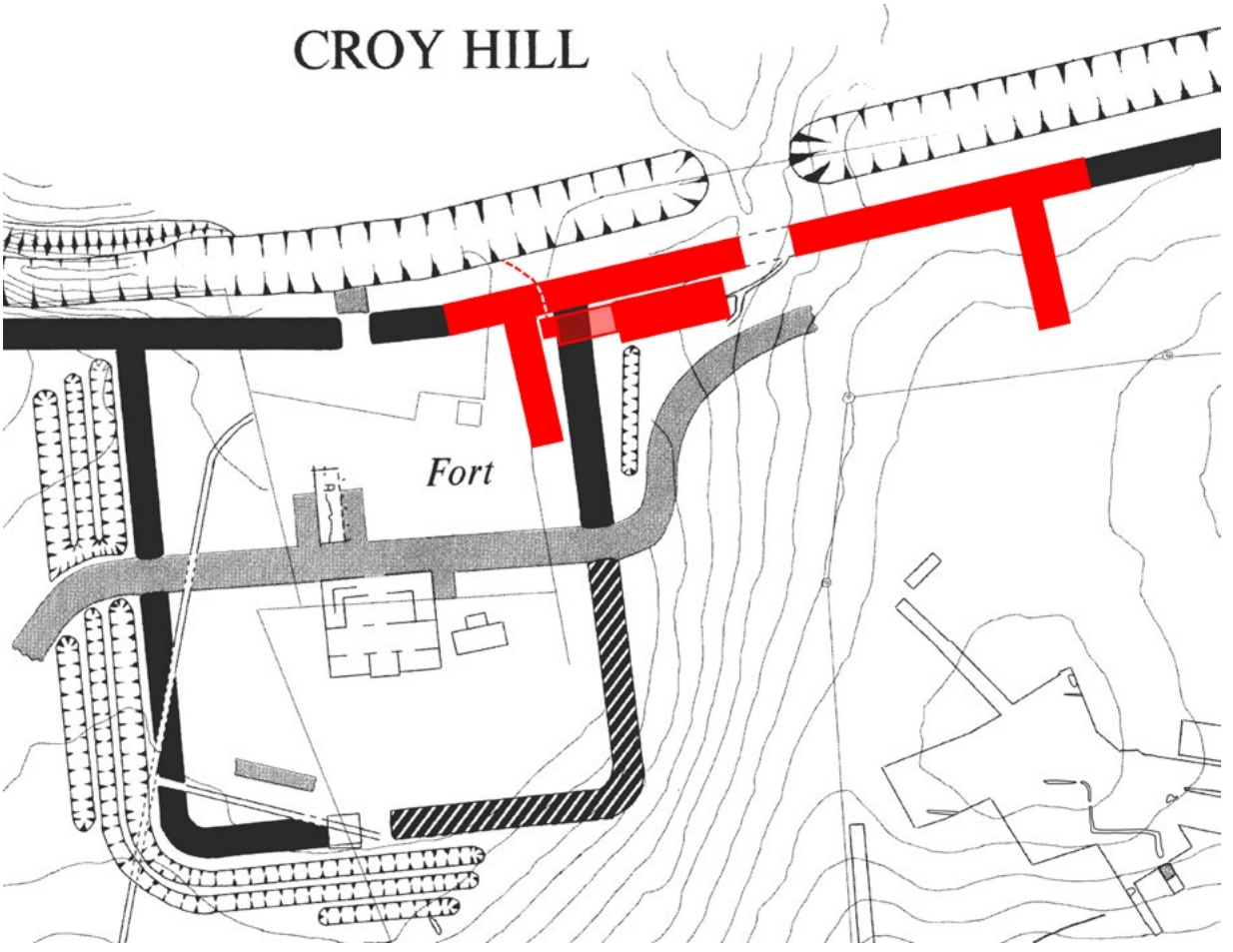

Figure 11.12. Hypothetical north side of the proposed abortive fort on Croy Hill, with bath and latrine (?) suite in the northwest corner (in red) (Base map courtesy of W.S. Hanson).

affordance or its reverse, that is visibility to target audiences. What is impossible to assess, of course, are the effects of vegetation and forest cover on specific planning decisions. One thing is clear, however: with the visual properties of the fort-fronts at top of the mind, the planners would have been easily impressed by the 'bridge'. This 'hog-backed ridge of basalt, sometimes barely concealed by the short grass, . . . crosses the line of the Roman frontier, and passes into the country beyond' (Macdonald 1934: 258). There would have been sound reasons to retain, and fortify, this pre-determined crossing-point. The availability of a water source a little to the west may initially have settled the matter.

If a change of plan occurred, it must have happened early in the local sequence. Apart from the north face and the structurally related sanitary suite, nothing substantial of the abortive fort may have been constructed, like at Bearsden. By the time the Military Way was constructed, the possible plan for a fort centered on the 'bridge' had apparently been abandoned. As the road approaches the site from the east, it comes very close to the line of the Rampart, servicing both the causeway over the Ditch and the bathhouse west of it. This suggests that the change of plan at Croy Hill, like at Cadder, predates the construction of the Military Way.

Where exactly the fortlet comes in is difficult to tell. The structure was bonded with its section of the Rampart, although the reader will remember the caveat of Kinneil. However, the overall sequence that is gradually taking shape implies that the fortlet is likely to postdate work on the wing-walled north face of the abortive fort. Again, one can only guess at reasons. For one thing, the fortlet would have backed up the crucial visual link between the watershed sites of Bar Hill and Croy Hill. It would also have been better placed to look past the hilltop quarried away north of Croy village and see the closest installation to the west, the suspected fortlet at Girnal Hill which would have helped monitor the concealed valley nowadays followed by the B802. Perhaps this crucial installation was what pushed the fortlet on Croy Hill 300 m east of its measured position. Its eventual location does not seem to have been particularly sensitive to clandestine infiltration. Interestingly, however, the fortlet occupies the only point along the Antonine Wall where the Ditch was allowed to make a wide detour from the Rampart, perhaps to avoid the local basalt knoll. Apart from directly overlooking a possible perceived weak spot, the fortlet would certainly have added to the all-round visibility and connectivity of the Croy Hill complex (Hannon 2018: 397, 401-2, 411, with figs. 8.7, 8.10, 8.16-17).

Coping stones: the Distance Stones and the western sector

There is no need to go over the Distance Stones again. A lasting monument of curation and scholarship has been erected to these unique documents by our dedicatee (Keppie 1998). The numbering system of Stones and sectors developed by Macdonald (1934: 359-400) and refined by Lawrence will be followed here. Apart from possible changes of plan (cf. Keppie 1974: 152) or differences between allotted and actual work, any attempt at collating the inscribed distances with the realities on the ground is bedeviled by uncertainties about the find spots of the Stones (the known ones are up to 500 m away from the Wall). In addition, it cannot be ruled out that some (of the more sumptuous?) Stones were placed at points with a greater visual footfall (cf. Hannon 2018: 384), although the very detailed inscribed distances and the fact that the monuments appear to come in neighbouring pairs suggest that they were normally displayed on the Wall on both sides of the work-stint break referred to (Steer and Cormack 1969: 124-25). Be that as it may, the archaeological variables (width of Ditch and Wall base, construction style of the Rampart, location of temporary camps) so far only partly and approximately correspond with the work sectors according to the Stones.

What stands out from this potential confusion is Mark Hassall's observation that slabs 2 and 4-8 of the central sector, east of Castlehill, appear to add up to a round total of 20 miles, about half the length of the Antonine Wall (1983). Hassall plausibly suggested that this figure represents a full season's allotment to the three legions, likely the first year of actual work on the Rampart. A start in the central sector may also be indicated by the milefortlet spacing-system which appears to have been set out from a point within the system, not from one of its terminals (Woolliscroft 1996: 159; Hannon 2018: 349). The two most detailed reconstructions to have appeared in recent times (Keppie 1974; Hanson and Maxwell 1986: ch. 6) both allow more than one season to accommodate all the work allotments and structural variation of the central and eastern sectors. Of course, we cannot be sure that both sectors were finished in single, and successive, seasons. A substantial time gap is implied between the overlapping work camps at Dullatur, east of Croy Hill, with two levels of turf formation occurring in the original ditch close to the point where the younger one cut it (Lowe and Moloney 2000: 248 with fig. 3).

The recent 'Hidden landscape of a Roman frontier' project has attempted to establish the original locations of the distance slabs in a 3D-environment through a process of iterative adjustment, looking for 'significant spots, such as changes in the Wall's direction, installations, hilltops, or river crossings' (Hannon *et al.* 2017: 456, 467-8). Interestingly, it was found that the *pes Drusianus* generally produced better results than the *pes monetalis* that appears to have been used for the fortlet system. However, even with the longer foot standard, this exercise brought to light a significant shortfall in the inscribed distances compared to the actual length of the Wall, except for those sectors that have no forts (10, 13-4). However, when the north faces of the forts are subtracted, following the suggestion of Hanson and Maxwell (1986: 122-3), most discrepancies disappear, except in sector 12, which harbours Duntocher (Hannon *et al.* 2017: 456-9). This would seem to imply that the upgrading of this installation *post*-dates the allotment of the work stints in the west, whereas the other forts, 'secondary' ones included, appear to predate the work allotments recorded on the Distance Stones.

The stints in the western (sectors 10-6, Stones 9-17) were not only much shorter but also expressed in feet (*pedes*), in contrast to the paces (*passus*) used elsewhere. This has generally been taken to indicate that the western sector came last in the construction order of the linear works. In keeping with this, all the installations west of Castlehill appear to have stood on their own for some time. Cleddans and Duntocher were built before the Rampart, the latter receiving a complete ditch circuit, as if this was going to be a stand-alone fortlet. Old Kilpatrick was provided with a full suite of ditches and rounded corners on all sides (Macdonald 1932: 220-30; Hanson and Maxwell 1986: 105), as if no frontier barrier was going to meet the fort in the near foreseeable future (although gaps were left in the ditches at the appropriate places which may have been secured with hawthorn bushes or similar obstacles for the time being).

Before the Rampart was built at Duntocher, the installation was upgraded to a small fort. Rather than Robertson's sequence of an initial 'fort' with an 'annexe' soon attached to it (1957: 14-15 and 91-95), what we have here really is a single elongated enclosure subdivided in two compartments, like Bearsden, as Vivien Swan has argued (1999: 432) and geophysical research now has confirmed (Jones 2016: fig. 3c). At Bearsden, the building sequence started with the defences of what appears to have been planned as a normal fort, with the headquarters and bathhouse soon following suit, when the decision came to subdivide the installation to accommodate a reduced fort *with* its annexe. This could mean that the construction of Bearsden was overtaken by the 'annexe decision' (Breeze 2016: 378-79). However, this would not explain the *c.* 35% reduction of internal space for the fort. Interestingly, the loss at Bearsden (*c.* 0.5ha) was in large part compensated by the upgrading of Duntocher. Possibly, then, the start-up of the western sector occasioned a review of its garrisoning arrangements, affecting both Bearsden and Duntocher.

Whatever caused it, the partitioning of Bearsden and Duntocher suggests that the annexe model was available when the rearrangement happened. One might argue that the fort annexes of the Antonine Wall developed autonomously, as they catered for the needs of local garrisons (Wallace 2017: 4). However, similarities in size, sequence and layout seem to suggest a central decision or synchronous development. Geoff Bailey has argued that the abandonment of a planned Vallum led to the creation of annexes (1994). Be that as it may, we are certainly looking at a distinct step in the development of the Antonine Wall, possibly marking the start of its operational stage when additional activities and regimental dependants had to be accommodated. At one time it seemed that the annexes were a late development, based on the finds assemblage in the innermost western fort ditch of Mumrills (cf. Swan 1999: 428), but Bailey has pointed out that this ditch may have

continued to function as a rubbish tip rather than being backfilled upon the creation of the annexe (1994: 303). The few things we can confidently say are: that at Mumrills, Balmuildy and probably Rough Castle, the annexe defences either cut or respected the fort ditches; their layout implies that they post-date the construction of the Military Way (note that the road never bends at annexe gates); and their defences imply the presence of the Rampart. Now, if the forts and the Military Way represent the first two major elements of the building programme, and the building of the Rampart in the central and eastern sectors took at least two seasons, the annexes may not have come before the third or fourth year of the project.

This could impact on the place of Bearsden in the overall sequence. If the fort builders were overtaken by the 'annexe decision', or at least had the annexe model available when the decision came to reduce the fort, the implication would seem to be that the building of this installation had been either shelved for quite a while or perhaps that it had been planned (and even started up?) elsewhere initially. It bears reminding that Bearsden is 'blind' in both directions, in deviation of the planning principle of intervisibility which appears to have been observed normally. Whatever is happening here, it seems that 'there is a rabbit away' at Bearsden, to borrow a phrase from John Gillam.

A sequential stratigraphy

John Gillam's hypothesis has proved to be one of the most original and productive theories ever developed about the frontiers of Roman Britain, moving on research and scholarship for fully four decades. Perhaps most fundamentally, what Gillam made us realise was just how close a copy of Hadrian's Wall Pius' new frontier in Scotland was, replicating most of its distinctive elements like the dimensions and details of the linear works as well as the British anomaly of forts and fortlets integrated with the frontier barrier. Given the original causeways at Rough Castle and Cadder, the Gillam hypothesis always implied that somewhere between the abandonment of the old frontier and the first work season on the Antonine Wall Rampart a change of concept occurred, the key element of which was an unprecedented 2-3 mile spacing-norm for the forts. The question is when precisely this step was taken. One might ask what a difference a year makes. We shall argue shortly that the issue is crucial for our understanding of the Antonine Wall.

As a new approach to an old issue, this paper has set out to develop a 'sequential stratigraphy' of logical, spatial and structural dependencies apparent in the Antonine Wall complex (Figure 11.13). At the start of this journey we saw that the picture of structural relations between forts and Rampart is varied and does not seem to support a generalised distinction between 'primary' and 'secondary' installations. A simple tabulation of potential pointers to priority may be helpful here (Table 11.1). The resulting picture largely blurs the received primary/secondary division. In a next step, a 'systemic' analysis suggested that the choice for the fort sites was largely determined by the principle of neighbour-to-neighbour intervisibility; the presence of penetrating valleys; the availability of acceptable fort plateaus (although this condition appears to have been negotiable); and, of course, a fairly rigid 2-3 mile spacing-guideline. One is inclined to add Macdonald's observation that at 'almost every [fort site] there is a clear view to the bottom of the valley' (1934: 83). Once the line of the Rampart had been established it would have been difficult to meet all these criteria for an additional dozen sites (cf. Poulter 2009: 118-19). All of this this speaks against the 'secondary' forts being an afterthought.

Site properties in order of discussion	'Primary'					'Secondary'										
	Old Kilpatrick	Balmuildy	Auchendavy	Castlecary	Mumrills	Duntocher	Castlehill	Bearsden 1	Cadder	Kirkintilloch	Bar Hill	Croy Hill 2	Croy Hill 1	Westerwood	Rough Castle	Falkirk
Fort size capable of housing complete unit	■	■		■	■		■	■	■							
Original causeway over Ditch		■		■					■				?		■	
Superstructure of fort wall bonded with Rampart		■		■											■	
Stone base of fort wall abuts foundation of Rampart					■				■			■		■	■	
Fort plateau partially protected by edge of plateau / valley	■			■	■		■	■	■	■		■			■	■
Close to penetrating valley or concealed incursion point	■	■		■	■	■		■	■	■		■	■		■	■
Situated on east side of nearby stream or burn	■	■		■		■	■		■					■	■	
Intervisible with both neighbour installations	■		■		■	■	■		■	■	■	■	■	■		■
Alignment of Military Way implies knowledge of fort					■				■		■			■	?	
Wing walls indicated by 'zigzag' or sharp bend of Rampart		■	■	■	■		■		?				■			
Sewage channel for sanitary facility provided in base of AW		■		■	■				?				■			
Change in width/line of Ditch at causeway or fort front/corner		■	■	■									■			
Different legions building fort and local sector of Rampart			■					■			■	■				

Table 11.1. Potential pointers to priority, distinguishing 'primary' and 'secondary' installations on the Antonine Wall Croy Hill 1' refers to the hypothetical abortive fort centered on the causeway.

Sites like Croy Hill, Kirkintilloch and Castlehill suggest that it was the north faces of the installations that mattered. In all probability, these served as the starting point for the whole planning process. It would therefore have been essential to mark out these elements securely from the very start. The sharp kinks at the end-points of the implied wing-walls, notably at Mumrills, Balmuildy and Castlehill, suggest that the fort positions had become unchangeable by the time the line of the Rampart was set out in that area. Seeing that most wing-walls are of just the right length to receive the fort ditches, what these elements hint at is an intention to start the construction of these forts well in advance of the Rampart. The proposed sequences at Croy Hill, Auchendavy and Cadder even suggest the possibility that the north faces of these forts took a head-start over the rest of the installation. Whatever, Old Kilpatrick, Duntocher and Cleddans serve to remind us that forts and fortlets could be built as self-contained installations, well ahead of the Rampart. Bearsden, interestingly, while sitting in a Sixth Legion construction sector, has produced a building inscription of the 20th (Breeze 2016: 81-4). Similar mismatches occur at Croy Hill, Bar Hill and Auchendavy (Table 11.2). It all seems to support the conclusion that the forts represent a distinct stage in the planning and building sequence, normally preceding the local linear works.

Fortlets at regular distances, like on Hadrian's Wall, were probably part of the plan from the outset. Although the position of some may have been influenced by local conditions, like Watling Lodge by the proximity of Dere Street, the recent 'Hidden landscape' project has robustly shown that most of these lesser installations fall in with a continuous 1-mile spacing system. As the intervals appear to have been measured along the line of the Rampart (either while it was being planned or in its marked-out state), the fortlets must belong to a different stage of the planning process from the forts. Interestingly, those locations that seem rather indifferent in terms of topography (Kinneil, Glasgow Bridge, Wilderness Plantation, Cleddans) conform closest to the spacing system, as one might expect. The different planning guidelines for forts and fortlets meant that near collisions could occur, like at

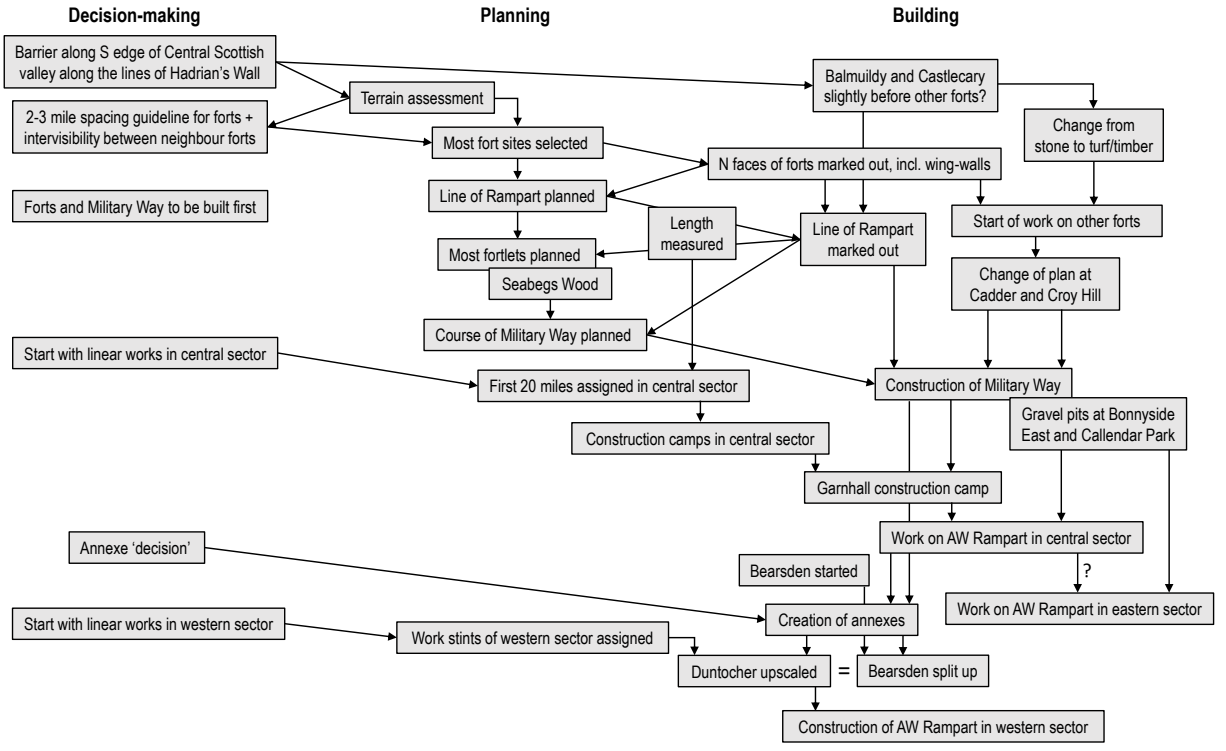

Figure 11.13. 'Sequential stratigraphy' of logical, spatial and structural dependencies between the main elements of the Antonine Wall system.

Croy Hill. In terms of building, most fortlets, apart from those in the western sector, were constructed in conjunction with the Rampart, while some, like Kinneil, may have been bonded into it at a slightly (?) later stage. With easily two seasons needed for the linear works in the central and eastern sectors, the implication of our proposed 'stratigraphy' is that most fortlets came relatively late in the sequence. So we end up with an almost complete reversal of the theory we set out to explore: in planning if not in actual construction, most 'secondary' forts must in fact predate the chain of fortlets that was always supposed to have preceded them.

The Gillam hypothesis remains as inspirational as ever, if only because it reminds us that the military institution that conceived, planned and built the Antonine Wall would have had Hadrian's model in mind, with stone-built, full-garrison forts being the norm. This means that at some point there was a change of concept. The original causeways at Cadder and Rough Castle always implied that the 'secondary' plan came almost imperceptibly early. Our sequential stratigraphy now suggests that the new concept was there

Fort	RIB nr.	Legion	Legionary sector
Croy Hill	2161-3	VI	II/XX
Bar Hill	2171	II and XX	VI
Auchendavy	2180	II	VI
Cadder	2188	II	II
Balmuildy	2191-2	II	II
Bearsden	3506	XX	VI

Table 11.2. Legionary building inscriptions for forts and respective Rampart construction-sectors

before the planning of the linear works started in earnest. Does this mean that this momentous step is irretraceable? Perhaps not.

Balmuildy and Castlecary must be very early on several counts. Both forts had their ramparts built in stone, which separates them from all the others. The wing-walls of Balmuildy may place the start of work at this site at a point in time where it was assumed that the Rampart too was going to be built in stone. In contrast to most other forts (save Bearsden), Balmuildy and Castlecary were relatively 'blind' to the east and west because of their classic valley locations – as if their sites predate the main planning phase of the Antonine Wall. A crucial hint to the same effect may be the awkward angle at which the Rampart abuts the north-face of the western wing-wall of Balmuildy. It suggests that the fort had been built on the assumption that the Rampart would run roughly east-west – before the planning of the complete system made it clear that Balmuildy would need the detour of the Rampart over Summerston to link it in with the rest of the system. Of course, Balmuildy is the only fort to have produced building inscriptions of Lollius Urbicus (*RIB* I 2191-92). Possibly, then, Balmuildy and Castlecary give us a glimpse of the earliest conceptual stage of the Antonine Wall, simply because these key sites were occupied and fortified slightly before the rest, Balmuildy guarding the crossing of the river Kelvin, Castlecary controlling the entrance to the Red Burn valley while sitting on the watershed of the isthmus.

The tentative timetable of Hanson and Maxwell (1986: 134-36) suggested that construction of the Antonine Wall may have started in AD 142 straight away, but this is far from certain. Apart from logistic preparations for the new major project, perhaps including harbour works at both ends, Urbicus is likely to have concentrated on the road and occupation network of the hinterland. From a logistical viewpoint, the natural first focus would have been on the infrastructure that was to feed, supply and otherwise support the massive workforce that was going to build Pius' new frontier. This would certainly have included the main axes of Dere Street and the Annandale/Nithsdale routes with all their logistical and security facilities (Symonds 2018: 78-86). Interestingly, the few surviving inscriptions that either name Urbicus (AD 139-*c*. 143) or are otherwise datable to the first two seasons after the proclamation of victory in AD 142, include not just those from Balmuildy but also *RIB* I 1276, recording construction work at High Rochester on Dere Street, as well as the Ingliston milestone, *RIB* I 2313, which pertains to the road's continuation from Newstead to the Forth (Maxwell 1983: 382-83). The other major route over Annandale, Miller suggested almost a century ago, may have continued until Bothwellhaugh before forking into two routes, one leading to Balmuildy, the other to Castlecary (1922: 2). In the latter case, Flavian antecedents may still have been on record (Hanson and Maxwell 1986: 39).

Inversely, two other forts, Bearsden and Duntocher, may have come appreciably later than all the rest. The archaeology of the western sector allows us to draw up a very detailed sequence. The following steps would seem to have come in quick succession:

1. Remaining length of Rampart divided into six sectors; work stints allotted with Duntocher still counted as a fortlet.
2. Initial work at Bearsden overtaken by 'annexe decision' and/or review of garrisoning arrangements for western sector
3. Fort walls of Duntocher 2 constructed.

4. Rampart constructed between Duntocher and Cleddans (the crews possibly mistaking the marked-out line as representing the Wall's north instead of south face: Poulter 2009: 110).
5. Fort ditches at Duntocher dug.
6. Rampart west of Duntocher built.

If it is right that the annexe 'model' inspired, perhaps even caused, the partitioning of Bearsden and, by implication, Duntocher 2, and if the Antonine Wall annexes postdate the completion of the linear works in the central and eastern sectors, it becomes clear that the upgrading of Duntocher really belongs in the closing stages of the Antonine Wall project, i.e. easily two years after the construction of – say – Rough Castle. This rather distracts from Duntocher's relevance for the Gillam hypothesis, seeing that its proponents always agreed that the putative 'secondary forts decision' must have happened very early, likely in the first season of work on the Rampart in the central sector (Hanson and Maxwell 1986: 134-5). Of course, one might riposte that the upgrading of Duntocher was decided on earlier, along with the other 'secondary' forts, but only effectuated later. However, this escape has now been foiled by the finding that the work allotments for the western sector apparently still reckoned with a fortlet at Duntocher (Hannon *et al.* 2017: 458-59).

The Antonine Wall: a radical experiment

When the Roman army came to create a successor to Hadrian's Wall on the Forth-Clyde isthmus, it seems to have largely reproduced the infrastructure it had become accustomed to, including such distinctive details as pits on the Berm and fortlets placed at 1-mile intervals. It is possible that the very first works at Balmuildy and Castlecary were started on the assumption that the new barrier wall was going to be of the same material as Hadrian's – a start had just been made with rebuilding the old Turf Wall in stone. It is even possible that, when the very first Antonine footprints were set at Balmuildy and Castlecary, the plan for the new frontier was still based on the concept of full-regiment forts spaced at normal intervals. However, before the planning of the linear works started in earnest a major conceptual change occurred.

The most striking aspect of the Antonine Wall is the very close spacing-norm for the forts. Between Castlecary and Kirkintilloch, the intervals are very regular, with an average of a mere 2.04 (Drusian) miles (Hannon 2018: fig. 7.8). There was no topographic necessity to bisect the 4 miles between Castlecary and Croy Hill, but Westerwood was plugged in halfway for no other apparent reason than the spacing norm. The distance between Bearsden and Castlehill was a mere 1.5 miles. Such close spacing is unparalleled in the Roman world, except perhaps for the Valu lui Trajan in south-east Romania (Hanson and Oltean 2012). It is all the more strange in light of our dedicatee's observation that 'the Antonine Wall was always lightly held' (Keppie 2009: 1141). The planners of the new frontier in Scotland also took the step to break up units and base them in separate installations that might not even be neighbours (Breeze, this volume). This was an unexpected diversion from the trend of the preceding decades. Trajan and Hadrian had heavily invested in regimental identity and *disciplina*. We have Trajan's repeated injunction to his governor Pliny to keep the soldiers close to their bases (*Ep.* X 20.2, 22.2). On the German *limes* and Hadrian's Wall, the preceding generation of forts for the most part appear to have been planned as accommodation for complete units.

There is a second aspect where the Antonine Wall seems to represent a break with the past: the new frontier in Scotland appears to have done without a regular, dense tower cordon (Breeze 2019: 96-97). 125 years of modern research have failed to produce convincing evidence for equivalents of the turrets of Hadrian's Wall. With well over 100 sections on record (Keppie 1974: 156-58) one cannot help feeling that there should have been more, and better, evidence by now than the single, arguable, post-pad at Callendar Park (Bailey 1995: 585-86 with fig. 3; for objections see Hanson and Breeze, this volume). By this time, timbers of the implied size appear to have been in very short supply, seeing the almost minimalistic gate architecture of the Antonine Wall forts and the complete abandonment, or at least the archaeological invisibility, of corner and interval towers (Hanson 1982: 171-72, 177-79). Counter evidence may also be provided by the enigmatic expansions that occur in a few places, typically in pairs (Hanson and Maxwell 1986: 98-9). Whatever their function (*pace* Poulter 2018), the fact that such elevated platforms were added to the back of the Wall would seem to confirm that the Rampart itself lacked such facilities. Gillam struggled with the lack of towers, knowing that the watch-posts on the German *limes* were systematically rebuilt in stone in the very years that the Antonine Wall was conceived (1975: 55).

So we are left with a new frontier that copied most elements of its predecessor, but broke with the past on two points: it dramatically raised the number of forts while abandoning, so it seems, the dense tower cordon that had become the hallmark of artificial frontiers. The question is: is there a deeper connection between the two most striking innovations of the Antonine Wall? Could we be looking at two sides of the same coin? To answer this question, we need to go back to the basics of Roman frontiers. Two generations earlier, artificial *limites* had been conceived as efficiency-raising infrastructures designed to support the army in its daily security work along the edges of the Roman world (Thorne 2007: 228-32). The classic form had been developed in the later Trajanic period in Upper Germany, with an advanced screen of observation towers, spaced at *c.* 1 km intervals and organized in clearly defined sectors each with their own 'response centres' (Woolliscroft 2001: ch. 4). Hadrian's Wall had carried this a step further, with fortlets placed at every mile and two towers in between, resulting in a visual acuity that enabled guardsmen to distinguish friend from foe (Foglia 2014: 31-2). The German and British *limites* of the Hadrianic period provided for an almost watertight monitoring of the frontier line, but this ambition came at a very high price in terms of manpower. With a fortlet and two towers every mile, Hadrian's Wall, if fully manned, may have absorbed close to 200 men per fort. In light of the frequent understrength status of units suggested by surviving *pridiana* (e.g. Campbell 1994: nos. 182-83), this was an enormous burden.

What the novelties of the Antonine Wall may bear witness to is an attempt drastically to cut down on manpower dispersed along the line while retaining the capacity to react on the spot to the type of military threats that were the stock in trade of the northern frontiers. The solution was as radical as it was simple: the plan for the new frontier largely conflated the two basic functions of observation and response. To achieve this, the forts were so closely spaced that it was no longer necessary to displace 30-40% of the units to a dozen or more line installations each. In the new concept, most of the Rampart and the immediate foreland could be covered from the response centres themselves, with the fortlets possibly serving as satellite 'eyes'. A crucial condition, however, for the increased dispersal of response capacity was optimum lateral connectivity so that the forces were able to coalesce and scale up quickly at any point along the line. Hence the apparent priority given to the planning principle of neighbour-to-neighbour intervisibility and to the Military Way as an operational baseline.

The breaking up of units and the dispersal of frontier forces, with several garrisons ending up with somewhere around 120-160 men (Breeze, this volume), is remarkable: it ran counter to administrative routine, supply-logistic efficiency as well as regimental culture. One might argue that this multiplication of fort-like installations was aimed at projecting a maximum visual presence, so that any party that approached the Wall with evil intent would always be aware of two or three major installations watching them. The army that built the Antonine Wall surely understood the symbolic language of victory and dominance – witness the Distance Stones. Yet, there is little other evidence that the new frontier in Scotland invested in visual appearance – the north gates of the forts do not seem to have been very impressive and the evidence for corner towers is limited at best. The Antonine Wall was largely made of earth, turf, timber and thatch, and the Rampart probably lacked a dense cordon of imposing towers. It serves to remind us that a Roman frontier could very well do without monumental projection of power – this was not their *raison d'être*. The purpose of Roman frontiers is to be sought in practical performance.

The set purpose to conflate the basic functions of observation and response would go a long way to explain the anomalous anatomy of the Antonine Wall. Yet, for all its dispersal of force, this was still a formidable and flexible chain of response. Even the smallest garrisons would be capable of dealing with the base level and nuclear element of martial activity in the barbarian north: raiding bands, usually mounted, consisting of the personal followers of local leaders – or the aggregates thereof. Like the Roman frontier units, such forces could quickly coalesce for the occasion, certainly if earlier pinpricks had proven successful (Graafstal forthcoming). Larger war bands from the farther north would usually follow the valleys and lowlands to feed on their resources and for speed of movement. A truly robust response system, then, would also have to be attuned to the larger geography of movement of Scotland.

The Antonine Wall seems fit to deliver on that level as well. The system's distribution of force across the isthmus is very revealing. If we take a step back, we can see the Antonine Wall can readily be broken down into three parts. The backbone of the system clearly consisted in the Mumrills-Castlehill sector, with the two more lightly held flanks naturally protected by the Firth of Forth and the Kilpatrick Hills, respectively. Significantly, it is in the Mumrills-Castlehill sector that that we see the 2-3 mile spacing norm for forts most consistently applied – and it was the 20 miles east of Castlehill that appear to have been singled out for the first season of work on the Rampart, sealing off the most penetrable part of the isthmus. Perhaps most revealing, the distribution of garrison sizes between Carriden and Old Kilpatrick shows a remarkable correspondence with the main potential incursion routes from the north (Figure 11.13).

The Antonine Wall was the most advanced of the classic *limites* of the 2nd century. It was a greenfield creation, representing the latest thinking about what preclusive frontiers were to deliver. It introduced a quite novel concept that largely conflated the two basic functions of observation and response. The dispersal of response capacity this entailed meant that lateral connectivity, both visual and infrastructural, was paramount. This, in turn, explains the crucial place of the north faces of the forts in the complex chain of planning. The result was a highly integrated and carefully balanced system whose distribution of strength reflected the geographical penetrability of the Forth-Clyde isthmus, while always providing for a minimal local response capacity in the size class of Rough Castle. All of this would seem to identify raiding in its full spectre, from small-scale rustling to major predatory incursions, as one of the principal concerns underlying the design of the Antonine Wall.

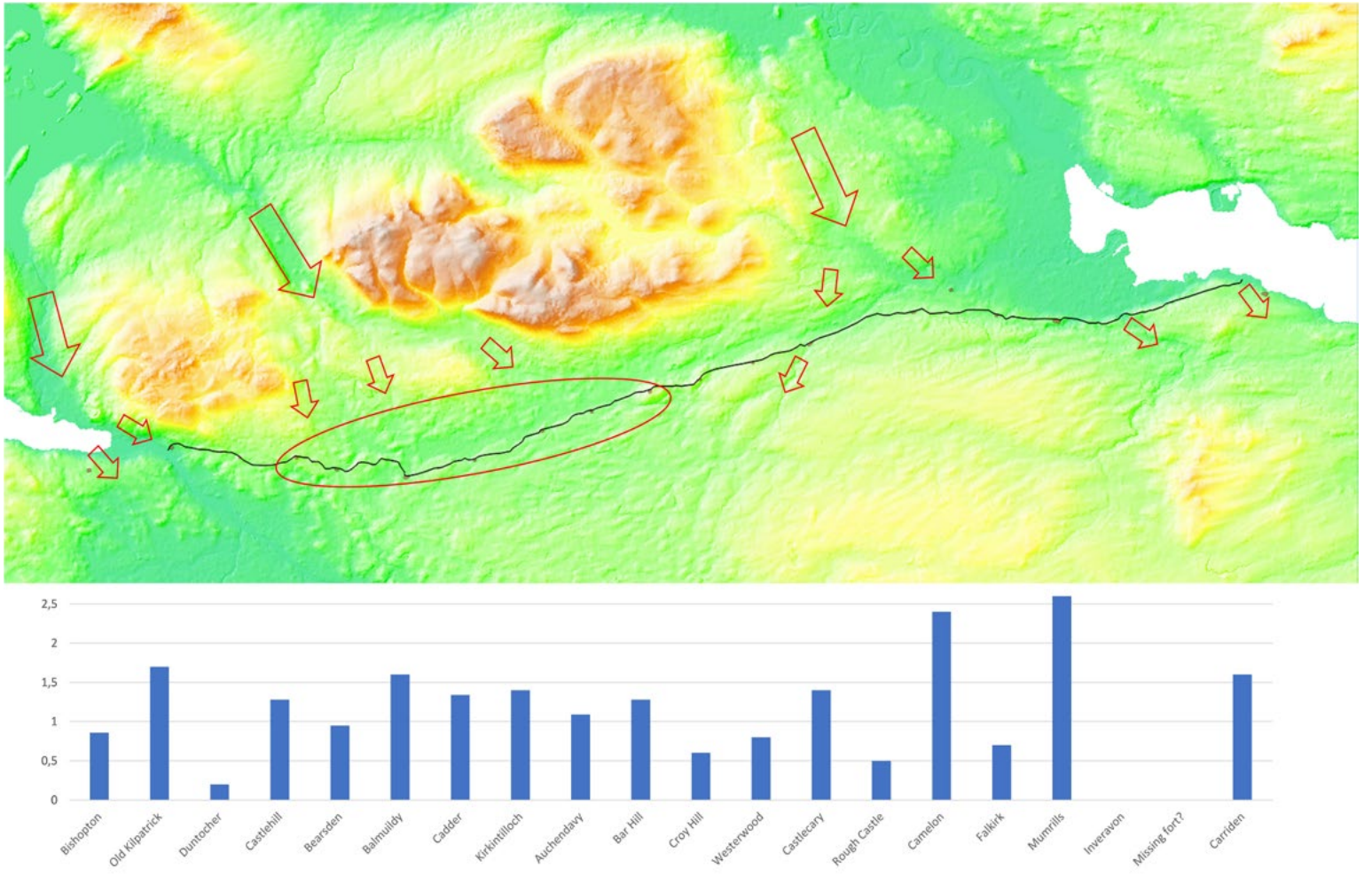

Figure 11.14. Fort sizes (internal, in hectares) in relation to the wider geography of the Forth-Clyde isthmus, with the red arrows highlighting natural corridors and more easily penetrable zones. The map and table include the fort of Bishopton, which was visually in contact with Old Kilpatrick, Duntocher and Castlehill. Elevation map with hillshade generated from SRTM/Aster data (EU-DEM).

Postscript

The completion of this paper was overtaken by confirmation that a new fortlet had been discovered at Boclair, some 700m east of Bearsden, during a watching brief in June 2017. The fortlet is well off the 1-mile mark (by some 500 m) of the spacing-system for this class of installations. Strategically overlooking the Manse Burn valley and situated almost perfectly halfway Balmuildy and Castlehill, the site ought to have received the fort of Bearsden, especially because it was able to see Castlehill (Figure 11.4). Although reports about the width of the installation's rampart suggest a fortlet, it may be noted that Boclair Road mirrors the expected behaviour of the Military Way if it were to service a planned fort in this area.

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12. The importance of fieldwalking: the discovery of three fortlets on the Antonine Wall

James J. Walker

The Roman Wall in Scotland is a monument alongside which I have spent my entire life. My father farmed Seabegs Place Farm, Bonnybridge, Stirlingshire; the Antonine Wall passed through our front garden; and Seabegs Wood was my playground as a child. So my interest in Roman antiquities began at an early age.

My interest was further increased when in 1963, at the age of 15, I decided to cycle to Westerwood fort near Cumbernauld to visit a stretch of the Antonine Wall with which I was less familiar. When I noticed that the field to the west beyond the fort had been ploughed, I asked Mr Duncan, the farmer, for permission to walk on his field as it had not yet been seeded. About 245 m to the west of the fort I noticed an elongated carved stone lying in a plough furrow. Ploughing had clearly pulled the stone to the surface and, as it was lying in the same direction as the furrow, it had survived further damage. I realised from its size and shape that it was a Roman altar. With difficulty I managed to turn it over and could see that one side and the back had suffered plough damage over the years, but the inscription was legible and intact (Figure 12.1). With a lot of effort I managed to roll the altar about 20 m to the edge of the ploughed field where there was a pile of stones that had been cleared from previous ploughing. I returned to the farm and asked Mr Duncan if he would move the altar to the farm for safety until I could arrange for its removal. The following day I contacted Miss Doreen Hunter of Falkirk Burgh Museum and asked if she would collect it from the farm. The altar was duly removed and exhibited in the museum at Dollar Park, Falkirk. It is presently on display at Falkirk Community Trust's Kinneil Museum, Bo'ness, West Lothian. My reward for discovering the altar was four pounds ten shillings and Mr Duncan the farmer got

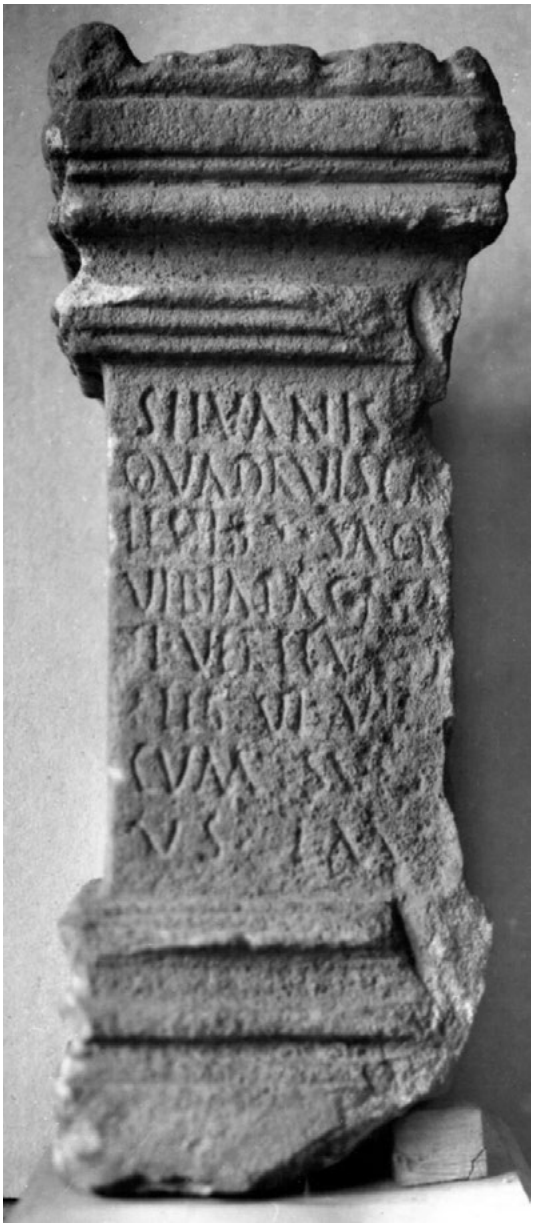

Figure 12.1. Altar dedicated by Vibia Pacata from Westerwood, as discovered in 1963.

the same amount. The altar was dedicated by Vibia Pacata, the wife of Flavius Verecundus, a centurion of the Sixth Legion, to the *Silvanae* and *Quadriviae Caelestes*, heavenly goddesses of the woodland and the crossroads (*RIB III* 3504). A later study of the couple's names has suggested that Vibia Pacata could have come from North Africa and Flavius Verecundus may previously have served in Pannonia, though the brief introductory remarks concerning the stone's discovery and location are incorrect (Wright 1968; see also Allason-Jones *et al*., this volume).

Some years later I was given a copy of Sibbald's *History and Description of Stirlingshire* (1707) and was intrigued to find in it Timothy Pont's reference to the Roman frontier and the location of forts, particularly where it specifically mentioned that 'at the west end of Seabegs Wood there was a fort and at the east end of Seabegs Wood there was a great fort'. This inspired me to search for the two sites.

For a number of years I had fieldwalked the ploughed fields around Seabegs Place Farm in search of the 'missing' fort between Rough Castle and Castlecary, but without success. My farm upbringing had taught me the difference in soil types and ground conditions. The only finds recovered from the fields around the farm were some sherds of late medieval pottery, no doubt from the former hall house at Seabegs, some 18th-19th century pottery and a few nondescript metal objects of agricultural origin. My thoughts then turned to the two Antonine Wall construction camps in the area. One at Dalnair in the field beyond the west end of Seabegs Wood and the other at Milnquarter to the east of the housing area of Seabegs (Jones 2011: 182 and 277). Could the remains of the Roman camps have been confused with forts in the 16th-17th centuries?

Extensive trenching across the field to the west of Seabegs Place Farm and more limited work in the small field immediately to its east was carried out in 1968 by Peter Briscoe of the Hunterian Museum and James Thomson of the Smith Art Gallery and Museum, Stirling, in an attempt to locate the site of the postulated fort at Seabegs (*DES* 1968: 44). This proved unsuccessful, so in 1972 I initiated a small excavation to extend the search further to the east. This was led by Hugo Millar, President of the Cumbernauld Historical Society, along with four of its members including myself. Permission was given by Miss Margaret Pollock of Milnquarter Farm, Bonnybridge to excavate on her land in two fields to the north of the farm. The small excavation was carried out over two weekends in May 1972. Four trenches were laid out east-west around 45.7 m to 61m south of the projected line of the Antonine Wall as shown on the 1946 Ordnance Survey 25 inch to the mile map.

Trenches 1 and 2 were located in the field between the railway track to the rear of the Caledonian Stove and Iron Works and the former access road to Milnquarter Farm, which ran north-south from the Bonnybridge to Castlecary road (B816). This area is shown as having a football pitch in the northern half of the field on the 1899 Ordnance Survey six inch to the mile map and later a cricket ground and pavilion in the southern half of the field on the 1913 Ordnance Survey map. The area proved difficult to excavate below the turf surface as both trenches revealed a layer of slag and ash placed on top of the natural sand and gravel. Presumably this had been used as a means of levelling the area and also for drainage. By the 1960s the cricket ground and pavilion had been relocated to an area to the east, south of Seabegs Motte. Trenches 3 and 4 were in placed the adjoining field to the west behind Seabegs Community Hall, around 61 m from and parallel to the south perimeter fence of the Caledonian Stove and Iron Works. This field had been cultivated and had agricultural field drains running through it, as was found in both trenches. The two trenches were easily cleared of topsoil and subsoil down to the natural sand and gravel below.

The objective had been to try to locate traces of the foundations of the east and west ramparts or the east and west ditches of the missing fort, but no evidence was found of either. The area to the west of the trenches, used as a recreational ground by the children from the housing area of Seabegs, was not examined. This housing had been built between the mid-1930s and mid-1940s on land originally part of Seabegs Place Farm. Almost surely it will have covered the site of Seabegs fort. No report appears to have been filed for this excavation by Mr Millar, presumably as no trace of the fort was found and no finds recovered.

In January 1973 our neighbour, Mr Reid of Dalnair and Skipperton Farm, had ploughed the field at the west end of Seabegs Wood. With his permission, I fieldwalked the field adjoining the wood on the 4th February 1973 and recovered a quantity of surface finds, including fragments of amphora, samian ware, possible iron nails and a number of red clay 'gaming' balls. The finds were recovered from an area of roughly 360 square metres behind the stone base of the Antonine Wall (Figure 12.2). The scatter of finds was indicative of the area that a fortlet would cover, rather than the larger area of a fort. I continued to fieldwalk the site of Seabegs Wood fortlet with the assistance of three members of Cumbernauld Historical Sociey and further finds were recovered in February and April 1973 before the field was planted with a crop.

Figure 12.2. Site of Seabegs fortlet (beyond the fence) from the north-east, showing the Antonine Wall ditch curving around it.

Figure 12.3. Site of Kinneil fortlet from the north-west in 1978

In January 1974 I arranged a visit to the Hunterian Museum to meet Dr. Anne Robertson, taking with me some of the finds I had recovered for her to confirm that the material was Roman. After our meeting she introduced me to her assistant, Dr. Lawrence Keppie. This was the beginning of a friendship that has lasted over 40 years. Lawrence and I remembered each other from some years earlier in 1963, when, as schoolboys, we had both taken part in an excavation of an area at Cumbernauld Castle.

In January 1974 the two fields west of Kinneil House, Bo'ness, had been ploughed and, with the consent of the farmer, I fieldwalked the area of the medieval village with four members of the Cumbernauld Historical Society. The first field beside the 12th century chapel yielded an assortment of green-glazed medieval pottery from the area where the former village straddled the line of the Roman frontier. My attention was drawn to the next field to the west, where the faint hollow of the Antonine Ditch was visible to the north of a knoll or raised area of ground (Figure 12.3). Although this area was beyond the medieval village, I decided to examine it as the field had been ploughed.

On the 2nd February 1974 the area south of the Antonine Ditch, roughly 550 m west of Kinneil House, was fieldwalked and various fragments of amphora, samian ware and coarse ware sherds were recovered. The field had been ploughed about two weeks earlier and, as a result of rain, frost and weathering, the furrows had broken up revealing discolouration and finer soil, indicating an area of occupation. The finds were recovered from an area of roughly 350 square metres. As at Seabegs, the finds scatter and soil discolouration were indicative of the location of a fortlet.

I contacted Lawrence Keppie at the Hunterian Museum to inform him of the finds recovered and arranged for him to visit to view the material. Lawrence suggested it may be another site for which we might seek permission for an excavation to confirm the size and dimensions of the fortlets.

Seabegs Wood fortlet was the first site to be excavated by Lawrence and myself in July 1977 (Keppie and Walker 1981: 143-49). The week-long excavation confirmed the existence of a long-axis fortlet measuring internally 21.8 m north-south by 18 m east-west, with a turf built rampart 2.8 m wide. The foundation of the fortlet rampart was laid out by the Antonine Wall builders with no join between it and the Antonine Wall base. The fortlet had north and south gateways, each 3 m wide. Two phases of occupation were observed. The site of the fortlet is within work sector 4 of the construction of the frontier, thought to have been built by the 2nd or the 20th Legion in this area (Keppie 1979: 6).

Kinneil fortlet was found in November 1978 when a small excavation lasting five days, confirmed its location (Keppie and Walker 1981: 150-54). Our first trench, by good luck, was within the north gateway and we were very quickly able to find the east and west rampart bases, initially by probing and then by trenching. The interval fortlet measured internally 21 m north-south by 18 m east-west, again a long-axis fortlet, with a 3 m wide stone rampart base constructed at the same time as the Antonine Wall. The superstructure of the Antonine Wall and fortlet rampart was clay and earth revetted by turf cheeks. This stretch of the Antonine Wall and the fortlet are within the first work sector, between Bridgeness and the River Avon, known to have been built by the 2nd Legion (Keppie 1974: 153). In 1980 the site was completely excavated by Falkirk Museums under a Manpower Services Commission scheme (Bailey and Cannel 1996), and the remains consolidated for display to the public in the grounds of the new Kinneil Country Park.

By 1980 Lawrence and I had walked most of the open areas of countryside along the line of the Antonine Wall looking for and evaluating possible fortlet sites. On a frosty morning in the first week of January 1980 we visited Duntocher fort and fortlet, and followed the line of the frontier eastward to Cleddans Farm, halfway between Duntocher fort and Castlehill fort, Bearsden. When we entered the second field to the west of Cleddans Farm, we both remarked that the area we were looking at would be an ideal location for a fortlet. The hollow of the Antonine Ditch was just visible along the north edge of the field and, as at Kinneil, there was a slight plateau to the south of the Ditch large enough to accommodate a fortlet (Figure 12.4), and from where it is possible to see both forts to the east and west.

An application was made to trench the area and two days of excavation later that month revealed the traces of Cleddans fortlet (Keppie and Walker 1981: 154-56). Ploughing had removed much of the Antonine Wall base and part of the fortlet rampart. The fortlet measured internally 17.6 m north-south by 18 m east-west and was thus a short-axis fortlet. Its rampart was turf built on a stone foundation 3.6 m wide. In this case the fortlet had been built prior to the arrival of the Antonine Wall builders. West of Bearsden the interval fortlets appear to have been built in isolation until the Antonine Wall arrived and joined on to them. This stretch of the frontier was one of the short work sectors, number 11, known to have been built by the 6th Legion (Keppie 1974: 153).

Antiquarians had the advantage of seeing the countryside in the 17th and 18th centuries before the Agricultural Revolution, whose new methods of cultivation and farming changed the landscape forever. Many of the upstanding remains previously visible have now been lost through intensive and deeper ploughing. Perhaps further study and re-examination of the reports or accounts of the antiquarians

Figure 12.4. Site of Cleddans fortlet from the east.

who visited the Antonine Wall could point to areas still accessible today, where geophysical or high resolution LiDAR surveys could be used to identify other missing fortlet sites or other features on the frontier, such as expansions.

As a teenager I discovered from walking over the fields on my father's farm and elsewhere that objects dropped or lost in antiquity were still in the ground. In most cases the finds tended to be claypipes or their stems, white and coloured Delftware sherds along with broken agricultural field-drain tiles. Most of these objects along with animal manure and waste from the town streets were spread by farmers on their fields as fertiliser in the 18th and 19th centuries. I also learned that where an area of ground had been inhabited for any length of time, the soil would often be finer and discoloured. My experiences have convinced me that fieldwalking is a most valuable tool in archaeology, particularly for identifying previously undiscovered sites.

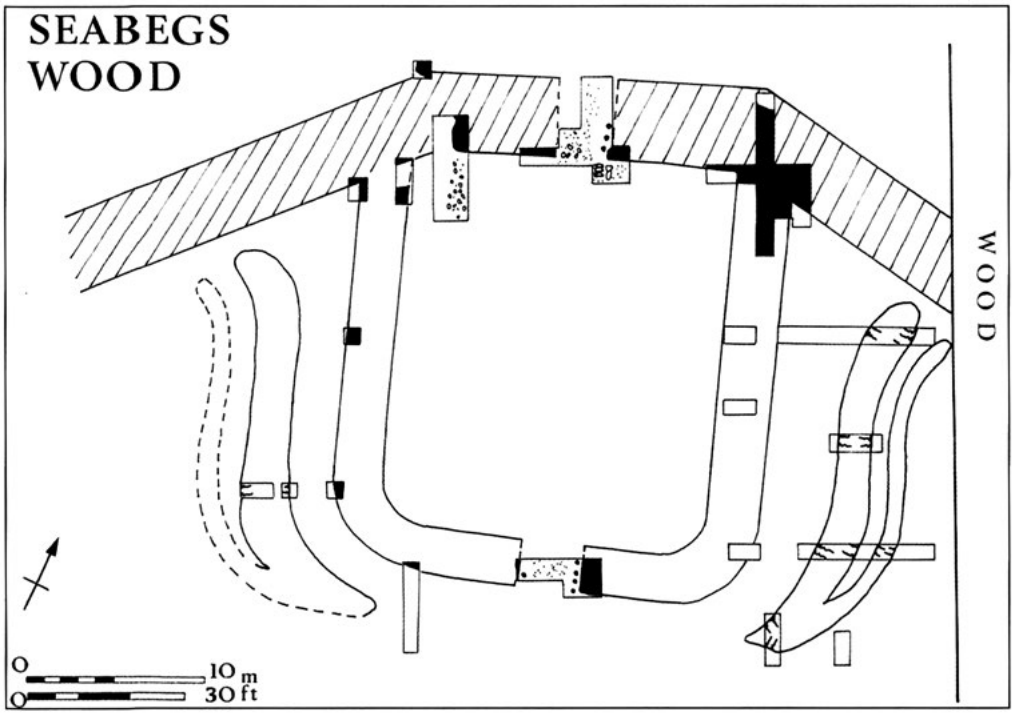

Figure 12.5. Plan of excavations at Seabegs fortlet (after Keppie and Walker 1981, reproduced by permission of Glasgow Archaeological Society.

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13. The Roman temporary camp and fortlet at Summerston, Strathclyde

Gordon S. Maxwell and William S. Hanson

The Roman temporary camp at Summerston (aka Temple of Boclair) (NS 57427237) to the north-west of Balmuildy was first identified from the air by the first-named author during the annual aerial reconnaissance programme undertaken by the then Royal Commission on the Ancient and Historical Monuments of Scotland (now Historic Environment Scotland) in 1977 (Goodburn 1978: 413; Maxwell and Wilson 1987: 28) (Figure 13.1). The north side of the camp lies some 30 m south of the Antonine Wall, whose location and alignment is confirmed by the wide positive cropmark of its ditch (Figure 13.1 and 13.2). The camp itself was revealed by the faint, narrow positive cropmark of the ditch defining the line of its eastern side and north-eastern corner. Subsequent aerial photography revealed part of the south side, indicating that its axial dimensions were *c.* 162 m north-south by at least 75 m, and possibly some 140 m, east to west, a probable internal area of *c.* 2.3 ha (Jones 2011: 307). Though there are gaps in the recorded line of the ditch, no gateways have been identified. The camp is generally included amongst a group of broadly similar size and morphology known along the Wall that are identified as construction camps (Hanson and Maxwell 1986: 117-20; Jones 2005).

Close inspection of the original air photographs revealed faint traces of a narrow curvilinear cropmark close up against the presumed location of the northern ditch of the temporary camp (arrowed in Figure 13.1). This appeared to define the end of a small ditched enclosure with rounded corners situated between the camp and the rear of the Antonine Wall. Though the southern ditch of the enclosure did not run quite parallel with the Wall (Figure 13.2 and 13.3), its morphology and size suggested that it might represent the site of a fortlet and so was worthy of further investigation. Indeed, the possibility of such an installation in this vicinity had been postulated for some time (Robertson 1974: 101), though it was assumed to lie on the summit of Crow Hill some 580 m to the west where Robertson unsuccessfully trenched in search of it in 1961 (2015: 107).

Accordingly, a brief examination of the temporary camp and adjacent enclosure took place over an inclement weekend in late November 1980 (Grew 1981: 320; *DES* 1981: 87-88). The camp is bisected by the march separating the farms of Summerston and East Millichen, whose line also broadly coincides with the probable western limit of the small enclosure. Excavation was restricted to the fields within the farm of Summerston, as those within East Millichen farm were sown with winter barley and so were not available for examination. Five hand-dug trenches were opened. The largest (A) ran at a slightly oblique angle across the two adjacent ditches of the enclosure and the camp, continuing for some 9 m into the interior of the former (Figure 13.3). A second (C) was placed across the line of the ditch just after it curved northwards on the east side of the enclosure, with a third beyond that to the north (not on the plan) to check for the continuation of the enclosure ditch. The fourth, a much smaller trench, was designed to pick up the line of the enclosure ditch as it began to curve northwards on its western side. Finally a fifth trench (B) was cut across the east side of the temporary camp (not located on the plan).

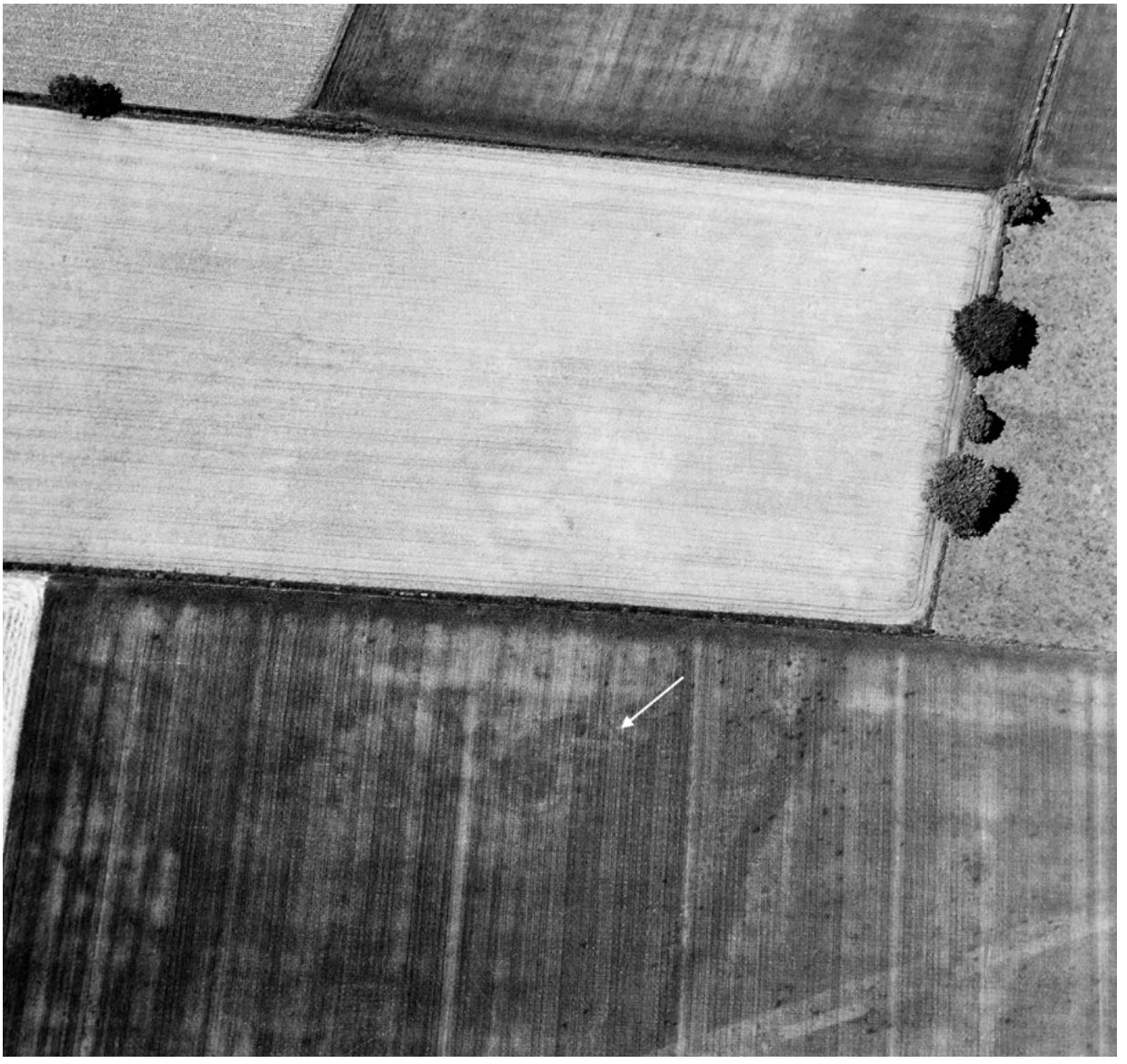

Figure 13.1. Aerial photograph of Summerston camp and fortlet (arrowed) from the east. The line of the Antonine Wall is visible as a broad positive cropmark in the right foreground (SC 1724870 Crown copyright © Historic Environment Scotland).

These trenches revealed that the ditch of the camp had been much attenuated by ploughing. It now measures at best only 1.55 m wide and barely 0.55 m deep and appreciably less elsewhere, which may explain why so little of its perimeter can be discerned from the air. The section (B) cut through the east side of the camp revealed a layer of red-brown rapid silt up to 0.1 m deep overlain by a slightly deeper layer of grey, gritty silt (Figures 13.4 and 13.5), indicating only one period of use, at the end of which the defences were allowed to silt up gradually. On the north side, however, the picture was somewhat different. Excavation (Trench A) revealed that the ditch in this sector had been deliberately

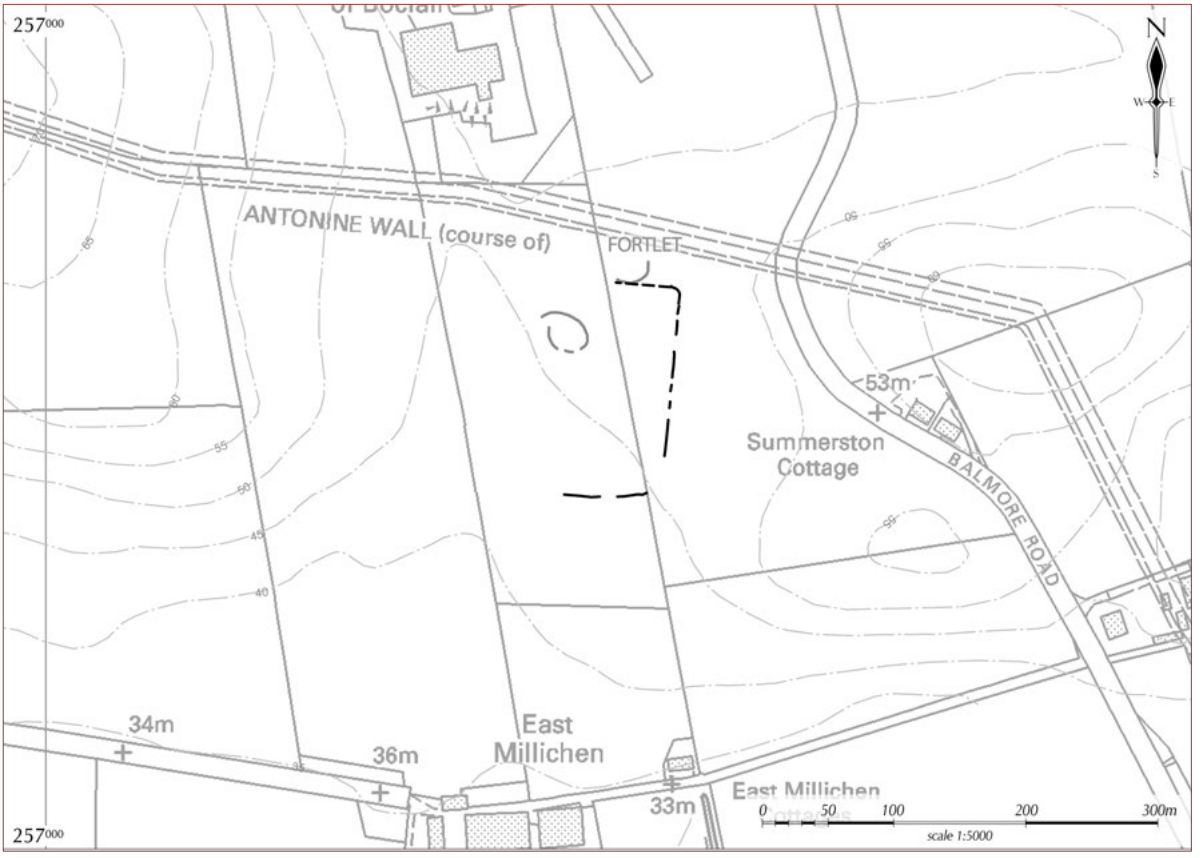

Figure 13.2. Location map of the line of the Wall, the construction camp and fortlet at Summerston (after Jones 2011) (reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown © 2010. Ordnance Survey Licence no. 1000020548).

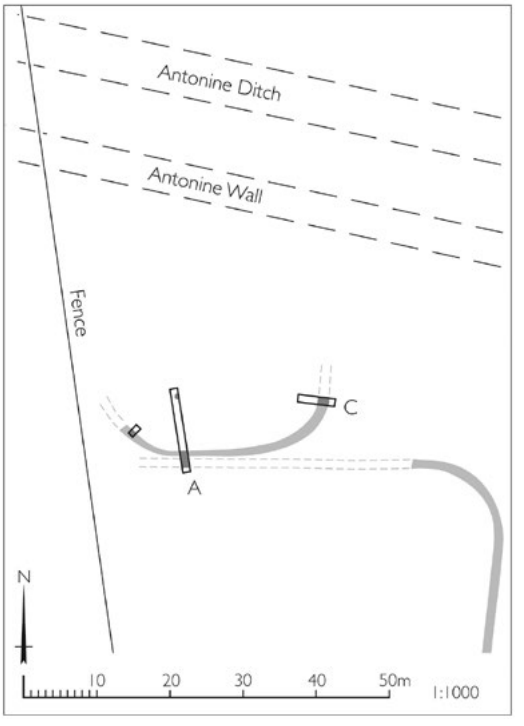

Figure 13.3. Overall site plan, showing the location of the excavation trenches.

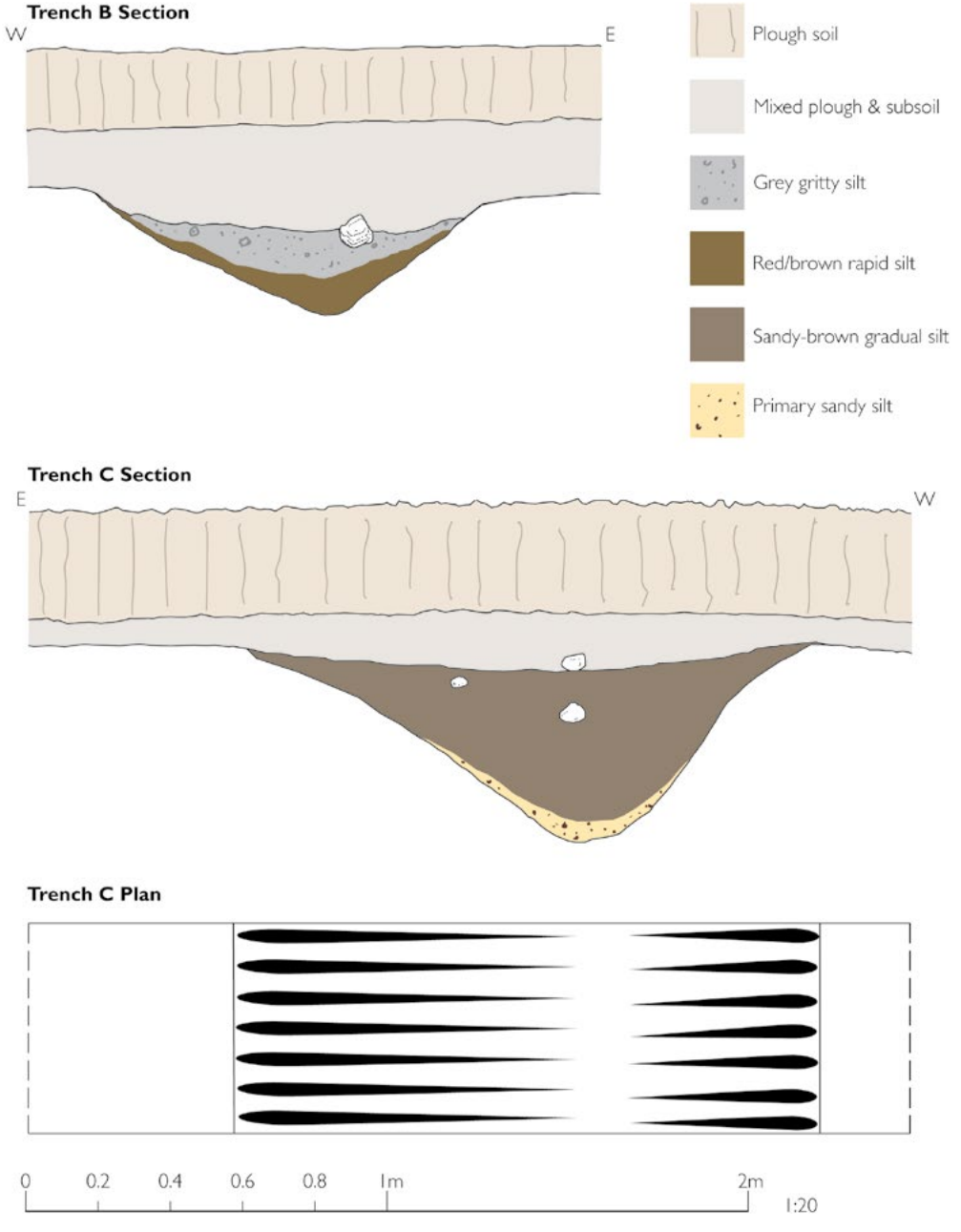

Figure 13.4. Trench B: south-facing section through the eastern ditch of the camp; Trench C: plan and north-facing section through the enclosure ditch on its east side.

Figure 13.5. Photograph of section (Trench B) through the eastern ditch of the camp from the south.

filled with a uniform gritty grey-brown loam with pockets of red-brown subsoil (Figures 13.6 and 13.7). This probably occurred during the cutting of the contiguous enclosure ditch, which appeared to be secondary to it. Indeed, care had evidently been taken to avoid intersecting the camp perimeter, since the enclosure, which lay on slightly lower ground than the north side of the camp, would otherwise have served as a sump for the surface water collected in the ditch system of the camp. For this reason the enclosure ditch was exceptionally narrow and shallow where it approached the camp, being only *c.* 0.8 m wide and 0.3 m deep, although again ploughing must have contributed to its present reduced state. It seemed to have silted up more gradually, with a basal layer of red-brown rapid silt up to 0.1 m deep overlain by a fairly narrow band of fine grey silt. A section through the ditch of the enclosure on its east side (Trench C) immediately to the north of the south-east angle, however, produced a more respectable V-shaped profile, 1.6 m wide and 0.65 m deep, slightly steeper on the inner edge (Figure 13.4). Here a shallow layer of sandy, yellow-brown primary silt was overlain by a deep fill of sandy brown silt, again indicating the gradual silting up of the ditch. A trial trench several metres further north on the same side, however, indicated that remains of the ditch had been completely obliterated by the plough. It is not surprising, therefore, that no trace of a rampart survived. The only feature found within the interior of the enclosure was a solitary, stone-packed post-hole some 0.6 m in diameter (Figure 13.6). No finds of any significance were recovered.

The proximity of the march fence line with its associated hedge discouraged more complete examination of the western side of the enclosure other than a small trench which picked up the inner edge of the ditch

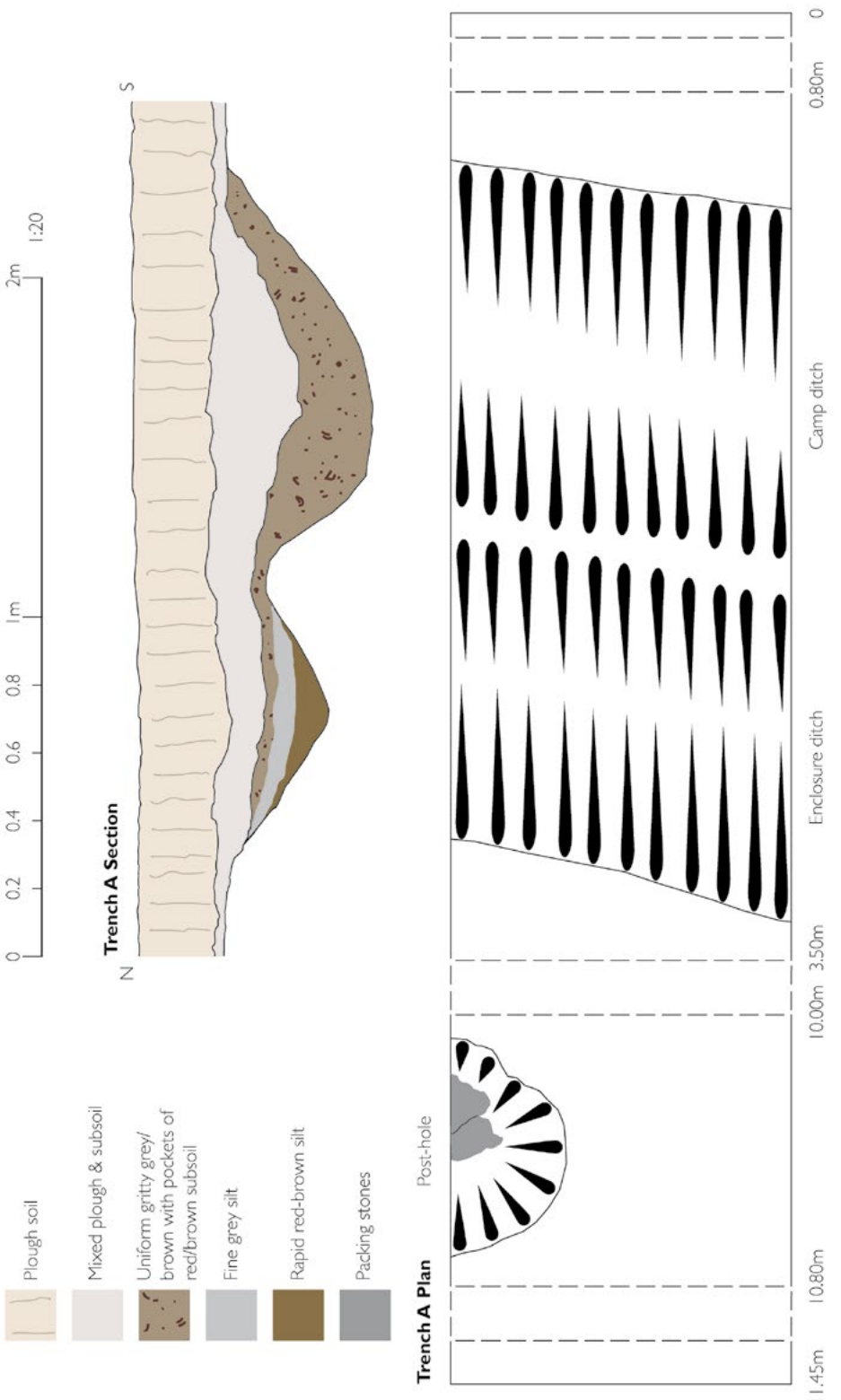

Figure 13.6. Trench plan (A) and west-facing section through the contiguous ditches of the camp and enclosure.

Figure 13.7. Photograph of section (Trench A) through the contiguous ditches of the camp and enclosure from the west.

as it began to curve northwards. This confirmation of the rounded south-west angle faintly apparent in the aerial photographs (Figure 13.1), combined with the known line of the Antonine Wall itself, furnished enough evidence to estimate that it would have measured some 33 m north-south by 30 m east-west within its ditches (Figure 13.3). This compares favourably with the area enclosed at other known fortlets, measuring within their inner ditches where two are attested (Table 13.1). Thus, on grounds of size and morphology alone, acceptance of the Summerston enclosure as a fortlet would seem justified; while its relationship to the temporary camp, which is generally accepted as one of the construction camps for the Wall, lends support to such a view. Finally, its spatial relationship to the fortlet at Wilderness Plantation, exactly two *pes Monetalis* miles to the east as calculated from the LiDAR data (Hannon *et al.,* this volume), would seem fully to justify its identification as a true Antonine milefortlet.

Site	**N-S dimensions**	**E-W dimensions**	**Reference**
Croy Hill	31 m	36 m	Hanson forthcoming: Fig. 3.7
Glasgow Bridge	*c.* 30.5 m	*c.* 30.5 m	St Joseph 1955: 86
Kinneil	34 m	42 m	Bailey and Cannel 1996: illus. 28
Watling Lodge	22.5 m	32 m	Breeze 1974: Fig. 2
Wilderness Plantation	28 m	33 m	Wilkes 1974: Fig. 2

Table 13.1. Area enclosed within Antonine Wall fortlet ditches

Acknowledgements

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14. Thinking small: fortlet evolution on the Upper German *Limes*, Hadrian's Wall, the Antonine Wall and Raetian *Limes*

Matthew Symonds

Today, scholars frequently use the design or general style of different Roman frontier systems to illuminate similarities or differences between them. One convivial expression of this tradition is, of course, the various international conferences devoted to Roman military matters, where frontier specialists can exchange ideas and in which Lawrence has been an enthusiastic participant. Regular attendees will know that inferences drawn from one frontier system are often used to bolster arguments relating to the design or operation of others. An area where a cross-fertilisation of ideas may also have occurred during the Roman period was noted by Lawrence in his 1979 *Limes* Congress paper: fortlets. Although he focused on the potential for regular spacing, an issue which, as will be discussed, remains a source of debate, he also noted the striking design similarities between Antonine Wall fortlets and Hadrian's Wall milecastles (Keppie 1980: 107). This paper proposes to build on that, by examining how fortlets were used to build security along the four great artificial frontiers constructed by the Roman military in north-west Europe: the Upper German *Limes* (UGL), Hadrian's Wall, the Antonine Wall and the Raetian *Limes*. This splitting of the German frontiers is a consequence of Sommer's exposition of the differences between the Upper German and Raetian frontiers (2011), making it appropriate to study them as two distinct, but ultimately conjoining entities.

Little wonder

Fortlets are found throughout the frontier provinces of the Roman empire, but vary in terms of both size and the nature of buildings present within them. Examples from north-west Europe have internal areas that run from under 200 m² to over 4000 m² (Figure 14.1). While smaller fortlets tend to contain primarily barrack accommodation, larger installations have produced a greater range of internal buildings. As a result, differences in size do not necessarily equate to differences in garrison strength. The fortlet at Pen Llystyn, Wales, encloses an area of 4060 m², for instance, and while our knowledge of the internal building plan remains inchoate, granaries or store buildings appear to have been present (Figure 14.1). Specialist ancillary buildings have been detected in other larger fortlets, suggesting these posts were effectively bespoke installations, which were carefully designed to equip small garrisons with appropriate facilities to maximise their capability to resolve a specific local problem or problems (Symonds 2017: 7). It is important to stress that fortlets were not an innovation that coincides with the development of frontier systems. Instead, the Roman military had been using fortlets in north-west Europe for at least 70 years – and probably longer – before they began adapting them for service along artificial frontiers. Prior to this, fortlets were usually positioned extremely carefully within the landscape, presumably in order to maximise the impact of the modest garrisons they contained.

Attempts to estimate the number of soldiers based within specific fortlets frequently produce variable figures, but in most cases the garrisons would have been substantially smaller than units based in auxiliary forts. The degree of uncertainty is ably demonstrated by the fortlet at Martinhoe, Devon.

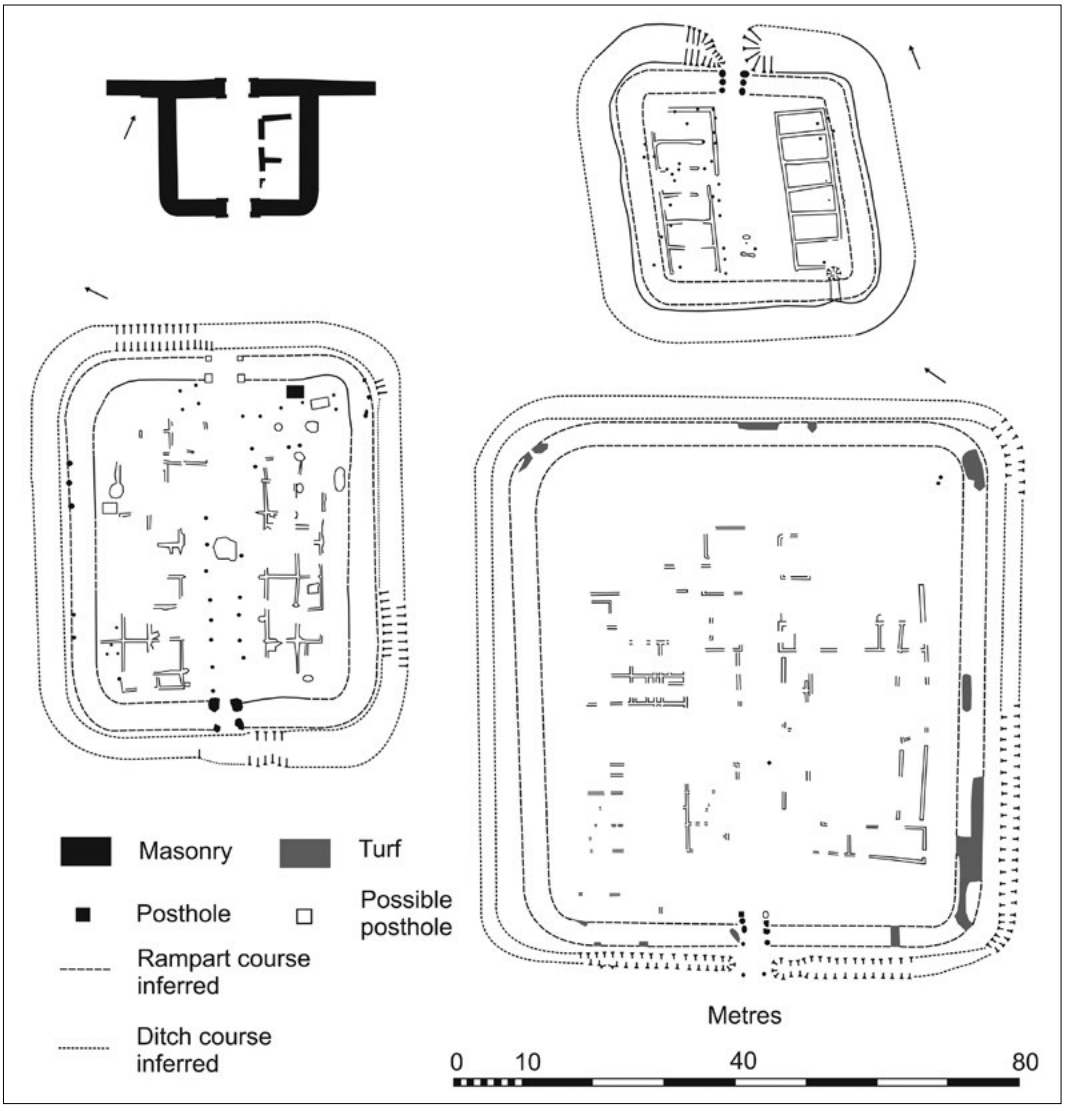

Figure 14.1. Fortlets exhibit highly variable internal areas, as illustrated by milecastle 37, in England (top left), Barburgh Mill, in Scotland (top right), Haselburg, in Germany (bottom left) and Pen Llystyn, in Wales (bottom right).

Even though its internal layout is known, different scholars have proposed that it held a complement of 12, 40, and 65-80 soldiers, with 40 probably presenting the most plausible figure (see Mackensen 1987: 73; Davison 1986: 126; Fox and Ravenhill 1966: 23). Naturally, these soldiers would need time to rest, so only about one third are likely to have been available to undertake routine tasks in and around the fortlet at any given time. Accepting the proposed 40 soldiers at Martinhoe would therefore equate to about 13 soldiers on duty, a number sufficiently small that it implies an intention to neutralise – at most – low-intensity threats, perhaps raiders or practitioners of guerrilla warfare. Documents from Egypt and Syria reveal that fortlet garrisons comprised soldiers posted away from their home fort or fortress for a period of between five months and several years (Symonds 2017: 25). Not only were they dislocated from the lives they had built for themselves at their home base and sent to regions where

security concerns seemingly existed, but they were also accommodated in somewhat spartan posts. Martinhoe, for instance, merely contained two barrack blocks facing each other across an internal yard, with a possible shrine in between and an adjacent pit that may have been associated with ritual activity, or acted as a latrine. Little wonder, then, that surviving documents suggest a degree of reluctance on the part of the soldiers involved (Symonds 2017: 24-25, 30).

Four frontiers

Although this paper is primarily interested in assessing Antonine Wall fortlets alongside their counterparts in north-west Europe, greatest clarity is achieved by adopting a broadly chronological perspective. The earliest fortlet cordon under consideration is the UGL (Figure 14.2), which is currently believed to originate in the reign of Trajan. His successor, Hadrian, seemingly contented himself with installing a timber palisade to create an artificial barrier that superseded and improved upon earlier stretches of fencing (Kortüm 1998: 51; Schallmayer 2003: 12-16). The original course of the UGL was subsequently revised, when the stretch known as the 'inner *limes*', which crossed the Odenwald and then followed the River Neckar, was abandoned in favour of a more easterly course. This transition occurred late in the reign of Antoninus Pius, with the new line annexing additional territory, prompting its modern designation as the 'outer *limes*'. Revising the course of the UGL enabled it to intersect with the Raetian *Limes*, which, on the basis of dendrochronological dates, also first received a palisade and smaller structure cordon towards the very end of Pius' life, with construction continuing into the reign of Marcus Aurelius (Czysz and Herzig 2008: 193). On that basis, the Raetian *Limes* is the latest of the four systems considered here (Figure 14.2).

Of the two British frontiers, work probably commenced on Hadrian's Wall early in the AD 120s (Figure 14.3). As Graafstal has pointed out (2012: 149-151), a date earlier than the traditional start in AD 122 is possible. This places Hadrian's Wall second in our sequence, following on from the UGL. As is well known, Hadrian's Wall was seemingly originally intended to comprise a cordon of fortlets (known as milecastles) and towers (known as turrets), before it underwent a major change in plan during the construction phase, which is generally referred to as the 'fort decision' (Breeze and Dobson 2000: 47-56). As the name implies, the most eye-catching alteration was the insertion of a series of forts along the Wall, although an enigmatic earthwork known as the Vallum was probably also added at around this time, and it seems likely that the 'rules' governing the design and placement of milecastles and turrets were also relaxed (Symonds 2013: 67; Symonds and Breeze 2016: 7-12). One curious anomaly concerning the milecastles is that many appear to have entered service with large areas of empty space, suggesting a failure to construct all of the originally planned buildings. If so, this may reflect the reduced status of many milecastles following the fort decision (Symonds 2019a: 49-50).

The Antonine Wall followed hot on the heels of Hadrian's Wall, after Hadrian died in AD 138. Antoninus Pius moved quickly to reincorporate southern Scotland within the empire, and work was probably underway on this new frontier by AD 142 (Figure 2.1). Traditionally, there is also believed to have been a secondary fort decision on the Antonine Wall, although whether this truly occurred is currently a source of debate (See Gillam 1975; Poulter 2009: 121-123; Symonds 2008: 128-156; Graafstal *et al*. 2015; Graafstal, this volume; Hanson forthcoming). There is not scope to rehearse the arguments for and against the existence of primary and secondary forts here, but it is certainly relevant to understanding fortlet use on the Antonine Wall. Although the evidence remains ambiguous, a case can be made for

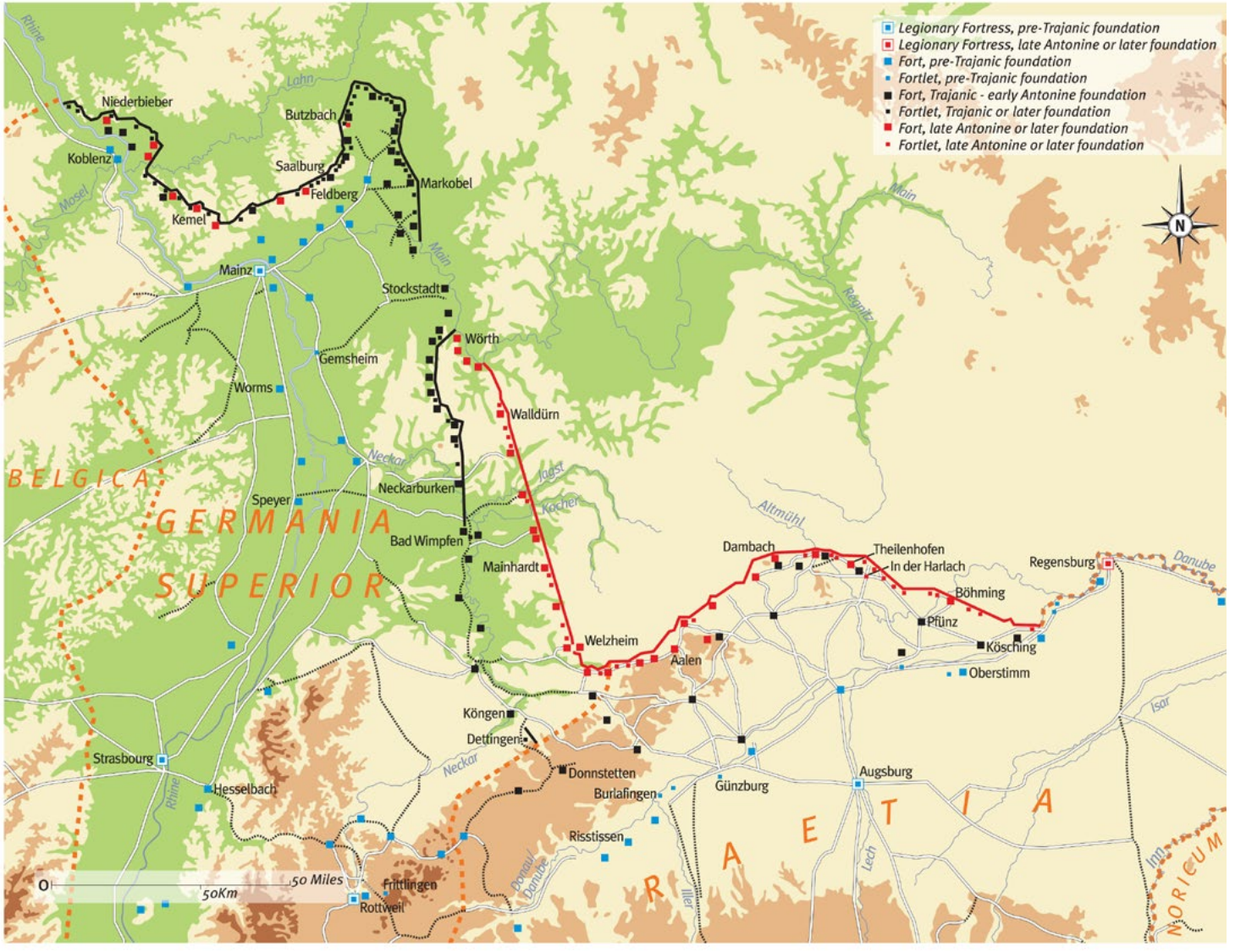

Figure 14.2. The Upper German and Raetian frontiers. The earliest configuration in Upper Germany is shown in black, but the line south of the River Main was adjusted during the reign of Antoninus Pius, when the 'inner *limes*' was exchanged for the 'outer *limes*'. The latter, and the broadly contemporary Raetian *Limes*, are shown in red.

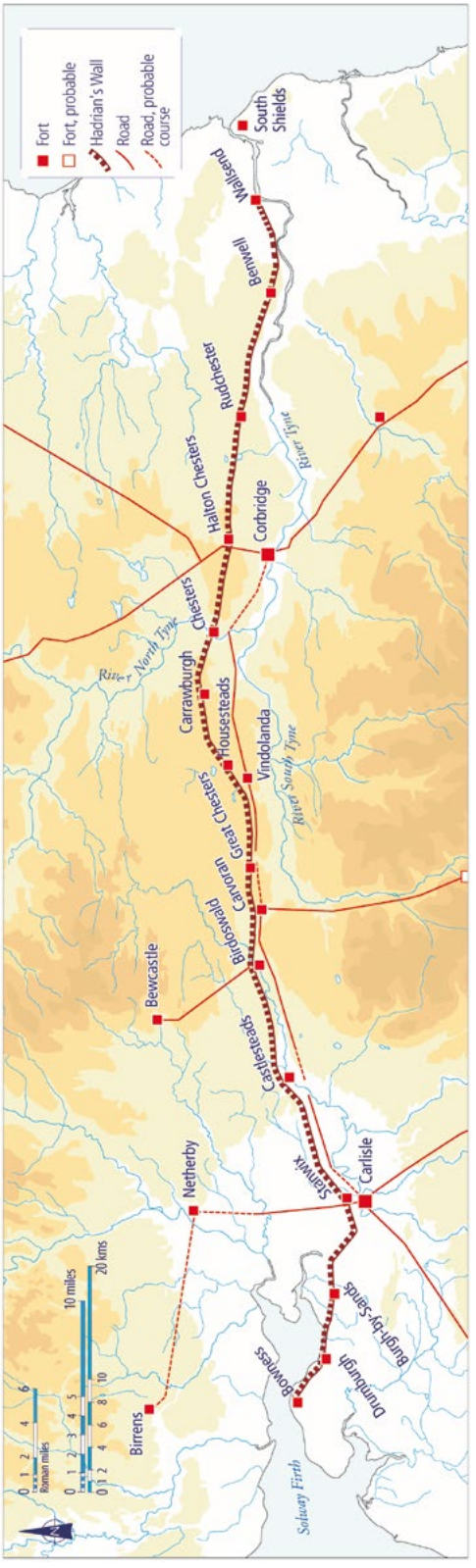

Figure 14.3. Hadrian's Wall, as completed at the end of Hadrian's reign in AD 138 (© D.J. Breeze).

all – or nearly all – of the so-called secondary forts being intended from the outset and that is the model accepted here (Symonds 2008, 130-137; Graafstal *et al.* 2015). So, to take the frontiers in chronological order, that gives us the UGL, Hadrian's Wall, the Antonine Wall, and the Raetian *Limes*.

Trial and error

One striking feature of the UGL fortlets is the degree to which they abide by the general rules established for fortlet use in earlier decades. Although only a handful of the turf-and-timber installations most likely to date to the earliest decades of the frontier are currently known, they come in various sizes, with internal areas ranging from under 400 m² to over 1000 m² (Figure 14.4). While some of the turf UGL fortlets are small compared to their predecessors, especially the 323 m² fortlet in the Saalburg pass, there is currently no sign of a reliance on large numbers of small fortlets based on a generic template. Such flexibility is in keeping with fortlets previously founded elsewhere in northern Europe. Another area of overlap with earlier fortlet use concerns how the UGL installations were placed within the topography. Considering just the turf fortlets produces examples positioned on prominent hilltops, controlling key upland passes, and along potential communications routes, some of which were presumably pre-Roman in origin. This is exactly the behaviour you would expect of fortlets founded in preceding decades, which were skilfully positioned within the wider physical – and probably also human – geography (Symonds 2017: 217-218). It is also a feature of many later stone UGL fortlets (Figure 14.5), although it is important to note there are also examples of both turf and stone UGL fortlets that were placed in less commanding positions, presumably in accordance with the needs of the wider cordon.

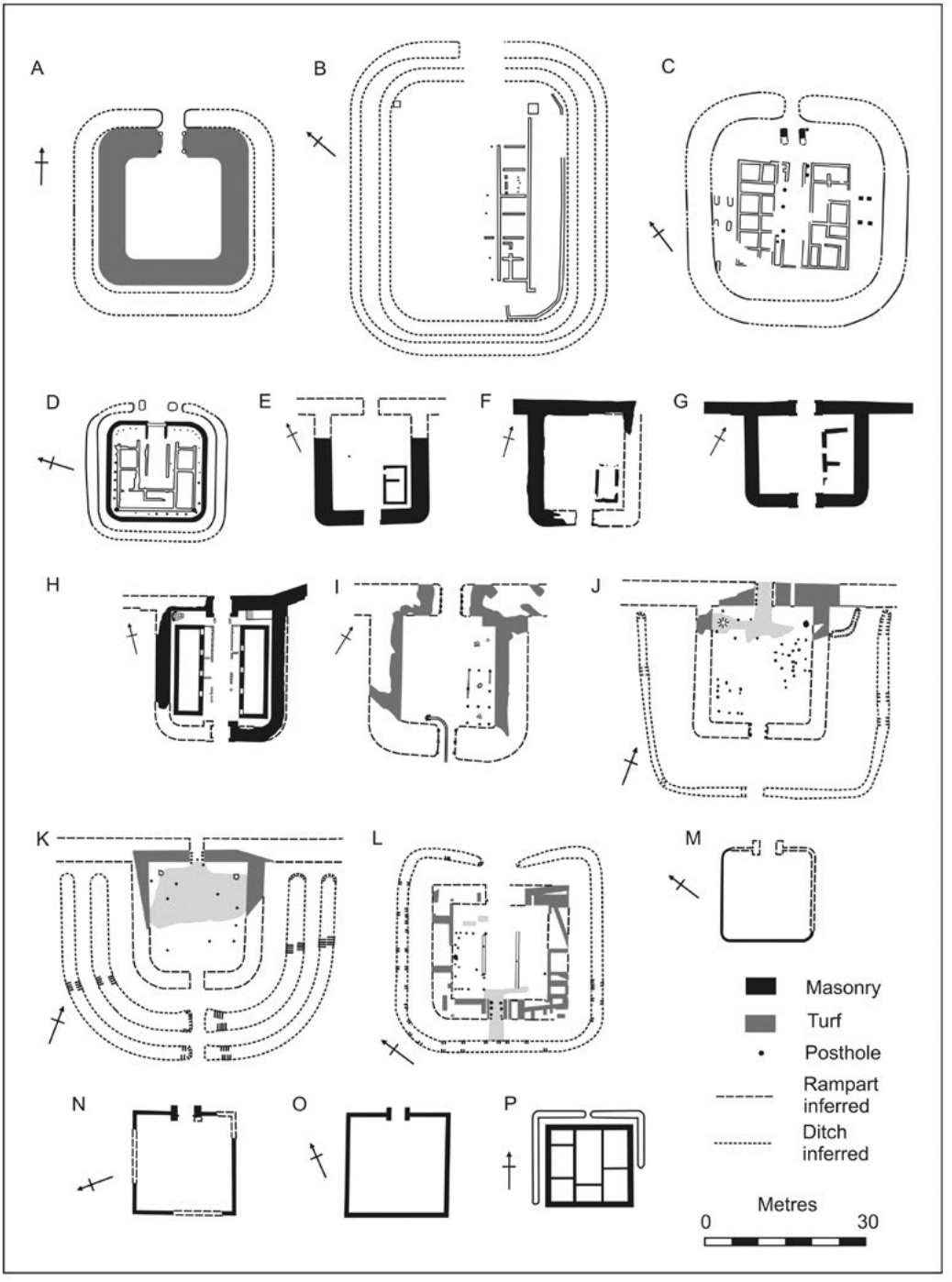

Figure 14.4. A selection of fortlet plans from the UGL, Hadrian's Wall, Antonine Wall, and Raetian Limes: (A) Forsthofweg, UGL, (B) Pohl bei Kemel, UGL, (C) Degerfeld, UGL, (D) Rötelsee, UGL, (E) milecastle 9, Hadrian's Wall, (F) milecastle 35, Hadrian's Wall, (G) milecastle 37, Hadrian's Wall, (H) milecastle 48, Hadrian's Wall, (I) milecastle 50 on the Turf Wall, Hadrian's Wall, (J) Kinneil, Antonine Wall, (K) Wilderness Plantation, Antonine Wall, (L) Duntocher, Antonine Wall, (M) Raitenbuch, Raetian Limes, (N) Hegelohe, Raetian *Limes*, (O) bei Petersbuch, Raetian Limes, (P) Hienheim, Raetian *Limes*.

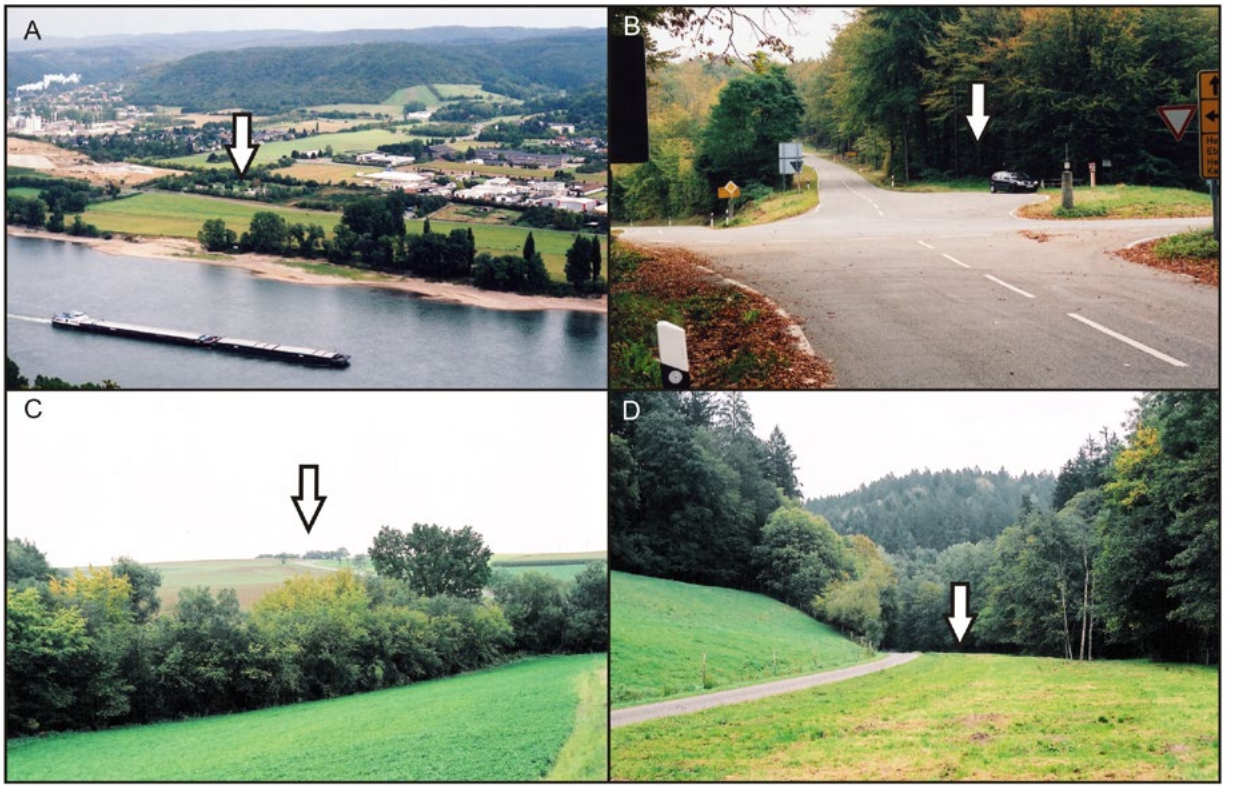

Figure 14.5. Fortlet locations on the UGL: (A) Rheinbrohl lies in the Rhine valley; (B) Seitzenbuche controls an upland pass in the Odenwald; (C) Haselburg occupies a false crest on the skyline from the perspective of anyone approaching from beyond the palisade; (D) Hankertsmühle blocks a narrow valley.

Moving on to Hadrian's Wall, we encounter what could almost be perceived as a knee-jerk reaction to the Trajanic cordon in Upper Germany (Symonds 2017: 221). Rather than placing fortlets of varying shapes and sizes judiciously within the landscape, a highly structured cordon was imposed. Although no two milecastles are identical, they represent variations on a standard design, resulting in a chain of small posts (Figure 14.4). While milecastles 47 and 48 have internal areas of just under 400 m², most of the known original milecastles enclose less than 300 m². Another novelty is that the milecastles contained a pair of gateways permitting passage through the Wall curtain, requiring them to be physically attached to it. Perhaps the most radical innovation, though, is evoked by the modern name for these fortlets, as they were positioned at intervals of approximately one Roman mile. Arranging these posts according to a predetermined spacing system ran counter to the established technique of placing them judiciously within the landscape. Although steps were taken from the very beginning to ensure that milecastles were not built on split levels or in watercourses, in practice the room for manoeuvre was limited. Study is hampered by a lack of modern measurements for the distances between milecastles, but on the basis of those available 210 m is the greatest difference between a theoretical and actual location. Woolliscroft has discussed how such subtle variations could have been employed to create signalling links (1989).

Taking this regular spacing system off the drawing board and embedding it in irregular terrain resulted in numerous posts occupying obviously inferior positions. In most cases it is the ability of the milecastle

gateways to function effectively that was compromised. This is infamously the case with milecastle 35, which lay directly south of a 30 m drop, but other installations facing steep slopes include milecastles 36, 37, 39, 41, 42, and 45. Milecastle 48, meanwhile, was built on a one-in-five slope (Figure 14.6), while milecastle 42 – arguably the finest example of a poorly executed position – was built on a steep slope, facing an even steeper slope, immediately adjacent to a pass on level ground. It has been argued that milecastle 42 could not have been relocated to this level ground, because it would lose a visual link to the nearby Stanegate fortlet at Haltwhistle Burn (Woolliscroft 1989: 10). Nevertheless, if the course of the Wall curtain had been adjusted to turn southwest and descend into the pass slightly farther to the east, or at a sharper angle, milecastle 42 could have both occupied level ground and retained a visual link to Haltwhistle Burn fortlet. Given that this opportunity for a pragmatic fix was not seized, the placement of milecastle 42 constitutes a statement that having gateways in the most sensible location was not the overriding consideration. Instead, it seems reasonable to propose that the regular sequence of posts was viewed as a means to minimise the opportunities for groups to slip across the Wall line unobserved. This aim is presumably reflected in the addition of the Peel Gap tower to block a significant blind spot in Wall mile 39 (Symonds 2010: 12; Symonds 2013: 59; Foglia 2014: 37-38).

A willingness to tolerate milecastles that do not fully capitalise on the local terrain makes milecastle 39, which we can infer from its Narrow Wall rampart was constructed comparatively late in the building programme, particularly interesting. It occupies precisely the setting that was shunned at milecastle 42: level ground, in the mouth of a pass. As the distance between milecastles 39 and 40 is currently the second longest interval between such posts known on the Wall, it seems unlikely that this superior setting occurred by happenstance. Another curiosity is that the northern gateway of milecastle 39 overlies a length of Broad Wall foundation, which could imply – along with several other factors – that the milecastle was originally planned to be built closer to its measured location, condemning it to a less-suitable building plot. If so, this intention was revised later in the building programme, and the decision taken to shift milecastle 39 to a more appropriate location (Symonds and Breeze 2016: 5-7). Although the ground drops away to the north of the milecastle gateway, it is not as severe as it would be closer to its measured location.

Milecastle 39 is not the only example of what is seemingly a trend to position milecastles and turrets more carefully later in the construction phase, following the advent of the Narrow Wall. Milecastle 45 on Walltown crags is almost certainly a Narrow Wall structure, and the surviving earthwork is suggestive of an artificial level platform being created within the rampart (Figure 14.6). Measures were certainly taken to address irregularities in the underlying surface at Narrow Wall milecastle 40, where excavations revealed that whinstone blocks were used in the north-east and south-east corners to level off the interior (Simpson 1976: 92). A substantial artificial platform was also discovered under the Turf Wall version of milecastle 79, which could suggest that it was constructed following the fort decision, although the excavators' view that it was a response to the risk of flooding provides a plausible alternative explanation (Richmond and Gillam 1952, 26-27). Either way, the care seemingly taken at milecastles 39, 40, and 45 stands in contrast to the willingness to place the earlier milecastles 42 and 48 on steeply sloping ground. This belated effort to engage more constructively with the terrain arguably extended to deviating more substantially from measured positions in order to occupy stronger positions (Symonds and Breeze 2016: 12). If so, the overly regimented use of milecastles and turrets, which left some posts working against rather than with the landscape, was another element that was assessed and revised during – or following – the series of changes collectively known as the fort decision.

Figure 14.6. A comparison between the plots occupied by milecastle 48 (A) and milecastle 45 (B). While the early Broad Wall milecastle 48 was built on a one-in-five slope, the later – probably Narrow Wall – milecastle 45 potentially contained an artificially-levelled interior.

In one regard this is hardly surprising, as the addition of Wall forts almost certainly marked a major revision to the overall frontier concept, making it appropriate to overhaul the plans for other elements accordingly. Perhaps the most celebrated alteration was the re-routing of the Turf Wall curtain between milecastles 49 and 51, when it was rebuilt in stone late in Hadrian's reign. Although the original course of the Turf Wall placed it hard against the northern lip of the Irthing valley, this route did at least allow the military infrastructure to occupy high ground. When the Turf Wall was rebuilt in stone late in Hadrian's Wall, it switched to a more northerly course, with part of its western length occupying poor terrain where dead ground rises to the north and south. This new line did, though, allow the milecastles and turrets to retain a visual link back to the Wall fort at Birdoswald (Jones and Woolliscroft 2001: 113-114). A new interest in integrating the forts, milecastles, and turrets in this manner may also be relevant to understanding turrets 44a and 44b, which were probably both Narrow Wall foundations. These posts are out of their measured locations, allowing them to occupy commanding positions within the landscape. Their placement also permitted turret 44a to retain a visual link with Great Chesters fort, and turret 44b one with Carvoran. A case can also be made for elements of the stretch between Great Chesters and Carvoran, the Walltown sector, being among the last to be completed on the original Stone Wall (Symonds and Breeze 2016: 10; Symonds 2019b: 38), potentially making this the ultimate expression of a control method that evolved through a process of trial and error during the construction of Hadrian's Wall.

Attempts to determine the length of time it took to complete Hadrian's Wall have produced very different estimates, but it is possible that the Walltown stretch was completed only a few years before the emperor's death in AD 138. If so, this stretch should be our template for establishing the degree to which the Antonine Wall followed or finessed the developed Hadrianic method for frontier control in Britain. It is certainly suggestive that a more integrated relationship between Wall posts, careful placement within the landscape, and greater use of smaller, closer forts in the vicinity of Walltown all seem to reach fruition on the Antonine Wall (Symonds 2019c: 61). As has been noted, the basic milecastle design also survived intact on the Antonine Wall (Figure 14.4) (Keppie 1980: 107; Hanson and Maxwell 1983: 93), presumably because it was judged well suited to the needs of frontier control, but it remains unclear how extensively the spacing system was overhauled. In 1979, Lawrence favoured the possibility of a mile spacing system analogous to that on Hadrian's Wall (Keppie 1980: 110), but over the last decade or so this has come under question. Poulter concluded that a regular spacing system may have contributed, although in general 'most of the positions of the military installations along the Antonine Wall were selected first, and the line of the Wall was then set out to run between them' (2009: 122-124). It has also been proposed that there was a policy of placing the fortlets 'at locations along the curtain where they would be useful. An element of regularity would still constitute part of this...This would allow them to exploit the best ground in the general area that they were required' (Symonds 2008: 151). Hannon has recently analysed the LiDAR evidence for the Antonine Wall and argued that the mile spacing format was retained, but used more loosely than on Hadrian's Wall (2018). If any of these revisionist readings are accurate, then the fortlets on the Antonine Wall effectively continue where the adjustments to the Hadrian's Wall format concluded. It is certainly suggestive that fortlets do not seem to occupy steep slopes like milecastles 42 and 48 on Hadrian's Wall.

Because forts were planned along the Antonine Wall curtain from the outset, it would be reasonable to infer that these impacted on how the fortlets were positioned and used. One suggestive example is the apparent pairing of Summerston fortlet and Balmuildy fort, with the former acting as a satellite capable

of compensating for the restricted visibility in certain directions from the latter (Figure 14.7) (Symonds 2017: 145-146). This aspect has been developed by Dyčka, who used viewshed analysis to reveal that Summerston is also intervisible with Auchendavy and Bar Hill forts, potentially leaving the fortlet well placed to bind Balmuildy into a visual signalling system, if one existed on the Antonine Wall. The distances involved – 9.2 km and 11.9 km – seem to be asking a lot of the naked eye for anything more ingenious than a beacon system, although Woolliscroft calculates a maximum visual range (by night) of 51km for Roman pitch torches (Woolliscroft 2001: 21-30, 35). Dyčka also notes that a feature of the Wall posts is that 'quite a lot of them were sitting on the edges of sightlines of others'. Perhaps the most impressive example of this is Wilderness Plantation fortlet, which lay close to the edge of areas visible from Bar Hill, Kirkintilloch, and Balmuildy forts (Dyčka 2018: 319-320). This broad technique seems reminiscent of the Hadrian's Wall turrets 44a and 44b being positioned near the edge of the viewshed from the forts at Great Chesters and Carvoran respectively. It also suggests that the planners of the Antonine Wall potentially had to site fortlets where they could detect and thereby minimise infiltration by raiders, practitioners of guerrilla warfare and so forth, across the Wall, as well as be effectively integrated with closely spaced forts positioned on or directly to the rear of the curtain. If so, it emphasises the degree of ingenuity and doubtless effort expended on positioning the Antonine Wall installations.

Such overlapping desires may help to explain the variety of fortlet positions along the Antonine Wall. The relationship between Wilderness Plantation and the local landscape is adequate though uninspiring, for instance (Figure 14.7) (Symonds 2017: 145), but if Dyčka is right the options were heavily constrained by fort viewsheds. Duntocher fortlet, by contrast, occupies a particularly fine location within the landscape, but at the cost of restricted sight lines (Symonds 2017: 146; Dyčka 2018: 317). These two examples suggest that trade-offs sometimes had to be made. Duntocher fortlet lies on gently sloping ground near the summit of Golden Hill, with a fine view from a false crest to the south, adjacent to the point where a river valley crosses the line of the Antonine Wall. This could potentially mark the line of a pre-Roman routeway leading from the Clyde valley to the Kilpatrick Hills and beyond. It is generally assumed that Duntocher fortlet was rapidly replaced by a secondary fort, but recent survey revealed that the causeway leading across the Antonine Wall ditches issued from the fortlet gateway (Hunter 2017: 325), which could point to a pair of fortlet annexes being misconstrued as a fort. Alternatively, it has been argued that the fortlet gateway was well placed to serve a successor fort (Hanson pers. comm.). Another recent discovery is the probable fortlet at Boclair, near Bearsden. As well as aiding surveillance of the approaches to the Wall, this fortlet lies about 500 m from a sharp turn in the Wall curtain just shy of a hill summit in New Kilpatrick cemetery. Both the distance from the fortlet and the behaviour of the curtain would fit with a tower existing there. If so, we might be seeing a best-of-all-worlds approach on the Antonine Wall, with fortlet garrisons being able to both occupy the best available ground, while also fulfilling the closer spacing needed to achieve control over a frontier line, and the integration with other posts necessary to create an effective system.

A holistic approach could explain another curiosity of the Antonine Wall fortlets when compared to their Hadrianic forerunners. As has been noted, many milecastles seem initially to have been brought into service with appreciable areas of empty internal space. While the Antonine Wall fortlets generally respect the broad milecastle design, they appear to have contained a larger quantity of internal buildings. This is based on a small number of observations, at Duntocher, Wilderness Plantation, and Kinneil, making certainty on the subject impossible. Even so, all three fortlets preserved traces of timber structures on both sides of their internal roads (Robertson 1957: 26; Wilkes 1974: 55; Bailey and

Figure 14.7. Fortlet locations on the Antonine Wall: (A) Croy Hill fortlet (arrowed) lies directly adjacent to a fort (under the trees to the left); (B) Wilderness Plantation occupied a ridge between two forts; (C) The site of Summerston fortlet (arrowed), as seen from the fort at Balmuildy. Although the fortlet site is obscured by the terrain at ground level, the two posts would have been intervisible from tower height. (D) Duntocher fortlet is marked by untrimmed turf, and dominated the approaches to the Antonine Wall from the Clyde valley.

Cannel 1996: 338). At Kinneil the interior was described as 'quite built up', which is normal for fortlets in general, but seemingly unusual among the Hadrianic milecastles. This raises the possibility that the version of the milecastle design used on the Antonine Wall is closer to that originally intended for Hadrian's Wall, prior to the fort decision. Indeed, the average internal area of the Antonine Wall fortlets, 351 m², is closer to milecastles 47 and 48 than most other known original milecastles, which were predominantly under 300 m² (Symonds 2017: 142). Carefully integrating the Antonine Wall fortlets with the wider frontier system potentially enabled them to overcome the loss of status that seemingly afflicted some milecastles after the forts were added to Hadrian's Wall. While the presence of more carefully positioned fortlets with built-up interiors seems an oddity when compared to Hadrian's Wall, it is a far closer fit with Roman military practice more generally.

With this in mind, the design and placing of the Raetian *Limes* fortlets is particularly interesting. Apart from Freimuhle, which is probably a product of the border between the provinces of Upper Germany and Raetia, the known stone fortlets represent variants on a generic design. In size, they offer a good general match with the milecastles and Antonine Wall fortlets (Figure 14.4), even though these posts are abnormally small when considered alongside fortlets more broadly. Although very little is known

about the internal layout of the Raetian *Limes* fortlets (Krieger 2018: 186-187), what evidence is available suggests that like the earlier Antonine Wall fortlets they contained a set of buildings commensurate with their size. Despite these similarities, it is important to stress that there are also differences between the Raetian *Limes* fortlets and those on Hadrian's Wall and the Antonine Wall. In terms of design, the Raetian *Limes* fortlet ramparts are much narrower and typically feature right-angled external corners. It is conceivable that this latter attribute was shared by the Antonine Wall fortlet at Duntocher, although plans in the excavation report conflict on the possibility of right-angled or rounded southern corners (Breeze pers. comm.; compare Robertson 1957: figures 5 and 23). Even so, the Raetian *Limes* fortlets may have found the inspiration for sharp corners rather closer to home. It has been argued that the abnormal design of five fortlets in Devon, including Martinhoe, is a consequence of the army co-opting elements of a pre-existing regional settlement style (Symonds 2018a). Intriguingly, earthwork enclosures known as *Viereckschanzen*, which feature sharp corners and have been interpreted as Iron Age ritual sites or rural settlements, occur in the broad region of the Raetian *Limes*. Although the *Viereckschanzen* were purportedly abandoned in the first century BC (von Nicolai 2009: 265), enough Roman material has been recovered for its assignation as stray finds to be questionable. Perhaps in the Raetian *Limes* fortlets we see a hybridisation between the broad milecastle design – but not spacing – concept and a pre-existing local predilection for sharp corners.

As the Raetian fortlets were placed to the south of the running barrier, they could not provide passage through it. Even so, this is the standard arrangement in Germany, while in Britain the importance of some fortlet gateways appears to have waned during the lifespan of the Antonine Wall, and this certainly occurred on Hadrian's Wall (Symonds 2018b). Two entrance ways were therefore unnecessary in the Raetian fortlets, but there is a faint possibility a few posts contained them (see Krieger 2018: 186), which would certainly fit with knowledge of the 'milecastle model'. The Raetian fortlets were also placed in a more regimented fashion within the landscape than those on the UGL, but in a less structured way than the examples on Hadrian's Wall. While fortlets on the UGL could lie over 200 m from the running barrier, those on the Raetian *Limes* were positioned rather closer to it. Guβgraben, for example, lay *c*. 35 m from the palisade, preventing it from capitalising on rising ground immediately to its rear. It would be difficult to reconcile known Raetian fortlet locations with an arbitrary spacing system, and it has been noted that the border cordon more generally was surveyed to allow a line of sight to the rearwards auxiliary forts (Sommer 2011: 21). With the exception of providing frontier gates, fortlet style and placement do seem to bear a broad resemblance to some Antonine Wall examples, which occupied useful but not outstanding positions in the landscape. Unfortunately, it is not clear precisely when the stone fortlets on the Raetian *Limes* were built. It is likely to be by the late second century, though, as the example at Raitenbuch had seemingly gone out of use by the time the *Teufelsmauer* was constructed in the early third century (Sommer 2011: 169). Whenever the fortlets were founded, they appear potentially recognisable as a local reworking of some general principles governing how and where Antonine Wall fortlets were built.

While the extensive use of small fortlets in Raetia could echo elements of the Antonine Wall arrangement, it does not seem to be the first use of what could be judged milecastle-design variants in the region between the Rhine and Danube rivers. Although most of the fortlets on the UGL are hard to date directly, largely due to the paucity of inscriptions and a considerable reliance on evidence from early excavations, a set of stone fortlets on the Odenwald stretch of the 'inner *limes*' were probably commissioned early in the reign of Antoninus Pius, making them roughly contemporary with the Antonine Wall (see Thiel

2009). A masonry tower on the 'inner *limes*' has produced a building inscription dating to AD 145, while a fragment from the fortlet at Trienz records work under Pius (Baatz 1976: 25; Fabricius 1926: 103-104). Trienz is, however, a larger fortlet with an internal area of 1840 m², while those on the Odenwald most similar to the Raetian – and British – frontier fortlets are smaller posts ranging in size from 127 m² to 342 m². Even so, as these small fortlets and many of the towers are distinguished by an unusual wealth of stone architectural elements, such as sculpture, dwarf pillars, bevelled cornices and half-cylindrical capstones, it seems likely that they were the product of a single building programme in the AD 140s (Symonds 2017: 163). If so, the presence of milecastle-sized fortlets could be taken as an example of an early Antonine fusion between the fortlet size judged most appropriate on Hadrian's Wall, and the positioning strategy favoured on the UGL. Rather than being regularly spaced, most of the small fortlets on the 'inner *limes*' control key Odenwald passes (Baatz 2007: 15) (Figure 14.5). Accordingly, while the appearance of such distinctive small fortlets has been nominated as a possible late-second-century development on the UGL (Thiel 2004: 71), the Odenwald installations suggest the earliest examples can be assigned to the immediate aftermath of the Hadrianic experiment with milecastles.

Fortlet variations

Figure 14.4 effectively sums up the arguments outlined here, and the process of evolution that may potentially be traced through fortlet use on these four frontier systems. Initially, turf fortlets of varying size were generally carefully positioned within the landscape on the UGL. While some of these have modest dimensions compared to earlier fortlets, there is initially no sign of the large numbers of smaller installations based on a generic design encountered on the other three frontiers under consideration here. The overarching Hadrian's Wall scheme seems to react strongly against the techniques employed in Upper Germany, by utilising fortlets constructed to standard specifications and positioned according to an arbitrary spacing system. Although the short distances between posts ought, in theory, to have restricted opportunities for infiltration across the curtain, in practice overly dogmatic positioning left some posts working against the local topography. This shortcoming seems to have been addressed following the fort decision, when a more flexible approach to design, spacing, and engagement with the terrain arguably becomes evident, before being further refined as construction progressed. Equally, there are some signs of localised attempts to integrate the milecastles and turrets with the new Wall forts. It was this adjusted and adapted version of the Hadrian's Wall format that was then exported north and tailored to conditions on the Forth-Clyde isthmus to produce the Antonine Wall.

While the Antonine Wall fortlets are recognisable as variants on the original pre-fort-decision milecastle design, they appear to have been placed more loosely within the landscape. This would have aided both the garrison's ability to control the Wall line, and attempts to integrate the fortlets into the wider frontier system. If the vestigial traces of fully built-up interiors are reliable, it suggests that this holistic approach enabled the fortlets to be fully manned, in apparent contrast to many Hadrianic milecastles. Intriguingly, this broad approach – a standardised fortlet format, with installations positioned more carefully within both the landscape and the wider cordon – is seemingly echoed on the Raetian *Limes*. Indeed, the size of most milecastles, Antonine Wall fortlets, and Raetian *Limes* fortlets is strikingly similar, suggesting that the general design was found highly satisfactory when it came to building frontier security. Furthermore, small fortlets based on a broadly comparable model also seem to appear on the UGL 'inner *limes*' in the early part of Pius' reign. Such posts apparently become more common over time, with examples including Rötelsee on the 'outer *limes*' (Figure 14.4),

even though larger fortlets also continued to be constructed on the UGL. Despite such local variations, it seems reasonable to propose that we are seeing the Roman military experimenting with different approaches to achieving border security. The techniques used on one barrier appear to inform those on its successor – be it in opposition – as between Upper Germany and Hadrian's Wall – or in harmony – as between Hadrian's Wall and the Antonine Wall. By this reading, the modern scholarly convention of comparing and contrasting these frontiers was also embraced with gusto during the Roman period itself!

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15. The Roman fort and fortlet at Castlehill on the Antonine Wall: the geophysical, LiDAR and early map evidence

William S. Hanson and Richard E. Jones

Introduction

The Roman fort on the Antonine Wall at Castlehill, East Dunbartonshire (NS 5250 7270) is located immediately to the west of Bearsden on the northwestern fringe of Glasgow. It sits partly astride the eponymous Castlehill, where the Wall makes a marked change of alignment. This it does with some frequency in the sector west of Balmuildy as it makes its way from drumlin to drumlin. The hill rises to a height of 118m above sea level, providing excellent panoramic views, second only to Bar Hill along the whole line of the Wall (Macdonald 1934: 170).

There is a long antiquarian tradition of a Roman fort on the hill dating back to the beginning of the 18th century (Keppie 1980). In the mid-1750s the fort was still sufficiently extant for its outline to be planned by Roy (1793: plate XXXV) (Figure 15.1). By the mid-19th century, however, it had been

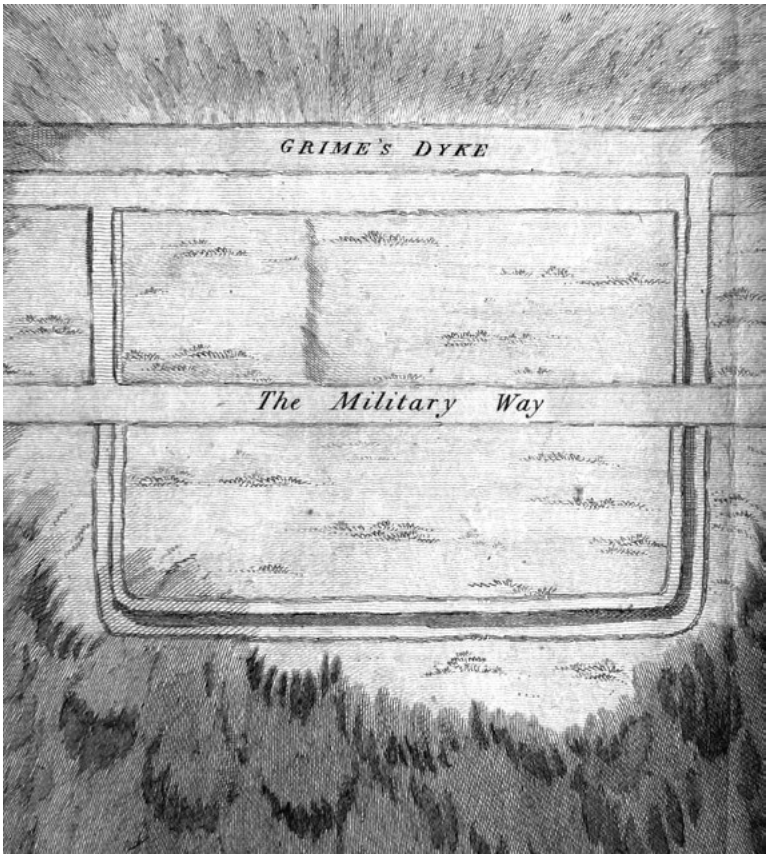

Figure 15.1. Roy's plan of the fort at Castlehill showing a smaller enclosure in its north-west corner (Roy 1793: pl. xxxv)

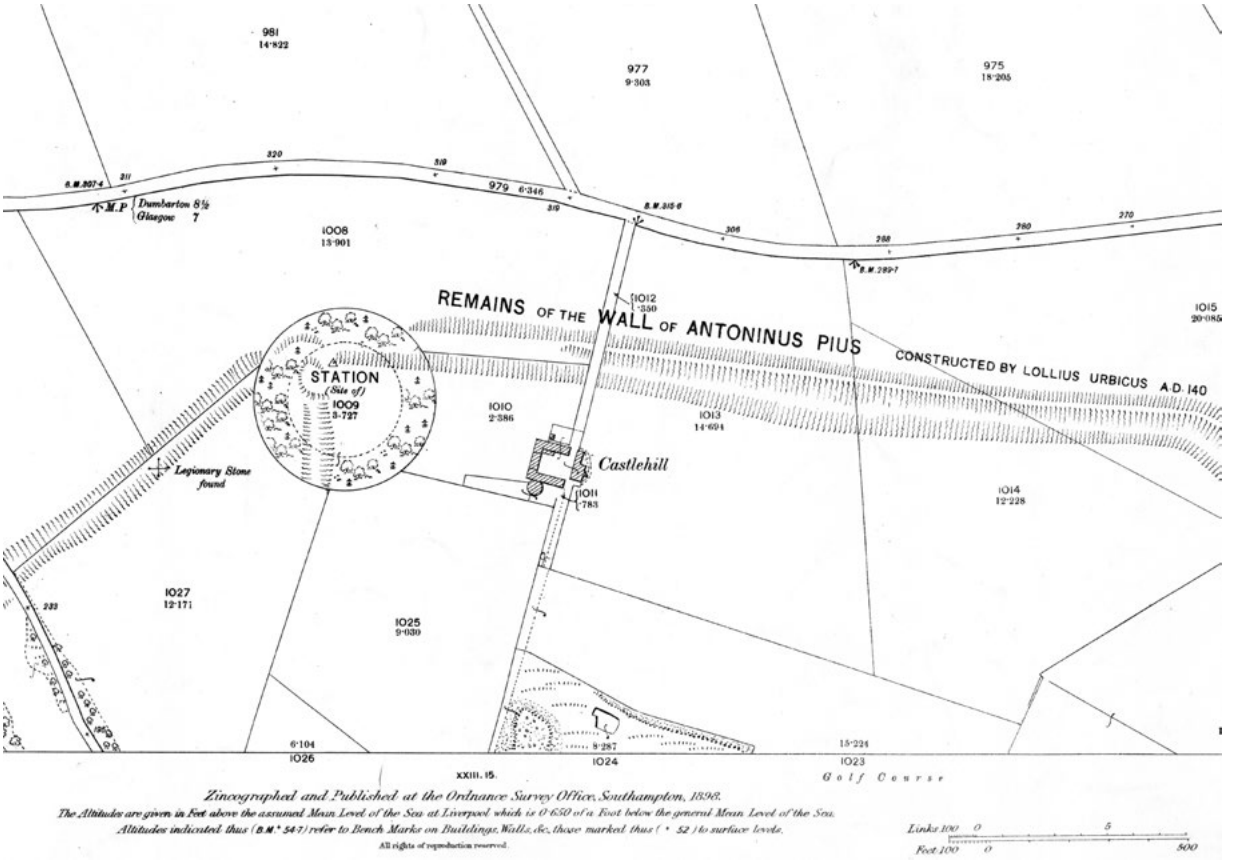

Figure 15.2. Extract from Ordnance Survey 2nd edition 25 inches to the mile map, Dunbartonshire sheet XXIII.11 (Reproduced with the permission of the National Library of Scotland)

largely ploughed flat and overplanted with a circular copse of trees, so that it features on the first edition 25 inch to the mile Ordnance Survey map of the area, surveyed in 1860, only as the 'site of a Roman station', though the line of the Antonine Wall ditch was still clear. In the second edition of the same map, published in 1898 (Figure 15.2), the line of the ditches defining the western side of the fort are recorded as a broad hollow, but this feature does not appear in any map revisions thereafter. Confirmation of the identification of the fort came in the early-19th century with the discovery nearby of an altar to the goddesses of the parade ground, dedicated by the commander of the Fourth Cohort of Gauls, and, some 20 years later, a probable tombstone and a decorated column capital (*RIB* I 2195; *CSIR* 144; 147). However, it was not until 1947 that the extent and precise location of the fort was confirmed, when its ditches on the south side and at the south-east corner were recorded from the air, indicating an area within the ditches of *c.* 3.5 acres (1.4 ha) (St Joseph 1951: 61-62; Keppie 1980: 82-83). No excavation has ever been undertaken, but Antonine pottery has been recovered from the roots of fallen trees on the hilltop (Robertson 2015: 114).

This confirmation of the size and location of the fort highlighted two issues. Firstly, it was considerably larger than most of the antiquarian accounts seemed to indicate; secondly, it was not centered on the hilltop, but extended down the relatively gentle slope to the east almost as far as the now derelict Castlehill Farm (*contra* Macdonald 1934: 326). Lawrence Keppie examined the antiquarian accounts in detail and drew attention

to inconsistencies in the recorded dimensions of the fort. He concluded that these were the result of two installations being present on the same site, as, indeed, was depicted by Roy (Figure 15.1). In the context of contemporary understanding those seemed best interpreted as a fort with a fortlet approximately 30 m square located by its north-west corner on the summit of the hill (Keppie 1980).

Geophysical survey – aims and methodology

Since so little was known about the fort and no excavation had been undertaken, Castlehill seemed an ideal site for geophysical investigation. All the more so as there was the possibility of testing for the possible existence there of another fortlet. Accordingly, following a full topographic survey, three programmes of geophysical survey were undertaken in 2008, 2011 (Jones *et al.* 2009; Jones 2011) and 2019 with the aim of covering as much of the fort as possible by at least one form of survey, within the constraints of some difficult modern land conditions (below).

The first programme involved both resistivity (Figure 15.3) and magnetometry (Figure 15.4) across the northern two-thirds of the fort. The second was confined to higher resolution magnetometry which

Figure 15.3. Location plan of the resistivity surveys. The main survey to the north was undertaken in 2008; the coverage of the southern defences was obtained in 2019

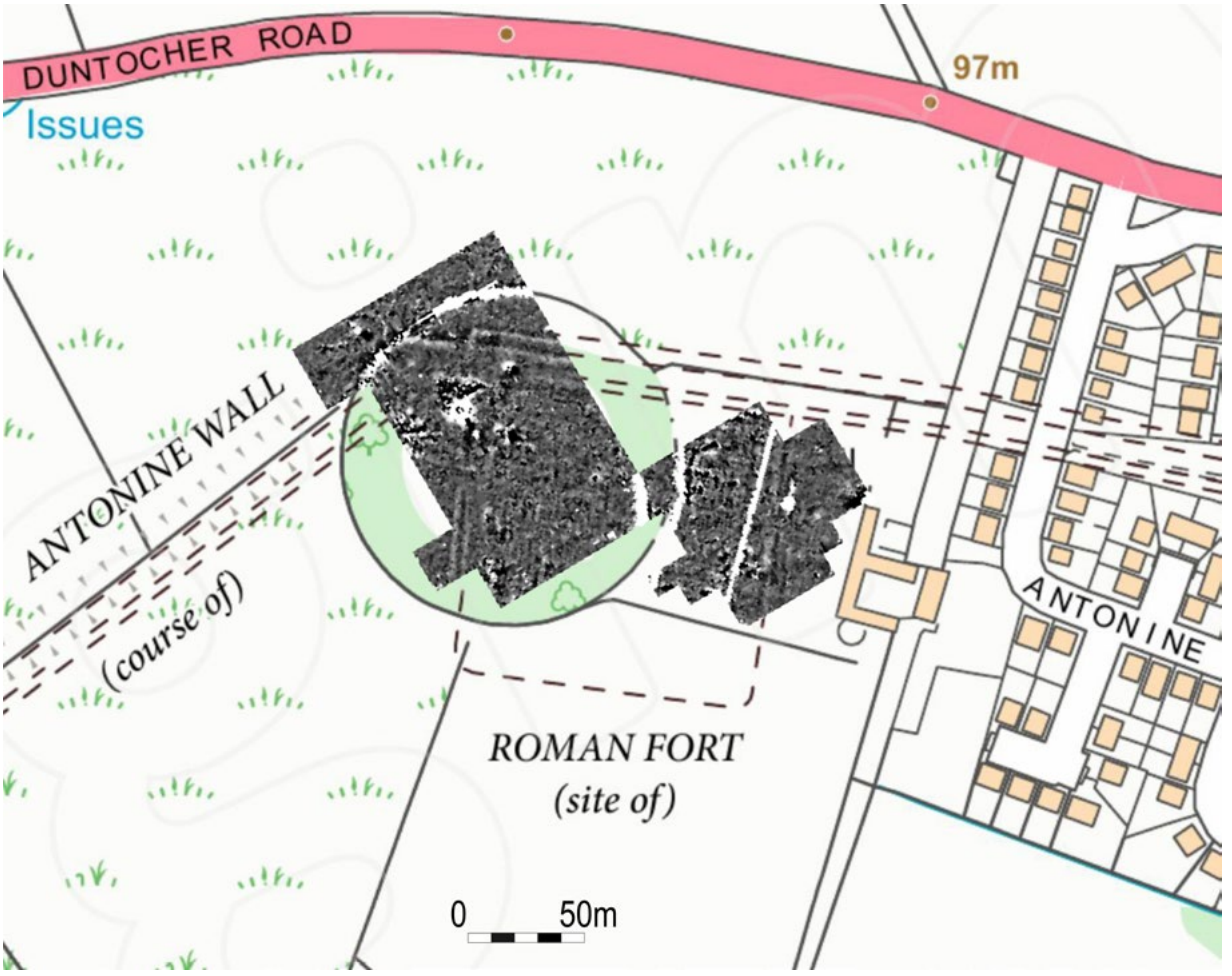

Figure 15.4. Location plan of the 2008 magnetic survey

duplicated some of the coverage obtained in 2008, but extended across the southern half of the fort and beyond (Figure 15.5). The third and most recent was confined to resistivity across the southern defences (Figure 15.3). In the first programme, a Geoscan FM36 gradiometer was used, with sampling and traverse intervals of 1 m in 20 m by 20 m grids. The same intervals applied to the resistivity survey with a Geoscan RM15 instrument in the twin probe mode in both 2008 and 2019. The 2011 magnetometry survey employed a Bartington Grad 601 single sensor gradiometer with sampling and traverse intervals of 0.25 m and 0.5 m respectively. The data was processed with Geoplot v. 3.1 using despike, low pass filter and interpolation procedures.

Operating conditions were not straightforward: as well as the slope, the vegetation was thick in places requiring trampling down in advance of survey; and the detrimental effects of standing trees or collapsed tree trunks, thick hedges and the remains of metal fences were significant. The relative clarity of the results in the field on the east side of the survey area closest to the farm can be attributed to the lack of surface obstructions.

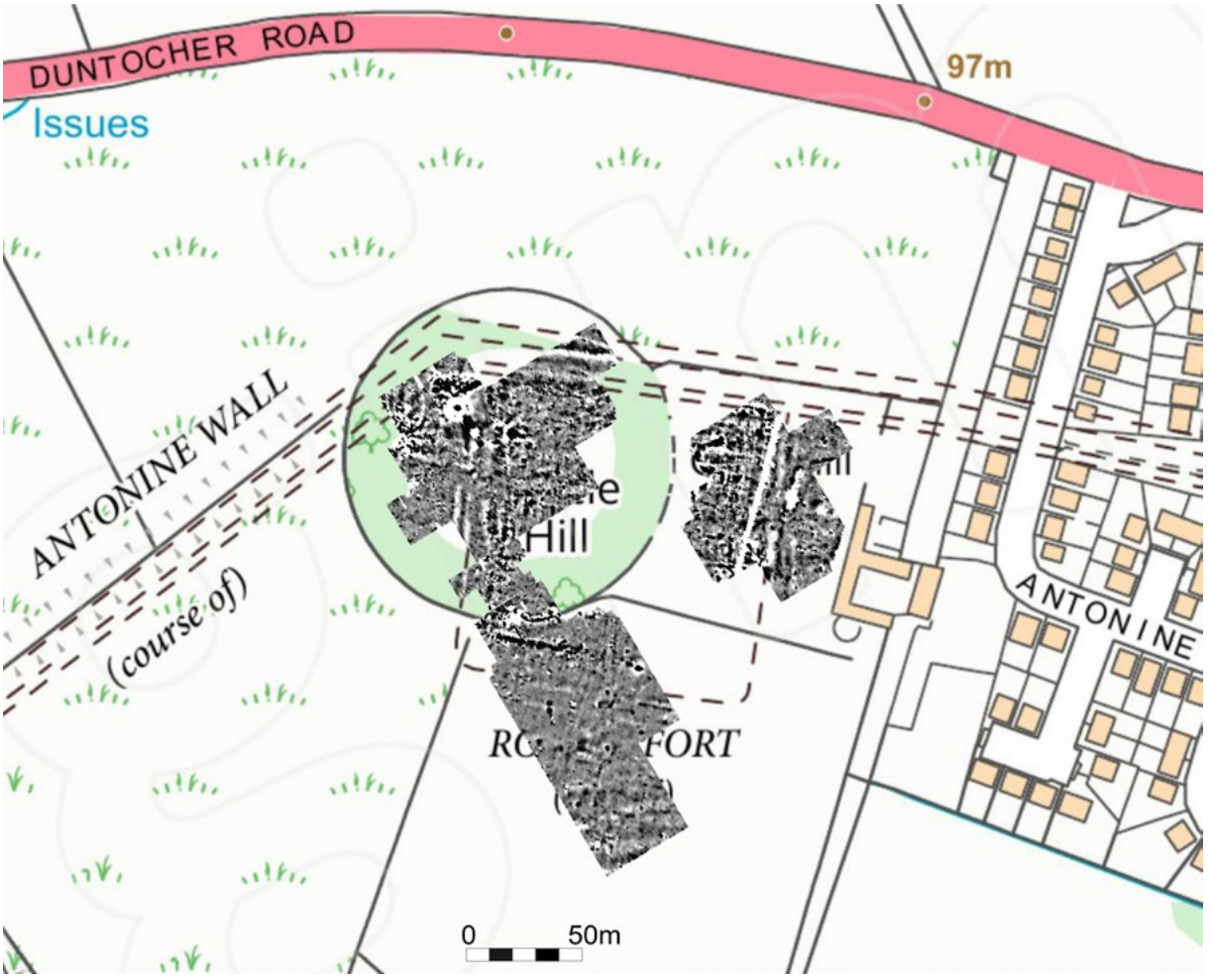

Figure 15.5. Location plan of the 2011 magnetic survey

Resistivity survey – results

Because there is no spatial overlap between them, the 2008 and 2019 resistivity surveys have been combined into a single, composite plot (Figure 15.6). The north-western part of the survey is somewhat dominated by modern features. The narrow curving line of high resistance at the top reflects part of the northern quadrant of the inner bank of the circular copse of trees that still rings the summit of the hill. The eastern side of same feature is similarly picked up as a curving band of high resistance, while parts of the south and west quadrants are apparent as much fainter lines of slightly elevated resistance. A short section of the corresponding outer edge of the copse is faintly visible as another slightly curving band of higher resistance in the centre of the survey. These concentric circular banks are also readily apparent in the LiDAR data (Figure 15.9). An inverted T-shaped, sharply defined, high resistance feature within the north-west quadrant of the inner ring also relates to a relatively recent intrusion. The point of very low resistance at its southern end corresponds with a rusting manhole cover that features prominently also in the magnetic survey as a strong bipolar anomaly (Figure 15.7).

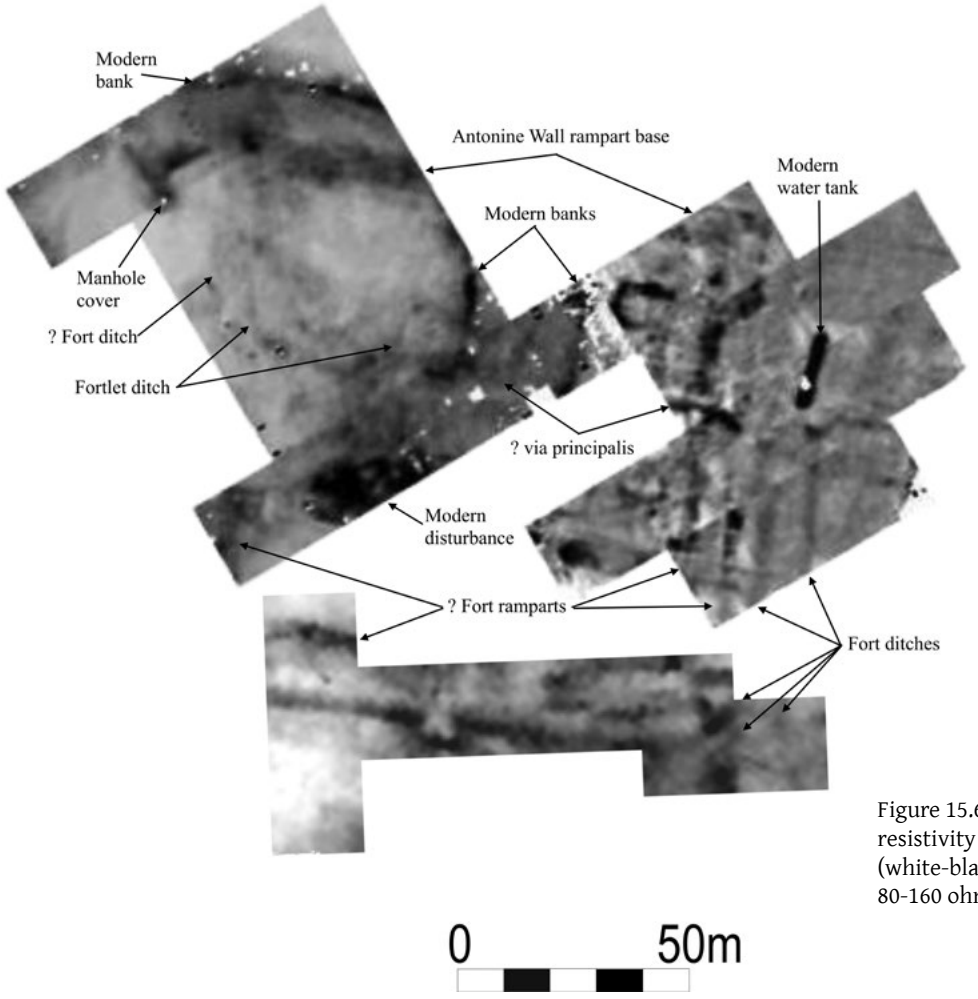

Figure 15.6. Annotated composite resistivity survey (2008 and 2019) (white-black palette equivalent to 80-160 ohms)

Finally, a large oval-shaped area of high resistance towards the southern limit of the 2008 survey coincides with an area of modern disturbance, again clearly visible in the LiDAR imagery (Figure 15.9), between the inner bank of the copse and the continuation of an earlier field wall.

Nonetheless, it is possible to discern some underlying archaeological remains. A broad band of high resistance, some 5-7 m wide, which is somewhat mottled in character in places, runs west-east from the modern T-shaped feature across the north-west corner of the fort. Though rather wider than might be expected, it would seem to represent the slightly disturbed line of the cobble base of the Antonine Wall rampart. This alignment is picked up again in the eastern half of the survey, where it joins what appears to be the east rampart(s) of the fort (below).

To the rear of the Wall base in the north-west corner of the fort is a U-shaped enclosure, some 30-37 m east-west by 35 m north-south internally, the latter dimension measured from the rear of the Antonine Wall rampart (Figure 15.6). This enclosure is defined by a single narrow ditch, visible as a line of slightly higher resistance, similar to those demarcating the east side of the fort (below). The ditch is clearest around the southern half of the enclosure. There are faint traces of another possible ditch

line running parallel to its west side, which may indicate that the enclosure was double-ditched. More probably, since there is no trace of an equivalent ditch on the south side, it represents the line of the western inner fort ditch that is partially apparent also in the magnetometer survey (Figure 15.7). A band of higher resistance at the south-western extremity of the 2008 survey may represent part of the line of the fort rampart, though there is no trace of it continuing further to the north. It coincides with part of the discontinuous broad band of positive anomalies visible in the magnetic survey (Figure 15.7).

Four parallel north-south alignments are readily apparent on the eastern side of the survey area (Figure 15.6). The innermost is a *c.* 4 m wide line of consistently higher resistance that is similar in character to the base of the Antonine Wall which it appears to join. This seems best interpreted as the eastern rampart of the fort. The outer two are visible as lines of slightly elevated resistance and presumably represent the fort ditches. The outermost can be traced only in the southern half of the surveyed area as further north it is overlain by a short band of very well-defined high resistance. This is clearly another modern disturbance, part of which, corresponding with a small circle of very low resistance, is represented on the ground by the capping of a sunken tank that, according to the landowner, relates to the early water supply for the farm. This feature coincides with a very strong negative anomaly in the magnetic survey (Figures 15.7 and 15.8), which is the usual signature for modern metal disturbance. The fourth linear alignment, located between the two ditches and the rampart, is of uncertain identification. It could be a third ditch, but contains occasional patches of higher resistance and appears to continue on to join the back of the Antonine Wall rampart. Though heavily masked by a modern fence line, the magnetic signal from the same feature is more reminiscent of a rampart than of a ditch (below) (Figure 15.8).

A slightly curving band of high resistance which cuts across the fort rampart and part of the enigmatic parallel linear feature approximately midway along their recorded lengths may represent the line of the *via principalis* as it leaves the fort. A band of slightly higher resistance continues that alignment both across the two outer ditches and possibly back into the interior of the fort.

The significance of the C-shaped band of high resistance in the north-eastern corner of the fort is uncertain. It could represent part of a stone structure, and corresponds with more angular linear alignments in the magnetometry (below and Figures 15.7 and 15.8), though it seems too wide for a wall foundation. It is perhaps more likely to be a relatively modern feature.

The inner southern ditch of the fort is picked up in the 2019 survey as a discontinuous line of higher resistance which curves northwards at its eastern end as it follows the south-east corner of the fort heading towards the inner ditch on the east side (Figure 15.6). A break in the line approximately half way along its length presumably coincides with the south gate of the fort. A short stretch of ditch immediately in front of that break is reminiscent of a *titulus*, but that would make no sense in front of an inner ditch; rather it may represent the western end of a narrow intermediate ditch in this quadrant which is hinted at in the aerial photographic record, as astutely noted by Keppie (1980: 82-83), and in the magnetometry (Figure 15.7). The line of the outer south ditch known from the aerial photographs is not readily apparent in the resistivity survey, though its position west of the gate may be broadly indicated by the break between a zone of enhanced resistance and one of very low resistance. At the south-east corner of the fort the course of the inner ditch is partly mirrored by faint traces of a narrow line of higher resistance that seems to represent a second ditch, presumably the intermediate one

noted above (Figure 15.6); while beyond it there are very slight indications of a curving line of higher resistance which aligns with the outer ditch on the east side of the fort, which presumably represents the continuation of that ditch around the corner of the fort.

A broadly parallel line of high resistivity some 10 m to the north of the visible southern ditch, which is clear at the western end of the 2019 survey and also perhaps on its northern limit further to the east, may represent the southern rampart of the fort (Figure 15.6). It mirrors a strong positive linear anomaly apparent in the 2011 magnetic survey that continues right across the surveyed area, allowing for a gap for the south gate (Figure 15.8).

Magnetic survey – results

The most prominent features at the north-western limit of the 2008 magnetic survey (Figure 15.7) again are modern. Strong positive and associated weak negative anomalies define the outer fence of the copse in two places as it curves around the hill. Just inside the band of trees it contains, in the north-west quadrant, is a line of three discrete strong bipolar anomalies. The most north-easterly of

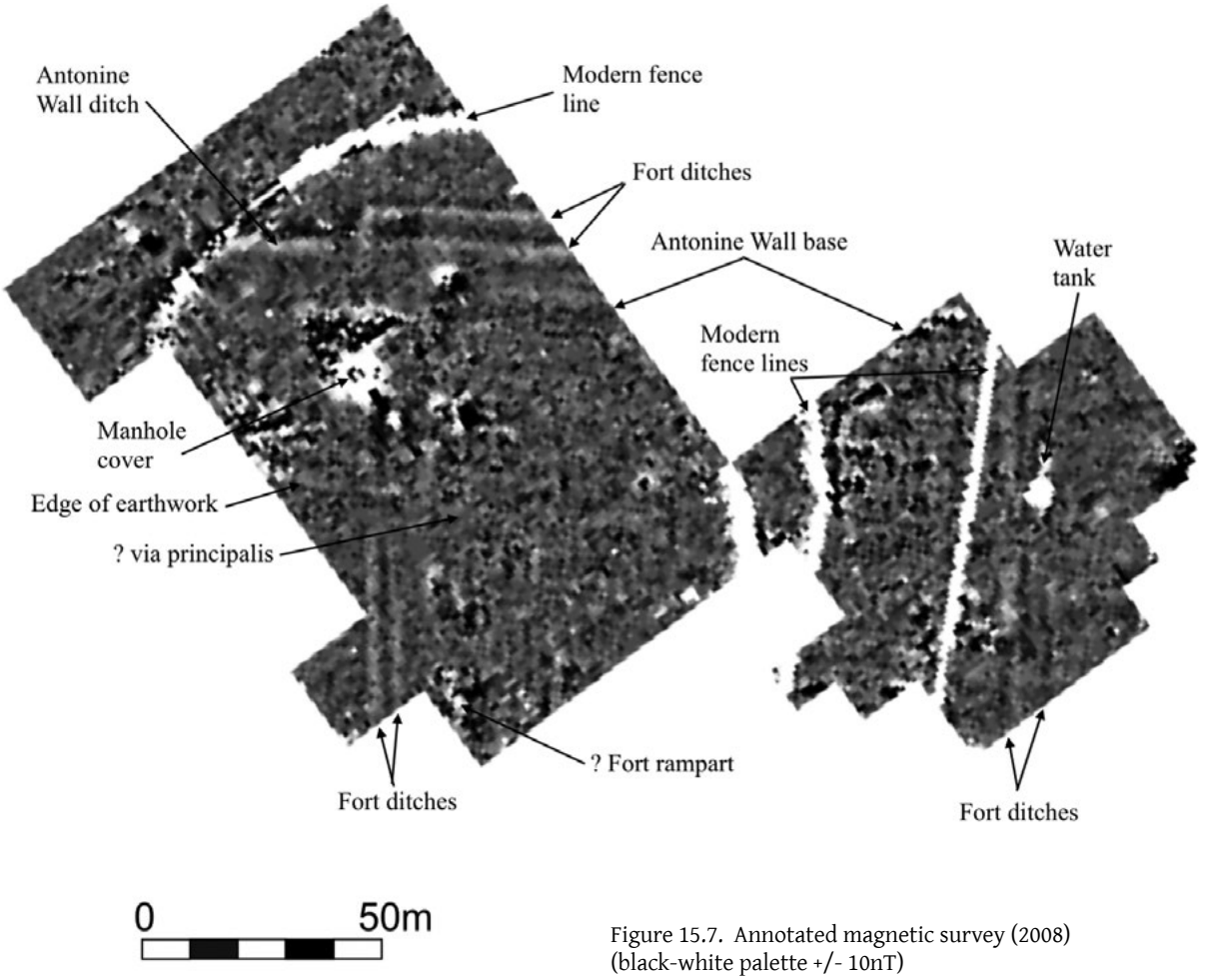

Figure 15.7. Annotated magnetic survey (2008) (black-white palette +/- 10nT)

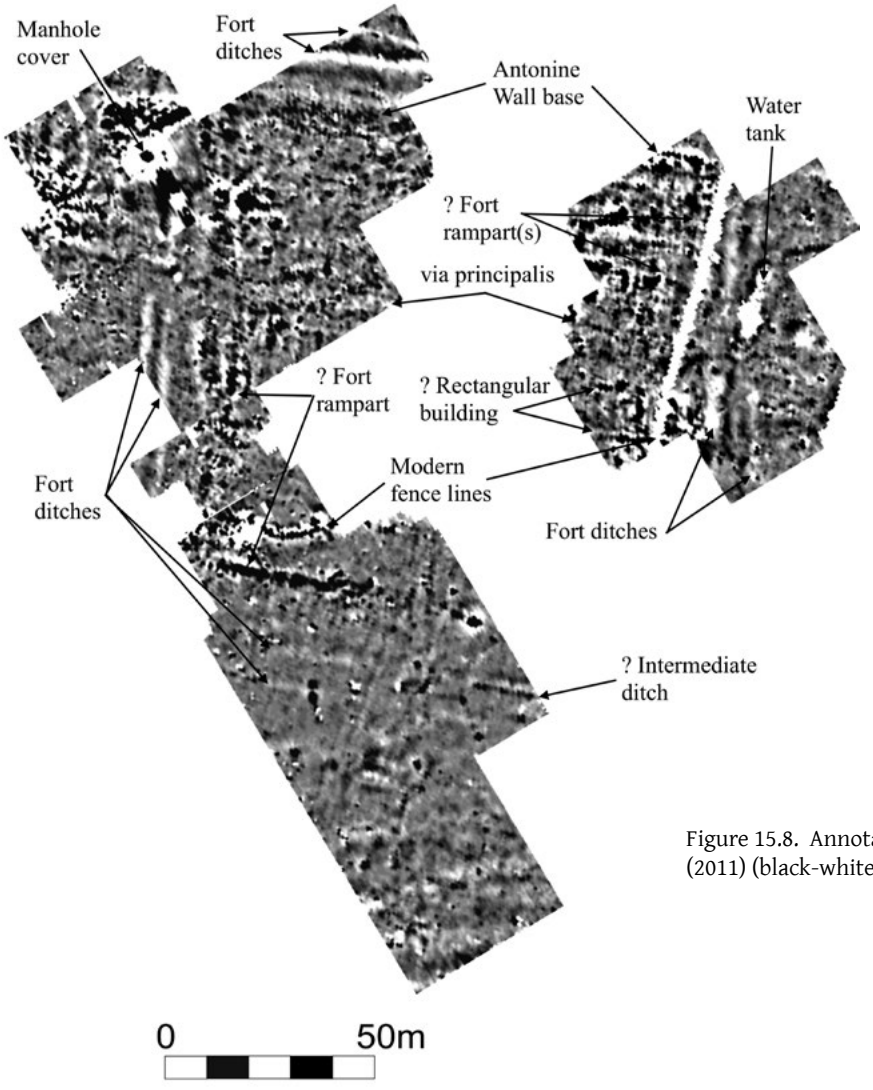

Figure 15.8. Annotated magnetic survey (2011) (black-white palette +/- 10nT)

these probably reflects an early trigonometric survey point that is recorded on the first and second edition 25 inches to the mile Ordnance Survey maps (Figure 15.2), but does not appear on large scale maps produced after the mid-1950s. Its position is now completely overgrown so could not readily be checked on the ground. The other two bipolar anomalies coincide with a small sub-rectangular earthwork visible on the LiDAR coverage (Figure 15.9), the strongest of which, visible also in the 2011 magnetic survey, reflects the presence of the manhole cover noted above.

The fence line at the north-west limit of the 2008 survey (Figure 15.7) cuts across and truncates a negative linear anomaly running west-east, combined with a slight positive one on its north side, with an overall width of c. 6.8m. This is clearly the ditch of the Antonine Wall, whose alignment continues to the eastern limit of the survey area and beyond into the additional area covered by the 2011 survey (Figure 15.8), though it appears to be slightly narrower in front of the fort. A second even narrower ditch line, similarly defined, runs parallel and immediately to the north (Figure 15.7). Only a small

section of this outer ditch falls within the 2011 survey, which hints at a slight southern curvature as it approaches the probable site of the north gate of the fort. The outer ditch does not continue to the west of the fort frontage, but turns south to cut across the line of the Antonine Wall ditch at right angles (Figure 15.7). It then follows the alignment of the outer ditch on the west side of the fort. Thus, not only was the Antonine Wall provided with slightly narrower double ditches to the north of the fort, but there is a clear disjuncture between its ditch and those of the fort.

A broad slightly speckled band of mainly positive anomalies *c.* 5.5 m wide running parallel to and to the south of the Antonine Wall/inner fort ditch presumably represents the base of the Wall/fort rampart. It is most clearly evident in the 2011 survey (Figure 15.8) and mirrors the band of high resistance in the resistivity survey (Figure 15.6).

The northern section of the western defences of the fort are masked by the strong signal from the manhole cover and associated modern disturbance, but two ditches showing as parallel negative anomalies, separated by a slightly enhanced positive anomaly, can be traced to the south-western limit of both surveys. There is a clear break in these ditches marking the position of the west gate. The line of the western rampart of the fort may be broadly demarcated by wide, slightly discontinuous bands of positive anomalies running inside and parallel to the ditches which are again visible in both surveys. Extending eastwards from the break in the ditches into the interior of the fort, the *via principalis* is faintly visible as a wide mottled band, particularly in the 2011 survey where it is demarcated on both sides by irregular lines of strong positive anomalies (Figure 15.8), possibly where drains have been variously infilled with debris. A slightly curving linear alignment which runs west from the northern side of the gap in the fort ditches corresponds with the southern limit of the subrectangular earthwork plateau visible in the LiDAR survey, which is discussed further below (Figure 15.9).

The lines of double ditches on the south side of the fort are faintly confirmed in the 2011 survey (Figure 15.8) in the same manner as the ditches to the north of the fort, though they are more widely spaced. There are also indications of a gap for the south gate. In addition, there is a slight hint of a possible third ditch to the east of the gate in the form of a narrow positive anomaly running between the inner and outer ditches, though closer to the inner. This mirrors evidence from the 1947 aerial photographs (Keppie 1980: 82-83) and is also hinted at in the resistivity survey (above) (Figure 15.6). A broadly parallel, strong positive linear anomaly to the north of these ditches may represent the southern rampart of the fort as there is a gap in its line broadly coincident with the gap in the ditches, though this linear feature is rather different in character to the other possible ramparts. The same feature is visible as a band of higher resistance in the resistivity survey (above) (Figure 15.6). The short, narrow curving line of a strong positive and associated weak negative anomaly to the north of it is part of the outer fence line of the copse (Figure 15.8).

Only two ditches are visible on the east side of the fort in both the 2008 and 2011 surveys (Figures 15.7 and 15.8). They are revealed as quite strong, parallel negative anomalies, particularly in the 2011 survey, which are slightly more widely spaced than on the west side and separated by a more strongly enhanced positive anomaly. The northern part of the outer ditch is obscured by a strong bipolar anomaly reflecting the presence of a buried water tank, as noted above. An apparent gap in the inner ditch, directly opposite one on the west side of the fort, marks the position of the east gate. As on the west side of the fort, a broad, slightly discontinuous band of mixed positive and negative anomalies

inside the ditches apparent in the 2011 survey may represent the line of the rampart base (Figure 15.8). This corresponds with a line of consistently higher resistance in the resistivity survey (Figure 15.6). The linear anomaly of uncertain identification immediately to its east, which is also apparent in the resistivity survey, is largely masked by the strong negative signal from a modern fence. However, where it is apparent in the 2011 survey (Figure 15.8), its character seems to have more in common with the rampart inside it than the ditches outside it.

There are few anomalies that can be identified as buildings in the interior of the fort, though there are several areas that show clusters of positive anomalies, some of which may be demolition pits. Though suggestive of part of a sub-rectangular structure, short linear alignments of positive anomalies to the north of the *via principalis* on the eastern side of the fort, corresponding with a small C-shaped feature in the resistivity survey (Figure 15.6), again seem too broad to be wall foundations. However, the end of one possible rectangular building *c.* 11 m wide is indicated in the 2011 survey by narrow positive and associated negative linear anomalies inside the probable rampart on the same side of the fort immediately to the south of the *via principalis* (Figure 15.8).

LiDAR (Figure 15.9)

The line of the Antonine Wall ditch is very clear in the LiDAR survey where it descends the steeper western slope of Castlehill. It remains visible on the ground today, though somewhat masked by a field boundary hedge. The line can also be traced to the east of the fort, but much more faintly and again masked by a prominent field boundary hedge. While still recorded as an earthwork on the first and second editions of the 25 inches to the mile Ordnance survey maps of 1863 and 1898 (Figure 15.2), ploughing seems to have removed any obvious signs of the ditch to the east of the fort within a few years as, by the 1918 edition of the same map, it is recorded only as a dotted line demarcating the track of the Antonine Wall. The disjuncture evident in the magnetic survey between the ditch of the Antonine Wall and the two ditches in front of the fort at its north-west corner (Figure 15.7) is clearly visible also in the LiDAR survey.

Immediately to the south of that disjuncture is a subrectangular area of raised ground which is still visible today. This is clearly the earthwork plateau recorded by Keppie in his plan and interpreted as the site of a possible fortlet (1980: 83-84). The plateau is variously recorded on large-scale Ordnance survey maps up to the later 1950s. It does not feature on the first edition 25 inch to the mile Ordnance Survey map of the area, surveyed in 1860, but first appears on the second edition of 1898 (surveyed in 1896), where it clearly overlies the faint traces of the ditches on the western side of the fort (Figure 15.2). This relationship is confirmed by the LiDAR survey, which also depicts a small raised circle at the centre of the plateau. This circle denotes the manhole cover that is responsible for the strongest bipolar anomaly in the magnetometry (above). According to the landowner, this cover caps a well from which the farm drew its water supply prior to the installation of mains water in the 1950s. It seems likely, therefore, that the well was dug at some time between 1860 and 1896 and the material from its construction was spread out to form the low mound or plateau that is still visible on the ground.

Finally, the line of the ditches of the fort to the south of the Wall is very faintly apparent as a broad hollow on all three sides. Indeed, the slightly raised platform of the fort can still be traced on the ground around its southern and much of its western side.

Figure 15.9. LiDAR-derived 1 m resolution digital terrain model

Interpretation and wider context

At *c.* 6.8 m in width, the Antonine Wall ditch conforms with other sections recorded in this westernmost sector of the Wall which are consistently narrower than the imposing obstacle still visible in parts of the central sector. For example, a section excavated at Peel Glen only 280 m west of Castlehill indicated a width of 7 m; three sections cut to the south-east of the fort at Duntocher were only 6.1-6.4 m wide; while some 1.5 km further west at Carleith the ditch was even narrower, only 5.6 m in width (Keppie and Walker 1989: 155; Robertson 1957: 7-11; Keppie and Breeze 1981: 235).

The provision of slightly narrower double ditches to the north of the fort is reminiscent of the situation at Duntocher and Auchendavy (Robertson 1957: 40-41; Jones and Leslie 2015: Fig. 22.2; Hanson forthcoming a), though recent geophysical survey has indicated that there were, in fact, three ditches north of the fort at the former (Jones 2016). There is a clear disjuncture or misalignment between the ditch of Antonine Wall and those of the fort at Castlehill outside its north-west corner, which must

indicate that the fort and Wall were not built contemporaneously. This relationship is most closely paralleled by the misalignment of the ditches outside the north-west corner of the fort at Auchendavy, which is also considered to have been constructed before the Wall (Jones and Leslie 2015: 319 and Fig. 22.2). The magnetic survey appears to indicate that the outer fort ditch at Castlehill is later than that of the Antonine Wall, though it is difficult to envisage how the depicted relationship would have manifested itself stratigraphically assuming the two ditches were open at the same time. It is perhaps more likely, therefore, that the fort was built as a freestanding structure to which the Wall later abutted. This was also the case at both the adjacent fortlet at Cleddans and the next fort to the west at Duntocher, where a similar misalignment between their ramparts and that of the Antonine Wall is apparent at their north-east corners (Keppie and Walker 1981: 154-56; Robertson 1957: Figs. 21 and 23). A similar chronological relationship between fort and Wall would not be out of place as Castlehill is the point at which the unit of measurement for the construction of the Wall recorded on the Distance Stones changes from paces to feet (*RIB* I 2196 and 2197), which is generally taken to indicate that this section of the Wall was the last to be constructed (Hanson and Breeze, this volume).

The east side of the fort is clear in both the resistivity and magnetic surveys, defined by two parallel ditches. The possibility of two adjacent lines of rampart within them is without ready parallel, but may hint that the site experienced an even more complex structural history than might have been anticipated. Two ditches were confirmed in the magnetic survey on the both the south and west sides of the fort, with the possibility of a third narrow intermediate ditch in the south-east quadrant. The position of the gates on all three sides is indicated by gaps in the ditches. If the broad discontinuous bands of higher resistance and positive anomalies within the ditches of the fort have been correctly identified as ramparts, the internal east-west dimension of the fort (measuring to the inner eastern rampart) would have been *c.* 94.5 m. Measuring from the back of the Antonine Wall rampart to the inner southern ditch, the equivalent north-south dimension would have been *c.* 119 m, allowing for the estimated width of the southern rampart and berm (*c.* 8 m), giving an internal area of *c.* 1.13 ha (2.8 acres). This is somewhat less than earlier calculations, though these were based on the area within the ditches plotted from oblique aerial photographs. If the strong positive linear alignment visible in the 2011 magnetic survey and in the 2019 resistivity survey does represent the southern rampart of the fort, that would reduce the north-south dimension to *c.* 110 m and, correspondingly, the internal area to *c.* 1.04 ha (2.6 acres). The possibility of a second rampart line on the east side may indicate a slight adjustment to the size of the fort during its construction, as happened at nearby Bearsden, where an annexe was carved out of an originally larger fort enclosure (Breeze 2016: 320 and illus. 21.14), and possibly at Auchendavy, where the 'trident' ditch configuration beyond the north-west corner of the fort recorded in the geophysical survey (Jones and Leslie 2015: 319 and Fig. 22.2) hints at an earlier intention to construct a larger fort enclosure.

Had the fort had been provided with an attached annexe, the local topography would have determined that it lay on the more gentle slope to the east of the fort. However, neither the 1947 aerial photographs nor the 2019 resistivity survey indicated the presence of any connecting ditches outside the south-east corner of the fort (Figure 15.6). Antiquarian records of Roman stonework from Peel Glen some 400m to the south-west of the fort may indicate the presence of a bathhouse taking advantage of the only running water in the immediate vicinity (Bailey and Mearns, this volume). Such an arrangement would be similar to that at Duntocher, where the bathhouse was located by the Duntocher Burn down the slope to the north-west, though in that case somewhat closer to the fort (Keppie 2004).

The traces of buildings within the fort are very slight and insufficiently clear to provide certain identifications. However, the hint of a rectangular building to the south of the *via principalis* visible in the magnetic survey from 2011 may represent one end of a barrack block running east-west or rather, since such buildings were normally post-built (Hanson and Maxwell 1986: 175-6), an infilled drain around it.

The earthwork plateau which is located just outside the north-west corner of the fort may be dismissed as a late 19th century construction. However, the small, ditched enclosure visible in the resistivity survey (Figure 15.6) clearly sits in the north-west corner of the fort on the very summit of the hill. Both its location and dimensions match the antiquarian accounts, as summarised by Keppie (1980) and depicted by Roy (Figure 15.1). Its dimensions and slightly irregular shape are also quite closely paralleled by the restored outline of the ditch surrounding the fortlet at Kinneil (Bailey and Cannel 1996: illus. 28). Its identification as a fortlet, therefore, may be asserted with some confidence. The overall sequence of construction at Castlehill, with a fortlet replaced by a freestanding fort before the line of the Wall reached the site, is closely paralleled by the adjacent fort to the west at Duntocher (Robertson 1957). Along with Croy Hill (Hanson forthcoming b: ch 3), this provides a third example on the line of the Wall of a fortlet succeeded by a fort, which adds further weight to Gillam's hypothesis that the Antonine Wall went through a major change of plan during its construction (Gillam 1975; Hanson forthcoming a).

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16. '... one of the most remarkable traces of Roman art ... in the vicinity of the Antonine Wall.' A forgotten funerary urn of Egyptian travertine from Camelon, and related stone vessels from Castlecary

Fraser Hunter

With contributions from Geoff Bailey, Kevin Hayward, Simona Perna and Colin Wallace

Lawrence Keppie is as familiar with laden museum shelves and antiquarian byways as he is with the mud of Wall and Ditch. This paper on some remarkable finds from the Antonine Wall zone, hiding in plain sight in the stores of the National Museum, illustrates the surprises yet lurking in Wall studies, and has implications which take us far beyond this northern frontier.

In one of the periodic upheavals which affect museum stores, while preparing to evacuate long-occupied premises in the old Customs House in Leith for a new custom-built store in Granton, I came across a box with a tantalising label: 'FR 219 Alabaster bowl, Grahamston, Falkirk, Stirlingshire'. Within, packed in newspaper, was a curious, large, discoloured but impressive fragment of a stone vessel. In an adjacent box with the same number was what seemed to be a smaller vessel of the same stone (Figure 16.1). Its number led me to the 1892 catalogue of the museum, where the entry for item FR 219 read:

> 'vase of alabaster, imperfect, 14½ x 9¼ in., found in railway cutting near Grahamston in 1849– Dr J.A. Smith, 1849' (Anon 1892: 222)

But this referred to one vessel, not two – and how had such an impressive item escaped the gaze of scholars? Was it a false association, or a Grand Tour souvenir? At this point, speculation was truncated by the pressing need to empty the store before it was sold off. When the boxes reappeared in our new store, it became clear that a previous curator had been similarly puzzled. Tied to the smaller one was a label stating 'Not FR 219'. Yet these two items were the same material – were they really separate finds? As I stared at them on the workbench, the penny dropped. They must be two parts of a large, impressive, multi-component vessel of valuable stone. Could the smaller one be the lid or base? How did they originally look? These and more questions were to be solved in the libraries of the Römisch-Germanisches Zentralmuseum in Mainz and the Römisch-Germanische Kommission in Frankfurt, the fruits of which are discussed below.

Discovery, discussion and dismissal (with Geoff Bailey)

In the mid-19th century, the country went railway-mad. Railway companies speculated, changed hands, built, boomed and bust. One line cut parts of the Wall en route from Glasgow to Edinburgh, mirroring the earlier Forth-Clyde canal; in their destructive courses, both had led to many interesting finds (Keppie 2012: 93–9, 115–7). Another railway cut a course for Stirling and points north. In 1848–51 the Polmont Junction Railway was built, linking the two. This carved through the fort of Camelon, just north of the Wall and known to antiquaries since the 16th century (Figure 16.2) (Christison *et al.* 1901: esp. 329–337; Crawford 1949: 10–16; RCAHMS 1963: 107–112). It revealed a multitude of pits full of interesting finds (almost none surviving today), including the urn, as well as the sewer of a bathhouse (Stuart 1852: 317–318).

Figure 16.1. The two Camelon urn fragments: a. body, angled view; b. body, plan view; c. base, angled view (© National Museums Scotland; photograph by Neil McLean).

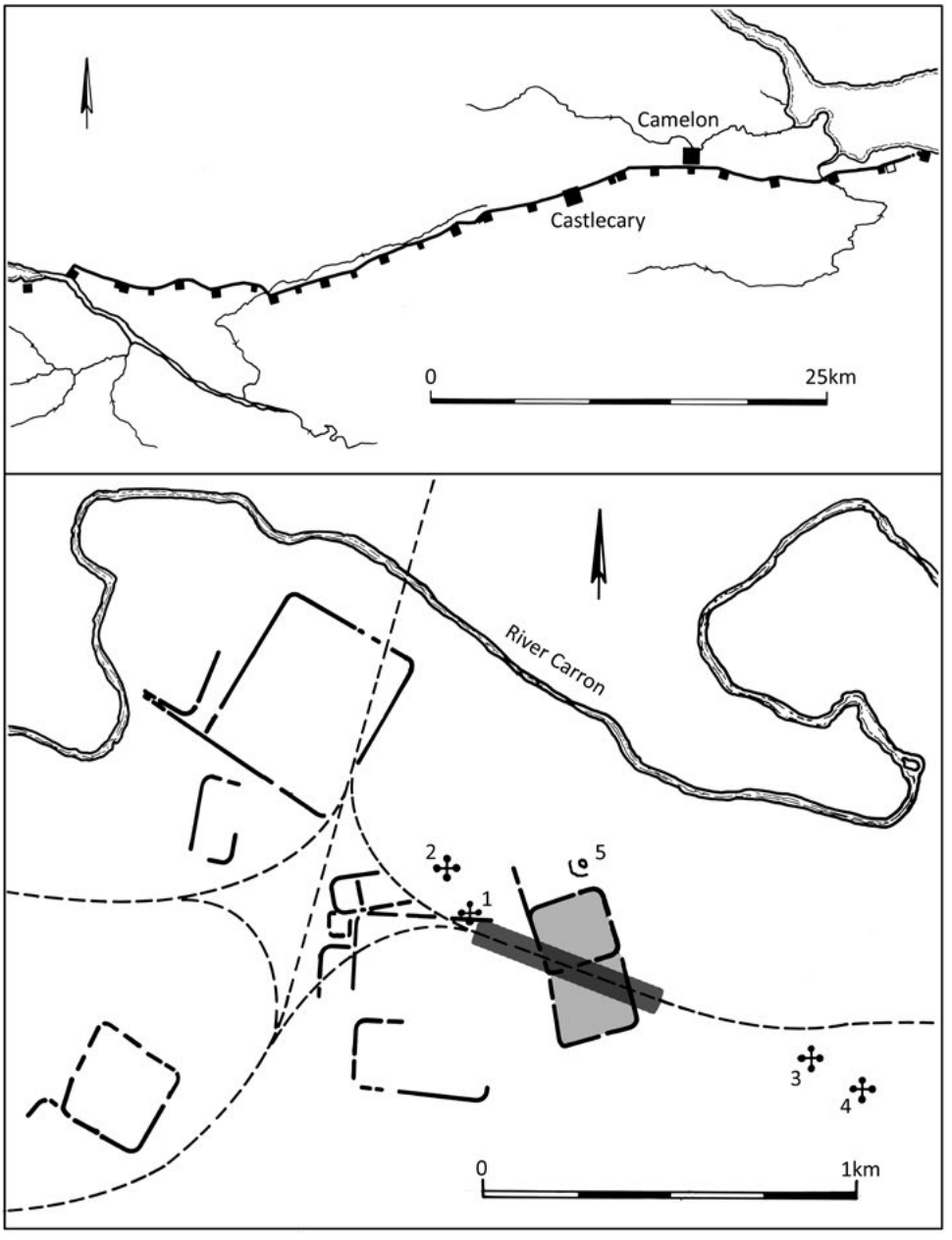

Figure 16.2. The Camelon complex, with other burials marked (based on Breeze *et al.* 1976: fig. 1 and Jones 2011: illus 167, with additions). Light shading marks the fort area; dark shading marks the line of the cutting through the fort complex, where the urn is likely to have been found. 1. 1975 weapon burial; 2. 1974 sword find; 3. 1922 casket and pot burial; 4.1922 sword burial; 5: Iron Age settlement (drawn by Alan Braby).

The earliest records of the urn's discovery were coherent, but rapidly became confused over discovery date and location. The first notice was contributed to the *Stirling Observer* in 1850 by 'W.G.' – William Grosart, a Grangemouth antiquarian (1850):

> 'So late as July 1849, great quantities of relicts of antiquity were found by the workmen at the Midland Railway, among which was a very fine alabaster urn, containing a quantity of calcined bones. Unfortunately the urn was broken, and fragments fell into different hands. The lid was similar to an inverted sugar bowl, and about four inches diameter; it was preserved entire, and is in the possession of Henry Aitken, Esq.'

This was expanded in footnotes to the second (posthumous) edition of Robert Stuart's *Caledonia Romana* (1852: 357–358):

> 'Recent excavations, consequent on the execution of the branch line which forms the eastern junction of the Edinburgh and Glasgow, and the Northern Railways, have brought to light many interesting traces of Roman remains in the vicinity of Graham's Town... But the most valuable of all the objects discovered was a very fine large alabaster vase. It is, unfortunately, greatly injured by time, in addition to which it was broken by the workmen, and its fragments dispersed through various hands. These, it is hoped, will be recovered, and the whole be deposited in the Museum of the Scottish Antiquaries. When found, it is said to have been full of calcined bones.'

The find was exhibited to the Society of Antiquaries of Scotland on 26 February 1852 at a *Conversazione* held in their Edinburgh rooms. The published record (Wilson 1854: 59) described it as:

> '... a remarkable large alabaster vase, dug up at Camelon, near Falkirk. The vase is greatly dilapidated, and its outer surface entirely water-worn, but it appears to have been a work of much beauty; and, had it been in a perfect condition, would have formed one of the most remarkable traces of Roman art hitherto brought to light in the vicinity of the Antonine Wall. It is broad and shallow, somewhat in general form resembling the Warwick vase.[1] It measures 14½ inches in diameter at the lip of the basin, and 10 inches in height. Unfortunately the two portions found have been acquired by different persons, but it is hoped that both will be deposited in the Society's Museum.'

This *Conversazione* was reported in the press with a findspot of nearby Grahamstown, muddying the provenance (Anon. 1852a; 1852b). There is no accurate note of when the fragments entered the museum.[2] In the 1892 catalogue the donation is credited to Dr John Alexander Smith (1818–1883), editor of the *Proceedings* from the first volume and Vice-President of the Society from 1852, with wide-ranging antiquarian interests (see obituary and bibliography, Anon. 1884: 5-11). His role as editor may have led him to omit notice of its donation from his hand. As the pieces had been dispersed, he presumably acted to bring (some of?) the fragments together.

The discovery clearly created considerable excitement at the time. Although it received no fuller publication, it saw regular mention in secondary sources, rarely with accurate details. James Young Simpson, for instance, who was involved in the excavation of part of the Camelon baths in 1868 (Keppie 2012: 116), commented that the railway finds included 'specimens of the most extraordinary kind, including an alabaster vase in complete preservation' (Anon. 1862). Catalogues of the period indicate it was exhibited in the National Museum (Anon. c. 1860: 77 no H35, 'Alabaster wide-mouthed Vase or Tazza found at Camelon, near Falkirk';

[1] A large marble vase, renowned since its discovery by Gavin Hamilton in excavations near Hadrian's Villa at Tivoli in 1769–70 (Michaelis 1882: 663–664; Jenkins and Sloan 1996: 220–222). Today it is in the Burrell Collection in Glasgow.

[2] The date of 1849 given in the 1892 catalogue is clearly a confusion with the discovery date, as it does not feature in the list of donations over this period (Anon. 1890) and it is not recorded in the Society's early *Proceedings*, though these donation lists were indicative rather than exhaustive.

Anon. *c.* 1870: 89, H35; Anon. 1872: 122, H36).[3] But cold water was poured over it in the report of the Society's excavations at the site in 1899–1900. In writing up the finds the Keeper of the National Museum, Joseph Anderson, dismissed it in a footnote (Christison *et al.* 1901: 380 n. 1):

> 'The alabaster vase is now in the Museum, but presents no features which suggest Roman workmanship.'

With this *ex cathedra* judgement, it vanished from scholarship for over a century.

The object (Figures 16.3 and 16.4)

Flattened hemispherical stone bowl, broken where it curves sharply in at the shoulder, with shoulder and neck lost. Broken more or less in half; junction point with the separate base lost. Stump of a vertically-set integral strap handle survives as a curved rib 67 mm wide where it joined the shoulder, with two stumps (D 12–15 mm) 96 mm below this and 55 mm apart, angled in towards one another. A second handle would have lain in the missing half of the vessel. Outer diameter 365 mm, surviving height (excluding handle) 145 mm, thickness 20 mm at base, 9 mm at shoulder, thinning to 4.5 mm where it is broken (but material may be lost here). Exterior roughened by weathering, leaving prominent rippling bands of harder material; interior preserves some polished areas.

Separate bell-shaped foot with concavo-convex profile, flared to the damaged base, which is flat and unpolished (W 18.5 mm) where the original surface is preserved. Topped with a flared disc which once attached to the main body. This has a flat flange, sloped slightly inwards to seat the bowl's curve; a lathe-cut flat-topped knob sitting *c.* 1 mm proud of the rest of the disc presumably once fitted into a slight hole in the base. The surrounding groove is roughened by pecking, perhaps to encourage adhesion of glue. Exterior weathered; interior well-smoothed and polished with lathe. D max. 170 mm, H 90 mm, top disc D 100 mm, knob D 22 mm; thickness at base 20–21 mm.

Figure 16.3. The two Camelon urn fragments, digitally restored to their original relationship (© National Museums Scotland; photograph by Neil McLean).

The material is yellow-brown as it survives, but glows golden under transmitted light. It was identified as alabaster in the earliest records, a term habitually used by classical archaeologists to cover both calcium sulphate and calcium carbonate, the latter sometimes differentiated as calcareous or calcitic alabaster (e.g. Dajani 1962; Coliviechi 2007: 3; Lazzarini *et al.* 2012; Perna 2015a: 127–128 and n. 11). However, geologically these are different stones (Aston 1994: 42, 47), and testing by Peter

[3] It is absent from the 1876 edition but present in the 1892 catalogue noted above.

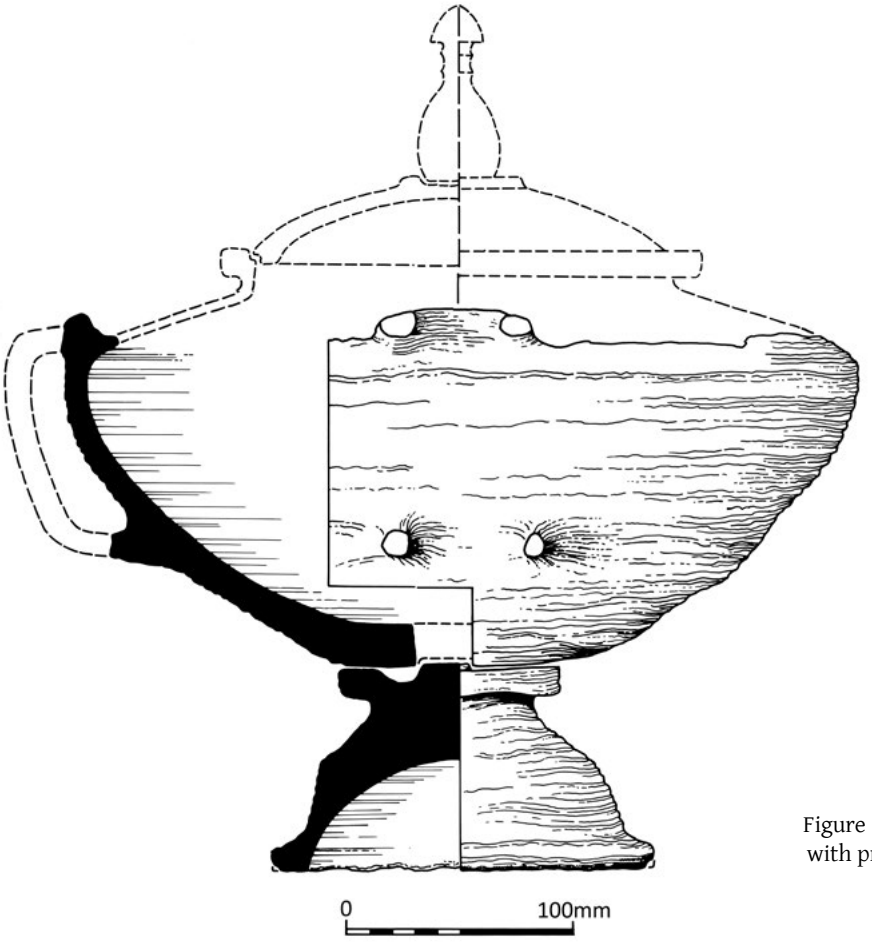

Figure 16.4. Drawing of the Camelon urn, with proposed restoration of its original form (by Alan Braby).

Davidson (based on its hardness and reaction to acid) confirmed it was travertine (calcium carbonate), not alabaster (calcium sulphate). Sources are recorded widely around the Mediterranean, in Egypt, Tunisia, Algeria, Italy and Turkey (Barker and Perna 2018: figs 1–2).

Parallels (incorporating comments from Simona Perna)

Although Roman vessels of precious and semi-precious decorative stone have seen a few general studies (Bühler 1973; extensive critical review by Gasparri 1975; Belli Pasqua 1989; Gasparri 2003; for porphyry, Delbrueck 1932: 193–211; Del Bufalo 2018: 137–143), and discussion within the catalogues of specific collections (e.g. Richter 1956: 23 no. 13; Calza 1977: 120), there has been little sustained archaeological rather than art-historical analysis. These were luxury goods made in rare imported stones which include some of the most prized pieces surviving from Antiquity, treasured in later royal and religious collections (such as those of St Denis in Paris and San Marco in Venice; Alcouffe *et al.* 1991: 69, 83–91, 173–176, 182–187, 244–245; Hellenkemper 1984: 84–103). They range in form and function from *unguentaria* through serving and drinking vessels to massive basins.

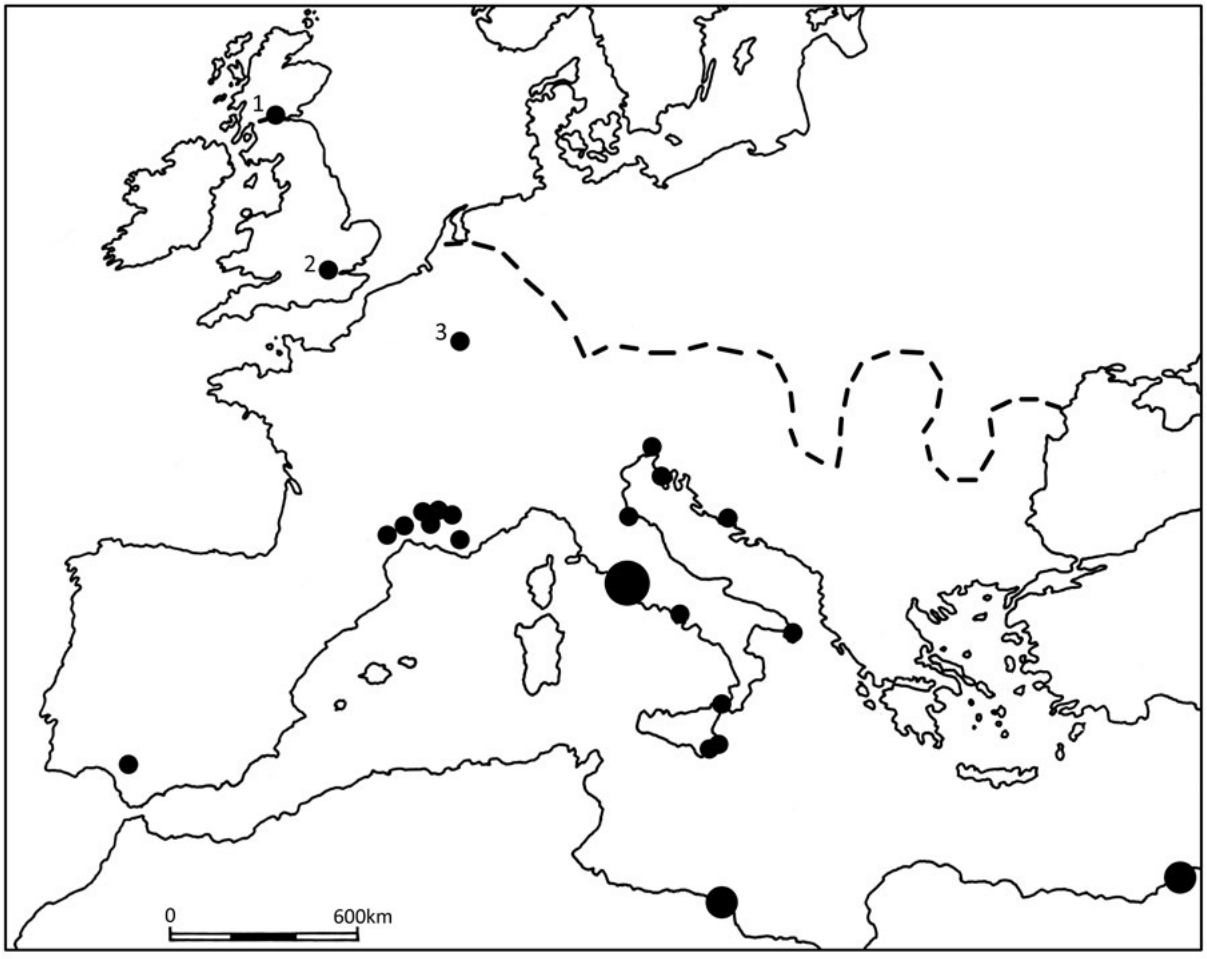

Figure 16.5. Distribution of 'tureen'-type funerary urns (from Perna 2019: figs 3, 6 and 7, with additions). Small dots represent a single example; medium dots 2-4 examples; large dot is Rome and environs with 16 examples. Findspots in the north-west provinces are numbered: 1. Camelon; 2. London; 3. Metz.

A key role was as funerary urns, and an invaluable study by Simona Perna (2014), now in the course of publication, has transformed knowledge of them. Here I draw extensively on her synthetic articles (2012; 2015a; 2015b; 2019) and helpful personal comments, with recourse to primary sources where relevant. Perna has systematically analysed the known corpus of funerary urns, weeded out later finds wrongly seen as Roman, and created a convincing typology. She identified 117 examples, predominantly of the type represented here: a double-handled lidded vessel which she terms a tureen (64 other examples are known; see Perna 2015a: 126 n. 2 for other types). These divide into three groups: A, its body taller than it is wide (typically 2:1); B, the most common, where body width and height are near equal; and C, wider than tall (typically 1:2). Our example is of type C.[4] The foot was a separate element (as was the lid's finial); she proposed that the vessel's interior was drilled out and used to form foot and lid (Perna 2015b: 1023–1025).

[4] With handle of her type b and base of type a1.

The vast majority of these tureens (60 of 65) are made of the stone represented here, travertine or 'calcareous alabaster' (Perna 2015a: 127 n. 11). The actual source has not been established scientifically, but the other stone types used for these urns (porphyry, exotic granites and basalt) are Egyptian types, and visually it is a good match for known Egyptian sources (Barker and Perna 2018: fig. 2), so an Egyptian source is plausible. Their distribution is predominantly in the western Mediterranean, mostly Italy and southern France (Figure 16.5); the concentration of numbers and different types in Rome suggests the stone was imported to workshops here (Perna 2019: 315).

Their shape is argued to be a hybrid of older forms of ritual vessel (Perna 2015a: 127), making it appropriate for funerary use. Simona Perna (2019: 315) argued for multiple strands to alabaster's significance: its preservative qualities, striking appearance (perhaps echoing gold) and fashionable Egyptian link. Egyptian stones had funerary resonances for the Romans, fascinated by their exotic burial traditions, with alabaster holding long-term funerary connections (Di Leo 1989: 52). Thus, this was not just an exotic and expensive stone, but one symbolically suitable for a burial container.

Tureen-type urns are attested from the Julio-Claudian period until the later 2nd century, with a mid-1st century peak (Perna 2015a: 128); of course, many antiquarian finds cannot be dated. The dating of the Camelon one cannot be refined beyond the occupation periods of the fort, which has both Flavian

Figure 16.6. Three alabaster urns as found in a *columbarium* on the Via Laurentina, Rome (Borda 1959b: pl XXXIV fig. 115).

Figure 16.7. Urn MNR 135738 from the Via Laurentina, Rome (By permission of the Ministerio per i beni e le attività culturali e per il turismo - Museo Nazionale Romano).

and Antonine phases (*c.* AD 79–86 and *c.* 140–158). The burial could relate to activity at the nearby complex of temporary camps which also fall most likely into these periods.

The small numbers of such urns and their exotic material point to a highly restricted social milieu, confirmed by associated grave goods in many cases (Perna 2015a: 129). Inscriptions indicate use among elites (in some cases specifically senatorial), including the imperial family, their households and wealthy freed slaves (Perna 2012: 788–793; 2015a: 129–130). Their use extended to the emperor himself: Severus is recorded to have brought an urn of alabaster (Herodian III 15.7) or porphyry ('an urn of purple stone') (Cassius Dio 77.15) to Britain on his campaigns, and it took his ashes home. In provincial contexts they are most often connected to local elites, often from burials on villa estates (Perna 2019: 318–322).

While many urns have no good context, over 40 of the tureens have a diverse range of burial associations (e.g. Perna 2012: 792–794). For instance, three were found in a *columbarium* of late 1st/early 2nd-century date on the Via Laurentina outside Rome, one being a particularly close parallel (Figures 16.6 and 16.7) (Giuliano 1979: 232–233 no. 145, 235 no. 149 (F. Taglietti), inv. nos 135737, 135738; Bruni 2002; Perna 2012: 793, fig. 7; Perna 2019: fig. 1).[5] Some were associated with grand monuments, such as a porphyry example buried within the Tour de l'Horloge at Aix-en-Provence, but many come from simple pit graves, often lined with stone or tile, and sometimes within a casket of another material (Perna 2019: 318–321, figs 8–9). The contrast between the wealth of the

[5] The third urn is now also in the Museo Nazionale Romano, inv. no. 531595. For the discovery, see Borda 1959a and 1959b. The measurements in Bruni 2002 are incorrect.

urn and the lack of visibly ostentatious grave monument may seem surprising, but a contemporary literary strand emphasised restraint in funerary practice (Hope 2001: 3). In any event, the cremation process itself, with the cold ashes placed in such a spectacular urn, would have been a memorable one.

Their distribution is strongly Mediterranean (Figure 16.5). Perna (2019: 316) recorded 16 from Rome and Latium, eight spread broadly across the rest of Italy, two from Croatia, two from Egypt, four from North Africa (all from Leptis Magna), one from southern Spain, and eight from France, all from the south except one from Metz (dép. Moselle). The latter is one of only two other such urns known from beyond the Mediterranean areas of the empire.[6] It is of type A, tall and near-cylindrical, found in 1910 in a burial south of the town (Flotté 2005: 260–261, E4, fig. 223, with further references; Perna 2019: 321). The other northern find came from a small cemetery at Warwick Square in the City of London in 1881. It was manufactured in Egyptian olivine basalt and accompanied by a coin of Claudius, suggesting the burial of a first-generation arrival (Perna 2015a: 130–131; Coombe *et al.* 2015: 110–112, no. 205).

Implications

The Camelon urn can be restored to a prime position among finds from Roman Scotland, and is a discovery of international significance: only the second such urn known from Britain, only the third known from the north-western provinces, and the only one with clear military associations. Parallels indicate a highly rarified social stratum of the imperial household, senatorial class and provincial elite, both male and female (Perna 2015a: 130). So who was buried in this urn? The most recent discussion of the London example speculates over an individual with an Egyptian connection (Coombe *et al.* 2015: 111; Perna 2015a: 131), but this seems unduly specific; such urns clearly became widely accepted status symbols. It certainly tells of someone who came prepared on campaign, like Severus, bringing their burial urn with them.

Of course, a campaigning army would have such powerful souls in its midst; probably not at the level of a normal auxiliary unit's officers, given the rarity of such finds, but in a legion with the legate, his family, and some tribunes (Webster 1985: 112–113). We also know of other high-ranking officials on the frontier, such as the imperial procurator Quintus Lusius Sabinianus, recorded in two inscriptions at Inveresk in the early Antonine period (*RIB* I: 2132; *RIB* III: 3499). Camelon itself was a large fort, and the Antonine stone barracks (the only ones known in the Wall zone) and possible presence of a thousand-strong unit (Hanson and Maxwell 1986: 159, 175), suggest a commanding officer of status.

The details of the burial itself are frustratingly vague. The line of the railway is embanked in places and cut in others, notably from Camelon station (just east of the fort) west to where the line branches at the Three Bridges temporary camps (Figure 16.2). The find is most likely to have come from this area,[7] the route taking it from south-east of the south fort, through a bath complex, at an angle across the two fort enclosures, and through an area to the west which produced pits full of finds. The urn was clearly used for burial, as it is recorded as being full of calcined bone, but nothing is recorded of the

[6] A porphyry vessel from Trier, said by Delbrueck (1932: 198) to be 2nd century, is actually 4th century (Belli Pasqua 1989: 106), and represents a different phenomenon.

[7] Although the Castlecary finds discussed below were uncovered in the construction of an embanked railway over the fort site, so clearly this too could cause disturbance, opening the possibility of the Camelon urn coming from the area east of the fort. I am grateful to the editors for pointing this out.

setting or associated grave goods. The sharp fractures point to recent rather than ancient damage, so it is clear that little care was taken in its discovery and recovery. This suggests there was no surrounding structure to draw attention to it, while the eroded outer surface indicates it was not in the protective environment of a stone casket or a lined pit. It seems it was buried in a simple pit.

Stray burial finds indicate cemeteries lay to the north-west and south-east of the fort (Figure 16.2) (Breeze *et al.* 1976). To the north-west, apart from this urn, a stray sword find some 200 m from the fort may well come from a burial. To the south-east, 500–700 m distant, sand quarrying revealed another cist with a sword and a Flavian burial with pot and casket. An intact Antonine samian platter purchased by the Hunterian Museum in 1912 lacks any provenance details, but its condition suggests an unusual deposit, plausibly a burial.[8] The well-known Camelon 'soldiers' burial' north-west of the fort, a double-grave with weaponry, is normally classed as an unusual Roman burial (Breeze *et al.* 1976). However, the grave rite, the presence of a campanulate-hilted sword (a style obsolete by the Roman period), and close parallels to a subsequent find at Marshill, Alloa (Mills 2004; Hunter 2001: 121; 2005: 65) suggest it is an Iron Age warrior burial; a radiocarbon date on one individual of 1969±30bp (SUERC-61321) calibrates to 44 BC – AD 85 at 95% probability (AD 3–68 at 68%), supporting the likelihood of a late pre-Roman Iron Age date (*DES* 2015: 196-97). The coincidence with a Roman burial area need occasion no surprise: exactly such a conjunction of Iron Age and Roman burials is recorded at Inveresk (Hunter 2012: 287–288), while the presence of another nearby burial with spearhead and Roman brooch at Goshen, north of the river Carron, suggests a wider area of Iron Age and Roman Iron Age indigenous burials (Hunter 2001: 114–117). The Iron Age settlement landscape is poorly known, though an enclosed settlement is recorded just outside the fort itself (Proudfoot 1978). North of the fort, 'fire pits' recorded during quarrying have been suggested as cremation pits (Breeze and Rich-Gray 1980), but seem more likely to be truncated field ovens (cf. Cook and Dunbar 2008: 133–149).

Figure 16.8. The two basalt vessel sherds from Castlecary (© National Museums Scotland; photograph by Neil McLean).

[8] F.1912.1: samian platter of form 31, stamped by Reogenus of Lezoux; Antonine, *c.* AD 140–170 (C. Wallace, pers. comm.; Hartley and Dickinson 2011: 374–376, Die 1a). Purchased 1912, circumstances of discovery unknown.

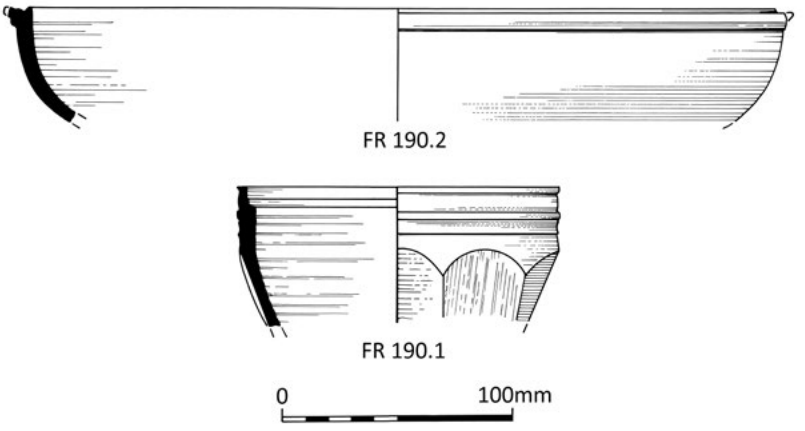

Figure 16.9. Reconstructed profiles of the two basalt vessel sherds (drawn by Alan Braby).

Frontier luxury: exotic stone vessels from Castlecary

(with a geological contribution by Kevin Hayward)

This travertine urn is a cut above the usual frontier finds. Other impressive items have come from the soil of Roman Scotland, such as the ornate imported bronze jugs from Newstead (Curle 1911: 275–276, pls LV–LVI) which are probably the personal possessions of wealthy officers, but luxury items of exotic imported stone are rare. Only three marble finds are known from Roman Scotland, two of them statuettes which could well have been personal possessions (a leg from Castlecary and a small torso from the Leader Water, near Newstead [*CSIR* no. 79; Henig 2012: 154–155, fig. 14.2]).[9]

Yet it turns out the Camelon urn is not our only exotic stone find. Perusal of antiquarian collections revealed fragments of two stone vessels, suspected to be of black Egyptian basalt, hiding among a collection of pottery from the Wall fort of Castlecary (Figures 16.8 and 16.9). Examination of images by Kevin Hayward suggests it has the characteristics of Egyptian basalt known from El Haddadin near Cairo (Mallory-Greenough *et al.* 1999), which was used for vessels found in London, at Drapers Gardens and Bermondsey Eyot (unpublished) and Warwick Square (the urn mentioned above; Coombe *et al.* 2015: 110–112, no. 205). Further work is planned to confirm this identification (I am most grateful to Kevin Hayward for discussion and references).

The finds came from the debris of building the railway through Castlecary fort in 1841 (Keppie 2012: 116; Wilson 1851: 401–402); its line took it close to the *praetorium*, providing a plausible context (see Appendix). As with the travertine urn, these were luxury items, but for the dinner table rather than the burial chamber. Single rim sherds survive from two different vessels which must once have formed part of a set (Figure 16.9). One is a small bowl or *pyxis* some 120 mm in diameter with lathe-cut moulded decoration and facetted walls. Its moulded rim and unpolished interior indicate it originally had a lid;

[9] The third example, the life-size Hawkshaw head, is from an official monument (*CSIR* no. 57).

the lack of interior polish suggests it was normally closed, arguing against use as a drinking vessel (it is unlikely that it was inverted to serve as a base, given the rounded rim). The second comes from a large dish some 300 mm in diameter with curving walls and a flat, thickened, decorated rim. These are spectacular and unusual items, as discussed below, and it is no accident that Castlecary was one of the more impressive Antonine Wall forts – one of only two with stone walls, and with records of successive milliary garrisons (Hanson and Maxwell 1986: 86, 153-5). It also produced one of the few marble fragments from Scotland, as noted above. Nevertheless, these are exceptional finds.

Cups, bowls and dishes are represented among precious and semi-precious stone vessels (e.g. Gasparri 1979: figs 6–7; Belli Pasqua 1989: 106), but finding precise parallels has been a challenge. The dish's profile resembles rather smaller examples in green granite and porphyry from the Tiber in Rome and Begram in Afghanistan (Gasparri 1979: fig. 7.4; 1999: 173 pl. 3; Del Bufalo 2018: 140, V23). Larger dishes are also known (with different profiles) such as a vertical-walled red porphyry example from Cremona (Lombardy/Italy), from a pre-Flavian context, 450 mm in diameter and 45 mm high (Slavazzi 2007, with further examples). Parallels for the lidded *pyxis*/bowl are much scarcer in stone, though facetted sides are attested, for instance on a rock crystal amphorisk (Bühler 1973: 56, pl. 18 no. 57). However, glass facet-cut beakers offer parallels (Cool and Price 1995: 71–74), their form and decoration probably inspired by precious-stone vessels (Vickers 1996). Hilary Cool and Jenny Price dated this type's production to the later 1st/early 2nd century; examples from Birrens, inter alia, show continuing use into the Antonine period (Robertson 1975: fig. 47 nos 4–5). The surviving facets here (which are flat, not concave) could represent arcaded tops of linear designs, but glass examples illustrated by Fritz Fremersdorf (1967: 68–80, pls 32–53) show a wide variety of patterns, including long ovals with straight-line borders between them (Fremersdorf 1967: pls 48, 50); a pattern of ovals rather than arcades is most likely on our example. One vessel illustrated by Fremersdorf (1967: pl. 41), from a rich Germanic burial at Wrocław-Zakrzów/Sackrau (Lower Silesia/Poland) is in a striking violet glass, surely intended to mimic exotic stone.

These Castlecary vessels are remarkable finds, unparalleled in Scotland and indeed across Roman Britain. An extensive literature review and consultations with colleagues have so far produced nothing similar. Indeed, non-local stone vessels are generally rare in Britain, where stone vessel traditions tended to be regional, rarely travelling far from their home areas. Stone mortars were made in Dorset, Cornwall, Gloucestershire, and Kent (Cool 2005), but only Purbeck Marble from Dorset saw extensive use (Palmer 2001: fig. 5; 2014: fig. 4). Forms other than mortars are rare: ?Gloucestershire limestone was used for a shallow bowl at Claydon Pike, Oxfordshire and a basin in the London Mithraeum (Roe 2007: 194, fig. 6.20.4; Shepherd 1998: 164–165, fig. 179; 181, fig. 212), while Purbeck marble saw use for bathhouse basins (Palmer 2001: 107). Only vessels of Kimmeridge Shale had a wider distribution, part of a package of Dorset products including Black-Burnished Ware I pottery, so common on the Antonine frontier (e.g. Brindle and Smith 2017: 198).

Imported stone vessels are even more exceptional. A few marble examples are known from the south of the province, generally large and showy items. In discussing three marble mortars from Richborough, Dunning (1968: 112) noted comparanda from London, Colchester and Cirencester; additional examples have come from recent London excavations at Three Quays Wharf and Bloomberg (M. Marshall, pers. comm.). Fishbourne palace produced large marble basins (Cunliffe 1971: 37–40), while another from the Wroxeter legionary fortress shows that such exotica were available in a military context (Webster 2002: 127, fig. 4.28). Richborough also produced a mortar of exotic granite, while one of non-British calcareous tufa came from a bathhouse at Well, North Yorkshire (Gilyard-Beer 1951: 59, fig. 19.4), and

the London Bloomberg site produced one or more large mortars or similar vessels of a North African igneous rock (M. Marshall, pers. comm.). Exotic stone was also imported for architectural purposes (e.g. Pritchard 1986), though it is not attested on the Scottish frontier as yet.

More personal vessels like the Castlecary ones are exceedingly rare. A search of all indexed volumes of *Britannia* (volumes 1–40) revealed only 'two vessels of imported stone' from 11 Ironmonger Lane, London (Esmonde-Cleary 1996: 427), and reference to an old find of an Egyptian alabaster *unguentarium* fragment near a temple at Silchester (see Boon 1974: 158). Further alabaster *unguentaria* come from Regis House and 78–87 Fenchurch St, London, and a marble bowl from Lloyds Register, Fenchurch St, London (M. Marshall, pers. comm.); it is likely more exotica lurk in London assemblages.[10] Late Roman levels at Colliton Park, Dorchester, Dorset produced the base of a lathe-turned schist vessel (Timby and Durham 2014: 319, fig. 186 no. 144), which is probably an import, but its provenance was not determined. From the Saxon Shore fort of Caister-on Sea (Norfolk) came fragments of a remarkable lathe-turned steatite bowl (Darling and Gurney 1993: 94, fig. 65 no. 351). This is an import from Switzerland or the north Italian Alps, where there was a tradition throughout the Roman period of making steatite vessels as standard cooking and serving dishes (Holliger and Pfeifer 1983; Siegfried-Weiss 1986). These everyday vessels in their home area occasionally moved into the Rhine provinces, predominantly in beaker forms which suggest valued personal possessions. The Caister example sits on the edge of this distribution, and it too was probably a soldier's prized item. The type-series published by Holliger and Pfeifer (1983: 42–49) and Siegfried-Weiss (1986: fig. 60) offer no precise parallels: closest are bellied bowls (IIIa in the former classification), though these lack the everted rim, but one can parallel specific elements (for the everted rim and low belly, Siegfried-Weiss 1986: pls 46.2, 46.7).

This rarity of imported stone vessels is not restricted to Britain. Henner von Hesberg, in discussing marble basins from Cologne, reviewed exotic stone vessels from the Upper German and Raetian frontiers (2005: 775–776 with footnotes), based mostly on the volumes of *Der Obergermanisch-Raetische Limes*; publication quality is variable, but it provided a sample.[11] On the Upper German frontier, he could quote only four vessels, three of 'marble' (which could refer to a range of decorative stones): a mortar from Arnsburg, a basin from Markobel, a bowl from Altenstadt and a lost bowl of uncertain character from Jagthausen. There was a single steatite bowl from Benningen. The Raetian frontier, lying closer to sources of steatite, produced such vessels from eleven sites, but other stones were rarely reported: 'marble' bowls or basins from Ruffenhofen and Weissenburg, and a single example of a serpentine beaker from the fort of Oberdorf am Ipf (Hertlein 1929: 10, no. 1, pl. 2 no. 15). Lower Germany was not considered in detail, but von Hesberg noted a steatite beaker from the legionary fortress at Xanten and an expensive agate bowl from the fortress at Neuss, while the provincial capital at Cologne has produced vessels of agate, marble and steatite. To this one can now add steatite vessels from Jülich and Bonn (Weiner 2009).

In striking contrast to this rarity of imported stone vessels on the frontier itself, Rudolf Laser (1986) discussed fragments of small serpentine bowls and cups from seven Germanic settlement sites, reaching almost to the Baltic, their differing appearances indicating a range of sources. There are also two spectacular agate vessels (a small perfume container and a drinking cup) from Kleinjena and

[10] Of relevance is another personal item, a cosmetic palette, identified as possibly serpentine, from the Wallbrook area (Wardle 2011: 501, no. S154, fig. 249); the geological origins of such items merit wider study. Other Egyptian basalt finds from London are noted above.

[11] *Der Obergermanisch-Raetische Limes* and *Limesforschung* volumes were checked again for this paper.

Nebra (Sachsen-Anhalt, Germany) (Becker *et al*. 2006: 207 no VIII-11-6/1.1; 212 no VIII-12-5/1.3, pl 121). This contrast suggests high-quality material was being given into 'barbarian' hands; sadly, there is as yet nothing similar from Scotland, though fragments of obsidian vessel from pre-Conquest contexts at Stanwick, North Yorkshire (Price 2016) are part of such a process.

A context for Camelon - rich frontier burials

The travertine urn's testament to a wealthy burial, while remarkable, is not without parallel. There are hints of other rich burials from Roman Scotland, though none with such a prestigious container. But the Cramond lioness must once have graced a spectacular funerary monument; so too did the pine cone from Inveresk, while two funerary reliefs from Shirva came from an architecturally impressive tomb (Hunter 2003; Keppie 1998: 116–118, nos 52–53). Here, effort was on the outward appearance rather than the receptacle for eternity; what held the bones or accompanied the bodies of these other individuals is now lost to us. Yet all serve to show the impressive investment in providing for the afterlife among the military elite here on Rome's edge.

Conclusions

Camelon has been dissected and destroyed by industry over the years, from the railway through iron foundries to quarrying and bus workshops. This, and the slow publication of more recent work, has rather inhibited appreciation of its significance, but the scale and complexity of the site, its potential role as a harbour (Tatton-Brown 1980; cf. Davies, this volume), and its strategic significance on the road north all indicate it was a major Roman centre, far more than an ordinary fort. The vast number of marching camps in its surroundings confirm its role as a gathering ground (Breeze *et al.* 1976: 73–74; Jones 2011: 257-62). It is at such powerful nodes, where armies marshalled for the fight, that we might expect people with the power to command them and the wealth to bring such an exotic urn, guarding their remains on this northern frontier until the railway's rude re-awakening. After a further century of slumber on museum shelves, the find deserves attention. Its occupant would have been the kind of person who might have left some epigraphic trace or literary hint – a challenge, perhaps, for Lawrence to pursue among unread scraps of inscription.

Appendix: the ?Egyptian basalt vessels from Castlecary

(with notes on associated pottery by Colin Wallace)

The building of the Edinburgh-Glasgow railway went straight through the middle of the fort at Castlecary in 1841. Antiquarians bemoaned not only the damage but the obtuseness of the landlord's agent, who refused them access to the spoilheaps (Wilson 1851: 401–402). Nonetheless, some material was gathered, and some made its way to the collections of the National Museum. Three sources are clear: from the landowner, the Earl of Zetland, in 1852; from the prolific Glasgow antiquary John Buchanan, long after his death; and from the antiquary Daniel Wilson in 1850. There were also other finds lacking donor details which came into the museum prior to 1850, as Wilson mentioned 'a few curious specimens' (1851: 402). Some of this latter material is problematical. A lamp published by Anderson (Christison *et al.* 1903: 333), 'long in the museum' (e.g. Anon. 1849: 56 no 21D), is a picture-lamp of first century type (Loeschcke VIII), stamped by an Italian maker, L. Fabricius Masculus, who

was active from the late Flavian to the early Antonine period (Bailey 1980: 95, 303–304, 360 Q1230). He is not otherwise attested in Britain, while the form is found on southern English sites of the early-mid first century (Eckardt 2002: 185–188, 203–206). On an Antonine fort, it is rather out of place, and is likely to be a continental piece given a false provenance, like so many early lamp finds. (Indeed, none of the early lamp 'discoveries' in the national collections are actually Scottish finds; Anon 1892: 221, nos FR 194–198; Eckardt 2002: 265 nos 2230–2232, 2244 [the current example was missed in her study].)

There are also problems with the Buchanan material (I am most grateful to Colin Wallace for discussion of this aspect, and for his advice on the ceramics). It was donated to the Museum long after his death, and was gathered from a range of sites along the Antonine Wall: as well as Castlecary, there is material from Bearsden (New Kilpatrick), Duntocher, Kirkintilloch, and 'a considerable quantity of Roman pottery' from Cadder (Buchanan 1854: 172; Anon. 1906: 47; Stuart 1852: 304, 324, 328–329, 346–349; Hunter and Scott 2002: 88 n. 3). Although his finds in the National Museum have associated provenances, doubts have been raised because of the presence of 1st-century material alongside clearly Antonine finds, while at least one of the Castlecary items, a terracotta female bust, is a Greek item of the 5th or 4th century BC (Stuart 1845: 341 note b, pl. XIV fig. 5). This latter is likely to be an unscrupulous false provenance from a dealer; there are other such finds in the collections (Anon. 1892: 220–221, nos FR 180–181, supposedly from West Kilpatrick/Old Kilpatrick). The sherds are much less likely to have been salted or sold; it is more likely that his collections got mixed after his death and that material lacking direct evidence of provenance (an inscription on the sherd itself) cannot be assumed to be accurately provenanced.[12] It leaves the intriguing question open as to where his Flavian material came from, but that is secondary to current concerns.

The key Castlecary material for current purposes is the small group donated to the National Museum in 1850 by Daniel Wilson, which he specifically noted as 'in my own possession, having been picked up in the vicinity of the railway embankment since its completion' (1851: 402). It is listed as pottery in the museum catalogue (Anon. 1892: 221, nos FR 189–192), but this errs in other ways, as it conflates at least one earlier find (a piece of stamped pre-Flavian *terra nigra* which is clearly not from Castlecary (Val Rigby, pers comm), and which Wilson specifically noted as being already in the museum; the conflation probably arose because Wilson first published it. The remainder of the Wilson pottery is consistent with an Antonine date (C. Wallace, pers. comm.), and is thus considered to be reliable. Among this are the rim sherds of two different vessels, suspected to be of Egyptian basalt (K. Hayward, pers. comm.). While there is a slender risk that these are also a conflation of earlier finds with Wilson's, there are no grounds to dismiss them as intrusive 'Grand Tour' souvenirs given that the associated material is clearly Romano-British. The material (kindly examined by Pete Davidson and Kevin Hayward) is near-black with attractive white and brown mottling.

Catalogue (Figures 16.8 and 16.9)

FR 190.1 Rim and body sherd of a facetted steep-sided small bowl. Remains of flat rim, expanded to exterior (its extent lost), with a step on the interior which indicates the former presence of a lid. Below the lipped rim was a plain zone before lathe-cut decoration of a narrow rounded rib above a broader reverse moulding. This sat above large arcaded facets as the body turned inwards. The highly-polished

[12] As a result, the imported limestone mortar noted in a previous paper as likely to be from Cadder (Hunter and Scott 2002: 87–88) must, reluctantly, be treated as unprovenanced but Scottish.

exterior has fine lathe-polishing traces. The interior retains visible lathe-cutting grooves and has not been polished, confirming that it was concealed in use with a lid. There is use-wear on the areas of higher relief on the sides (the rib and the convex surface above the facets). Diameter at rib *c.* 120 mm (14% survives); H 61.5 mm, W 45 mm, T 4.5–7 mm.

FR 190.2 Rim and body sherd of a larger, shallow bowl with sides curving quickly away from the flat, externally thickened rim. The outer edge of this is broken, but it preserves a decorative lathe-groove on the top and a step on the underside. Both exterior and interior are highly polished, indicating an open form with visible interior. Internal diameter *c.* 300 mm (5% survives); L 63 mm, H 51 mm, T 5 mm (rim minimum 8.5 mm).

Acknowledgements

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Above all, I am delighted to be able to offer this to Lawrence, as some thanks for his support over the years. From formative experiences as child labour in service with Keppie's Coolies in the mud-filled ditches of Barochan, the sun-baked surfaces of Annan and the glaur of Westerwood, to endless support, advice and abuse since I joined the National Museum, I owe him a lot. He has often advised, 'Don't let small things get in the way of big things'. These particular small things may have been a distraction from big things I was meant to be finishing off, but I hope he will find topics of interest among these musings.

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17. The Kirkintilloch hoard revisited

J.D. Bateson

The hoard of denarii found in 1893 on the site of the Lion Foundry, situated to the south east of the Roman fort at Kirkintilloch, has been noted on several previous occasions. These references, however, have tended to be brief, and often repetitious, resulting in a lack of detail and discussion of the find which remains somewhat enigmatic. This paper brings together the records of the hoard and provides a fuller, updated listing of its contents along with some discussion of its relationship to the fort and its place in the coinage of Roman Scotland.

Records

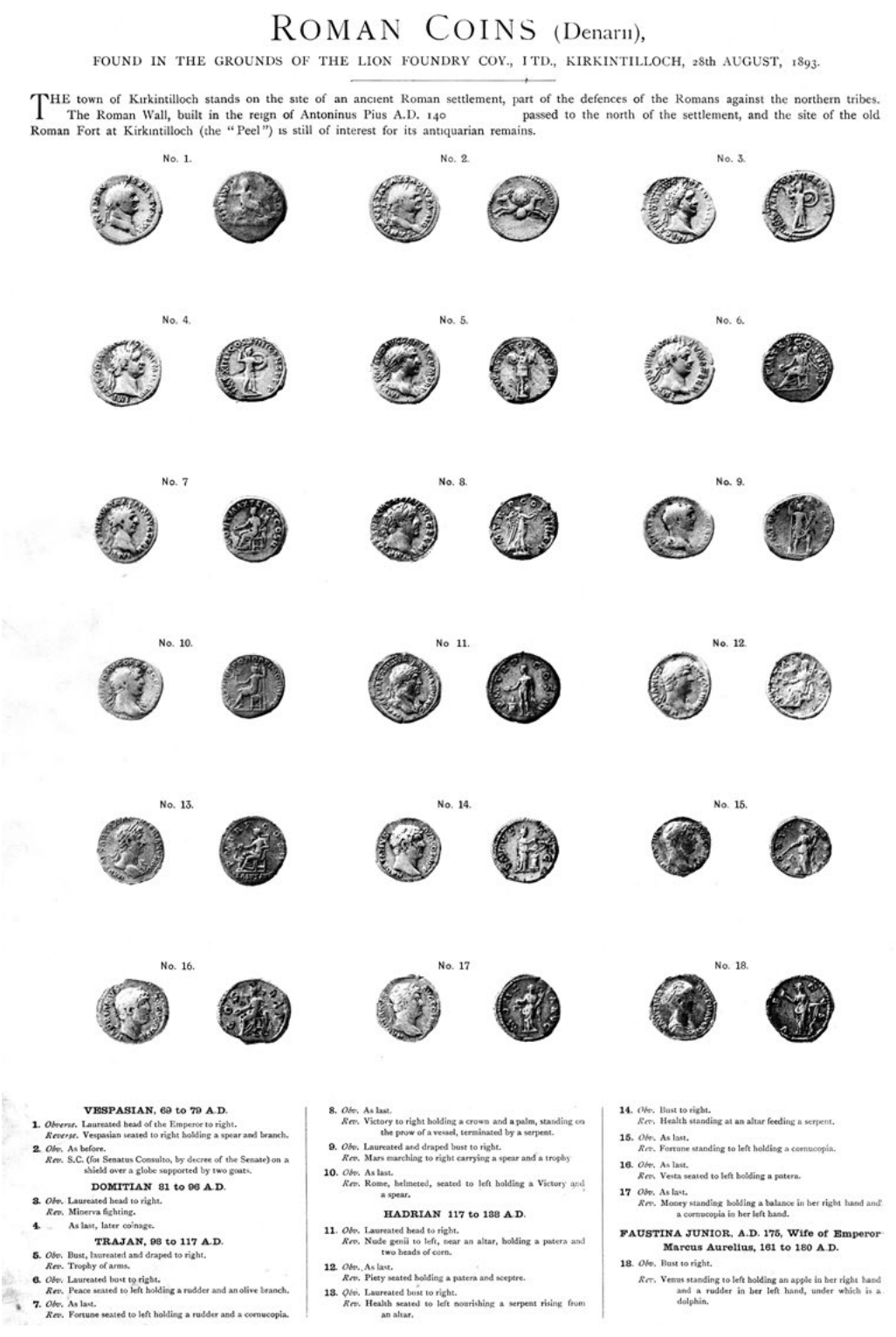
The hoard was first noted the following year in the *Proceedings of the Society of Antiquaries of Scotland* (Richardson 1894: 276). This is disappointing in its brevity especially as regards the lack of details of the coins. However, the account of the finding is important and may be quoted in full, 'On the 28th of August 1893, when a labourer named Malcolm Stark, employed in the Lion Foundry, Kirkintilloch, was engaged in digging sand for moulding purposes in a sand-pit between the foundry and Barley Bank houses, he came on some coins, also an iron spear-head and a large nail.' The 24 denarii sent to Richardson for examination by 'the Exchequer' are merely listed by reign and number: Titus, 1, Domitian 2, Nerva 1, Trajan 9, and Hadrian 11.

This lack of even standard references is odd as Richardson was Curator of Coins at the National Museum of Antiquities of Scotland, though specialising in medieval coins.

This was made up for to some extent the next year by a rather obscure reference to the hoard in a plate included at the beginning of the Lion Foundry's products catalogue (Lion Foundry 1895) (Figure 17.1). This reference was passed on by Lawrence Keppie, who in turn had been given it by Janice Miller, Archivist, Kirkintilloch Archives Branch. I am grateful for being given ready access to the volume and for a scan of the plate. The plate is entitled, 'Roman Coins (Denarii) found in the grounds of the Lion Foundry Coy., Ltd., Kirkintilloch, 28th August, 1893.' It depicts clear images of the obverses and reverses of 18 denarii, with descriptions, from Vespasian to Faustina II. This has allowed fuller details with modern standard references to be included in the catalogue (below).

Another reference was found by Anne Robertson in 1946 when compiling a retrospective register of acquisitions by the Hunter Coin Cabinet. In a 'List of Donations to Museum 1894-95' the University's calendar includes, 'Dr. D. Murray, part of find of Roman coins at Kirkintilloch' (Glasgow University 1895: 136). David Murray was a Glasgow lawyer and President of the Glasgow Archaeological Society.

This is confirmed by a note in the *Papers of the Regality Club* [of Glasgow]. It says, 'Ten silver coins ranging from Domitian to Antoninus Pius were recently found at Kirkintilloch, and are now in the Hunterian Museum (Murray 1899: 38.1). The author is the same Dr. Murray named as the donor in the



ROMAN COINS (Denarii),

FOUND IN THE GROUNDS OF THE LION FOUNDRY COY., LTD., KIRKINTILLOCH, 28th AUGUST, 1893.

THE town of Kirkintilloch stands on the site of an ancient Roman settlement, part of the defences of the Romans against the northern tribes. The Roman Wall, built in the reign of Antoninus Pius A.D. 140 passed to the north of the settlement, and the site of the old Roman Fort at Kirkintilloch (the "Peel") is still of interest for its antiquarian remains.

No. 1. No. 2. No. 3.

No. 4. No. 5. No. 6.

No. 7 No. 8. No. 9.

No. 10. No 11. No. 12.

No. 13. No. 14. No. 15.

No. 16. No. 17 No. 18.

VESPASIAN, 69 to 79 A.D.

1. *Obverse.* Laureated head of the Emperor to right.
   Reverse. Vespasian seated to right holding a spear and branch.
2. *Obv.* As before.
   Rev. S.C. (for Senatus Consulto, by decree of the Senate) on a shield over a globe supported by two goats.

DOMITIAN 81 to 96 A.D.

3. *Obv.* Laureated head to right.
   Rev. Minerva fighting.
4. As last, later coinage.

TRAJAN, 98 to 117 A.D.

5. *Obv.* Bust, laureated and draped to right.
   Rev. Trophy of arms.
6. *Obv.* Laureated bust to right.
   Rev. Peace seated to left holding a rudder and an olive branch.
7. *Obv.* As last.
   Rev. Fortune seated to left holding a rudder and a cornucopia.
8. *Obv.* As last.
   Rev. Victory to right holding a crown and a palm, standing on the prow of a vessel, terminated by a serpent.
9. *Obv.* Laureated and draped bust to right.
   Rev. Mars marching to right carrying a spear and a trophy
10. *Obv.* As last.
    Rev. Rome, helmeted, seated to left holding a Victory and a spear.

HADRIAN 117 to 138 A.D.

11. *Obv.* Laureated head to right.
    Rev. Nude genii to left, near an altar, holding a patera and two heads of corn.
12. *Obv.* As last.
    Rev. Piety seated holding a patera and sceptre.
13. *Obv.* Laureated bust to right.
    Rev. Health seated to left nourishing a serpent rising from an altar.
14. *Obv.* Bust to right.
    Rev. Health standing at an altar feeding a serpent.
15. *Obv.* As last.
    Rev. Fortune standing to left holding a cornucopia.
16. *Obv.* As last.
    Rev. Vesta seated to left holding a patera.
17. *Obv.* As last.
    Rev. Money standing holding a balance in her right hand and a cornucopia in her left hand.

FAUSTINA JUNIOR, A.D. 175, Wife of Emperor Marcus Aurelius, 161 to 180 A.D.

18. *Obv.* Bust to right.
    Rev. Venus standing to left holding an apple in her right hand and a rudder in her left hand, under which is a dolphin.

Figure 17.1. Parcel from the Kirkintilloch hoard (actual size: 375 x 275 mm)
(Reproduced by permission of East Dunbartonshire Leisure and Culture Archives).

University's calendar for 1895. This is the only reference to coins of Antoninus Pius being included in the hoard.

In the first edition of *The Roman Wall in Scotland* there is listed under Kirkintilloch an entry referring to Richardson's note and adding that photographs of 18 more belonging to the same find had been seen (Macdonald 1911: 379). The photographs would seem to the same as on the Lion Foundry plate. Overall 42 are listed though again only by reign: Vespasian 2, Titus 1, Domitian 4, Nerva 1, Trajan 15, Hadrian 18 and Faustina Junior 1. There is, however, no comment on the coins especially the last and latest of Faustina II, and strangely Macdonald appears to add a caution by saying 'apparently a hoard', for which there seems no justification.

The find was included by Macdonald in the first of his series of records of Roman coins found in Scotland (Macdonald 1918: 262-3). He says, 'The exact spot was on low ground south of the wall, about half a mile east of The Peel'. Otherwise details are similar to those in his *Roman Wall in Scotland*. However, Macdonald adds, 'According to the Papers of the Regality Club (iii, p.34) ten of these were presented to the Hunterian Museum'. Presumably as Honorary Keeper of the Hunter Coin Cabinet he had checked and was unable to locate these.

The second edition of *The Roman Wall in Scotland* (Macdonald 1934: 295-6 and 462-3) adds little to what was said in the first edition. The location is given as a sand-pit 'at a spot between 300 and 400 yards east of The Peel'. In the third 'record' Macdonald lists two stragglers from the hoard seen by him early in 1939. These were denarii of Domitian and Nerva for which he gave the then standard references which has allowed fuller details to be included here (Macdonald 1939: 244).

A further three stragglers were brought to the Hunterian Museum in 1954 (Robertson 1961: 151). References given for the one of Trajan and two of Hadrian, again, now allow fuller details to be presented. The then owner had obtained them from a Mrs. Fulton of Kirkintilloch, granddaughter of Mr. Hudson founder of the Lion Foundry. It was also reported that Mrs. Fulton had possessed eight coins of which five had by then been lost. The enquirer added that the coins had been found in digging the foundations of the Lion Foundry about 1870. The foundry in fact did not open until 1880 (Rorke *et* al 2009: 38). It might be that part of the hoard had been found earlier or perhaps, after 60 years and three owners, memory of the finding had become hazy. Anne Robertson was almost certain that only one hoard was involved and there seems no reason to disagree.

The same author in her paper on Roman coin circulation in North Britain provided a brief synopsis of the hoard, giving the total as 47 coins (Robertson 1978: 199). The note in the *Regality Club Papers* of the donation of ten to the Hunterian Museum is included but the coins 'are not now to be identified there'.

In 1979 the current writer was asked to identify two denarii of Domitian and Hadrian, which had been brought into Kirkintilloch Museum by 'an old lady whose father worked at the Lion Foundry'. These, too, appear to have come from the 1893 find and are so dealt with. The Hunterian possesses casts and photographs of the pair.

Canmore contains an account of the main facts pertaining to the find, giving a total of 47 coins and a full bibliography. The accompanying map shows the find spot in relation to the modern town (https:canmore.org.uk/site/45205/kirkintilloch – accessed 22.06.2019).

The Antonine Wall guide records the hoard as containing at least 42 denarii and its find spot being near the Luggie Water close to the Lion Foundry (Robertson 2015: 98).

The find spot

Canmore gives the find spot as NGR NS 6559 7393 and on its accompanying map shows this to be at Barleybank on the modern New Lairdsland Road (A806) opposite to the entrance of the Barleybank Carpark which runs along the canal bank to St. Mary's Church on the Cowgate. The spot lies on the edge of the Glenview housing development at the back of the blocks of flats.

The find spot is indicated on the 1896 Ordnance Survey 1:2500 map Stirlingshire / Dumbartonshire sheet XXXIII.2 between Barleybank on the west and the extensive Lion Foundry to the east. The factory, which was closed in the early 1980s and subsequently demolished (Rorke *et al* 2009: 46), lay in the angle formed by the Forth and Clyde Canal running eastwards and crossing the Luggie Water flowing northwards to join the Kelvin beyond the line of the Antonine Wall.

The Lion Foundry was situated east of Peel Park and the site of the Roman fort though this, like the hoard, has been somewhat of an enigma. The site has been much disturbed by the subsequent erection of a medieval motte and then stone tower (The Peel) and their associated defences and habitations, landscaping from the late 19th century and Second World War air-raid shelters. For long it was thought The Peel was the Roman fort projecting north of the Antonine Wall until its true role was recognised by Macdonald early in the 20th century (Robertson 1964: 180). Anne Robertson carried out a considerable amount of trenching in the area west of The Peel and southwards towards Union Street between 1952 and 1961. Apart from defining the bend in the Wall in the north-west corner of the park, many features and Roman items were unearthed but the excavator was unable to conclude whether these represented the fort or a fort-annexe (Robertson 1964: 181-8).

Further excavations in the 1970s and 80s greatly clarified the situation indicating that the south front of the fort roughly followed the line of Union Street from the south-west corner of the park almost to the Town Hall (Keppie *et al* 1995: 650-53). Current thinking is well summarised in the Antonine Wall guide (Robertson 2015: 98-9). Here the possibility of an annexe and a bathhouse to the south of the fort are raised. Overall this brings the find spot of the coin hoard much closer to the fort – around 350 metres – than hitherto thought. However, it is the only Roman find from this area despite the digging of extensive foundations for the Lion Factory and on a smaller scale the Barleybank houses. In Roman times the main feature, less prominent in the modern urban landscape, would have been the Luggie Water. The description of the find spot as near the Luggie Water is therefore very pertinent (Robertson 2015: 98). The hoard was deposited about 100 metres from its west bank.

Contents

The exact number of coins found is unclear. Twenty-four were sent to the Queen's and Lord Treasurer's Remembrancer who passed them to Richardson for identification and assessment. The author is grateful to Nicholas Holmes for checking the numismatic treasure trove archives at the National Museum of Scotland though this produced nothing relevant. There is no mention of the Museum acquiring any of the Kirkintilloch hoard in the donations and purchases reports in the *Proceedings of the Society of*

Antiquaries Scotland volumes 28 and 29 for 1893-4 and 1895-6. Presumably, the coins were returned to the finder or more likely the management of the Lion Foundry.

It is clear ten coins from the find were donated to the Hunterian Museum in 1894 by Dr. Murray. The donation appears to be by Murray rather than through Murray. This could therefore be another group or part of the 24 returned from Edinburgh. Anne Robertson may have considered the latter to be the case as she did not include these ten with her total of 47. Nor did she include the five coins 'lost' by Mrs. Fulton, but did include the latter's three coins seen in 1954 which she does not seem to have regarded as duplicated reports. In addition there are the two stragglers shown to Macdonald in 1938 and the further two examined at the Hunterian Museum in 1979. It was accepted by Macdonald that the 18 coins in the photographs were additional to the 24 listed in 1894. These two larger groups constitute the basic contents of 42 coins. The stragglers of 1938 and 1954 raised the total as given by Anne Robertson to 47 and the 1979 pair of stragglers bring this up to 49. Adding Mrs. Fulton's missing five coins and the ten in the Hunterian Museum would give 64 as the highest possible number of specimens. Perhaps it might be regarded as a hoard of *c.* 50+ denarii, not all of which were reported to the authorities or fully detailed. The present location of these coins is unknown, with the exception of the ten in the Hunterian Museum, which, lacking specific provenance tickets, cannot currently be identified.

However, a clear breakdown of the hoard is provided by the 49 coins identified whether merely to a reign as with the original group of 24 or with the much fuller details from the 18 illustrated by the Lion Foundry and the seven stragglers subsequently examined by Hunterian staff. The earliest coin present is a worn *Pontifex Maxim* denarius of Vespasian issued in AD 73. There is a second Vespasian denarius, of AD 77-8 with wolf and twins reverse, in the name of Domitian. Two coins of Titus, one for *Divvs Vespasian*, are followed by five of Domitian, two of which are of AD 88 and another of AD 92; the first of odd appearance and possibly a contemporary forgery. Two denarii of Nerva and two of Trajan of AD 98-9 and AD 100 complete the 1st century coins. There are a further 12 of Trajan though three only can be dated, two to AD 103-11 and one to AD 114-17. Then come 21 issues of Hadrian, ten of which range in date from AD 118 to AD 134-8. These are in fairly worn or worn condition.

The latest coin is a denarius of Antoninus Pius struck for Faustina II with *Faustinae Avg Pii Avg Fil* and Venus reverse. Coins were issued for Faustina II by both her father Antoninus Pius (AD 138-61) and her husband Marcus Aurelius (AD 161-80). Those indicating her relationship to the former, *Avgvsta Pii Filia*, are generally assigned to Antoninus Pius while those without are listed under her husband after he became emperor in AD 161. The start of her father's issues would most likely be after her marriage to Marcus Aurelius in AD 145, but may be later, and these may have ceased by AD 157 (*RIC* III Introduction: 3 and 19). The coin from Kirkintilloch is only slightly worn and may have been removed from circulation by the early AD 150s. This along with the make-up of the hoard, especially the predominance of issues of Trajan and then the more so of Hadrian, and the single coin of Antoninus Pius, would suggest the hoard is a deposit of the reign of Antoninus Pius perhaps *c.* AD 150. However, the absence of coins in the name of this emperor himself is noteworthy unless the reference to Antoninus Pius regarding the Hunterian Museum group is to be interpreted as a few of these being present (Murray 1899).

Catalogue

1. Vespasian, AD 73, Rome, worn, *RIC revised* 546
obv. laureate head, right
IMP CAES VESP AVG CENS (outwardly from 5 o'clock)
rev. Vespasian seated, right, holding branch and sceptre
PONT[IF] MAXIM
Lion Foundry, plate, no. 1

2. Vespasian for Domitian, AD 77-8, Rome, *RIC revised* 961
obv. laureate head, right
CAESAR AVG F DOMITIANVS
rev. Wolf and Twins
COS V
Macdonald 1939: 244

3. Titus for Divus Vespasian, AD 80-81, Rome, worn, *RIC revised* 357

obv. laureate head, right
DIVVS AVGVSTVS VESPASIANVS (outwardly from 5 o'clock)
rev. S C on shield supported by two capricorns, globe below
Lion Foundry, plate, no. 2

4. Titus – no details, Richardson 1894: 276

5. Domitian, AD 88, Rome, worn, 2.31 gm, 19 mm, 180, *RIC revised* 572
pierced (?modern) reverse 12 o'clock, possibly contemporary forgery,
obv. laureate head, right
IMP CAES DOMIT AV[G GERM PM TR P VII]
rev. Minerva advancing, right, holding spear and shield
IMP XIIII COS [X]IIII CENS P [PP]
Seen by author 1979

6. Domitian, AD 88, Rome, fairly worn, *RIC revised* 572
obv. laureate head, right
IMP CAES DOMIT AVG GERM PM TR P VII
rev. Minerva, right, holding spear and shield
IMP IIII COS XIIII CENS P PP
Lion Foundry, plate, no. 4

7. Domitian, AD 92, Rome, fairly worn, *RIC revised* 728
obv. laureate head, right
IMP CAES DOMIT AVG GERM [PM TR P XI]
rev. Minerva, right, holding spear and shield
IMP XXI COS XVI CENS P PP
Lion Foundry, plate, no. 3

8-9. Domitian - no details, Richardson 1894: 276

10. Nerva, AD 96, Rome, *RIC 3*
obv. laureate head, right
IMP NERVA CAES AVG PM TR P COS II PP
rev. clasped hands, holding legionary eagle on prow
CONCORDIA EXERCITVVM
Macdonald 1939: 244

11. Nerva - no details, Richardson 1894: 276

12. Trajan, AD 98-9, Rome, worn, *RIC* 12
obv. laureate head, right
IMP CAES NERVA TRAIAN AVG GERM
rev. Concordia seated, left, holding patera and cornucopiae, altar before her
PONT MAX TR POT COS II
Lion Foundry, plate, no. 7

13. Trajan, AD 100, Rome, fairly worn, *RIC* 41
obv. laureate head, right
IMP CAES NERVA TRAIAN AVG GERM
rev. Victory seated, left, holding patera and torch
PM TR P COS III PP
Lion Foundry, plate, no. 6

14. Trajan, AD 101-02, Rome, fairly worn, *RIC* 59
obv. laureate head, right
IMP CAES NERVA TRAIAN AVG GERM
rev. Victory standing, right, on prow, ending in serpent, holding wreath and palm
PM TR P COS IIII PP
Lion Foundry, plate, no. 8

15. Trajan, AD 100-02, Rome, worn, *RIC* 59
obv. laureate head, right
IMP CAES NERVA TRAIAN AVG GERM
rev. Victory standing, right, on prow, ending in serpent, holding wreath and palm
PM TR P COS IIII PP
Robertson 1961: 151

16. Trajan, AD 103-11, Rome, worn, *RIC* 116
obv. laureate head, right
[IMP TRA]IANO AVG GER DAC [PM TR P]
rev. Roma seated, left, holding victory and spear
COS V PP SPQR OPTIMO PRINC
Lion Foundry, plate, no. 10

17. Trajan, AD 103-11, Rome, slightly worn, *RIC* 147
obv. laureate head, right
IMP TRAIANO AVG GER DAC PM TR P
rev. trophy of arms
COS V PP SPQR OPTIMO PRINC
Lion Foundry, plate, no. 5

18. Trajan, AD 114-17, Rome, worn, *RIC* 337
obv. laureate head, right
IMP CAES NER TRAIANO OPTIM AVG GER DAC
rev. Mars walking, right, holding spear and trophy
PM TR P COS VI PP SPQR
Lion Foundry, plate, no. 9

19-27. Trajan - no details, Richardson 1894: 276

28. Hadrian, AD 118, Rome, fairly worn, *RIC* 46
obv. laureate head, right
IMP CAESAR TRAIAN HADRIANVS AVG
rev. Salus seated, left, feeding snake coiled round altar
PM TR P COS III; SALVS AVG (exergue)
Lion Foundry, plate, no. 13

29. Hadrian, AD 119-22, Rome, fairly worn, *RIC* 90
obv. laureate head, right
IMP CAESAR TRAIAN HADRIANVS AVG
rev. Genius standing, left, holding patera, over altar, and corn-ears
PM TR P COS III
Lion Foundry, plate, no. 11

30. Hadrian, AD 119-22, Rome, slightly worn, 2.99 gm, 18 mm, 180, *RIC* 139
obv. laureate head, right
IMP CAESAR TRAIAN HADRIANVS AVG
rev. Salus seated, left, feeding snake coiled round altar
PM TR P COS III; SALVS AVG (exergue)
Seen by author 1979

31. Hadrian, AD 125-8, Rome, worn, *RIC* 158
obv. laureate head, right
HADRIANVS AVGVSTVS
Neptune standing, left, right foot on prow, holding sceptre and acrostolium
COS III
Robertson 1961: 151

32. Hadrian, AD 125-8, Rome, worn, *RIC* 172
obv. laureate head, right
HADRIANVS AVGVSTVS
Concordia seated, left, holding patera, left elbow resting on figure of Spes
COS III
Robertson 1961: 151

33. Hadrian, AD 125-8, Rome, worn, *RIC* 172
obv. laureate head, right
HADRIANVS AVGVSTVS
rev. Concordia seated, left, holding patera, left elbow resting on figure of Spes
COS III
Lion Foundry, plate, no. 16

34. Hadrian, AD 134-8, Rome, fairly worn, *RIC* 244
obv. laureate head, right
HADRIANVS AVG COS III PP
rev. Fortuna standing, left, holding rudder, on globe, and cornucopiae
FORTVNA AVG
Lion Foundry, plate, no. 15

35. Hadrian, AD 134-8, Rome, fairly worn, *RIC* 256
obv. laureate head, right
HADRIANVS AVG III COS III PP
rev. Moneta standing, left, holding scales and cornucopiae
MONETA AVG
Lion Foundry, plate, no. 17

36. Hadrian, AD 134-8, Rome, worn, *RIC* 260
obv. laureate head, right
HADRIANVS AVG COS III PP
rev. Pietas seated, left, holding patera and sceptre
PIETAS AVG
Lion Foundry, plate, no. 12

37. Hadrian, AD 134-8, Rome, fairly worn, *RIC* 267
obv. laureate head, right
HADRIANVS AVG COS III PP
rev. Salus standing, right, feeding snake coiled round altar
SALVS AVG
Lion Foundry, plate, no. 14

38-48. Hadrian - no details, Richardson 1894: 276

49. Antoninus Pius for Faustina II, AD 145-61, Rome, slightly worn, *RIC 517*
obv. head of Faustina II, right
FAVSTINAE AVG PII AVG FIL
rev. Venus standing, left, holding apple and rudder set on dolphin
VENVS
Lion Foundry, plate, no. 18

50-59. Hunterian Museum, Domitian to Antoninus Pius, no details, not identifiable

60-64. Owned by Mrs. Fulton, no details, lost before 1954.

Associated material

The original report by Richardson (1894) states that the finder, 'came across some coins, also an iron spear-head and a large nail'. The spear-head and nail have been included in most subsequent references to the discovery but always without comment, though perhaps little indeed can be said on this aspect. It might be, of course, that the two objects were not part of the hoard itself though this seems unlikely. The nail seems too large to be from a wooden box or such like once containing the hoard. If there was a container this may not have been recognised at the time of finding but most likely it was of an organic material long decayed. Did the nail perhaps come from a building or was it of enough value to be included with the coins? The spear-head would have been of value, most likely belonging to a Roman soldier rather than to a native who should perhaps not have been in possession of such a weapon so close to the fort. Some speculation is reasonable and it might be wondered if the find could possibly represent a soldier's burial?

Relationship to Roman coinage in Scotland

The interpretation of the hoards of Roman silver coins from Scotland dating to the late 2nd and early 3rd centuries as representing bribes to native rulers to keep the peace is well established (Blackwell *et al.* 2017: 19-31). From AD 197 comes the frequently quoted reference to Cassius Dio reporting that the Maeatae were bought off by the governor of Britain (Blackwell *et al.* 2017: 21 and 30.7). Bribes may have been resorted to earlier but during the Antonine occupation large quantities of denarii will have been required for the military establishment. By then the denarius was the more common coin used by the army (Robertson 1983: 422) and it would be odd if there were no military hoards. Is the Kirkintillloch hoard military or bribery? It was placed by Anne Robertson (1978: 189-90) in her group of hoards to Pius, Marcus or Faustina II. After her death in AD 175 *Diva* coins were produced by Marcus until his own death in AD 180. However, Robertson was not aware of the specific issue of the Faustina II coin in the Kirkintilloch find. Its date of issue and deposit would now seem to be around the middle of the century. This would necessitate its transfer in the recent bribes maps from those ending with Marcus Aurelius and Commodus to those ending with Antoninus Pius (Blackwell *et al.* 2017: 24: 3.6b to 3.6a). Being deposited in the earlier reign and given its close association with a major Antonine Wall fort would strongly suggest this to be a Roman as opposed to a native hoard.

Conclusion

Found in 1893 beside the Lion Foundry and, close to the Luggie Water, the Kirkintilloch hoard of Roman denarii has been referred to on many occasions but without great detail. It may have contained as many as 64 coins but those that can be described to some greater or lesser degree number 49. The discovery of a sheet of 18 images by East Dunbartonshire Archives has allowed a major group from the find to be published in detail for the first time. The contents range from Vespasian to Antoninus Pius for Faustina II and are mostly of Trajan and Hadrian. The single identified coin of Antoninus Pius is an early issue for Faustina II and is only slightly worn. This suggests it was deposited early in the 150s. The find's close proximity to the Roman fort indicates that it is likely to have originated there.

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18. The external supply of pottery and cereals to Antonine Scotland

Paul Bidwell

Introduction

In 1771 labourers working to the west of the fort at Castlecary discovered 'a large hollow in the rock, containing nearly a hundred quarters of wheat, quite hard and black, and mixed with numerous pieces of charred wood, as if the whole had been exposed to the action of fire' (Stuart 1852: 346). Sir George Macdonald, who also mentioned a similar find in the fort at Westerwood, speculated on the origin of the wheat: 'Whether it was grown on the spot, we do not know. Not improbably it was' (Macdonald 1934: 256, 453). Antiquarian finds had thus raised a question that has become important to archaeologists studying Roman frontiers: to what extent could the army rely on local supplies, not only of cereals but also of animal products, pottery and other essentials?

The blending of older scholarship with modern research has been at the heart of Lawrence Keppie's outstanding achievements in the study of Roman Scotland and of the Antonine Wall in particular. This tribute to Lawrence, exploring long-distance supply from southern Britain to the army in Antonine Scotland, tries to answer an old question using recent research. The main subject is the possible association between the transport of pottery and cereals. First there is a summary of the little that is known and what can be reasonably conjectured about the sources of the cereals, particularly wheat, that were consumed in Antonine Scotland. It is then shown that more than half of the pottery on the Antonine Wall came from beyond Scotland, even when amphorae and samian ware are excluded from the quantifications. There were certainly a number of potteries on the Antonine Wall (Hartley 1976; Breeze 1986; Swan 1999), but the reliance of the army on coarse wares from distant sources was very much greater than previously in Britain. Possible reasons for this change are explored, as well as the extent to which pottery can be viewed as a proxy for the movement of bulkier consumables, such as wheat, which are poorly represented in the archaeological record.

The supply of cereals to Antonine Scotland

Until the 1970s it was believed that the army in Britain could not have depended to any great extent on the local supply of cereals because of the lack of agricultural capacity in the frontier areas. Following his investigation of the granaries at South Shields, Richmond (1952: 2) concluded that the supply base of which they formed part, though built for the Severan campaigns in Scotland, had then been retained until the end of the Roman period to serve Hadrian's Wall. The Fenland, parts of Wessex and perhaps the region around Chester were regarded as imperial estates supplying cereals and other produce to the army (Rivet 1964: 117–18; Frere 1967: 276). By the 1970s, however, the density of native settlements dating to the Iron Age and Roman period in the frontier areas had become apparent, leading Manning (1975) to propose that forts could indeed have been supplied with cereals from local sources, avoiding the expense of long-distance transport. Higham (1982: 108–10) even suggested one of the factors that

decided their sites was the need to be close to the best farming land. The difficulty with the idea that forts could be largely supplied with cereals and other agricultural produce from local sources was that very few of the settlements had been excavated. It was by no means certain that their occupation coincided with that of the forts and in any event that they were capable of producing a surplus for use by the army.

Agriculture in Roman Britain has been studied intensively in recent decades, something made possible by the enormous amount of information retrieved by developer-funded archaeology. The view from the civilian areas now contrasts sharply with the picture of self-sufficiency on the frontiers which developed in the 1970s: 'comparatively low arable productivity overall in areas north-west of the Central Belt (roughly the Upper Thames valley and eastern Midlands) perhaps suggests that the bulk of agricultural produce consumed by the army was supplied over long distances from parts of central and southern Britain' (Allen and Lodwick 2017: 174) (Figure 18.1). This sentence comes from one of the three volumes in the monumental series *New Visions of the Countryside of Roman Britain* (Smith *et al.* 2016; Allen *et al.* 2017; Smith *et al.* 2018). Other contributions described the increase in the number of settlements in the central part of Britain during the second century AD, seen as a response to the needs of military and urban populations (Smith and Fulford 2016: 410), and admitted the possibility that the state encouraged this trend, particularly around the Fen edge (Smith 2016a: 192–5). Lodwick's (2017: fig. 2.1) key indicators for arable farming, especially agricultural tools, corndryers and field systems, emphasise the dominance of the Central Belt and regions to its south.

In one area of the northern frontier in Britain there is now detailed knowledge of changes in settlement patterns in the earlier Roman period and by implication in the general agricultural economy. On the southern coastal plain of Northumberland beyond Hadrian's Wall, settlements flourishing in the late pre-Roman Iron Age were abandoned probably in the Hadrianic period and certainly before the end of the second century AD, as at Pegswood (Proctor 2009: 98) and other sites on the coastal plain of Northumberland (Hodgson *et al.* 2012: 213–6, a general review, incidentally arguing that at Pegswood abandonment of the settlement and its replacement by a stock enclosure could date to the early second century, rather later than was suggested in the original report). Patchier evidence suggests that had also been the fate of settlements as far north as East Lothian. These changes seem to have been brought about by a shift from mixed farming to the raising of livestock (Hodgson *et al.* 2012: 211–20).

In Scotland, as in northern England, barley, emmer and spelt wheat were grown (ScARF 2012: 38), but there is no way on present evidence of knowing how much indigenous production, with or without improvement, contributed to supply of the army. Hanson and Maxwell (1986: 178) considered that the 'presence of the frontier garrison could well have stimulated the farming industry of the Lothian and Berwickshire area, in particular, to a point where it was capable of supplying a reasonable proportion of the army's needs'. Subsequent research has added some detail. Grain driers were found in the annexe of the Flavian fort at Elginhaugh, and in the best-preserved example, remains of emmer and spelt wheat were recovered together with barley and some oats (Hanson 2007: 216–19, 673, fig. 8.9), evidence that locally-grown crops were being processed. Arable cultivation seems to have been more extensive on native sites in southern Scotland than was once thought, but in general barley is predominant in the cereal assemblages. In his review of the evidence, Hanson (2007: 672–3) cited other indications that 'a reasonable proportion' of the cereals at Elginhaugh were from local sources, perhaps more so in the early stages of occupation before the supply system was fully established. The predominance of barley

Figure 18.1. British potteries as far north as Hadrian's Wall which supplied Antonine Scotland, and other places mentioned in the text (earlier military sites given up before the Antonine period are not shown).

on native sites suggests that in Scotland it was mainly deficiencies in wheat that were made good from external sources.

Further south in Britain there are some deposits of carbonised wheat which because of the weed seeds associated with them are considered not to have been from local sources, as in a late first-century building storing spelt wheat outside the fortress at York (Kenward and Williams 1979: 62). The opposite has also been demonstrated by a large deposit of the late third or early fourth century AD from the forecourt granary at South Shields where spelt wheat was mixed with seeds of heath grass, which has also been found with spelt wheat in late Iron Age assemblages south of the Tyne, a combination 'very rare or absent' elsewhere in Britain (Figure 18.2). However, the deposit at South Shields also included about the same amount of bread wheat as spelt. Assemblages which include large quantities of bread wheat are rare in Roman Britain, and Van der Veen (1994: 257–8) suggested that the consignment at South Shields had been imported from northern Gaul, revising an earlier suggestion that the bread wheat came from the Netherlands (Van der Veen 1988).

Small quantities of bread wheat have been recorded elsewhere in northern England (Hall and Huntley 2007); recent occurrences include a third-century deposit in the east granary at Vindolanda (Huntley 2013) and finds from the fort at Carlisle (Huckerby and Graham 2009), but spelt wheat always predominates. Amongst forts on the Antonine Wall, bread wheat is also known, again in small quantities, at Rough Castle, Castlecary and possibly Bearsden (Dickson and Dickson 2016: 228). The early deposit of spelt wheat at York, noted above, also included traces of possible bread wheat, which was regarded as a weed or crop contaminant and not part of a separate consignment (Kenward and Williams 1979: 58). That might often be the explanation for its other minor occurrences in northern Britain. Reviewing the evidence for arable farming in Britain as a whole, Lodwick (2017: 19–20) emphasised the lack of evidence for the cultivation of bread wheat and considered its importation from the Continent 'increasingly likely', following Van der Veen's arguments. Durum, another type of wheat, is known from Bearsden and was probably of Mediterranean origin (McLaren 2016).

The coastal position of South Shields, still the largest group of military granaries known anywhere in the Roman empire, shows that it was receiving most of its cereals by sea. For a while it was thought to have been solely concerned with the Severan campaigns (Dore and Gillam 1979: 63–4); once they came to an end, the supply base was unnecessary because the army on Hadrian's Wall 'was probably able to live, up to a point, on local supplies' and any deficiencies could be met by transporting cereals directly to the forts. However, Richmond's contrary opinion, noted at the beginning of this section, was justified by larger-scale excavations which began in 1977. After the Severan campaigns, the supply base had continued in use until the late third or early fourth century AD, when at the beginning of Period 7 at least 15 of the original 24 granaries were demolished or converted to other uses; the other 9 granaries, largely unexplored, probably survived to serve as a supply base with a much reduced capacity (Bidwell and Speak 1994: 20–45). The forecourt granary was one of those that survived the apparent reduction in the size of the supply base (Bidwell and Speak 1994: 93, 103). In its basement was the large deposit of carbonised grain discussed above, which was probably burnt in an extensive fire that immediately preceded the beginning of Period 7 (Hodgson 2005).

If in the apparently settled conditions that obtained for much of the first three-quarters of the third century AD it was necessary to maintain a depot for seaborne supplies as large as South Shields,

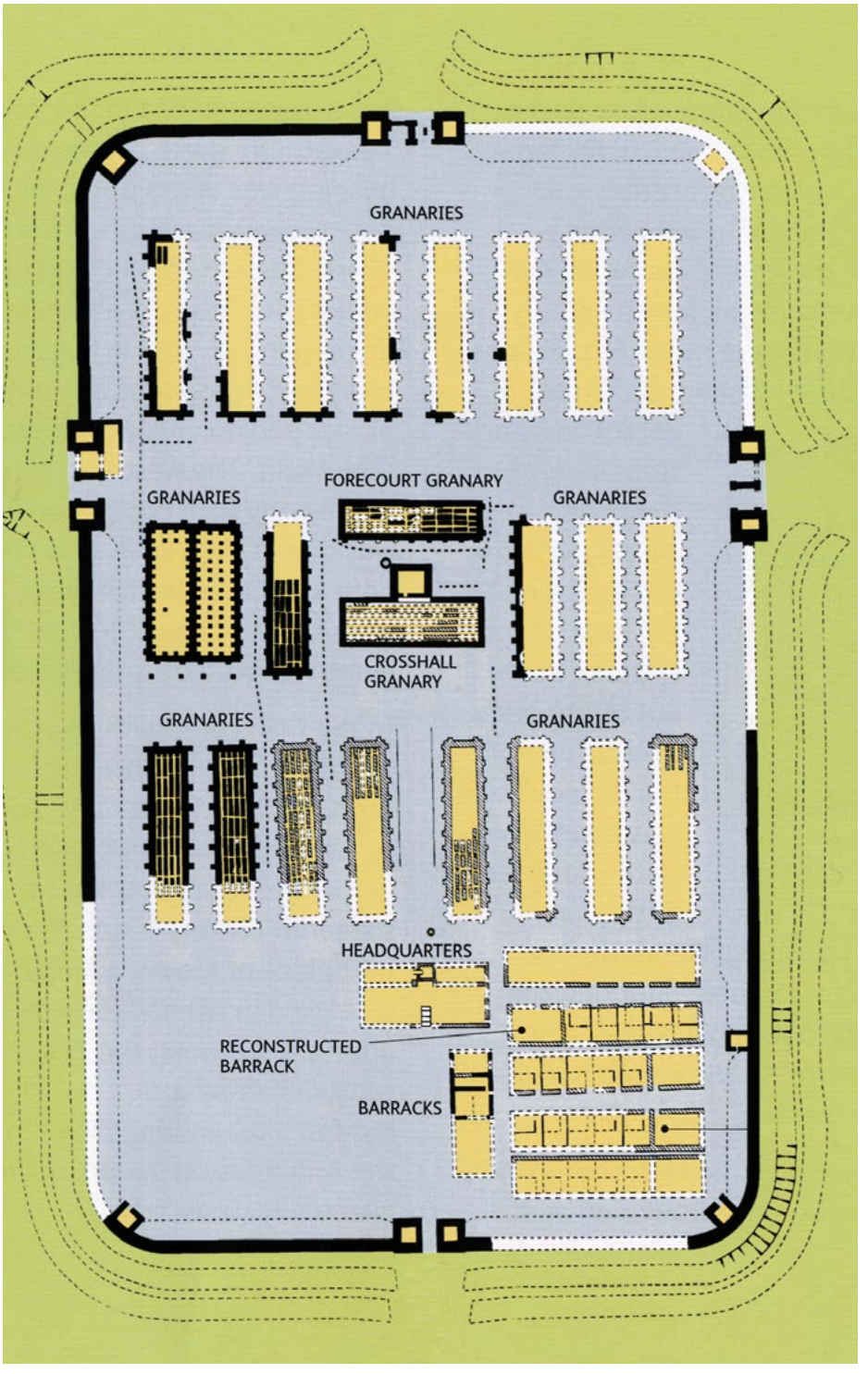

Figure 18.2. The supply base combined with accommodation for *cohors V Gallorum* in the fort at South Shields in Period 6B, beginning in *c.* AD 222; the fort had an area of 2.1 ha (© Tyne and Wear Archives and Museums).

similar needs in earlier, less settled circumstances such as those of Antonine Scotland are easier to accept. There is ample evidence in an earlier period for the long-distance supply of wheat to the army elsewhere in the north-west provinces. In the report on the South Shields finds, Van der Veen (1994: 258) referred to military sites in the Netherlands from which there were 'very large, more or less pure bread wheat assemblages' imported from further south, presumably from northern Gaul. The need for the long-distance supply to these sites is now clear from what has been learnt about the limited range of crops which were grown in local and regional settlements, where there was a greater emphasis on cattle-rearing to meet the demands of the army (Thomas and Stallibrass 2008: 10–11). Recent studies of the Rhine delta in the Flavian to Hadrianic period make it 'certain that spelt wheat and bread wheat were imported to military sites from the loess areas of Germania Inferior', where there was surplus production, particularly of spelt wheat (Cavallo *et al.* 2008: 77). Reddé (2018: 143–8), however, regarded the centre of the Paris basin (Ile-de-France and southern Picardy) as a more likely source, cultivation of bread wheat having already been established there in the pre-Roman period.

Establishing what the balance was between local and long-distance supply in Antonine Scotland will always be difficult, but since the 1970s the broad picture has become clearer. In at least some periods the army in parts of the north-west provinces relied on distant sources for wheat; in Britain the more agriculturally-productive areas were developed to serve distant markets, probably with official encouragement, and in frontier areas the emphasis might have been on pastoral farming and the cultivation of barley; and some carbonised deposits in military and urban deposits, from both the earlier and later Roman periods in Britain, represent wheat imported from northern Gaul or farther afield. Against this background, there is a strong likelihood that the army in Antonine Scotland, though obtaining what cereals it could locally, relied on sources in southern Britain and beyond for much of its supply of wheat.

Pottery and supply systems operating over long distances

Many classes of pottery can be tied down to specific sources, though some still remain difficult to identify. In Scotland, for example, it is not always possible to be certain whether the grey coarse wares were from local or distant sources. More generally, establishing the origins of other goods and consumables poses greater problems, and pottery has been used as a proxy to illustrate trends in the development of trade (Peacock and Williams 1986: 2; Fulford 1978). Long-distance movements would have relied as far as possible on transport by sea and along rivers. Its costs would have been much lower than those of carriage by land, removing some of the economic advantages of production centres close to their consumers. Pottery industries could have used established routes, benefitting especially if their products were small elements in larger cargos, the main transport costs of which were borne by the larger items; one example discussed by Fulford (1984: 132–7) is the importation of Central Gaulish samian ware to Britain in the second century AD.

The application of this principle to specific pottery industries and the destination of their products is often far from straightforward. One problem is that some pottery vessels, because of what they contained or because they were of exceptional quality, could have been the principal products carried on a particular route. The obvious example is the export of olive-oil amphorae from southern Spain to Britain; in many Mediterranean wrecks amphorae were the main cargo. The same sort of evidence, however, suggests that samian ware formed part of mixed shipments (Dannell and Mees 2013, 182).

Another problem in Antonine Scotland is that there were small amounts of pottery from a number of distant sources. Some might have travelled long distances in the baggage of individuals, especially soldiers being transferred to new postings (Swan and Bidwell 1998). This can be difficult to demonstrate beyond doubt; occurrences which allow no other explanation, such as the mortarium stamp from Syria which was found at High Rochester (Clark 1887; Hayes 1967), are very rare. Finally, transport costs might have been subsidised (Fulford 2004: 323), though there is nothing to demonstrate that there was this sort of official intervention. Other factors influencing pottery supply and not specifically to do with transport costs will emerge in what follows.

The supply of coarse wares to the army in Britain before the Antonine occupation of Scotland

From the earliest stage of the conquest, the army in Britain drew on many sources for its pottery supply. Amphorae, samian, other fine wares and some mortaria were imported, but most of the coarse wares were supplied either by immigrant potters or by indigenous potters working in local pre-Roman traditions. In Wales, north-west England, Scotland and a few other areas, there had been little or no pottery production in the immediately pre-Roman period, and for most of their coarse wares in the first and early second centuries AD the army relied on potters who followed the advances of the army or perhaps on soldier-potters. Kilns served individual forts or fortresses, and their products often had a limited distribution, as can be seen from some examples in the Neronian and early Flavian periods. Pottery produced locally for the fortress at Gloucester seems not to have travelled far (Timby 1990: 246). On the other hand, mortaria produced for the adjacent, earlier military site at Kingsholm occurred at Usk, but mortaria made at the latter 'are rare to non-existent at other sites' (Hartley 1993: 393), and, as at Gloucester, other coarse wares made at Usk are not found elsewhere (Greene 1993: with no mention of occurrences other than at Usk). Occasionally, coarse wares made at fortresses had a wider distribution, as at Exeter from where small quantities of the locally-made Fortress Ware B travelled as far as Carvossa in Cornwall and Dorchester in Dorset which are 180 km apart (Holbrook and Bidwell 1991: 16, 145; Seager Smith and Davies 1993: fig. 131, types 601– 4); the ware also reached Camelon and Elginhaugh in Scotland, but that might have been connected with the transfer of units from the South-West (Swan and Bidwell 1998: 22).

The products of some indigenous potters were also widely distributed in the Neronian and early Flavian periods. BB1 from south-east Dorset (SED BB1) and east Devon (SOW BB1) was of some importance at Exeter, and smaller quantities from south-east Dorset are known at Usk. Other examples are gabbroic ware from western Cornwall, which reached military sites as far east as the small fort at Pomeroy Wood in east Devon (Seager Smith 1999: table 81), and Malvernian ware from Herefordshire or Worcestershire which travelled as far south as Cirencester and Kingsholm (Hurst 1985: 78). Production of all three wares was well established in the late pre-Roman Iron Age, and there was obviously the capacity to increase output to meet the needs of the army.

Only the BB1 industries developed further, eventually supplying much of Britain with cooking wares. Malvernian ware continued to meet the needs of a regional market, while after the army left the South-West gabbroic ware was hardly if ever transported beyond Cornwall. BB1 first arrived in northern Britain when Hadrian's Wall was built, though it seems only in small quantities. At Carlisle locally-made wares were still much more important in the Hadrianic deposits (Swan *et al.* 2009: 591); similarly at Hardknott, its main occupation confined to this period, BB1 represented less than 10% of the coarse

wares, most of the remainder being products of the kiln nearby at Muncaster (Bidwell *et al.* 1999: figs 34–6; pottery not quantified, and percentage based on the number of rims illustrated). BB1 was not present at Ribchester in large quantities until the second half of the second century AD (Buxton and Howard-Davis 2000: 13, 191). There are scarcely any quantified groups exclusively of the Hadrianic period from the central and eastern sectors of Hadrian's Wall and from north-east England. It is therefore impossible to know whether the total for BB1 (54% by weight of the coarse wares excluding mortaria) in a small group of this period at South Shields is typical (Bidwell and Speak 1994: 220–1). The ware seems well-represented in the Period IA (Hadrianic) levels of turrets in the eastern sector (e.g. T 18b, T 25b and T 26a, listed but not quantified: Woodfield 1965), but not in such large quantities as in the South Shields group. Most of the BB1 which reached northern Britain probably travelled by sea up the west coast after being transported by road to the Bristol Channel, avoiding the very long voyage around the Cornish peninsula from Poole Harbour (Allen and Fulford 1996: 255–60, fig. 13; Rippon 2008: 134–7, for Crandon Bridge, Somerset, as a trans-shipment port). Nevertheless, BB1 reached London by the early Hadrianic period at the latest (Davies *et al.* 1994: 107–11, 209, fig. 92) and was being shipped up the east coast before the Antonine occupation of Scotland (Bidwell and Speak 1994: 221). Significant quantities have been recorded from levels of Hadrianic or early Antonine date at Colchester (Symonds and Wade 1999: 354-60, table 1.70), at Lincoln and sites near the east coast in Lincolnshire (Precious 2014a: 112 and fig.87; 2014b: 314) and at York (Monaghan 1997: 891) — all sites accessible by sea via navigable rivers.

Pottery supply in Antonine Scotland

In this section a series of quantifications will illustrate the extent to which the army and its dependants in Antonine Scotland relied on coarse wares from sources further to the south. Assemblages quantified to modern standards are few and are confined to the Antonine Wall and its environs, but they certainly provide a better picture of pottery supply than the sketchier evidence from Hadrian's Wall can for its earliest period of occupation. There are many reports on forts in other parts of Antonine Scotland which preceded the systematic publication of pottery and the classification of common coarse wares such as BB1, BB2 and Severn Valley ware. Some idea of the relative frequency of their occurrences can nevertheless be gained by comparing the numbers of illustrated examples in cases where the types are sufficiently distinctive.

The amounts of coarse wares from distant sources were first apparent in John Gillam's publication (1961) of the group from the outer ditch on the west side of the fort at Mumrills, an early and very valuable example of quantification which showed that roughly 85–90% of the coarse and fine wares came from beyond Scotland (the basis of this calculation is explained towards the end of this paper). There is no reason to doubt this figure, but the amounts of coarse wares from distant sources are not quite as large in assemblages which have been quantified more recently. An explanation for the exceptional character of the Mumrills group is suggested towards the end of this paper. Figure 18.3 illustrates the percentages of coarse wares, excluding mortaria, from three other forts or their attached settlements. The excavations at Bearden were inside the fort and its annexe, which are on the line of the Antonine Wall (for the coarse wares excluding mortaria, see Bidwell and Croom 2016); those in 2011 at Camelon, which lies 1.2km north of the Wall, took place on its defences and in its annexe (Bidwell and Croom forthcoming), and at Inveresk they were in the extensive civilian settlement outside the fort (Dore 2004; Croom and Bidwell forthcoming) (Figures 18.1 and 18.2). By weight, the

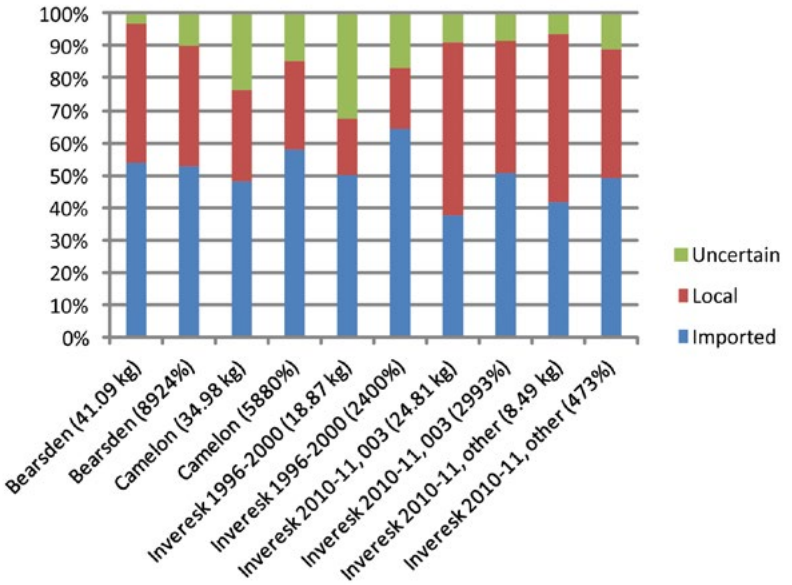

Figure 18.3. Quantities of coarse wares from beyond Scotland compared with those of local or uncertain origins, excluding mortaria. Each assemblage is represented by two columns giving the percentages by weight and by EVEs.

average for coarse wares from beyond Scotland is 46.2%, with figures varying from 37.4% to 53.9%, and by EVEs (estimated vessel equivalents) 54.9%, ranging from 48.4% to 64.5%. It is important to note that the sources of varying but significant amounts of the pottery, mostly grey wares, cannot be identified. Not included in Figure 18.3 are the figures from the excavations by Mr Charlie Hoy at Cramond. This is because the quantification necessarily included Severan and possibly later material; early Antonine and Severan rim forms in BB1 and BB2 can often be distinguished, but this is much more difficult with sherds from the body and bases of vessels. The figures for coarse wares from distant sources, 19.9% by weight and 32.0% by EVEs, are markedly lower than those for the other assemblages (Croom and Bidwell 2017: table 5).

Mortaria have been excluded from the figures set out above, largely because they have been quantified by different methods. Distant sources played an important part in their supply, though to varying extents. There were large amounts from beyond Scotland at sites to the east and north-east of the Antonine Wall: at least 18–19 from a total of 33–34 at Inveresk (1996–2000 excavations: Hartley 2004: table 37) and 26–28 from a total of 48–54 at Antonine Cramond, some of the remainder perhaps being from Northern England rather than Scotland (Hartley 2003: 49–50, table 1). At the outpost fort of Strageath, 71.1% of the 142 Antonine sherds were definitely not Scottish, and some of the remainder might have been from north-west England rather than Scotland (Frere and Hartley 1989: table VII). However, at Bearsden, towards the western end of the Antonine Wall, 78% by weight of the mortaria were local (Hartley 2016: ill. 7.13).

There are no overall, detailed surveys of the sources of mortaria in Scotland, but a sample of those which came from farther south is presented in Figure 18.4, which is based on the identifications of stamps published by K. Hartley from 1963 to the present. The numbers from Colchester and Mancetter-Hartshill overwhelm the remainder.

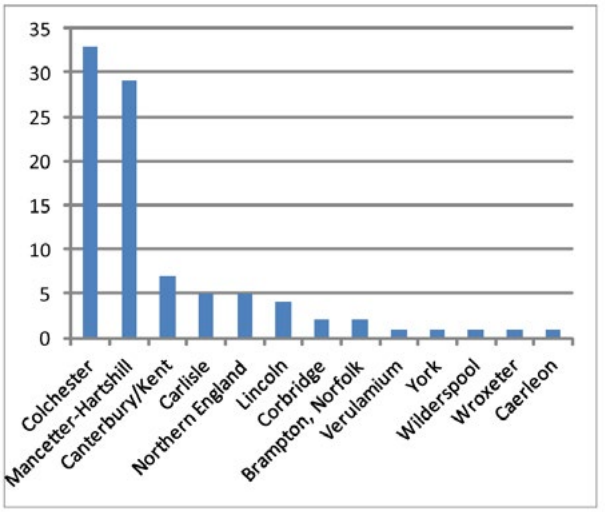

Figure 18.4. Sources of stamped mortaria exported to Antonine Scotland which are identified in publications by K.F. Hartley from 1963 to the present date. For references see the bibliography complied by Dannell and Irving (2005), and for subsequent reports see Inveresk (Hartley 2004) and Bearsden (Hartley 2016). Birrens, continuing for a while as an outpost fort of Hadrian's Wall after the abandonment of Antonine Scotland, is excluded, but Cramond, where the early Antonine mortaria were distinguished by Hartley from the Severan and later examples, is included. Hartley 2016 (139, table 7.5) has shown that mortaria in Scotland stamped by Sarrius and previously attributed to Rossington Bridge were made at Bearsden, and their identifications have been amended.

The British pottery industries supplying Antonine Scotland

Introduction

The possible relationships between the supply of pottery, cereals and other materials is best examined in the light of rural settlement as characterised in the regions defined in *New Visions of the Countryside of Roman Britain* (Fulford and Brindle 2016: fig. 1.5). In effect, the focus is on two areas: the area of BB1 production in the South and the major pottery industries in or neighbouring the Central Belt (Figure 18.1). The regions to the north extending as far as Hadrian's Wall, much of which was controlled by the army until the end of the Hadrianic period, supplied little to Antonine Scotland, and the reasons for the poor showing of these industries are discussed below. One major industry in southern Britain, in the Alice Holt and Farnham region, seems to have contributed nothing at all. It was situated inland and its products were mainly distributed in the eastern part of the South region (Tyers 1996: ill. 226), London being one of its major markets.

The BB1 industries

No other pottery industry in Britain rivalled the output achieved by the BB1 production centre in south-east Dorset (Allen and Fulford 1996). Amongst the coarse ware potteries of the north-west provinces, excluding those specialising in mortaria, its reach is only paralleled by the gritty wares of the Eifel industries which from the later second century AD were distributed over an increasingly large area, eventually extending as far south as Raetia and including south-east Britain with a trickle up the east coast to Hadrian's Wall (Brulet *et al.* 2010: 402–23). Both industries lasted to the end of the Roman period and played an important part in military supply. The extraordinary expansion in the production of BB1 has been partly attributed to the intervention of the provincial procurator, arranging for the pottery to be supplied to the army (Allen and Fulford 1996: 267–9). Much of the output of the industry, however, went to civilian markets, presumably without official intervention. Its penetration of the military market might have been achieved because of commercial factors, which also seem to have worked in favour of the lesser industries discussed below, and without the participation of the procurator.

Pottery was only one of the industries around Poole Harbour and in the Isle of Purbeck: they included the quarrying of Purbeck marble and shale working. Salt was also produced and might have been exported using BB1 jars as containers (Woodward 1987: 69 for their possible use for various commodities; Gerrard 2008, 21–3, specifically for salt). This remains a possibility, but the estimated annual volume of production — perhaps more than 1,500,000 vessels involving 750-1,000 workers (Allen and Fulford 1996: 253–5) — would amount to far in excess of what would be required for the transport of salt and indeed preserved food stuffs, both of which were produced in other areas which transported pottery to Antonine Scotland. There can be little doubt that most of the BB1 was distributed entirely for use as kitchen and everyday table wares.

The distribution of BB1 on the northern frontiers shows a clear bias towards the west, and most of it was clearly shipped up the west coast (Gillam and Greene 1981: 9–21), though some arrived via the east coast route, as noted above. The same westerly bias is evident in the products of a second centre, now known to have been in east Devon on the border of the South and South-West regions, which also sent small amounts to Antonine Scotland (SOW BB1: Holbrook and Bidwell 1991: fig. 26, with later finds at Camelon and Cramond).

If BB1 from south-east Dorset and east Devon was taken overland to a port on the southern side of the Bristol Channel, for example Crandon Bridge (Rippon 2008) (Figure 18.1), there might have been some association with the transport of cereals from the regions through which the route to the sea passed. The difficulty is that the area in question is on the borders of the South-West, South and Central Belts; although there is no detailed knowledge of its agricultural capacity in Roman times, the area is not noted in later periods for cereal production and was unlikely to have contributed as much as the main part of the Central Belt to military supply. Had cereals been brought from further to the east, Savernake ware might have been expected to play a minor part in supply to Scotland; it was distributed widely in Gloucestershire and Somerset from kilns in Wiltshire (Tyers 1996: ill. 248). More important for military supply were perhaps minerals from the South-West: lead from the Mendips; iron from the Blackdown Hills (the same area was the source of South-Western BB1) and Exmoor; and tin from Dartmoor and Cornwall, the latter also a source of copper, gold and other minerals.

Pottery industries and cereals in and close to the Central Belt

Central Roman Britain has been described as the bread basket of the province (Smith 2016a: 206). Much of this zone has been classified by Natural England as the Central Belt (Fulford and Brindle 2016: fig. 1.5), stretching from the Bristol Channel to the Wash (Figure 18.1). It included a wide variety of landscapes, but there were common trends in the development of its settlement and agriculture. In most areas major changes and expansions in the patterns of occupation established in the Iron Age took place only from the beginning of the second century AD. Numbers of complex farmsteads, trackways and field systems increased, and there were new 'implantations' in the western part of the region (Smith 2016a: 206). Spelt wheat was 'overwhelmingly dominant' in all areas, and on almost every site it occurred in greater quantities than barley (Smith 2016a: 190, figs 5.52–3). As already noted, this intensification of cereal cultivation has been linked in part with supply to the army.

Apart from at its north-east and south-west ends, the Central Belt is land-locked. Production centres are generally situated on its borders, and other centres in adjacent regions might well have been on routes used to take cereals from the Central Belt to coastal ports.

Colchester: kilns outside the *colonia* were the source of a wide range of pottery found in Antonine Scotland. Their mortaria were of 'outstanding importance' in eastern Scotland (Hartley and Tomber 2006: 31; cf. Figure 18.4) and occurred in significant quantities throughout the length of the Antonine Wall. Hartley (1978–80: 263, table 2) was able to show that 'allowing for possible differences in the extent of excavation of different sites it seems likely that more than a third of all the Colchester mortaria with herringbone stamps were sold in Scotland'. Even more important was BB2, most or all of which came from Colchester (evidence for its sources is summarised in Bidwell and Croom 2018: 200–2); it was the single largest supplier of cooking pots, bowls and dishes in the eastern and central sectors of the Antonine Wall. Other products included fine-ware beakers; grey and oxidised wares might also have reached Scotland, but their fabrics are difficult to distinguish from products of many other centres. The output of the industry at Colchester was on a very large scale, supplying not only the *colonia* and the army in northern Britain but also a regional market, seen most clearly from the distribution of mortarium stamps in south-east England (Hartley 1999: 211). Expansion of production, none of which had previously reached military markets after the Claudian period, began at the beginning of the Antonine period (Bidwell 1999: 495) and included the introduction of new types of mortaria which were possibly of continental origin (Hartley 1999: 211). Military supply continued after withdrawal from the Antonine Wall. It was probably then that small-scale production of samian ware began at Colchester, perhaps in an unsuccessful attempt to win a share from the continental potters (Dickinson 1999: 120–1).

Navigation on the River Colne was not practicable as far upstream as the *colonia*. Fingringhoe, 8 km downstream, seems to have served as the port for the Claudian fortress, and Roman roads led from Colchester to other possible landing places at Mistley and Mersea Island (Crummy 1997: 71–2). Colchester lies at the north-eastern extremity of the South region. Agriculture in much of its hinterland, which embraces parts of two other regions, was very productive. Spelt wheat was 'grown and processed with some intensity' in the southern part of the East region, which lies to the west and north-west of Colchester (Smith 2016b: 239). Further to the west, it was cultivated 'almost to the exclusion of other crops' in the West Anglian Plain, part of the Central Belt (Smith 2016a: fig. 5.2; Allen and Lodwick 2017: 174). The southern part of the Plain is *c*. 80 km from the closest part of the east coast which is also near Colchester. Ports and landing places that served the *colonia* and its pottery industry were very likely to have been involved in the export of cereals from the very productive areas to the west. A possible alternative is London, roughly the same distance from the southern part of the West Anglian Plain, but it is considerably further by sea to Scotland than Colchester.

Mancetter-Hartshill mortaria: the kilns were near the north-western edge of the Central Belt, near the Fosse Way. The distribution of their mortaria on the Antonine Wall shows a western bias (Tyers 1996: ill. 120). At Bearsden there were 13 examples as opposed to 10 Colchester mortaria (Hartley 2016: table 7.2), whereas at Inveresk and Camelon they were scarce. In the early Antonine period all the Mancetter-Hartshill mortaria were probably shipped to Scotland up the west coast, first travelling overland to the north-west and then being shipped north perhaps from the lower reaches of the Rivers Dee or Mersey. The route to the north-west passed through the Central West region which, lacking any evidence for intensive cereal cultivation, might have concentrated at least in some areas on animal husbandry and its products (Brindle 2016: 305–7). It is of course possible that cereals from the nearest parts of the Central Belt passed along the same route as the Mancetter-Hartshill mortaria. Worth noting are eight legionary and auxiliary lead sealings from various sites at Leicester, *c*. 28 km east of the mortarium

kilns (Bidwell 2015: 128). Such finds are scarcely known from other towns in Britain, and the examples at Leicester suggest that in the later second and earlier third century AD, if not earlier, army supply played an exceptional part in its commercial life.

Lincoln: the kilns at South Carlton, 5 km north-west of the *colonia*, were minor suppliers of mortaria and possibly other wares to Scotland (Figure 18.4), but in terms of the size of their overall market the northern frontiers were of great importance: a third of the potter Crico's stamps are from Scotland (Hartley 1978–80: 259), and Darling (2014: 310, fig. 244) has shown that little of their output reached the *colonia*.

Severn Valley ware: vessels in this ware, most commonly narrow-mouth jars, were of some importance in Antonine Scotland, though much less common than BB1 and BB2. It once seemed that their distribution showed no marked bias towards the west (Webster 1977: 173), but subsequent quantifications suggest that there was such a bias: at Bearsden the ware represented 5.3% of the pottery by weight (Bidwell and Croom 2016: table 7.17) but less than 1% at Camelon and Inveresk (Bidwell and Croom forthcoming; Croom and Bidwell forthcoming). Its general distribution is entirely confined to the west of Britain apart from on the two Walls (Tyers 1996: ill. 254; there can now be added occurrences at the eastern end of Hadrian's Wall: Bidwell and McBride 2010: 115).

Production of the ware extended over a large area, from Shepton Mallet in Somerset as far north as Wroxeter (Figure 18.1), but the most important production centre seems to have been around Malvern, on the north-west edge of the Central Belt (Timby 2017: 313). Mortaria were also made at Wroxeter, but the two stamped examples known from the Antonine Wall are thought to have been taken north from Chester by soldiers of *legio XX* (Hartley 1975: 142). Webster (1972: 197), discussing the much smaller amounts of Severn Valley ware from Hadrian's Wall, favoured shipment northwards from the River Dee, but, as the main distribution area of the ware was in the lower Severn Basin and to the south (Timby 2017: 314-22, fig. 7.21), it was possibly taken north via the Bristol Channel.

Other minor suppliers: the minor sources of coarse wares that reached Antonine Scotland were generally situated near the Thames estuary or in the East region. Kilns in the area of Verulamium seem to have commanded about half of the market for mortaria in Britain, both civilian and military, during the Flavian-Trajanic period (Swan 1984: 97). The industry was in decline by the Antonine period, resulting in a comparatively poor showing of their products in Scotland. Perhaps the most important sources of other pottery were the kilns at Upchurch and perhaps elsewhere in north Kent that supplied poppyhead beakers, though some also came from Highgate (information from Paul Tyers), and those at Canterbury and in its vicinity which supplied mortaria (Hartley and Tomber 2006, 97). Small numbers of other pottery types also came from Kent: storage jars in shelly ware, and probably a few grey wares from kilns in north Kent (Monaghan 1987, 211-13). From these modest beginnings the industries around the Thames estuary eventually captured almost the entire market for coarse wares, excluding mortaria, in the eastern part of Hadrian's Wall during much of the third century AD (Bidwell 2017).

Likewise, in Antonine Scotland a few mortaria from Brampton, Norfolk (Figure 18.4), storage jars from Horningsea and smaller jars from the Nar Valley were the precursors of a much larger influx of East Anglian pottery to northern frontier in the third century AD, particularly Lower Nene Valley mortaria and colour-coated ware (the identification of the latter on the Antonine Wall is doubtful

because of possible confusion with similar wares from Colchester and Cologne: Tyers 1996: 173–4). The only western British pottery represented in Antonine Scotland, apart from those already listed, is a mortarium from Caerleon found at Bar Hill and assumed to have arrived with a soldier of *legio II* (Hartley 1975: 146).

Supply from industries north of the Central Belt

The legionary fortress at Chester and its surroundings, in the north-west part of the Central West region, were served by a pottery at Wilderspool, and its potters also worked at Walton-le-Dale, 40 km to the north (Figure 18.1) (Hartley and Tomber 2006: 52); the legionary pottery at Holt was in decline by the early Antonine period (Swan and Philpott 2000: 62). Small numbers of mortaria made by the Wilderspool potters reached Antonine Scotland, but other products of industries in the area around Chester, including Cheshire Plain ware (as defined by Webster 1991: 11–13), were absent. Local farms seem to have concentrated on rearing stock (Brindle 2016; 306), and there might not have been surplus cereals to be shipped north. The main traffic was probably in cereals from the Central Belt and salt from processing sites such as Middlewich and Droitwich, together with mortaria from Mancetter-Hartshill and possibly Severn Valley ware. Whether Chester itself served as an *entrepôt* for all this material is uncertain: it could have been embarked directly from a coastal site such as Meols on the tip of the Wirral.

The fortress at York, in the North-East region, was likewise served by local industries, but virtually none of their products have been recorded from Scotland; a mortarium found at Bar Hill and stamped by Muco, apparently a York potter, was perhaps brought to the fort by a soldier of *legio VI* (Hartley 1975: fig. 49, no. 1). A study of the transport system used for exotic imports in Roman Britain indicates that York was a consumption rather than redistribution centre (Orengo and Livarda 2016: 30). There was also nothing from potteries north of York along Dere Street, at Aldborough, Catterick and Piercebridge, and from others in east Yorkshire and in the Tees Valley. Their periods of production in the second century AD are not well dated, but some at least were likely to have been operating when Scotland was occupied. The capacity of local agriculture to produce a surplus for export is uncertain: field systems established in the Iron Age were reorganised, presumably to improve productivity, mainly in the later Roman period (Hodgson 2012: 52–5; Allen 2016b: 280).

The two legionary fortresses had easy access to the sea and were served by local industries that produced pottery for the army. It might be thought that surpluses not only of pottery but also of cereals and other goods produced in the region would have been available for export when parts of the legions were sent to Scotland to build the Antonine Wall and then perhaps to hold some of the forts. To judge from the pottery, this did not happen. The explanation is probably that what has been regarded as exceptional – the long-term absence of parts of legions from their fortresses – was by no means unusual. The majority of the legion at Chester, it has been suggested, was absent between *c.* 120 and *c.* 210 because of events further north in Britain, 'with the fortress – still nominally the regimental headquarters – becoming little more than a rearward depot functioning variously and intermittently as arms and equipment manufactory, stores compound and transhipment centre' (Mason 2012: 164). Those were always amongst the many functions of fortresses and their satellite establishments. Equally typical was the absence of vexillations, rarely so amply attested as the cohorts working on the two British walls are by building inscriptions. Even so, many of the centuries presumably returned to Chester at the

end of the building seasons, leaving a holding force during the winters. After the Antonine Wall was finished, some forts seem to have been held by legionaries (Keppie 2009: 1137), but probably only one or two cohorts from each of the three British legions were involved. Most of the forts were probably occupied by auxiliaries. Signs of dereliction in the fortress at Chester during the period in question are equivocal, and at the same time the *canabae* 'continued to prosper and expand' (Mason 2016: 168). Similar reservations have been expressed about suggestions of exceptionally reduced numbers in the fortress at York in the Hadrianic and early Antonine periods (Bidwell 2016: 132). If Chester and York were still occupied by large parts of their legions throughout most of the early Antonine period, there might have been no surplus, either of pottery or other commodities, for export.

On Hadrian's Wall and in its environs circumstances were different. The Wall forts were largely vacant or at the most held by small caretaker forces (see Hodgson, this volume). At Corbridge, where the fort lay south of the Wall, occupation continued, as it probably did in some form at the Carlisle fort, likewise situated behind the Wall. Both places sent mortaria to Scotland and perhaps also grey wares, though none of the latter has yet been identified with any confidence.

Factors other than transport costs in the long-distance supply of pottery to Antonine Scotland

The preceding survey shows that the Central Belt and adjacent areas were the main sources of coarse wares imported to Antonine Scotland, except for BB1. More than anywhere else in Britain, these areas also had the agricultural capacity to make good any deficiencies in local supplies to the northern frontiers of wheat and other cereals. Low transport costs, resulting from the combination of pottery with bulkier and higher value consignments, were not the only factor that explains the successful export of products from kilns in southern Britain to the army in the north. Many of their products were technically superior to what was made in Scotland. The wide distribution of BB1 vessels, reaching not only most of Britain but also parts of northern Gaul, resulted from their efficiency as cooking wares (Allen and Fulford 1996: 266; Tyers 1996: 66). Mancetter-Hartshill mortaria, with their hard, creamy-white fabrics, resemble superficially the products of several successful industries of other periods in Britain and northern Gaul. Another factor was capacity. As explained above, the industries serving the British legionary fortresses sent almost no pottery to Antonine Scotland. Chester's main contribution was to send potters making 'raetian' mortaria from the legionary depot at Holt (Hartley 2016: 213). Carlisle and Corbridge were able to export more because most of the army was withdrawn from Hadrian's Wall.

Perceptions that the annexation of a huge tract of territory would open up new commercial opportunities cannot be discounted. One result, as we have seen, was that there was a new system of supplying coarse wares to the army, with much greater reliance on distant sources. But why did the Colchester potters, supplying only a local civilian market since late Claudian times, suddenly obtain a major share of the military market for mortaria and other coarse wares? The answer must lie in the regular methods of procurement, succinctly summarised by Breeze (1984: 277–81): taxation in kind, requisition at fixed prices or purchase on the open market. The last seems most likely at Colchester, the success of its industry depending on capital to expand production and engage potters to make new types. Nothing suggests that the volume of general traffic along the east coast was much less earlier in the Roman period, but the only pottery industry in south-east Britain that sent appreciable amounts to the north was in the area of Verulamium. Long-distance supply of British coarse wares on the east-

coast route was not developed further until the early Antonine period, and only from the early third century AD was it fully exploited, leading to the extinction of most pottery production in the Hadrian's Wall zone (Bidwell 2017: 292). The stimulus for this further development was probably the advance into Scotland, which added a huge tract of territory to the province. It extended the supply lines and offered new commercial opportunities. The building of Hadrian's Wall, part of a reorganisation of the existing frontier areas, had not involved radical changes to the supply system.

Expectations of lucrative new markets also attracted potters to Scotland, such as the mortarium maker Sarrius or workers from his main base at Mancetter-Hartshill (Hartley 2016: 144–5) and artisans working in the North African tradition perhaps from Gallia Narbonensis (Bidwell and Croom 2016: 180–1), in addition to the potters from Holt.

Fluctuations and difficulties in supply

A final consideration is the comparative difficulties of the two coastal routes to the north. Assuming that BB1, probably the most important commodity transported on the western route, was taken overland from Poole Harbour to Crandon Bridge on the Bristol Channel, a journey of about 115km (Allen and Fulford 1996: 258–9; Rippon 2008), the sea route to the Clyde was only slightly longer than that from Colchester to the Forth; for comparison, the distance calculated for modern shipping between Bristol and Glasgow is 394 nautical miles (730 km), and between Wivenhoe (just up-river from Fingringhoe which served Colchester at least in the early Roman period) and Leith (a modern port between Cramond and Inveresk) it is 353 nautical miles (654 km) (Sea-Distances). Both routes had difficulties of navigation (Ellis Jones 2012: 24–7), but voyages along the west coast in the second century AD might have been vulnerable to piracy from Ireland or even from parts of Wales and western Scotland. This sort of threat to the east-coast route came later. Apart from BB1, the quantities of pottery which arrived in Scotland along the west-coast route were small. The distribution of mortaria suggested to Hartley (1999: 209) that 'delivery by coastal traffic served the east very well, and as a result the production of mortaria was limited in this part of Scotland; the reverse appears to be true in the west'.

Changes in pottery supply were evident at Camelon (Bidwell and Croom forthcoming). The inner ditch of the fort on its south side, excavated at Glasgow Road in 2011, was sealed beneath a widening of the rampart. Its filling was of two phases, the lower of which, in addition to 90 leather shoes, contained a large group of pottery. Samian associated with this deposit suggests that it was closed no later than *c.* AD 150. As Table 18.1 demonstrates, there was about two and a half times as much BB1 as BB2, whereas in the pottery from the rest of the excavations, presumably representing occupation of the site throughout the early Antonine period, the ratio of these wares was reversed. A similar variation in the amounts of BB1 and BB2 in earlier and later deposits has been noted at Inveravon, though the quantities involved are much smaller (Thomas 1995). The early predominance of BB1 at these eastern sites can be explained by the extension of its distribution up the east coast, which as shown above was established before the early Antonine period. BB2 gained a predominant share in eastern Scotland as the Antonine occupation wore on.

Another informative deposit is from the outermost west ditch at Mumrills, a *terminus post quem* for which was established by an *as* of Antoninus Pius issued in AD 154–5, 'not much worn', supported by samian ware and mortarium stamps respectively no earlier than *c.* 150 and *c.* 150-5, or even perhaps

Fabrics	% weight		% sherd numbers		% EVEs	
	ditch 485, lowest fills: wt 14.4kg	remainder of area 2: wt 26.4kg	ditch 485, lowest fills: 513 sherds	remainder of area 2: 1304 sherds	ditch 485, lowest fills: 2002%	remainder of area 2: 4286%
Samian	8.5	17.1	10.1	14.9	14.6	19.9
Mortaria	15.5	14.6	1.0	4.2	6.1	3.9
Flagons	1.9	5.1	2.3	7.7	2.9	6.8
Fine wares	0	1.7	0	3.3	0	6.1
BB1	24.8	12.4	25.9	10.8	28.3	11.9
BB2	9.8	17.9	7.0	23.7	13.5	24.6
Grey wares	38.0	15.0	51.9	16.6	34.6	16.5
Oxidised	0.5	6.4	1.2	6.1	0	4.2
Other	0.9	9.9	0.6	12.7	0	6.1

Table 18.1. Comparison of the quantities of wares from the ditch of the Antonine fort at Camelon and from all other features in Area 2 in the excavations at Glasgow Road in 2011 (Bidwell and Croom forthcoming)

160 (Steer 1961: 100, 109, 113). Gillam (1961) identified 306 separate vessels, including fine wares but excluding mortaria and samian (amphorae were not mentioned); 252 were in black-burnished ware, of which 96 were in his category 1, now known as BB1 and mainly from south-east Dorset, and 156 in his category 2, that is BB2, mainly and perhaps exclusively from Colchester in the period of the Antonine Wall. Amongst the remaining vessels there were eight fine-ware beakers from Cologne or the Argonne region, another decorated in barbotine which was probably from Colchester, and a poppyhead beaker likely to have been from Upchurch in north Kent or perhaps the Highgate kilns, 10 km north-east of London. The coarse wares included the rim of a jar now recognisable as a North Gaulish product (Gillam 1961: fig. 15, no. 91; cf. a largely complete example from Bearsden: Bidwell and Croom 2016: ill. 7.8, no. 219), and some of the flagons and narrow-mouth jars might have been from southern Britain. Therefore, according to Gillam's figures, roughly 85–90% of the coarse and fine wares came from beyond Scotland, a higher figure than from other quantified deposits (Figure 18.3). This raises the possibility that in the final years of occupation local production had come to an end because of successful competition from the southern British industries. There is perhaps a contrary indication from Bar Hill where a pottery kiln, some of its products of North African style, was built in the stoking area of the internal baths after they had gone out of use (Keppie 1985: 60, fig. 5; Swan 1999: 426–7), presumably at a late stage in the occupation unless they had been replaced by external baths still to be discovered. Further late groups are needed to show whether Mumrills represents a widespread trend in Scotland.

Conclusions

Demonstrating how the transport of various categories of supplies to Scotland might have been interdependent necessarily involves some uncertainties. The origins of much of the pottery are clear, but evidence for the long-distance supply of cereals is circumstantial. It relies partly on a pessimistic view of the capacity of local agriculture, as opposed to developments in southern Britain, particularly in the Central Belt, which would have made a surplus available for export. There are also the various deposits from military contexts, earlier and later than the Antonine occupation of Scotland, that point

to long-distance movements of spelt wheat and the importation of bread wheat from northern Gaul, which also supplied the army on the lower Rhine. Also important are the indications in the second century AD of a shift from mixed agriculture to cattle-rearing on the Northumberland coastal plain and perhaps further north. More carbonised deposits such as those found long ago at Castlecary and Westerwood would be helpful, but they occur very rarely.

There is always the possibility of a *deus ex machina* in the form of written materials, easier to imagine since the discoveries at Vindolanda and Carlisle, and more recently from the Bloomberg site in London. They might itemise the movement of cereals more clearly than previous discoveries and say something about its organisation. Apart from mentioning the possible involvement of the provincial procurator in the distribution of BB1, a special case because of the scale and longevity of the industry, there has been little discussion here as to whether there was official involvement in the supply of pottery from other sources. The reason is that the mere fact that pottery was moved over long distances says little about the underlying commercial calculations. Capital would have been needed to increase production at Colchester, but was this available because a contract was awarded by the army or because exceptional returns were expected from the new market in Scotland? All that can be said is that the large number of sources seem more readily explicable by the opportunism of private enterprise, a view favoured by Gillam in his analysis of BB1 and BB2 on the Antonine Wall (Gillam and Greene 1981: 20–1). In the early AD 140s hopes for the rapid transformation of the newly-conquered territories into a prosperous part of the province might have ridden high: for example, one of Sarrius's mortaria came from a near-primary context at Bearsden, indicating that this potter expanded his production to Scotland at an early stage in the occupation of the Antonine Wall (Hartley 2016, 139). The outcome was different, and lucrative new markets failed to materialise.

How well the system of supply worked, whatever its basis, is uncertain. The changes in pottery supply detectable during the two decades that Scotland was held might have resulted from difficulties in establishing local production or in maintaining long-distance transportation of goods. The frontier works were advanced 160 km to the north of Hadrian's Wall, and territory extending up to 240 km from east to west was added to the province. The length of the east-coast route from London was increased by more than a third: the distance to the Tyne is 311 nautical miles (576 km), but to Leith it is 413 nautical miles (765 km) (Sea-Distances). The additional burden on supply systems was perhaps overlooked when the decision to enlarge the province was taken. Production in Britain might already have been overstretched: the agricultural development of the Fenland and possibly the Upper Thames Valley is likely to have resulted from anxieties about supply of the army (Smith and Fulford 2016: 410). Such difficulties would have been ameliorated when the abandonment of Scotland began in the late 150s and supply lines were shortened. They could hardly have been the main reason for this change in frontier policy but could have been a factor.

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19. The army of the Antonine Wall: its strength and implications

David J. Breeze

In a paper in the proceedings of the twentieth meeting of the International Congress of Roman Frontier Studies, Lawrence Keppie argued that 'the Antonine Wall was always lightly held in contrast to forts in its rear across Southern Scotland and the so-called "outposts" to its North' and that this was the result of the Roman army in Britain not having 'sufficient troops to occupy all [the forts and fortlets in Scotland] simultaneously' (Keppie 2009: 1141). This is an important statement. It relates not just to how the Antonine Wall operated but also to how we see the general military situation in Britain at the time. After all, if the Antonine Wall could be lightly held, what does this imply about the strength of Rome's enemies beyond the frontier and what relationship might it have had to the reasons for the abandonment of the Wall? It is primarily these implications which I wish to explore, but first I must consider Lawrence's statement.

Throughout his paper, Lawrence acknowledged the problems in seeking to determine the nature of the military occupation of the Antonine Wall. He pointed out that most forts were excavated over 80 years ago and their occupational histories are only 'sketchily' known. The size of a fort may be no direct indicator of the number of men based there, but common sense would suggest that there is normally a correlation between the size of a fort and the number soldiers it housed. The presence of legionaries, attested at many forts, could either relate to soldiers being there while undertaking building activities or subsequent occupation, though at the small fort on Croy Hill, he argued, the evidence was strong enough to indicate occupation by a legionary detachment (Figure 19.1).

Lawrence argued that previous estimates of 6000 to 8000 men based in the forts and fortlets along the Antonine Wall were too large. He noted that the 'primary' forts were large enough to hold complete or nearly complete auxiliary units, but that the situation was not straightforward. Two auxiliary units are attested at Castlecary (as well as legionaries) but the fort was not large enough to hold either of the thousand-strong units recorded there. An altar of the First Cohort of Baetasians testifies to its presence at Old Kilpatrick, the unit also being recorded at Bar Hill (Figure 19.2). In this case, Lawrence suggested either that the unit was divided between the two forts, or that, as only one period of occupation has been found at each, the explanation could be that the Baetasians were employed in building one fort and occupying the other.

In reviewing that archaeological material, Lawrence drew attention to the paucity of evidence for barrack-blocks. At Bar Hill he suggested that the steep slope in the northern part of the fort was such as to render usable buildings here unviable. Only one barrack-block was excavated at Balmuildy and the remainder assumed on the basis of the road patterns. No buildings were found in the northern half of the forward part of the fort at Cadder. The number of barrack-blocks at Bearsden could only have housed a small number of troops, while at Rough Castle the split barrack-blocks would be sufficient for just one or two centuries. At several forts, Old Kilpatrick, Westerwood, Castlecary and Mumrills barrack-blocks were either not sought, not found or not recognised by their excavators.

Figure 19.1. The tombstone found at Croy Hill depicting three legionaries (*CSIR* 90) (© National Museum of Scotland).

Lawrence noted that while the principal buildings were generally similar in size to those on Hadrian's Wall, and the granaries often seemingly larger than required for the soldiers in residence, the barrack-blocks were often smaller than normal and the bathhouses of simple design and smaller than those on Hadrian's Wall. He hypothesised that the addition of annexes may suggest a need to defend activities immediately outside the fort because of the 'sparseness of the garrison as well as vulnerability to attack'. He acknowledged Lindsay Allason-Jones' discussion of the paucity of the material culture of the Antonine Wall forts, accepting that several explanations were possible: the early date of excavations; the shortness of the occupation; tidiness; and now the smallness of the occupying force.

Finally, he pointed to the lack of evidence for civil settlements outside forts in spite of investigations at several sites. Civilian communities certainly existed (see Hanson, this volume). Carriden has produced an inscription recording the civilian community, and inscriptions found near Auchendavy are of civilians. Otherwise, only Croy Hill stands out through the richness of the finds. Field systems are also known. Lawrence suggested that the close spacing of the forts might have resulted in the civilians grouping themselves outside certain forts rather than living beside each one.

Figure 19.2. The altar dedicated by the First Cohort of Baetasians at Old Kilpatrick; they are also attested at Bar Hill (*RIB* III 3509) (© Hunterian, University of Glasgow).

Any paper which challenges widely-held perceptions is worthy of consideration, and critical review, and this is my intention.

Lawrence's statements are true, of course, but they are open to interpretation. Crucially the absence of evidence is not evidence of absence. The nature of the timber buildings in forts, with uprights placed in individual post-holes and not construction trenches, may have led to them not being found by early excavators. Indeed, John Gillam in his visit to my excavations at Bearsden in 1973, remarked on viewing the pattern of the post-holes of the barrack-blocks that some excavators may have investigated the site and completely missed the buildings. It is possible, therefore, that there may have been unlocated barrack-blocks in the forts at Old Kilpatrick, Balmuildy, Castlecary and Mumrills. Indeed, it would be surprising if there were not as each of these forts were, as Lawrence admits, large enough to hold a complete auxiliary unit. First, it is necessary to review the evidence.

The archaeological and epigraphic evidence

The forts are listed from east to west but only those with some evidence for accommodation are discussed.

Mumrills

Post-holes were planned in the forward and rear areas of the fort (Macdonald and Curle 1929). The former were incomprehensible but the latter formed three rows and were presumed to be parts of barrack-blocks. One row of post-holes was 36.62 m long. A 500-strong cavalry unit and a 480-strong infantry unit are attested here (*RIB* I 2140; 2142). The reduction in the size of the headquarters building may suggest that the sequence of occupation was in that order.

Rough Castle

Two timber buildings partially examined in the western half of the forward part of the fort were interpreted as being half-sized barrack-blocks, either together forming one such building or operating with similar buildings in the eastern half of the area, though there was some doubt whether permanent buildings had been erected there (MacIvor *et al* 1980: 241). Assuming that each building is half of one complete barrack-block, which is not certain, the total length of the building would be about 41.76m,

appropriate for the 480-strong infantry cohort attested there (Breeze and Dobson 1969: 26; *RIB* I 2144; 2145). There would appear to be space for two half barrack-blocks behind the central range, but it seems better to err on the cautious side and allow for two barrack-blocks, each divided into two (Figure 2.6).

Castlecary

No barrack-blocks were identified, but the available space could have accommodated up to eight such buildings (Christison *et al.* 1903). The maximum length for each building would have been 54.86m, approximately appropriate in size for the infantry barracks of either of the 1000-strong mixed unit of infantry and cavalry or the legionaries attested at the fort (*RIB* I 2146; 2148; 2149; 2151; 2155). There is no suggestion that all these soldiers were stationed at the fort at the same time and indeed its size would preclude the whole of either auxiliary unit being present; there is evidence that part of the First Cohort of Vardulli was elsewhere at this time, perhaps on the continent (Davies 1977: 169-70).

Bar Hill

The excavators of 1902-5 recorded rows of post-holes relating to three or four buildings in the rear part of the fort and two rows in the forward part of the fort (Macdonald and Park 1906: 53). If these relate to barrack-blocks, the statutory six buildings would have been provided for the six centuries of the two 480-strong infantry units attested there, presumably at different times (*RIB* I 2167; 2169; 2170; 2172). The most clearly defined building measured 37.49 by 9.45m, but a single post-hole may indicate the location of the officer's quarters pushing the building to a length of about 40.12m, and, by extrapolation, ten barrack-rooms. The forward part of the fort is certainly on a steep slope, but so was that part of the fort at Bearsden where there is clear evidence that the slope was terraced. Ploughing through the post-Roman centuries could have evened out any terracing at Bar Hill.

Cadder

Six timber buildings each measuring about 36.58 by 9.14m were recorded at this fort (Clarke 1933: 49). Four lay in the rear part of the fort together with a building of similar length but narrower width, and two in the forward part. The barrack-blocks were broadly similar in size to those postulated at Bar Hill and sufficient for a 480-strong infantry cohort.

Balmuildy

While only one building interpreted as a barrack-block was excavated, the stances for seven other buildings were identified (Miller 1922: 32-40), though not all may have been barrack-blocks. These were defined by drains, the existence of which might be thought to imply the existence of buildings between them. The measurements of the presumed barrack-blocks averaged 42.67 by 12.19m. Six barrack-blocks would be appropriate for a small infantry unit. The greater size of this fort in relation to Bar Hall and Cadder, where it is believed the same type of units were stationed, may be explained by the fact that Balmuildy was constructed earlier in the building programme.

Bearsden

Extensive excavations were able to confirm just two long narrow buildings as barrack-blocks (Figure 2.5). Adjacent to both were buildings of similar size but with different internal partition patterns. It

is possible that these were stables, but no drains were found which have been recognised in stable-barracks elsewhere and no chemical evidence was found to suggest the presence of horses. These buildings could therefore have held the equipment of the soldiers in the barrack-blocks and on that basis each barrack may have held two troops, a total of 128 men (Breeze 2016: 343). Little was excavated in the southern part of the fort. The only evidence in the eastern half appeared to be for some kind of industrial activity. To the west of the *via decumana* there appeared to be two timber buildings. In the report I stated that neither convinced as barracks (Breeze 2016: 343), but on reflection it must be admitted that 128 is a small force for a fort the size of Bearsden. One building (14) is wide enough to have been a barrack-block and perhaps it would be safe to place men within it, and possibly an infantry century rather than two cavalry troops. The total number of men at Bearsden would therefore be about 200. This number is less than a complete unit and the detachment may have been drawn from the mixed infantry cavalry unit based at Castlehill to the west (*RIB* I 2195).

Old Kilpatrick

As Lawrence noted, the rear part of the fort was not excavated. The excavator identified six barrack-blocks in the forward part, varying in length from 49.38 to 53.04m and in width from 7.32 to 9.14m (Miller 1928: 15). An inscription to Jupiter records the presence of a 480-strong auxiliary unit (*RIB* I 3509). The length of the barrack-blocks, however, combined with the size of the fort and the extent of the unexplored area, would suggest a more senior unit.

Barrack sizes

It is difficult to be sure of identifying the occupants of any barrack-block. Usually, ten barrack-rooms are taken to indicate the presence of infantry and eight rooms occupation by cavalrymen though there are variations (Breeze and Dobson 1969). As noted, only Bar Hill and Bearsden provide evidence on the number of barrack-rooms, the former probably containing ten and the latter eight.

The measurements of stone-built barrack-blocks on Hadrian's Wall are listed in Table 19.1. together with their timber Antonine Wall equivalents. The differences between the Antonine Wall and its predecessor, Hadrian's Wall, have been explored before (Breeze and Dobson 1970). In terms of this discussion, the singular feature of Hadrian's Wall is that all forts with but one exception appear to have been designed for whole units. That cannot be said for the Antonine Wall where only Bar Hill and Cadder have the appropriate number of barrack-blocks for a single unit, but the division of units between forts as well as the brigading of units together was common before the Hadrianic period

Unit	Hadrian's Wall	Antonine Wall
480-strong infantry	41.50 x 8.84 m	42.67 x 12.19 m
		40.12 x 9.45 m
		36.58 x 9.14 m
1000-strong infantry	49.38 x 9.75 m	54.86 m maximum length
cavalry troop (stone)	46.20 x 8.40 m	34.40 and 36.00 x 4.20/8.40 m
cavalry troop (timber)	45.00 x 7.20 m	

Table 19.1. A comparison of barracks between Hadrian's Wall and the Antonine Wall. The Hadrian's Wall cavalry barrack is Wallsend; the Antonine Wall equivalent is Bearsden

(Maxfield 1986). The division of regiments between forts makes it all the more difficult to reach conclusions on the implications of the size of barracks as much as their numbers.

The evidence that we have would suggest that the size of the accommodation for the infantry compares fairly well with that of equivalent sized units on Hadrian's Wall. The relationship between the cavalry barracks is more difficult to determine not least because the buildings had different internal arrangements, but the putative cavalry barracks at Bearsden are certainly shorter than their opposite numbers at Wallsend. Since the buildings at Wallsend contained horses as well as soldiers, the width of the soldiers' quarters is very similar to those at Bearsden.

Summary of archaeological and epigraphic evidence

Where the post-holes of several barracks have been recorded, at Bar Hill, Cadder and Old Kilpatrick, there are sufficient buildings to provide accommodation for a 480-strong infantry unit. The presumed stances for barrack-blocks were not investigated at Castlecary and Balmuildy but it is difficult to believe that these were not occupied, not least in the former case as we have epigraphic evidence for units based there. In the latter, drains were laid to each side of the presumed barrack locations. The size of the barracks on the Antonine Wall does not suggest that they held fewer soldiers than, say, the barrack-blocks on Hadrian's Wall.

Mumrills, Castlecary, Balmuildy and Old Kilpatrick were amongst the earliest forts to have been built on the Wall. Each, as Lawrence acknowledged, was large enough to hold a whole auxiliary regiment though that may not have happened. The 'secondary' forts are a different matter. Duntocher may be called a fort, but in size it approximates more to a large fortlet while the internal area of Rough Castle is at the larger end of the range of fortlet sizes (Symonds 2018: 8). The forts at Westerwood and Croy are so small that the number of troops based there must have been few in number; interestingly legionaries are attested at both (*RIB* I 3504; 2160; *CSIR* 90). Moreover, as Lawrence pointed out, there are areas in several forts, Cadder, Bearsden and probably Bar Hill, normally allocated to barracks but where none seem to have been constructed. We can only presume that some units were divided between forts while other soldiers were outposted to the fortlets along the Wall, but this must remain an assumption as we have no evidence for the nature of the occupants of the fortlets.

There can be no doubt of the veracity of Lawrence's statement that in some cases units were divided between forts. Rough Castle was too small to hold the unit recorded there. Part of the cohort of Vardullians attested at Castlecary was elsewhere. Castlehill appears to have been too small to have held the unit of 600 soldiers attested there and a division of the regiment between that site and Bearsden seems possible. The evidence is summarised in Table 19.2. In addition, detachments of legionaries were removed from their bases to man some forts along the Wall (Figure 19.3).

When we come to the fortlets, the situation is equally fraught. We have no evidence for the origin of the soldiers based in these installations. We usually assume that the soldiers in the milecastles and towers of Hadrian's Wall were outposted from the forts, but in Scotland the situation is more complicated for there is evidence that forts like Birrens and Crawford were planned on the assumption that some soldiers were always to be outposted. The same situation might pertain on the Antonine Wall. Yet, there are indications that some forts had accommodation for complete units while others certainly did

Site	Garrison	Estimated no. of men
Carriden	large enough to have held at least 480 soldiers	480
Inveravon	a small fort, perhaps a century	80
Mumrills	a 500-strong cavalry unit attested	500
Falkirk	perhaps half a 480-strong infantry unit	240
Rough Castle	perhaps 2 centuries of a 480-strong infantry unit	160
Castlecary	perhaps 6 centuries and 2 troops	544
Westerwood	some legionaries	160
Croy Hill	some legionaries	120
Bar Hill	a 480-strong infantry unit	480
Auchendavy	some legionaries	240
Kirkintilloch	? a 480-strong infantry unit	480
Cadder	a 480-strong infantry unit	480
Balmuildy	perhaps a mixed unit of infantry and cavalry	600
Bearsden	4 cavalry troops and a century	200
Castlehill	part of a 600 strong mixed unit	480
Duntocher	perhaps a century of 80 men	80
Old Kilpatrick	a large infantry unit	480
	Total	5904

Table 19.2 Estimated garrison sizes for Antonine Wall forts

not. Nor can we be sure of the number of men allocated to each fortlet. Duntocher appears to have had one building the same size as such structures in several milecastles on Hadrian's Wall, each believed to have been occupied by eight soldiers, but there are hints of a second building. There were two smaller buildings in Kinneil, though the clay subsoil made locating post-holes difficult. There would appear to have been buildings within Wilderness Plantation, but no measurements could be ascertained. Finally, we cannot be sure of the number of fortlets along the Wall. Perhaps we should go no further than acknowledge that the theoretical total for the number of soldiers based in the forts along the Wall should be increased by an uncertain number of soldiers outposted to the fortlets.

The total number of soldiers arrived at through this calculation is at the lower end of the range of figures noted by Lawrence as the generally accepted number of soldiers based on the Antonine Wall (Hanson and Maxwell 1986: 169). There are, however, caveats. Roman army regiments have been recorded under strength, in one case by 25% (Breeze 1984: 265). On the Antonine Wall, this might reduce the theoretical total to a working total of 4500 soldiers. There is also the perennial problem of the paucity of our evidence and our interpretation of what evidence we do possess. Many of the suggested figures for the number of men at individual forts are guesses.

The figure offered for the total number of soldiers in the forts along the Antonine Wall is a little less than that normally suggested and therefore corresponds more closely to Lawrence's preference. It is, however, still substantial. If it is related to the length of the Wall, the figure works out at about 150 men per Roman mile. The equivalent figure for Hadrian's Wall is about 100 soldiers per Roman mile, assuming that the soldiers in the milecastles and towers were supplied by the forts. On this basis, the strength of the force based on the Antonine Wall was considerable.

Civilians

Lawrence listed the evidence for civilians, and this subject is explored further by Hanson in this volume. There is a difficulty in using the evidence from extra-mural settlements to indicate the strength of the force in the adjacent fort in that, as Allason-Jones has stated, while most Scottish forts are relatively poor in artefactual remains, some are not so and the pattern appears to be random (2016: 349). Nevertheless, it might be expected that any group of soldiers would wish to keep their dependants close by, just as the reverse is true.

The occupation of southern Scotland

Lawrence drew a comparison between the Antonine Wall, lightly held in his view, and the forts of southern Scotland and the forts to the north of the Wall. The latter can be put to one side as it might be expected that there were stronger forces based in these more isolated installations than in the Wall forts. Military deployment in southern Scotland, however, is more helpful as it emphasises the integrated nature of the Antonine arrangements (Maxwell 1977: 29). Forts like Birrens and Crawford were not provided with all the barrack accommodation for the units which were based there, presumably on the assumption that some soldiers would always be on outpost duty in the fortlets. This splitting of regiments, of course, parallels the division of units on the Wall and implies that a single plan lay behind the disposition of the army of the frontier zone in the Antonine period.

Figure 19.3. One of the altars erected by M. Cocceius Firmus, a legionary centurion, at Auchendavy where there has been no excavation within the fort (*RIB* I 2176) (© Hunterian, University of Glasgow).

Like Lawrence, I have considered connections between the united strength of the forts along the Wall and the density of military deployment to its south as well as their relationships to wider issues (Breeze 1976: 73; 1982: 109-10). I suggested that it 'seems unlikely that the Roman army was preoccupied with the local tribesmen, fearing attack from them at any time and therefore going out of their way to control them' but that if 'the advance north had been merely in order to gain for Pius military prestige ... it would be expected that his legate in Britain, Lollius Urbicus, and his successors, would do everything in their power to ensure that nothing soured that victory.' That challenge between our understanding of the local scene and the wider imperial and military issues remains, but is now more nuanced as a result of recent in-depth analysis. And, when it comes to the local situation, definition of the area of study is important.

All agree that the characteristic feature of the land between the abandoned Hadrian's Wall and the Antonine Wall is the number of fortlets, yet most of the discussion and analysis relates to only one part of the inter-Wall zone, that where the pattern is most dense, Annandale and Nithsdale. The fortlets, however, spread northwards into Clydesdale and along the south-eastern slopes of the Pentland Hills reaching the southern edge of Edinburgh suburbia on the Lothian Plain, as well as westward to the Cree. They are present on Dere Street, with significant examples at Chew Green and Oxton. Is there one explanation which explains the whole pattern? After all, if the explanation of the density of fortlets in the south-west is the result of local hostility in that region (Hodgson 2009), why do we find them elsewhere, and especially in the territory of the supposedly friendly Votadini? One reason may be that the use of fortlets reflects an economic use of manpower (Miller 1952: 219-221), which chimes well with Lawrence's comment on the over-stretching of the army of Britain.

The military deployment of this time can also be placed in a different wider context. In an important discussion, Symonds suggests that 'the system instigated in southern Scotland represents the apogee of early imperial experimentation into highway security in the north-west provinces. It would be over a century before such installations reappeared in any numbers in Germany and France, and over 200 years before they experienced a renaissance in Britain. As such, they represent the culmination of [a] process of development' (Symonds 2018: 77). This statement is very similar to another relating to the Antonine Wall. 'The artificial barrier had now reached its peak. With the completion of the Antonine Wall there were more men per mile stationed on that frontier than on any frontier in Britain either before or after. ... With the return to Hadrian's Wall ... there was no attempt to increase the number of troops on the Wall line to bring the barrier into step with the Antonine Wall' (Breeze 1982: 162-4). In short, both the military deployment along the Antonine Wall and in its hinterland reflect a particular approach which reached its apogee at this time and was indeed the furthest swing of the pendulum of the development of frontiers which had started many decades earlier. Such a statement requires justification.

It is generally accepted that Augustus brought the empire to the bounds which it retained, though with some significant additions, for the next 400 years. Major army groups were located along the Rhine facing Germany which Augustus had tried – and failed – to conquer and hold. The army groups were generally situated beside routes into Germany (Breeze 2011: 172). At the other end of the empire, in Syria, there was a similarly large army group though in that case more focussed on providing defence against an attack from Rome's neighbour Parthia (Mann 1974: 521-2). In the century after the death of Augustus, the growing threat from the states across the Danube resulted in several legions moving east. Nevertheless, groupings can still be recognised. In several cases, this took the form of cavalry units being located close to legions, or sometimes even within the legionary fortress (Breeze 1993). This may be observed at Xanten and Neuss on the Rhine, and at Vienna, Carnuntum and Brigetio on the Middle Danube.

In Britain, little may be said in detail about military deployment until the conquests of the Flavian governors in the 70s and 80s and the subsequent disposition of their forces. In his discussion of military deployment in Wales following the conquest of the Welsh tribes, Davies noted that the governorship of Julius Frontinus (74-77) was 'something of a period of experiment in which large and small garrison posts, and intervening fortlets, were ingeniously utilised to control a very large and often mountainous tract' (Davies 1980: 261).

The complex terrain of hills and valleys in Wales led to the creation of a particular pattern of military deployment. The topography of the north of England was different. Here the main routes led northwards, sometimes though open countryside, sometime along river valleys, to east and west of the Pennines, linked by roads crossing the hills. The early forts were generally of a size to hold a single auxiliary unit in the Flavian period (Bidwell and Hodgson 2009: passim) and fortlets were few in number (Symonds 2018: 73).

In the lands north of the Tyne-Solway isthmus the topography was different again. In the late first century the pattern was for a large fort to be placed in each of the main river valleys, Annandale, Nithsdale, Tweeddale and the Forth basin, with a smaller fort in Clydesdale. These forts were each over 3.1 ha (8 acres) in size and capable of holding two regular auxiliary units. In between were smaller forts, each appropriate for a single auxiliary unit, smaller forts and fortlets (Breeze and Dobson 1976: 124-6; Maxwell 1977: 25). This alternating sequence was extended to the line of forts leading north from the Forth to Stracathro after Agricola's conquests there (Breeze and Dobson 1976: 127-8).

The Antonine pattern is entirely different (Figure 19.4). With the exception of Newstead in Tweeddale and Glenlochar in the south-west, the forts are generally of a size for a single auxiliary unit (Breeze

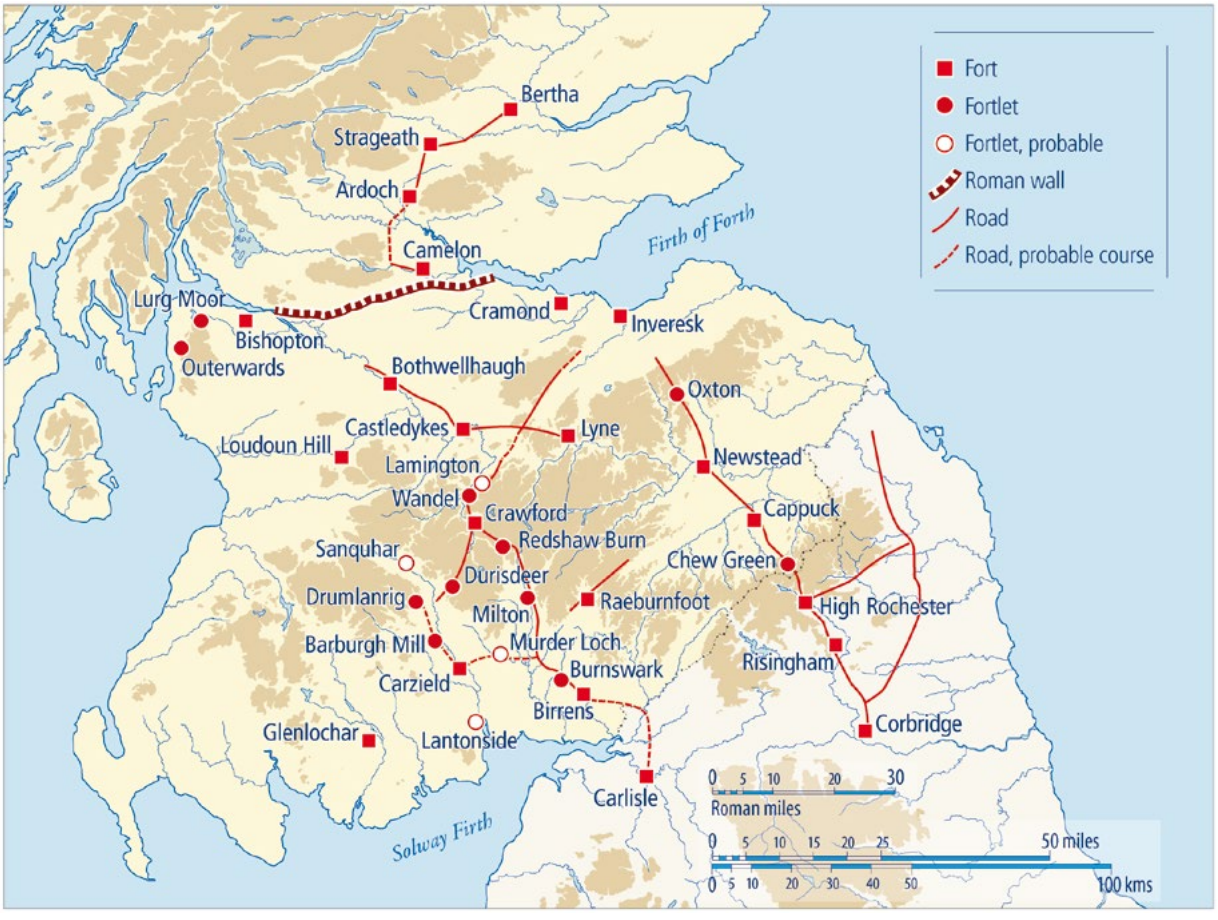

Figure 19.4. Map of Antonine Scotland (© David J. Breeze).

and Dobson 1976: 135-7). A similar pattern may be recognised on both Walls. Each fort on Hadrian's Wall, with but one exception, appears to have been designed for a single auxiliary unit. This, as we have seen, also seems to have been the case with the 'primary' forts on the Antonine Wall. Here, though, many of the other forts were too small to hold even the smallest unit in the Roman army of Britain.

This use of smaller installations was extended to the hinterland of the Antonine Wall (Figure 19.5). Here, the major difference in the Antonine period from the late first century was the number of fortlets employed (Maxwell 1977). Topography may have played a part here as in other areas. North of the Tyne-Solway isthmus the roads all followed river valleys, Redesdale in the east, Annandale

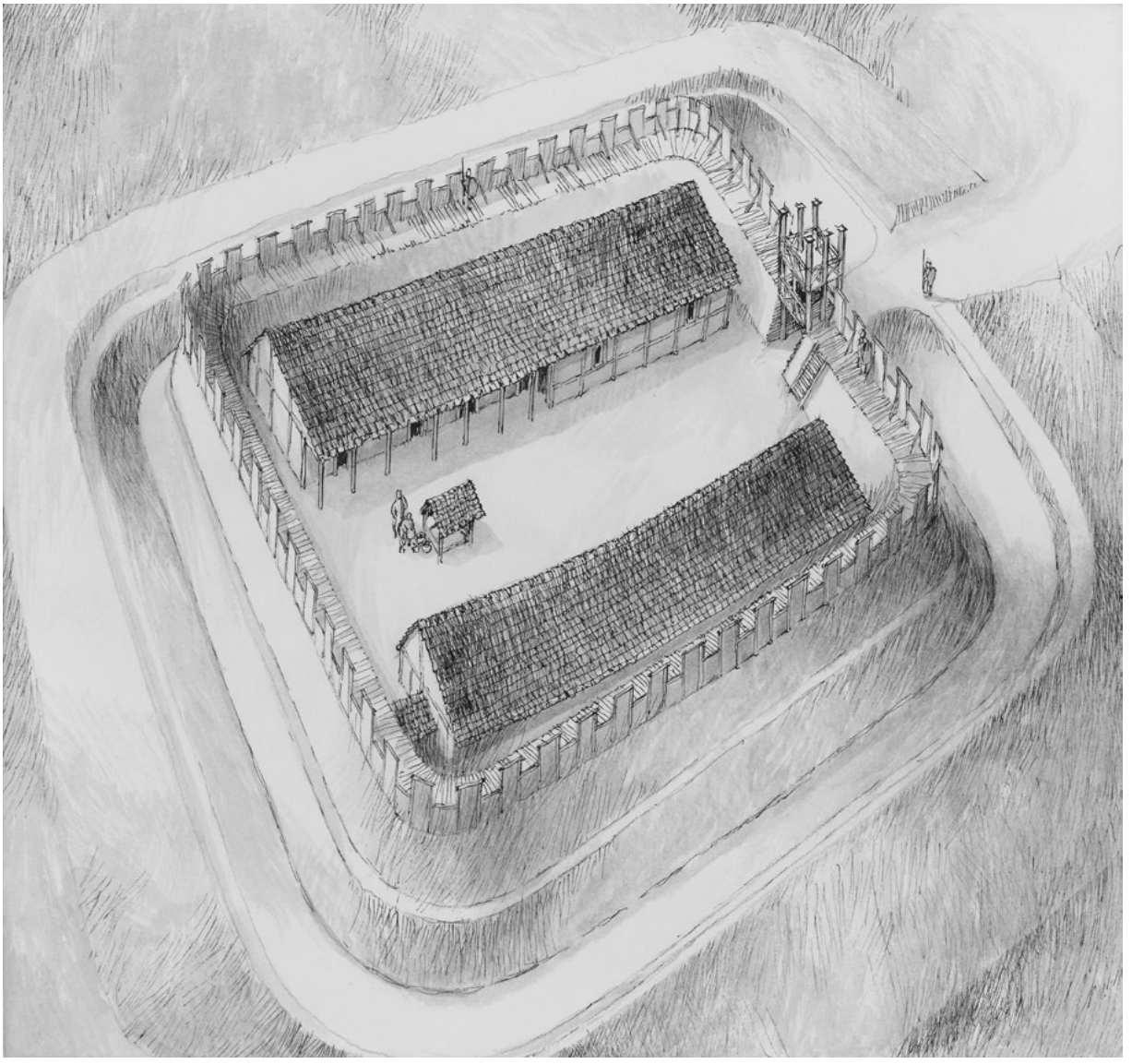

Figure 19.5. An impression of the fortlet at Barburgh Mill by Michael J. Moore (© Michael J. Moore and David J. Breeze).

and Nithsdale and then Clydesdale in the west. Here, perhaps, there was a greater requirement for surveillance in the more enclosed spaces of the valleys through which the roads passed (Maxwell 1976: 37; Symonds 2018: 84). Symonds, on the basis of his study of fortlets in Wales and northern Britain, suggested that their main role lay in the period following active campaigning when control of an area required consolidating and when Roman military communications might have been subject to disruption through raiding and banditry. He also noted that, with the exception of the milecastles on Hadrian's Wall, there are no certain examples of turf-and-timber fortlets being rebuilt in stone suggesting that they were not intended to be permanent features of the military landscape (Symonds 2015: 83. Maiden Castle fortlet on Stainmore is unusual in being stone-built but nothing is known of its history). This argument is open to challenge as Hanson (2009) has emphasised that new forts were generally built in turf and timber and only rebuilt in stone when necessary. The hinterland fortlets were therefore not rebuilt in stone because they, and the forts, were not occupied long enough for such action. It may be that the fortlets in the hinterland of the Antonine Wall were a temporary measure lasting only until control had been fully established, but we have no way of determining whether they were abandoned before the general withdrawal from the area (Breeze 1974: 144).

The use of fortlets in southern Scotland in the Antonine period therefore may be taken to reflect a basic Roman military practice in the various stages of invasion, conquest and consolidation. Their appearance, together with towers, in some numbers in south-west Scotland does not in itself demonstrate that the indigenous population of that area was particularly restless. The point may be emphasised by the use of fortlets beyond the south-west, northwards into the valley of the Lothian Esk and along Dere Street to the east, into areas which have not been suggested as restless, in fact, quite the opposite as they are generally considered to be part of the tribe of the Votadini seen as friendly to Rome. It may be that some fortlets, such as Durisdeer, were more strongly defended than others, but that would hardly be a surprise to a modern visitor to the site in view of its position in the narrow valley of the Dalveen Pass. Its impressive status, however, is determined by the way it sits on a prominent knoll rising out of the valley floor (Symonds 2018: 89). At Barburgh Mill, Durisdeer and Redshaw Burn, the entrance is protected by an additional length of ditch, but the placing of the entrances on the opposite sides of the two enclosures at the first site is a technique employed at Martinhoe and Old Burrow in the first century (Symonds 2018: 43; 90). On Dere Street, not generally regarded as a target for dissidents, Chew Green was, unusually, protected by three ditches (Symonds 2018: 88). In comparing Welsh and Scottish fortlets Symonds concluded that the 'simplest explanation for this [stronger defences] is that it reflects a palpable sense that the risk of an assault on a fortlet was considerably higher in Scotland' (Symonds 2018: 90). This reaction appears to have been part of a general pattern in Antonine Scotland where extra ditches were provided at several forts with no special relevance to topography (Breeze 2002: 885).

Conclusions

Lawrence is surely right to encourage us to look at our British evidence in its wider context. This not only emphasises the uniqueness of the Antonine Wall but also encourages us to compare the pattern of military deployment in its hinterland to those pertaining elsewhere. An argument which relates to manpower pressures also resonates with wider imperial issues, and not least the reason why Hadrian chose to abandon some of Trajan's hard-won conquests and consolidate Rome's expansion by the construction of land frontiers; both actions may indicate that Hadrian appreciated there was a

problem of manpower. The significant use of fortlets in the hinterland of the Wall would fit well with that scenario.

There are, however, other aspects to consider. The Antonine Wall is unusual within Britain in its use of small forts as well as the density of military deployment. It can be argued that this reflects the furthest point of a development in military deployment along frontiers which started under Augustus, thereafter the pendulum swinging back to reflect an earlier disposition of troops with stronger forces at individual sites. The multiplicity of fortlets in southern Scotland may be part of the same pattern, but also, it has been argued, their use fits into a particular military framework, the phase between conquest and consolidation, and therefore does not in itself indicate particular hostility by the local people. A further element is the imposition of the topography of the area which led to different systems of control in the inter-Wall area than those employed in northern England. Finally, the splitting of regiments both on the Wall and in its hinterland points to a coherent plan for disposition of forces across the newly conquered territory. This plan entailed the use not only of many fortlets, but extra defences to forts; the general impression is that the army did not feel totally secure in its occupation of southern Scotland. Perhaps more than anything, we can observe in the different methods of military deployment the pragmatic responses of the Roman army to the various landscapes in which it operated.

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20. Why was the Antonine Wall made of turf rather than stone?

Nick Hodgson

The two Walls

Describing how Antoninus Pius' legate Lollius Urbicus advanced into Scotland and built another wall, the *Historia Augusta* biographer makes a point of saying that the new wall was made of turf (*Antoninus Pius* 5.4). This contrast with Hadrian's Wall in its final form was therefore a feature of note for the Romans. It has led to much consternation and speculation among modern historians. The purpose of the present paper is to review thought on how the two walls related to one another and to explore again the question of why different materials and overall a noticeably lower specification than that of the Hadrianic scheme were used on the Forth-Clyde isthmus. These necessarily speculative thoughts are offered with affectionate gratitude to Lawrence Keppie, who has contributed so much to the study of the Antonine Wall and whose incomparable *Scotland's Roman Remains* has been my faithful companion and guide on expeditions north of the border.

The relatively impermanent look of the Antonine Wall influenced Haverfield in his belief that it was a kind of outwork to Hadrian's Wall: 'We must suppose that both walls were held together and that the northern line was defended by detachments from the garrisons of the southern line...whatever Pius meant by his vallum, it was in addition to, not instead of, Hadrian's Wall' (Haverfield 1899: 157).

Collingwood thought something the same: convinced that 'the garrisoning of the Antonine Wall was planned with a view to economy in men', and that, 'Both in construction and organization...the Antonine Wall bears the marks of a deliberate effort after cheapness, at the cost of a serious decrease in efficiency', he argued that 'Hadrian's [Wall] was to remain the chief bulwark of the province' (Collingwood and Myres 1937: 146): the Antonine invasion had been to defeat and deport troublesome tribes threatening Hadrian's Wall from the Scottish lowlands, and no serious threat was anticipated from central and northern Scotland. Collingwood concluded that: 'Granted the insecurity of the Antonine Wall's strategic position, the slightness of its works, the makeshift character of its organisation, and the strain which, even so, it imposed on the resources of the province, it may be thought to resemble a temporary measure, to last until the pacification of the lowlands had stood the test of time, rather than a revision of the frontier system designed for permanance' (Collingwood and Myres 1937: 148).

As late as 1967 Frere in his *Britannia* saw the Antonine Wall as a kind of outwork, arguing that the two walls were held simultaneously in a second Antonine period from *c.* 160-180 (Frere 1967: 155-6). This position was dropped in subsequent editions of the book after Hartley's study of the samian pottery in 1972 set the end-date of the Antonine Wall in the 160s at the latest, while his study of samian stamps in the same paper has been generally accepted ever since as showing that the two walls cannot have been held simultaneously for more than a brief period (Hartley 1972).

Both Haverfield and Frere could see the Roman army facing a formidable threat, and having much to gain by using a system of two walls: 'Pius...intended by his vallum to secure some quiet in the

district between the two walls, to relieve the pressure of attack on Hadrian's lines by what I will call a "breakwater", to push the Caledonian back and to isolate effectually the untamed Brigantes of the Yorkshire moors and Cumberland fells' (Haverfield 1899: 157).

By the 1970s no-one seems to have been thinking along such lines any longer. The Antonine advance was seen as a permanent move to extend the province and the Antonine Wall a replacement of, not an augmentation of, Hadrian's Wall. The Romans could move from one frontier line to another simply because they wanted to, for the glory of an emperor who needed a triumph. Hartley's influential argument that the incidence of samian dies precluded simultaneous occupation of the two walls must have been instrumental in this shift of thought, but it also reflected a change in attitude to seeing the Roman army as unstoppable, native hostility or resistance a negligible factor, and advances and withdrawals determined by imperial will – or imperial lack of interest. The walls (as distinct from the military units accommodated upon them) were no longer seen as 'bulwarks' but as devices intended to hinder low-intensity raids and to monitor movement in and out of the province – hence by definition only one could function at a time. Subtle variations on these themes can be traced in major works of synthesis of the period (Breeze 1982; Breeze and Dobson 1976; Hanson and Maxwell 1983).

Although the point has been made that turf construction does not necessarily imply temporary construction (Hanson 2009), the Antonine Wall clearly did not aim for the same monumental effect as Hadrian's stone wall, and did not attempt to outdo it in terms of prestige. One problem with the new interpretation was that, unlike the Haverfield-Collingwood model, it did not give a ready explanation for the inferior specifications of the new northern wall. This question was answered by saying that the original intention may have been to build the Antonine Wall in stone (Breeze and Dobson 1976: 85-7; Hanson and Maxwell 1983: 79). This was almost certainly correct (we shall return to the evidence for this belief), but no explanation was given for the evident change of mind, beyond suggesting that 'turf was a speedier rampart-building material than stone...and it was probably this factor...which determined the materials employed' (Hanson and Maxwell 1983: 79; cf. Hanson 2009). Also, why was no start made on stone replacement during the life of the Antonine Wall? Replacement in stone was in progress on Hadrian's Turf Wall (where the choice of material may well have had to do with the need for speedy completion) at the accession of Pius and was resumed (in all probability) immediately after his death in 161.

Also invoked were frontier works and forts elsewhere in the empire, undeniably permanent in intention but not built in stone, such as the Pfahlgraben of Upper Germany (often compared to the Antonine Wall). But again this simply opened up more questions: if meant to be the culminating monument of a glorious victory for Antoninus Pius, why was the northern wall not made as splendid as the superseded wall of Hadrian? The same objection can be made to geological explanations (that turf and earth, not stone, were the available building materials).

Some other explanation needs to be found. It does not lie in a return to the Haverfield-Collingwood model of the Antonine Wall as a planned temporary outwork of Hadrian's Wall. Collingwood's position rested on two perceived facts: that it was intended that Hadrian's Wall should continue in use, and the intended slightness of the specifications for the Wall and sites in Antonine Scotland. Both propositions are false, at least as far as original intentions go. The Antonine advance into Scotland is still the only plausible context for the insertion of crossings in the Vallum, the rearward earthwork of the Hadrian's

Wall system, at regular intervals (Swinbank 1954: 270-5; cf. Swinbank 1966: 90-91), and the removal of milecastle gates (Symonds 2013: 63-4). The systematic (though incomplete) nature of the slighting of the Vallum speaks of a symbolic action to negate Hadrian's Wall, to cancel out whatever it said about the need to mark a limit to the Roman empire on the Tyne-Solway Isthmus. The Vallum crossings were planned at a regular interval going beyond the requirement to provide a practical means of passing through the barrier every so often. Then there is the well-known evidence from the stone Antonine Wall fort at Balmuildy, with stone wing walls 30 feet (9.14 m) long, that for a time under Lollius Urbicus it was intended that the forts on the new wall should be of stone construction, and that a stone curtain wall was expected to join them up. There are no precise dimensions for the wing walls at Balmuildy, but what is recorded suggests that a curtain wall 7-8 feet (2.13-2.43 m) wide was anticipated (Miller 1922: 6-7 and plan at Plate LVIII) – possibly identical to the width of the Hadrianic Narrow Wall above its foundations. The late-Hadrianic stone replacement of Hadrian's Turf Wall west of the Irthing was on average 7 feet 7 inches (2.32 m) wide above the foundations and lacked offsets (Simpson 1913: 301; cf. Hodgson and McKelvey 2006: 45; 51-2). The earlier-Hadrianic Narrow Wall extension to Wallsend was marginally narrower, at 2.26 m. In terms of original intention, at least, Balmuildy suggests that the plan was to suppress Hadrian's Wall and replace it with a stone Wall further north. The start made at Balmuildy also casts doubt on geological explanations for the materials eventually used.

In the event the slighting of Hadrian's Wall was not carried to completion and the design of the Antonine Wall was modified. The characteristics which Haverfield and Collingwood relied on to deduce the functional relationship of the two walls were the results of a change of plan, admittedly extremely early in the building process, but nevertheless a change of plan. This initial modification of the plan led the way to others which came only a short time later – notably the likely decision to modify a Hadrian's Wall-like scheme of milefortlets and some six auxiliary forts spaced at 7-mile intervals so that every other milefortlet was replaced by a fort, giving a total of some 17 forts of various sizes, 19 if forts await discovery at Seabegs and Kinneil as spacing would suggest (Gillam 1975). The fact that there had already been a first stage of modification of plan, from stone to turf for both wall and installations, supports the idea that the addition of the 'secondary' forts was itself a further modification, despite a recent suggestion that the extant arrangement of forts was what was planned from the beginning (Graafstal *et al.* 2015). A change of plan also best explains points where milefortlets are superseded by apparently secondary forts (e.g. Duntocher, Croy Hill, Castlehill) – a point strongly made in a paper given to the 2018 Limescongress by Bill Hanson, and the subject of a forthcoming publication by him (Hanson forthcoming).

The programme of slighting of the Vallum of Hadrian's Wall, obviously intended to be general and systematic, remained unfinished. At various points only notches or incompleted gaps have been made in the Vallum mounds (Simpson and Shaw 1922: 52, Fig. 5), and causeways across the ditch were often not completed and in many cases were probably never provided at all (it is difficult to tell because of later removal of some causeway material). This could be interpreted as half-heartedness in the execution of an order, but a change of plan is equally possible and a better explanation for work abandoned while half-complete.

Evidence for continuing occupation on Hadrian's Wall

The Vallum was at least partially slighted with crossings and there seems no doubt about the removal of milecastle gates. The turrets are assumed to have been deserted and locked up, although there is rarely

clear-cut evidence for a period of abandonment (Charlesworth 1977: 19-20). The linear barrier was clearly thrown open. All our evidence for *possible* continued occupation comes from the auxiliary forts of Hadrian's Wall rather than the milecastles and turrets. On the question of whether the forts were completely abandoned, the archaeological evidence remains ambiguous and opaque, although there are indications of continuing occupation at some places, as well as a lack of clear evidence of dereliction or abandonment. It is remarkable that at those Hadrian's Wall forts where there has been extensive modern area excavation of interiors, including complete barrack blocks (Wallsend, Housesteads) no trace has been found of any interruption in occupation during the early-Antonine period. At Wallsend, on the contrary, there were traces of structural alterations that might have temporarily adapted a cavalry barrack to infantry use in this period (Hodgson 2003: 13; 60-1). The Hadrianic barracks at Wallsend were of timber and not replaced in stone until the 160s at the earliest. At Housesteads the investigated barracks are thought to have been stone from the outset and there was no indication that they had not been occupied uninterruptedly through the 2nd century (Rushworth 2009: 273).

A low level of early Antonine samian ware (a phenomenon supposed to indicate abandonment of several forts to the south of Hadrian's Wall) has been noted as a feature of the overall assemblage of samian from the 1974-81 excavations at Housesteads, and it has been suggested that his might reflect early Antonine abandonment (B. Dickinson in Rushworth 2009: 488). However, Rushworth has pointed out that the quantity of Hadrianic samian in the total assemblage is almost equally tiny, both the Hadrianic and early Antonine sherds being greatly outweighed by samian of post-160 date. He seeks to explain the small quantity of pre-160 samian by reference to the relatively limited investigation of the earliest levels at Housesteads, which in any case were noticeably clean and produced relatively few finds (Rushworth 2009: 273-4). In part the small quantities are also attributable to a dip in samian production that is general in the north-west provinces.

The problem of limited investigation of early levels applies equally to the excavation of Wallsend between 1975 and 1984. The samian report on the subsequent excavations of 1997-8, which did explore the early levels more extensively, neither supported nor contradicted the idea of early Antonine abandonment (B. Dickinson in Hodgson 2003: 189-93). At Birdoswald the samian also allows for the possibility of continued occupation, although here too the evidence is ultimately inconclusive (B. Dickinson in Wilmott 1997: 256-67).

If the ceramic and structural evidence remains ambiguous and unforthcoming, numismatic evidence also fails to provide a positive indication either way. Sites re-occupied after 160 will always have early-Antonine coins whether they were in use in that period or not, because the coins continued in circulation. Brickstock has developed a theory that a hoard of known deposition date can be used to establish the expected degree of wear occurring between the mint date of coins and their date of deposition, and on the basis of the comparable wear in the Rudchester Hoard suggests coin loss and therefore uninterrupted occupation at Halton Chesters, Housesteads and Vindolanda through the 2nd century. By the author's own admission, however, the proposed methodology cannot be relied upon until it is based on many more hoards than the single example used in his experiment (Brickstock 2017).

As evidence for some form of 'caretaker' occupation on Hadrian's Wall an altar from the *mithraeum* at Housesteads (*RIB* I 1583), dedicated by soldiers of legion *II Augusta*, *agentes in praesidio*, is often invoked.

Rushworth is very cautious about assuming an early Antonine date and suggests that small groups of legionaries might be outposted on special duties at any time, often alongside auxiliary units or detachments (2009: 285). But this seems to ignore the rarity of the formula and natural meaning of the Latin, which is 'acting or serving in garrison', implying that the legionaries were stationed at Housesteads in the absence of all or most of the regular unit. It is hard to envisage circumstances other than the Antonine Wall period when this might have happened. The early 160s, when legionaries were also detached to Benwell, might be another possibility. Note that the chip-carved ornament on this altar is right for the Antonine period (illustrated in Bosanquet 1904: 280; cf. Keppie 1998: 96, No. 24 = *RIB* III 3488). An altar dedicated by a soldier of *VI Victrix*, also to Cocidius, and also from the *mithraeum* area, is almost certainly contemporary. A building inscription from Housesteads (*RIB* I 1615) possibly dates to the reign of Pius, and is possibly legionary. Rushworth is quite right of course to suggest that whether or not these legionaries were *in praesidio* in the early Antonine period, some part of *cohors I Tungrorum* may have stayed behind at Housesteads when the bulk of the unit moved up to Castlecary on the Antonine Wall, which is too small to have accommodated the cohort in its entirety.

Reminiscent of the legionary altars from Housesteads in coming from an extra-mural shrine, an altar from a temple of Jupiter Dolichenus at Benwell also dates the reign of Pius (*RIB* I 1330). The legionary centurion who dedicated it may well have been involved in rebuilding work on Hadrian's Wall in 158 onwards (he appears on a post-Hadrianic building inscription (*RIB* I 2077) from nearby Newburn), but serving in a different legion (XX); his stay at Benwell while in the IInd legion could possibly have been during the Antonine Wall period. Two legionary building inscriptions from Chesters (*RIB* I 1460-1) certainly date to the reign of Pius but otherwise cannot be precisely dated. Halton Chesters has produced a legionary building inscription which on the basis of its decorative style is obviously of Antonine date (*RIB* I 1428). This could date to a re-occupation after 158 rather than the early-Antonine period, but the style of decoration is very close to that of the Antonine Wall distance slabs. Inside the fort is a large bath building (Hodgson 1840: 316-20), clearly an addition to the original plan, which, on the basis of its quality of building, *Reihentyp* plan and parallels on the Upper-German limes (for example, *ORL* B 33 Stockstadt, Taf. 4) is probably of 2nd or, at latest, early 3rd century date and most unlikely to be a 4th century insertion as often said in the past (Daniels 1978: 87: 'late-4th century'; cf. Breeze 2006: 181: '3rd or 4th century'). The insertion of this fine bath building into the fort implies that it may no longer have been filled with the accommodation of a regular auxiliary unit and might have been turned over to some special purpose. Although this is obviously speculative, Halton Chesters lies close to Portgate on the main road into Scotland and may, like Corbridge, have had a changed role under Pius for that reason. However, the baths are equally likely to date to the time (probably later in the 2nd century) when the fort was enlarged to accommodate an *ala*. It should also be borne in mind that both the Halton Chesters and Chesters inscriptions could conceivably denote continuing building work on Hadrian's Wall at the very beginning of Pius' reign (say 138-9), before the decision to advance into Scotland had actually been taken.

Hartley did not include Corbridge, rebuilt in 139-40, in his Hadrian's Wall samian statistics, and excluded South Shields on the assumption that this important port of supply may well have been held throughout the Antonine period. From the recent excavations at South Shields there is no decisive evidence either way, the matter complicated by the fact that site of the pre-160 fort is still unknown; there is pottery (some published) that was probably deposited in the early-Antonine period from what must be areas peripheral to the undiscovered fort (Bidwell in Snape *et al* 2010: 100-101).

A diploma of 146 (*RIB* II 2401.9) found at Vindolanda, issued to a soldier of *cohors I Tungrorum*, has led to the suggestion that this veteran settled at what had been the base of his unit before its move up to Housesteads (Roxan 1985). At Chesters there is also a diploma of 146 (*RIB* II 2401.10: one of two Antonine diplomas from the south gate of the fort). Here the unit of the recipient is uncertain: he might have belonged to the *ala Augusta Gallorum Proculeiana* of the diploma list, which some have equated with the *ala Augusta* which garrisoned Chesters under Hadrian (Birley 1931: 146; Holder 1982: 107). The identification has been challenged by both Breeze and Jarrett (Austen and Breeze 1979: 119-122; Jarrett 1994: 41), but strongly reasserted by Spaul (1994: 55-7). Wherever the recipients' units actually were in 146, one obvious interpretation of these diplomas is that there were still at that time active civilian settlements at Vindolanda and Chesters to which these veterans could retire. On the other hand, the diplomas might have been carried back by veterans displaced from abandoned civilian settlements in Scotland when units fell back to Hadrian's Wall 12 years or more after the diplomas had been issued. But taken at face value these diplomas raise the possibility that when units moved forward into Scotland their civilian attendants did not always move wholesale with them; and that – along with the possibility that the detachments in many Antonine Wall forts were too small to provide a market for permanent *vici* – might be an explanation for the difficulty in finding structural evidence for *vici* on the Antonine Wall.

Various strands of evidence therefore suggest some continuing activity, military and civilian, on Hadrian's Wall, although Hartley's study suggesting that the occurrences of samian dies from the two walls are mutually exclusive must be borne in mind. Almost half a century on there are enough new stamps available to justify extending Hartley's survey to see what results would now be produced, and it would be an interesting exercise to re-assess the statistical basis of his conclusions. If the bulk of his sample of stamps from Hadrian's Wall date to after 160, as seems likely (he does not provide this data), then the percentages he gives for overlap with his Antonine Scotland sample might conceivably allow for continued if reduced occupation at some Hadrian's Wall sites.

Where forts had functions independent of the wall-system, continued occupation might be expected. The major north-south routes into Scotland passed through the Hadrian's Wall zone, and explain continued activity at Carlisle and Corbridge. The Stanegate remained an important east west communications route, as noted by Breeze and Dobson (2000: 92), the baseline of the intensive network of military occupation between the walls. Presumably South Shields continued to guard a port. But some of the hints of continued use come from forts whose existence was due solely to the decision to build Hadrian's Wall on the Tyne-Solway isthmus, such as Chesters, Housesteads and Birdoswald. The Hadrian's Wall corridor itself may have continued in use as a communications route parallel to the Stanegate. As suggested above, civilian and veteran communities may have remained where they were on the Wall and on the Stanegate, requiring military protection and co-operation. Finally, the suggestion here is that there may have been an awareness that Hadrian's Wall might need to be fully re-commissioned at any time. It is possible that complete abandonment of the forts was originally envisaged but never completely carried out.

How much of the army was transferred into Antonine Scotland?

A further way of testing the extent to which Hadrian's Wall and other forts in north Britain were emptied of troops is to make an estimate of how many were needed to occupy Antonine Scotland and

how many troops were available from 'abandoned' Hadrianic forts. Do the numbers correspond to each other?

Frere estimated a total troop number for Antonine Scotland (Britain north of Hadrian's Wall) of 23,550. He calculated that 6,800 were left in north Britain south of Hadrian's Wall, and that 18,100 had moved from evacuated northern forts into Scotland, the shortfall being made up by transfers from Wales. Thus the north under Pius was manned by 30,350 out of a provincial auxiliary army Frere estimated at over 42,000 (1999: 148).

However, it is possible that Frere overestimated the numbers needed for sites in Antonine Scotland, and underestimated the potential number freed up by fort evacuation in the north. A simple list of known sites in Antonine Scotland, and Hadrianic sites probably evacuated, annotated with plausible garrison figures, suggests that in the region of 25,000 soldiers might have been available from northern England, but only 17,500 or so necessary to man *new* sites north of Hadrian's Wall (Appendix 1). Obviously some sites will await discovery, which will have depressed the numbers. The figures for the Antonine Wall are not based on any precise calculation, but merely on a rough appraisal of the size of the forts and plausible sounding totals for the units or vexillations that might have occupied them (Appendix 2). This estimate assumes that detachments manning fortlets, and some smaller forts on the Antonine Wall, were drawn from units already included in the count. Interestingly it gives a figure for the Antonine Wall forts not far in excess of Lawrence Keppie's own recent suggestion of 4,500-5,000 (Keppie 2009) and agrees remarkably closely with David Breeze's much more carefully constructed estimate in this volume. Various Antonine Wall forts (Rough Castle, Castlecary, Castlehill) can only have held detachments of their attested auxiliary units, and this may be the case with many (but not all) others. Whether the other parts of *cohors VI Nerviorum*, *cohors I Tungrorum*, *cohors IV Gallorum* and others were still on Hadrian's Wall or were elsewhere in Scotland is not clear, but the former is a clear possibility in at least some cases. Also, legionary detachments, almost certainly accommodated in some forts in Antonine Scotland (Breeze and Dobson 1976: 95-7; Keppie 2009: 1136), are not taken into account and would further have relieved the burden on the north British auxiliary army. If any reliance is placed on this estimate it suggests that roughly 7,000 auxiliaries might have been available to carry out military activities in the area of Hadrian's Wall and its hinterland, *in addition* to those based in forts already considered likely to continue in occupation in this period. We could reduce that to 5,000 to allow for undiscovered sites in Antonine Scotland. Some of these men may have been at forts that we are accustomed to think of as 'abandoned' under Pius. Simple maps showing distributions of empty squares in northern England in the early-Antonine period might be rather misleading.

Conclusion: an original intention disrupted by unforeseen events

The picture that emerges is that movement from one wall to another a much muddier, less simple process than we have imagined; there were considerable elements of simultaneous activity, even if there was not wholesale simultaneous military occupation; troop numbers were thinly stretched in Scotland (and on the Antonine Wall) while on Hadrian's Wall the forts were never wholly deserted but maintained as a rearward base and fall-back position.

The situation as it turned out is much closer to what Haverfield and Collingwood believed, when they saw the Antonine Wall as a kind of temporary expedient or outwork advanced north of Hadrian's Wall,

a view abandoned in the 1970s. But we have seen, from the intention to decommissioning Hadrian's Wall, and the evident first plan for the Antonine Wall, that this cannot have been the original plan. For the Romans the original intention was that one stone wall should replace another. Naturally the broad brush picture we have is of what transpired after the various changes of plan during the early stages of the Antonine occupation of Scotland – leading to a distinctive pattern there of many detachments in small forts and fortlets, and use of rapidly accomplished turf and timber construction. The Romans were as economic with the building materials used as they were in the numbers of troops supplied to Scotland, but this was not necessarily the scheme in their minds when the invasion was launched.

Distinguishing between original intention and events as they actually transpired, offers a means of reconciling the 'pro-native' or 'insular' interpretation of Haverfield and Collingwood with the more recent and dominant 'pro-Roman' or 'empire' centred historical tradition which sees the Antonine advance into Scotland as determined by external political events, specifically the perception that the new emperor Antoninus Pius, lacking a military reputation, required a triumph to bolster his authority in Rome. Breeze defines the debate about the reasons for the Antonine advance into Scotland in terms of 'insular' and 'empire' solutions and makes the case for the latter (1982: 97-99). The security and prestige of the regime at home by means of a victory and the creation of a splendid wall advanced even further north, may well have been the original objective, and the initial advance may indeed have been 'a walkover', entered into with such confidence that a favoured Greek historian with no previous military experience, Aulus Claudius Charax, might be given command of *legio II Augusta* to enable him to enjoy watching the spectacle unfold; 'In the "Indian Summer" of the Antonines the Roman army.... could afford to carry some distinguished passengers' (Tomlin 2018: 127; cf. Breeze 1991). Or so they thought. The idea of an initial 'walkover' is not incompatible with a rapid deterioration in the situation or sudden military setback leading to the changes of plan in the construction of the Antonine Wall. Lawrence Keppie himself envisages such a reaction, when he suggests that the increase in the number of forts on the Antonine Wall was 'perhaps in response to the reaction of the local tribe, the *Damnonii*... who found their territory bisected by it...' (Keppie 2009: 1136; cf. Hanson and Maxwell 1983: 135-6: 'The construction of the additional [secondary Antonine Wall] forts...will...have prolonged the building of the Wall...especially if the decision had been prompted by local hostilities...').

The change in building materials from stone to turf can be interpreted as a reappraisal triggered very early on by some unknown event or events which meant that there was greater urgency to complete the Wall rapidly and perhaps fewer men available to complete the task. After the order to build the Wall in stone, perhaps given by Lollius Urbicus about the time of Pius' acclamation as Imperator II in 142, and the initial construction of Balmuildy fort (the only element of the Wall to bear inscriptions of Lollius Urbicus), the structural evidence implies a rapid sequence of modifications to the original plan: a decision to build curtain and fortlets in turf rather than stone (the fort at Castlecary, built of stone in anticipation of a turf curtain wall, shows that at this stage the primary forts were still intended to be in stone); then came the decision to build the remaining primary forts in turf, and at the same time or slightly later the decision to add the secondary forts, also in turf. Whether this chain of modifications began while Lollius Urbicus was still in the province, or whether it commenced at the time of his replacement, or early in the governorship of his unnamed successor, is uncertain.

Of the nature of the event(s) which intervened we can only speculate. It has often been difficult to follow up 'shock and awe' invasion with instant peace and security, as we have seen in the case of

invasions of faraway places in recent times. A seemingly rapid 'walkover' Roman victory may have been followed by serious resistance to the building of the Antonine Wall; there may have been unanticipated difficulties caused by the withdrawal of units from the area south of Hadrian's Wall, or revolt in the area between the two walls. An alternative explanation might be a need to withdraw troops from Britain because of an emergency elsewhere, resulting in there being too little manpower in Scotland to carry out the building project as originally envisaged. There is, however, no obvious occasion for this, except perhaps Pius' Mauretanian War, which did involve troops from Britain. There is no firm evidence for the date at which this war began, but the main action seems to have taken place in the later 140s (Speidel 1977), and that it had an effect as early as 143, the date we must give to the events that forced change in the design of the Antonine Wall, seems unlikely.

The less than splendid specification of the completed Antonine Wall and forts attest that whatever the events were they were unexpected and unwelcome; the unusual and never really explained elaboration of the distance slabs may have been intended in some way to compensate Antoninus Pius for the failure of his wall as modified to live up to the rustic durability and grandeur of Hadrian's Wall, which one would imagine that the Antonine project had set out to exceed. Could this be why Lollius Urbicus' successor, whose name appears to have been erased from the Ingliston milestone (*RIB* I 2313 + add), apparently suffered *damnatio memoriae*? If he had been withdrawn or replaced in difficult circumstances this might also help explain the omission of a governor's name from the distance slabs.

Some such setback early in the building of the Antonine Wall is, at any rate, a way of explaining various things, besides the use of turf and the other changes in specification for the Antonine Wall itself: the evident back-pedalling on the slighting of Hadrian's Wall; the apparent morphing of the situation into that perceived by Haverfield and Collingwood (and wrongly thought by them to be the original intention), whatever the confidence, ambition and *initial* speedy success of the Antonine invasion of Scotland. While the Antonine Wall was still building, it seems possible that a process of complete abandonment on Hadrian's Wall was arrested; a wholesale movement of units and their attendant communities into Scotland reconsidered; and the possibility even ventilated that there might sooner rather than later have to be return to the southern wall, which was in fact being fully re-commissioned by 158 (Hodgson 2011).

Appendix 1

Estimated troop totals:
(i) freed up from forts in north Britain if totally abandoned under Pius
(ii) required for newly occupied sites in Antonine Scotland

Hadrianic forts abandoned			**New in Antonine Scotland**		
Wigan	500				
Widerspool?	500				
Northwich	500				
Middlewich	500				
Slack	500				
Doncaster	500				
Melandra castle	500				
Brough on Noe	500				

Hadrianic forts abandoned			**New in Antonine Scotland**		
Chesterfield	500				
Kirkham	500				
Elslack?	500				
Ilkley	500				
Lancaster	500		Risingham	500	
Burrow in Lonsdale	500		High Rochester	500	
			Newstead	500	
			Inveresk	500	
Bewcastle?	500		Cramond	500	
Wallsend	500		Carriden	500	
Gateshead?	500		Kinneil	200	
Benwell	500		Inveravon	150	
Rudchester	500		Mumrills	500	
Haltonchesters	500		Falkirk	250	
Chesters	500		Rough Castle	200	
Carrawburgh	500		Seabegs	200	
Housesteads	800		Castlecary	600	
Vindolanda?	500		Westerwood	250	
Greatchesters	500		Croy Hill	200	
Carvoran	500		Bar Hill	500	
Birdoswald	800		Auchendavy	200	
Castlesteads	500		Kirkintilloch	200	
Stanwix	1000		Cadder	200	
Burgh by Sands	500		Balmuildy	500	
Bowness	500		Bearsden	250	
Beckfoot	500		Castlehill	250	
Maryport?	500		Duntocher	100	
Moresby	500		Old Kilpartrick	500	
Totals for the two walls		10600			5750
Hardknott Castle	500		Birrens (enlarged)	500	
			Ladyward	500	
Papcastle	500		Carzield	500	
Caermote	500		Glenlochar	500	
Troutbeck	500		Drumlanrig	500	
Old Carlisle	500		Crawford	500	
Old Penrith	500		Castledykes	1000	
Whitley Castle?	500		Lyne	500	
Kirkby Thore	500		Loudon Hill	500	
Brough under Stainmore	500		Bishopton	500	
Bowes	500				
Greta Bridge?	500		Camelon	500	
			Stirling?	500	
Binchester	500		Ardoch	1000	
Ebchester	500		Strageath	800	
			Bertha	1000	
TOTAL	**24600**			**17550**	

Appendix 2: Units on the Antonine Wall

Hadrianic base	Antonine Wall fort	Main early-Antonine unit	Other attested unit
	Carriden	*cohors quingenaria*?	
	Kinneil	?	
	Inveravon	?	
?	Mumrills	*ala I Tungrorum*	Soldier of *coh II Thracum* commemorated on tombstone
	Falkirk	?	
From Greatchesters?	Rough Castle	Detachment of *cohors VI Nerviorum* (building principia) –commanded by legionary centurion	
	Seabegs	?	
From Housesteads?	Castlecary	Detachment (?) of *cohors I Tungrorum milliaria quingenaria* (building)	Detachment of *cohors I Fida Vardullorum milliaria equitata* – after 158?
	Westerwood	Auxiliary detachment commanded by legionary centurion?	
	Croy Hill	Auxiliary AND/OR legionary detachments	
From Carvoran	Bar Hill	*Cohors I Hamiorum*	*Cohors I Baetasiorum* – after 158?
	Auchendavy	Auxiliary detachment – or poss. *cohors quingenaria* – commanded by legionary centurion AND/OR legionary detachment	
	Kirkintilloch	?	
	Cadder	?	
	Balmuildy	Unit commanded by a tribune? *cohors milliaria equitata*?	
	Bearsden		
From Castlesteads?	Castlehill	Detachment of *cohors IV Gallorum*	
	Duntocher	?	
	Old Kilpatrick	*Cohors quingenaria equitata*? – on basis of barrack layout, suggesting 10-12 barracks?	*cohors I Baetasiorum* altar – unit not necessarily based there but could have been departing or arriving by sea

The table shows what we know of the units based on the Antonine Wall. It is essentially an updating of Table 8.1 in Hanson and Maxwell 1983, adjusted so that it no longer attempts to fit the known units into two distinct periods of occupation at every fort on the Antonine Wall. Legionary building inscriptions are not included, but where there are hints from altars or tombstones that legionary detachments may have been in garrison, they are indicated.

Four units attested on the Antonine Wall might have gone there straight from forts on Hadrian's Wall. *Cohors I Tungrorum*, probably the earlier of the two cohorts attested at Castlecary, seems now most likely to have been the Hadrianic garrison of Housesteads. The Hamian archers at Bar Hill probably moved directly there from Carvoran. Tombstones of successive commanding officers imply a long presence, and it was inscriptions of the other attested unit (*cohors I Baetasiorum*) that were cast down the *principia* well when the fort was finally abandoned. Possibly both the *Tungri* and the *Hamii* returned to their respective bases on Hadrian's Wall around 158 (when work on re-commissioning that barrier began), to be replaced by other units (*cohors I Fida Vardullorum* at Castlecary and *cohors I Baetasiorum* at

Bar Hill) for a few years, say 158-61. Elsewhere on the Antonine Wall, *cohors VI Nerviorum* (Rough Castle) possibly came from Greatchesters, *cohors IV Gallorum* (Castle Hill) from Castlesteads.

A few early-Antonine garrsions planted between the two walls can *possibly* be identified: *ala Vocontiorum* at Newstead; *ala Sebosiana* at Inveresk (although there is also a lead seal from Castledykes); an unknown *ala* at Carzield; *cohors II Tungrorum* at Cramond; *cohors I Lingonum* at High Rochester; *cohors I Nervana Germanorum* at Birrens (this unit might have come directly from Burgh-by-Sands on Hadrian's Wall); an unknown cohort at Bothwellhaugh.

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21. Antoninus Pius' Guard Prefect Marcus Gavius Maximus with an Appendix on new evidence for the *Fasti* of Britain under Antoninus

Anthony R. Birley

Introduction

This discussion of a celebrated Prefect of the Guard results from the encouragement by David Breeze to elaborate on a sentence in the revised version of a biography of Marcus Aurelius, published in 1987 (Birley 1987. The original edition came out more than fifty years ago). David Breeze cited a theory (2006: 168-9), evidently found in that 1987 volume, though he does not give a page reference. As he reported it, slightly inaccurately, 'the retirement' of Gavius Maximus 'in about 157' - it should be the Prefect's death rather than his retirement - 'may have been the impetus for a review of commitments', including the abandonment of the Antonine Wall, only two decades after its construction. It cannot be claimed that the following pages prove what was suggested in that sentence: there is no direct evidence to support it. But perhaps this discussion of what is known or may be inferred about the origin and career of the long-serving Guard Prefect Gavius Maximus will have some interest, not least for Lawrence Keppie (although it may be assumed that he will be sceptical).

The reign of Antoninus Pius can be frustrating for the historian. Although he was emperor for longer than any predecessor since the death of Augustus or any successor before Constantine I, rather little about him seems to be known. His *vita* in the *Historia Augusta* is relatively reliable but very short; modern commentaries (Callu 1992; Walentowski 1998) do not offer much help. On Antoninus' 'foreign policy' one may still benefit from consulting two older contributions by Stroheker (1966) and his pupil Kerler (1970: 38-48). Of course, new information regularly makes it necessary to modify details: for example, Peter Weiβ has shown that it was at the end of Antoninus' reign that reinforcements were taken to the eastern frontier by L. Neratius Proculus 'on account of the Parthian War' (*ILS* 1076), not at its beginning, as virtually everyone had previously supposed (Weiβ 2007). Improved analysis by Kai Juntunen of Cassius Dio's Book 70, which had contained the history of Antoninus' reign and the first part of the reign of Marcus Aurelius (up to AD 169), has demonstrated that it was already at an early stage completely missing from the manuscript of Dio - even before the earliest Byzantine summaries were made. The few items ostensibly excerpted from Dio's Book 70 - as printed, for example, in the Loeb edition - in fact derived, as Juntunen has proved, from Dio's earlier or later books. Dio's account in Book 70, covering Antoninus' reign and the first part of Marcus Aurelius' reign up to the death of Lucius Verus, was indeed completely lost by early Byzantine times (Juntunen 2013a and 2013b).

Naturally, the limited literary evidence must be supplemented by coins, inscriptions, papyri and archaeology. An attempt to compile all the sources before evaluating the reign was undertaken over eighty years ago by Willy Hüttl of the German University of Prague: this was, at first sight paradoxically, presented as volume II of his study of Antoninus (1933). It starts with almost two hundred pages listing all known higher officials and army officers who served under Antoninus, province by province in

alphabetical order, from Achaia to Thracia, followed by 'Roma et Italia', and then another 173 pages on 'Antoninus Pius in den Inschriften seiner Zeit'. Volume I finally appeared late in 1936 (Hüttl 1936), with chapters on the literary sources; Antoninus' life before accession; his titulature; his role in the development of Roman law; religion; foreign policy - the longest chapter, almost one hundred pages, with lists of military units in each province; domestic policy; the emperor's death and consecration; and 'the problem of his personality'. *Addenda* and *corrigenda* followed and detailed indices, resulting in a work of 470 pages.

Naturally, the increase in source material, above all the remarkable increase in finds of military diplomas, makes a good deal of what Hüttl wrote outdated, but the work is still worth consulting. As Hüttl noted in his *Vorwort*, he was himself unable to use the awaited 'epoch-making' third volume of Strack's study of the imperial coinage, covering the reign of Pius (Strack 1937); he ended his *Vorwort,* dated *Weihnachten* of that year (1936: 6), with warm thanks to Professor Arthur Stein, who had read the whole of his work in manuscript and to whom the author felt especially indebted because of his sympathy and support. Arthur Stein, Professor of Roman Archaeology and Epigraphy at the German University of Prague since 1922, was forced to retire after the Nazi takeover because of his Jewish origin - and was later to be interned at Theresienstadt from 1942 to 1945. With his friend and colleague Edmund Groag of Vienna University, also Jewish, he had composed the entries for the second edition of the Prussian Academy's *Prosopographia Imperii Romani* (*PIR*^{2}), of which two volumes had appeared by 1936.[1]

The sources for Antoninus' reign

Antoninus, unlike his predecessors Trajan and Hadrian, whose careers began under the Flavians, had no military experience at all. As far as is known (*Historia Augusta*, *Antoninus Pius* 2.9 and 11; 3.2-8), he was only once outside Italy in his life, as proconsul of Asia, probably for the proconsular year 135-136 (Thomasson 2009: 84). Of later writers, Aurelius Victor, writing two hundred years after Antoninus' death, praised him effusively: no fault could be found, 'unless it seems to be a sign of sloth that he did not hold triumphs. But this is far from being the case, since there was, rather, no doubt that no one dared to disturb the settled state of affairs, nor did he make war in order to boost his own image, while the peoples were quiet' (*De Caesaribus* 15.5 '*nisi forte triumphorum expertem socordiae videtur; quod longe secus est, cum maius haud dubie sit neque quemquam turbare ausum composita neque ipsum ostendandi sui bellum fecisse quietis gentibus*'). A few years after Victor, Eutropius in his *Breviarium* offered his own version: Pius enjoyed 'moderate glory in military affairs, preferring to defend provinces rather than extend them' (8.8 '*in re militari moderata gloria, defendere magis provincias quam amplificare studens*'). Victor and Eutropius are both assumed to have relied on a predecessor whose work is lost, the so-called *Kaisergeschichte*.

[1] His colleague Victor Ehrenberg, also Jewish, Professor of Ancient History, likewise lost his Chair, but managed to migrate to England. Stein could not follow him; but continued working on PIR^2 - until 'Hüttl secretly informed the (Nazi) party that Stein is still working on an ancient history project of the Prussian Academy although he is a Jew' (Rebenich 2001: 219; 2005: 45). For more detail see Eck (2017; 28-29 and, on the work of Groag and Stein for PIR^2, 18-45) and Wachtel (2012). Hüttl himself became professor of ancient history at the now Nazi-run Prague University in 1941, thus occupying the positions of both Ehrenberg and Stein; but he was shot dead in 1945, either while fleeing to escape arrest or while trying to remove the coin collection (Wachtel 2012: 151 n. 141; updating Losemann 1977: 185, 210 n. 35). Arthur Stein survived Theresienstadt and, in spite of losing his library and notes, resumed his academic work, publishing several monographs and contributing further entries to PIR^2, including names beginning G; he died in 1950.

On similar lines, a generation later the unknown author (often called Pseudo-Aurelius Victor) of the *Epitome de Caesaribus* stated that Antoninus 'showed such goodness during his principate that he lived a life which, there is no doubt, cannot be paralleled, although his own era did compare him to Numa, because he governed the world for twenty-three years by means of his authority alone, without any war' (*Epitome de Caesaribus* 15.2-3: '*tantae bonitatis in principatu fuit ut haud dubie sine exemplo vixerit. quamvis eum Numae contulerit aetas sua, cum orbem terrae nullo bello per annos viginti tres auctoritate sola rexerit*').

The *Historia Augusta*'s *vita*, probably based on the lost *vita* by Marius Maximus (Birley 1997a: especially 2731-3), by contrast, supplies a rather different picture. It begins the account of the reign with the mistaken or invented claim that Antoninus 'on becoming emperor did not replace anyone whom Hadrian had appointed and was so steadfast that he left good governors in the provinces for seven or nine years each' (*Antoninus Pius* 5.3).[2] This unpromising first sentence is followed by a concise but mainly accurate listing of military activity: 'Through his legates he conducted many wars. In fact, he both defeated the Britons through his legate Lollius Urbicus, another wall, of turf, being constructed, the barbarians having been removed, and he compelled the Moors to seek peace, and he crushed both Germans and Dacians and many peoples and the Jews who were rebelling through his governors and legates. In Achaia, too, and Egypt he suppressed rebellions; he frequently reined in outbreaks of the Alans' (*Antoninus Pius* 5.4-5.). A new attempt to look at the reign, focusing on the non-literary sources - the subtitle is 'Antoninus Pius in den nicht-literarischen Quellen' - has recently been published as a collaborative volume with over a dozen authors (Michels and Mittag 2017). The chapter on military matters by Michael A. Speidel is especially welcome (2017). Speidel discusses all the items listed by the *Historia Augusta* in exemplary fashion, bringing in, of course, the evidence of several contemporary writers, notably Aelius Aristides, Appian and Pausanias, as well as a mass of inscriptions and coins, and concludes that 'there were wars going on in practically every year of Pius' long reign' (Speidel 2017: 265).

At the end of his chapter Speidel refers briefly (2017: 267) to a remarkable paper by Peter Weiß, who explains in a new way the abolition, first detectable in December 140, of what had been a longstanding practice: from this point onwards illegitimate children of non-citizen veterans would no longer share their fathers' grant, on discharge, of citizen status (2008: 30-37). Weiß explains the motivation behind this decision not least by Antoninus' strong personal belief in the importance of legal *conubium*. This was influenced, he suggests, by Antoninus' own marriage to Faustina, and was reinforced after her death and consecration in late autumn 140. At this moment, Weiß argues, a *senatus consultum* was passed, celebrating the *insignis concordia* of the Emperor and his deified wife, with an imposing new monument (2008: 4-24).

Weiß also stresses, at the start of his paper, that the volume of coinage commemorating Diva Faustina greatly exceeded that struck for Divus Hadrianus (2008: 2, with notes 2-3). Indeed, to a considerable extent policy in the new reign was a reaction against Hadrian, in spite of Antoninus' initial struggle to win the senate's support for the proposed consecration of his predecessor - it was his success in achieving his aim here that led him to take the name Pius. The abandonment of Hadrian's Wall, the prestige frontier project in Britain, and the establishment of a new line further north, can be seen as an

[2] This is often believed, e.g. by Hüttl (1936: 329) and many others; for a detailed disproof and an explanation of how the notion arose see Birley (1966a).

open rejection of Hadrianic policy right at the start of the reign. On the reasons behind the new policy see also 'Some retractions and a conclusion' (below).

As far as the army is concerned, the cancellation of the retrospective legitimation of veterans' children was not an isolated action by the new Emperor. Weiß argues that Antoninus can be inferred to have been already responsible for two innovations in the last months of Hadrian's reign, first detectable in diplomas of 28 February 138 (*CIL* XVI 83; *RMD* IV 253): one a short-lived change in the wording of the award, the second a systematisation, which endured, of the seven witnesses who signed the diplomas (cf. *RMD* V 924, Appendix III). Before Antoninus was officially adopted and made Caesar, with other powers, on 25 February 138, he had known since 24 January, when Hadrian had announced his intention on his birthday, that he was the chosen heir - he had asked for time to consider (Birley 1997b: 294). Weiß argues that he may be supposed to have played a big part in the two decisions reflected in the diplomas, taken in the weeks immediately before his appointment as Caesar. Weiβ goes on to comment that in spite of his previous lack of military experience, Antoninus involved himself in the details of such matters more than any other emperor (2008: 30-32). After reviewing the evidence, Weiβ concludes that the death of the Empress and the subsequent *senatus consultum* were the trigger which impelled the Emperor to implement his no doubt longstanding doubts about the existing practice and, in agreement with his advisers, to bring in new regulations, which were, in effect, a defence of traditional Roman *conubium*. He sums up: '*Kein Kaiser nach ihm hat mehr daran gerüttelt*' ('No emperor after him made any more changes in this field') (2008: 36-37).[3]

Antoninus' advisers and the role of his Guard Prefect Gavius Maximus

Looking back on many years of studying Roman military affairs, in an address at Heidelberg in 1986, Eric Birley offered a brief sketch of the organisation of the Roman army in the second century AD. His opening remarks may be cited, first in translation: '...As for the army command, the commander-in-chief was the emperor himself, even if he (as for example Antoninus Pius) had no military experience at all. Clearly it was the highest ranking knight, the *praefectus praetorio*, the praetorian prefect, who was at the emperor's disposal as senior adviser in all military matters, even when the ruler himself (as was the case with Augustus, Vespasian, Trajan or Hadrian) himself had military training and was ready to act independently ...Through the praetorian prefect, who was in reality the Chief of the General Staff, all military questions could be worked out or guidelines for their implementation laid down.'('*Was die Heeresleitung betrifft, war der oberste Befehlshaber der Kaiser selbst, auch wenn er (wie beispielsweise Antoninus Pius) gar keine militärische Erfahrung besaß. Offenbar war es der rangälteste Ritter, der* praefectus praetorio*, d.h. der Prätorianerpräfekt, der dem Kaiser in allen militärischen Angelegenheiten als erster Berater zur Verfügung stand, auch wenn der Herrscher selbst (wie Augustus, Vespasian, Trajan oder Hadrian) militärisch erprobt und bereit war, selbständig zu handeln...Durch den Prätorianerpräfekten, der in Wirklichkeit Chef des Generalstabes war, konnten sämtliche militärische Fragen bearbeitet oder Richtlinien für die Bearbeitung gegeben werden*') (Birley, E. 1987: 3-4).

These reflections invite one to ask the question: who advised Antoninus Pius when he was making decisions on military policy? In 1966, in a biography of Marcus Aurelius, attention was drawn to Gavius Maximus' role: 'Because of his military inexperience, Pius relied a good deal on experts, prominent

[3] On military diplomas see further Eck (2007) and cf. Waebens (2012).

among whom were the two praetorian prefects, M. Petronius Mamertinus and M. Gavius Maximus... Maximus was to remain prefect for nearly twenty years - an unparalleled length of tenure. He was not universally liked – 'a man of great severity' - but he must have been competent and was in a position to influence profoundly the military policy of the reign' (Birley, A. R. 1966b: 72; unchanged in Birley, A.R. 1987: 60; cf. 112, 113-14, on the abandonment of the Antonine Wall); Breeze (2006: 168-9), citing this theory of 'Anthony Birley', without giving a page reference, refers to this suggestion relating to 'the retirement' of Gavius Maximus 'in about 157' - it should be the Prefect's death rather than his retirement - which 'may have been the impetus for a review of commitments'. On the warfare in Mauretania, it was also suggested that 'Gavius Maximus would undoubtedly have been able profitably to capitalize on his experience as procurator of Mauretania Tingitana fifteen years previously (cf. below), when the selection of officers and other matters concerning the war were discussed at the imperial council' (Birley 1966b: 114; unchanged in the revised edition, Birley A.R. 1987: 90; cf. Birley 2000b: 151).

Gavius Maximus is not mentioned anywhere in the new collaborative volume, over 300 pages in length. On the other hand, in a monograph on Antoninus by one of the editors, Christoph Michels, published a year later, the suggestion that Maximus influenced Pius' foreign policy is dismissed as unfounded speculation. Referring to the lack of sources for the reign Michels comments: 'This lack of information was probably also responsible for the fact that the basic principles of Pius' foreign policy have sometimes been attributed to the substantial influence of the long-serving (from 138 to 158?) Praetorian Prefect Gavius Maximus, for which there is no evidence of any kind' (*Dieser Informationsmangel war wohl auch dafür verantwortlich, dass mitunter die Grundlinien der Aussenpolitik des Pius auf den wesentlichen Einfluss des langjährigen (von 138 bis 158?)* praefectus praetorio *Gavius Maximus zurückgeführt wird, wofür es keinerlei Zeugnisse gibt*' (Michels 2018: 211).[4] Michels even regards the *Historia Augusta*'s characterisation of Maximus as *severissimus* (cited in full at the beginning of the next section) as more or less fictional. 'That the *Historia Augusta* refers to the strictness of Gavius Maximus (*Pius* 8,7) can hardly be seen as relevant information, but rather as a story-teller's embellishment' ('*Dass die* Historia Augusta *auf die Strenge des Gavius Maximus verweist* (Pius 8,7) *kann kaum als relevante Information gesehen werden, sondern eher als erzählerische Inszenierung*': (Michels 2018: 211 n. 1248). This seems to carry scepticism to an unnecessary extreme: one may compare the *Historia Augusta*'s *vir severissimus* on Maximus with Tacitus on Nero's Guard Prefect Sextus Afranius Burrus, stressing that Prefect's 'strictness of character', ('*severitas morum*') (*Annals* 13.2.1).

Of course, it can be labelled 'pure speculation' (although it may be justified to call it, rather, 'rational conjecture') that Antoninus Pius took advice from experts such as Gavius Maximus. Yet, after all, Marcus Aurelius, who so greatly admired his adoptive father, stressed this very point: 'A particular characteristic was his readiness to give way without ill-feeling to the experts in special fields, whether it was in the use of words, the knowledge of civil law or traditions, or anything else' (Marcus Aurelius, *Meditations* 1.16.6). Surely this 'readiness to give way' would also have applied to Antoninus' consultation of experts in military matters, among them his long-serving Guard Prefect. This is reminiscent of a statement in the *Historia Augusta*: 'Nor did he decide anything about the provinces or any matters unless he first brought it before his friends, and he composed his rescripts in accordance with their

[4] He cites 'Birley 2000b: 151' (a chapter submitted in 1988; 2000b in the Bibliography below) and '2000b: 112' (which is in fact a reprint of Birley, A.R. 1987) for this notion.

opinions' (*Antoninus Pius* 6.11, *neque de provinciis neque de ullis actibus quicquam constituit, nisi quod prius ad amicos retulit, atque ex eorum sententia formas composuit*).

The origin, family and career of Gavius Maximus

For a long time, almost all that was known about Maximus, apart from a diploma showing him to have been procurator-governor of Mauretania Tingitana under Hadrian and three of Fronto's *Letters*, was based on the statement in the *Historia Augusta* that he was kept in office as Guard Prefect for nearly twenty years: '(Antoninus) did not appoint a successor for any holder of judicial office as long as the man was alive, except in the case of Orfitus, the Prefect of the City, but Orfitus requested it himself. Indeed, Gavius Maximus, the Prefect of the Guard, reached his twentieth year of service under him, a very stern man, who was succeeded by Tattius Maximus' (*Antoninus Pius* 8.6-7, *successorem viventi bono iudici nulli dedit nisi Orfito praefecto urbi, sed petenti. Nam Gavius Maximus praefectus praetorii usque ad vicensimum annum sub eo pervenit, vir severissimus, cui Tattius Maximus successit*). This must show (*viventi... nulli*) that Maximus died in office. During his Guard Prefecture he was awarded honorary consular rank, the *ornamenta consularia* (Stein 1927: 248; 1952: 22). It has also long been known that Maximus had been procurator-governor of Mauretania Tingitana under Hadrian, between AD 129 and 132; and also, less certainly, according to an inscription from Hierapolis Castabala in Cilicia, reported by Josef Keil but evidently never published, that he had been procurator of the emperor, thought to be of the province of Asia (*PIR*^{2} G 104). Donati (1971: 128) reported that Keil's transcript or drawing could not be found when she made an enquiry to the Austrian Academy of Sciences.

Much more is now known - or rather, can be conjectured with a very high degree of probability - about Gavius Maximus. Since very little of the new evidence has been published, let alone discussed, in English, it may be worth setting it out as fully as possible here. His origin was long assumed to be an Italian town, Firmum in Picenum, where he was honoured by several inscriptions (*PIR*^{2} G 104; Pflaum 1960-61: 249; Donati 1971: 127-8). The fact that his tribe was the Palatina required some explanation, as Firmum was enrolled in the Velina. But as the Palatina was one of the two *tribus urbanae* in which traditionally freedmen were enrolled (Koch 1942: 2529f.), it was thought that Maximus might have been of libertine origin (Stein 1927: 117; 1952: 22, citing Mommsen). This can of course be doubted - Angela Donati cites works indicating that several high-ranking persons were also enrolled in the Palatina (1971: 127-8). But the question was complicated by a new inscription which she published, from another town in Picenum, Adria: it is the base of a statue honouring Maximus, set up by the community and showing that he was in a different tribe, the Sergia: *M. [Ga]vio | M. fil. | Ser(gia) | [M]aximo | [p]raef. pr(aetorio) | c(olonia) | publice* (Donati 1971: 136-8, whence *AE* 1972.169; cf. Zevi 1971: 463-4, n. 40). Donati's suggestion for line 6, *c(os.)* is to be rejected and *c(olonia)* is plausible; the text was by mishap incompletely reproduced and hence misunderstood in the postumous publication by Pflaum (1982: 32-33). Ronald Syme commented that Maximus 'managed to discard (his tribe 'Palatina') in favour of the more resplendent 'Sergia'' (Syme 1982: 399; 1988: 161).

However, inscriptions from Ephesus in the province of Asia honouring two men called Gavius have been shown by Werner Eck to reveal the uncle and father of Gavius Maximus, and the second one indicates a completely different home town (1993: 368-77). The first, with a text in Greek, was published in the 1920s (Keil 1923: 133-5, no. 48 = *AE* 1924.82). It was from the base of a statue in honour of P. Gavius P.f. Palat(ina) Balbus. He had had an equestrian career, listed in detail: at the beginning are listed

the award of the *equus publicus*, the position of juryman at Rome, *iudex de selectis*, and the role on the staff of an influential senator, as *praefectus fabrum*; there follow the equestrian *tres militiae*, prefect of the *cohors II Lucensium*, based in Moesia inferior, tribune in the British legion *II Augusta*, and prefect of the *ala I Cannanefatium*, based in Pannonia superior; finally three procuratorial posts, *proc. Aug. ad census Galatiae et Paphlagoniae*, *curator viae Corneliae et triumphalis* and *proc. Aug.* of the (sub-)province Chersonesus. The statue was set up by the town-councillors of the *municipium Aelium Coela*, chief city of the Thracian Chersonese (formerly a principality in the possession of the great Agrippa), in gratitude for the benefits he had conferred on city and people (Pflaum 1960-61: 343-5; Devijver 1976-2001: G7). Commentators noted that Gavius Balbus was not from Ephesus, because of his tribe Palatina, but could not explain why he was honoured there. The connection to the Guard Prefect was not noticed.

Many decades later a second stone from Ephesus was published (Knibbe 1968-71: no. 2; mentioned in *AE* 1969/70.595, reproduced in full as *AE* 1972.593), honouring in Latin as well as in Greek M. Gavius P. filius Palatina Bassus, whose home town - it was a surprise - is given as Rome (Devijver 1976-2001: G8; Eck 1993b: 370-377; Birley 2000a: 60; Wheeler 2012: 128, 130-1): *[M. Gavio P. filio Palatina Basso]| Romae, praef. coh. VI Britt. eq. p.f., trib.|mil. leg. I adiutric., adlecto in dec. V inter| selectos, praef. eq. alae Cl. novae, donis donato|| bello Dacico ab Imp. Caesare Nerva Traiano| Aug. Germanico Dacico corona murali hasta| [p]ura vexillo, praef. orae Ponticae maritimae*. He had a conventional career in the equestrian *tres militiae*, starting as prefect of a part-mounted cohort of Brittones, either in Germania inferior or Moesia, then as tribune of the legion I Adiutrix in Pannonia superior. He evidently interrupted his career to serve on the jury-panels at Rome, before becoming prefect of the *ala Claudia nova*, which moved from Moesia superior to Dacia during the Dacian wars, for service in one of which he was decorated by Trajan. After the Latin text the career is set out in Greek, in which the first line, with Bassus' names, is complete; thereafter, in Latin, come the names of the dedicators, eight members of Bassus' staff in his final post, as prefect of the *ora Pontica maritima*, two *stratores*, three *cornicularii*, two *optiones* and a *tesserarius.* Maxfield discusses his decorations, speculating that there may have been a pause in his career before the appointment to command the Pontic Shore (Maxfield 1981: 170-1).

Bassus' service in his final post was already known from the tenth book of Pliny's *Letters*. Pliny as governor of Pontus-Bithynia wrote to Trajan that Bassus had called on him, 'with due ceremony and respect' (*et reverentissime et officiosissime*), spent several days with him and was, as far as he could see, 'an outstanding man and one deserving of your favour' (*vir egregius et indulgentia tua dignus*); Bassus was trying to get more soldiers allocated to his staff and wrote to Trajan himself about this. Trajan's reply to Pliny suggests that he was reluctant to accede to the request (Pliny, *Epistulae* 10.21-22), though the copy of the Emperor's reply to Bassus has not been preserved. Also in the correspondence is Pliny's recommendation for Bassus, presumably when he was leaving his post: 'Having experienced Gavius Bassus, prefect of the Pontic Shore, as high-principled, honest and hardworking, and as well as that very respectful to myself, I give him my full support and recommendation, with the same good faith that I owe to you' (*Epistulae* 10.86a, *Gavium Bassum, domine, praefectum orae Ponticae, integrum probum industrium atque inter ista reverentissimum mei expertus, voto pariter et suffragio prosequor, ea fide quam tibi debeo*).

Eck was able to show that Gavius Bassus and Gavius Balbus were brothers, both being sons of Publius and both in the Palatina; that Bassus was the father of Gavius Maximus, who was son of Marcus and in the Palatina; and that Balbus was his uncle; that Bassus and Balbus must have been honoured at

Ephesus because that was where they had their main residence, in spite of their *origo* being Rome (1993b: 368-377; 1995: 213-214; 2010: 146-7). By the same token, Gavius Maximus may be taken to have had Rome as his *origo* and to have had a residence at Ephesus. No doubt the Gavii had been settled at Ephesus for some time and had become prosperous there.

At about the same time that the inscription of Gavius Bassus was published, new light had been shed on Maximus' own career. In 1971 Fausto Zevi recognised that two previously published inscribed fragments at Ostia (*CIL* XIV 191+4471; taken over in *AE* 1971.65, but incomplete) belonged to the same honorific inscription, clearly from a statue-base (1971). Although the name of the honorand was missing, he proposed that the Ignotus was the great Guard Prefect, whose lengthy earlier career was thus in large part revealed: *[praef(ecto) clas]s(ium) [praet(oriarum) Misenen]s(is) et Raven(natis),| [proc(uratori) Ma]uret(aniae) Tin[git(anae), proc(uratori) XX he]r(editatium), praef(ecto)| [- - - i]n Aegypto, p(rimo) [p(ilo) bis, trib(uno) co]h(ortis) III pr(aetoriae), trib(uno)| [eq(uitum) sin]g(ularium) divi Hadria[ni, trib(uno) coh(ortis) - - - vi[g(ilum)| [- - - - ... - - - -].* In descending order, the career evidently shows as the earliest surviving appointments three successive tribunates in the Rome garrison: of the *vigiles*, the *equites singulares divi Hadriani* and of the third cohort of the praetorian guard. Slightly unusually, the second tribunate was the command of the Deified Hadrian's horse guards, rather than, as was mostly the case with the Rome tribunates, in one of the urban cohorts. There followed the second primipilate and an appointment in Egypt, as prefect or *praefectus castrorum* of the legion II Traiana. Next came, it seems, the post of procurator of the *vicesima hereditatium* (heavily restored, to be sure) and then, the only item which matches what was previously known of Maximus' career, the procuratorship of Mauretania Tingitana, dated by diplomas to the period AD 129-132. The final items preserved registered the command over the two Italian fleets, first the one at Ravenna then that at Misenum.

The date of the Ignotus' career fits that of Gavius Maximus, given the mention of the Deified Hadrian. Further, no other prefects of the two praetorian fleets are known from the later 130s, after M. Calpurnius Seneca (to use only his main names), attested as commander of the Misenum fleet on 15 September 134 (*CIL* XVI 79; Pflaum 1960-61: 257-9, no. 107; Dobson 1978: 236-7, no. 118). The attribution of the Ostian career to Maximus was accepted by those well qualified to judge (Eck 1978: 109-110, cf. Eck 1993b: 375 and n. 30; Pflaum 1982: 32-3). Michael P. Speidel, the leading authority on the *equites singulares Augusti*, regarded the attribution as probable ('*vermutlich*') (1994: 100-1, no. 73), while Brian Dobson, in his great work on the *primipilares*, judged it possible (1978: 237-41), registering the career as his 'no. 118a Ignotus'; on Maximus' *origo* he was not aware of the evidence from Ephesus and he does not mention the procuratorship of Asia - Zevi attributes this mistakenly to Groag rather than Stein (and Keil) and dismisses it as lacking 'really solid arguments' ('*argomenti davvero solidi*') (1971: 450). Further support for Zevi's identification of the Ignotus is given by Maximus' well attested presence as a benefactor at Ostia, where he gave his name to the magnificent public baths in the Forum: presumably he had paid for them, a sign of great wealth (Zevi 1971: 450-1, 464-7; Meiggs 1973: 415, 475). Apart from the text published by Zevi, another Ostian stone registers a statue to Maximus (*AE* 1955.176=288).

Zevi (1971: 462) suggests that between the fleet prefectures and that of the Guard the Ignotus was probably *praefectus vigilum* or *praefectus annonae*; likewise Dobson (1978: 240). That may be so. But why not suppose that if the man was Maximus he did indeed, as the now lost inscription from Hierapolis Castabala apparently indicated, before his Guard Prefecture serve as procurator of Asia, as accepted with hesitation by Pflaum (1960-61: 1107; 1982, 33)? In that capacity he would have had the chance

of re-visiting his home at Ephesus, and, further, perhaps, of coinciding with the proconsul Aurelius Antoninus (i.e. the future emperor Antoninus Pius), as suggested by A.R. Birley (1987: 60), but overlooking the evidence for Maximus' long career proposed by Zevi (1971).

Maximus is first attested as Guard Prefect on 1 March 139, along with his colleague M. Petronius Mamertinus (*ILS* 2182), who from 133 had been Prefect of Egypt, was still in office there on 26 May 137 and had left Egypt at latest by the autumn of that year (Thomasson 2009: 147). It is not certain when Mamertinus and Maximus took command of the Guard, nor exactly when Hadrian's long-serving Prefect Q. Marcius Turbo had left the post: Cassius Dio included a laudatory passage about Turbo in the context of the year 136, citing his statement that 'a prefect should die on his feet' (69.18.1-4), while the *Historia Augusta* reports that Hadrian 'assailed Turbo harshly' (*graviter insecutus*) (*Hadrian* 15.7) -merely a verbal attack, no doubt. In his pain-wracked dying days, after failing to persuade a slave to stab him to death, Hadrian was visited by (plural) Prefects and his son (Antoninus): *ingressis ad se praefectis et filio* (*Hadrian* 24.9). Perhaps Hadrian had replaced Turbo with two Guard Prefects. As Ronald Syme pointed out, the statement in the *Historia Augusta* that Gavius Maximus *ad vicensimum annum sub eo pervenit* (*Antoninus Pius* 8.7) 'does not preclude appointment before the death of Hadrian' (1980: 75; 1984: 1293; followed by Birley 1997b: 296). Mamertinus, who is named before Maximus in inscriptions, is attested for the last time in the year 143, after which he presumably either died or retired (*PIR*^{2} P 288).[5] Maximus seems to have remained as sole Prefect until his death. As Prefect he was honoured by at least six statues: three at Firmum, one at Adria, one at Flavia Solva in Noricum and one at Trier. In five of them he is described just as *praefectus praetorio*; two also mention his *ornamenta consularia*. As Werner Eck points out, this brevity must reflect the wishes of Maximus himself: his Guard Prefecture was all that he wanted to be registered; that was enough to show that Maximus 'stood directly at the Emperor's side' (1995: 230; 2010: 166); cf. Eck (1988), reinterpreting *CIL* IX 5360 as the dedication of a statue to Maximus by the procurator L. Marius Perpetuus, whose career Maximus had clearly enhanced. Nothing is known of Maximus' mother, nor of a wife, assuming that he had one. But he clearly had an adopted son, M. Gavius T. f. Vel. Appalius Maximus, of Firmum, who achieved senatorial rank (*CIL* XIV 2607; *PIR*^{2} G 92). The natural father was an equestrian officer, later a junior procurator, T. Appalius Alfinus Secundus (*PIR*^{2} A 942; Pflaum 1960-61: 341-3: Devijver 1976-2001: A 153).

A glimpse into the high standing of Maximus during the reign of Antoninus is provided by three letters, two of them very fragmentary, in the correspondence of the orator M. Cornelius Fronto (van den Hout 1988: 162-6), recounting an episode probably in the 150s. Fronto had been named as heir to five twelfths of the property of a friend, the former procurator Censorius Niger. To Fronto's great embarrassment, Niger had in his will angrily attacked Gavius Maximus. As Fronto wrote in a brief letter to his former pupil Marcus Aurelius Caesar, Maximus was 'a man of senatorial rank and entitled to my regard' ('*clarissimum et nobis observandum virum*'). He told Marcus that he had had to write to the Emperor himself, 'our Lord your father', and to Gavius Maximus himself, letters which have been 'very difficult to compose' ('*difficillimae quidem rationis epistulas* ')(van den Hout 1988: 164). Fronto told Antoninus that he had been glad to become Niger's friend, for the latter had himself been close to Marcius Turbo and Erucius Clarus, respectively 'the leading figures in the equestrian and senatorial order' (van den Hout 1988: 162-3, very fragmentary after the opening sentences). Clarus had been Prefect of the City and consul for the second time in 146, when he died (Birley 1987: 92). As Fronto

[5] He had died before 156; for his family cf. the stemma in *PIR*^{2} P 118.

recalled in his letter to Maximus, Niger had apparently been a friend of Maximus himself until some breach, *discidium*, occurred, a breach which caused Niger to weep copiously, tears which he, Fronto, had often witnessed (van den Hout 1988: 165-6, very fragmentary until the last paragraph). Niger had, so it appeared, like Maximus, been procurator of Mauretania Tingitana under Hadrian (he was later procurator of Noricum according to undated inscriptions of his *beneficiarii* (*CIL* III 5174; 5181)), and it was once suggested that there had been some rivalry between the two men or jealousy on the part of Niger - that he was senior to Maximus and resented the latter's rise to the top of the equestrian ladder (Pflaum 1960-61: 226-9, 968); however, Pflaum revised Niger's date, putting him later than Maximus (1960-61: 1108). A new analysis of the diploma in question (*CIL* XVI 176) by Paul Holder makes it almost certain that Niger was actually governing Tingitana in July 139, a year after Hadrian's death and considerably later than Maximus (2018: 265-7). At all events, it is striking that Fronto, a senior ex-consul, felt it necessary to keep in Maximus' good books: he ended his letter to Maximus by pledging his lasting and unimpaired loyalty to the Prefect.[6] Another sidelight on Maximus' influential position is offered by an inscription from Sparta (*AE* 1929.21), correctly interpreted by Edmund Groag. It shows that an ambassador had gone from there 'to Rome, to the man at the seat of the Emperor Caesar, Ga<v>ius Maximus' (the name was originally interpreted as that of 'Gaius (Tattius) Maximus', Gavius' successor). Groag commented that 'it is remarkable and indicative of the massive extension of the powers of the prefect, that the Prefect of the Guard interfered in the affairs of the senatorial province Achaia and of the free communities' (1939: 71 n. 291; approved by Stein in *PIR*^{2} G 104).

Some retractions and a conclusion

Before offering some kind of conclusion, there is need for retractions. Firstly, in an article published in 1966 it was asserted that 'Pius' conduct as an administrator must be regarded as less than impeccable. If one looks for someone to blame for the disasters of the next reign, Pius must take his share. He gave Marcus and Lucius Verus no military training; he retained one man as praetorian prefect for nearly twenty years - an incitement to the abandonment of original thought' (Birley, A. R. 1966a: 53). Fausto Zevi commented that it was not justifiable to regard Maximus' long tenure of the Guard 'as an example of foolish administration' ('*come esempio di una insipiente amministrazione*'). On the contrary, the fact that Maximus was not replaced was a sign 'that Antoninus had made a very careful choice' ('*che Antonino aveva effettuato una scelta molto oculata*') (Zevi 1971: 463 n. 39). In 1966 I could not yet be aware of Zevi's remarkable detection of the Ostian career inscription and his identification of the Ignotus as Gavius Maximus. When it did come to my notice (via the incomplete *AE* 1971.65, published in 1974) I was sceptical (Birley 1993: 49 n. 89). I should have paid attention to Brian Dobson's careful discussion, which took Zevi's remarkable paper seriously, even if reserving judgment (1978: 237-41, cf. above). To be totally frank, I had not even troubled to seek out Zevi's paper, instead simply relying on the inadequate version in *AE*.

Another matter where a retraction is perhaps required concerns the debate about the decision to give up Hadrian's Wall and move north to the Forth-Clyde line again. It was once suggested that the decision was a political one, 'a sop thrown to the marshals, the *militares viri*, whose ambitions had been thwarted for more than twenty years.' Hadrian had set a limit to expansion, there were to be no

[6] See also on this imbroglio Champlin (1980: 100-1; with notes at 169-70), citing Fronto from an earlier edition; the argument he mentions about the relative seniority of Niger mentioned in his notes now lapses.

more wars of conquest: his policy caused some resentment and looked to some, such as surely Tacitus, too much like that of Tiberius, 'not interested in extending the empire' (*proferendi imperii incuriosus*) (*Annals* 4.32.2) (Birley 1974: 15-17, citing Syme 1958: 488, 496, 517; dismissed by Michels 2017: 222 n. 21). The fact that Q. Lollius Urbicus, who was to implement the new forward advance, had been a close associate of Sex. Julius Severus during the prosecution of the Jewish war is surely important: Severus had gone from Britain to Judaea to deal with the great revolt (Birley, A.R. 1987: 56, 60; 1997b: 116; 2005: 138-9; 140). For his part, David Breeze suggests that Antoninus needed to win some military prestige (Breeze 2006: 12-13; cf. Speidel 2017: 259). The weight of argument in the new collaborative volume allows one to treat the move back north of the Wall as one of many conscious rejections of Hadrian's policy. As for the abandonment of the Wall, one may now consult two papers by Hodgson (1995; 2009) and, for a very different approach, Breeze and Ferris (2016).

Some final comments on Gavius Maximus may be offered. If his father was Gavius Bassus, who had a conventional career as an equestrian officer, it may safely be assumed that Maximus could have followed the same path had he wished. But if he can be identified with the Ignotus of Ostia, it is surely likely that he chose the centurionate instead of the *tres militiae*, entering it *ex equite Romano*. This would afford him a long and no doubt profitable career, including, as tribune of the *equites singulares divi Hadriani*, close attendance on the Emperor - in this capacity he could well have accompanied Hadrian on his travels from 121 onwards, perhaps, in 122, during the stay in Britain and the early stages of Wall-building. Analysis of his career, coupled with the information that he reached the twentieth year in the office of Guard Prefect, suggests that he probably died in AD 157 at the age of 77 or 78.

Two military policy items may be mentioned again. First, the changes in privileges for auxiliary veterans that were in force by December 140, for which Peter Weiß suggested an interesting explanation (cf. above). Sofie Waebens helpfully reviewed a range of further explanations: the change was to restore military discipline; to stimulate recruitment; to prevent excessive or fraudulent claims of Roman citizenship; to put auxiliary veterans on the same level as veterans from the legions, praetorian guard and urban cohorts. She also, of course, registers the Weiß theory as well (Waebens 2012: 8-16). After the change an anomaly remained: veterans of the praetorian fleets continued to receive the old privilege, citizenship for existing children. Waebens suggests that this was because there had been no increase in numbers of citizens in the fleets. In 158 the fleet veterans lost this exceptional status (Waebens 2012: 15-20). One might hesitantly ask whether the death of Maximus at that very time was relevant. If, as seems very probable, he was the Ignotus of *AE* 1971.65, he had previously commanded the two praetorian fleets and could well have grounds for exempting them from the change in 140. When he was gone the fleet veterans would have lost their protector. Weiß (2008: 30-2) stressed that Antoninus seems to have involved himself more than any other emperor in the details of such matters: but perhaps Gavius Maximus kept urging Antoninus to make changes?

The war in Mauretania also deserves highlighting. There was already trouble there early in the reign, to judge from the appointment of a governor of senatorial rank as governor of Tingitana, attested in December 144, Uttedius Honoratus (*AE* 1931.38 for senatorial status; dated by *AE* 2004.1924 = *RMD* V 398; Speidel 2017: 264-5). But more and more evidence is turning up showing massive reinforcements in Mauretania, sent from the Rhine and Danube armies, and from Britain.[7] A diploma fragment has

[7] On the war see Speidel, who lists the evidence for troops from elsewhere (2017: 262-5).

recently been published with *alae* from 4 provinces serving in Mauretania in 152 (Eck and Pangerl 2018). As Paul Holder kindly informs me (pers. comm.), a not yet fully published complete tabella I discovered at Skopje must be a second copy of the same constitution, dated 31 May 152, and was for no fewer than 12 *alae* from five provinces - Pannonia superior, Pannonia inferior, Moesia superior, Moesia inferior, Germania superior. This is yet another sign of the increased weight placed on the Mauretanian war, so briefly mentioned in the *Historia Augusta* (*Antoninus Pius* 5.4), cited above and, more fully, by Pausanias (8.43.3), who registered the Moors' reliance on cavalry - hence no doubt the need for reinforcements from so many *alae* in the war against them, which, Pausanias states, resulted in them being forced into the Atlas mountains. Can one infer the influence in this policy of a former governor of Tingitana?

Of course, to return to nearer home: no literary source mentions the giving up of the Antonine Wall, nor, for that matter, another apparent change of policy at about the same time, the extension of the Upper German Limes (on which cf. Speidel 2017: 261-2). It is perhaps no more than chance that these changes more or less coincided with the death of Maximus in the later 150s. But the notion that Maximus had played an important role in Antoninus' policy is at least worth consideration.

Appendix: New light on the Roman government of Britain under Antoninus

Eric Birley commented sixty-five years ago on the gradual 'breakdown of the system' of command by senators established by Augustus. 'It must be explained, at least in part, by the failure of successive emperors to exercise sufficient care in the selection of candidates for initial appointment, or for subsequent posting to key commands. At first sight it might seem surprising that Antoninus Pius should have been at fault in this respect; but he gave the consular provinces of Upper Germany and Pannonia to L. Dasumius Tullius Tuscus, who had never commanded a legion...and he appointed the jurist Salvius Julianus to the Lower German command, though he had not even served as *tribunus laticlavius*. Yet on second thoughts there is less cause for surprise; for Pius himself ... neither as a private citizen did he ever visit an imperial province, or see a legion. It is really remarkable that appointments to the old standard should have continued to be made during his reign, in cases like that of Julius Verus;[8] but the Augustan system was a strong one and well established, and it took many years for it to be overthrown. M. Gavius Maximus, praetorian prefect for twenty years, was no doubt its real guardian in this reign' (Birley: 1954, 208; 1988, 86).

We may now add another very well qualified man, T. Caesernius Statianus. A recently published diploma (Eck *et al.* 2016), which unusually records the grant of privileges to men from two provincial armies, of Moesia Inferior and Britain, can be dated to the year 152 or 153. It records as governor of Britain Caesennius (sic) Statianus. As the editors point out, there can be no serious doubt that this man is the same as the polyonymous senator whose *gentilicium* is otherwise spelled Caesernius. Furthermore, the editors give good grounds for identifying Statianus with the governor on the Colchester diploma (*CIL* XVI 130; *RIB* II 2401.12), of whose name in the ablative only the last three letters are preserved, followed by three more letters. This gave the reading variously as *[ ]ano Lon[ ]*, *[ ]ano Len[ ]* or *[ ]ano Lep[ ]*. The last one was favoured by Birley (2005: 151), who restored the governor's names as *[Pisib]ano Lep[ido]*, and identified him with the consul of 159, M. Pisiban(i)us Lepidus. He suggested that the Colchester diploma

[8] On whom cf. Birley (2005: 145-9); add now T. Caesernius Statianus, discussed below.

can be dated to 160 and that the prefect [ ] Verus of *coh. I fida Vardullorum* in that diploma was the same as Trebius Verus, the prefect of that regiment who dedicated to Neptune at Castlecary (*RIB* I 2149). This notion was clearly mistaken. The governor on the Colchester diploma, [ ]anus, must be the same as the governor of Britain, Caese<r>nius Statianus, dated to 152 or 153 on the new diploma, and the Colchester diploma is thus to be dated about then and not to the year 160. The surviving part of the governor's name, *[ ]ano*, should no doubt be followed by *leg(ato)*, (suggested as a possibility long ago by Birley (1938: 228), reviewing *CIL* XVI, where the editor, on 130, had read *[ ]ano Lon[ ]*).

By his full names Statianus was called T. Caesernius [T.] f. Palat(ina) Statius Quin<c>tius Statianus Memmius Macrinus. He was the younger brother of another man with many names, T. Caesernius Statius Quinctius Macedo Quinctianus. Their father was the procurator T. Caesernius Statius Quinctius Macedo (Pflaum 1960-1961: 158-60), their mother was probably either Rutilia Prisca Sabiniana, a lady of senatorial family (*PIR*^{2} R 266; Raepsaet-Charlier 1987: 542, no. 676), or another senatorial lady, Memmia Macrina. The latter would explain Statianus' last two names (*PIR*^{2} M 484; Raepsaet-Charlier 1987: 449-50, no. 539). Eck was non-committal ('möglicherweise') (1985: 59 n. 2). The family came from the great city of Aquileia in north-east Italy (see especially Šašel 1960; Šašel 1992: 54-74; also Alföldy 1977: 347-50; Krieckhaus 2006: 66-79, 219-21, with further references). The careers of the two, in their youth both clearly favourites of Hadrian, are relatively well known up to their tenure of the consulship. Quinctianus' year is not quite certain, presumably a few years before his brother Statianus, who was consul in 141 (Eck 2013a: 73). For the elder brother, Quinctianus, see especially *ILS* 1069, for Statianus *ILS* 1068 and eight inscriptions from Numidia, where he was legate of III Augusta and held the consulship in absence (Thomasson 2009: 164), as well as *CIL* XIII 5609, Pontailler-sur-Saône, a dedication by a *b(ene)f(iciarius) Caeserni Statiani co(n)s(ularis)* dated by the consuls of 150, showing that he went on to be legate of Germania Superior in that year (Eck 1985: 59). It was noted in an earlier study that '[a]t least two unknown governors must be postulated between Aelianus and Julius Verus' (Birley 2005: 144), referring to Cn. Papirius Aelianus (cos. 135), attested in 146 (*CIL* XVI 93; *RIB* II 2401.10) and Cn. Julius Verus, attested on 27 February 158 (*AE* 1997.1001). Now we have one of them. The text of the inscription which gives his career up to the consulship is as follows: *T. Caesernio [T.] f. Palat. Statio| Quin<c>tio Stat[ia]no Memmio Ma|crino cos., sod[al]i Augustali, leg. pr pr.| provinciae Af[ri]cae, leg. leg. XIIII G. M. V.,| misso ad dilec[tu]m iuniorum a Divo| Hadriano in r[e]gionem Transpada|nam, trib. pleb., quae[st.] candidato Divi Hadriani, | comiti eiusdem in [Ori]en<t>e, XVvirum* (sic) *stlitib. | iu[dican]dis| d.d. patrono IIII c] olon., p.p.* (*ILS* 1068, etc., Cirta). Géza Alföldy notes that the praetorship has been omitted, presumably by oversight, in this career, which is given in descending order; he notes also the remarkable favour that Statianus was a *comes* of Hadrian before he had even entered the senate as quaestor (1977: 349-50). The tour of the east with Hadrian can probably be dated to 129, hence Statianus' quaestorship would fall soon afterwards, followed by the tribunate and, presumably, the praetorship. The special mission to recruit young men for military service in Italia Transpadana may be explained by the heavy Roman losses in the revolt of Bar-Kochba (Birley 1997b: 274). Thereafter Statianus served as legate of legion XIV Gemina at Carnuntum in Pannonia superior before becoming legate of III Augusta, effectively governor of Numidia, where he is attested by a total of eight inscriptions. During his term of office he held the consulship, datable to 141. He may well have had other posts after that before becoming governor of Upper Germany.

In the inscription at Cirta, quoted above, the wording may be assumed to have been provided by Statianus himself to the authorities of the four colonies of the Cirtensian federation when they

expressed a wish to honour him, 'at public expense' (*p(ecunia) p(ublica)*). It is striking that his office in Numidia is expressed simply as *leg(ato) pr(o) pr(aetore) provinciae Af[ri]cae*, with no mention of the legion III Augusta, or of the Emperor Antoninus whose *legatus* he was. By contrast, the fact that he was chosen by Hadrian on three occasions as *comes*, as quaestor and as recruiting officer is spelled out. Even if the non-mention of Antoninus cannot be taken as implicit criticism of the reigning Emperor, his clear wish to recall Hadrian's favour deserves registering, as Werner Eck points out (2005: 67; 2010: 325-6).

Another change to the *Fasti* of Britain involves the redating of a legate of VI Victrix, Q. Antonius Isauricus, previously published as follows (Birley 2005: 250-51). The notes here cited follow the same numbering as the original but, have the references adjusted to match those used in the current paper:

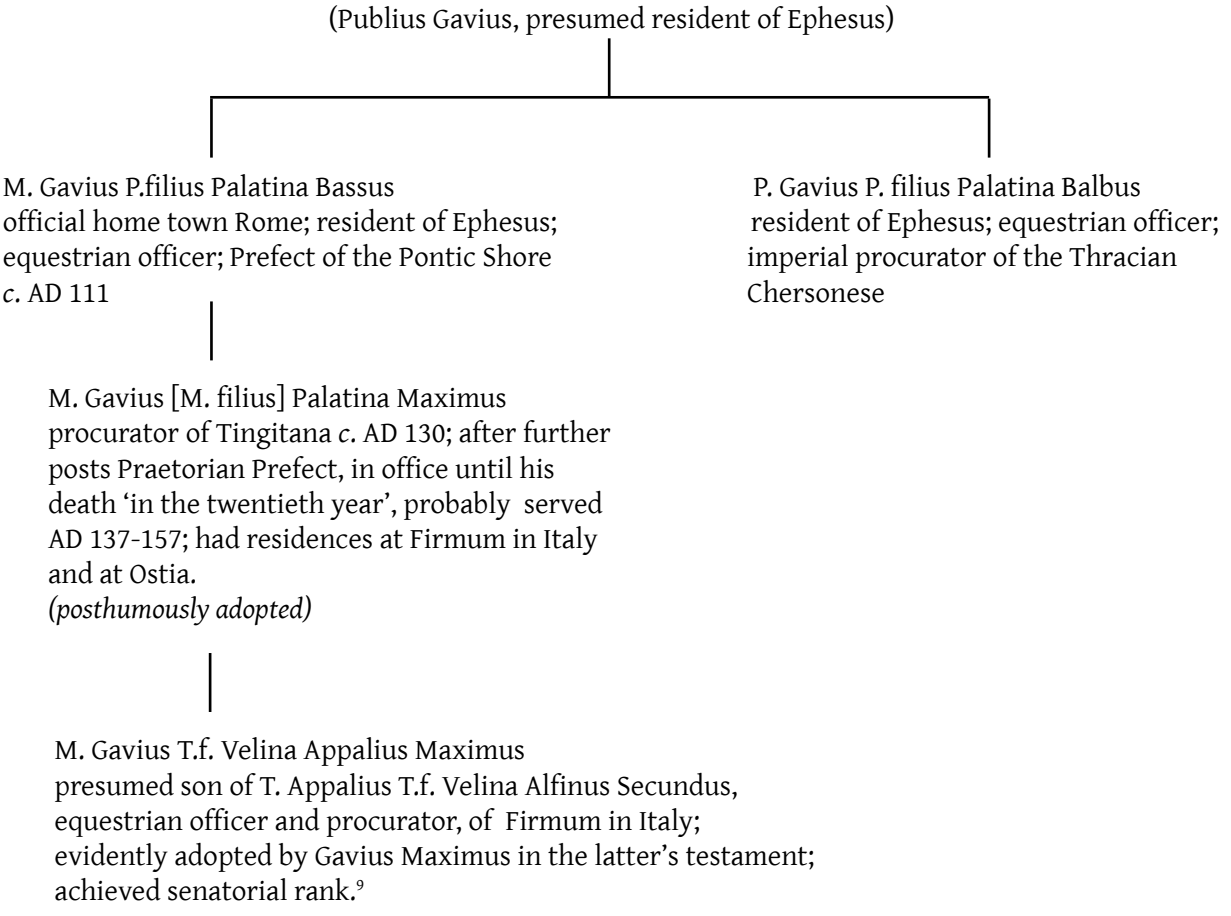
'23. late Hadrianic: VI Victrix, Quintus Antonius Isauricus (*cos. c.* 143) *RIB* 644, York (*Eburacum*):

Deae | Fortunae | Sosia 4| Iuncina | Q(uinti) Antoni Isaurici, leg(ati) Aug(usti). To the goddess Fortuna, Sosia Juncina, wife of Quintus Antonius Isauricus, legate of the Emperor', with the following commentary: 'A *leg. Aug*. at York must be a legionary legate rather than governor. He is surely the suffect consul Q. Antonius I[sa]u[ricus], in office *c.* 143,[95] so may be assumed to have commanded VI Victrix late in Hadrian's reign, *c.* 135. Nothing else is known of his career. Quinti Antonii are rare everywhere and only one other known senator is so named.[96] 'Isauricus' recalls the *cos. ord*. 79 BC and his son, *cos. II ord*. 41 BC, P. Servilius Isauricus. The latter had several children (Cic. *Phil*. 12.5), and apparent descendants may be detected as late as the second century.[97] Antonius Isauricus might perhaps descend from them through the female line. His wife was perhaps connected with the family of Q. Sosius Senecio (*cos. II ord*. 107).[98]

'[95]Alföldy, G. 1977: 144-5. [96] Q. Antonius Cassius Cassianus (*cos.a.inc.*): *PIR*^{2} A 819. [97] Two owners of brick-works in or near Rome in the early second century, Plotia (Servilia) Isaurica): *PIR*^{2} P 524; Raepsaet-Charlier 1987: no. 620, and Flavia Seia Isaurica: no. 380; Caesennius Servilius Isauricus, a senator of the late Antonine and Severan period: *PIR*^{2} C 175. [98] Raepsaet-Charlier 1987: no. 721, cf. 719, Sosia Frontina, daughter of Senecio: no husband is known; she might have married L. Aemilius Juncus (*cos.* 127): *PIR*^{2} A 355––a daughter of such a marriage might have retained her mother's *gentilicium*, as did other descendants of Senecio.'

The date confidently offered for this man's consulship (e.g. Eck 2013a: 73) is now shown to be mistaken. A fragment of a diploma for a veteran from a cohort in Dalmatia registers as consuls Q. Antonius I[sauricus, L. Aurelius Flaccus], a pair already known from the *Fasti Feriarum Latinarum* to have been in office in May, in a year thought to have been one of those between AD 140 and 144. But the new diploma mentions Antoninus' fourth consulship, held in AD 145, hence a year earlier than this for these consuls is excluded; and the only possible years under Antoninus when no other consuls are known to have been in office in May are 156 or 157 (Eck and Pangerl 2017). Antonius Isauricus therefore presumably served as legate of VI Victrix in the late 140s, rather than *c.* 135.

Family tree of M. Gavius Maximus



[9] See Salomies (1992: 28, 44), also suggesting that Gavius Maximus might have been Appalius' maternal uncle, but still assuming that Firmum was Gavius Maximus' home town.

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22. Civil settlement and extra-mural activity on the Antonine Wall

William S. Hanson

It is generally agreed that civilian settlements (*vici*) were set up outside virtually every auxiliary fort in the Roman Empire and that these settlements were established at broadly the same time as the relevant fort. This close connection between fort and *vicus* is apparent from their integrated layout, including the location of cemeteries some distance from the fort in order to leave sufficient space for the development of a *vicus* (Sommer 1999). The inhabitants of military *vici* are likely to have included some of the (unofficial) wives and families of the soldiers, as well as their slaves, and army veterans, along with craftsmen, shopkeepers, innkeepers, prostitutes and merchants attracted by the captive market which the troops in garrison represented (Salway 1965: 22-33). There has been a considerable expansion in our knowledge and understanding of these military *vici* in Roman Britain between the 1980s and the 2000s, as is apparent when comparing Sommer's original survey with his more recent overview of the evidence (1984; 2006). This improvement has come about through a combination of increased levels of excavation, aerial reconnaissance and, particularly, geophysical survey (e.g. Biggins and Taylor 2004a and 2004b; Hopewell 2005), combined with a greater emphasis on the evidence for women and children on the northern frontier (e.g. Allason-Jones 1999). Analysis of the material culture from within forts has suggested that more non-combatants may have been resident within them than has previously been assumed, further blurring the distinction between military and civilian (e.g. van Driel-Murray 1997; Greene 2014; Allason-Jones *et al.* this volume).

There can be no doubt that this general principle of associated settlements for non-military personnel applied even to Rome's most northerly frontier, despite its remote location and relatively short period of occupation. Most telling is the very specific epigraphic evidence from the fort at Carriden where an altar was dedicated to *Jupiter Optimus Maximus*, the tutelary diety of Rome, by the villagers living together at the fort (*vicani consistentes castellum Veluniate*) (*RIB* III 3503). The inscription confirms the Roman name of the fort, Velunias or Veluniate, and the terminology used implies that the settlement had official status as a *vicus* with its own communal organisation. The altar was recovered some 135-140 m east of the north-east corner of the fort during ploughing, its location indicating it was probably set up on the parade ground, as such official dedications tended to be (Richmond and Steer 1957). Breeze has suggested that it may well be a physical manifestation of civilians from the *vicus* swearing the oath of allegiance to Rome and the emperor as referred to by Pliny (Breeze 2016a: 267; Pliny *Letters* 35, 36, 100-03), which further emphasises the very close relationship between such settlements and the army. Indeed, he goes on to suggest that the occupants of the *vicus* may have brought such privileges with them, further underlining their direct link to the military community.

Later aerial photography seemed to indicate that in fact the altar came from an area of small ditched enclosures (Keppie *et al.* 1995: 601-06) (below), making this association with military formalities seem less likely, but closer investigation suggests that Richmond and Steer were probably correct. Unfortunately, they marked the position of the inscription on their original plan as some 60 m

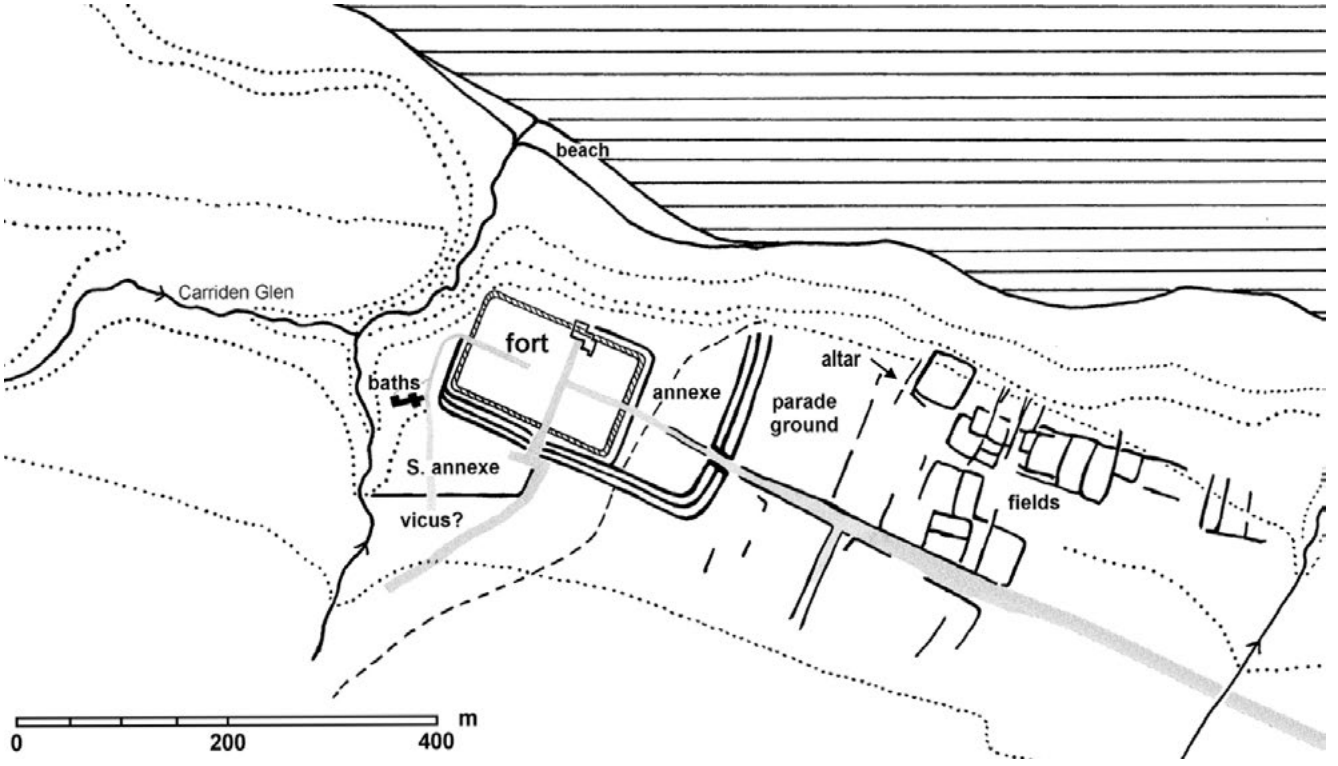

Figure 22.1. Plan of the fort, annexe and adjacent field system at Carriden, showing the corrected location of the altar dedicated by the *vicani* and the ditches of probable Roman date (after Bailey forthcoming, with corrections)

further away from the fort than they indicated in the text, an error that was further magnified when this planned location was included in the subsequent plotting of the aerial photographic evidence. Correcting that error places the inscription near the north-eastern corner of an open area to the north of the road leading out from the south-east gate of the fort's annexe (Figure 22.1), which has, not unreasonably, been interpreted as a parade ground. Interestingly, other parade grounds are attested along the Wall by altars to the goddesses of the parade ground found outside the forts at Castlehill and Auchendavy (Keppie 1998: 104-05; 107-08) in circumstances suggestive of deliberate burial.

Settlement foci

Despite considerable research effort over more than 40 years very little structural evidence of civil settlements outside the forts along the line of the Antonine Wall has been forthcoming. Some of the best evidence comes from Croy Hill where a single rectangular, open-ended building of slightly unusual construction was uncovered to the south-west of the fort (Hanson forthcoming: ch. 6). It was set within a fenced compound adjacent to a trackway that curved down the hill towards a well-constructed, metalled road that bypassed the fort. The wide range and large quantity of finds from the upper sections of the drainage ditches on either side of that trackway clearly indicated a strong focus of settlement activity on the well-sheltered, flat plateau immediately to the west of the fort

(Figure 22.2). This redeposited material represented some 75% of all the finds recovered from four seasons of excavation across 7000 m^2 of hillside to the south and east of the fort. It also hints at the quality of the *vicus* buildings, some with plastered walls, window glass and highly Romanised forms of decoration, as well as indicating the intensity and range of activities that was taking place within them.

Scattered post-holes, pits, road metalling and three ovens or kilns have been recorded immediately to the east of the fort at Falkirk, though these are assumed to lie within an annexe (below) as several of the features overlie the infilled ditches of the fort (Bailey forthcoming, ch. 10). Some 500 m further east, however, a somewhat enigmatic rectangular stone structure probably does relate to civilian activity (Keppie and Murray 1981). Though defined by rather ramshackle walls, the building was provided with a quite well-built, double hypocaust system and a pebbled courtyard area to the south. Window glass was also recovered. Despite these characteristics and its position adjacent to a good water supply, identification of the building as a military bathhouse seems improbable because of the distance separating it from the fort. It may, perhaps, have served as an inn for travellers (*mansio*) and its location implies that there would have been more extensive settlement between it and the fort. The significance of an apparent break in the Wall ditch some 70 m to the west of the building remain unclear in an area where the precise line of the Wall is uncertain (Breeze 1975; Bailey forthcoming, ch. 9).

Elsewhere along the Wall only very fragmentary structural remains have been identified. At Bearsden two separate lengths of broad cobble foundation, presumably designed to underpin timber walling, were recorded just outside the west gate of the fort (Breeze 2016b: 73-75; 348). Both were associated with Roman pottery and one had a pivot stone at one end, perhaps for a door. At Bar Hill traces of hearths associated with quantities of pottery were revealed in the early excavations to the north of the Military Way on the east side of the fort (Macdonald and Park 1906: 132; Robertson *et al.* 1975: 23), but geophysical survey across an area to the south and west, where quantities of Roman pottery and other finds had been recovered from fieldwalking (*DES* 1974: 34; 1976: 70), proved inconclusive (Jones *et al.* 2008a). Excavation to the west of the fort at Westerwood revealed a scatter of post-holes, overlying the remains of slight field ditches, adjacent to an area of burnt debris including window glass (Keppie 1995: 91; 97-98). Although the post-holes could not readily be assigned to specific buildings, they seemed to indicate north-south alignments. Some 145-150 m west of the fort at Mumrills a scatter of small post-holes forming a broadly rectilinear structure was identified (Smith 1939). It lay next to a north-south alignment of larger post-holes, from whose fill came the top of an altar to the mother goddesses (*RIB* I 2141) and other fragments of Roman building stone. The large post-holes had in turn been replaced or augmented by a line of clay and cobble foundation pads. An Antonine date for this structural complex is possible, but the absence of Roman pottery from the excavation and the re-use of Roman stone to pack the post-holes would tend to suggest that it was slightly later in date. Finally, slight remains of a rectangular timber building were recorded to the west of the northern annexe at Camelon (McCord and Tait 1978: 156 and Fig. 2) and in more recent excavations to the south-west of the south annexe (information from Martin Cook).

There are slight indications of buildings in some of the geophysical surveys that have been undertaken in recent years outside Wall forts. At Mumrills a rectilinear anomaly, presumably a stone structure, is visible in both the magnetic and resistance surveys of the area immediately outside the east gate of the fort (Stephens 2008); while at Castlecary a rectilinear stone building is apparent to the south of

the fort in the resistance survey (Jones *et al.* 2006). The latter, however, seems likely to be contained within a second annexe, an identification suggested by the earthworks which extend out from the fort to encompass the area according to the First Edition six inch and 25 inch Ordnance Survey maps. Accordingly, it may be interpreted as a bathhouse, though a stronger magnetic response might reasonably have been expected. Some support for the existence of a bathhouse to the south of the fort is provided by fieldwalking and limited trial excavation some 65 m further east, where quantities of Roman pottery and box flue tile were recovered, but no buildings identified (Bailey forthcoming: ch. 12). Extensive survey south of the Wall to the west of the fort at Auchendavy identified numerous anomalies, but no clear structures other than the fort bathhouse (Jones *et al.* 2008d); while similar survey to the south and east of the fort at Balmuildy was inconclusive (Jones *et al.* 2006).

The general failure of the extensive programme of geophysical survey to find substantive evidence of civil settlement along the Antonine Wall is a disappointment, all the more so given the success of the technique along Hadrian's Wall and in Wales noted above. Though it has been suggested that many of the forts may have been too small to provide a market for *vici* (Hodgson, this volume), the general failure of geophysical survey to identify them does not necessarily mean that such settlements did not exist, rather it seems to highlight a limitation of the survey technique in the soil conditions that pertain across the central belt of Scotland (Jones and Leslie 2015: 321-23). Geophysical survey has been highly successful in revealing more substantive features, such as ditches and the remains of stone buildings. However, it can be far less responsive to the more ephemeral remains of timber buildings, even within forts (Woolliscroft 2009: 1173). This is particularly the case if the buildings had not subsequently been demolished and partially infilled with burnt debris, and even more so when they are based on post-hole rather than post-trench construction, a method commonly in use in Antonine Wall forts (Hanson 1982: 177-79 and Table 9.2). Thus, while elements of the central range of stone buildings at Balmuildy and Mumrills are clear in the surveys undertaken within the forts, barrack buildings, even those known from excavation, are barely recognisable (Jones *et al.* 2006; Stephens 2008); similarly at Westerwood and Castlehill, the ditches of the fort are visible, along with a probable internal bathhouse at Westerwood, but other internal buildings much less so (Jones *et al.* 2008b; Jones and Hanson, this volume).

There is a marked increase in the quality of the evidence for civil settlement if the search is extended to contemporary sites along the southern coast of the Forth isthmus. Some 33 km east of Carriden a fort has long been known at Inveresk by the mouth of the river Esk, which may have served to protect a harbour for the transhipment of seaborne supplies (Hanson and Maxwell 1986: 190-91). Antiquarian records of Roman finds and modern excavations have confirmed the existence of quite an extensive settlement to its east (Thomas 1988; Bishop 2002b; 2004). Three phases of occupation have been uncovered. The first consisted of adjacent rectangular timber buildings; the second saw greater elaboration with more massively constructed buildings associated with elements of a street grid; and the third was characterised by the use of unmortared stone, stone-lined drains and furnaces related to ironworking. Finally, two altars known from the site, one re-used later in the Roman period, record the presence of Q. Lusius Sabinianus, the imperial procurator, second in rank only to the governor (*RIB* I 2132; Maxwell 1983: 385-89). Why the chief financial officer in the province was at Inveresk long enough to have dedicated these altars is not known, but it implies that the site was of some importance.

Land divisions and industrial activity

A range of other activities is known to have taken place in the immediate vicinity of forts, though determining the nature of the personnel involved can be problematic. However, activities that may have involved small-scale farming or animal husbandry seem more likely to have been in the civilian than in the military domain. Extensive investigation of the area to the east of the fort at Croy Hill revealed a combination of fences and ditches on both sides of the bypass road, respecting but not aligned with it (Figure 22.2) (Hanson forthcoming: ch. 5). A number of sherds of Roman pottery recovered from their fills, including an almost complete mortarium, confirmed an Antonine date. The fences and ditches served to divide up the area into small rectangular plots of varying size. Scatters of post-holes at the western end of these land divisions indicated the presence of what were probably rather ephemeral structures, though a single piece of window glass from one hints at some level of sophistication. A spread of occupation debris was identified less than 20 m to the north, but was not examined sufficiently extensively to determine its full extent or character and, given its location on the edge of a more low-lying and damp area, may have served as a midden.

Similar land divisions or field systems are attested outside several other forts along the Wall. Excavation some 150 m north-west of the fort at Auchendavy on the north side of the Wall revealed elements of a rectilinear arrangement of fields defined by a main ditch and two smaller linear features running at right angles (Dunwell *et al.* 2002: 274-279). Both of the latter seem likely to have been structural, presumably fence lines. Two of these features contained quantities of Roman coarseware of Antonine date and a few iron nails and probable hobnails. Excavation to the west of the fort at Westerwood located a few short sections of ditch and gully beneath later buildings, as noted above (Keppie 1995: 90-91 and 97-98), while at Rough Castle a group of some 12 small, conjoined sub-rectangular enclosures, defined by extant slight banks and ditches, are located 60-100 m south-east of the Roman fort. Sample excavation recovered no associated Roman material, so the excavators offered only a cautious endorsement of a possible Roman date (Máté 1995). However, since the system is aligned on a metalled road that in turn seems to be aligned on the bypass road around the east side of the fort, it may have defined contemporary garden plots or domestic/industrial enclosures similar to those at Croy Hill. Finally, at Carriden a system of small, ditch-defined rectilinear fields or plots aligned on the Roman road leading east from the eastern annexe of the fort has been recorded from the air, confirmed by geophysical survey and sampled by very limited excavation (Keppie *et al.* 1995: 602-06; Jones *et al.* 2008c). The system of conjoined enclosures starts some 145 m to the east of the annexe, just beyond the postulated parade ground (above) on the north side of the main road from the fort, and extends for over 365 m (Figure 22.1). Discontinuous lengths of ditch are recorded also to the south of the road on either side of a T-junction in the road, but they do not form a coherent pattern of enclosures. A few sherds of highly abraded pottery, either Roman or medieval, were recovered from the ploughsoil in sample trenches across the area.

Other sites in the wider vicinity confirm that contemporary agricultural activity adjacent to forts in the Antonine period was not unusual. A possible system of rectangular fields, broadly similar to that at Carriden, was recorded on aerial photographs in 1949 just beyond the Wall at Carmuirs to the west of the fort at Camelon (CUCAP DH29), while recent excavations to the south-east of southern annexe of that fort have identified U-shaped ditches or gullies which seem to have been used in the Antonine period (Kilpatrick 2016: 24-26; information from Martin Cook). At Inveresk on the Firth of

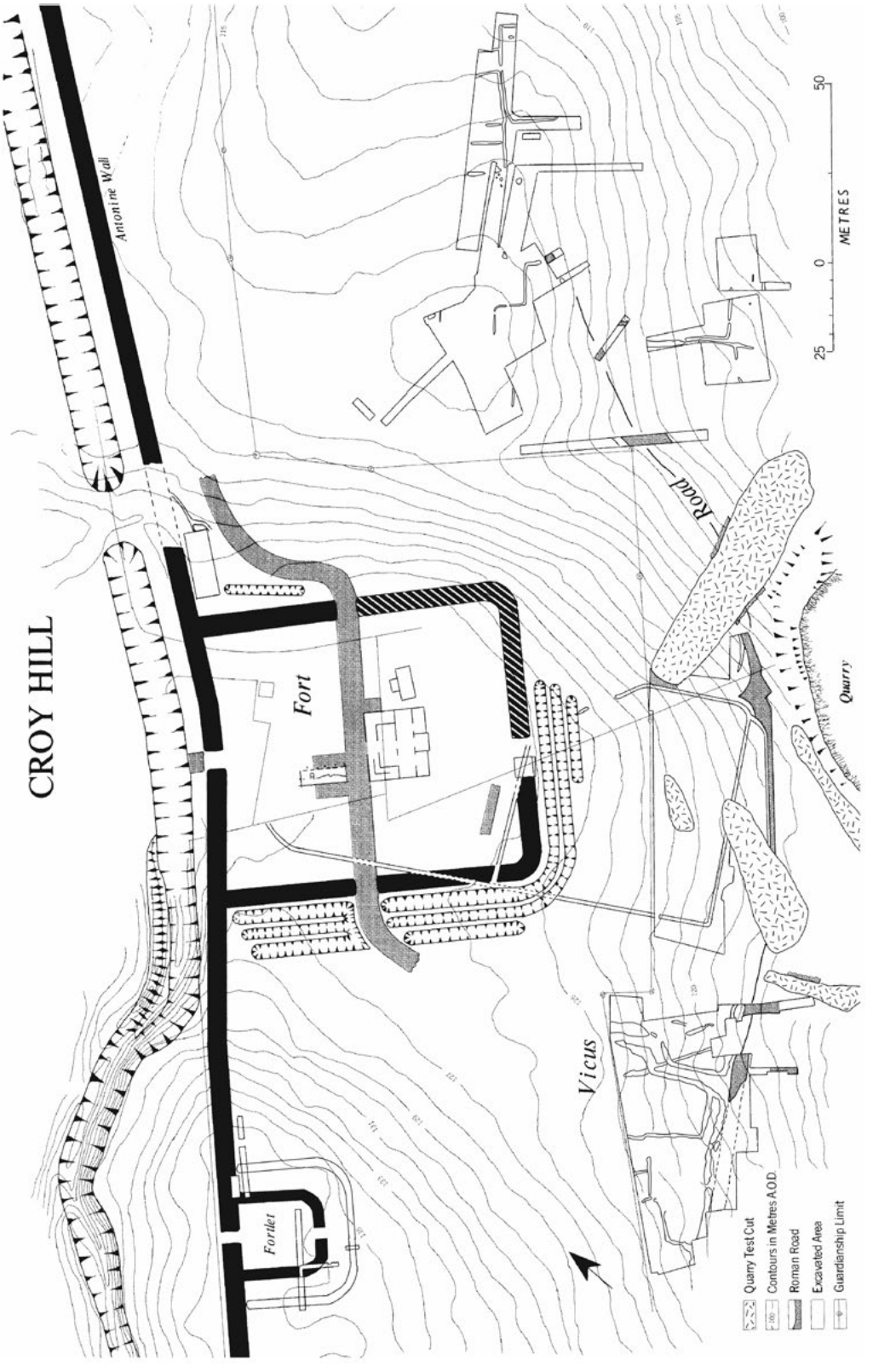

Figure 22.2. Plan of land divisions around the fort at Croy Hill (drawn by Lorraine McEwan; © W.S. Hanson).

Figure 22.3. Aerial photograph of field systems to the south-east of Inveresk partially overlying the end of a Neolithic cursus monument (© W.S. Hanson).

Forth (above), an extensive system of rectilinear field has been recorded over a number of years to the south-east of the fort (Brown 2002: 12-13 and figs. 5-9) (Figure 22.3). Such excavation as has taken place has been very small scale, but has provided confirmation that the fields were ditch-defined and in use in the Roman period (e.g. Cook 2004: 138-9 and 149-50; Leslie 2002).

Soldiers were certainly involved in aspects of production and manufacture (Breeze 1984: 275-77), particularly metalworking. However, the involvement of non-military personnel is also well attested, particularly in relation to pottery supply. Indeed, awareness that civil potters had moved their production centres into Scotland has grown in recent decades based on a range of evidence: fabric analysis; potters' stamps on mortaria; the recognition of wasters; and the restricted distribution of particular products (Hartley 1976; Breeze 1986). Such evidence has been noted at a number of forts on the Antonine Wall, including Balmuildy, Bearsden, Bar Hill, Croy Hill, Duntocher, Mumrills and Westerwood (Swan 1999: 452-61; Hartley 2016 and in Hanson forthcoming). Only rarely, however, have actual kiln sites been identified. A small figure-of-eight shaped furnace dug into the subsoil was located

Figure 22.4. The pottery kiln to the east of the fort at Croy Hill during excavation, showing broken masonry in its upper fill (© W.S. Hanson).

within the area of the rectangular plots east of the fort and to the north of the bypass road at Croy Hill and identified as a probable pottery kiln (Hanson forthcoming: ch. 5). It had clearly gone out of use in the Roman period as its furnace bowl had been backfilled with broken stone architectural fragments (Figure 22.4). A large deep pit nearby may also have been linked to pottery production. Several pottery kilns broadly similar in design to that at Croy Hill were located during building work partly dug into the hillside some 50 m to the south-west of the fort/annexe complex at Duntocher (Newall 1998: 25-8). Similarly, tile production is attested at Mumrills, where a substantial and well-preserved stone-built kiln was recorded (Macdonald 1915: 123-28 and plates II and III). It lay immediately behind the Wall rampart just outside the small annexe to the east of the fort. The likelihood that such tile kilns may have existed outside other forts is indicated by the variations in the style of box flue tiles at different sites, which suggest localised production, though this may have been undertaken by military personnel themselves (Keppie 2004: 218-19).

Other forms of industrial activity are occasionally recorded outside fort sites, though whether involving military or civilian personnel is less certain. For example, the presence of damaged architectural stonework in the backfill of both the kiln (Figure 22.4) and the adjacent large pit at Croy Hill (above) suggests the activities of a stonemason in the immediate vicinity, since they are clearly pieces, including two altar plinths, that were not completed and/or had broken during manufacture (Allason-Jones in Hanson forthcoming). Two of the linear features to the north-west of the fort at Auchendavy (above) contained non-ferrous metallurgical ceramics from a furnace or hearth. Glass-blowing may have been taking place at Camelon where one fragment of a moile, the surplus glass from the end of a blowing iron, was recovered from a pit adjacent to a multi-phase furnace within the Antonine annexe (Price 2002: 90 and information from Prof. Jenny Price). The fragmentary state of the glass recovered from

the fort at Bearsden, along with the absence of the heavier parts of vessels, suggests that broken glass was being systematically collected for recycling (Price 2016: 185).

People, religion and burial

The only cemetery known outside any of the Wall forts is at Camelon, though the evidence is both disparate and scattered. A cist containing an inhumation with weaponry, a stray find of a sword and six possible cremation pits have been recorded in gravel quarrying to the north-west of the fort (Breeze *et al.* 1976; Breeze and Rich-Gray 1980), along with an exotic stone funerary urn recovered from a nearby railway cutting in the mid-nineteenth century (Hunter, this volume). Elsewhere burials have been found only rarely, including a single cremation burial in a cooking pot to the south-east of the fort at Croy Hill (Hanson forthcoming) and undated burials outside the fort at Mumrills. However, tombstones or funerary reliefs are recorded from several forts. Though the majority of these are for military personnel, there are four that are almost certainly civilian in character (Keppie 1998: 65-67; 114-18). They were all found re-used in a souterrain built into the ditch of the Antonine Wall at Shirva approximately midway between Auchendavy and Bar Hill (Welfare 1984: 314-16). One of the tombstones is of a teenage boy, Salamanes, erected by his father of the same name (*RIB* I 2182). Neither were Roman citizens and the name form is Semitic. The absence of any reference to military rank suggests the father may have been a trader. A second stone commemorates Verecunda (*RIB* I 2183) (Figure 27.1). The use of only a single name, which translates as 'modest', indicates she was not a Roman citizen and was possibly a slave (Keppie 1998: 115; see also the brief discussion in Allason-Jones *et al*., this volume). The other two stones built into the souterrain are funerary sculptures depicting women, or possibly the same woman, perhaps the wife of an officer given the more elaborate nature of the monument and the traditional Roman character of the depictions (Keppie 1998: 116-17). A derivation for all the stones found at Shirva from a cemetery outside the fort at Auchendavy is preferred here for three reasons: among the re-used stones was a building inscription of *legio II Augusta* which is also recorded on a tombstone from that fort; the type of sandstone used in the gravestones most closely resembles that of a group of altars from Auchendavy; and a column base, which was also recovered from the souterrrain, is different in style from those found in the well at Bar Hill (*RIB* I 2174-79; Keppie 1998: 68).

Other named civilians who are known include specialist craftsmen. Potters who produced mortaria often stamped their wares with their names. Sarrius, who had workshops in both Warwickshire and Yorkshire, also set up production at Bearsden, along with possibly Mascellio and Cicu[ro] (Hartley 2016: 137-45). Finally, a further woman's name, Materna (mother), is recorded as a graffito scratched after firing on two samian sherds, presumably as a mark of ownership. These were recovered from the filling of the outer ditch in the south-west corner of fort at Mumrills (Bailey forthcoming: ch. 5).

In most cases identifying the gender of the owners of artefacts is fraught with difficulty (Allason-Jones 1995), but shoes can confidently be assigned to women and, indeed, children because of their direct correlation with foot size. Despite the evidence being limited to waterlogged contexts, women's and/or children's shoes have been recovered at five Wall-related forts, predominantly from excavations at the beginning of the 20th century. The contexts of recovery include a refuse pit and the east ditch at Castlecary (Christison *et al.* 1903: 341-2); the ditches outside the west gate at Balmuildy (Miller 1922: 98-101 and plate 57); the defensive ditches, refuse pits and the well in the *principia* at Bar Hill (Robertson *et al.* 1975: 78-82); the southern annexe ditch at Camelon (Arkesteijn and van Driel Murray 2015); and

unstratified from Rough Castle (MacIvor *et al.* 1980: 276-8; Douglas 2015: 175-76). To the evidence of the shoes may be added two examples of pottery *tettinae*, sometimes identified as infant's feeding bottles, one from the infilling of the outer fort ditch at Mumrills and one unstratified in the annexe at Bearsden (Steer 1961, 92 and 122-23; Bidwell and Croom 2016, 118-19). The presence of women and children at sites on the Antonine Wall has long been acknowledged, even if the potentially large number involved was not fully appreciated. What remains in debate is where they were living (see Allason-Jones *et al.*, this volume; cf. Hodgson 2014). The traditional view was that the shoe finds belonged to the wives and families of senior officers who would have been resident within the forts (Salway 1965: 160-61). While this might serve to explain the single example of a high status child's shoe from Rough Castle, it is difficult to apply the same argument to the shoes from Bar Hill or Camelon, of which between 30% and 50% are from women, youths or children (Robertson *et al.* 1975: 80-82; Arkesteijn and van Driel Murray 2015; Allason-Jones *et al.*, this volume). The shoes have been recovered most commonly from the defensive ditches around forts or their annexes. These were often receptacles for rubbish, particularly during the clearing-up process when forts were being demolished, so there remains a slight element of uncertainty whether their original wearers were resident within the fort or in an adjacent civil settlement.

Altars dedicated to a range of deities have been recovered from apparently primary contexts some slight distance removed from several forts, which hints at the possible presence of small shrines in their immediate vicinity. One found close to the burn to the west of the fort at Castlecary was dedicated to Neptune by *cohors I Vardullorum*, while another to Victory, dedicated by *cohors VI Nerviorum*, was recovered in association with a quernstone and unidentified Roman coins some 180-275 m south of the fort at Rough Castle (*RIB* I 2149 and 2144). A small altar to Mars was found alongside a separate altar base during quarrying some 30 m south of the bypass road around the fort at Croy Hill, while at the foot of the hill, on which a number of natural springs have been recorded, an altar to the Nymphs was found which had been set up by a detachment of *legio VI Victrix* (*RIB* I 2159; 2160). Similarly, an altar to Silvanus dedicated by the prefect of *cohors I Hamiorum* was found some 220 m north-east of the fort at Bar Hill (*RIB* I 2167) and an altar to Hercules Magusanus, dedicated by a *duplicarius* of the *ala Tungrorum*, was found *c.* 1 mile (1.6 km) south-east of the fort at Mumrills (*RIB* I 2140; Bailey 1992). Finally, an altar to the wood nymphs and goddesses of the cross-roads dedicated by the wife of a legionary centurion, presumably the commanding officer of the unit there, was found during ploughing some 245 m west of the fort at Westerwood (*RIB* III 3504; Walker, this volume), while another altar, which may still be in its original position, is located on high ground (156 m OD) some 1.4 km to the south-west of the fort. Unfortunately, this altar, known traditionally as the Carrick stone, lacks any surviving dedication (Donelly 1897). Though most of these altars were set up by military dedicators, the character and location of some of the dedications indicates less formal associations and links to dieties with some local resonance.

The role of annexes

At least nine of the forts on the Wall were provided with an annexe, that is an enclosure attached to one side of the fort (Hanson and Breeze, this volume), though few have been subject to extensive excavation. These annexes varied considerably in size, with one or possibly two examples (Rough Castle and Duntocher) being even larger than the forts to which they were attached. The forts at Carriden and Mumrills, and probably also those at Falkirk and Castlecary, had two annexes, as did the fort at

Camelon just to the north of the Wall. Apart from bathhouses, which have been recorded within five or possibly six of the annexes, there are occasional remains of timber buildings in their interiors, though in one case attention was been drawn to the general absence of structures (McCord and Tait 1978: 156). Not infrequently annexes also reveal evidence of multiple pits, ovens or furnaces, suggesting that they housed semi-industrial activities (Bailey 1994: 307-09 and forthcoming: chs 5 and 10).

This general paucity of evidence is partly the cause of an ongoing debate about the function of these attached annexes. Some argue that they represent enclosed civil settlements (e.g. Sommer 1984: 18-22; 2006: 123; Thomas 1988: 163), hence their inclusion in this discussion. Others interpret them as serving entirely military requirements, such as for the production and maintenance of equipment, the provision of secure areas for goods and vehicles in transit, or the protection of livestock, such as cavalry horses (e.g. Salway 1965: 156-58; Bailey 1994: 305-11; Breeze 2006: 95).

This author prefers the latter interpretation for a number of reasons. The best examples of a civilian settlement, both on the Wall at Croy Hill or beyond it at Inveresk, show no sign of having been enclosed; nor do the traces of buildings outside the forts at Westerwood and Auchendavy; while at Bearsden, Falkirk and Mumrills there is evidence of buildings outside both fort and annexe. This chimes well with the evidence from Wales, where several forts are provided with both annexes and unenclosed civil settlements (Burnham and Davies 2010: 212-14; 217-19; 226-29; 272-75 and 282-86). This suggests that annexes served different functions from civil settlements, as Sommer now seems to agree (2006: 121-22). Elsewhere, when annexes have been more extensively excavated or geophysically surveyed, they not infrequently indicate open areas lacking in remains of buildings (Hanson 2007: 13-17; 240-45; 667-68; Hanson *et al.* 2019: 298-301; 308-12; 316). Finally, the provision of multiple annexes at four forts on the Wall makes more sense as a reflection of the compartmentalisation of different military requirements than the existence of multiple civil settlements.

Conclusions

While no single site along the Antonine Wall provides a comprehensive example of a civil settlement comparable with any of those recorded along Hadrian's Wall, traces of buildings and/or land divisions and/or pottery manufacture have been recorded to varying degrees around 11 of the 18 known forts, if Camelon is included. In addition, indications of the presence of non-military personnel, either in the form of names or of distinctive material culture, are known from nine of the forts, two of which lack structural evidence of civil settlement. This suggests that the impression of an absence of civilians living and working in the vicinity of the Antonine Wall is less an indication of the true situation and more a reflection of the short-term nature and more ephemeral character of the structural remains involved, and the concomitant limitations of the archaeological techniques that have been applied to their recovery. In contexts where the areas around forts have been subject to intensive and long-term agricultural erosion or building development, only large-scale area excavation is likely to recover further meaningful data.

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23. Roman women in Lowland Scotland

Lindsay Allason-Jones, Carol van Driel-Murray and Elizabeth M. Greene

Introduction

Although, over the years, much has been written about Roman Scotland and the Antonine Wall, little attention has been paid to the women who lived in the area during the Roman occupation of Britain. This contribution attempts to address the deficit by exploring all the available archaeological evidence, whether epigraphic or artefactual. Lawrence Keppie will be familiar with most of the ladies discussed here but, hopefully, there will be some surprises for him.

Presented below is the evidence for women living on the Antonine Wall from three different perspectives: inscriptions and sculpture, leather footwear and small finds. This three-pronged approach has allowed an interesting insight into how we use material remains to identify individuals from the past and how very different the picture can be from different types of evidence. Debate has continued for decades about how individuals are identified in the archaeological record and how we correlate artefacts with sex or gender (Allason-Jones 1995; Allison 2006; 2013). What results are three different pictures of the presence of women in the Antonine Wall forts.

The epigraphic and sculptural evidence, discussed below by Lindsay Allason-Jones, reveals a picture of only a few women on the northern frontier, but nonetheless the presence of those women is recorded and a tantalizing glimpse of their social roles is discerned. On the other hand, Carol van Driel-Murray's investigation of the leather footwear from those forts on the Wall that preserve organic remains concludes that the presence of women and children in some abundance is quite clear. At the opposite end of the spectrum, the artefacts discussed by Elizabeth Greene reveal an uncertain picture of the population of the Antonine Wall forts. While there is little artefactual evidence that can be associated with female inhabitants with certainty, other than the footwear, the majority of the small finds are ambiguous and not definitively associated with men either. This investigation provides yet another caveat that the nature of evidence and its appropriateness to answer any question must be assessed carefully during discussions about the women of Roman Scotland.

The epigraphic evidence (LA-J)

To start with the evidence that gives the names of individual women, there are only four inscriptions on stone in Lowland Scotland: two altars and two tombstones. This compares unfavourably with the 27 altars dedicated by individual men and 23 by military units, although four of the altars, possibly five (see Keppie 1998: 57, no. 37), dedicated by men were all paid for by the somewhat obsessive Marcus Cocceius Firmus, the infamous centurion at Auchendavy (*RIB* I 2174-77).

The altar dedicated to Jupiter Best and Greatest of Dolichenus by Magunna at Birrens, to the south of the Wall, indicates that the women living in the area were able to dedicate in their own right (*RIB* I 2099). However, it also hints at the cosmopolitan nature of the inhabitants at that time as Magunna

would appear by her name to be of Celtic origin whilst Jupiter Dolichenus is a deity with eastern origins, often worshipped by army officers who associated his cult with the health and safety of the reigning emperor. It is noticeable that throughout Britain dedications to Jupiter by women invariably equate him with the ancient Hittite sky-god, Dolichenus, although why this should be so is unclear (Allason-Jones 2005: 141).

The altar dedicated by Vibia Pacata, wife of Flavius Verecundus, centurion of the Sixth Legion Victrix at Westerwood, North Lanarkshire, is even more exotic (*RIB* III 3504) (Figure 12.1). This was dedicated to 'the celestial Silvanae and Quadriviae'. The Silvanae were wood nymphs, particularly favoured in Pannonia, whilst the Quadriviae were the goddesses of crossroads. These deities were usually worshipped as separate groups but were occasionally worshipped in association with each other in Upper Pannonia, the suggested birthplace of Flavius Verecundus (Wright 1968; *CIL* III 4416; see also inscriptions from Carnuntum: *CIL* III 4441, and Vindobona: *CIL* III 13497). According to Birley (1984: 230), 'the dedication smacks of Pannonia', citing Domaszewski (1909, 78ff). Moreover, the epithet Caelestis is unusual and to Birley suggested that Vibia Pacata was familiar with the African cult of the Punic Tanit, a deity which was often syncretised with the Roman goddess Juno and given the epithet Caelestis, although Caelestis was occasionally used as the name of the goddess.[1] Wright stated that the centre of the cult of Caelestis was at Carthage and confirmed that both the names Vibia and Pacata can be found in Roman North Africa (1968). Birley speculated whether Vibia Pacata was herself African or if she had been influenced whilst in Lambaesis with her husband when he was posted to the Numidian *Legio III*, although there is limited evidence for this latter suggestion (see also Wright 1968).

In regards to this altar, it is clear that Vibia Pacata was the main dedicator. Hanson and Maxwell (1983: 186) wondered whether the combination of deities implied that Vibia Pacata was pregnant and seeking divine assistance for a successful delivery but, again, there is little supporting evidence. The inscription states that she acted 'with her family', although it does not give any clues as to how extensive this family was. It can only be presumed that she was the wife of Flavius Verecundus as she is simply referred to as 'of Flavius Verecundus', the word *uxor* not being included in the inscription, leaving us to speculate whether this was a stone mason's error, if it was felt unnecessary to mention their relationship or if the relationship was not one of wedlock.

The date of the altar is also unclear. The Antonine Wall had a limited period of occupation in the mid-second century AD and it might be presumed that this would provide a tight date of AD 142-162 for the inscription. However, Birley was of the opinion that the lettering suggested a third century date and may have been dedicated when Septimius Severus re-occupied the area very briefly around AD 208 (Birley 1984: 231); Tomlin, on the other hand, was not convinced and was of the opinion that the altar could still 'easily be Antonine' (*RIB* III 3504).

At Birrens, a tombstone was set up by Flavia Baetica to her husband Afutianus, son of Bassus, centurion of the Second Cohort of Tungrians (*RIB* I 2115). Although a serving soldier had funds deducted from his pay to cover the cost of his funeral, many soldiers appointed an official heir to oversee the rites and ensure these were carried out according to their wishes; there are a number of examples from Britannia, however, as in this case, where a widow was responsible for the erection of a tombstone

[1] See dedications from Chesters (*RIB* I 1448); Corbridge, where she is linked with Brigantia (*RIB* I 1131); but also from Carvoran, where 'Caelestis' is used descriptively (*RIB* I 1791).

(see, for example, *RIB* I 11; 17, 360; 670; 1026 and 1667). Given the restrictions on formal marriage for a serving soldier until the Severan Edict of AD 197, it would have been wise for a soldier to specify that his wife was his heir if he wished her to take responsibility for the funerary rituals, although as centurions were freer to marry (Allason-Jones 1999a), Flavia Baetica may not have needed to be formally mentioned in Afutianus' will. The names of Afutianus and his father indicate that they were not Roman citizens and may have come from Germany or Gaul or may even have been Tungrians from Eastern Belgium, whilst Flavia Baetica's name may imply that she had Spanish origins.

Even less is known of Verecunda, whose tombstone was found around 1728 at Shirva near Auchendavy, as the inscription merely gives her name with no mention of her grieving relatives or her age (*RIB* I 2183; *CSIR* 110) (Figure 27.1). Robertson was of the opinion that Verecunda was the wife of the commanding officer at the fort, or another one close by on the Antonine Wall, possibly Bar Hill, but Keppie dismissed this, as the single cognomen would more likely 'suggest a slave or local girl given a Roman name' (Robertson 1960: 38; Keppie 1998: 115, no. 50). Verecunda was not an uncommon name in Roman Britain, appearing as the name of the actress and girlfriend of the gladiator Lucius at Leicester (*CIL* VII 1335.4) and on the tombstone of a tribeswoman of the Dobunni at Templebrough (*RIB* I 621),[2] so her name provides no clues as to the antecedents or status of this Verecunda.

The benefit of an inscription on stone is that it is usually possible to be confident that the main person mentioned in the inscription, be it a deceased person or the sponsor of a stone, lived at one time at the site where the inscription was found. Inscriptions on other materials are less conclusive as they could move around independently from the owners, changing hands as the original owner moved on or died or the item was sold or stolen. The following items, therefore, may or may not indicate a woman who lived in Roman Scotland.

Throughout the Roman Empire pottery is the most commonly inscribed object found in excavations. In a military zone, where the range of products available would be limited, it would be a sensible precaution to label one's belongings, if one did not wish them to go astray. At Camelon two fragments of a plain samian bowl (Dragendorff form 31) were inscribed as being 'the property of Aurelia' (*RIB* II.7, 2501.92). This may be the same Aurelia who marked a small fragment of unidentifiable samian found at the same site in the same campaign of excavations (*RIB* II.7, 2501.90). Another fragment of a Dragendorff 31 bowl, found at Birrens in 1895 during excavations of the fort, was scratched below the carination with the letters '....ndida', which has been presumed to refer to a woman named Candida (*RIB* II.7, 2501.118). Two samian sherds, scratched with the name Materna, have also been found recently in the outer fort ditch at Mumrills (Bailey forthcoming, ch. 5). None of these brief mentions of a woman's name provide any clues as to the status or ethnic origins of these women.

More unusually, an amphora rim (Dressel 20) was found in 1981 in an Antonine I demolition layer in Building XI of the fort at Strageath; this was inscribed on the rim in such a way as to be read from the outside edge: IVLIA (*RIB* II.6, 2494.135). Women's names are rarely to be found on amphorae and it is not clear if this inscription indicates that Julia was the amphora's owner and lived at Strageath or if the letters were inscribed at the source of the pot or its contents, or inscribed *en route* by a female merchant or trader.

[2] Verecunda is expanded from Verecud...; see also Flavius Verecundus at Westerwood (*RIB* II 3504).

A silver cup found at Traprain Law, which was dedicated by Victorina (*RIB* II.2, 2414.23; Curle 1923: 34, no. 24), is another item open to discussion. The letters are scratched on the base rather untidily in three registers, and are clearly an owner's mark but was Victorina ever at Traprain Law? The cup was found in five fragments 'which were all folded flat, but these were successfully opened out and the vessel restored to its original shape' (Curle 1923: 34). This misguided enthusiasm for restorative conservation concealed the fact that the vessel as found might be best described as *Hacksilber.* Recent work on Traprain Law, and on *Hacksilber* in general, has altered our previous ideas about the treasure found at Traprain Law (Hunter and Painter 2013; Blackwell *et al*. 2017). It is now clear that *Hacksilber* was used in uncertain times as a reliable, transferable currency. In the case of the material from Traprain Law, there are several possible methods by which Victorina's cup arrived on the site. Looting has often been seen as the explanation for the presence of *Hacksilber* on a site but this may be considered the least likely reason at Traprain Law. Alternatively, on accession, and on various subsequent occasions, an emperor would be expected to pay his serving soldiers a donative which would usually include one pound of silver; the average soldier would not particularly care what form that silver took, as long as the weight was correct. On the return of soldiers to their native homes at the end of their term of service, this silver would return with them. However, the presence of *Hacksilber* in the Traprain Law Treasure could equally represent the custom of paying diplomatic subsidies. The people at Traprain Law had a long and amiable relationship with Rome and the Treasure may represent recognition of this relationship. Whichever of the reasons outlined above, or a combination of these factors, is the true explanation for the silver cup being found in five pieces on the site, it is unlikely that Victorina was ever at Traprain Law, indeed may never have stepped foot on the island of Britannia.

There are a number of stone sculptures which have no inscription but which depict women. In particular, from Shirva near Auchendavy, there is a tombstone showing a woman in a canopied carriage, a form of transport that may have been used extensively when women were travelling around the province, although, in this case it is more a funerary *trop* (*CSIR* 113). She is wearing an ankle length tunic with a swathed garment, reminiscent of a toga, across her right shoulder, emerging below her left elbow to drape across her hips. Keppie points out that the carriage as shown would not be a practical vehicle and it is unclear if the sculptor intended to portray a two-wheeled *carpentum* or the more usual four-wheeled funerary carriage (1998: 117, no. 53). Another funerary monument from Shirva shows a more common tombstone image, that of a person reclining on a four-legged couch with the statue of a small animal perched on her legs (*CSIR* 112)(Figure 23.1). There is some confusion as to whether this depicts a bearded man or a woman. Keppie in 1998 identified this as a female, considering this and the other tombstone from Shirva to depict 'the same woman, in two poses, reflecting stages in her journey to the afterlife'. He further postulated that the nature of the two monuments would suggest a woman of some substance, such as the wife of a commanding officer or a comfortably-off centurion (1998: 116, no 52; see also p. 67). This is in direct opposition to the opinion given in 1984 that the deceased was 'a bearded male figure' (*CSIR* 112). Such problems of identification are not unknown when the faces of sculptural pieces are damaged (see Hill 1974); the clothing, however, is exactly the same as that worn by the lady in the carriage and breasts are evident on both, so the balance of probability is that the deceased was female.

The stylised head of a woman with her hair arranged in rigid curls from Balmuildy may be a woman or a deity (*CSIR* 133). Several other depictions of women's heads from Scotland are more likely to be intended to portray goddesses rather than human women, such as one from Birrens, which is tentatively identified as Minerva (*CSIR* 10). The head from Burnfoot House, which may have come

Figure 23.1. Funerary monument from Shirva of a person reclining on a four-legged couch with the statue of a small animal perched on her legs (*CSIR* 112) (© Hunterian, University of Glasgow).

originally from Birrens, has the woman's hair completely contained within a close-fitting cap which is drawn into two wings on either side of her head by two bands or 'fillets', like a 1920's cloche. This head is very stylised but may portray a human woman, albeit one from one of the Continental tribes, such as the Ubi or the Treveri, who favoured bonnets; there is little evidence to suggest that the native women or the native deities of Britain wore such caps (Allason-Jones 2005: 109).

This paucity of epigraphic or sculptural evidence from Roman Scotland may not be surprising. Throughout the province of Britannia only 10% of inscriptions refer to a woman (Allason-Jones 2005: xi). This may well be because epigraphy was largely a military habit in which civilians were less inclined to indulge; a high proportion of surviving inscriptions are building inscriptions recording the erection of military edifices, such as Hadrian's Wall or the Antonine Wall or buildings associated with those barriers. Even in regard to religious dedications, women attached to military men were likely to expect formal religious observance to be the responsibility of the *pater familias* of the household; see, for example, a base found at Newstead dedicated to Silvanus by Gaius Arrius Domitianus 'for the welfare of himself and his family' (*RIB* I 2124).

The Roman Empire covered a vast area and evidence for inhabitants of Roman Scotland can be found in other provinces or in Rome itself. This can be seen in the story of the female servant of the

centurion Marcus Cocceius Firmus, a man famous for having dedicated at least four altars: to Diana and Apollo (*RIB* I 2174), the genius of this Land of Britain (*RIB* I 2175) Jupiter and Victory (*RIB* I 2176) and Mars, Minerva, the Goddesses of the Parade Ground, Hercules, Epona and Victory again (*RIB* I 2177) at Auchendavy. This female servant, sadly anonymous, committed a crime, presumably when at Auchendavy, also unspecified but heinous enough for her to be sentenced to cook for the other convicts in 'the saltworks' (*Digest* 49.15.6; Birley 1936). It is unclear where these saltworks were; Birley argued for somewhere along the coast of Fife, on the grounds that this was one of the few places where the necessary requirements for effective extraction of salt from seawater were available, but Whatley has shown that salt was extracted in many other places in Scotland in later periods, so either the east or west coast is a possible location (1987). Whilst she was serving her sentence this woman was 'captured by bandits of an alien race'. Birley, due to his conviction that she must have been in Fife, presumed that these bandits were from further north on the mainland but other translations specify that these malefactors were pirates, in which case they could have come either from Ireland or one of the Germanic tribes (Mason 2003: 129, 172; Haywood 1991; Elverhøi 2010). The site of Auchendavy, being in the central sector of the Wall, does not help any argument. Whoever kidnapped her, they immediately sought to make a profit and 'in the course of lawful trade' she was sold back to Marcus Cocceius Firmus, although by then he might have thought she was more trouble than she was worth. The canny centurion then sought to recoup the sale price by demanding a refund from the Roman government, on the grounds that the State should have taken better care of his property whilst she was in its charge. That he was successful explains why the case was entered into the Roman Law Codes, the only case from Britannia to do so: it set a precedent. The tale tells us much about life in Roman Scotland; firstly, that centurions had households with them including female servants and, secondly, it gives us an insight into crime and punishment in the province as well as indicating that there were dangers to be faced which might not necessarily be the result of political activity. Life for any woman on a frontier, particularly one as short-lived as the Antonine Wall, was likely to be arduous and dangerous.

The evidence of footwear (CvD-M)

Some of the women discussed above may have left their shoes behind as a tangible legacy of their presence on the Antonine Wall. Favourable conditions have led to the survival of leather shoes at a number of Scottish forts, and from the start shoes belonging to women and children attracted attention (Anderson 1903). Indeed, at Bar Hill it was footwear that defined the concept of a military community:

> 'Nothing brings this home so vividly, or with so distinctively human a touch, as the heaps of shoes that have been worn by women and by children.' (Macdonald and Park 1906: 131).

Lawrence Keppie himself published the first full study on footwear from the Antonine Wall and considered the question of families at some length, concluding:

> 'The Bar Hill footwear points to the presence in the vicinity of the fort of a considerable number of civilians, both women and children, even babies.' (Keppie 1975: 82).

Following on from this study, I will draw on (partially) published assemblages from Balmuildy and Rough Castle, and my own observations on material from Camelon, Castlecary and Birrens (unpublished work in progress; Anderson 1903; Macdonald and Park 1906; Curle 1911; Miller 1922; McIvor *et al.* 1980). All

these assemblages date to approximately the same relatively short time span, *c.* 140-160 AD and the footwear forms a tightly knit 'Antonine' spectrum. To these can be added the large assemblage from Newstead, which covers a rather longer period of occupation,[3] and a small group from Inveresk that appears to date slightly later in the second century (Bishop 2004). Together they present a consistent picture of women and their children as a normal adjunct of military life, supporting Keppie's conclusion of more than 40 years ago.

Footwear is a particularly sensitive tool with which to trace the presence of women and children in a living community. Shoes are common: unlike altars and gravestones, they are not restricted to the wealthy and several pairs of shoes would be required annually. When worn out they tend to be dumped casually as they are hardly worth recycling – and smelly to burn. In addition, on the Antonine Wall in particular, there seem to be sporadic clearance episodes that resulted in mass dumping of footwear in ditches, as is the case at Camelon, Bar Hill and possibly other less well-documented sites as well.

Shoes preserve the foot size of their owners and these sizes can, in turn be correlated with both sex and age (Groenman van Waateringe 1978; van Driel-Murray 1993: 42-6, Fig. 20; 1998; Greene 2014). From birth the feet of boys and girls grow – often in spurts – till puberty. At this point, girls' growth slows and ceases, while boys' feet continue to grow till about the ages of 15-16. Put simply, men have bigger feet than women, and when set out in a graph a characteristic double peak results, marking male and female sizes (cf. Figure 23.4). Furthermore, shoes form one of the few unequivocal archaeological markers for infants and children, and, as pointed out by Greene (2014: 27), these are especially powerful proxies for the presence of entire family units, rather than the 'slaves' and 'servants' (*calones*) that are occasionally trundled out in attempts to detract from the evidence for female presence in and around Roman forts.

Direct comparison between sole lengths from different sites is, however, complicated by various factors, such as original state, soil conditions, post excavation treatment (or lack of it), all of which affect the degree of shrinkage. Generally accepted estimates lie between 5-10% size loss but shoes from old excavations are likely to have suffered more shrinkage than those from a site such as Camelon, where the leather was not only sealed shortly after deposition, but was also professionally treated immediately following excavation. In such cases shrinkage is likely to be minimal (Douglas 2015: 171; Greene 2014: 30). Sometimes, as at Bar Hill, it is not clear whether the dimensions were taken only from insoles, or whether allowance for the rather larger outer sole was made, and it is likely that the larger sizes are inflated here. Nevertheless, an attempt to compare the profiles of the forts is presented in Table 1.

Except for Bar Hill, Camelon and Newstead, numbers of shoes are low and hardly representative, but even so, almost all sites display a range of sizes from children/juveniles to large adults. Even allowing for a male/female overlap and a tailback for boys (under 16's), the conclusion that women and children were present in some numbers in and around these forts is inescapable. Indeed, already in 1975 Keppie noted that 'only *c.* 65% ... may have come from full-size men's shoes' (1975: 82).[4] Bar Hill is exceptional in the number of children's shoes as most children will have gone bare foot, resulting in the failure of

[3] Newstead has a number of Flavian/Trajanic styles, and a few shoes post-date the Antonine Wall occupation. There is also some fragmentary evidence for Flavian/Trajanic shoe styles at Castlecary.

[4] At Camelon the figure is 41%; at Newstead 39%.

site	child	juvenile	female	f/m	male	total
Bar Hill	21	12	67	46	176	322
Camelon	3		31	7	29	70
Newstead	7	6	28	7	31	79
Castlecary		4	8	2	8	22
Birrens			2		1	3
Balmuildy	1	2	3		5	11
Inveresk (well)			1		3	4
Rough Castle		1		1	7	9

Table 23.1 Antonine Wall forts summary of shoe size categories

them to show up in the smaller assemblages - as Johnson and Boswell noted on their travels, people were still going barefoot in the highlands in the eighteenth century: shoes are a luxury, not a necessity.

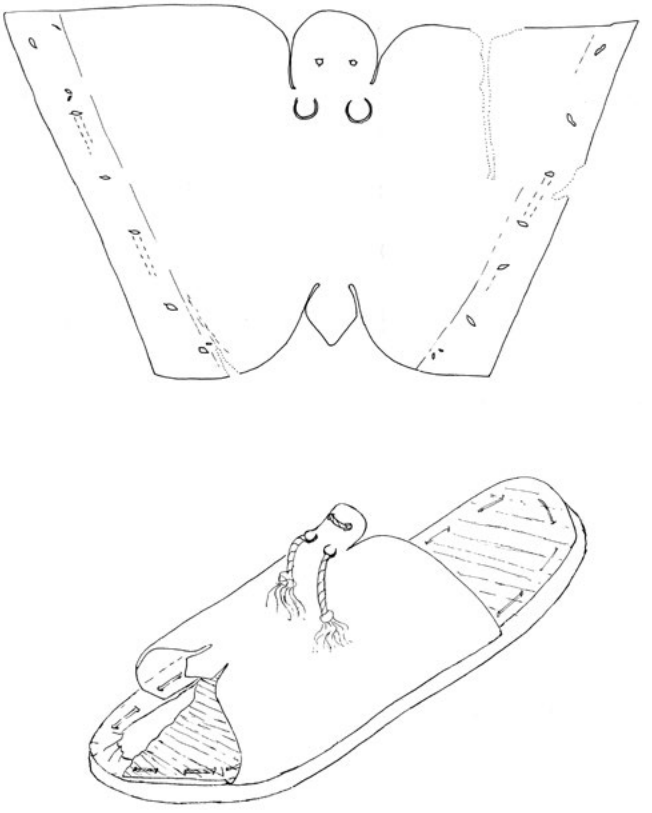

Figure 23.2. Cork slipper from Inveresk.

The child's shoe from the Flavian fort at Camelon (Maxfield, pers. comm.) is significant, as it attests to the presence of women in this earliest phase of military activity, as do the three Flavian/Trajanic female/child sized sandals from Newstead. This is hardly surprising in view of the occurrence of female clothing attributes and children's shoes at the early first century fort of Velsen (Netherlands), but such evidence needs to be stressed in relation to the interpretation of other finds categories (see below; van Driel-Murray 1999a: 175-6). An unusual find from Inveresk is the very fine cork slipper from a well in the *vicus* (van Driel-Murray 2004: 159, Fig. 111) (Figure 23.2). Found together with three to four adult male soles, this type of slipper is, according to Judit Pásztókai-Szeőke exclusively female, appearing on tombstones as a symbol of femininity along with attributes such as spindles, combs and mirrors (2005; van Driel-Murray 1999b: 80-82). Even if a link with the family of the procurator Lusius Sabinianus, who dedicated two altars at the site, is entirely speculative (if attractive), the slipper reveals that women of status were present – and not just raggle-taggle camp followers – even in forward forts and during unsettled times (Bishop 2004: 6; *RIB* I 2132). This particular leather assemblage post-dates the Antonine occupation, and presumably represents renewed interest in the

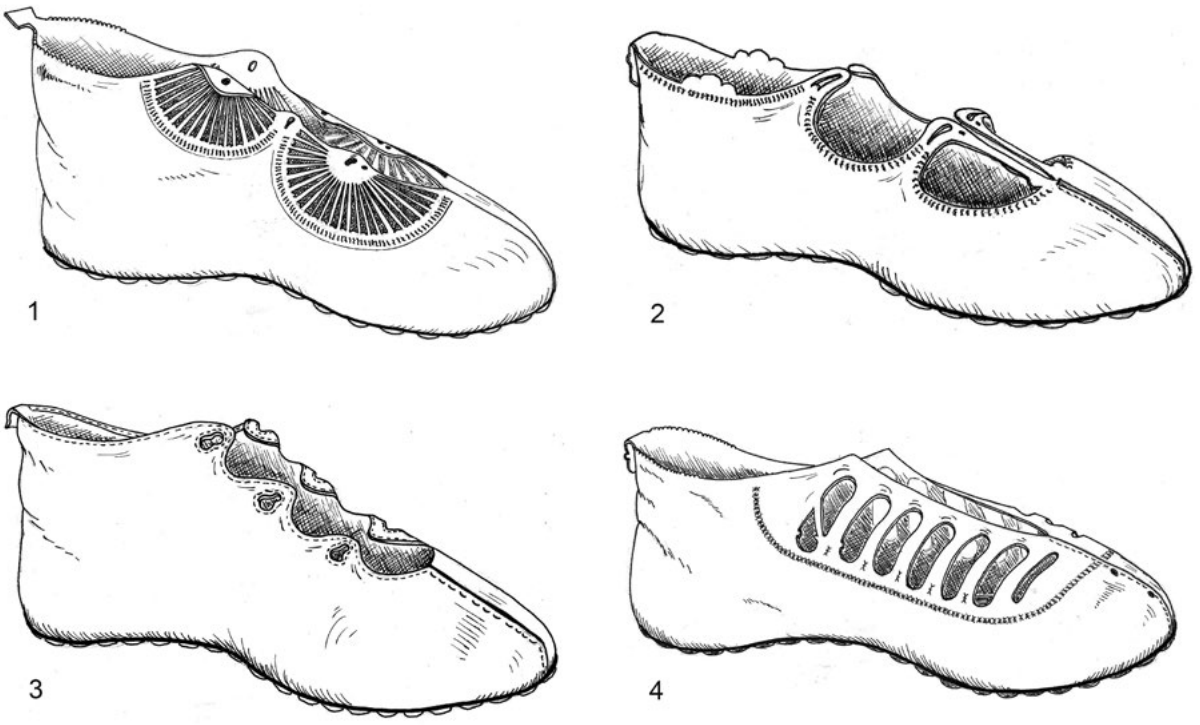

Figure 23.3. Main Antonine footwear styles: 1. Zwammerdam 2. Hardknott 3. Carron 4. Melrose (drawings © Mareille Arkesteijn).

region later in the second century (Bishop 2004: 185), which accords with the later date of some of the footwear recovered from Newstead. No other Antonine Wall site has slippers of this sort and, indeed, all the lighter types of footwear, such as sandals and soft sewn shoes, are in general rare. This is likely to reflect the harsh living conditions in these rather isolated forts, not to mention their sometimes awkward hill-top locations.

They may have lived on the edge of the Empire, but all members of these communities were abreast of current footwear fashion (van Driel-Murray 2016: 134). The most popular styles form a clearly defined Antonine association that can be recognized throughout the Roman Empire (Figure 23.3). The most distinctive feature is that shoes have become the norm for soldiers and civilians, women and children alike, replacing the boots and ankle boots that had dominated the footwear spectrum previously (van Driel-Murray 2001a; 2001b).[5] Within the four dominant styles, shoes are individualized through slight variations in fastenings and with all manner of decorative details or openwork, giving the purchaser ample opportunity for self-expression.

Roman footwear is rarely sex specific and styles generally appear in all sizes. The popular style 'Hardknott', for instance, ranges from *c.* 13 cm (size 20, for a 3-4 year old child at Bar Hill, cf. Figure 23.6) to a huge example from Camelon at 28 cm, size 42. But from Camelon comes a hint of gendered

[5] The classic military *caliga* had already been abandoned by the close of the first century in Britain. There are just two examples from Scotland: from Newstead and Mollins.

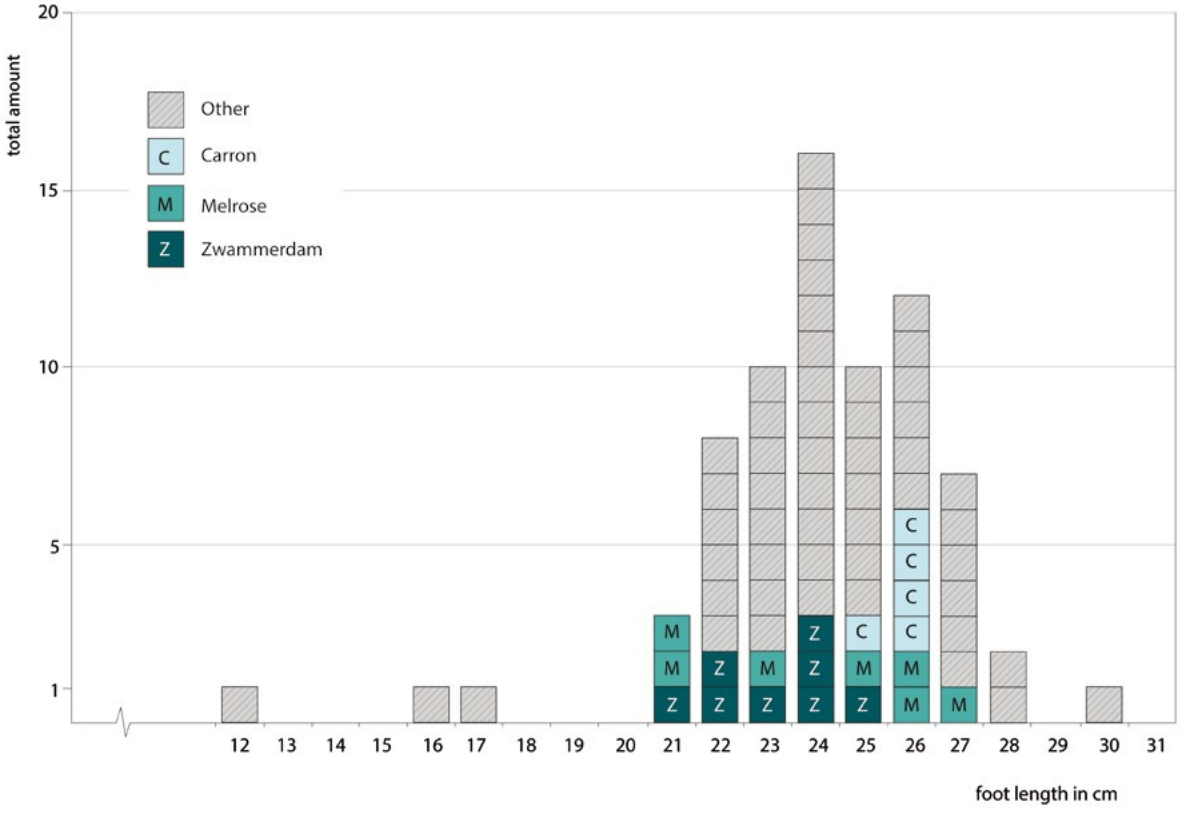

Figure 23.4. Graph of shoe styles correlated with size from Camelon.

preferences (Arkesteijn and van Driel-Murray 2015). Here, a sturdy lace-up shoe with radiating openwork around the lace holes, style 'Zwammerdam', clusters between 22-26 cm, with the mean at 24 cm (Figure 23.4). Complementing this ladies' shoe are two styles seemingly favoured by men: the 'Carron' and the 'Melrose', with most examples at 27+ cm and a tail off into smaller sizes (25 and 24 cm), possibly indicative of the area of the male/female overlap. However, these preferences are as yet only partly supported by finds from other sites. Although the majority do seem to be small, several 'Zwammerdam' shoes lie in the 24-25 cm range: are these larger size women, or is this a warning that the style might also be chosen by men? And if so, which men? For unlike the 'Melrose' and 'Carron' there do not seem to be any really large examples (over 25 cm). Even so, this illustrates the caution that is necessary in drawing conclusions and the need for testing such observations against large, statistically significant collections for certainty. Similarly, though the width of the sole may distinguish male from female, other factors are also at play: whether there is an allowance for socks or insulation in winter shoes and the degree of physical activity will also affect foot width (splaying). Changes in fashion are a major issue at sites with longer occupation, such as Newstead, even affecting the shape of soles, as is evident when the narrow shape current towards the end of the first century is compared to the more natural forms of the second (van Driel-Murray 2001b: 320).

Figure 23.5. A pair of 'Camelon' style ladies' shoes from Camelon.

On the other hand, Camelon represents a single dump episode, preserving the footwear current at a particular moment of time. It is quite likely that shifts in age and gender profiles may take place throughout the fashion cycle of a particular style. Thus sandals are rare in male sizes till the later second century, though women in urban communities had eagerly taken on the new fashions, and in Vindolanda sandals were being worn in the commander's household at the beginning of the second century. There are three Flavian/Trajanic sandals from Newstead and two sandal soles from Bar Hill (Keppie 1975: Fig. 21.1, 3) all in female sizes. A third fragment (Keppie 1975: Fig. 21.2) is evidently larger, and is of a rather narrow, shapely style that, curiously enough, witnesses the start of the gradual male acceptance of sandals as normal wear. This style of dress was seemingly first adopted by women in urban and elite military circles, and only slowly gained general currency, but by the end of the century, sandals for men and women are common even on northern settlements. Taken together, the Antonine Wall assemblages provide the sort of snapshots that are needed to unravel gendered variation in the uptake of clothing, quite apart from the normal fashion cycle where early adopters may, in time, stimulate emulation outside the initial groups (van Driel-Murray 2016: 145-6).

Although most shoes are relatively plain, some women sported elegant and even luxurious footwear. The upper of a pair of delicate boots from Camelon, ladies' size 35, is cut in a lacy pattern that demands a coloured lining, and the tiny lace holes would only allow the passage of a silk ribbon (Figure 23.5). Similar lacy openwork occurs at Newstead and Bar Hill, in both cases from small shoes, and other shoes are prettified with roundels, tabs and tooling on the surface. But it would be wrong to think that fine footwear was the privilege of women: one of the most elaborate of the Bar Hill shoes (Keppie 1975: Fig. 23.25) is a respectable size 40. Similarly, decorative nailing is more frequently seen on male footwear

than on ladies' (Bar Hill, Fig. 26.59; also at Camelon and Newstead). Such decoration is evidently a sign of status, not gender, as was already apparent from shoes of the officers' households at Vindolanda (van Driel-Murray 1993: Fig. 18-19, Pl VI; Greene 2014).

Macdonald and Park were slightly uncomfortable with the unexpectedly large numbers of women's and children's shoes at Bar Hill:

> 'These followers cannot, of course, have dwelt within the gates; that would have been a grave breach of military law. They must have been housed outside, with traders and others, in an *annexe* or civil settlement such as was invariably associated both with the *castella* of the auxiliary cohorts....' (Macdonald and Park 1906: 131).

From the barrack block finds at Vindolanda we now know these rules were not as strictly applied as was once thought, and considering the location of Bar Hill and the areas covered by the excavations, it seems likely that the shoes belonged to people living in the fort itself. Besides finds from the ditches, boots are recorded as coming from four of the nine refuse holes within the ramparts, as well as from the *praetorium* well (Macdonald and Park 1906, 61-63: 133; Keppie 1975: 82). In contrast, at Newstead, leather was preserved mainly in the ditches and the wells in the southern annex, reflecting the community and craftsmen living and working nearby. The footwear from Camelon had been dumped in one of the outer ditches of the southern annex, and presumably derives from people living there. However, as a single event dump, it is conceivable that the footwear had been collected from within the fort before it was tipped into the ditch and deliberately sealed over with clay (Arkesteijn and van Driel-Murray 2015; Douglas 2015: 171-2). This is reminiscent of the '...heaps of shoes...' noted at Bar Hill, and the disposal of collected fort refuse also remains a possibility for other assemblages from fort ditches, such as Castlecary and Balmuildy. Here the shoes were mixed with sheet leather[6] in the ditches at the west gateway, again suggesting the refuse might have come from inside the fort (Miller 1922: 98, Pl. LVII). Any families living in Rough Castle must have been housed either within the fort, or else around the bathhouse in the small annexe to the east. It is unfortunate that so little of the footwear recovered from these forts can be traced to an exact location, but the overall impression is that families are to be found as much inside the forts as in the annexes.

The footwear is serviceable and long lasting, and subtle differences suggest shoes were made to measure. Even on isolated forts there was a desire for display and purchasers were keenly aware of the potential for individual expression in the playful combination of decorative details. These people must have been very conscious of presenting the Roman way of life on the furthest frontier and this may to some extent explain the impractical nailed shoes worn by some infants (Greene 2014; van Driel-Murray 2005). Two tiny soles from Newstead (13 and 14 cm = size <21) are relatively lightly nailed, but a similarly sized 'Hardknott'-style shoe from Bar Hill is a miniature adult's shoe, carefully made, with decorative treatment and a fully nailed sole. Some of the *c.* 60 hobnails had even been replaced, indicating serious wear (Keppie 1975: Fig. 25.49) (Figure 23.6). If iron nails possessed some kind of magical purpose, as Dungworth has argued (1998: 157), such ideas may have transferred to hobnails, rendering nailed baby boots doubly protective, but there is also an ideological element involved, with nailed footwear projecting the sartorial expectations of correct Roman dress (Greene 2014; van Driel-Murray 2005).

[6] Tent leather, but first assumed to be soldiers' clothing.

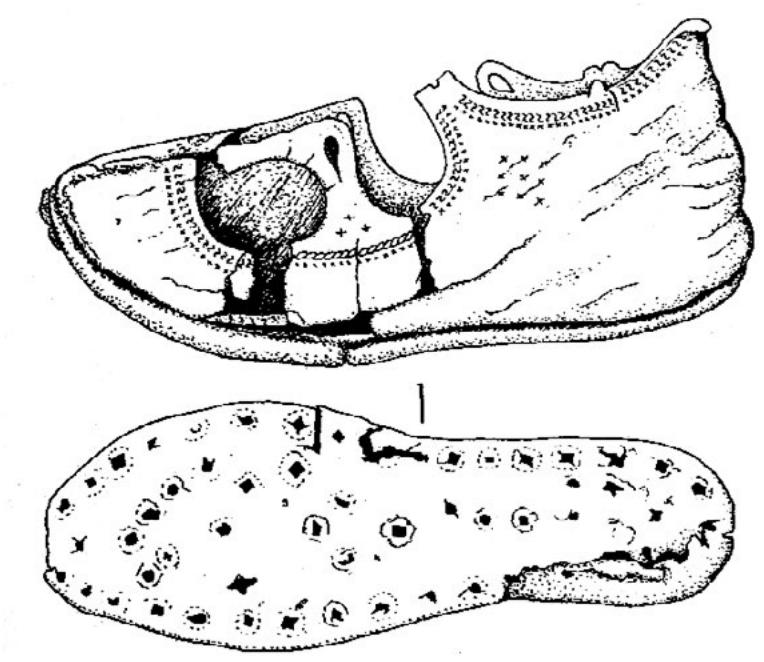

Figure 23.6. Bar Hill child's shoe. The outer sole length is 15.5 cm; foot length *c.* 14 cm (drawing by Margaret Scott, from Keppie 1975: Fig. 25.49).

Here, women take an active part in the creation of social cohesion by protecting their children and promoting 'Roman-ness' across the generations in a hostile environment. This pride may also explain the extreme wear visible on some shoes, especially noticeable in the assemblage from Camelon. Even in times of supply stress, Roman nailed shoes had to be displayed at all costs by all members of the military community, regardless of whether the sole had worn through, or a loose upper had to be tied back with string.

Nailed footwear defined a visible community of soldiers and non-combatants, including numerous women and children, contrasting strongly with the dress of the native inhabitants. This emphasis on visible symbols matches the aggressive displays of martiality on the Distance Stones, and might be taken as a sign of fear and uncertainty. Small communities huddled behind extensive earthworks felt their vulnerability and needed to reinforce their sense of belonging to the wider empire through their distinctive footwear and the protection it gave them.

The small finds (EMG)

The picture we have so far shows quite clearly that to find women in the archaeological record — on the Antonine Wall or anywhere else — requires consideration of all the evidence available. The fact that the most robust evidence appears to be the leather footwear provides a keen warning about how often our analysis is affected by what is not available to us. So often inscriptions are used to reconstruct the people and lives of the past, and they are indeed usually our only hope of starting to understand how individuals identified themselves, but in this case-study the results would appear to support the old notion that the military environment, especially on the developing frontiers, was no place for women and children. However, when other evidence is brought to bear, the image changes dramatically. The leather footwear makes it quite clear that the Antonine Wall forts were inhabited as much by non-combatants, either inside or outside the forts themselves, as they were by military personnel. It is, perhaps, not surprising that so few inscriptions reflect the lives of women on the Antonine Wall, as was discussed above, in which case one hopes to look to other bodies of evidence for support. This is especially true when other frontiers of the empire, such as Hadrian's Wall or the Raetian *limes,* have given so much evidence for the presence of military families in both peaceful and unsettled periods (Allason-Jones 1997; 1999a; van Driel-Murray 1993; 1998; Maxfield 2002; Allison 2013; Greene 2013a).

If we turn to the last category of evidence — the artefacts left behind by the inhabitants of the Antonine Wall settlements — a somewhat bleak picture is presented, but one that can nonetheless be used as an important caveat for the study of women in the archaeological record. The small finds from the Antonine Wall could prove to be especially interesting because of its short occupation period of about twenty years. It is commonly suggested that wives and children would have joined their soldier-husbands only after life was settled, perhaps a decade or more after a unit occupied an area. However, since the Antonine Wall assemblages, particularly the footwear, betray the presence of these individuals in the short period of occupation, it suggests a rather quick settlement of women, children and families, if not immediate occupation, even during periods of conquest and consolidation of a region, as was concluded above in consideration of the Flavian period footwear from Camelon and Newstead. As Allason-Jones has stated (1999a), the best way for a military family to thrive is to stick close to the soldier/breadwinner, and this notion was perhaps heeded in both peaceful and unsettled periods. If women and children were present on the Antonine Wall in some numbers, which the footwear evidence considered above seems to suggest, then we also need to consider how this operated when the units moved to a new frontier in a potentially volatile zone. Settlement patterns of this sort, occupation of women and children in zones of uncertainty if not volatility, are almost never considered for the non-combatants associated with the Roman army (Greene 2013a; see also Velsen in the first century: van Driel- Murray1999a).

Evidence from elsewhere on the northern frontiers indicates that we do not necessarily need to think in terms of significant lag times for family members to join the soldiers, nor even that the region be particularly settled and peaceful. At Vindolanda, the evidence from the very earliest occupation phase (Period 1, *c.* 85-90 AD) betrays the presence of women and children even in this short-lived period of settlement in a newly created, potentially volatile frontier zone (Greene 2013a: 19-23). The defensive ditches of the Period 1 fort have produced nearly 60 leather shoes (van Driel-Murray 1993; Birley 1994: 15-35; Birley 2003: 1-7; Birley and Blake 2005: 77-81), of which at least 37% and possibly more belonged to individuals that fit the profile of women, adolescents and children (Greene 2013a).

It is unfortunate that we cannot compare the small finds assemblages from this period because the internal spaces of the fort are inaccessible, lying metres under the third-century stone fort and its internal structures. However, the shoes alone suggest that women and children were along for the ride, at least in some forts on the northern frontiers, at the same time that the units occupied and settled these regions. The writing tablets from Vindolanda dating to the periods just after initial occupation (Periods 2-4, *c.* 90-120 AD) further support the notion that families were a constant presence in and around the forts, even during periods of settlement and entrenchment (van Driel-Murray 1998; Greene 2013a; 2013b; 2014). Though the Antonine Wall area was consolidated during a time when the empire as a whole was more settled than it had been in the first century, it was still an active military zone that was newly established in the middle of the second century and could give us clues to the timing of familial movement in and between military zones.

With the footwear evidence in mind, a look at the artefacts associated with Antonine Wall forts is in order. Though the picture is not filled out particularly well from the remaining evidence, this investigation provides another important caveat about how much the material remains are able to answer our questions. Other than two examples of *tettinae* (sometimes identified as infant feeding bottles) from Mumrills and Bearsden (Steer 1961: 92 and 122-23; Bidwell and Croom 2016: 118-19),

none of the artefact assemblages loudly betray the presence of women in the Antonine Wall forts, but at the same time, most artefacts are also not exclusively related to male activity. This situation should be heeded as a warning about how we assign a gender association with certain items, a subject made clear decades ago by Allason-Jones (1995). Since the archaeology of sex and gender became a popular research subject in the early 1990s, the onus has been on scholars to prove the presence of women through various means. That is to say, the presence of men and the fact that the material record inherently reflects their existence in a particular place has been considered a given everywhere. The presence of women, apparently, still needs to be proven. To be sure, in the case of Roman military forts and their surrounding communities it seems obvious that men are there from a quantity of evidence including texts, inscriptions and artefacts. Yet, the only small finds that really loudly declare the presence of soldiers with certainty are armour and weaponry, those items that are necessary for a soldier to do his job. However, if we look at the vast majority of finds reports from Roman forts, they are filled with all manner of artefacts that have no particular gendered association, yet they have been assigned 'male' because of their presence in a fort. Even hobnails are sometimes associated with soldiers, despite the thousands of shoes from the western Empire that were clearly worn by women or children and are kitted out with a sole of iron hobnails. As Allason-Jones asked twenty years ago, 'what is a military assemblage?' (1999b).

The finds catalogues from the Antonine Wall do not differ greatly from one another and none of them provides strong evidence that small finds will prove beyond doubt that women were present in military forts. However, we saw above from the footwear evidence that women and children comprised a significant part of the population at forts where leather is preserved in the material record. It seems unlikely that those shoes reached the site erroneously and it seems less likely that those are the only forts where women and children were present and we happen to have found their shoes in those places. Therefore, we may assume that women occupied most military settlements and made up at least some of the population on the Antonine Wall. It is more challenging to understand their locations of activity, social role and generally what their lives were like living on the northern frontier of the Roman empire.

If we look at the Antonine period finds from Camelon as an example (Allason-Jones forthcoming), a typical picture emerges from the small finds of life at a Roman military fort. Metal work is ubiquitous, but it is clear that finds of specifically military character are not. From the Antonine period associated with the Wall garrisons there are only three finds - a scabbard runner, a harness junction and a *lorica* belt - that are certainly associated with military kit, presumably worn by men. Weapons and armour were found in small quantities (four each of spear heads, arrow heads and bits of mail together with a dagger handle) and hobnails are listed as potentially reflecting the military individuals present on site. Other finds may be part of military accoutrement but are not certainly associated with soldiers. In other words, this description sounds very much like one that discusses the presence of female individuals, with a number of qualifications about the lack of evidence and ambiguous nature of its deposition or location. We often point to spinning or weaving equipment, which in a military context may or may not indicate the presence of women (Allison 2013; 2006; Alberti 2018: 2-4; James 2006), or perhaps beads, hairpins or other pieces of jewellery that are presumed to have been left behind by female inhabitants (e.g. Hoffman 2006). All of these, however, have been questioned at some time about their ability to reveal the presence of a female user, just as we see with most of the finds at Camelon. Therefore, the number of items that are by default used to indicate the presence of men in a fort - and

it is worth saying that that usually included everything found when there was no expectation that women might be present - are indeed rather ambiguous.

The majority of finds from the Antonine phase at Camelon include the expected group of ironwork related to structures such as nails and hinges, items associated with transport, and vessels (though they predominate in the Flavian period) all of which would be absurd to assign use by a male or female. A few stand-out decorative items are equally ambiguous; items decorated with panther motifs and a silver ring with carnelian intaglio with a parrot incised on the bezel show a Bacchic influence, but upon whom we cannot say. These items no more suggest the presence of women or men than anything else since we simply cannot know who chose to associate themselves with them. This conclusion is equally true for the many copper-alloy studs, plates, and buckles that cannot with certainty carry an assertion of their owner unless they have a very specifically military character, which most do not.

Camelon, therefore, despite having an almost equal number of shoes in its deposits that were as likely worn by women as those worn by men (Table 23.1), would be classified as a predominantly male preserve if not for the survival of the leather. This is all the more surprising and something to heed carefully considering that the Camelon shoes appear to represent a single event of discard, perhaps before departure, rather than the extended period of casual loss and discard from the long years of occupation. Since it is untenable to argue that women joined the population from the moment of decampment, and since it is clear that women and children were always part of the extramural communities surrounding Roman military forts, we can only assume that the daily lives of the entire population of a military settlement left behind very little material culture that can be 'gendered' with any certainty.

At another Antonine Wall fort, there is a slightly different but not dissimilar picture to that found at Camelon. Lawrence Keppie will be familiar with the metalwork catalogue from Bearsden (Keppie 2016: 197-220), which includes quite a few more pieces of weaponry than at Camelon. Several *pilum* heads make up the assemblage together with 47 arrowheads and other pieces of what are clearly weaponry and armour. Otherwise, the assemblage of iron comprises items such as tools and small implements, structural items and strapping that carry no association with an individual. Included in the iron report are the hobnails from shoes, but of course, as was shown above, the studs on their own can carry no assumption of who wore the shoe to which they once belonged. Only a very small amount of leather has come from Bearsden (Gallagher 2016: 305-7), only one item of which is measurable (24.5 cm), but had there been greater anaerobic conditions on the site, we may have shown a similar range of inhabitants as was revealed from the Camelon material assemblage.

If we consider items of adornment at Bearsden the image is no less cloudy. Two intaglios that originally sat in a metal ring could be associated with anyone living on the site (Henig 2016) and the same could be said for the ring and gemstone evidence at Camelon (Allason-Jones forthcoming). This is particularly true for the middle second century when intaglios had ceased to be a personal marker for sealing letters and were a mass-produced product with low-quality knock-offs available to almost anyone who chose to obtain one. Glass vessels and ceramic tableware from the Antonine Wall are similarly unable, on current research, to give us information about women either making or using such items.

In short, most of the artefactual evidence from Bearsden, Camelon and other sites on the Antonine Wall will tell us little about individuals. Other than military equipment that we can clearly associate with

a Roman soldier, items that have in the past been associated with either male or female occupation are either quite ambiguous or rather foolish to consider as having a 'gendered' association. This short evaluation provides a renewed caveat that we are not seeing the whole picture of life at a fort, and especially not the population present, when we evaluate single categories of evidence such as small finds. It is only when we are given the rare glimpse of organic remains such as leather or wooden shoes that we can really fill in the picture of the inhabitants of a settlement, and it is only when we have inscriptions (or the rare cases of writing tablets) that we start to understand the individuals themselves and catch a glimpse of their projected identities.

Conclusions

Over the years, most discussions of women being on the Antonine Wall have tended both to ignore the evidence and to reflect the attitude of the predominantly male antiquarians and archaeologists of the day. This was particularly noticeable when Macdonald and Park tried to account for the large number of women's shoes at Bar Hill (1906: 131, quoted above). If, however, one uses the evidence, even if it is on occasion rather sparse, it is clear that there were women in and around the forts, women from all levels of society from those who wore highly decorated shoes tied with silk ribbons to those who wore their shoes until the soles were worn through.

The paucity of evidence, however, should not be seen as damning. The limited number of inscriptions, for example, accurately reflects the 10% identified as the norm for inscriptions dedicated by women as opposed to men throughout Roman Britain (Allason-Jones 2005: xi). Few of the sites on the Antonine Wall have been excavated extensively or with modern excavation techniques, and Roman Scotland as a whole is not known for its large material assemblages. It should also be remembered that, despite their best efforts, the Roman occupation of the land north of the Tyne-Solway line was intermittent. The move to the Antonine Wall was a short occupation with later intentions to conquer Scotland even shorter.

If twenty years is a considerable chunk of an individual's life, however, it is a short period for a Roman installation and the Antonine Wall would still have seemed a new venture when the order came to abandon it and return south. The inhabitants, male or female, would have gone through their accumulated belongings and disposed of what they did not need to keep, such as worn out shoes, but carefully packed up what they wanted to take with them to their next posting. What would be left would be the rubbish or items that were immovable because of their size or their nature, such as altars and tombstones. In the case of Roman Scotland, the evidence of the small finds, usually a large proportion of a site's material evidence, is minimal in quantity but, as stated above, the survival of small finds depends on the way a site is abandoned. In the past, the presence of women on a site was usually only accepted if jewellery was found (Allason-Jones 1995), the very items most women would carefully pack and take away with them.

Even if the evidence is limited, it is most revealing. It is noticeable that the different sources of information available to us reflect different levels of society. Epigraphic evidence, for example, not only provides us with the names of people who lived in an area at any one time and, in the case of Lowland Scotland, indicates the cosmopolitan nature of these people, it also represents the better off and the more or less literate. It is evident that women from all over the empire were present, as is

shown by the Celtic Magunna and the possibly African Vibia Pacata. These inscriptions also indicate how different religions travelled with people as they crossed the empire. The tombstone of Afutianus (*RIB* I 2115) also demonstrates how women would take responsibility for ensuring that the correct funerary rituals were carried out for their deceased relatives. Flavia Baetica, sadly, would have had to leave her husband's grave behind when she moved away from Birrens.

The wearing of shoes represents a wider cross section of society, including those who are often nameless, and indicates whether their wearers required stout boots or party pumps, although the poorest and the natives may have gone unshod or with footwear made from un-tanned leather which does not survive. Shoes from the Antonine Wall also point to an interest in fashion and the lines of communications that kept wearers abreast of the latest modes. Knowing the latest fashion in hairstyles simply required seeing the latest coins of an empress; the latest shoe styles needed more direct information (Allason-Jones 2005: 129-30; van Driel-Murray 2016: 144). In this, the material evidence from Lowland Scotland reflects the empire as a whole, an empire in which approximately 50% of the population will have been women.

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24. Where did all the veterans go? Veterans on the Antonine Wall

Alexander Meyer

The fate of auxiliary and, to a lesser extent, legionary veterans has been a problem for quite some time. This is largely a result of the fact that the evidence we have for individual veterans in the western provinces is almost entirely limited to diplomas and inscriptions on stone, although various artefacts and sometimes architecture have also been used to adduce the presence of veterans (Derks and Roymans 2006; Ivleva 2012). It has also long been recognized that the number of inscriptions and diplomas that come down to us from the Roman world vary widely province to province and region to region. Despite intense antiquarian and archaeological investigation over two hundred years, Britain has produced remarkably little evidence of veterans, either legionary or auxiliary. It is, therefore, difficult and perhaps dangerous to draw conclusions about veteran behaviour from a study of veterans of the Antonine Wall. Consequently, this examination includes all veterans that *may* have served in the Roman army in Britain during the period of the Wall's occupation. The result is a microstudy of auxiliary and legionary veterans in a single province in a brief period. It demonstrates, anecdotally, that the auxilia and the legions must often be studied as distinct institutions, because the evidence for their behaviour comes in different forms, but also that auxiliary veteran behaviour especially was not uniform and that it changed with circumstances in ways that are rarely transparent to modern scholars.

The Roman garrison of Britain under Hadrian included 30-40,000 auxiliary troops (Holder 2003: 118-20, 145). In theory 4% (*c.* 1400) of these soldiers should have been discharged each year, in the absence of casualties and early dismissals. It is more likely that about half of Roman soldiers survived to the end of their service (Mann 1983: 59; Scheidel 1996: 117; Keppie 2000a: 306), but even if one assumes that only a quarter of enlisted soldiers served out their 25 years of service, we should expect 350 newly discharged veterans each year. Yet, in 2002, Mann could cite only 22 diplomas and 12 inscriptions that named auxiliary veterans who had served in Britain. Subsequent publications, including volumes IV and V of Roman Military Diplomas and volume III of the Roman Inscriptions of Britain, have provided texts of at least a further 16 diplomas and two inscriptions. Thus, we now have a total of 38 diplomas and 14 inscriptions that relate to auxiliary veterans of the Roman army in Britain. This is a miniscule fraction of the total number of soldiers who must have been discharged after serving in the province.

Legionary veterans are similarly poorly represented in the epigraphic record. Only 19 legionary veterans are explicitly recorded in Roman Inscriptions of Britain, despite the presence of at least three legions (approximately 15,000) soldiers in the province throughout almost four centuries of Roman occupation. This leads one to wonder where all the veterans have gone and what, given the paucity of the sources, we can possibly say about them. These questions are brought into particularly clear focus when one attempts to discuss veterans from the Antonine Wall.

Among the already small number of Roman military veterans known from the British garrison, only one auxiliary soldier, whose diploma has been recovered, and one legionary veteran who dedicated an

altar to an unnamed deity at Castlecary, on the line of the Antonine Wall, can be directly associated with it. The first of these is a diploma, dating to AD 159, that was recovered from Colchester (*CIL* XVI 130). This diploma was presented to a veteran of *cohors I Vardullorum*, at least a vexillation of which was stationed at Castlecary on the Antonine Wall (*RIB* I 2149; Holder 1982: 124). Castlecary and Colchester are approximately 350 miles (560 km) distant from each other. Furthermore, this veteran is identified as a member of the Glevi, who occupied territory in and around modern Gloucester. The triangulation of this soldier's origin, his service and his likely place of settlement highlight the unpredictable movements of auxiliary veterans after their service. The recipient of this diploma neither stayed with his unit - nor indeed in the 'military zone' - nor did he return to his homeland. Rather he seems to have been attracted to a former legionary base, turned veteran colony.

The only legionary veteran known from the Antonine Wall is C. Iulius Spiratus, who is recorded on an altar dedicated to an unnamed deity that was discovered at Castlecary in the nineteenth century (*RIB* I 2151) (Figure 24.1). The altar was erected by Spiratus, who was a veteran of *Legio VI Victrix* and a member of the Mattiaci. This tribe inhabited the area surrounding the eponymously named Aquae Mattiacorum (modern Wiesbaden, Germany). Spiratus' presence on the Wall is curious. *Legio VI Victrix* is recorded along the line of the Antonine Wall on a series of altars from Castlecary and on building inscriptions from Croy Hill to Old Kilpatrick. It also seems likely from the density of altars naming this unit at Castlecary (*RIB* I 2146, 2148, 2151), and mention of vexillations for *Legio II Augusta* and *Legio VI Victrix* there, that the fort was a hub of legionary activity on the Antonine Wall. It is not clear, however, why a veteran of *Legio VI* would have been at the site. Legionary veterans commonly settled near the forts where they had served, but Spiratus is unlikely to have served much of his s*tipendium* at Castlecary since it was not a permanent legionary installation. Furthermore, *Legio VI* continued to be based at York throughout the occupation of the Antonine Wall (Keppie 2000c: 32). It is also clear that Spiratus, as a Mattiacus, had no roots in Castlecary. Rather, one might suspect that Spiratus' altar was a vote of thanks for the completion of his service, rather than an indication of where he spent his retirement.

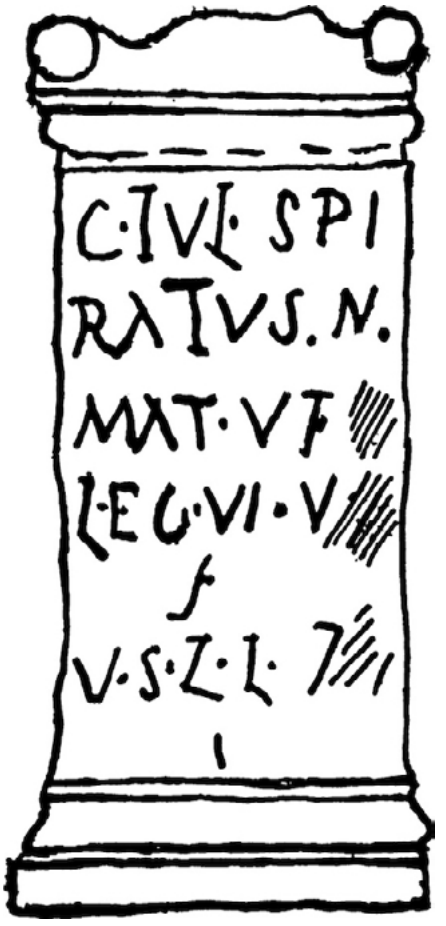

Figure 24.1. Altar from Castlecary dedicated by a veteran of *legio VI Victrix* (*RIB* I 2151, reproduced by kind permission of the Haverfield Trustees).

In addition to these two secure records of veterans who had served on the Antonine Wall, there are 17 diplomas that were issued in Britannia between AD 138 and 189 and thereby may have been issued to soldiers who had served on it (Table 24.1). Regrettably, the information preserved on many of these diplomas is incomplete, as is our knowledge of the Wall's garrisons. The provenances of only seven of these 17 diplomas are well-established, but the

	Reference	Date	Findspot	Unit of recipient
1.	*RMD* III 168	140-154	Tarazone (Hisp. Cit)	unknown
2.	*CIL* XVI 115	140-160	Chesters	unknown
3.	*RMD* I 45	141-147	Cirencester (?)	unknown
4.	*CIL* XVI 93	145-6	Chesters	unknown
5.	*RMD* II 97	146	Vindolanda	*Coh. I Tungrorum*
6.	*RMD* V 420	158	Ravenglass	*Coh. I Aelia Classica*
7.	*RMD* V 450	114-125 or 154-203	unknown	unknown
8.	Eck *et al.* 2016	152/3	unknown	unknown
9.	Tomlin 2019: no. 30	156/8	Vindolanda	unknown
10.	*CIL* XVI 130	159	Colchester	*Coh. I Vardullorum*
11.	*RMD* IV 293	178	Bulgaria (?)	*Coh. II Gallorum Veterana*
12.	*RMD* IV 294	178	Private collection	*Ala Gallorum et Thracum Classiana*
13.	*RMD* III 184	178	Thrace?	*Coh. VII Thracum*
14.	Weiss 2006: no. 2	178	Balkans	unknown
15.	Eck *et al.* 2004: no. 12	178	unknown	unknown
16.	Eck *et al.* 2004: no. 13	178	unknown	unknown
17.	Eck and Pangerl 2007: no. 3	178	unknown	unknown

Table 24.1. Diplomas from Britain, issued between AD 138 and 189

entire corpus provides interesting fodder for further consideration. Six of the seven well-documented diplomas were discovered in Britain. Those that have come without provenance seem to have been discovered in the Balkans and on the Lower Danube. While this information is frustratingly imperfect, and the Balkans and Lower Danube have produced a disproportionate number of military diplomas (undoubtedly a result of metal-detecting), it still suggests that a significant number of Antonine-era auxiliary veterans chose to leave Britain. It may also be significant that four of the diplomas found in Britain, and the single example from Spain (*RMD* III 168), were issued before any of those that have come to us with insecure provenance from the Balkans and lower Danube. In fact, the well-documented diplomas may all date to the period of the Wall's occupation. This may suggest that while the Wall was garrisoned the military situation was such that veterans were encouraged or required to remain within the province in which they served. Conversely, none of the diplomas that were issued after AD 159 were found in Britain according to the available information.

This may be the result of shifting military focus from Britain to the Danube frontier during the Marcomannic Wars of Marcus Aurelius, but there is little evidence to support this hypothesis. One may suggest that the veterans who received these diplomas followed their units to the Danube after their discharge, but none of the three units in which they are known to have served are recorded there. *Cohors II Gallorum Veterana* is recorded in Britain as late as AD 235, *Cohors VII Thracum* is known only from Britain, and the *ala Gallorum et Thracum Classiana* is recorded in Britain throughout the second century. Therefore, we must look elsewhere to explain the discovery of these diplomas on the Danube frontier. Fortunately, *origines* are often explicitly ascribed to the recipients of these diplomas in their

texts. In each case in which an *origo* is preserved the recipients are referred to as *Dacus*. Thus, we may presume that they left behind the units in which they had served and chose to travel hundreds of miles to return to the lands from which they had been recruited. The same may well have been true of the recipients of the other diplomas from Britain that are reported to have been discovered in the Balkans and lower Danube.

This in not, in and of itself, remarkable. Approximately 15 percent of all known veterans for whom such determinations can be made, seem to have settled outside their province of service after retirement. Furthermore, a significant portion of them travelled very long distances. However, over half of the known diplomas for veterans of the Roman army in Britain were found outside of the province. This suggests that veterans of the auxilia in Britain left the province in higher numbers than did veterans of other provinces. These statistics are suggestive but may be misleading due to the vagaries of the epigraphic record and of recovery processes.

Possible misrepresentations inherent in the evidence for British veterans are visible in the chronological distribution of diplomas issued for service in Britain in the Antonine period. Seven of the 17 diplomas of this period were issued in AD 178. This comes nowhere close to representing the steady dismissal of time-served veterans that one might expect. Rather, it seems to represent an inconsistent and perhaps haphazard or *ad hoc* system of recruitment and dismissals. The soldiers who were dismissed in AD 178 were likely to have enlisted in AD 153 or shortly before. Thus, they may represent a surge in recruitment in order to reinforce the units that were stationed on the Wall. Furthermore, their service on this short-lived frontier and their subsequent transfer to other posts might have slowed the development of lasting ties to local communities that would have led them to settle in Britain after their service. This may have been aggravated by the instability of *vici* near their garrisons. Whatever *vici* developed during the occupation of the Antonine Wall were certainly abandoned with the Wall and would have been radically disrupted during the withdrawal. The geographical and chronological distribution of military diplomas may, in fact, be a subtle reflection of localized social consequences of broader military factors.

Alternatively, Margaret Roxan plausibly suggested, as an explanation for the disproportionate number of cavalry diplomas that have been found, that newly discharged veterans were required to purchase bronze diplomas if they wanted them and, further, that soldiers who expected to move far from their former garrisons were more likely to purchase diplomas because they could use them to support their claims to certain rights and privileges (1986: 265-6). Roxan's argument is very attractive as a means by which to explain the distribution of diplomas issued for service in Britain during the occupation of the Antonine Wall. However, five of the 17 diplomas of the Antonine Wall period were likely discovered at or near the former station of their recipient. *CIL* XVI 420 was awarded to a veteran of *cohors I Aelia Classica* and found at Ravenglass (ancient Tunnocelum), where *cohors I Aelia Classica* was stationed in the fourth century and probably in the second century (Holder 2004). Thus, this veteran likely settled in the *vicus* outside his former post. *CIL* XVI 97 was awarded to a veteran of *cohors I Tungrorum* in AD 146, and was discovered at Vindolanda. *Cohors I Tungrorum* had been stationed at Vindolanda in the pre-Hadrianic period, before being posted to Housesteads on Hadrian's Wall, Castlecary on the Antonine Wall, and later back to Housesteads again (Spaul 2000: 226-7). The date of this diploma suggests that its recipient may have completed his service on the Antonine Wall and returned to his former post, or near it, upon his discharge. The same may well be true of the recipient of the diploma fragment discovered

at Vindolanda in 2018 (Tomlin 2019), though the surviving text does not include the name of the recipient's unit. No details about the recipients of *CIL* XVI 115 and 193 are known, but both diplomas were recovered from Chesters on Hadrians Wall. The dates of these two diplomas (between AD 140 and 160 and in AD 145/6, respectively) again allow speculation that their beneficiaries were discharged while serving on the Antonine Wall and retired to the Hadrian's Wall frontier, though this is far from a certainty. While Hadrian's Wall was no longer on the very edge of the empire and its forts and *vici* were not as densely populated as they had been, the communities along it must have maintained their military character during the occupation of the Antonine Wall (Breeze and Dobson 2000: 90-92). Therefore, it is hard to imagine that veterans who settled there would need to undertake the extra expense of buying diplomas if they were not supplied for free. Furthermore, it is quite possible that these veterans were still living after the abandonment of the Antonine Wall and the reoccupation of Hadrian's Wall.

If Roxan's hypothesis that veterans who intended to travel long distances were more likely to purchase diplomas is correct, the evidence examined here might suggest that those soldiers were still not an overwhelming majority of diploma recipients. If travelling veterans were more likely to receive diplomas, and therefore their diplomas are more likely to be recovered, the ratio of traveling versus remaining veterans must be lower than the surviving evidence suggest *prima facie*. This statistical distortion may also be aggravated by more extensive metal-detecting activity in the Balkans and on the Danube frontier than in Britain. As a result, we have reason to believe that the proportion of auxiliary veterans who remained in Britain was higher than these statistics suggest. Indeed, it has been accepted wisdom that local recruitment into the auxilia became increasingly common in Britain, as elsewhere, from the Flavian period and was the norm by the third century (Dobson and Mann 1973: 193-6). Certainly these local recruits would have little reason to leave the province and, therefore, little need for proof of their status. It must be remembered, however, that all this speculation is dependent on Roxan's suggestion about the need to purchase diplomas. Because of the complication and ambiguities brought about by accidents of recovery and debates about the conditions of awarding diplomas and of auxiliary recruitment, we are still left to wonder why we have so little epigraphic evidence of auxiliary veterans and, consequently, where auxiliary veterans who had served on the Wall actually settled.

While some of these problems are unique to the auxilia, tracking legionary veterans and explaining their settlement patterns present similar problems especially when looking at a period and area as narrow as the Antonine Wall (Table 24.2). Though the presence of legionaries on the Wall is well established, whether they were there solely to participate in building projects, or if they comprised part of the standing garrison is much debated (Keppie 2000b: 1135-6). It is also broadly accepted that legionary veterans, like auxiliary veterans, tended to settle within the province in which they had served, often in *coloniae* or very near their former posts (Jones 2002; Mann 1983: 61-8). Therefore, when searching for legionary veterans who had served some or all of their careers on the Antonine Wall, one might reasonably turn to the legionary *coloniae* founded at Camulodunum (Colchester), Lindum (Lincoln) and Glevum (Gloucester) in the first century. Hundreds, if not thousands, of legionaries were among the early inhabitants of these communities and they were logical destinations for discharged veterans in later eras. However, there is little evidence of second-century legionary veterans at any of them. Glevum has produced only one epitaph of a veteran (*RIB* III 3074) (Figure 24.2) and two of serving legionaries (*RIB* I 122; *RIB* III 3073). The epitaph of the legionary veteran may well date to the second half of the second century and, therefore, its recipient may have served on the Antonine Wall, if only

	Reference	Unit	Findspot
1.	*RIB* III 3121	*Leg. II Augusta*	Alchester
2.	*RIB* I 361	*Leg. II Augusta*	Caerleon
3.	*RIB* I 358	*Leg. II Augusta*	Caerleon
4.	*RIB* I 367	*Leg. II Augusta*	Caerleon
5.	*RIB* I 359	*Leg. II Augusta*	Great Bulmore
6.	*RIB* III 3108	*Leg. II Augusta*	Great Bulmore
7.	*RIB* I 363	*Leg. II Augusta*	Great Bulmore
8.	*RIB* I 679	*Leg. VI Victrix*	York
9.	*RIB* I 685	*Leg. VI Victrix*	York
10.	*RIB* I 2151	*Leg. VI Victrix*	Castlecary
11.	*RIB* I 654	*Leg. VI Victrix* (not explicit)	York
12.	*RIB* I 526	Not explicit	York
13.	*RIB* I 495	*Leg. XX Valeria Victrix*	Chester
14.	*RIB* I 500	*Leg. XX Valeria Victrix*	Chester
15.	*RIB* I 517	*Leg. XX Valeria Victrix (not explicit)*	Chester
16.	*RIB* I 534	*Leg. XX Valeria Victrix (not explicit)*	Chester
17.	*RIB* III 3074	*Leg. XX Valeria Victrix*	Gloucester (Glevum)
18.	*RIB* I 160	*Leg. XX Valeria Victrix*	Aquae Sulis (Bath)
19.	*RIB* I 770	Not explicit	Kirkby Thore (Bravoniacum)
20.	*RIB* I 887	Not explicit	Old Carlisle
21.	*RIB* I 252	*Leg. VI Victrix*	Lincoln
22.	*RIB* I 249	*Leg. XIV*	Lincoln
23.	*RIB* I 478	*Leg. II Adiutrix*	Chester

Table 24.2. Legionary veterans discharged from Britain

briefly (Hassall and Tomlin 1984: 333 no. 1). Even if, however, his cognomen, Aurelius, is derived in some way from the *Constitutio Antoniniana* of AD 212, which would be unusual, and the tombstone dates to the third century, this inscription serves as proof that some legionary veterans, of *Legio XX Valeria Victrix* in particular, still chose to retire to Glevum after the advance to the Antonine Wall.

Similarly, few veterans may be associated with the colony at Lincoln. Its initial settlers must have included many veterans of *Legio IX Hispana*, which had occupied the site before moving to York in about AD 71 and of *Legio II Adiutrix*, which occupied the site from the departure of *Legio IX Hispana* to AD 77/8 when it was moved to Chester. The formal name of this colony, Colonia Domitiana Lindensium (*CIL* XIII 6679), suggests that it was established in the Flavian period, probably soon after the departure of *Legio II Adiutrix* (Keppie 2000a). Nevertheless, Lincoln has yielded only nine records of legionaries (*RIB* I 249, 252, 253, 254, 255, 256, 257, 258, 260), and only two of these are clearly veterans (*RIB* I 249 and 252). Furthermore, *RIB* I 249 commemorates a veteran of *Legio XIIII Gemina*, which left Britannia by AD 67 and therefore must be quite early. This leaves the tombstone of G. Julius Calenus (*RIB* I 252) as the only possible evidence of an Antonine Wall era legionary veteran at Lincoln. Even this is unlikely, since *Legio II Adiutrix* had been stationed at Chester for over fifty years when the Antonine frontier was established.

Figure 24.2. Tombstone of a veteran of *legio XX Valeria Victrix* from Gloucester (*RIB* III 3074, reproduced by kind permission of the Haverfield Trustees).

Not surprisingly, there is more evidence of legionary veterans at Caerleon, which housed *Legio II Augusta* from about AD 75 to 300. Three tombstones of veterans that may well be from the second century have been recovered from the site (*RIB* I 358, 361, 367) (e.g. Figure 24.3). None of these can be dated specifically to the Antonine Wall period, though they may well be of that era. The first of these was erected by Titus Flavius Natalis, a veteran of an unnamed unit, though its location suggests he served in *Legio II Augusta*. The third (*RIB* I 367) commemorates a former signifier of *Legio II Augusta*, but could date from any time after the arrival of the legion. Similarly, *RIB* I 361 cannot be directly associated with the Antonine Wall period. However, Severus' *origo* at Dinia (modern Digne-les-Bains, France), highlights the tendency of legionary veterans to settle at their former stations, regardless of their origins and the links that developed between legionaries and local communities; Severus was commemorated by his wife, which demonstrates the depth of these ties.

Epigraphic vestiges of *Legio II Augusta* also survive from Great Bulmore, very near Caerleon. All three inscriptions naming legionary veterans that have been discovered here (*RIB* I 359, 363; *RIB* III 3108) mention wives and one (*RIB* I 363) mentions a son (Figures 24.4 and 24.5). These inscriptions, which are second century at the earliest, cannot be linked directly to the Antonine Wall, but strengthen the sense that legionary veteran communities were strong and attracted most, if not all, legionary veterans.

The evidence for veterans of *Legio VI Victrix* and *Legio XX Valeria Victrix* is also focussed on their long-time bases, York and Chester. York has produced two certain traces of legionary veterans (*RIB* I 679, 685) and two likely cases (*RIB* I 526, 654). Likewise, Chester has produced two inscriptions that name legionary veterans explicitly (*RIB* I 495, 500) (Figure 24.6) and two that almost certainly do (*RIB* I 517, 534). Any of these inscriptions could be from the second century, though a date in the third century has been suggested for *RIB* I 685 and 517. While these two inscriptions are unlikely to date to the period of the Antonine Wall, they provide strong evidence for the ongoing settlement of veterans in York and Chester and the strength of those communities. Also, while these eight inscriptions are the only ones that explicitly identify veterans, it is likely that many more from these locations were erected by or commemorate veterans who are not identified as explicitly. Omission of similar information from epigraphic texts has

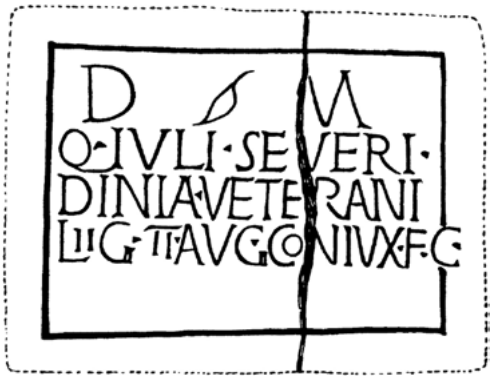

Figure 24.3. Tombstone of a veteran of *legio II Augusta* from Caerleon (*RIB* I 361, reproduced by kind permission of the Haverfield Trustees).

Figure 24.4. Tombstone of a veteran of *legio II Augusta* from the settlement at Great Bulmore by Caerleon, dedicated by his wife (*RIB* III 3108, reproduced by kind permission of the Haverfield Trustees).

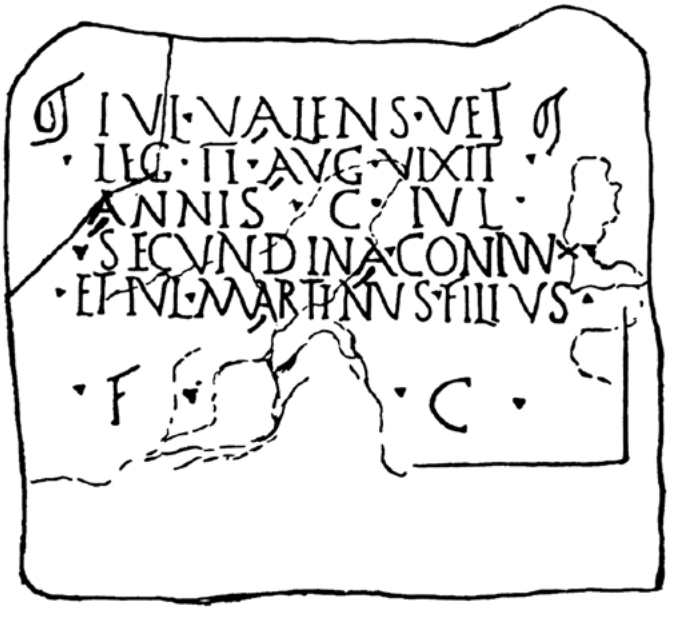

Figure 24.5. Tombstone of a veteran of *legio II Augusta* from the settlement at Great Bulmore by Caerleon, dedicated by his wife and son (*RIB* I 363, reproduced by kind permission of the Haverfield Trustees).

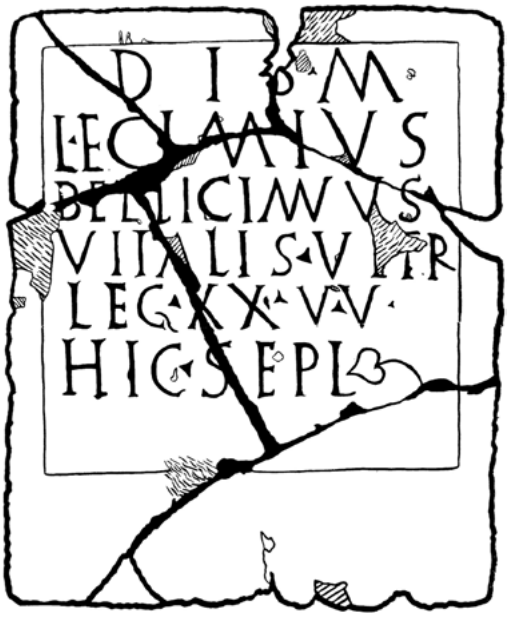

Figure 24.6. Tombstone of a veteran of *legio XX Valeria Victrix* from Chester (*RIB* I 495, reproduced by kind permission of the Haverfield Trustees).

long been recognized in the absence of *origines* from the memorials of locally born auxiliary soldiers (Dobson and Mann 1973: 200 and 203; Alföldy 1968: 100). It seems that veteran status may have been assumed or signalled in some other way for many of the former soldiers living in legionary communities.

All this evidence for legionary soldiers seems to confirm the assertion that legionary veterans preferred to settle where they had served, or perhaps more precisely where their legions had been stationed. There is, however, evidence from further afield of soldiers who had likely served on the Antonine Wall

	Reference	Unit	Findspot
1.	*CIL* XIII 1899	*Leg. VI Victrix*	Lyon (Lugdunum), Lug.
2.	*CIL* II 490	*Leg. VI Victrix*	Merida (Emerita), Lus.
3.	*CIL* II491	*Leg. VI Victrix*	Merida (Emerita), Lus.
4.	*CIL* XII 679	*Leg. XX VV*	Arles (Arelate), Narb.
5.	*CIL* II 662	*Leg. XX VV*	Villamesias (Turgalium), near Merida, Lus.

Table 24.3. Veterans of the legions of Britain found outside Britain

(Table 24.3). The difficulty of dating inscriptions precisely prohibits a definitive list of these soldiers, but once examples with dating criteria that place them in other eras and those from former garrisons of the legions are eliminated, some possibilities remain. The most promising are a veteran of *Legio VI Victrix*, who is commemorated at Lugdunum (Lyon) (*CIL* XIII 1899), and two veterans of *Legio XX Valeria Victrix*¸ who were named on a tombstone from Arelate (Arles) (*CIL* XII 679). To this one could add three examples from Augusta Emerita (Merida) and its surroundings (*CIL* II 490, 491 and 662). The first two of these may be associated with the final years of *Legio VI Victrix's* time on the Iberian Peninsula, but it seems likely that each of these soldiers had returned home after their discharge. The dates of these inscriptions are, however, impossible to determine precisely, so they must be taken only as a reminder that some veterans were recruited to the legions that served in Britain and later chose to return home.

There were also more complex circumstances that led legionaries who had served in Britain to be recorded elsewhere. For example, two tombstones of former centurions of legions that are recorded on the Antonine Wall have been found at Lambaesis in North Africa. C. Julius Maritimus (*CIL* VIII 2907) reportedly served as a centurion in *Legio VI Victrix*, *Legion XX Valeria Victrix* and *Legio II Augustae*, (all of which are recorded on the Antonine Wall) before being transferred to *Legio III Augusta* in Lambaesis, where he died. Similarly, but more interestingly, T. Flavius Virilis (*ILS* 2653) served as a centurion in *Legio II Augusta*, *Legio XX Valeria Victrix, Legio VI Victrix, Legio III Augusta* and *Legio III Parthica*. It seems clear that Virilis started his career in Britannia while serving in the first three of these units. It was here also that we presume he met his wife, Bodicca. Later he was transferred to Lambaesis with *Legio III Augusta* and *Legio III Parthica* in the east. Finally, he retired to Lambaesis. Virilis' service in *Legio III Parthica* puts at least the end of his career after AD 197. Nevertheless, it is possible that Virilis served in Britain during the Antonine Wall period since his career spanned forty-five years. Therefore, Virilis may provide an exceptional example of a veteran from the Antonine Wall settling far from his former base, though his subsequent service included a period at the very location to which he eventually retired. These two epitaphs serve to remind us that transfers may account for the absence of some veterans of the Antonine Wall, though only a small portion of the total number of veterans who would have served on it.

The low number of veterans recorded in the documentary sources associated with the Antonine Wall is the result of several factors. First and foremost, the Wall was occupied for no more than twenty years. This may be contrasted with much longer periods of occupation along Hadrian's Wall and at settlements further south. Furthermore, because of the Wall's lack of longevity, there were no long-established civilian communities along its line to attract veterans. Indeed, after the withdrawal from the Wall, its territory was no longer safe for settlement. The dearth of evidence for veterans even during the Wall's occupation may also be indicative of a sense among veterans that the Antonine Wall was not destined to serve as a permanent frontier of the empire. The ephemeral nature of the Wall and the relocation

of the units that served on it also reflects the greater mobility of auxiliary units compared to legions. This mobility during service seems to be echoed in the settlement patterns of auxiliary veterans, who seem to be willing to move longer distances after their discharge, perhaps to seek out established, stable and prosperous communities. Alternatively, one might suspect that labour shortages or economic challenges discouraged soldiers and veterans from participating in the epigraphic habit on newly established frontiers, while prosperity encouraged commemoration elsewhere. It is also worth mentioning the traditional ideal that veterans, especially legionary veterans, should settle on land outside urban areas to farm. We might expect that further investigation of areas outside legionary centres would yield more evidence of legionary and auxiliary veterans (Keppie 2000a: 310-12), though rural settings were far less conducive to epigraphic expression than were urban centres.

This study has demonstrated the limits of epigraphic evidence to track veterans and other relatively small groups. There is, however, hope for other archaeological investigations that could augment what we know from epigraphy. For example, attempts have been made to use writing paraphernalia and jewelry as proxies for veteran movement (Derks and Roymans 2006; Ivleva 2012). Studies of this kind may well add a great deal to our knowledge of veterans' lives. However, for the time being veterans remain an enigmatic population about which we may feel secure in making only broad statements. The study of these men and their families has benefitted greatly from scholarship in the past half century, but there are more theoretical approaches, using both epigraphy and archaeology, that need to be explored.

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25. ‘So the great Romans with unwearied care’: Sir John Clerk’s museum

Iain Gordon Brown

The antiquarian activity of Sir John Clerk of Penicuik (1676-1755), second baronet and Baron of the Court of Exchequer in Scotland, has been one of the scholarly threads which have bound Lawrence Keppie and me together as researchers in the delicious byways of antiquarianism in the first half of the 18th century. Clerk’s more general role as a major figure on the Scottish cultural scene has long been a particular interest of mine. In the course of my early, often primary, excavation in the Clerk of Penicuik Muniments, certain archival hares were set running which I myself was not quite nimble enough to pursue. Some of these have subsequently been chased, snared and lured into the net of eventual publication by Lawrence Keppie, an admirably meticulous researcher equally at home in the field, the museum, the library and the record repository. In specialised aspects of discovery his documentary scholarship has brightly illuminated many antiquarian relationships in 18th-century Scotland, and indeed in the wider Britain of the early Society of Antiquaries of London and the eccentric Society of Roman Knights. In paying tribute to him, it is my pleasure to offer the following additional notes and further thoughts on Sir John Clerk’s museum. My essay deals with aspects of Clerk’s collecting and curation in general and, more particularly, with potential arrangements for the better preservation and display of the Roman and other antiquities in his cabinet of curiosities.

From the earliest days of his antiquarian work in Scotland, which would result in publication of his celebrated *Itinerarium Septentrionale* (1726), Alexander Gordon greatly valued the support and patronage of Sir John Clerk (Brown 1977: 204; Brown and Montgomery 2016: 254). Gordon was able to tell Clerk in February 1726 that he had spoken of him in London antiquarian circles as ‘our chief and only Maecenas’, with the pleasing result that Clerk now bore ‘a very exalted character among the learnd part of men here’ (GD18/5023/3/17). Clerk was, indeed, the outstanding Scottish example of one of those lauded by Gordon (in the delightful phraseology of the charming Preface to his *Itinerarium*) as ‘Men of the best Learning and Taste’ who held ‘the Illustrious Ruins of the Ancients… in the utmost Veneration and Esteem… because of the inseparable Connexion which Antiquity has with History, and other Parts of Erudition.’ Clerk and those few who shared his antiquarian conscience gathered together, studied and preserved ‘Things which have escaped the Pens of Historians’ – altars, inscribed stones, coins and other material remains of the past – albeit those things were, in the context of Roman Scotland, generally crudely provincial as being ‘made by Military Hands’. Collectors and patrons such as Clerk, with his uniquely significant position in the antiquarian sphere in North Britain, had saved those things that but for their actions ‘Oblivion would have infallibly swallowed up’: a demonstration, in the Scottish context, of Clerk’s wider concern to ‘keep the Ark of Learning from sinking in that Part of the World.’

In the body of Gordon’s book, Clerk’s distinguished record of collecting activity is duly praised: ‘Among all the Collections of *Roman* Antiquities in *Scotland*, that of Baron *Clark* [sic: Gordon consistently spells the name of his patron wrongly!] justly claims the Preference both as to Number

and Curiosity' (Gordon 1726: 117). Gordon felt able to say this even though, at that particular point in his text, he left out of account those Roman inscribed or sculptured stones from the Walls of Hadrian and Antoninus Pius. These stones, along with other, rather more spectacular ones from Birrens, Dumfriesshire, subsequently acquired by the Baron, gave the enlarged Clerk collection its eminence as the most important in private hands in Scotland in the 18th century. With the Middlebie (Birrens) sculptured stones – 'most singular in their Kind' – available to be taken into Gordon's consideration in time for his *Additions and Corrections, by Way of Supplement to the Itinerarium Septentrionale* (1732) the author could declare himself yet further indebted to the 'Learned Gentleman... in whose Custody they are, and whose Care for preserving the Monuments, and promoting the Study of Antiquity is scarcely to be parallel'd' (Gordon 1732: Preface, iv). By this time Clerk's collection had grown to be the most significant of those which Sir Robert Sibbald had long before designated as belonging to 'private Men' – those who had appropriated inscribed or sculptured stones from the Antonine Wall in contra-distinction to those assemblages which we might categorise as 'institutional' (Sibbald 1707: 47).

By the time John Horsley was assembling material for what would be published posthumously as his magisterial *Britannia Romana* in 1732, Sir John's collection was justly seen as the private partner to the leading institutional collection of Roman material, namely that of Glasgow College. These were certainly, as Horsley stated, the two principal such accumulations in Scotland: indeed Horsley vouchsafed that he knew of no other such collection, public or private, with more than 'three inscriptions together in any other place in Scotland' (Horsley 1732: 181). Horsley's visit to Penicuik had been facilitated by Professor William Hamilton, who had written to Clerk suggesting that 'the curious collection' he had made of 'pieces of Antiquity' might be of great use to a scholar such as the deserving though poor Horsley (GD18/ 5034, Hamilton to Clerk, 30 October 1728). Clerk's efforts, as a private collector of sufficient means, exemplify that impulse (commended by Horsley) to bring Roman inscriptions within bounds both physically and intellectually secure, and which saw such material increasingly moved 'into the *musea* of the *virtuosi*' where it might be available for study (Horsley 1732: 354; Brown 1980a: 112). Academics at both Glasgow and Edinburgh Colleges, men professionally involved in the teaching of medicine and mathematics respectively, yet able to appreciate distinction and commitment in fields other than their own (and men coincidentally located more or less at either end of the Antonine Wall!), commended Clerk on his 'thorough knowledge and sagacity' which rendered him 'no moderate knower of antiquities'; one whose 'expense in collecting Antiquities' and whose 'skill and pains that way [were] universally known' (GD18/ 5048, John Johnstoune to Clerk, 7 March 1737; GD18/ 5097/7, Colin Maclaurin to Clerk, 27 May 1741).

Clerk himself certainly knew the line of, and probably some individual sites on, the Antonine Wall, possibly as early as the 1690s. From 1692 to 1694 he was a student at Glasgow – more or less at the very time that the College's great collection of inscribed and sculptured stones from the Wall was being initiated. On one occasion he fell out with his very strict father over his wish to divert from the normal route to or from Glasgow across the isthmus of central Scotland in order to see one curiosity or another. This was an odd circumstance, because the first baronet was by no means uninterested in art, architecture and antiquity; but he was a martinet in matters of parental discipline (Brown 1980a: 47). Some quarter-century on, the younger John Clerk's customary journeys from his own house at Cammo, Midlothian (where he lived before inheriting Penicuik in 1722), to Lord Eglinton's seat at Finlayston[e] ('Finliston', as Clerk called it), on the Clyde in Renfrewshire will have taken him approximately along

the line of the Wall. In 1720, for example (GD18/ 2100), he joined with a 'Liutennant' Burn on one such journey across central Scotland. This was certainly the man who (as Richard Burn, tenant farmer) shortly afterwards enters the story of Clerk's antiquity-collecting as his principal agent in the quest to secure Roman stones from Antonine Wall sites in competition with other local collectors, or owners and their representatives reluctant to relinquish what Clerk coveted. Burn seems to have played an intriguing role in supplying all manner of goods and services to the Clerks of Penicuik: linens for the ladies; horses for the first baronet; dogs, Bohea tea and books (including Purchas's *Pilgrims* and John Aubrey's *Miscellanies*) for his son and successor. Later it would be Burn who would find himself handling the much more difficult commission to secure inscribed stones from the Wall for the antiquarian second baronet (GD18/ 5320/2, 3, 4, 6, 7; Keppie 2014).

In 1721 Clerk corresponded with John Simson, Professor of Divinity at Glasgow, on the history of the Antonine Wall, and specifically about the highly significant 'Lollius Urbicus' stone 'unluckily broke in the turning up' (GD18/ 5019; Keppie 1998: 94). This correspondence saw the initiation of a series of episodes involving the drawing of Roman inscribed and sculptured stones, and of transcribing their texts for Clerk – information which he in turn conveyed back to his agents or would-be agents in the field – in the hope of securing the stones for his collection. Valuable evidence is provided by the drawings (possibly after Gordon) and the notes (unquestionably by Clerk) preserved in GD18/ 5068, to which Richard Burn's series of letters in GD18/ 5024 relate (cf. Keppie 2014). In this process of information exchange a 'fit person to copie them [the inscriptions] exactly', or else a professional artist to do the work (such as the unidentifiable 'Robison the painter', who also worked for Clerk on more regular artistic commissions), were essential desiderata (GD18/ 5041/3). At a subsequent moment Simson wondered whether Clerk wanted him to arrange for 'a designer' to 'take off the Inscription & form of the stone exactly... or if it will suffice to get any friend that can write well to copy the letters exactly with a description of the dimensions & figure of the altar stone' (GD18/ 5047, 12 March 1736). The former process sounds very much like a *papier-maché* 'squeeze', but, if so, there is no trace of any such cast surviving in the Clerk papers or in the Penicuik charter-room today.

Clerk's learned cousin Andrew Brown of Dolphinton wrote to him about inscriptions mentioned by Sir Andrew Balfour and Sir Robert Sibbald 'in the books of their Musea', the implication being that Sir John Clerk himself was now stepping forward in the tradition of such museum proprietorship (GD18/ 5022, 20 December 1723). Later still, as a further indicator of Clerk's standing in the world of antiquarian learning, he was consulted by Charles Mackie, professor of 'universal civil history' at Edinburgh, on the significance and precise usage in antiquity of the terms *vallum* and *fossa* (GD18/ 5050). Building on the information provided by his various sources, Clerk himself established a fairly sound knowledge of the length, strength and structure of the Antonine Wall, as documents show: GD18/ 5054 is a significant paper (cf. Keppie 1998, 74-75). (Figure 25.1) By 1740 Clerk could receive a report of a Roman stone, newly-found at Kirkintilloch, written on the very day of its discovery (GD18/ 5053): he had become something of a human 'databank' or clearing-house for information on such finds and their significance in the developing picture of the Roman wall as a whole (Brown 1980a: 105-06). Interestingly enough, Clerk would also find himself from time to time in the position of supplying information to others, and indeed – on one notable occasion – of commissioning a drawing, that of a supposedly Roman sculptural panel, for the use of scholars elsewhere. This he may well have done with motives not, perhaps, so very different from those of some of his own correspondents and informants (Brown and Montgomery 2016: 255-56).

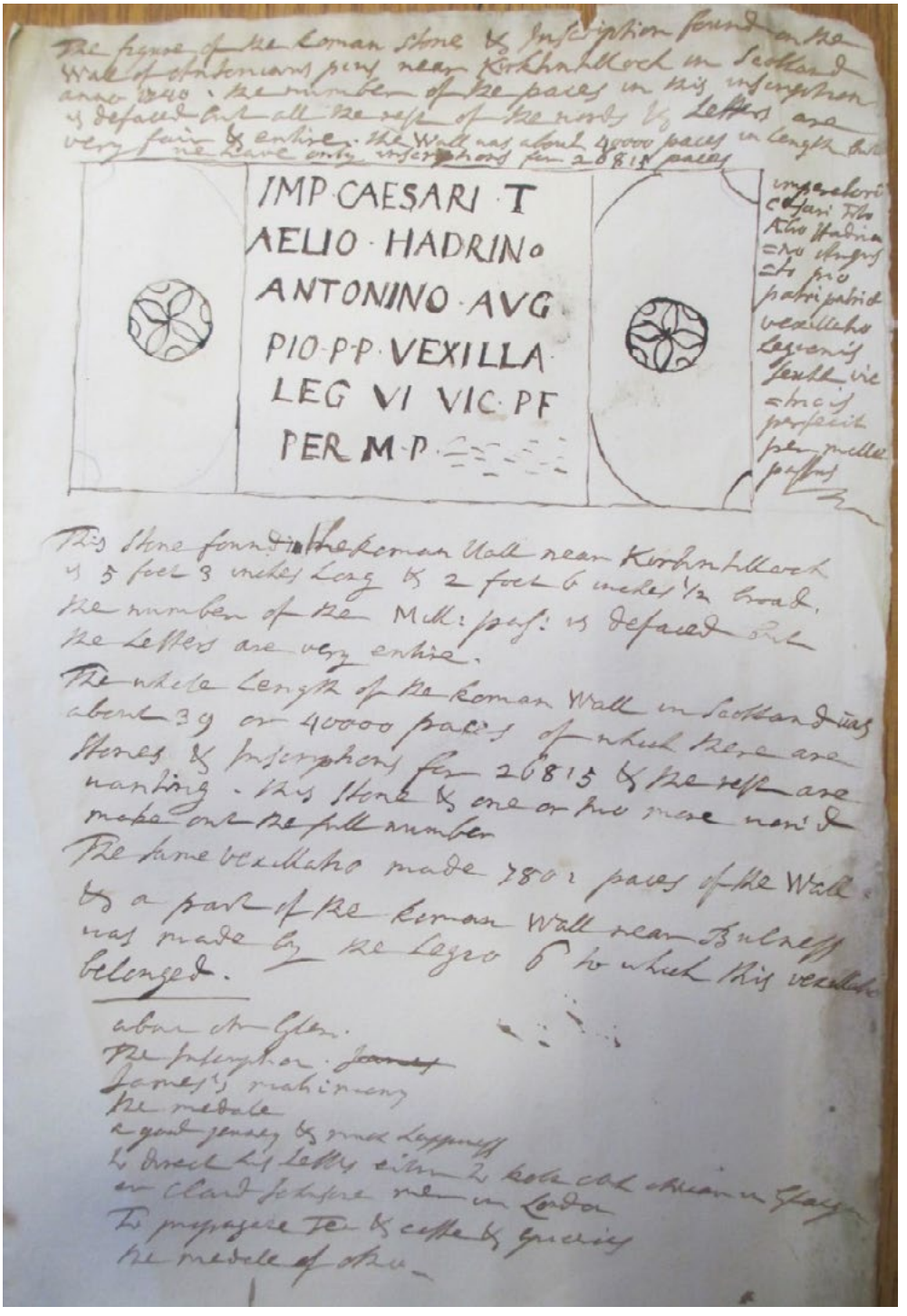

Figure 25.1. Sheet of notes on Antonine Wall topics by Sir John Clerk, 1740, showing a Distance slab of the Sixth Legion from Kirkintilloch (Keppie 1998: 74-75), recently found, and giving calculations of cumulative wall length in paces according to distance stones found up to that time. NRS, GD18/ 5054. By permission of Sir Robert Clerk of Penicuik, Bt.

Lawrence Keppie has discussed at some length the Clerk collection of Roman stones and, in continuation of earlier work of my own (Brown 1980b: 20), has traced almost as fully as could be done the ways in which that collection was enhanced by finds from the Antonine Wall in the 1720s (Keppie 2012: 9, 69, 72-74, 76-77, 79; Keppie 2014; Brown 1980a: 110-11, 335, notes 125-26). Thanks to careful research in the archival sources, and through Keppie's narrative skill in conveying the excitements and frustrations of the chase, the story of Clerk's attempts to acquire inscribed stones now forms by itself a most interesting and appealing episode in and sidelight on the history of Scottish antiquarianism. The efforts of Clerk's agents as revealed in the correspondence are vivid in their immediacy.

First, there is Alexander Gordon, using all the slyness at his command such as slipping shillings into hands when rival stone-hunters were otherwise distracted, even when it caused relationships with people such as James Glen, whom he wanted to keep in with, to become (as he put it) 'aliquanto fraddo'(sic) (GD18/ 5023/3/1, Gordon to Clerk, 19 September 1723).

Then there is Richard Burn. He had to employ techniques extending from 'flatory' through 'drinking' to unspecified 'oyr [other] methods' so that a satisfactory outcome might sometimes (though regrettably not often enough) be achieved 'per fass awt nefas' – as Burn expressed the matter, in a way he thought his classically-minded patron might appreciate (GD18/ 5024/1: this is the correct reading of Burn's dog-Latin tag; cf. Keppie 2014: 23). Such approaches were especially needed when the country people, alerted by the flurry of searching and acquisition taking place in the fields and from the dykes and farm-buildings around them, came to realise that if such workaday things as old stones were (as Burn termed it) 'in esteem' then such apparent trifles had to be worth money. Stones earmarked for Clerk, or even already secured in his interest, were subsequently stolen and effectively held to ransom, and had to be recovered. 'I was forced', wrote Burn, 'to purchase the gardner his good will...' (GD18/ 5024/3, Burn to Clerk, 18 November 1723). Burn's actions in the field as a stone-buyer could later be discussed with Sir John in person at Loanhead fair, as they looked together at livestock.

Lastly, there is the Revd James Robe, parish minister of Kilsyth, who surely contradicted his religious principles when he confessed, in unrequited pursuit of stones for Clerk, that he might have to resort to 'stealing, robing or purchase' – the last appearing the most likely if least desirable route to success, 'for something may be got not much valued by those where they [the stones] are to be found that you will value.' Robe claimed, perhaps disingenuously and possibly motivated by a desire to ingratiate himself with Sir John, not to have been much aware of such antiquarian or epigraphic matters heretofore. But now, as he wrote, 'If any thing occurs worth notice, if the Lord spare, I'll endeavour curiously to look... having been employed these great many years otherwayes unacquainted with such curious pieces of Antiquity' as he was now telling Clerk about, and indeed attempting to help him acquire. 'It's with a great deal of pleasure I embrace the opportunity offerd to serve a Gentleman of your curiositye and real knowledg in Antient Learning'. By the end of the year 1731 the Revd Mr Robe declared himself completely converted to the cause: he was now enthusiastic and keen to rescue stones for Clerk (GD18/ 5041/1; 5041/4). In fact, it is probably the case that he had himself been interested in such matters for some time past: it was just that Clerk, the increasingly acquisitive collector, had now made it all fashionable and the quest financially attractive to the finders and vendors of stones – and perhaps even to Clerk's would-be middle-men.

Successful purchases of stones after protracted negotiations and other vicissitudes will have afforded Clerk something akin to what Walter Scott made his antiquarian hero and alter ego Jonathan Oldbuck

– in whom may be recognised some traits of Clerk of Penicuik himself – describe as 'the white moments of life', in which many a rare book could be acquired at the expense of a little tobacco or ale. Oldbuck and his actual progenitors knew the pleasure of the antiquarian chase (Brown 1980b: 13; Scott 1995: 25). But it is perhaps as well that it fell to Burn, rather than James Robe the clergyman, to comment further that – in the rush to make an acquisition for a patron in the face of active competition – one had to be careful to distinguish the genuine ancient Roman material from 'old popish efiges such as are on the pillars at the chaple of rosland [Rosslyn]' (GD18/ 5024/3). And men of the cloth might sometimes be embarrassed by what they found in a collection such as Clerk's. The stone from Westerwood depicting 'a Priapus or penis', unabashedly described and illustrated by Gordon in all its upstanding nakedness, was drawn by Horsley with a discretion verging on the absurd so that it appears not so much veiled by a fig-leaf but almost as a fig-leaf *per se*. But the urbane Gordon had once been an opera-singer in Italy. Horsley was an earnest, non-juring North Country clergyman. It shows.

Keppie has neatly denominated this rash of collecting activity and its nuanced intricacies as 'the politics of stone acquisition', a game where 'diplomacy and perseverance were both needed, and alcoholic drink could smooth the path' (2012: 72; 2014: 26). If public institutions, most notably in the shape of the ever-burgeoning one in the library of Glasgow College, largely won out this was no bad thing in the long term. But if some quasi-public institutions such as the Advocates' Library in Edinburgh were not likely to be the best custodians of what came their way in the form of Roman altars or building stones, then at least it was fortunate for posterity that there were enlightened private collectors – of whom Clerk of Penicuik was the outstanding representative – to keep the lamp of learning alight in the interim.

On occasion, stone information or putative stone acquisition had its price in a peculiarly academic form and in a characteristic 18th-century way. The 'fit person to copy them exactly' identified by Professor John Simson was a Glasgow undergraduate named Lawrence Hill, 'a youth of an excellent genius who diligently follows his studies & makes good progress in them.' But, though deserving, Hill was poor, his father being dead and his mother (with many other children to feed) 'in low circumstances'. Twice he had been nominated by the professors of Glasgow College for the 'Royal burse [bursary] here & disappointed of it'. If Sir John Clerk and his fellow Barons of Exchequer could see their way to granting such a bursary now, Simson would take it 'as a singular favour' (GD18/ 5019). It must have been tacitly accepted that Simson would also try to convey more epistolary transcripts to Clerk in future, and (who knows?) maybe the odd actual stone might come Baron Sir John's way...

More blatant still was the case of the distance slab in Aberdeen (Keppie 1998: 72-74). Clerk had raised the matter of this stone (once at Dunnottar Castle, but then lodged in Marischal College) with Alexander Gordon when the latter was in Aberdeen in 1723 (GD18/ 5023/ 3/ 2). Clerk had conceived the bold – even outrageous – notion of being able to 'swap' some of his unwanted 'natural curiosities' for this potent symbol of the Roman presence in Scotland, something much more appealing to his classical soul. The story which I first outlined on discovering the documentary evidence (Brown 1980a: 31; Brown 1980b: 20) has since been well told at length by Lawrence Keppie (1998: 14, 72; 2012: 74). The stone might be obtainable for Sir John but the price would be his interest with the Lord Justice-Clerk in what Gordon coyly termed this 'criticall occasion'. And what was that? It was a vacant regent-ship at Marischal College. The Principal of the College was Thomas Blackwell, who clearly wanted the job for his son, Thomas Blackwell the younger. Gordon was confident about the deal working out. The younger Blackwell did indeed get the post: as Professor of Greek there, and later still as Principal,

he subsequently pursued an interesting correspondence with Clerk on many different intellectual subjects, as we shall see. But unfortunately the stone was never to be Clerk's. It remained in Aberdeen until, six years after Clerk's death, it was translated to Glasgow by the wish of the once-attainted Earl Marischal himself. Clerk would have harrumphed at this: he had never been one to trust Jacobites.

As an aside – though one taken from fiction rather than fact – we can adduce another instance of old sculptured stones being useful gifts or bargaining counters to secure favours. In *The Antiquary* (Scott 1995: 120-21) the magistrates of Fairport seek to bring a new watercourse into the town through the policies of Monkbarns, their suit being pressed by means of a proposed gift to Mr Jonathan Oldbuck of some mediaeval carved fragments just right for his garden.

If antiquities might play their part not just as museum objects but as bargaining counters in matters connected with university patronage, so might antiquaries themselves on occasion have to forego the delights of the *kunstkammer* or the medal-cabinet and allow themselves to be forced up to date. Like his contemporaries, Clerk was greatly interested in ancient coins. But in the summer of 1727 King George I died in Hanover and thoughts turned to a new reign, a new ministry and new questions of office-holding, patronage and placemanship. A Baron of Exchequer had to give heed to such contemporary issues even if his heart was in the ancient world and his head more happily turned to matters of Roman coin issues. Smart Lethieullier wrote to Clerk from London that August: 'Our late Great Change you will believe has turnd the thoughts as well as discourse of this part of the world on Modern Affairs, and made it of more consequence who governs or is dismisd under King George the 2nd than under Augustus or Tiberius; so that the Belles Letters must for a little while lie neglected, and a Coronation medal be preferred to an Otho or an Alexander' (GD18/ 5032/ 1).

Sir John Clerk was as 'Roman' a Scot as might be found in the 18th century (Brown 1980a: *passim*; Brown 1987b). The idea and the ideal of the Classical world pervaded his own, and its spirit entered into almost every aspect of his daily existence. It was to him a source of profound satisfaction that Scotland had once been a part, however much a transient part, of the Roman Empire: to find Roman structural remains and Roman artefacts (or such, at any rate, as could be deemed Roman) compounded this sense of pleasure in the Classical heritage (cf. Brown and Montgomery 2016: 254, 269). He was conscious of the Roman tradition of collecting; and so it is not unnatural that, as a collector himself, he should have looked to Roman precedent. The mere process of collecting Roman antiquities was itself to feel Roman. Through the collection and study of material remains he felt able to enjoy direct communication with the spirit of Antiquity. For Clerk, collecting was not an occasional pastime but rather a constantly didactic exercise. He was not one to share Smart Lethieullier's view that a cabinet 'att least amuzez some idle hours which might be worse employ'd' (Brown 1980a: 102-103; GD18/ 4635, Lethieullier to Clerk, n.d. [*c.* 1730]). 'The knowledge of Antiquity has a good deal of humanity in it and secures to posterity a certain immortality which all men covet. If we were negligent in the remains of the Antients, we must expect that posterity must treat us in the same manner' (GD18/ 5078/ 44, miscellaneous notes on Roman antiquities).

A constant theme of his long, blank verse poem 'The Country Seat', begun in 1726 and revised several times thereafter, but never published, was not just the Classical inspiration for the architecture of the country house itself, and the form of its park with – ideally – its landscape of literary association, but indeed of the art which filled it (GD18/ 4404/1-3: the quotations below follow the text of 4404/3, which is in fact the earliest version). This art could be both antique and more recent. As collectors, the British were truly the heirs of Rome.

Do not we see the treasures of the world
The sacred reliques of old Greece & Rome
Transfer'd to this our Isle; do we not see
Italia's self devested of her stores
To glut our senses...
So the great Romans with unwearied care
Amass'd the produce of all human Arts.
Their social minds a greater pleasure felt
In such like spoils than vainly to behold
Kings led in Chains, and wagons fill'd with gold.

Drawn by this great example, we may still
Encourage vertue from superfluous wealth;
And as we shine in Arms, in Arts excel
To fill our magazines each foreign land
Will contribute a share: we need not fear
The proud invidious eye or hostile hand;
All must submit, the strongest walls & towers
Faintly resist Britannia's Golden Showers.

Against the line 'So the great Romans...' Clerk added, in one version of the poem, this note: 'The greatest men amongst the Romans were in use to make collections of all manner of curious things, an instance of which we have in Julius Caesar from Suetonius his life, cap. 47...' This, clearly, was the inspiration for the 'virtuoso' tradition of collecting in Clerk's circle. A preface to one of his manuscript catalogues of his collection (GD18/ 1810) continues the theme of taking inspiration from famous Romans who themselves were acquisitive and who took pleasure in the variety of their possessions. Clerk's prefatory note fills an overfull page to its very end:

> Tho I have knowen some people silly enugh to laugh at Cabinets or Repositories of Curiosities yet I must here tell such, that if things of the very same nature that are here, had not been preserved by Curious people down to our Age, ther had been an end of all Arts & Sciences, at least the perfection of them had been utterly Lost. If Statues had not been preserved, for instance, there had been an end of all painting & if all the world has been such Goths as to have broken down & quite defaced all antient monuments, there had been an end of all Architecture. If medals, coins, entaglios, cameos, &c had been throwen away, and to these I may add old books, good God in what a Gulph of Ignorance & Stupidity had we been all in. How much philosophy & the mathematics owe to the preservation of all Natural & Artificial Curiosities, all the learned in these sciences know, in short the preservation of such things are so useful that I wou'd not even advise any tollerably learned, wise or discreet man, to throw away even Trifles ...
>
> How far this advice has been given by others I cannot tell but I am sure that great families, great men & even great warriors have followed it, witness what has been told us both of Caesar & Augustus. Of Caesar, as Suetonius has it in his Life, cap. 47 gemmas, toreumata, signa, tabulas operis antiqui semper animosissime comparasse... [he was always a most enthusiastic collector of gems, carvings, statues, and pictures by early artists...]; & of Augustus Suetonius writes, in his Life, cap. 72 sua vero quamvis modica non tam statuarum tabularumque pictarum

> ornatu quam xystis et nemoribus excoluit rebusque vetustate ac raritate notabilibus... [His own villas, which were modest enough, he decorated not so much with handsome statues and pictures as with terraces, groves, and objects noteworthy for their antiquity and rarity...]
>
> But here my paper fails, not my subject...

If we return to 'The Country Seat' and within the context of the poem to the description of one of Clerk's categories of house – namely the royal palace – we are presented with yet further instances of the Roman inspiration for modern British collectors. Clerk writes of the library of his ideal royal seat, and in both text and notes we are taken back to Classical Antiquity. A fine library, preserving the literature of the ancient world, was essential. As a foil for the 'gaudy ornaments to please our eyes' – in other words, the more flagrantly attractive elements of the palace, such as decorative mural paintings or art collections displayed on the walls of drawing rooms or saloons – one such, well-stocked library would 'best improve the mind'. Yet a library alone was not sufficient without examples of the *things* themselves – the actual artefacts surviving from Antiquity – which were the physical objects treated of in the ancient texts.

> Next let it not be thought a trivial care
> From Art & nature to collect the stores
> On which there learned labours are compos'd;
> Likeways the Reliques of old Greece & Rome,
> Inscriptions, statues, bas-relieves & coins,
> With every monument that may explain
> The laws & customs of the wisest states.
> All such deserve their place & cannot fail
> In some degree our learning to advance...

Two different versions of the poem have alternative forms of the line quoted above as 'From Art & nature to collect the stores'. 'To make Collections of the things themselves' is the other. This latter line carries the explanatory note in the appendix to one text of the poem: 'All those who have libraries ought to make collections of the things which are the subjects of their books, and such as don't like both have no pretence to learning.' (GD18/ 4404/1: text p.13; notes p. 3). Clerk's note to 'From Art & nature...' (GD18/ 4404/ 3: text p. 21; note 25) is very much fuller and it shows, moreover, that his thinking was informed by direct contact with Roman sculptured and inscribed stones from local sites. One can also understand more fully how he was inclined to offer his natural curiosities in exchange, as might be, for the Twentieth Legion distance slab in Marischal College:

> To the observation I made before with relation to Julius Caesar I may add that the greatest virtuosi in our days are not more taken up in making collections of Antiquities, statues, coins & other curiosities of art & nature than the Greeks & Romans were. This will appear in most of their writings, but more particularly in the Natural History of Plinius, lib. 35, 36, 37. However, tho' the same Plinius deals a good deal in trifles, yet I scarcely believe that the generality of the antient virtuosi descended as low as he or as some of our Moderns, who amuse themselves with all kinds of fossils, grasses, butterflies & other such insects. I own in the mean time that these diminutive works of God's creation & providence deserve no small part of our admiration; but then there

> are so many other things of greater consequence that I wou'd doubt much that man's judgement & good sense who bestows any part of his time in such minute pieces of knowledge. But if I shall be told that even these trivial matters deserve as much if not more of our time than Greek or Roman Antiquities such as Inscriptions, Altars, Vases, Urns &c, I make the following answers which to me seem to carry some weight with them. *1:* Since all arts & sciences are founded in the knowledge of the Greek & Roman languages, & since we cannot attain to any degree of perfection in these languages without being acquainted with the histories & antiquities of those people, therefore a collection of the materials I mention may be necessary as a better way to form our knowledge upon that we can have from any grammars or dictionaries whatsomever, or even from any of the antient authors. *2:* The things collected may either serve for models which we may imitate, or which we improve upon as daily experience tells us, for this is a certain truth that we had never seen any famous artificers in painting & sculpture if it had not been for the Greek & Roman statues & sculptures which remain to this day. *3:* Some of these Antiquities, especially altars & such sculptures that relate to religious worship, must afford to a thinking man many usefull speculations; for instance, one cannot look upon a Roman altar dedicated to any of the heathen gods but he must enter upon these thoughts. *First*, That the Romans were generally very religious & sincere in their worship which we may believe was acceptable to the omnipotent creator & preserver of all things since they acted by all the lights that were given them till the Revelation of the Christian faith. *Second*, That they believed that the foundation & preservation of their Empire & in a word that their good or bad fortune depended on their zeal for religion & the worship of the gods & therefore Livius inserts the following remark in the speech of Camillus to the people of Rome when they intended to remove the seat of their Empire to the Veii: 'Moreover consider the good or bad fortune of these years & you shall find all things succeeding prosperously to these who followed the councils of the gods & unsuccessfully to those who despised them.' *Third*, That religious principles & zeal for the worship of the gods entered into all degrees of men from a Captain General to the meanest soldier, for all of them erected altars to the gods as we may observe in severals found here in Britain, & this observation well leads us to make this comparison between an old Roman & a modern Christian army, viz. that the first left everywhere monuments of their religious zeal which animated them to all glorious exploits, whereas if the last was to march through the whole world they wou'd be so far from leaving any marks or tokens of religion amongst them that almost every days march wou'd be attended with evident marks of barbarity & cruelty. *Fourth*, That those who acted most upon religious principles outdid all others in martial achievements & to all these I may add that it wou'd be a kind of sacrilege not to pay a due regard to such things as had been dedicated or set apart for religious purposes...

Clerk tried to practice what he preached about great houses having libraries *and* collections of antiquities, the one to complement the other. In 1730 or thereabouts he wrote a very long epistle, in Latin, to his old friend of Leyden days, the great Dutch physician Hermann Boerhaave. This described Penicuik House and its policies, and detailed some of what the place exhibited in terms of art and antiquities (Clerk 1892: 237-38; GD18/ 5082a is Clerk's retained holograph copy). 'But lest my library should', he wrote, 'be quite empty of the monuments and delights of the arts, you may see there certain ancient bronze and marble statues, altars, inscriptions... Greek and Roman coins, incised vases, traces of a picture of ancient workmanship... for so I would imitate Julius Caesar and Augustus (according to Suetonius), and even if I had not the example of such great men, I should regard it as a mean thing

to build up a library of huge volumes on antiquities, and yet to disdain as useless the very objects which the most learned men, as Graevius, Gronovius, and Montfaucon, have explained with such expenditure of time and toil. The things themselves speak and for the most part explain themselves; but descriptions, however, accurate, present to the mind only confused or shadowy ideas...'

Sir John was indeed increasingly regarded as an authority on Roman antiquities and equally on their display. That great Scottish collector and Italophile, James Johnstone, second Marquess of Annandale, wrote to Clerk in these terms from Craigiehall, Linlithgowshire [West Lothian] on 15 January 1724: 'I have now got a Cabinet for my Meddals and am about Ranging them in it. I should be rejoiced to have the pleasure of your good Company here, if it wou'd be any Amusement to you to see them. I'm sure no body could assist me better to place them right' (GD18/ 5336/ 2). Clerk told his cousin Laurence Chartres that he made it his business to collect antiquities and other curiosities to 'enrich my country as well as my cabinet'. Such 'rarities' and 'gimcracks' were to him more valuable than luxury goods or objects of *virtù* fashioned in silver or gold (GD18/ 5245/ 4/ 19, 2 July 1724; / 73, 27 November 1730). Although it is unnecessary to give credence to the flattery of William Stukeley in his absurd suggestion that Penicuik House, Midlothian, must surely resemble some northern Wilton as a kind of 'Tramontane Italy' – the Earl of Pembroke's Wiltshire seat was outstanding for its huge collection of ancient marbles – it is nevertheless true that many English visitors were genuinely impressed both by Clerk's rather more modest though agreeable seat and its infinitely more modest collections. Without stretching imagination and credibility too greatly, one can appreciate why in his day and age, and at a distance of four hundred miles, Stukeley could with some justification see Clerk as 'the only Atlas and Hercules too, that sustains the cause of polite literature beyond the Vallum... who has both learning and fortune to preserve and retrieve the noble and numerous monuments on that side of the kingdom' (GD18/ 5027/3, Stukeley to Clerk, 7 June 1725).

In his epistle to Boerhaave, Clerk referred to his collection as in 'the museum'. We do not know precisely how his archaeological objects (of all kinds, and with many different provenances) were displayed. Clerk's sculptured and inscribed stones from sites in Roman Scotland and from Hadrian's Wall were added to a collection which reflected his burgeoning Classical interests sparked first in Glasgow, formed in Holland, and subsequently brought to fruition on the Grand Tour which was truly the seminal episode in his cultural development (Brown 2008). In his cabinet might be found a marble head of 'Cicero', given to him by an eminent old antiquary he had known in Rome, a sprig of laurel plucked from Virgil's tomb at Posillipo, and also a fragment of what he labelled 'an old Roman's skin', this cut from a body in the catacombs of Naples in 1698 (Brown 1977: 207; Brown 1980b: 21).

Evidence has been adduced from the correspondence of John Horsley with Clerk as to where at Penicuik House some at least of the Wall stones were arranged (Keppie 2012: 79). But Horsley himself (GD18/ 5038/1) does not actually state where they were located: for that information we need, in fact, to rely on a letter of Matthew Craufurd (GD18/ 5035) which relays to Clerk some outstanding queries to which Horsley sought answers and regarding which he enlisted Sir John's help at a distance. This provides the information that there was a small altar in Clerk's study; a 'Roman soldier' in his garden; and another 'piece of a pillar' also in the garden. Later annotation in Clerk's own recently-rediscovered copy of Gordon's *Itinerarium*, the identification and analysis of which has been of some significance (Brown 2011: 66-68), adds to our knowledge of the actual location of specific stones in the grand new Penicuik House which Sir John Clerk's successor, James, third baronet, built in the 1760s.

However, as Lawrence Keppie has pointed out, transfer to (old) Penicuik House (often, if paradoxically, called Newbiggin) was no absolute guarantee of survival in the long term. Just as some stones, which Alexander Gordon had hoped to acquire for Clerk but which James Glen secured instead, were subsequently lost, so others safely acquired by Clerk were similarly misplaced and forgotten (Keppie 2012: 74-75; 2014: 21). Perhaps this is understandable given that some fragments seem to have been comparatively small – though one also lost was that same substantial 'piece of a pillar', from Bar Hill: if they were placed outdoors they may easily have been moved by gardeners, or otherwise abused. One fragment seems to have been lost even between its acquisition in 1726 (GD18/ 5029, Clerk to Gale, 2 February 1726) and the moment when Horsley failed to find the same item in 1728.

It is thus pleasing to rediscover a stone which had long been missing, even though on this occasion its disappearance was due neither to an owner's absent-mindedness nor a labourer's carelessness, but rather to Victorian prudery. The phallic stone (referred to above) was omitted from the donation by Sir George Clerk, sixth baronet, of the rest of the Clerk collection of inscribed and sculptured Roman stones to the museum of the Society of Antiquaries of Scotland on the very eve of its becoming the National Museum of Antiquities (Clerk 1857). What Gordon had described in 1726 (1726: 56) as a 'singular Curiosity' was evidently deemed, 130 years later, just too singular for public consumption. It alone remained behind at Penicuik; survived the devastating fire of 1899; and was subsequently secreted in a dark corner of the charter room established in the former stable court when that series of buildings was converted to form a yet newer Penicuik House after 1900. There I found it in 1976, forgotten and unloved, conveniently just in time for the celebration of Clerk's tercentenary that year. It had been my subsequent intention to write up the whole story of this stone from initial discovery, through concealment, to re-discovery as an article to be entitled 'Decency Forbids: Sir John Clerk's X-Rated Ex-Voto'. However I later shared the tale with Lawrence Keppie; introduced him to the stone under the intrigued and speciously innocent eye of the late Elizabeth Lady Clerk; and encouraged him to do the decent thing by this ill-used piece of Romano-Scottish history and symbolism (Brown 2011: 67; Keppie 2012: 73, 84, n. 38; Keppie 2014: 19, 26-27).

On his visits to London and on tours of English country houses and collections, most notably those of 1727 and 1733, Sir John Clerk recorded many opinions on individual items he had seen in the ownership of rich men of antiquarian inclination (GD18/ 2107; GD18/ 2110/ 1). Antiquities, either displayed in bulk or as individual pieces, always attracted his attention and he would come away with – to adapt the phrase he used in 'The Country Seat' – 'senses glutted'. Often the presence of Roman material was a particular recommendation to a specific collection (Brown 1980a: 23-24, 26). Of Sir James Lowther's house at Whitehaven, Cumberland [now Cumbria], he observed that a Roman altar was really 'the best part of its furniture'. This – he noted that it has been published by Camden, and that it appeared in Horsley, page 192 as no 51 – was a large monument: 'The bulk and ornaments make it by much the finest altar in Britain' (GD18/ 2115, pp. 11-12).

In the last twenty-five years of his life Clerk gave increasing thought to the preservation of his collection. Thought, however, was easier than action; and little was in fact done, at any rate in physical terms. Lawrence Keppie has discussed in detail arrangements made at about the same time for the better custody of the Roman stones in Glasgow College, which were mostly arranged in passageways or in specially-constructed locked wooden cupboards or 'presses' (1998: 21). One would not expect to see such utilitarian arrangements in a private country house where part of the whole ethos of the virtuoso collection was to find antiquities used decoratively in association with other treasures. Yet there could

be such a thing as a private 'museum', especially when such a function could be seen as part of the more general identity of a 'villa'. Builders of Georgian British 'villas' were very conscious of ancient precedent and of the life that aristocratic Romans had pursued at their country houses, surrounded by art and antiques. As early as 1725 Clerk has mused to Alexander Gordon (GD18/ 5029/ 1) on how attractive it would be if the Earl of Hertford (Algernon Seymour, later seventh Duke of Somerset), President of the Society of Antiquaries of London, would commission Sir John – himself newly elected FSA – to design a museum: 'to be employed as his architect to form some villa where a collection may be made of all the Roman antiquities now lying disregarded in Northumberland.' Hertford was a Percy on his mother's side and had estates in that county; Clerk was an amateur architect and also an antiquary who had himself visited the sites of Hadrian's Wall and indeed who had 'carried away' (as he put it) a few sculptured and inscribed stones from Wall find-spots.

Nearer home – that is at his own 'villa suburbana' of Mavisbank, near Loanhead, Midlothian (Sir John's other country house) – ideas emerged for some more formal Clerk museum (Brown 1980a: 182-84). Here the museum function of the modern 'villa' might be developed upon, or out of, the more cerebral notion of the antique Roman villa which was known to Clerk and his scholarly friends from their familiarity with ancient authors such as Cicero, Horace and Pliny. The prime mover here was Thomas Blackwell the younger, the man whose post at Aberdeen (see above) was to be secured by the putative deal over the Dunnottar Castle/ Marischal College distance slab. Clerk had evidently sent Blackwell a drawing of the sculptured and inscribed stones recently found at Middlebie, Dumfriesshire, and which he had successfully secured from the tenant proprietor of the ground for the substantial sum of two guineas (Clerk 1892: 139) – a much larger amount than the going rate for Antonine Wall inscribed or sculptured stones. The transaction was doubtless made that much easier because the wider estate was actually in the ownership of his extended family, his younger brother William Clerk having married the heiress Agnes Maxwell of Middlebie.

'You should certainly think', Blackwell wrote, 'of some proper repository about Mavisbank for all the Remains you have so generously saved from Oblivion. Their Order and Arrangement is capable of adding a very great beauty to them; as they are to any place where they are properly disposed off, at least to those that can feel, and have the *docti oculi* celebrated by Cicero. He was extremely sensible that way himselfe...'[Quotations from letters of Cicero to Atticus, then in Greece, follow: these relate to purchases of works of art for the Tusculan villa, and specifically for its 'gymnasium' and terrace.] Blackwell continues: '... next to the pleasure of looking on so great a Pattern for a Taste which the reputed wise people in our Country think trifling, I wou'd take Occasion to enquire how it comes that Cicero's great delights, the Gymnasium and Hystus [he means the ancient term *xystus*, the portico of a gymnasium] are entirely neglected by our Builders [that is, those who commissioned British classical country houses, so largely inspired – both in philosophical terms and in architectural form, at any rate in outward style and appearance – on ancient prototypes.] Did the Romans stand more in need of covered Walks and dry Pavements than we? Or had they more wet weather to provide against and marshy ground to walk upon than the inhabitants of the British Climate? You are the properest Man in the world to consider whether this improvement from the Ancients might not be added to the pleasures of our House and Garden, and to lead to such a Taste among the Men of Magnificence and Spirit. I was going to say that a Hystus, adorned with the rougher Monuments of Antiquity [such as Clerk's Roman Wall stones] at proper distances, and a repository for the smaller ones at the end of it, wou'd be a beautifull addition to the finest villa in Scotland, which without doubt is your own. But the

old proverb *γλαῦκ' εἰς Ἀθήνας* ['owls to Athens'] bids me hold.' Blackwell might well have said Mavises (thrushes) to Mavisbank! (GD18/ 5036/ 12, Blackwell to Clerk, 24 September 1731).

Appealing as Blackwell's idea for a Mavisbank museum may have been, and though Sir John Clerk divided his collections between his two houses on an apparently arbitrary and possibly on something akin to a circulating basis (several manuscript catalogues survive, that listed as GD18/ 1810 being the most significant) no steps were actually taken towards construction of any dedicated 'museum' building, or even a discrete apartment or room set aside for the like purpose within either house. Following the 1745 Jacobite rising, Clerk lamented the fact that his curiosities had been 'put out of order' by events (GD18/ 2334). The Jacobite army had made itself free of supplies at Penicuik when it occupied Edinburgh and the surroundings before marching south. Certain emergency measures had been taken to hide valuables when the Clerk family themselves fled to Durham, and the manuscript of Sir John's enormous Latin history of Britain, which in it later passages is not just pro-Union but openly anti-Jacobite, was consigned to the secure obscurity of a coal-pit for the duration. In the aftermath of the rebellion Clerk must have been more aware than ever of the hazard to which a collection might be subject.

It so happens that, just a few years previously, Clerk had sketched a building which was notionally to be sited in an attractive location on the Penicuik estate (GD18/ 1483a, p. 10). Of a strangely old-fashioned form, lacking any real architectural regularity, and with the eccentric feature of a *three*-columned portico such as no credible architect would surely have thought of, this was to be a free-standing library *cum* museum (Figure 25.2). To be more specific, it was to have an attic story for 'curiosities'; but it was to all intents and purposes designed to bring together in cultural union the literary and material elements that Clerk had so often said were desirable and inter-dependent as representing the sum total of knowledge of the ancient world. We need not elaborate again his belief as expressed (for example in GD18/ 5078/ 44) that material evidence was invaluable in clarifying obscure points in the literary record. This building was to have borne the name Clerhall, which he explained was (for some reason wholly opaque) called after 'a college in Cambridge', even though he had no connection whatsoever with Clare College and did not much admire the University. But the name does appear to have some link with others with which he toyed – Clerville, Clermont – which related to his family name and which he thought whimsically might be 'Frenchified a little' seeing his grandfather, the first laird of Penicuik, had made much of the family's money in Paris as an art-dealer in the 1620s to 1640s.

A fanciful 'museum' building apart, there was another way to preserve one's collection: publication. Although writing came easily to Clerk, actual publication did not. Many putative works remained but 'unlick'd cubs' (Brown 2012: 521-27). However his ownership of the Middlebie stones gradually assumed such an importance that he persuaded himself to publish his dissertation thereon in 1750, at the age of 75 (Clerk 1750). To Thomas Blackwell he had sent a drawing of the monuments some twenty years previously. Now he wrote to Blackwell in these terms: 'At this time of Life I did not think it proper for me to write any thing by way of amusement. All I intended was a Compliment to these Antiquities in my custody & to prevent their being lost & destroyed as our Templum Termini near Falkirk lately was' (GD18/ 5037/ 4, to Blackwell, 6 August 1750; Brown 1980b: 23; Brown 2012: 527). His reference was, of course, to the much-lamented fate of Arthur's O'on, which had been barbarously demolished in 1743 by Sir Michael Bruce of Stenhouse, greatly to Clerk's anguish (Brown 1974; Brown 1987a: 14). It was quite permissible – and indeed socially and intellectually acceptable – for a professional academic

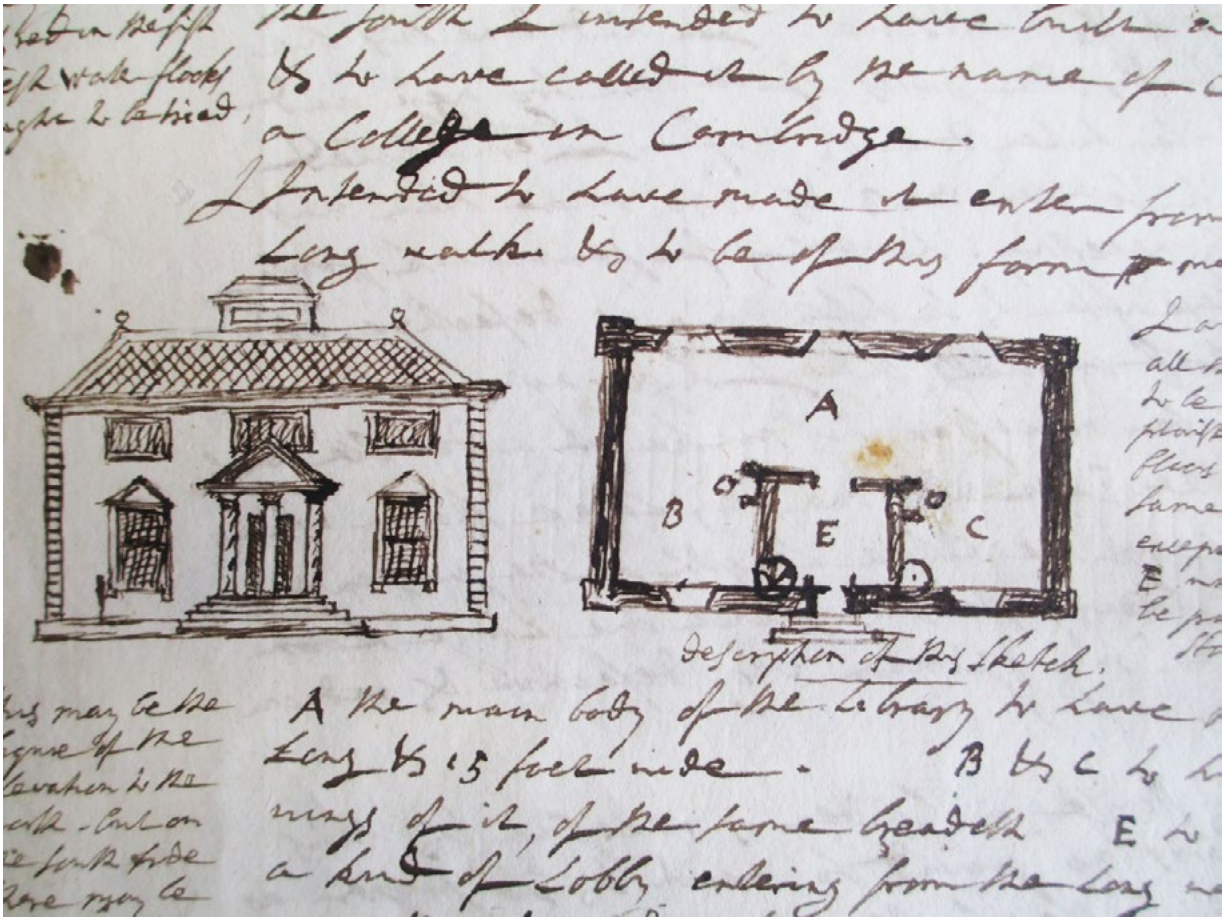

Figure 25.2. Sir John Clerk's sketch for a library and museum on the Penicuik estate, 1741, from his 'Schem of Improvements...', NRS, GD18/ 1483a, p. 10. By permission of Sir Robert Clerk of Penicuik, Bt.

like Blackwell, or his and Clerk's mutual acquaintance Dr John Pringle, the physician, to write books: indeed that was 'in perfect character & as become[s] both your professions; but I cannot say so much for myself in relation to my own performance.' As if to compound the sense that it was not in some way proper to have written his *Dissertatio de monuments quibusdam Romanis, in boreali Magnae Britanniae detectis anno MDCCXXXI*, he continued the process of self-justification by noting in his memoirs that he had done so 'only to preserve these monuments which I have in my possession...' (Clerk 1892: 222). *Pietas*, preservation, posterity: all were his concern, and these mattered far above personal pride in possession let alone publication.

Leaving aside, however, Clerk's peculiar view of what did – and what did not – become the gentlemen and the judge that he was, the telling word in his letter to Blackwell quoted above is surely 'custody': the antiquities in his collection were but temporarily his. As he had told Laurence Chartres years before, he was keen to collect objects that would enhance not just has own cabinet but his own country. When, towards the end of his life, he came to look over the manuscript of his extensive memoirs, a volume compiled retrospectively from many sources such as contemporary letters, memoranda and travel journals, he

made a marginal addition relating to the year 1731 (Clerk 1892: 138-40). This revisited his acquisition of the Middlebie stones: 'About this time the fine pieces of Antiquity now at Pennicuik were found near the Roman camp at Midlebee. They consist of a statue of the Godess Brigantia... 2 altars inscribed to Mercury. These stood in a little [te]mple which, by age, had fallen down and become a Ruinous kind of heap. These Ruines were in the grounds of a poor Lady. She caused some of the stones to be made use of for building a little Stable. [When] I chanced to pass the way, I discovered the stones, and gave the poor Lady 2 guineas for them. I consider these Antiquities as the chief of the kind in Britain, and therefor I wrote a Latine dissertation upon them, that at least posterity may not despise or destroy them. The above remains of Antiquity I still valow [value] exceedingly after they have been now in my possession since 1731 to 1751...'. Clerk then continued with a whimsical passage, as follows: 'I doubt not but some great men in England who are Lovers of Antiquity have so far rever[enced] the Heathen Reli[gion] as to have built a [tem]ple for the sake [of] this statue...' (By 'have', he meant 'might have reverenced'.) Clearly he was letting his mind run over some of the great houses and great collections he had seen in past years: in London, Dr Richard Mead's and Sir Hans Sloane's in Bloomsbury; the Devonshire, Burlington and Methuen collections in their town *palazzi*; his old acquaintance Lord Pembroke's at Wilton; Sir Robert Walpole's at Houghton in Norfolk; and many others. Maybe, in this mood of 'might have been', was he mulling over the pleasing idea that even he, with his much more limited resources, could perhaps have built a little *aedicula* or *tempietto* for his own beloved goddess Brigantia to inhabit, and which he might have visited on his daily walk through the landscape of literary association which he had created?

Baron Sir John Clerk's antiquities caused problems for his son and successor, Sir James when, in 1779, anti-popery mobs wanted to burn Penciuik House because it contained 'Roman altars' – surely papist symbols if ever a narrow and ignorant Scottish protestant crowd needed such objects of vituperation to condemn to oblivion. Almost worse, Sir James had 'a portico with columns' on his house; and those, too, were deeply symbolic of the Rome the mobs so hated, but had never seen, and which Sir John and Sir James had seen, and loved (GD18/ 4213/1, John Clerk of Eldin to Peggy Adam, 9 March 1779; Brown 1980a: 111; Brown 1980b: 6-7; Keppie 2012: 90). One can appreciate how, three generations of Clerk baronets later, an ithyphallic carving might well be deemed not quite the thing to have in one's house, or still less to bestow upon a grateful nation. It is significant, too, that the blood of John Napier of Merchiston ran in Clerk veins; and it was Napier (as Lawrence Keppie has pointed out: 2012: 29) who had once gleefully reported on the presumed – and greatly approved destruction – of a Roman altar from Inveresk. But the very year after the incident of the anti-popery mob at Penicuik, the Society of Antiquaries of Scotland was established. As it grew in size and significance, the Society's museum offered a much more secure (albeit initially peripatetic) home for collections of antiquities; and the Society's museum ultimately became a national one in the care of the State. Of that, Sir John Clerk of Penicuik – ardent accumulator, doughty defender and persevering preserver of Roman antiquities – would surely have approved.

Acknowledgements

I am grateful, as ever, to Sir Robert Clerk of Penicuik, Bt, for permission to consult the Clerk of Penicuik Muniments (GD18) in the National Records of Scotland, HM General Register House, Edinburgh and to quote freely from these papers, as I am, too, for his authority to reproduce the images which illustrate this essay. Dr Patricia Andrew has exercised her customary good judgement in reading and offering constructive comment on this contribution: her criticism has greatly improved it.

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26. John Anderson and the Antonine Wall

Geoff B. Bailey and James Mearns

Introduction

This paper was inspired by Lawrence's work 'The Antiquarian Rediscovery of the Antonine Wall' (Keppie 2012) which identified for one of the authors that John Anderson's manuscript was retained in the Archives of the University of Strathclyde and had never fully been published. The paper is, effectively, a transcript of Anderson's original manuscript, including notes within that by John Hart. The spelling is therefore Anderson's original as best understood from his handwriting. The authors have inserted references and translations of the Latin quotations in square brackets in the body of the text, along with footnotes to clarify some of the original text and to give some modern interpretation on the material covered by Anderson and Hart.

Lawrence's work on the Antonine Wall and his association with the Hunterian Museum, which maintains the key collections of material found on the Wall, might have been enough to generate his interest in the history of antiquarian researches into the Wall and its environs. In addition, however, his long involvement as a member, president and archivist of the Glasgow Archaeological Society, and his willingness to continue to edit and publish that Society's 'Handbook' to the Antonine Wall, (e.g. Robertson 2015) certainly opened up a number of further avenues for historical research.

Both authors of this article worked in the early 1980s at Bar Hill Roman fort on excavations led by Lawrence and Jim Walker. One (JM) subsequently worked with Lawrence in Italy and followed him as President of the Glasgow Archaeological Society and as the archivist; the other (GBB) has had a career in archaeology in the Falkirk District and has collaborated with Lawrence on several excavations and publications. We have both benefitted from his sage advice and good humour over several decades. We are grateful to Strathclyde University Archives and, as Anderson had no children of his own, to Mrs Jean Buchanan and her daughter Margaret Buchanan, surviving descendants of John Anderson's brother Andrew, for their kind permission to publish the text of Anderson's talks on the Antonine Wall.

John Anderson was born in 1726 and served in the Hanoverian cause in the Uprising of 1745-6. In 1754 he was appointed Professor of Oriental Languages at the University of Glasgow; transferring to the chair of Natural Philosophy in 1757, which he held until his death in 1796. He embodied the innovative spirit of the age during which Scotland leapt forward in knowledge and wealth. His own advances included improvements to firearms and munitions, and his interest in this area and practical experimentation led to him being given the nickname 'Jolly Jack Phosphorus'. He helped Carron Company in the development of its projectiles for the carronade and attended trials of the weapon at Greenbrae Reach near Grangemouth. Anderson is known to have been a Fellow of the Royal Societies of London and Edinburgh, a Fellow of the Society of Antiquaries of Scotland, a Member of the Natural History Society of London and of the Society of Agriculture and Economics of the Empire of Russia.

Anderson was friendly with James Watt, having attended the same school, and is credited with supporting Watt when he worked in Glasgow. Anderson was very popular with tradesmen and other Glasgow citizens for opening up some of the classes he gave to non-students and even going so far as to provide classes for women. This led to the Natural Philosophy classroom having to be extended twice to accommodate the increase in students from around 38 to 200! After the publication of a collection of engravings of the Roman stones in the University, known as the '*Monumenta Romani Imperii*' in 1768, Anderson played a leading role in promoting the collection (Keppie 1998: 24-29; Keppie 2012: 96-98).

Anderson's interest in the Antonine Wall was reinvigorated by the construction of the Forth and Clyde Canal which began in 1768 and he was able to make some observations of his own during the resulting disturbance to the Roman remains, as well as having the opportunity to question those undertaking the digging. The University commissioned him to obtain those interesting stones that were found during the construction work. In June 1771, for example, he went to Auchendavy to acquire the recently discovered altars. He also seems to have been to the summerhouse at Kerse House in Grangemouth to see the altar and relief of Fortuna that had been discovered in the bathhouse within the fort at Castlecary in November 1769 when it was being used as a quarry for the Canal. These were donated to the University collection in 1774.

As Lawrence Keppie noted 'A manuscript in John Anderson's hand, datable to 1770-1771 (but with supplementary pages of 1773), now in the Andersonian Library, University of Strathclyde, is the draft text of lectures on the Romans in Scotland, under the title "Of the Roman Wall between the Forth and Clyde, and of some Discoveries which have been lately made upon it". The lectures were given to the Glasgow Literary Society. The text (of which there is also a 'fair copy') consists of an historical outline, a description of the Antonine Wall and its remains and an account of the stones known to him, described according to the sequence adopted in the *Monumenta'* (Keppie 1998: 26). Anderson joined the Literary Society in 1753 (Butt 1996: 10-11) and this was one of the first times that such a talk was delivered beyond the academic confines of a university. It is this account of the Wall that is reproduced here.

Anderson's account of the Wall is largely based upon those of Stukeley, Gordon and Horsley, though as it was intended as a lecture it is briefer. He adds a few observations of his own and took many measurements of the Ditch (Table 26.1). It will be noted that the depths are greater than those often quoted today (Table 26.2)

Although there are snippets referring to the latest discoveries along the Canal, these are surprisingly few. Rather than incorporating them into the main descriptive text at the fort, he leaves the details of the 1769 Castlecary finds to Section V on the stones: 'About fourteen months ago the workmen who wanted stones for the Canal discovered at the east end of the Fort at Castle Cary circular buildings which seemed to have been a Sudarium. At the same time they found pieces of vessels of Terra Cota which are as beautiful as modern Staffordshire teapots and not far from them a Number of bones some of which are plainly the tusks of boars. These circular buildings were quite covered over with earth. They were made of small stones very well dressed but not cemented with lime. In one of them was found an altar that is very entire.'

Anderson grew more and more annoyed with the way in which the University was run and became more disputatious with colleagues as the histories of the University show (Coutts 1909; Murray 1927),

Location	Ditch width (feet)	Ditch depth (feet)	Comments
General	40	20-25	much broader and deeper in places
Shirva	60	*c.* 30	
East of Duntocher	33	8 or 10	
Westerwood	37, 40 and 43	20, 23 and 25	
Bonnybridge	66	25	
Bonnyside	56	*c.* 23	
Bantaskine	40	15	
Callendar House	40	13	
Polmont Hill	40	15	

Table 26.1. Anderson's measurements of the Antonine Wall Ditch

Source	Ditch width (metres)	Ditch width (feet)	Ditch depth (metres)	Ditch depth (feet)
RCAHMS 1963: 94	12.2	40	2.7	9
Skinner 1973: 5	12	39	3.5	11.5
Robertson 2015: 18	12	39	3.6	11.8
Breeze 2006a: 77	12	39	4	13.1

Table 26.2. Recently published 'average' measurements of the Antonine Wall Ditch

and this involved him in taking cases both to the Court of Session and to the King. His disillusionment was so great that in his will Anderson left materials for the establishment of a new college in Glasgow, which eventually became the University of Strathclyde. Anderson specified in great detail the structure, rules and courses of his new Institution and explicitly excluded anyone with connections to the then Glasgow College from having anything to do with his creation.

John Hart was a long-serving trustee of Anderson College from the 1820s onwards. Being from the Bo'ness area he evidently felt compelled to add some notes to Anderson's manuscript: 'It is perhaps not proper to take the liberty of writing any remarks on the blank leaves of one of our venerable Founder's own essays, but as I am a native of that particular part of the country when he seems to have been a little acquainted and when he has had erroneous information respecting this part of the Wall, I thought I could not do better than insert my own observations here to put the reader to right on this subject. But least it should be wrong I have wrote it in pencil so that it can be scribbled out.' These are signed and dated 1834 and have also been included here to provide an illustration of how our knowledge base advances, though not necessarily taking us in the right direction.

Both Anderson and Hart are interesting for what they tell us about the state of knowledge and understanding of the Wall, as well as the condition of the monument, at the period that they were writing. Today we are accustomed to seeing small negative features along the line of the Wall, like the shallow dip of the remaining Ditch, but in the eighteenth century the slightly raised path of the Roman road could still be made out. The state of preservation led to mistakes in identification then and now. The prominent upcast mounds derived from the ditches of the fort were called 'ramparts',

and so a fort may have as many as three or four ramparts – a number which has led later readers to doubt the accuracy of the original observations. Hart also gives us useful additional information of prehistoric discoveries near Bo'ness and at Meadowbank, Polmont. The record of place names will be of particular interest to those who study such things. Anderson, following Horsley, spells out the names phonetically, providing us with contemporary pronunciations. Thus, for example, we have Kinneel rather than Kinneil, Simerston instead of Summerston, Bemulie for Balmuildy, Evon for Avon, and so on. On one occasion he tells us that Carriden (Caerridden) is 'commonly pronounced Carrim'.

Anderson's record of the stones in Section V is invaluable and was used extensively by Lawrence in his definitive work on the *Roman Inscribed and Sculptured Stones in the Hunterian Museum* (1998). As usual, he concisely summarised its contents. So, rather than reproduce it here we will place it on the website of the Glasgow Archaeological Society where it can be consulted by future researchers.

John Anderson's Text: Of the Roman Wall between the Forth and Clyde; and of some discoveries which have lately been made upon it

The low ground between the Forth and the Clyde has been destined for great Works.[1] A few years ago some very noble manufacturing machines were erected upon it, and in all probability their number will increase very fast.[2] At present a Canal with locks is carrying on, which in beauty and workmanship will be superior to every one of the same extent in Europe.[3] And about sixteen hundred and seventeen years ago, a military Bulwark was made in the same place, which was so magnificent that a minute survey of it will not diminish the high Idea which is commonly entertained of Roman greatness.

We will consider this famous Wall under the following Articles. Its Builder, Name, Extent, Dimensions and Forts; together with the Sculptured Stones formerly, and lately found upon it.

A Review of these particulars will bring a thousand Ideas into the mind of every Literary Man concerning the vicissitude of human Affairs, and the State of the Arts and Sciences, in Antient and Modern times.[4] I however will content myself at present with some observations upon a few things which are remarkable in the History of Mankind and which naturally arise from a Survey of this Wall. The first relates to the uncouth Objects of Sculpture among the Antient Romans. The second to their Religious Principles of Toleration. The third to their Modesty with regard to the Sexes. And the fourth to their great Vallums, or Lines of Posts, as a branch of the military Science.

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[1] The Central Scotland Rift Valley extends across the waist of Scotland between the two estuaries and is centred on the rivers Kelvin, Bonny and Carron. Before the agricultural improvements of the eighteenth century there were large marshes such as Dullatur Bog along the courses of these waterways, but the adjoining hill slopes were productive.

[2] In 1759 the Carron Company was established at Larbert beside the River Carron and within twenty years it was one of the largest works in Scotland. Other industries soon followed and this period was one of great innovation and growth in the Central Valley.

[3] The first sod for the Forth & Clyde Canal was cut in 1768 and although the construction progress was slow it was soon well used. Water was first let into the canal in 1773 from Grangemouth to Kirkintilloch. It was 1775 before it was watered as far as Stockingfield. Its economic impact on the areas that it went through was immense. The Forth & Clyde Canal linked the two coasts and so it was built on a greater scale than a conventional canal – hence the appellation the Great Canal. There were 39 locks in all – 20 in the eastern section up to Wyndford near Castlecary.

[4] The authors have decided to omit the latter part of Anderson's text from the present paper in order to concentrate upon the material relating to the physical remains of the Antonine Wall.

Sect I[5]

This military road is very distinct where there is no Agriculture. Where it is defaced by the Improvements of the Country, Fancy must supply its Tract by taking the nearest road from the different Stations, or from one Vestige of it to another.[6]

The most common opinion is that these Forts were outworks or exploratory towers[7] belonging to the great Roman Wall which it will be shown afterwards was built not by Agricola but by Lollius Urbicus. This opinion I cannot assent to and for the following reasons.

If any sculptured stones had been found in them with the name of Agricola they would prove fully that the common opinion is not well founded but as no stones of any kind have been found which can ascertain the date of these Forts all the arguments for their being built by Agricola and not by Lollius Urbicus must be drawn from conjectures and general reasonings and they are the following.

Tho forlorn hopes are admitted in war yet it is so rarely that it is a maxim in making fortifications that every part should defend and be defended. It should be remembered that many of these forts are two miles to the north of the Wall. If they were attacked therefore by the enemy they could not be defended by the Legions upon the Wall. If on the other hand we suppose them to have been impregnable by all the forces which the Caledonians could employ they still were useless in defending the Wall because supposing it [were] attacked, their garrisons could not harass the assailants in the rear without fighting

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[5] Anderson provides a resume of the military campaigns in Britain from the time of Julius Caesar to the governorship of Gaius Agricola, largely based upon the text of Tacitus. This has been excluded here but is in the full on-line version. In this account he follows the contemporary convention of seeking a series of forts across central Scotland that might be attributed to Agricola. His list and description of these '*praesidia*' is based upon the account of Alexander Gordon (Gordon 1726). They are, from west to east:

1. Little Castle Hill near Duntocher (Nimmo 1817: 630).
2. At a small distance from the little Castle Hill there is another tumulus of a similar construction which is called Cring Castle.
3. About three miles farther east there is another called Wester bankier. It is surrounded by a rampart of earth and stones about 10 feet thick, having an entry to the east; its circumference is about 470 feet. There are marks of stone buildings in the middle.
4. Broken Tower – to be equated with Tower Farm (NS 6136 74180.
5. Carlestoun (NS 632 752) a cairn (RCAHMS 1982: 14).
6. Kings Hill, Antermony Loch [NS 665 765] – near Milton of Campsie (RCAHMS 1963: 446).
7. Balcastle motte (NS 7011 7817).
8. The motte known as Castle Hill at Colzium near Kilsyth (NS7350 7824).
9. Colziumbea – possible dun NS 739 777) (RCAHMS 1963: 85).
10. Ruchill –probable dun (NS754 785) (RCAHMS 1963: 84).
11. Chesters – unknown, but probably also a dun somewhere around NS 7578, unless this is a reference to Coneypark hill fort
12. Auchincloch – now considered to have been a broch or dun (NS 7679) (RCAHMS 1963: 84).
13. Bankier Castle – considered to have been a medieval earthwork (RCAHMS 1963: 421).
14. East Bankier – an indeterminate site, now lost (RCAHMS 1963: 450).
15. Chapel Hill – probably the same as chapel Haugh near Dennyloanhead (RCAHMS 1963: 450). The name suggests that this may have been an early ecclesiastical site.
16. Wester Cowden – Cowden Hill in Bonnybridge is considered to be a native site occupied during the Roman period.
17. Camelon – this was a Roman fort in both the Flavian and Antonine periods.
18. Hills of Dunipace – the eastern of which appears to have been a motte.
19. Castlehill at Larbert Bridge was also a motte.

[6] The agricultural revolution was gaining momentum in this part of Scotland in the early 18th century (often referred to as enclosures) and by the time that Anderson was writing it had already severely denuded the archaeological record; a process that was to continue for at least two hundred years. Agriculture was just as destructive as industry, if not more so.

[7] As will have been noted from the list provided in note 5 most are now seen as duns, brochs, cairns, and medieval settlements.

the enemy in the open field contrary to the intention of such defences. For these reasons the troops within the great Wall could give no aid to these forts when attacked and they, as forts, could be of no use in harassing the enemy.[8] If therefore they were useless as forts, the supporters of the common opinion must alledge that they were merely watch towers which were designed to give notice of the enemies approach. To this opinion however there are strong objections. In the first place if they were merely signal posts why were they not small towers fit only to contain two or three men. In the second place suppose them signal towers they could be of little advantage because there are better views of the country from the Roman Wall itself and because they are in many places so distant from each other that an enemy might easily march between them without being discovered in the darkness of the night. But in the third place some of them are so large, that taking small and great together, it would require a considerable number of men to garrison them moderately and as they could neither give nor receive aid they singly and uselessly exposed small numbers to the attack of the enemy. The true way of securing such a wall from unexpected insults was by what is called Vedettes,[9] patrols and safeties. The two first are small detachments of light armed cavalry and infantry dispersed in the front at proper distances which as soon as the enemy comes within a mile or two of the Wall give notice of their approach and retire to the Safeties, which are small defences upon the edge of the ditch where they either continue to fight as in redoubts or by crossing the Ditch join the main body. Every modern engineer knows this perfectly and it was not unknown to the Romans.... [Anderson then finishes his discussion of Agricola and the history of northern Britain to Hadrian's reign.]

There is nothing in any of the historians relating to the Britons for the first four years of Hadrian's reign excepting a few hints in Spartian [*Historia Augusta, Hadrian* V] concerning their insurrections. So that the silence of the Roman historians with regard to our island may be extended from the year 85 when Agricola was recalled by Domitian to the year 120 when we are informed that Hadrian came over into Britain. Eutropius [*Breviarium historiae Romanae* 8.7] says '*Orbem Romanam circumivit et multa aedificavit*' [He travelled through the Roman empire and constructed many buildings]. Xiphiline [Cassius Dio 69.9] says expressly that this Emperour visited the several Provinces, Countries and Cities, altered the Walls and Citadels of some of them, and took cognizance of all that related to the Armies, arms, machines, ditches and ramparts. Spartian [*Historia Augusta, Hadrian* XI] says '*Britanniam petiit, in qua multa correxit, murumque per octoginta millia passuum primis duxit, qui barbaros Romanesque divideret*' [There he put right many abuses and was the first to build a wall, eighty miles long, to separate the barbarians and the Romans]. There are two things remarkable in this passage. First it is said that the Wall was eighty miles in length and secondly that he was the first person who made a Wall across the island. There is a passage in Capitolinus concerning the Emperour Antoninus Pius and there is an Inscription upon a stone in Glasgow College which when joined to the above quotation determine without a doubt what Wall was built by Hadrian and what by Antoninus Pius. The passage in Capitolinus [*Historia Augusta, Antoninus Pius* V] is '*nam et Britannos per Lollium Urbicum vicit legatum alio muro cespiticio submotis barbaris ducto*' [He (Antoninus) overcame the Britons through his legate Lollius Urbicus and, having driven back the barbarians, built another wall, this time of turf] and the Inscription upon the broken stone taken out of the Wall between the Forth and Clyde is '*Legio secunda Augusta sub Quinto Lollio Urbico Legato Augusti Propraetores fecit mille passuum*' [the Second Augustan Legion under the command of Quintus

[8] Hadrian's Wall did have outpost forts at Bewcastle, Netherby and Birrens, and later at Newstead, High Rochester and Risingham (Breeze and Dobson 2000; 46 and 132-33). Their success is still a matter of debate.

[9] A mounted sentry positioned beyond an army's outposts to observe the movements of the enemy. Derived from the French word for scout in the late 17th century.

Lollius Urbicus, the emperor's legate with praetorian powers, built [this) (*RIB* I 2191; Keppie 1998: 94-95. Current reading of this stone does not restore *mille passuum* at the end]. It is clear therefore that a Wall eighty miles in length was the first that was made across Britain and that this could not be the Wall between the Forth and Clyde which is only half that length. It is clear likewise that the Wall between the Forth and Clyde was built after Hadrian's Reign because it is said '*alio muro cespiticio*' [*Historia Augusta, Antoninus Pius* 5.4] referring to another formerly made. And it is clear that the Wall between the Forth and Clyde is Antoninus' Wall because the stone informs us that the work was by Lollius Urbicus who was his Propraetor.

Antoninus Pius succeeded Hadrian in the government of the Empire in the year 138. From the above quotations it is plain that he built the Wall between the Forth and Clyde. It cannot be ascertained from the Historians in what year of his Reign this was done, but from a Stone in Edinburgh College it is probable that it was begun during his Third Consulate. This seems to be the Inscription upon it: '*Imperator Caesari, Tito Aelio Hadriano Antoninus Augusto Pio Patri Patriae Consuli ter, Cohors prima Cugenorum opus tribulo millibus passuum perfecit*' [*RIB* I 2313; Maxwell 1983: 379-85].[10]

Antoninus Pius was succeeded by M Aurelius Antoninus Philosophus and took L Verus for his Associate in the Empire. We meet with nothing remarkable in the Roman Historians concerning the transactions in Britain during the reign of these Emperors. It is only said in general that Calphurnius Agricola was sent against the Britons who had made very dangerous Insurrections [*Historia Augusta, Marcus* VIII].

Commodus succeeded his father M Antoninus and was made sole Emperor in the year 180. It is certain there were considerable wars in Britain during his Reign tho the accounts we have of them from the Roman Historians are short and general. Xiphiline takes notice that this Emperor had several Wars with foreign nations but none so dangerous as that with the Britons for they having passed the Wall which divided them from the Romans attacked the Romans and cut them in pieces [Cassius Dio 72.8]. It cannot be determined I think which of the Walls is here meant. If the Caledonians broke thro their Wall during the last reign as some have supposed it must mean Hadrian's Wall but if this was not the case it means Antoninus' Wall.[11] There is no reason to think that the Roman affairs in Britain were in a very good way during this reign. It is true that Commodus assumed the name of Britannicus and conjoined the titles of Pius and Felix but Lampridius [*Historia Augusta, Commodus* VIII] says of him '*Quum Adulterum Matris Consulem designasset, appelatus est Pius; quom occidisset Perennem apellatus est Felix; et quum Britanni Imperatorem contra eum deligere voluerint appelatus est Britannicus*' [Meanwhile, because he had appointed a former lover of his mother's to the consulship, the senate mockingly gave Commodus the name Pius; and after he had executed Perennis, he was given the name Felix; .... .He was also called Britannicus, although the Britons actually wished to set up an emperor against him].

The two succeeding Emperors were Pertinax and Julianus both of whose reigns did not amount to six months and we know nothing of the affairs in Britain during that period excepting that Clodius Albinus was Commander in Chief.

[10] This is a milestone from Ingliston near Kirkliston. The ending is now differently restored as '*Trimontio millia passuum*' indicating a distance from Newstead, though the Antonine date, previously disputed, has been confirmed.
[11] Since the Antonine Wall seems to have been abandoned in a phased withdrawal between *c.* 158 and 165AD (Hodgson 2009), it is now generally agreed that the Wall broken through was that of Hadrian.

In the year 193, Clodius Albinus, Pesseninus [Pescennius] Niger and Septimius Severus were competitors for the Empire. The lives of all these three are written by the Roman Historians but there is nothing relating to Britain that deserves notice till the expedition of Severus who prevailed over the other two and reigned alone from the year 195 till the year 210 inclusive. The antiquarians have not been able to determine in what year Severus came into Britain. It is only certain that it was after his other expeditions were over, for he ended his reign and his life in this island. Herodian [III.14] and Xiphiline from Dion [Cassius Dio 76.11-13] give a full account of the expedition made by Severus against the Britons. Their descriptions show that the northern Britons not only had the same manners which Tacitus ascribes to them in Agricola's time, but that they were in some respects the same which belong to the Highlanders at present. Severus was greatly harassed by them in this expedition and Xiphiline says expressly that the Romans lost fifty thousand men [Cassius Dio 76.13.1]. Spartian, Aurelius Victor, Eutropius, Orrosius, who wrote in the fifth Century and Cassiodorus, who lived in the sixth, all say that Severus built a wall of defences against the Britons and they mention it as the greatest exploit of his life. His *'majora aggressus'* says Spartian [actually Aurelius Victor (*de Caesaribus* 20.18)] *'Britanniam, quoad ea utilis erat, pulsis hostibus muro munivit per transversam insulam ducto utrimque ad finem oceani*' [He undertook greater works than these for he defeated the enemy and then protected Britain, up to the point where the country was useful, with a wall which he built across the island right up to the ocean at both ends].[12] '*Novissimum Bellum'* says Eutropius [VIII.19], '*in Britannia habuit; utque exceptus Provinciae omni securitate muniret, vallum per XXXII millia passum a mari ad mari deduxit*' [He (Severus) waged his last war in Britain, and in order to secure thoroughly the provinces he had retrieved he built a rampart 32 miles long from sea to sea] – '*Itaque*', says Orrosius [VII.17] who wrote before the Romans had left Britain, '*magnam fossam firmissimumque vallum, crebris insuper turribus communitum, per centum triginta et duo milia passuum a mari ad mare deduxit'* [He therefore built a great ditch and strong rampart, fortified with many towers, from sea to sea – a distance of 132 miles]. *'Hic Consulibus Severus in Britannos bellum movit; ubi ut receptae provincias ab incursione barbarica faceret securiores, vallum per se XXXII passuum milia a mare ad mare deduxit*.' [Severus brought war to the British; where, so as to make the restored provinces more secure from barbarian invasions, he built a rampart 32 miles long from sea to sea (Cassiodorus Chronica 886)]. The difference of the numbers expressing the length of this Wall in the several authors is supposed to be owing to the common error of transcribers. The true reading say the critics has been LXXXII and thus by omitting the L becomes XXXII or by changing the L into a C the number becomes CXXXII. This criticism seems to be well founded for two reasons. First the Wall between the Forth and Clyde is more than thirty two miles in length and secondly, in the copies where there are words and not letters to denote its length, a much greater length is given to it than the distance between the Forth and Clyde. But there is a passage in Spartian's life of Severus [*Historia Augusta, Severus* XXII.4], which when added to this and the monuments of Antiquity in the North of England, will be decisive. After Severus, says he, had finished the *Murus* or *Vallum* in Britain he returned to the next Station not only as a conqueror but as the founder of peace. '*Post murum aut vallum missum in Britannia quuam ad proximam mansionem rediret non solum victor esse*'. Now it is proved by the Antiquarians that this Station or *Proxima Mansio* was the City of York where Severus died.

[12] Anderson mentions five Roman authors, but goes on to quote only three. It is clear from the Latin that in two cases he has conflated references from two different sources. These have been separated out in order to make better sense of his subsequent discussion. The correct 'Spartian' quotation (*Historia Augusta, Severus* XVIII) says '*Britanniam, quod maximum eius imperii decus est, muro per transversam insulam ducto, utrimque ad finem Oceani munivit*.' (He fortified Britain with a wall built across the island from sea to sea – the crowning glory of his reign)(WSH).

This then is the account which the English Antiquarians give of Severus' Wall and I think it is well founded. They say it is plain from the above quotation and from the ruins still extant that Severus made a peace with the Caledonians and in order to secure it made a stone wall from Tyne to Solway Firth near the same tract of ground, tho not upon the same foundation, with the Vallum which had formerly been made by Hadrian. They say that the two different tracts may be seen at this very day. They say that Hadrian's Vallum was plainly an earth or turf wall but that of Severus was made of stone.[13]

After Severus had finished this Wall the Britons revolted, upon which he gave orders not to spare even children and women with child but he lived not to see these orders executed. His son and successor Caracalla immediately concluded a peace with the Britons and left the island and there is nothing more to be found so far as I know concerning these Walls in any of the ancient writers.

In giving an account of the Builder of the Roman wall between the Forth and Clyde it was necessary to enter into the above particulars because some of the learned have said that it was made by Hadrian, and others that it was made by Severus. We now however will have no difficulty in ascertaining who was its real founder and in accounting for the different names given to it, which are as follows.

Sect II

By the vulgar it is called Graem's Dyke. By the learned the Wall of Severus, the Wall of Hadrian, the Wall of Antoninus Pius and by both, the Roman Wall, because undoubtedly made by the conquerors of the Antient World.

There are two famous Etymologies of the vulgar name. According to some it is so called because a Caledonian whose name was Graeme first broke thro it and repulsed the Romans. According to others Graeme's Dyke is a literal translation of Severus' Wall, the Celtic word which resembles the sound Graeme having exactly the same meaning with Severus. The Learned in the Celtic languages say that this Etymology is not well founded. If so, we must admit the first, tho supported by nothing but Tradition.[14]

The first of the names which the learned gave to this Wall was because they believed that it was made by Severus and this belief seems to have been founded upon some of the passages in the Antient books above quoted. But upon the discovery of the sculptured stones which begin with Titus Aelio Hadriano it was thought that this was the Wall which the Historians say was built by the Emperor Hadrian. They considered not that the accounts which the Historians give of Hadrian's Wall will not answer to a Wall between the Forth and Clyde. Nor will the rest of the name Antoninus Pius answer to the fifteenth Emperor of Rome. The last and the proper name given to the Wall of late years is the Wall of Antoninus Pius who it is certain from the above proofs, built-it and who we know from the Roman

[13] Anderson was not alone in proposing that Hadrian built a wall of turf and Severus the stone wall. However, we now know that the vallum of Hadrian's frontier was contemporary with the Wall itself and seems to have provided a rear defensive work creating a militarised zone; the western third of Hadrian's Wall was of turf and that it was already being replaced in stone by the end of his reign; and that much of this stone wall had to be rebuilt in the third century, a process begun by Severus, using a harder white mortar (Breeze 2006b: 53-62 and 84-88).

[14] The tradition goes back to at least the 14th century and as with many was embellished by Hector Boece (Glasgow Archaeological Society 1899: 102).

writers assumed the name of Hadrian in compliment to the Emperor of that name whose adopted son he was and to whom he succeeded in the government of the Empire.

Sect III

Mr Gordon and Mr Horsley[15] have taken so much pains in examining this Wall, and the Vestiges of it are in general so distinct that there is no dispute concerning its tract excepting at the Extremities. Some suppose Caerridden commonly pronounced Carrim to be the eastern limit and Old Kilpatrick the Western.[16] Others suppose Dumglass to be the Western limit and Kinneel to be the eastern. The Common Tradition is in favour of Dumglass and the Arguments in support of it are the following. Dumglass is a Promontory[17] and the river is deep close to the Shore but at Old Kilpatrick the river is shallow so that at low Water there was room enough for Troops to pass by the end of the Wall. Besides this there are remains of a military way at Dumglass which shows that if the Wall was not continued to Dumglass there was at least a Military Station. There are two Arguments however, against this opinion. The first is that there are no visible remains of it farther West than old Kilpatrick. And the second is the Authority of Bede who says it ended at the Town of Alcluith, which is supposed to be Old Kilpatrick.[18]

It is as difficult to determine the exact termination of the Wall on the east. For such as would have it end at Kinneel own that a Military way was carried as far as Caerridden and that a military Station has been there. The Ditch is visible to Kinneel so that the Wall must have come to this place at least. The Ditch is nowhere visible between Kinneel and Caerridden.[19] The Firth is not very deep near Kinneel and the banks steep, and at Caerriden it is the same. Two circumstances render it still more difficult to settle this dispute. The first error, the firth is not very deep at either of these places is that supposing the Wall ended at old Kilpatrick and Kinneel it is very probable that there was a station at Dumglass and another at Caerriden. And the second is that there is good reason to think that both the Firths of Forth and Clyde were formerly deeper than at present.[20] We know well the termination of the Roman Wall at the Solway Firth and yet at low water the land is dry there for more than a mile so that supposing no higher tides than at present and supposing no Castella lower down the country it must have been easy at low water for a body of men to march by the end of the Wall if there were no guards to interrupt them. There is one argument for making the termination of the Wall at Caerriden which appears to have great weight. It must have been pretty entire in the time of Bede who flourished in the end of the 7th century and he says expressly that it began just two miles to the west of Abercurnig that is

[15] Alexander Gordon undertook a survey of the ancient remains in southern Scotland and Northumbria and his published work stands out at the time for its empirical observations (1726). John Horsley also travelled extensively and paid particular regard to inscriptions (1732).

[16] This pronunciation of Carriden has caused confusion in the past. A Bronze Age rapier in the National Museum was provenanced on a hand-written label as Carrin on Grahamsdyke, but it was only recently that this was recognised as Carriden. The location of the eastern terminus of the Wall is still a matter of debate (Bailey and Devereux 1987). The western terminal fort of the Antonine Wall was finally fixed by Macdonald in 1913 (1915: 103-107) and from this a short spur led towards the Clyde (Miller 1928: 1).

[17] Dunglass Point lies at the western extremity of Bowling on the Clyde. It now houses the remains of a castle and an obelisk monument to Henry Bell who pioneered steam navigation.

[18] Alcluith is now identified as Dumbarton, the Rock on the Clyde.

[19] The Ditch and Rampart were found by excavation in 1989 at Richmond Corner (NS 996 809) (Keppie and Bailey 1995: 606-610).

[20] Quite the reverse, as since Anderson wrote the Clyde has been dredged to make it deeper

Abercorn. And even at this day tho the ditch is not visible the rampart may be faintly traced to the house of Grange which is about half way between Kinneel and Carrin.[21]

John Hart's note 1:

Caerriden is at least 4 English miles West of Abercorn. Blackness Castle is more likely the point Bede alludes to but I think the Ditch and Rampart may have terminated at the point of land to the N: West of Kinnel house, however the steepness of the bank or side of the hill from Kinnel to Grange would form a natural Rampart being at least twice the height of the artificial mound. The military way after passing Grange House takes a South east direction keeping along the brow of the hill from this point to Carrin. A very little labour would continue the Rampart, here the bank again becomes Steep till it leaves Carriden Estate. The slope then becomes more gentle along the Estate of Binns till it loses itself in the promontory on which Blackness castle Stands. However very little cutting along the brow of the hill would compleat the line of the Rampart.

There is another reason why the Ditch and Rampart would almost be unnecessary beyond Kinnel, the Carses or open country terminates at this point, as the sea washes the foot of this headland. Now no hostile tribes could assemble in sufficient numbers along the narrow strip of ground between and the sea beach to become formidable because with the exemption of the point on which Borrowstouness is built and the short space from the house of Grange to Carriden, the sea shore is scarcely a bow shot from this line of Rampart - and at Bridgeness there is a hill or Basaltic Rock about 40ft in hight about 100 yds diameter on the top. On this hill tradition say stood a Roman fort where a circular tower formerly a Windmill now stands[22] - this outpost being in the centre would command the open ground formed by the bend in the Rampart to the south. From Kinnel therefore to Blackness the whole of the opposite coast the firth, and this space from the shore to the wall lay open before them, but besides this the Military Way branched off at Upper Kinneel, passed along by the farm of Ruslin thence crossing the road between Linlithgow and Borrowstouness at the old houses of Flints, It led along the top ridge of Ironcath Hills on the summit of which the Camp is still pretty entire.[23] From this camp the opposite coast the firth and the lower Rampart with the intervening ground could be distinctly seen, together with the track of country to the south, East & West.

The Military way proceeded eastward where it crossed the road from Linlithgow to Blackness. Near this place was another station. The farm and the house on the roadside still retains the name of Walltown and Champney, supposed to derive from there vicinity to the Roman Camp.[24] Binns Hill being a continuation of the Basaltic ridge of Irongath Hill, the whole district South to Binny, and east as far as Cramond, or Edinburgh can be seen and the firth and opposite coast and being direct south from Blackness, the North rampart, the Castellum and the intermediate coast as far as the promontory at

[21] Grange House was much nearer to Carriden than to Kinneil.
[22] The windmill, known as Bridgeness Tower, was built in 1751. There are no known Roman structural remains in the area, though a voussoir stone was found nearby (Macdonald 1937: 383-386). Macdonald thought that the Wall ended here (1934: 103).
[23] The route of the Roman road from Upper Kinneil to Irongath Hill appears to be completely conjectural, though it was still noted as such in 1913 (Salmon 1913: 10). Irongath Hill has produced cist burials, but no Roman remains are known there.
[24] Walltown, now Walton, has 'well' rather than 'wall' as its first element (Macdonald 1941: 33). A flat-topped hill here disclosed cist burials, but no Roman remains have ever been found (Salmon 1913: 9); Champney, although often considered to be of French origin, is probably a personal name (Macdonald 1941: 34).

Abercorn. From the camp at Binns or Irongath Hill any hostile movement could be seen and from Inveravon to Queensferry or Cramond and the army could be upon the Ramparts before the enemy could land or form into a body.

In 1832 at this place where the Military way branches off at upper Kinneil a gentle rise in the centre of a Park was dug into. It proved to be a tumulus containing stone coffins and urns filled with calcined bones. The urns were placed on their mouths with a flat stone underneath; the coffins contained nothing but a little black earth. The coffins and urns were alternate and placed in a Circle round the hill. The hill [Laughing Hill] itself was principally stones with a little earth among them like a cairn (Salmon 1913, 8-9). Another small hill [Deacons Hill] was removed in 1802. This eminence was on the North side and close by the Military way as it passed Grange house. On the top stood a stone, about 3ft of the stone was above the ground, on leveling down the hill it was found full of stone coffins, in several the bones were pretty entire but very tender, the stones were slabs from the surface of the Rock with many marks of dressing. I do not think any urns were found here [Fleming 1845: 68, though the date of discovery was 1833].

Allowance being made for the different methods which Mr Gordon and Mr Horsley took for measuring the length of this Wall their measurements agree very well and its exact length is thirty nine Roman miles and seven hundred and seventeen paces, thirteen English miles being equal to about fourteen Roman.[25]

Sect IV

This Vallum, Dyke, Defense or Wall as it is commonly called consisted of five Parts. A Rampart of Earth towards the North that is towards its enemy, Close by it a Great Ditch. To the South of this another Rampart of Earth, both having their foundations made of Stone[26] At certain Intervals upon this Rampart there were Stations, Towers and Turrets;[27] And to the South of them a Via Militaris or causeway for the march of the troops.[28]

The breadth and width of the Ditch is distinguished by Mr Horsley into four States. Where it is scarcely visible is the first degree and where its breadth and depth is greatest in the whole tract is the fourth. The two intermediate Degrees are equally distant from both. This Wall is crossed by the great Canal near Shirva.[29] As it is not very difficult for workmen to distinguish Earth that has been moved from

[25] Using LiDAR Hannon *et al.* (2017) have recently produced the most accurate estimate of the length of the Antonine Wall to date from Old Kilpatrick to Bridgeness, now put at 62.03 km, though we are still uncertain where its east end lay. The statute or 'English' mile is 1.609 km, whilst the Roman mile of 5000 *pedes* is either 1.48 km, using the *pes Monetalis*, or 1.66 km with the *pes Drusianus*, both of which may have been used on the Wall (Hannon *et al.,* this volume).

[26] The 'North Rampart' is the upcast mound, the soil dug out of the ditch and deposited on its north side. The Great Ditch is larger than the ditch in front of Hadrian's Wall. The 'South Rampart' is the Wall. We now know that west of Watling Lodge it was made of turf; eastward it was of earth retained by turf or clay cheeks. The Wall has a basal stone raft *c.* 4.3m wide with quarried dressed kerbs. The upcast mound often has small stones at its toes because these rolled down the mound during its formation and this may have given the appearance of a stone base. It also seems that stones were used to retain it.

[27] Stations here mean forts; the distinction between towers and turrets may be equated with that between what we now call fortlets and expansions.

[28] It is clear that much of the line of the Roman road that ran parallel to and south of the Antonine Wall, which we still call the Military Way, was still visible in the early 18th century. In low-lying places it was placed on a slight agger, hence the use of the term causeway. However, causeway may also sometimes be used for the diminished Rampart.

[29] The Canal also crosses the Antonine Wall at Cadder.

Natural Earth even after many Centuries I endeavoured to get the exact size of the Ditch at this place which might serve as a general measure of its breadth and depth; and it seems to have been about 60 feet Wide and about 30 feet deep.[30]

Tho this Ditch has been made above sixteen hundred years yet in many places it is still forty feet in breadth and from twenty to twenty five in depth. In some few places it is much broader and deeper. The base of its North Rampart seems to have been above 30 feet in Breadth but how high cannot be ascertained.[31] The South Rampart was about 20 feet from the edge of the Ditch. It here is about 20 feet in breadth. Its height is unknown. In some Places it measures even at present, six feet in perpendicular Height.[32] The causeway is about 20 feet in Breadth, in many places is wonderfully entire. It is commonly near the South Rampart but not always at an equal distance.[33]

There have been three kinds of Forts upon this Wall. Ist Stations of which ten are very distinct. These Stations were Square Encampments fortified with two or three Ditches and Ramparts and fit for quartering all the year round a Cohort of six hundred Men. Some of these could receive a much greater number. The second kind of which two or three appear were Turrets or Towers which were fit for receiving small detachments. The Third were Turricula or Exploratory Turrets which could hold only a few men by way of vedettes. Some of these are still to be seen. There is no having a complete Idea of this Wall but by riding upon its tract from Clyde to Forth or by studying Gordon and Horsley with Accuracy. To such as have done neither I will now describe it by means of this map and my observations will at least have brevity to recommend them. The map was made by Mr Laurie for the Proprietors of the great Canal, and to it I have added the Roman Vallum. As this map is the most accurate that has been made of the tract of Country, it is to be hoped that my addition will partake of that merit. See the Map.[34]

Some of the sculptured Stones would lead one to imagine that Lollius Urbicus began his Work at the West end, but whether there, in the middle or in different places at once cannot be ascertained. It is reasonable however to believe they would begin at one end, suppose at Kilpatrick, and carry it on regularly because they were in an Enemy's Country and their security would increase by carrying it on in this manner whereas if they wrought in different places they could derive no advantages from it till

[30] It is evident that Anderson did not make these observations himself and that he is reliant upon the keen senses of the navvies. However, 30 ft is excessive for the depth of the Ditch and it should be noted that his original description (crossed out) was that the depth was about half of its width, showing it to be a rough figure. The miscalculation may have been due to the steep hill slope here and to the still prominent nature of the upcast from which the depth would have been measured; this would agree with the slightly wider width than usual. The same comments apply to the 25 ft depth in the next paragraph, though it is also true that the more recent method of estimating the depth of the Ditch by extrapolating the angles from known sides is prone to underestimate it.

[31] This is a considerable underestimate and again shows the difficulty in seeing where the Ditch begins and the upcast continues. For the turf Wall it is possible to estimate the height of the upcast mound from the amount of material dug out of the Ditch.

[32] The Rampart is between 14 and 15 ft broad at the base (4.3-4.6 m), but slumping makes it appear larger. Even today it is still 6ft high between Bonnyside and Rough Castle.

[33] The Military Way, as Anderson noted further on, often takes a more direct and less precipitous route.

[34] There is no map with the document in the archives. Maps of the Forth and Clyde Canal cannot purport to show all of the countryside through which the Antonine Wall passes as they end at Bowling on the west and Grangemouth on the east, and often the distance between the Wall and the Canal is considerable. The early Canal maps show features such as the stream courses and towns, but not the fields or minor structures. It would therefore seem that Anderson's annotations were limited in geographical extent. John Laurie was employed as a freelance land surveyor on the construction of the Canal between 1767 and 1779 under Smeaton, and later with Whitworth (Skempton and Chrimes 2002: 423). He also produced maps of Edinburgh.

the whole was complete.[35] Kilpatrick was probably a Station tho there are no vestiges of it to be seen.[36] For it is at or near the termination of the Wall and the Stone in Glasgow College No1 was found there [*RIB* I 2208; Keppie 1998: 87-89]. About a quarter of a mile to the east of Kilpatrick the first Vestige of the Causeway is to be seen and about a quarter of a mile farther east the first vestige of the Fossa or Ditch. At this place and near a mile eastward the Causeway is very distinct to Duntocher miln [The Beeches].[37] Here the vestiges of a fort are plainly seen. It is a square of more than eighty paces on the outside. The *Praetorium* and *porta* are visible. It seems to have had two Ditches and three Ramparts [Robertson 1957]. The Vallum passes thro it at one side. At this place was found the Stone which is the second in the Glasgow Collection [*RIB* I 2204; Keppie 1998: 85]) and a gold medal of the Emperour Hadrian with Fortuna Redux on the reverse.

From this fort the Wall is visible for a quarter of a mile farther east where the Ditch is in the second state measuring thirty-three feet in breadth and eight or ten in depth. Here the Causeway takes a considerable turn to the South, not following the Vallum and the straightest Line but the declivity of the Hill for the easier march I suppose of the Troops, a circumstance well worth consideration of such as make Roads in this Country at present.

Before it comes to the next Fort at Castle-Hill it passes a Brook called Peelglen. Here there seems to be the foundation of a Roman bridge consisting of large Square Stones regularly cut and Chequered. If this is so it is the only mark of a Stone Bridge to be seen in the whole tract.[38]

At Castle-Hill there is a most extensive view of the Country from a Castellum which is nearly of the same dimensions with that at Duntocher, but the Ramparts and Ditches are less distinct. Here was found the sculptured Stone which is the third in the Glasgow Collection [*RIB* I 2193; Keppie 1998: 77-78]. From Castle-Hill the Vallum goes to new Kilpatrick and in part of this way the Causeway is to be seen in the greatest Perfection measuring twenty feet in breadth [In Roman Park].

At new Kilpatrick [Bearsden] there are the vestiges of another Fort which in length is one hundred and thirty-five paces and in breadth between seventy and eighty. The Via Militaris passes through it and the Vallum makes one of its sides. Here was found the Stone which is the fourth in the Glasgow Collection [*RIB* I 2196; Keppie 1998: 74-75].

[35] Macdonald thought that the Distance Stones showed that work had begun at the east end and proceeded to a western terminal (1934). Keppie used the evidence from his own research on these and combined it with new evidence for the positions of temporary camps and changes in the dimensions of elements of the linear barrier to refine this scheme (1974). Hassall also looked at the work units for the different legions (1983). The rivers Kelvin, Bonny and Carron run along the northern front of the Wall and increase security in these areas. There is a case to suggest that different sections would have been prioritised. Similarly, Hadrian's Wall was built in segments. 250 years since Anderson wrote we are still refining our understanding.

[36] The Canal dug through the external bathhouse of Old Kilpatrick fort in 1790, after Anderson wrote his account. Even then the location of the fort was not fixed until 1913.

[37] It is curious that the road should survive where the Ditch did not and it is probable that here the causeway referred to was the Antonine Rampart.

[38] The stones are mentioned by Horsley. It is probable that the structure was a bathhouse for the fort at Castlehill which could not have been provided with sufficient water; it is thus similar to the situation at Duntocher where the bathhouse lay beside the stream some distance from the fort. Stones found close to where the Wall crosses the Rivers Avon and Kelvin were thought for some time to represent two more Roman bridges. However, those at the Avon can be associated with the mill at Jinkabouts, and those at the Kelvin with a medieval bridge.

From new Kilpatrick the Wall goes nearly east south east and crosses a small rivulet called Ferguson's burn where the Ditch is entirely lost tho the Military way may be in the third state! About a mile east from new Kilpatrick it changes its Course and runs nearly east north east, the Ditch and Military Way being very distinct but the Vallum defaced. In this place the Stone foundation of the Rampart was laid open and dug up for near a mile together by the late Mr Graham of Dougalston who used the Stones for building a Park Wall. The Stones were commonly square and dressed but they did not appear to have been cemented with lime [Keppie 2009: 50, based on the joint testimony of Horsley and Wodrow]. The Military way is lost in the soft ground opposite to Boglair. At Simerston [Summerston] there is some appearance of it again.

Simerston is supposed to have been a Roman Town known by the name of Simetria.[39] It is about a quarter of a mile from the fort of Bemulie [Balmuildy] which is on the south side of the River Kelvin and at the west end of the Village. Here the ruins of an antient Town are very remarkable, and if the country People are not mistaken there are many subterraneous Vaults and likewise Stone Conduits from the Kelvin.[40] Bemulie Fort has three ditches and four Ramparts. It is in length about 157 paces and in breadth about 130. It is not unlikely that this was the head Quarters of the Second Legion for here was found the sculptured Stone which is built in the Wall of Calder house with this Inscription *Legio Secunda Augusta Fecit* [*RIB* I 2209].

From Bemulie the Wall runs nearly east north east and the ditch being very wide and deep may be seen here in the fourth Degree with the Military way for a little space in the second degree and running parallel to it. When the Wall enters Calder Parks the Ditch continues in much the same state. A little to the east of Calder burn there is a mount in figure like the lower part of a Pyramid having a rectangular Parallelogram for its base.[41]

The distance of Calder Church from the neighbouring Forts would lead us to imagine that there has been a Castellum here, but there are no marks of this. On the contrary there is a fine tumulus of Stone and Earth which is flat on the top surrounded by a Ditch on the north side.[42]

The Fosse of the Wall is visible in the first degree on the high road between Calder and Kirkintilloch. At the west end of this village and on the top of a small Hill there is a Roman Fort called the Peel.[43]

John Hart's note 2:

In 1830 Mr Thomson of Bellfield near Kirkintilloch cut a road through his grounds a little to the west of the Peel, the cut laid open to view a Section of the Ditch. It seemed to be about 6 ft wide at the bottom, about 18ft at the top and about 14 deep from the present surface but what was remarkable,

[39] It was Stukeley who first conjectured this to have been the Roman city of Simetria, but for no apparent reason. His remains of a 'city' were probably those of nearby Balmuildy (Stuart 1852: 316).
[40] This information is derived from Gordon.
[41] This may be the motte at Cadder, but the tumulus referred to in the next paragraph suits that better. It is therefore possible that this could be the Roman fort of Cadder which used to have steep approaches on the north, west and south, but has since been quarried away. When Anderson was writing in 1771 construction had not begun on this section of the Forth and Clyde Canal. However, the most plausible explanation is that Anderson has misread Horsley's account of the motte which is similarly worded and mistaken it for two separate entities.
[42] Due to the local topography the ditch on the north side of the motte at Cadder was the most prominent.
[43] The Peel is now known to have been a medieval fortification that occupied the north-east corner of the Roman fort.

although the hill is a light sandy soil, that exposed sections of the ditch soon became covered with rushes sprouting out from every part of it while none grew on any of the rest of the bank, shewing that it had been filled with water and that the seeds may be buried for ages but yet retain the power of Germinating when exposed in a proper situation.[44]

Sect IV continued

It is a square of near 70 paces on the outside. No sculptured Stones have been found here excepting Altars without Inscriptions. This Fort is supposed to be on the north side of the Vallum. If so this singularity may be the Reason of the greater quantity of masonry that seems to be there than in the other Forts.[45] And to this uncommon situation the Romans were perhaps lead by the steepness of the ground to the north which secured them against any attack from that Quarter.

The Fort at Achendavy has had a triple Rampart and Ditch. It is in length above a hundred paces and in breadth near eighty. From it to Barhill is exactly two Miles in which space the Vallum is sometimes to be seen in the first State. Between Achendevy and Kirkintilloch in the year 1740 the sculptured Stone was found which is the twentieth in the Glasgow Collection [*RIB* I 2185; Keppie 1998: 74-75].

In this present year four Altars were found buried in one place without the Castellum [*RIB* I 2174-8; Keppie 1998: 102-05] were found to the south of Auchendavy fort during the construction of the Canal in 1771] and above thirty years ago the Stones in the Glasgow Collection N.....[46] were found here and a small Roman Milnstone with several Medals and an altar without any Inscription.

The next Station is upon Barhill. Its situation and Strength and the Ruins of buildings within it are very remarkable. The hill has two small summits opposite to each other. To build a fort upon either of these was neither convenient nor easily practicable, it is therefore placed about a Furlong from the summit of the Hill upon a declivity facing the South and under cover from the east and north east Winds. The prospect from this fort is so extensive that the beds of Clyde and Forth are distinctly seen and high lands at much greater distance. It is a square of 105 paces. It has three Ramparts and two Ditches. The Praetorium is visible and of a similar figure with the Fort itself. Three rows of ruins appear within the Praetorium.[47] There are springs of Water a little south from this Fort. At or near this place there was found an Altar with a Corona Triumphalis which is at Pennycuik [*RIB* I 2165, now in the National Museum in Edinburgh]. There was likewise found another altar with a Patera and Praeferriculum which is in the possession of Mr Glen of Linlithgow [*RIB* I 2166; Keppie 1998: 99-100].

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[44] Bellfield lies immediately to the south-west of Peel Park and the cut made by Thomson was for either Washington Street, or more likely Bellevue Road. Most of the west-east ridge upon which the Wall ran to the west of Peel Park has been removed since 1800 as the result of the extraction of sand. Other cuts were noted in 1909 and 1931 (Macdonald 1934: 90, 154). The dark fill of the Ditch readily contrasted with the pale coloured sand. The dimensions noted by Hart seem reasonable, though the Ditch was evidently not bottomed. It is not surprising that seeds grew better in the humic richer soil of the backfilled Ditch than in the pure sand to either side.

[45] 'Altars without inscriptions' are often stone hypocaust pillars, which would have been derived from the commanding officer's house. The rectangular earthworks of the medieval fortification are depicted on early OS maps as extending north beyond the line of the Roman frontier, thus blocking access along its route. Within these earthworks are the stone walls of the peel. The mottes at Watling Lodge and Seabegs were located wholly to the north.

[46] There is a blank space here in the original text.

[47] In the 18th century the headquarters building was called the *praetorium*. It was the discovery in 1903 of an inscription at Rough Castle that led to it being known today as the *principia* (*RIB* I 2145). At Bar Hill this building lay central to the fort and on the same alignment. The three rows of ruins may indicate the tripartite structure – courtyard, cross hall and offices.

Soon after the Vallum leaves Barhill the Military way comes near it and it enters on a ridge of Rocks near the bottom of which the Ditch is cut but not very deep and sometimes thro a part of the rocks themselves.[48] The northern face of the Rocks seem to have been smoothed by Art in order to render them more inaccessible. The Wall runs along the top of the precipice within a few yards of the brink and is very conspicuous at this place. About a quarter of a mile more to the east it passes a single house called Ashybench and another called Overcrouy.[49] Here the Military way is only in the first degree and is near the Ditch which is in the second. But about half a mile farther on the Ditch is very large and deep and in the highest degree. It next passes Croy hill where there are scarce any vestiges of a station at present. But in Gordon's time it seems to have been visible and some sculptured Stones were dug up there. Half a mile farther east the Wall comes to a Village called Dolater. It afterwards goes over a Hill where the Ditch and Military Way are both in great perfection. They proceed parallel to each other about a mile farther east to Wester Wood where there is another visible fort situated on Ground that is level and low there being only a small descent on the north side.

The Ditch here measures thirty seven, forty and forty three feet in breadth, and twenty, twenty three and twenty five in depth. About half a mile farther on, the military Way is so entire that it has the appearance of having been made but a few years.

Castle Cary is one of the largest and best preserved of all the Forts upon this Wall. It has been surrounded with a Wall of hewn free Stone, at least at the base of the Rampart, which the Country people are just now pulling down for building Walls and houses.[50]

From Castle Cary the Vallum runs eastwards to Nethertown at which place the Ditch measures forty feet in breadth. At Seabeg the Ditch is very large and full of Water. About a quarter of a mile from thence to a place called Dick's house there is a mount like that at Calder Church but more beautiful.[51] Formerly great quantities of Iron and Lead were found here from whence it is conjectured that it was a Roman Foundery.

At a quarter of a mile from Dick's house the Wall crosses a Brook called Bonny Miln Dam after which the Ditch appears very great: and the Vallum and military Way become visible. In no place of the whole tract can a Stranger acquire with so much ease a distinct Idea of this Wall as by riding along it eastward. In some places the Ditch measures sixty six feet in breadth and twenty five in depth. A little farther eastward there are two Mounts called Elf Hills[52] upon the south side of the Wall and on the north side a little more to the West there is another mount [Cowden Hill] where it is said that Grime the nephew of Eugenius King of the Scots with his Army broke down the Wall. Gildas and Bede confirm this common Tradition. They do not indeed say that this was the place, they only mention the time which was after the first Legation of the Provincial Britons.[53]

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[48] This is Castlehill, the site of an earlier hill fort. The Wall lies on its north side and the Military Way is now some distance to the south, the southern side of the rock having been quarried away.
[49] Over Croy lay just to the east of the B802 road to Kilsyth.
[50] Castlecary and Balmuildy both had stone perimeter walls. That at Castlecary was the most conspicuous because it was being used as a quarry. The process of the removal of these walls occurred over a long period and this is a useful additional mention of it.
[51] Seabegs Motte. Sam Smith conducted excavations here and had some of the iron analysed (1934).
[52] Elf Hill lies between the Wall and the artificial St Helen's Loch, but only a single hill is known. Horsley (1732: 171) mentions two hills and shows them on his map of the Wall.
[53] This contradicts Anderson's own account, for by that time the Wall being occupied was Hadrian's.

A little farther to the east there are the Vestiges of an Exploratory Tower of a square form and like those of Severus' Wall.[54] Here the Ditch is about fifty feet in breadth and about twenty three in depth. The South Rampart is about twenty four feet broad five in perpendicular height and distant twenty two from the Ditch.

About a Mile and a Quarter from Dick's house are the distinct Vestiges of a Fort called Rough Castle, which says Gordon, for entireness and magnificence exceeds any [of the Forts] that are to be seen on the whole Tract from sea to sea. It is indeed very large but it must have been more entire in his time than at present.

About four hundred and fifty paces farther eastward there is another Tumulus or Turret of a Square Form like that already mentioned.[55] Its base is a Square of only fifteen feet. About three hundred and twenty seven paces farther on there is a third [Tentfield East], the base of which is sixty five feet square.

The Ditch all along here is very distinct and large and one sees the great Military way which comes from England passing thro old Camelon[56] and running on towards Stirling.

A little farther on, the South Rampart becomes quite flat nor is it afterwards to be discerned very distinctly upon the whole Tract.[57] When the Vallum passes Stockbridge burn[58] the Ditch measures forty feet in breadth and fifteen in depth and continues so till it passes Bentasken. After which it is almost quite lost till it comes near the West Avenue of Callander house where it measures forty feet in breadth and thirteen in depth.

From Callendar it goes towards the village of Langton Lauristown[59] and from thence to Mumrills where from the Urns found and other appearances of Antiquity it is supposed there was a Fort tho there are no distinct marks of it at present.

John Hart's note 3:

Our Antiquaries seem to have lost the track of the wall at this point. It did not go down to Beancross although they may have had some outworks there. After passing the Mumrills Castellum, a watchtower was placed upon a hill to the southwest while the steep side of the hill itself answered as the Rampart. The remains of a tower was only taken down about 30 years since. The tower hill even still retains the

[54] This must be the expansion now referred to as Bonnyside West, which is the more prominent of two. It appeared as a square platform attached to the rear of the Rampart, much as the turrets on Hadrian's Wall did before excavation.
[55] Gilmour Seat or Tentfield West expansion. Horsley does not mention these, though Roy provides a depiction (1793: 163 & pl.xxxv).
[56] Old Camelon refers to the Roman fort. New Camelon village was established in the 1760s.
[57] This length of the Wall was quite densely populated from the medieval period onwards and resulted in the attrition of the monument.
[58] Stockbridge occurs as a place name in Falkirk (Reid 2009: 330), but here (and in Horsley) it refers to the stream displaced by the Forth and Clyde Canal between Tamfourhill and Bantaskine. It is odd that here, and elsewhere, Anderson fails to use the Canal as a reference point.
[59] The small hamlet of Langton lay to the south-east of Laurieston which was only established in 1740s with the name New Merchiston. The name was changed to Lawrence's Town or Laurieston around 1764. Horsley uses the name Langton.

name of Castletourie.[60] It then took a South East direction to the village of Redding and enters the Lands of Meadowbank. Here the Rampart is perhaps as entire as in any part of the whole line.[61]

This part of the wall goes by the name of the Claddings,[62] it is at least 30ft in height and about 20ft broad on the summit. On each side there is a terrace about 6ft broad, the following sketch [not included here] is a section of it as it is at present.

Meadowbank house is built upon the side of it. On the lawn in front of the house stood one of the circular mounds, it was about 20ft higher than the top of the wall. This mound was removed in 1795, 2 or 3 stone coffins were found and part of a Skull with a few teeth and some other fragments of bones were found in them.[63] The Rampart is now covered with planting but is distinctly seen from the Union Canal as it continues nearly parallel to it from the Redding and through the whole land of Meadowbank there being only the breadth of a park which separates them, the canal being the south and the Claddings or mound the North Boundary of the parks.

It now takes a North East course till it crosses the Avon water at Inneravon – here the remains of one of the flanking towers of a castellum still exists [Figure 26.3].[64] Some country people attempted to take it down about 40 years since, but the strength of the Mortar and the persuasion of a neighbouring proprietor preserved it to this day. This Gentleman caused the farmer dig round the found by which they discovered that the Building had been an oblong square with a tower at each corner.[65] As he was not the proprietor he could not do more to preserve it but from the measurements obtained he built a similar Castellum on the opposite side on his own property [Figure 26.1]).[66] A lintle found in the ruins – of which the following is a sketch [Figure 26.2] – is now built into the old farmhouse as a lintle to a window.

Beneath is from a sketch of the tower which I took in 1810 [Figure 26.3] – it is now grown round with trees. As the Romans were said to have built in regular courses this is not done so but the stones were all properly jointed altho sometimes a thin course is introduced as shewn in the sketch. Both outside and in were built of Ashlar, between the two walls small boulder stones were filled in and the whole grouted together with mortar. About halfway up the inside wall there is a break of about 4 inches. On this planks might have rested as a kind of floor. The hollow seems to have been a narrow Staircase leading to the top of the tower. The mortar is so good that not the least dropping or signs of dampness is ever perceived in the inside of the arch.

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[60] In fact the Wall did go down to Beancross, though this meant taking it across a low-lying area on the edge of the carse which was prone to flooding. Castle Towrie was the name of the field to the west of Mumrills fort in which the main annexe stood. It housed large areas of boulder foundations, which probably gave rise to the name – 'torr' being a heap of ruins (Reid 2009: 302). There is no other mention of a tower here. The reference to the removal of the remains in *c.* 1800 is of particular interest, as it is not noted elsewhere.

[61] This line is entirely spurious and the features referred to are geological.

[62] Claddens or Claddings derives from 'cladh' which is Scottish Gaelic for bank. It is found at the north-east corner of Callendar Park on the Antonine Wall, and east of Duntocher also on the Wall and is sometimes thought to be specifically associated with the Wall. However, it occurs here at Redding, a little further east at Whiteside and at Denny (Reid 2009: 68).

[63] Meadowbank House, near Polmont Station. There is no other record of this tumulus or the discovery of cists.

[64] This was the south-west corner tower of the outer defences of Inveravon Castle. The tower still remains. The walls are thick and the ground floor vaulted – held together by a strong white mortar.

[65] An exercise repeated by E.J. Price in the 1970s (unpublished), with the same results.

[66] This must be the folly on the lands of Avondale (formerly Clerkston) which also has corner towers – in miniature. It stands on a hill to the south of Inveravon.

Figure 26.1. Avondale Folly looking north-east.

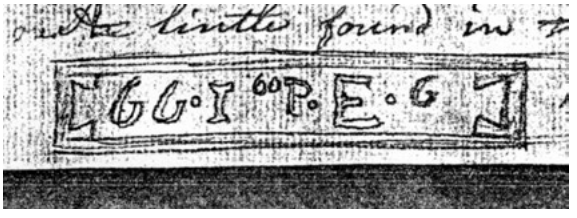

Figure 26.2. Hart's drawing of the lintel at Inveravon Tower. The whereabouts of this stone is unknown.

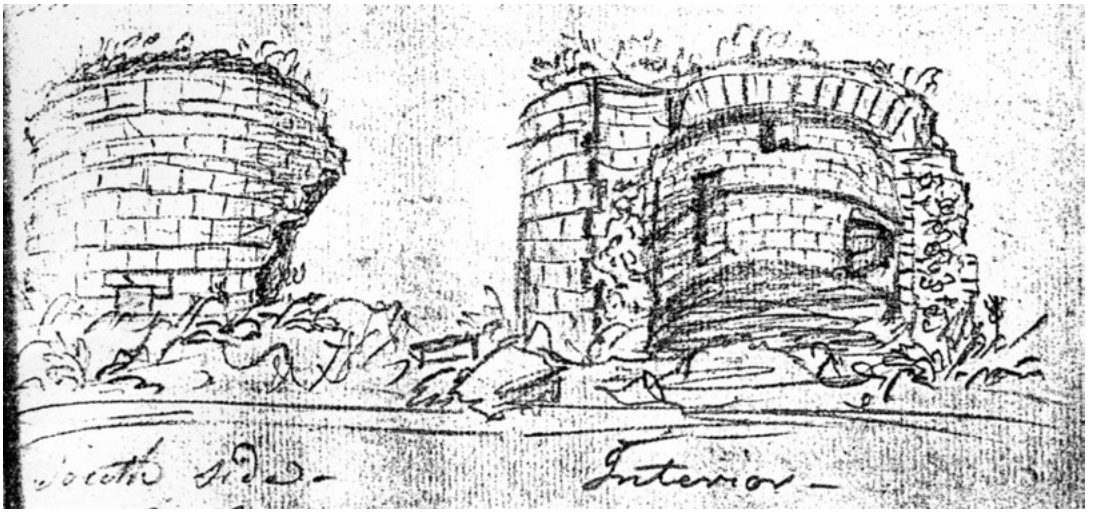

Figure 26.3. Hart's drawing of Inveravon Tower.

It is perhaps not proper to take the liberty of writing any remarks on the blank leaves of one of our venerable Founder's own essays, but as I am a native of that particular part of the country when he seems to have been a little acquainted and when he has had erroneous information respecting this part of the Wall, I thought I could not do better than insert my own observations here to put the reader to right on this subject. But lest it should be wrong I have wrote it in pencil so that it can be rubbed out.

Sect IV continued

From the Mumrills it passes Bencross, Wedding's Burn and the house of Mill-Hall but it is very indistinct till it goes over the rising ground where the Ditch measures forty feet in breadth and fifteen in depth. From thence it crosses the water of Evon, passes thro the village of Inner Evon and goes two miles farther to Kinneel Wood where its tract is hardly to be seen. For a mile beyond Kinneel the rampart may be faintly traced to the house of Grange above Borrowstonness which is but half a mile from Carrin, its supposed extremity to the east.

Because the distance between a few of the Forts is two Miles some would suppose that all of them have been at the same distance from each other upon the whole Tract. It is not just however to suppose that an able Engineer would place them without regard to the ground at equal distances. This is certain that if the length of the Wall was forty Roman Miles and if two miles was the mean distance between the Forts we must suppose that there were twenty one in all in order to have such intervals. Of that number thirteen are certain, old Kilpatrick, Duntochar, Castle Hill, new Kilpatrick, Bemulie, Kirkintilloch, Achendevy, Barhill, Wester Wood, Castle Cary, Rough Castle, Kinneil and Carrin. Faint Vestiges and the situation of the ground make it probable that there were seven more at the following places; Calder, Crouy Hill, Dick's House, Sea beg, Falkirk, Mumrills, and the Banks of the Evan. So that if we suppose one to have been at Dumglass the number will be complete but the intervals will not be equal.

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27. Reconstructing Roman lives

Jim Devine

I first encountered Professor Lawrence Keppie in 1986 when, as a first year archaeology undergraduate at the University of Glasgow, I responded to a call on the noticeboard of the archaeology department. This missive was an invitation to apply for an Easter break opportunity to participate in an excavation being run by Lawrence on the Antonine Wall. Little did I know then that this first encounter, both with Lawrence and with Scotland's Roman past, would lead to a long career at the Hunterian Museum. I worked with Lawrence on a range of pioneering projects incorporating the Roman collection of the Hunterian Museum, and developed what were then ground-breaking techniques for the presentation of museum collections of artefacts and archives of Roman resources, placing them in their archaeological and historical contexts.

I was privileged to collaborate with Lawrence from the early 1990s into the twenty-first century at the Hunterian. This was an era when the Internet was still in its infancy, particularly in terms of its uptake by museums and heritage organisations. So it was with some pride that in 1995 the Hunterian Museum was able to boast the launch of the first web site of any museum in Scotland, and only the second in the United Kingdom - the Natural History Museum in London beating us to launch date by only two weeks. The first full-featured section of the web site was of course dedicated to the Roman collection.

We were able to achieve these major advances in new technology at the Hunterian, at a time when very few museums had been able to embrace computer technology, thanks in no small part to a collaboration that I had established with University of Glasgow colleagues in the Department of Computing Science. Many student projects over the years were based around the Roman collection of the Hunterian and the Antonine Wall.

One project in particular seemed to demonstrate well the results that could be achieved by bringing together expertise from archaeologists, multimedia technologists and educators. This was the Verecunda Project, which was conceived and developed by the author, involving close collaboration with Lawrence Keppie and David Breeze on the archaeological side and with pedagogical input from the late Margaret Robb, Primary school teacher and partner of Lawrence.

One of the most enigmatic artefacts in the Hunterian Museum's Roman collection is a gravestone (*RIB* I 2183), recovered from Shirva on the line of the Antonine Wall approximately midway between the forts at Auchendavy and Bar Hill. Unlike most Roman gravestones, which typically display the full titles and family names of the deceased, this gravestone bears the simple inscription: DM (*Dis Manibus*) VERECUNDAE (to the spirits of the departed (and) of Verecunda)(Figure 27.1).

Nothing is known of this person beyond the inscription on the gravestone (see the brief discussion in Allason-Jones *et al.*, this volume). The *praenomen* Verecunda is a female name. It has been suggested by Lawrence and others that, due to the absence of a *nomen* or family name on the gravestone, this person was most likely a slave. This then begs the question, why would anyone go to the expense of erecting

what is a fairly grand gravestone for a mere slave? Was this person more than just a slave? Maybe she was a good companion? Maybe she was a favoured concubine? Maybe she was a trusted guardian of her owners most prized possessions? We can never know the real answer, but one thing is certain, someone felt sufficient loss at her passing to take the trouble and expense to erect a fine gravestone for her.

Figure 27.1. Gravestone of Verecunda (© Jim Devine)

So it was with this comparatively blank canvas that we set about reconstructing the life of Verecunda as she might have lived it at Bar Hill fort on the Antonine Wall in the second century AD. The next stage was to bring our target audience together to assist in the development process. The author runs a Junior Archaeologists' Club for children, and had been working with local primary and secondary schools to generate interest in the Antonine Wall World Heritage Site. These groups were recruited to come to the Museum and discuss what life might have been like for this person living on the Antonine Wall in the second century AD. This proved to be a very popular way of getting young people actively engaged with an artefact and its provenance that they might otherwise have regarded as being uninteresting and difficult to understand.

The discussions held around the gravestone brought up many interesting scenarios, but we finally settled on a storyline that envisioned Verecunda as a young girl of perhaps about 12 or 13 years old (we have no actual knowledge of her age at death), who was the slave of the Roman commandant of the fort at Bar Hill. Bar Hill was occupied by auxiliary troops, foreigners recruited into the Roman army from around the Empire who would not have been married, at least not officially anyway. The auxiliary units known from surviving inscriptions to have occupied the fort at Bar Hill were the *cohors I Hamiorum*, a unit of archers from Syria, and the *cohors I Baetasiorum*, from the Netherlands/Belgium area (*RIB* I 2167; 2169; 2170; 2172). Both of these auxiliary units were *cohortes quingenariae peditatae*, infantry units of around 480 men. The Commandant of the fort would most likely have been a *Praefectus Cohortis*, a young officer, a Roman citizen, and probably one of the few people in the fort who could afford to own a slave, and who might be accompanied by a wife and family (see Allason-Jones *et al.*, this volume, for a discussion of the presence of women inside forts). We envisaged that Verecunda might have had general household duties that included child minding for the young children of the commandant. This provided a number of opportunities for storylines to explore, including the reason why there were a number of children's shoes excavated from refuse pits and the ditches of a fort that might ordinarily be thought to house only male adult soldiers. We thus re-created a life for Verecunda, and used her as an ancient guide to the Roman fort for present-day visitors.

In developing the project we made every effort to retain historical accuracy, whilst allowing a degree of creative licence in the development of the character of Verecunda in order to enhance audience engagement, both in the children's re-creation of the character and in allowing the character of Verecunda to engage 'virtually' with visitors. Having worked together with the young people to build a story around the life of Verecunda, we then needed to find someone to play out the role for us in front of the camera. One of the Junior Archaeologists volunteered for the part, and we got the camera rolling with her acting out some simple directions in front of a green screen set up to provide a live action guide within the computer-generated imagery (CGI). This Live Action-CGI technique had been used extensively in the film industry for several years previously, but I believe that this was the first time that it had been employed in the cultural heritage industry, and it certainly proved to be a popular and innovative approach for the presentation of the Antonine Wall.

The live action sequences were subsequently composited with a CGI model of the Roman fort at Bar Hill, that we had previously developed, to produce a series of short introductions to various parts of the fort and brief explanations of what each building within the fort was used for (Figure 27.2). The completed movie clips were intended to be a free resource that could be downloaded to mobile phones and tablets, and used to enhance the visitor experience of on-site visits to the Antonine Wall, and encourage further investigation of associated Roman collections in nearby museums (Devine 2015).

The final scene had Verecunda in the courtyard of Bar Hill fort looking down the well and informing us that, when the Romans had left the fort, they had thrown a lot of things down the well that they could not take with them, and that these items could now be seen in the Hunterian Museum. This was an intentional hook to encourage the visitors subsequently to explore the museum displays (both at the Hunterian and at the Auld Kirk Museum in Kirkintilloch) that show the excavated material from the well at Bar Hill (Figure 27.3).

Figure 27.2. Filming Verecunda against a green screen backdrop (© Jim Devine)

Figure 27.3. Verecunda at the well in Bar Hill fort (© Jim Devine)

The Verecunda project was a resounding success. The storyline approach to interpretation of the Antonine Wall and its associated museum collections for younger visitors has proven to be very popular with children and adults alike. The engagement with the gravestone as a silent museum artefact that might generate discussion on the possibilities of lives lived long ago is a poignant example of the readiness of the young visitor to have their imagination stimulated and channeled, to obtain a greater understanding and a deeper appreciation of the past around them.

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28. The power of vivid images in Antonine Wall reconstructions: re-examining the archaeological evidence

Christof Flügel and Jürgen Obmann

Paul Zanker's book *Augustus and the power of images* (first published in German) can be considered as one of the most influential books in modern archaeology, as it revealed how carefully selected images and symbols influenced public opinion (Zanker 1987). In a certain way this is true especially for reconstructions of Roman military architecture, shaping the collective memory of whole generations of archaeologists and non-archaeologists. Clearly, every reconstruction must be seen in the context of the author's individual background as well as the influence of 'Zeitgeist' (Breeze 2018). Turning to the Antonine Wall, in the 2001 edition of the Antonine Wall Handbook the appearance of gates was described as follows: 'The fort gates were usually flanked by gate-towers, containing guard-chambers on the ground level and upper storeys from which it was possible to gain access to the rampart walk on top of the fort walls' (Robertson 2001: 24-25). In the 2015 edition, this phrase was omitted, probably because the editor had become aware of challenges to the veracity of these statements. We would like to explore this issue further, examining the archaeological evidence and setting the existing reconstructions of the Antonine Wall into a European context. In this paper we will focus on selected issues of reconstructions, namely towers and merlons.

Reconstructing timber-and-turf/earth architecture by means of experimental archaeology has been a topic of research since around 1900. After a short interim heyday with the reconstruction of the turf wall at The Lunt, Baginton, in 1966 (Hobley 1971), this topic has become a focal point of academic research again only since 2010 (Chorus 2018; Peterse 2010; Aßkamp and Brentführer 2012; Tremmel 2018). In 1901 the first archaeological reconstruction had been set up at the Augustan fort of Haltern in Germany, but was replaced after a short time in 1905 because of a new interpretation of the archaeological evidence. This new reconstruction became so popular that it appeared in 1921 on emergency paper money issued by the city of Haltern during the monetary inflation in Germany after World War I (Aßkamp and Brentführer 2012: 281 fig. 3).

In spring 1913, more precisely between April 14th and 18th, two earthen temporary camps (Erdschanzen A and B) were erected east of the Saalburg (Krebs 1914; Schönemann 1913; Hummel 1984; Peuser 2001) by order of his majesty Kaiser Wilhelm (cf. Figures 28.3 and 28.5), who had a vivid interest in archaeology for political reasons (Beigel and Mangold-Will 2017). The traces of this archaeological experiment (Figure 28.1) are still clearly visible in LiDAR scans. We possess a detailed, hitherto unpublished, account as well as a series of photographs (Figures 28.2-28.7) of this large-scale experimental archaeology project (Obmann, in preparation), written by a Prussian army major general and inspector of the engineering corps, Hildemann, which was kept in the archives of the Saalburg museum (1913). The 120 soldiers participating in this project, simulating the tactical unit of a legionary *manipulum* consisting of two *centuriae,* were equipped with replica tools like *dolabrae* and saws. The reason for choosing the *manipulum* strength instead of a cohort was because the Erdschanzen were interpreted as the first traces of Roman military presence on the Saalburg pass and therefore

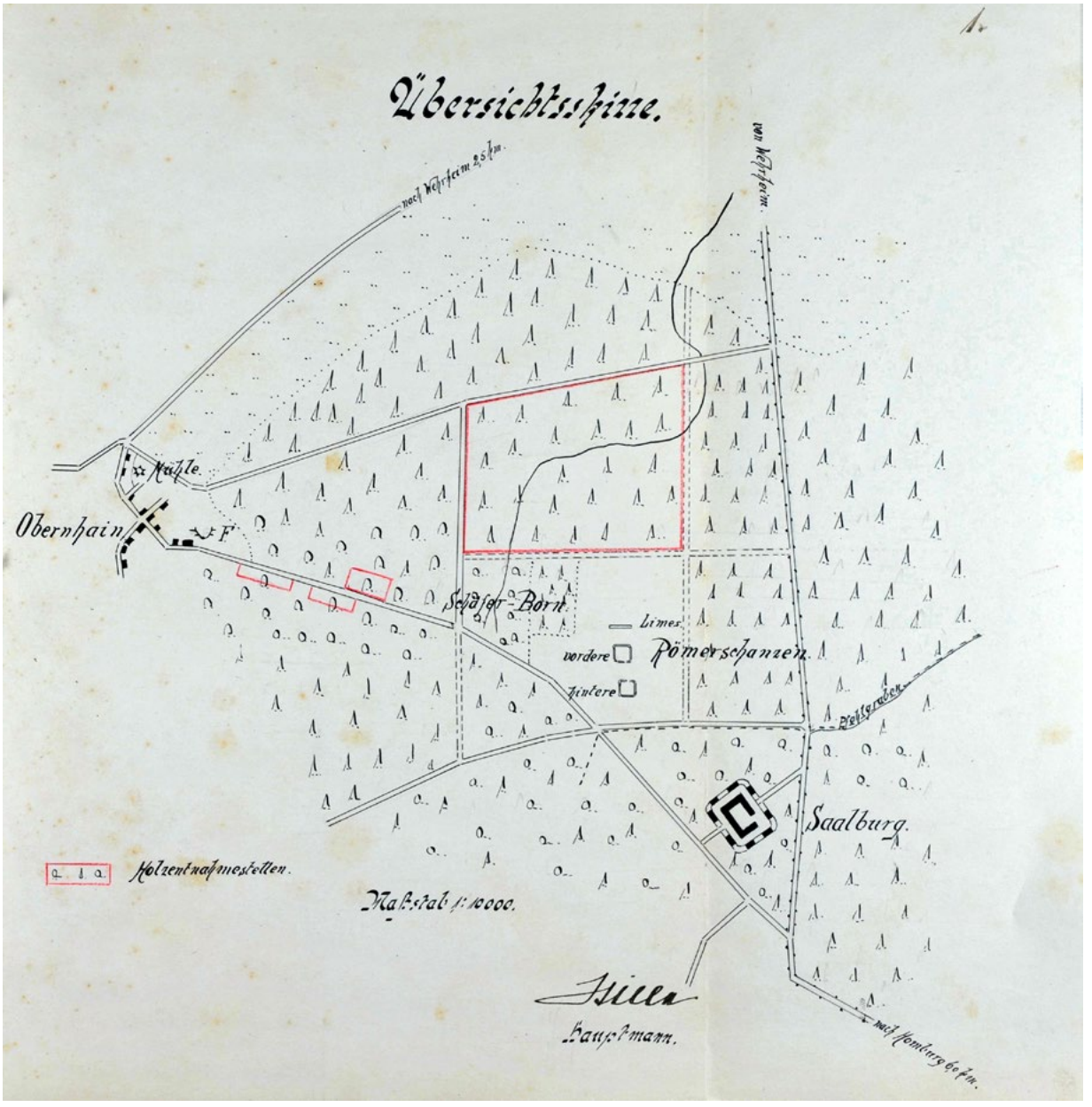

Figure 28.1. Saalburg 1913. Position of reconstructed earthworks A (vordere Römerschanze) and B (hintere Römerschanze) north of the Saalburg stone fort and the line of the Upper German Limes (Pfahlgraben), with indication of zones for harvesting wood (Holzentnahmestellen) used in the 1913 replicas. Saalburg Archives Neg. No. SbA_SR01.019-2.

attributed to Domitian's advancing Roman legions in his war against the Chatti in Hesse. Hildemann calculated in detail the necessary space for tents and streets inside camp A and came to the conclusion that it may well have been suited for a *manipulum*.

Hildemann's account is a surprisingly precise report on the 'Waldübung Saalburg' (Saalburg forest manoeuvre): Figure 28.1 shows the archaeological features of the two Römerschanzen A and B north

Figure 28.2. Saalburg 1913. Total view of the reconstructed earth works B (foreground) and A. Saalburg Archives Neg. No. FA_050.050.014.

Figure 28.3. Saalburg 1913. Kaiser Wilhelm and dignitaries inside earthwork A. Note the supporting posts in the middle of each merlon, supported by a horizontal beam. Saalburg Archives Neg. No. FA_050.050.010.

Figure 28.4. Saalburg 1913. Earthwork A. Preparing the posts and cleaning the building plot of bushes. Saalburg Archives Neg. No. SbA_SR02.002.

Figure 28.5. Saalburg 1913. Kaiser Wilhelm inspecting work in progress on the wattle-and-daub-construction. Saalburg Archives Neg. No. FA_050.050.009.

Figure 28.6. Saalburg 1913. Hammering down the posts for merlons. Saalburg archives Neg. No. FG_050.050.014.

Figure 28.7. Saalburg 1913. Earthwork A with merlons in wattle and daub. Note the rear posts in the middle of each merlon. Saalburg archives Neg. No. FA_050.050.021.

of the Saalburg stone fort and of the Upper German Limes, as well as, outlined in red, the zones, from which the wood for the Wilhelminian replicas, erected east of the stone fort, was taken.

Hildemann was especially interested in how the parapet may have been constructed and recorded the amount of time used at various stages of the reconstruction process in a very detailed manner. His account, combined with observations made during the modern reconstructions of the timber-and-earth fortification walls at the Augustan forts of Oberaden and Haltern, and the relevant archaeological evidence, all exhaustively presented by Peterse in one of the most detailed papers on wooden military architecture (2010), allow us to re-examine various proposals for reconstructing military architecture also on the Antonine Wall, which often appear in popular guidebooks and illustration panels.

Contrary to international charters (e.g. ICOMOS 2008), the scientific evidence for these illustrations is never set out in full. We should, therefore, come back to Roman sources first, especially Trajan's Column, where we find some illustrations of wooden forts. The form of the wooden towers has mostly been taken for granted in reconstruction projects, but has never been questioned in detail. In our opinion architecture on Trajan's Column, however, has not been considered to be a true-to-reality illustration in most cases. Depictions of architecture serve to define the individual setting of the relevant scene and have always to be interpreted in its narrative context (Schiwall 2013: 141-42), rather implying a propaganda aspect, as can for example be seen in representations of palisade constructions on the Columns of Trajan and Marcus (Flügel forthcoming) or on depictions of foreign architecture in monumental reliefs (Thill 2018: 270 and fig. 8).

In his discussion of the archaeological evidence for reconstructing wooden military architecture, Peterse focused on the interval towers which can be seen on Trajan's Column (e.g. Cichorius 1900: Scene LI; cf. Peterse 2010: 167 and fig. 17), set with four posts into the double timber-and-earth wall. The wall itself reached a height of between 2.5 m and 2.8 m until the wooden parapet walk, which would add another 0.4 m for the planks (Peterse 2010: tab. 2). For turf constructions like the Antonine Wall, it can be assumed that the top of the turf bank coincides with the parapet walk, assuming there is one, which not all commentators accept (e.g. Hanson and Maxwell 1986: 83, 162-63 and fig. 5.1; Breeze 2006: 144-45). A height of about ten Roman feet for timber-and-earth-constructions is therefore very likely (cf. Peterse 2010: 150-55 and tab. 3), as found at Haltern, Oberaden and Waldgirmes, or on the Antonine Wall at Bonnyside East where some 20 closely-spaced laminations were recorded (Steer 1957: 164; Hanson and Maxwell 1986: 82). This also seems to be a 'standard height' for enclosure walls in sacred and profane civil stone architecture (cf. Meyr and Flügel 2016: 166-67).

On Trajan's Column (e.g. Cichorius 1900: Scenes L-LI; cf. Coarelli 2000: 96-97 pl. 52-53) the wooden towers project above the parapet walk and show an open parapet cross-braced in the form of St Andrew's crosses. According to Antonescu only ten out of a total of 57 fort depictions on Trajan's Column are permanent military installations (2009: 62; cf. Schiwall 2013: 141), the rest being interpreted as 'Marschlager' (temporary camps), indicated in most cases by tents inside an enclosure without towers (e.g. Cichorius 1900: Scenes LXI-LXII; cf. Coarelli 2000: 106 and pl. 62). Taking into account the irregular and unrealistic ground plans of the forts on Trajan's Column (e.g. Antonescu 2009: 134 and fig. 18), it is not clear if the form of the towers in the permanent forts on the Column can be used as a reliable source for reconstructing the towers of forts and fortlets on the Antonine Wall. Hölscher developed the idea of the 'Bildformel' (metaphorical element) for the Columns of both Trajan and Marcus (1991;

2000) and it may well be, therefore, that the motif of a wooden tower served only as a visual key ('Schlüssselmotiv') for transmitting the message that the scene in the foreground was located in a timber fort, and that it was not intended to be a true-to-reality depiction of wooden architecture, which most of the spectators in the capital would never have seen in reality. Moreover, the structures were barely visible in detail due to the height of the Column, even if we consider the possibility that the upper parts probably could have been viewed from the galleries over the *bibliothecae* and from the *basilica* on the *Forum Traiani*, which would have facilitated viewing details at heights of 9.5 m and 14.9 m respectively (Stefan 2015: 113). Frontier architecture on Trajan's Column according to Thill '.. is more connected to ideology than architectural accuracy (2018: 268). However, selected wooden structures, like the Dobreta Bridge (Cichorius 1900: Scenes XCIX; cf. Coarelli 2000: 162 and pl. 118), shown to stress their value for propaganda purposes, can be related to existing wooden building techniques, as shown by Huther (2014). Paul Zanker summarized the problems of interpreting the frieze on Trajan's Column as follows: 'The direct relationship with the reliefs, their accessibility as images, was certainly not foreseen in the original conception. Neither the Roman senate, ... nor the architect, who had the original idea of 'wrapping' the column shaft with the unique figurative frieze, and certainly not the many carvers who produced the reliefs at those dizzy heights could have imagined that others would later focus so carefully on their work. Indeed, the column was situated in a relatively narrow 'courtyard' between the two libraries, so that the ancient observer could only clearly read the lower spirals of the frieze. Despite this fact, the quality of the relief remains constant in the upper part of the column. Like the sculpture of Gothic cathedrals, the images chiseled with such care were done not so much for the potential observer as for duration in eternity. They were intended to witness to the fame of the exploits of the Emperor and his troops in an enduring monument. The concrete reading of the images had no role in the planning.' (in Coarelli 2000: preface).

If we examine early reconstruction illustrations of fortlets on the Antonine Wall, the gap between the presumed parapet walk and the adjacent fortlet is closed by a gateway with two posts (Breeze 2006: fig. 5.17) (Figure 28.8). This seems to be directly influenced by illustrations of stone milecastles on Hadrian's Wall (Figure 28.9). Taking the example in Figure 28.8, the illustrator, Michael J. Moore, argued in 1982 that, if the fortlet was to act as a self-contained defensive unit, such gates would be required (David Breeze, pers. comm.). Some recent reconstructions, like that of the fortlet at Watling Lodge (https://vimeo.com/232311653), propose that the lateral walls of the fortlet were directly attached to the rear of Antonine Wall (Figure 28.10) and that the fortlet interrupted the continuous line of the presumed Wall-walk.

Observations in the legionary fortress of Regensburg (Aumüller 2013), as well as in auxiliary forts like Gheriat-el-Garbeia in Libya (Mackensen 2013), underline the fact that, at least in middle Imperial stone forts, there seems to have been no direct access from inside the gate towers onto the parapet walk. However, such access is often assumed in illustrations of fortlets or true-to-scale-reconstructions of forts, such as in Weißenburg and Pfünz in the province of Raetia (cf. Figure 28.9), both dating from the 1980s. At both sites the height of the towers can be considered as too low on the basis of current research and understanding (Flügel and Obmann 2013b; 2013c). This reconstruction proposal seems to be influenced by medieval fortification architecture and therefore does not correspond to Roman reality, as the gate towers and the adjacent wall at Regensburg and Gheriat-el-Garbeia were two separate architectural units. The standard wording in Roman building inscriptions '*portae cum turribus*' refers only to the two elements of the gate structures. If the observation that there was no direct access from towers onto the wall for stone forts is also true for wooden fortlets on the Antonine Wall,

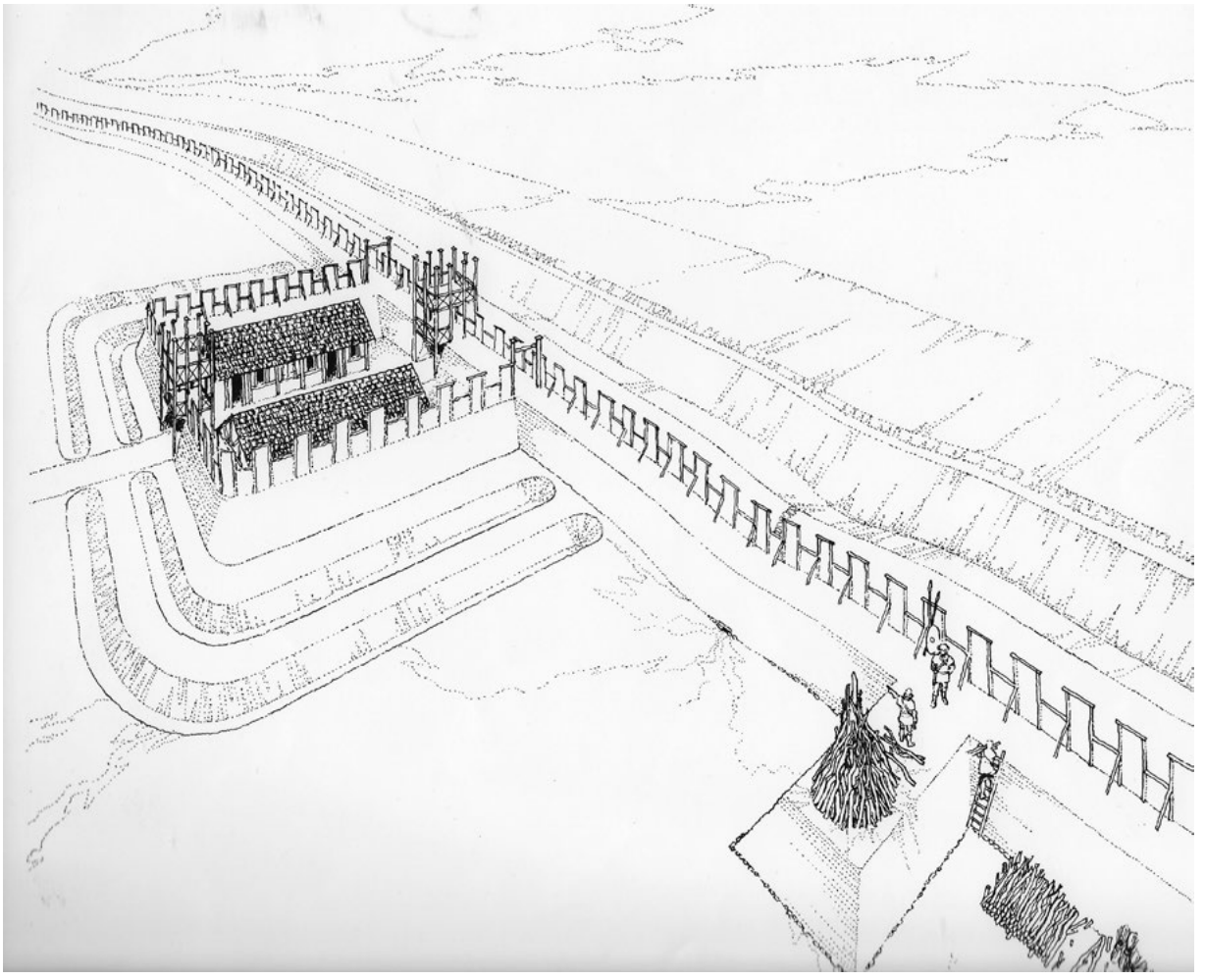

Figure 28.8. Antonine Wall, reconstructed milefortlet (drawn by Michael J. Moore).

the stretches of wall between the gate towers must have been accessible individually by wooden or earthen steps set into the rear side of the *vallum*. Pseudo-Hyginus (*de mun. castr.* 58) speaks of *ascensus* in marching camps and earthen *ascensus* have been found in the Antonine forts at Strageath and Lyne (Frere and Wilkes 1989: 21; Steer and Feachem 1962: 212), as well as in Flavian contexts at Strageath and Elginhaugh (Frere and Wilkes 1989: 17; 27; 29 and 87; Hanson 2007: 124 and fig. 12.3).

Merlons in wooden architecture on Trajan's column are often T-shaped, which is a standard form for merlons in depictions of fortifications from the Late Republic until Late Antiquity (Flügel *et al.* 2017: 212). The form of the merlons in wooden architecture has been a matter of extensive debate (Peterse 2010: 159-66) focusing on the basic question whether these were made of planks (which would require an oblique post at the back of each individual merlon), or whether they were of wattle and daub construction, which is the most likely form for double timber-and-earth walls. During the building of the 'Erdschanze A', Major General Hildemann paid special attention to the question of merlons (Figures 28.3 and 28.7) and based his proposal on the archaeological evidence: 'It is unlikely that the Romans did

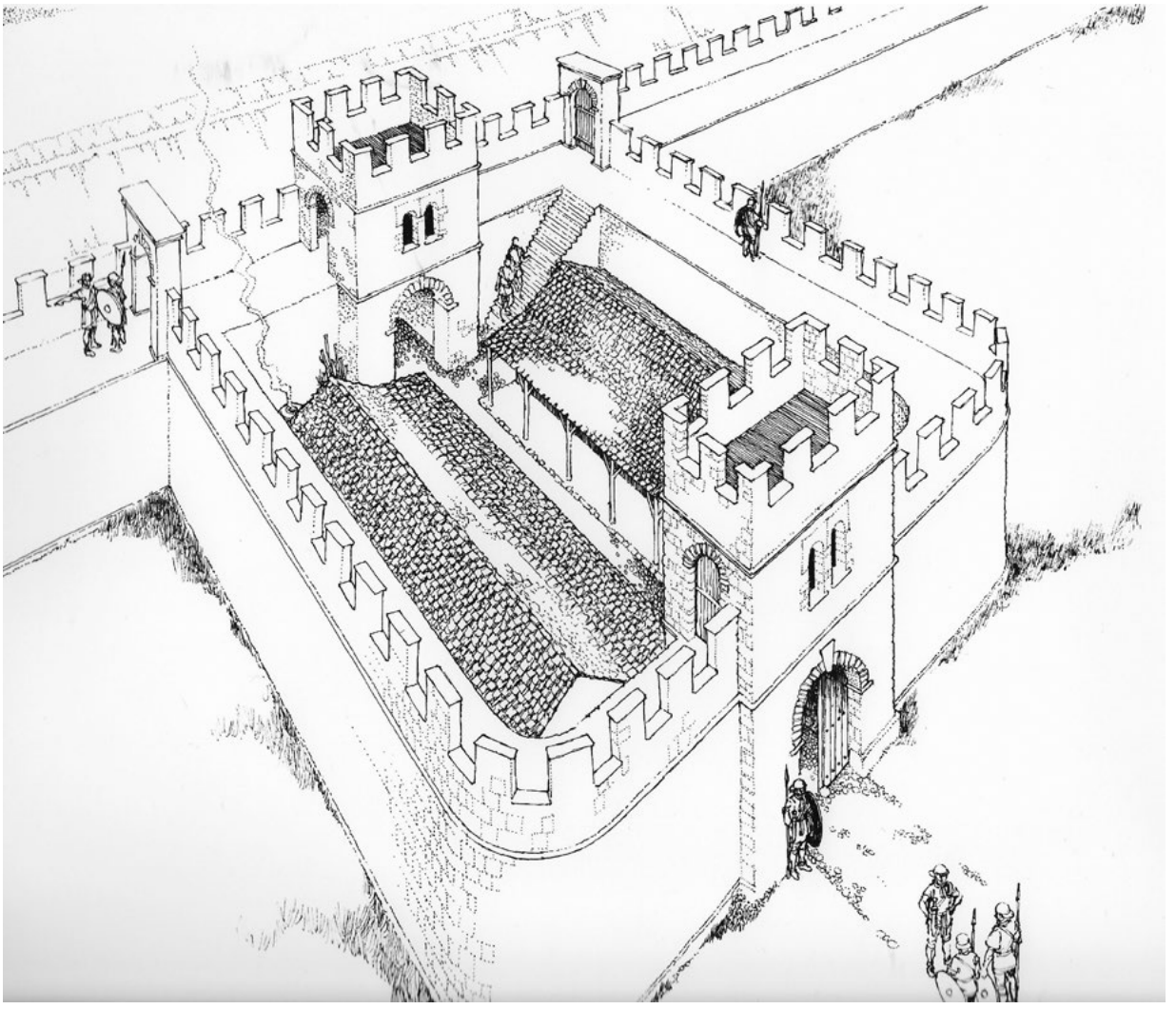

Figure 28.9. Hadrian's Wall, reconstructed milecastle (drawn by Michael J. Moore).

not consider continuing the wattle-and-daub-bracing of the front also for the merlons. This is proved by postholes at regular intervals of about 1.8 to 2 m behind the front wall, where stronger posts would have stood strengthening the middle of each merlon.' (Hildemann 2013; translation by Christof Flügel; cf. Figures 28.3, 28.4, 28.6 and 28.7).

However, it is not even confirmed that the Antonine Wall had merlons and a parapet walk at all: 'Exactly how the rampart was 'finished off' on top is not known. There may simply have been a line of vertical stakes set into the top of the turf stack. Alternatively the flat top could have been covered by duckboards fronted by a wooden breastwork' (Robertson 2015: 18). This crenellated parapet walk, which is only a hypothetical reconstruction possibility, appears in most illustrations of the Antonine Wall as a secured fact and these pictures remain in the public memory – a classical example of circular reasoning and 'self-fulfilling prophecy' (Breeze 1994; Flügel 2016). Comparing images of Antonine Wall

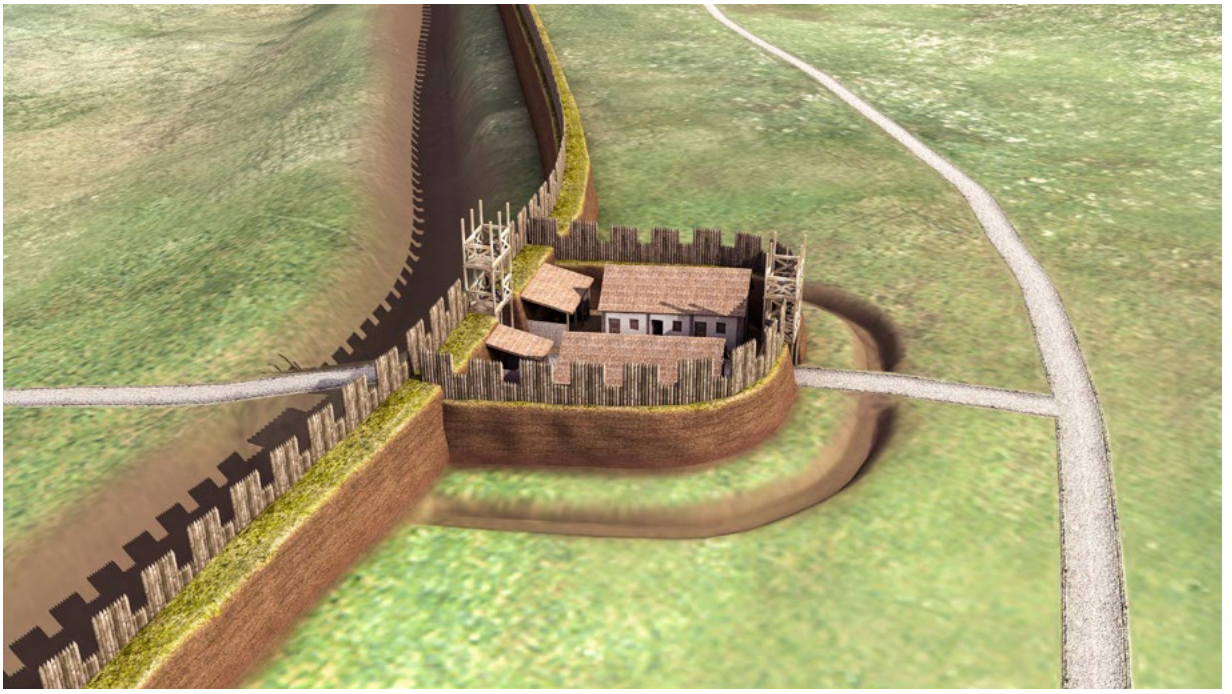

Figure 28.10. Antonine Wall, Watling Lodge fortlet, virtual reconstruction (https://vimeo.com/232311653). The vertical stakes set into the top of the turf stack make this reconstruction resemble more a fort in the American West. Courtesy of Historic Environment Scotland and Centre for Digital Documentation and Visualisation, Stirling.

fortlets with reconstructions of milecastles on Hadrian's Wall, it seems that Hadrian's Wall often serves as an artistic model for reconstructions, including questionable fortification details, like merlons on the lateral sides and the rear of the surrounding ramparts of the fortlets, which would have been unnecessary as they could not be attacked by a potential enemy as they lay behind the line of the Wall.

Concerning the amount of time necessary for constructing the Saalburg camps in 1913, these experiments led to surprising results: 120 soldiers managed to build the 1.3 m high turf wall with front and rear wattle-and daub construction of Schanze A (measuring 32 m by 36 m) in only 20 hours. Clearing the building site of vegetation, as well as digging the *fossa* and completing the wattle-and-daub-construction required 80 soldiers, whereas cutting the trees and bushes as well as preparing the posts for construction was the responsibility of 40 members of the Prussian engineering corps. The larger Schanze B, with a double *fossa*, was finished in 40 hours, maintaining the same work plan of the participating soldiers of the engineering corps (Hildemann 1913).

Even if we have to consider the more complex architecture of permanent forts on the Antonine Wall with towers and barracks as well as the (at least) double height of the turf walls in relation to the marching camp replicas of the Saalburg experiment, it was proved that wooden military architecture could be realized in a quite short period of time (cf. Hanson and Maxwell 1986: 132-134). This conclusion supports the results from the construction of the turf wall replica at The Lunt, where it was calculated that building the fortification rampart and ditch under good weather conditions would have required a total of 210 to 300 men working for nine to 12 days for (Hobley 1971).

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29. The Antonine Wall: some challenges of mapping a complex linear monument

Peter McKeague

Introduction

The transition from antiquarian interest in the Antonine Wall, admirably researched and presented by Keppie in his volume *The Antiquarian Rediscovery of the Antonine Wall* (2012), to a systematic consideration of the frontier is represented by Macdonald's *The Roman Wall in Scotland* (1934). These publications draw on unique observations and data from excavation, survey, documentary and cartographic sources, to inform our documentation and interpretation of the Antonine Wall and associated sites along the Roman frontier.

Research, including developer funded archaeology, continues to inform our understanding of the course of the Antonine Wall. As Britain's national mapping agency the Ordnance Survey (OS) is responsible for mapping topographic features, including archaeological sites, across a range of scales. Since the mid 19th century the OS has depicted the upstanding earthworks of the Antonine Wall on their large-scale maps. From the 1920s to 1983 the OS had specialist archaeological advice in-house to manage the depiction of antiquities on those maps. In 1983, the archaeological functions of the OS were transferred to the Royal Commission of the Ancient and Historical Monuments of Scotland (RCAHMS) and in turn to Historic Environment Scotland (HES) in 2015. The division of responsibilities reflected the expertise of both parties. The archaeologists provided the authority to review and recommend 'antiquities' for depiction across the full range of OS maps, whilst the OS retained overall editorial control of the cartography.

Linge observed in 2004 that 'The 1980 Survey is now 25 years old, and in the intervening period hundreds more points of isolated evidence and information have accumulated. Sooner or later the archaeological community in Scotland will have to collate all this new material within some recognizable map form (in effect revising the 1980 line) or face the charge that they are merely stamp-collecting' (2004: 168 and 170). It is now almost 40 years since the 1980 survey and Linge's observation still stands.

Mapping the Wall

The origins of the OS lay in the Military Survey of Scotland undertaken by General William Roy in the aftermath of the Jacobite uprising of 1745 and subsequently the threat of French invasion of south-east England during the Napoleonic Wars. Recording of prominent archaeological sites as topographic features was an essential part of map-making as these served as useful landmarks and way markers for navigation, but, with the exception of Roy who had a particular interest in the Roman antiquities, surveyors were not particularly skilled in the interpretation of archaeological remains.

In his introduction to *The Cinderella Service: the Ordnance Survey and the mapping of the Antonine Wall*, Linge summarises the history of the recording and depiction of the Antonine Wall on large scale OS maps from Macdonald's research in the 1930s until the last systematic resurvey in 1980 (2004). However, the OS had depicted their interpretation of the upstanding earthworks of the frontier as topographic

features from the 1st edition published during the mid-19th century. It is worth reviewing Linge's article to understand the circumstances under which each revision was undertaken.

Ordnance Survey map depiction from the 1st edition to the Macdonald folio

The large scale survey of Scotland was undertaken by the OS on a county by county basis between 1843 and 1882, although the Antonine Wall, which passes through the historic counties of West Lothian, Stirlingshire, Dunbartonshire (detached), Lanarkshire and Dunbartonshire, was surveyed and published between 1854 and 1863. Recognising the potential of the survey to record for posterity sites that were likely to disappear through agricultural improvements, the Society of Antiquaries of Scotland specifically requested that 'all remains, such as barrows, pillars, circles and ecclesiastical and other ruins should be noted on the Ordnance Survey of Scotland' (Davidson 1986: 11). Whilst the request may have been met by the OS, nomenclature was antiquated by today's standards (Davidson 1986: 14) and interpretation suspect; many a prehistoric fort was erroneously annotated 'ROMAN CAMP'.

Following recommendations of the Dorington Committee, in 1893 the OS commenced a systematic map revision of Great Britain - to be repeated every twenty years. As this ambitious programme commenced, it coincided with the conclusion and publication of a series of excavations along the frontier undertaken by the Glasgow Archaeological Society between 1890 and 1896 (1899). The timing may be coincidental but Macdonald (1934: 81) asserted that 'Largely in consequence of the interest they aroused, the Ordnance Survey, were induced to have the whole line very carefully re-surveyed, with a view to securing an accurate permanent record of the surface appearances' – a decision no doubt influenced by the appointment of O.G.S. Crawford as the first Archaeological Officer to the OS in 1920. In the words of Charles Close, Director General of the Ordnance Survey, 'I appointed O.G.S. Crawford to the Ordnance Survey as Archaeological Officer in October 1920. ... Crawford was just the man for the post, which I established to get the archaeology of the national maps into order: for there still survived "giants' graves" and such titles, and a larger number of objects of antiquarian interest remained unmarked on the maps...' (Myres 1951: 9). This was mirrored in Crawford's own view of his role: 'The primary purpose of my appointment was to reduce to order the chaotic mixture of antiquarianism and speculation that disfigured the Ordnance maps, and to bring it into conformity with existing knowledge.' (1955). The OS were thus very receptive of the information Macdonald communicated to them to improve the depiction of The Antonine Wall.

In acknowledging the undoubted technical skills of the field surveyors of the OS, who 'on the whole ... did their work admirably, providing a basis sufficiently definite and secure to ... lay down the precise course of the Rampart and Ditch', Macdonald also recognised that 'Even the skilled officers of the Survey were here and there led astray by natural depressions which were erroneously supposed to be the hollow of the Ditch' (1934: 81). Although critical of the interpretative skills of the surveyors, the OS maps still proved essential for Macdonald in conducting his research. The maps gave him a base to build and refine the interpretation of the frontier and, in turn, communicate the results of his research 'from time to time' (Macdonald 1934: 96), although the nature of that communication has not been preserved (Linge 2004: 161). To manage the information received, the OS produced the first systematic archaeological record of a monument in Scotland comprising a map folio of 25-inch OS maps annotated in red with observations supplied by Macdonald (Ordnance Survey 1931) (Figure 29.1). The earliest opportunity to incorporate the revisions proposed by Macdonald in published maps would have been the 3rd revision of the OS map during the late 1930s.

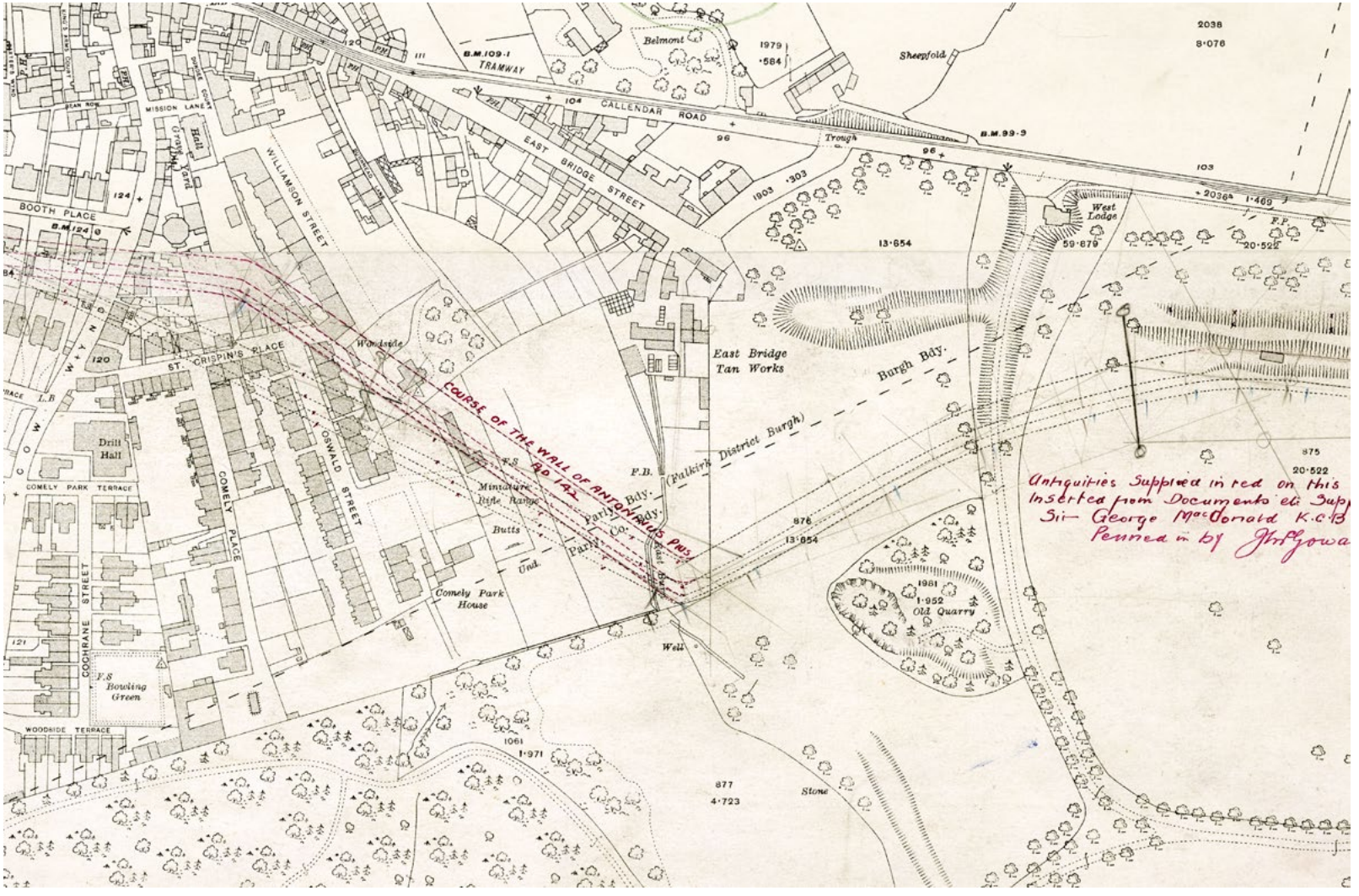

Figure 29.1. Extract from the Macdonald folio; the course of the Antonine Wall to the west of Callendar House, Falkirk as depicted on an undated Ordnance Survey 25- inch map, annotated in red by the OS with comments supplied by Sir George Macdonald.
(Canmore DP302094: © Historic Environment Scotland and background mapping Crown © Ordnance Survey)

As the earliest large scale surveys of the earthworks undertaken to a consistent methodology, early OS maps are an invaluable source of evidence for understanding the frontier. Charting the evolution of the landscape over some sixty years, these maps offer considerable insights into the condition and deterioration of the frontier earthworks – made easier by the online map catalogues of the National Library of Scotland (https://maps.nls.uk/). Feachem (1974) used the early editions of the OS 25-inch map to trace the disappearance of the Roman fort at Bearsden (New Kilpatrick) under suburban encroachment during the late 19th and early 20th centuries. Depicted as a largely upstanding earthwork in 1860 on the 1st edition OS 25-inch map (Dumbartonshire and Stirlingshire sheet XXIII.16, surveyed 1860, published 1863), by 1896 (OS 25-inch map, sheet XXIII.16, surveyed 1896, published 1898) the interior of the fort was occupied by residential villas standing in spacious gardens and the SE angle of the fort was no longer depicted. By the 1914 revision (OS 25-inch map, Dumbartonshire sheet XXIV.9 and Lanarkshire sheet 1.9, surveyed 1914, published 1918) there were no longer any visible traces of the earthwork. Comparing the changes in the depictions of the earthworks at Castlehill Hanson and Jones (this volume) observed that, whilst the earthworks to the east of the fort were depicted on both the 1860 (1st edition, published 1863) and 1896 (2nd edition, published 1898) surveys, by the time of the 1914 survey (revised 2nd edition, published 1918) the earthworks had been so reduced they were shown as a pecked line indicating 'Course of'. Analysis of the historic maps can also offer new insights into the frontier. Comparing the changes in the depictions of the earthworks at Castlecary, Hanson (this volume) suggests that earthworks depicted on the 1st edition 6-inch and 25-inch OS maps may represent traces of a second annexe to the fort.

From Macdonald to the 1980 OS Survey

In the decades following Macdonald, fieldwork continued to reveal new insights about the frontier on an *ad hoc* basis with limited efforts at synthesis. Linge (2004: 161) describes the challenge succinctly: 'Since the culmination of his [Macdonald's] work in the early 1930s (Macdonald 1934), scores more archaeologists have added pieces to the Antonine jigsaw, but none has attempted to fit them together in the same manner. This unenviable task, it seems, had always been the responsibility of the Ordnance Survey (OS) who became the custodians of Macdonald's original work and his esteemed 'line'.

The 1st edition OS maps and subsequent revisions adopted the Cassini Projection for the publication of large-scale maps (6-inch and 25-inch) for individual counties or groups of counties. With a local origin and central meridian the Cassini projection was adequate for small areas but inappropriate for national coverage (Maling 2013: 335), where mapped detail from adjacent county series maps needs to be transformed to fit the neighbouring detail. Following the re-triangulation, which commenced in the 1930s, the OS adopted a Transverse Mercator projection, The British National Grid, to provide seamless cover from Unst to The Sicily Isles – unthinkable with the county series maps. One consequence of the change from county series projections to the Transverse Mercator projection was the need to revise the depiction of the Antonine Wall which traversed the historic counties of West Lothian, Stirlingshire, Lanarkshire and Dunbartonshire. This task was undertaken by the Ordnance Survey Archaeology Division between 1954 and 1957 (Ordnance Survey 1954-57) to create a folio of the 'working sheets' (Linge 2004: 91) based on the 25-inch County series maps (Figure 29.2).

Linge provides a summary of the strengths and weaknesses of the work undertaken in the 1950s. In line with their remit to map the topographic features of the country, the OS survey of extant and

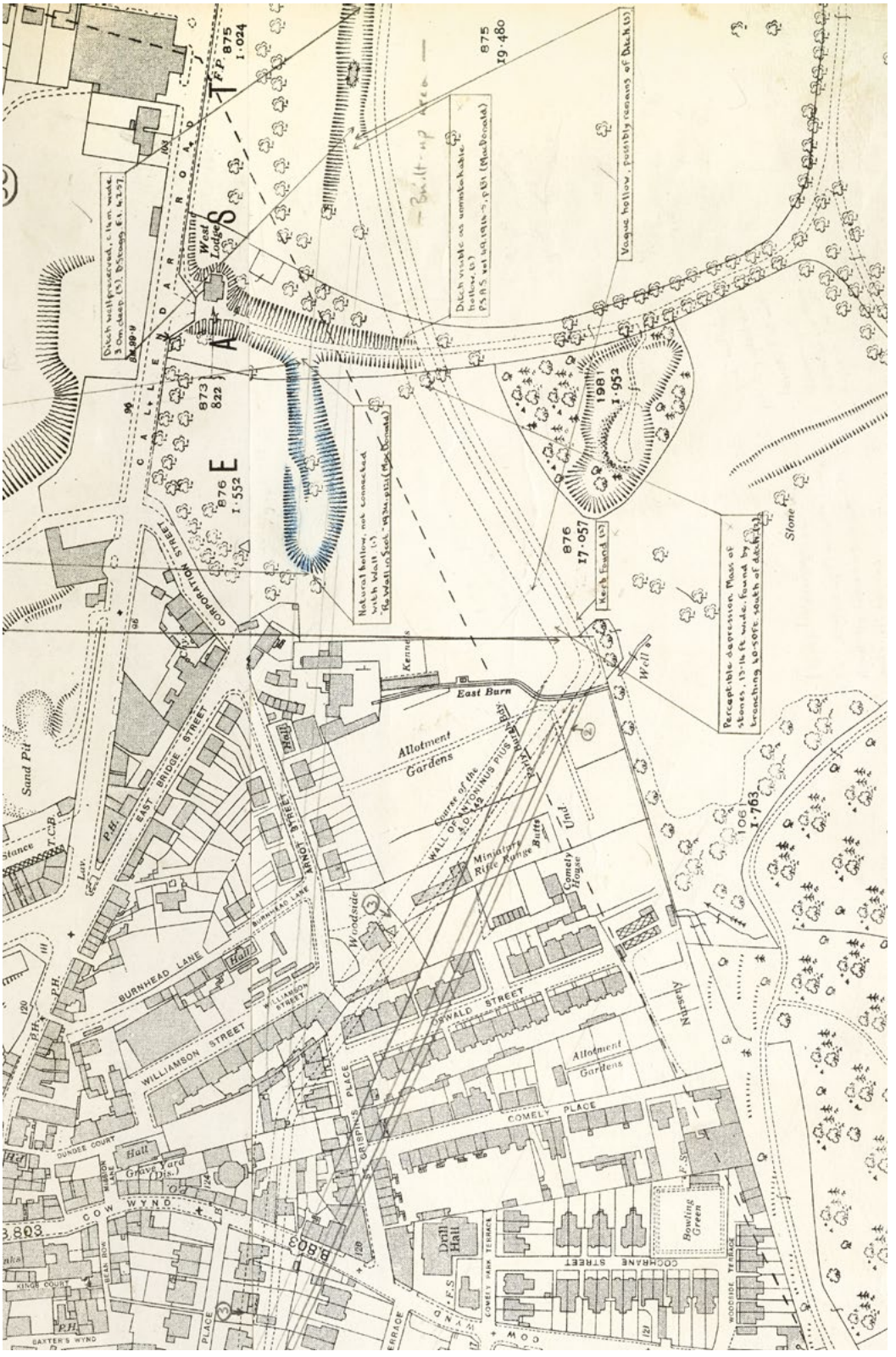

Figure 29.2. Extract from the 1954 to 1957 Ordnance Survey map folio depicting the course of the Antonine Wall to the west of Callendar House, Falkirk annotated with observations from field investigators (and Sir George Macdonald) (background mapping Ordnance Survey 25-inch map Stirlingshire 1944, sheets xxx.4 and xxx.7) (Canmore DP302095; © Historic Environment Scotland and background mapping Crown © Ordnance Survey)

formerly extant areas was 'extensive and well executed'. However, where the published line of the Wall was depicted as a series of parallel pecked lines and annotated 'Course of' the existing depiction was generally accepted without question and remained dedicated to Macdonald and the 1931 folio (Linge 2004: 161-62). The results of the re-survey were incorporated into the large scale OS maps.

By the late 1970s the archaeological functions of the OS and its records were deemed a non-essential luxury by the OS hierarchy (Bainbridge 1977) prompting a number of letters to the Times (e.g. Cunliffe 1977; Evans *et al.* 1977). The last systematic survey of the Antonine Wall in 1980 (Ordnance Survey 1980) was thus conducted under the cloud of the imminent demise of the archaeological functions of the OS. The survey was completed a year before the transfer of responsibilities to the respective Royal Commissions of Ancient Monuments in England, Scotland and Wales in 1983. There are three significant differences between the 1980 folio and the earlier folios. Adoption of the British National Grid by the OS provided a consistent map base across the length of the frontier as opposed to the county series maps. By and large, the base maps were published at a scale of 1:1250 as opposed to the 25-inch (1:2500) scale of the earlier county series. Lastly, rather than annotate the map (Figure 29.3) with lengthy field observations as happened previously, a separate Reference/Field Report Folio was maintained (Linge 2004: 164) (Table 29.1). The structure of this report enabled the OS Surveyors to document evidence from unique observations and fieldwork over time as well as logging observations from the OS field visits in 1980.

Both revisions were informed by the results of individual pieces of fieldwork, dutifully reported through the pages of *Discovery and Excavation in Scotland* since 1947 and, for the 1980 resurvey, the timely publication of a report collating the evidence from fifteen small excavations along the line of the Antonine Wall between 1957 and 1980 (Keppie and Breeze 1981). Yet it remained the responsibility of the OS to collate the archaeological evidence to inform the revision of the Basic Scale OS maps.

Post 1980

Following completion of the 1980 revision programme in 1983, the archaeological responsibilities of the OS were transferred to RCAHMS and the folios lodged with the National Monuments Record of Scotland (now National Record of the Historic Environment) where they can be consulted. Whereas the primary purpose of the OS was to ensure that the map content was accurate and current, the role of RCAHMS was to maintain a national inventory of Scotland's archaeology and architectural heritage. Although RCAHMS also assumed responsibility for the archaeological content on OS maps (with the OS retaining overall editorial control), there was no particular requirement to revisit the recently revised depiction of the Antonine Wall.

Since the completion of the 1980s revision, archaeologists continue to provide immediate summaries of their fieldwork annually through *Discovery and Excavation in Scotland*. The practice of collating and publishing final reports of small interventions along the frontier as papers in the Proceedings of the Society of Antiquaries of Scotland also continued (c.f. Keppie and Breeze 1981; Keppie and Walker 1989; Keppie *et al.* 1995; Dunwell *et al.* 2002) though there has been none since 2003.

Across Scotland the volume of investigation has increased with the growth of commercial archaeology companies from the early 1990s responding to the increasing ability of local authority archaeological services to place archaeological conditions on proposed development sites outside scheduled areas,

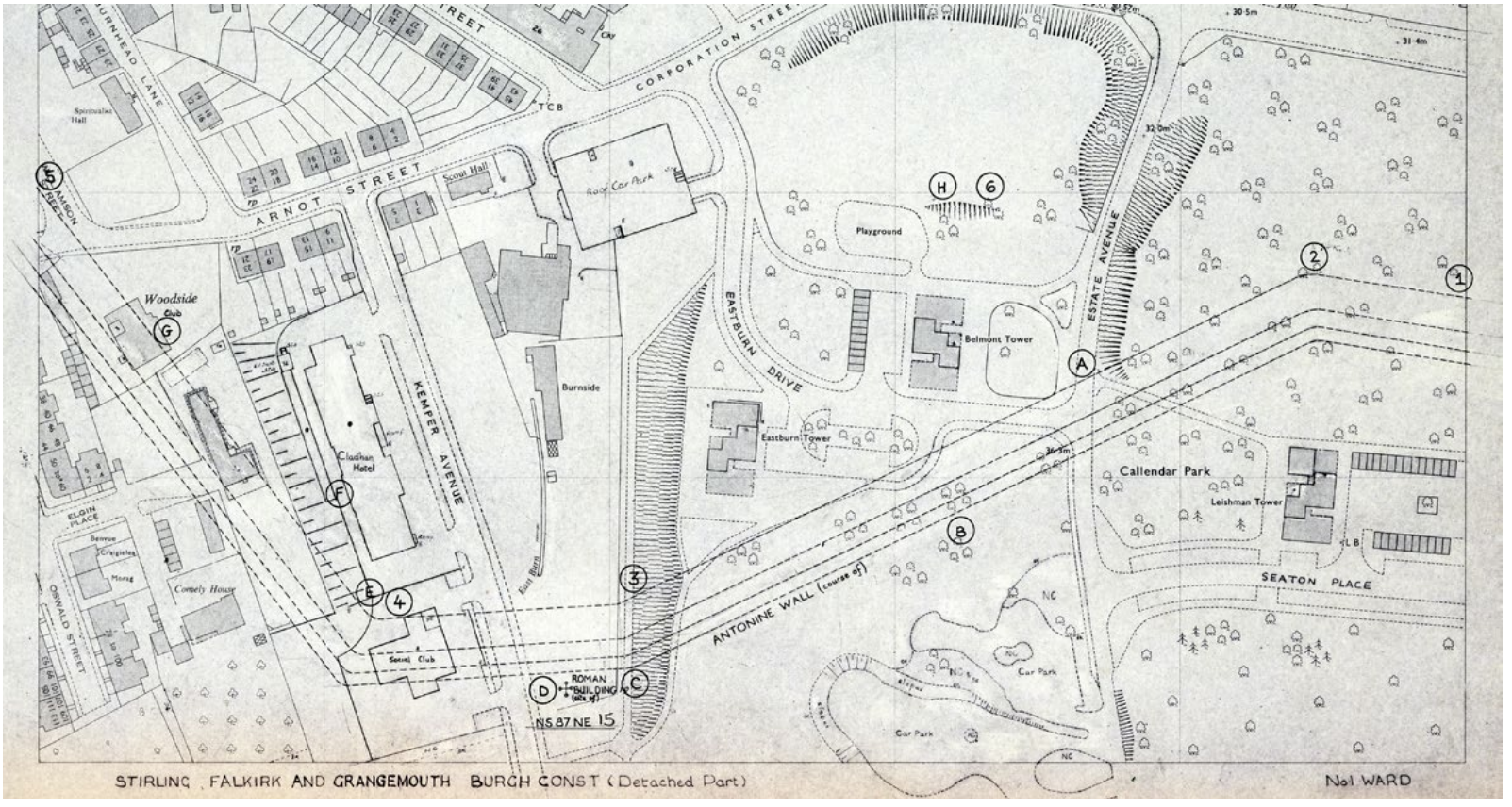

Figure 29.3. Extract from the 1980 Ordnance Survey 1:1250 map folio (sheet NS 8979 NW) depicting the course of the Antonine Wall to the west of Callendar House, Falkirk. The annotation on the map refer to a supporting Reference/Field Report Folio (Canmore DP302096: © Historic Environment Scotland and background mapping Crown © Ordnance Survey licence number 100057073)

Selected Record Information	*Authorities*
A - Ditch located by trenching (exact location measurements given)	PSAS 49 1914-15, 131 (G M)
B – Spreads of stone, some 14ft wide found in various places parallel with the slight depression of the Ditch, taken as evidence of the Wall course	Ibid
C- Portion Wall kerb found in situ near park wall	Ibid
D- Wall-base and Ditch excavated (and their alignment secured for a distance of about 30m) during excavations of a Roman building in 1980 (see NS 87 NE 15).	DandE 1980, 3 (L J K and F J Murray)
E – Butt-ended ditch segment located in 1971; thought to be the Antonine Ditch. (Alignment secured at 'D' almost certainly proves this correct.)	PSAS 106 1974-5, 200-3 (DJ Breeze)
F – Macdonald located a depression with loose fill and vegetable matter and took this as evidence of Ditch line. (Sections across the corresponding area in 1971 – see 'E' – found nothing)	PSAS 49 1914-15, 130 (G M)
G – Subsidence reported at Woodside when built.	Roman Wall in Scotland 1934, 123 (G M)
H – Former artificial gully accepted as Ditch on early OS maps refuted as such by Macdonald. Trenching along S side failed to locate a rampart.	PSAS 49 1914-15, 130 (G M)
OS Field Report - 1980	
1-2 – Published survey (OS 50" 1970) revised, Disturbed ground, on the continued straight of the extant Ditch further E, shows in landscaped parkland and is distinct on APs (RAF: 106G/SCOT/UK10 15.4.46. nos.5097-8). See also slope detail on OS 1st and 2nd editions -25"	
2-3 – Published survey revised. The evidence of 'A' 'B' and 'C' is consistent with soil marks on RAF photographs (see 1-2 above). There is no evidence to support the curving course as formerly published. The area is severely landscaped and developed.	
3-4 – Published course revised. Alignment secured and surveyed at 1:1250 during excavations in 1980 (see 'D'). The Ditch section at 'E' falls on this alignment. The area is now developed, but kerbing of the wall-base is permanently displayed at 'D'.	
4-5 – Published course revised. Rejecting the now doubtful evidence of 'F', this is the most natural edge-of-slope line that incorporates the findings of 'G' and allows for the assumed alignment angle at '4' where the change of slope and nature of the butt-end ditch 'E' dictate a probable sharp turn.	
6 – The scant remains of the former E-W trench comprises a short, landscaped length of the N slope; surveyed at 1:1250. The amorphous remains of what appears to be the spoil bank occurs on the N side. This trench was largely effaced by landscaping in the 1960's, but as late as 1957 its form was impressive enough for it still to be considered a possible alternative Ditch line. Although the established line is to the S, no satisfactory non-archaeological explanation of origin has been proffered, and its potential significance remains. The 1st edn 25"(Stir 30/4) indicates that it may have once continued to the steep scarp of the East Burn.	

Table 29.1. Transcribed extract from the 1980 Reference/Field Report Folio (NS 8979 NW accompanying Figure 29.3. (Archaeological sources referred to: Breeze 1975; DES 1980; Keppie and Murray 1980; Macdonald 1915; 1934)

further stimulated by the National Planning Policy Guideline 5 (Scottish Executive 1998). Much of this work was simply reported to the relevant local authority archaeology service and deposited with the National Monuments Record of Scotland with only a few projects formally published in journals.

The problems associated with the growth in developer-led fieldwork were recognised in England from the late 1990s, where there was no national equivalent to *Discovery and Excavation in Scotland* to at least alert the researcher about recent fieldwork. It was both difficult to know where fieldwork had taken place and critically where to find and easily access project reports, either physical or increasingly in digital formats, which all too often resided in an archive backlog. The problem was addressed through the establishment

of an online reporting tool -OASIS (Online AccesS to the Index of archaeological InvestigationS (https://oasis.ac.uk/)) (Hardman and Richards 2003). OASIS was adopted in Scotland in 2007. Individual projects may be reported through the form with digital copies of the project reports uploaded. OASIS ensures that both the relevant local authority archaeology service and the national record receive copies of the reports for their records. In addition, a copy of the project report is usually made available for download through the Archaeology Data Service Library (https://archaeologydataservice.ac.uk/library/) and Grey Literature Library (https://archaeologydataservice.ac.uk/archives/view/greylit/) improving accessibility to the results of fieldwork that may otherwise be difficult to access.

World Heritage Site nomination

In the early 2000s the Antonine Wall was proposed by Historic Scotland as an extension to the transnational Frontiers of the Roman Empire World Heritage Site. Historic Scotland invited RCAHMS to produce the nomination maps. Representatives of the two organisations discussed the best way to depict the Antonine Wall in map form. First, consideration was given to recording the features as recorded on existing maps. It was realised, however, that not all elements were recorded in sufficient detail, in particular the northern limit of the upcast mound. It was therefore decided to adopt a stylised depiction of the components: the rampart, the ditch and the upcast mound as well as the Military Way (Figure 29.4). Although stylised, the features portrayed reflected the width of rampart, ditch and upcast mound. The stylised depiction of the Antonine Wall was informed by mapping the archaeological evidence within a Geographic Information System (GIS). The project mapped the extents and archaeological detail from excavations and geophysical surveys, undertaken along the frontier since the 1980 OS revision as well as data from the airborne mapping programme. Where available, pre-1980 investigations were also digitised to create a digital map of investigations, or 'Events', along the frontier (Figure 29.5).

Conceptually, each piece of fieldwork, research or antiquarian observation is known as an 'Event'. Each activity, or event, represents 'a single episode of primary data collection over a discrete area of land. This single recording event can only consist of one investigative technique and is therefore a unique entity in time and space' (Catney 1999). Collation of information gleaned from individual events either initially defines a monument or helps refine our understanding of that monument. Thus, Keppie and Macdonald both drew together the strands of evidence from unique observations from antiquarian sources and fieldwork to inform our understanding of the Antonine Wall. The GIS Events layer was the digital equivalent of the Reference/Field Record Report folio (Table 29.1).

In theory, once the GIS layer was created to document the archaeological investigations along the wall, the event layer should be maintained and updated as new research is undertaken with the intent of an expert group periodically reviewing the evidence every five to ten years. The reality is that, without robust guidance and the technical standards in place, there is no compulsion for those undertaking fieldwork to provide project extents or any detail about the archaeological features discovered in order to update the Events layer.

Technological change

Since 1980 there has been no overarching driver to revise the depiction of the Antonine Wall on the Basic Scale OS Map. This is despite the challenges and opportunities presented by new technologies,

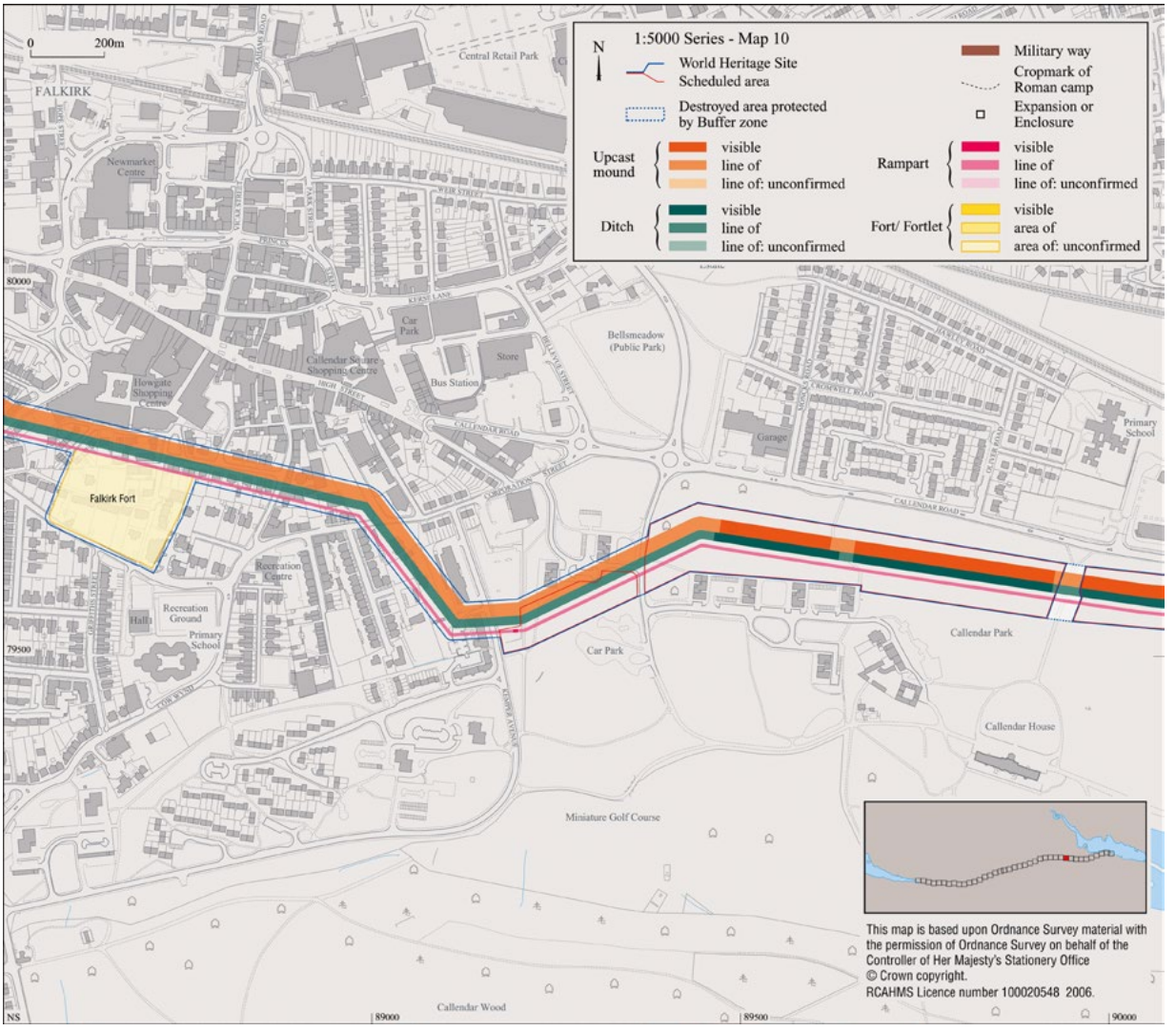

Figure 29.4. Sample map (V-10-CS2) depicting the components of the Antonine Wall based on the Antonine Wall World Heritage Site nomination documentation.

through transformation of established working practices, democratisation of map-making and access to knowledge presented by the Internet.

Maps are now digitally produced, providing the user with seamless coverage when viewed in a GIS or web-map browser, rather than having to consult individual map-sheets in a library or archive. Maps are now licenced rather than purchased by map sheet, although acquiring coverage of large scale OS maps (1:10,000, 1:2500 and 1:1250) has been beyond the resources of many projects and institutions. Premium digital OS products (OS MasterMap) remain beyond the cost of most users outside the public sector, but there are now affordable alternatives. Although lacking the archaeological detail present on

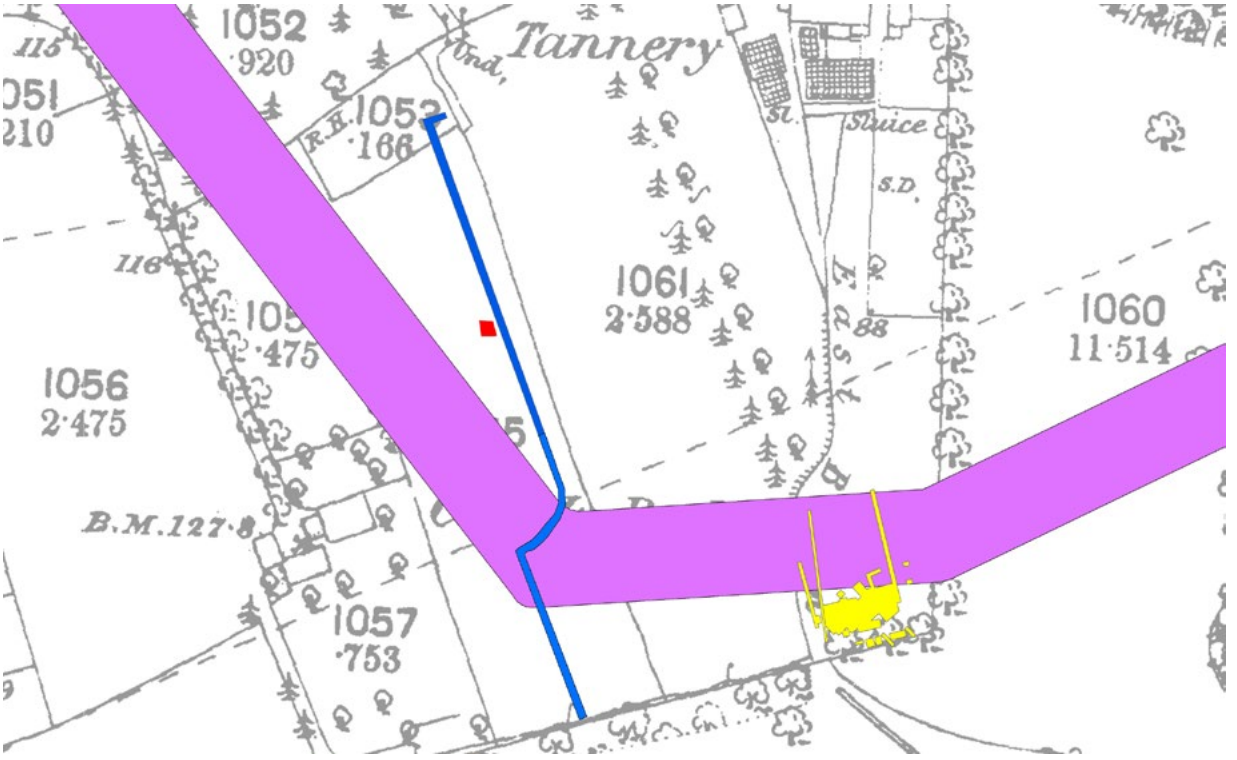

Figure 29.5. Extract from the Event map prepared to support the nomination of the Antonine Wall as a World Heritage Site. The course of the frontier is shown in purple, overlain on an OS 25-inch map re-projected to fit the British National Grid. Three separate investigations are displayed in the map: Macdonald 1913 (red) corresponds to Table 1 'A'; Breeze 1975 (blue) Table 1 'E'; and Keppie and Murray 1981 (yellow) Table 1 'D'. Further excavations by Devereux - 1980 and Bailey – 1980 (Keppie and Walker 1989) could not be accurately located.

OS Basic Scale mapping (and using a different map projection), OpenStreetMap provides an alternate base map, released under a Creative Commons Share Alike licence 2.0, whilst the OS is making more and more of its map data available under an Open Government Licence – a process being accelerated by the work of the Geospatial Commission (HM Government 2018: 10). With these developments there is a risk that users do not understand that OpenStreetMap is typically viewed using a WGS84 projection whereas the OS maps default to the British National Grid. Nor do users realise that the map content may be generalised and that the metrical accuracy of Open products is often inferior to premium OS products. The pitfalls of relying on control from out of date maps are highlighted by Linge (2004: 167), to which in a digital context can be added a lack of understanding of mapping projections and the generalisation of surveyed detail on open mapping solutions.

Through the Scottish Government One Scotland Mapping Agreement (Ordnance Survey 2013) and the Aerial Photography for Great Britain contract (https://www.apgb.co.uk/), the Scottish Government ensures that public sector bodies can access and use the wealth of premium digital products from OS MasterMap and the latest available seamless ortho-imagery of the country. These products underpin the display of archaeological data on the PastMap (https://pastmap.org.uk/) and Canmore (https://canmore.org.uk/) browsers.

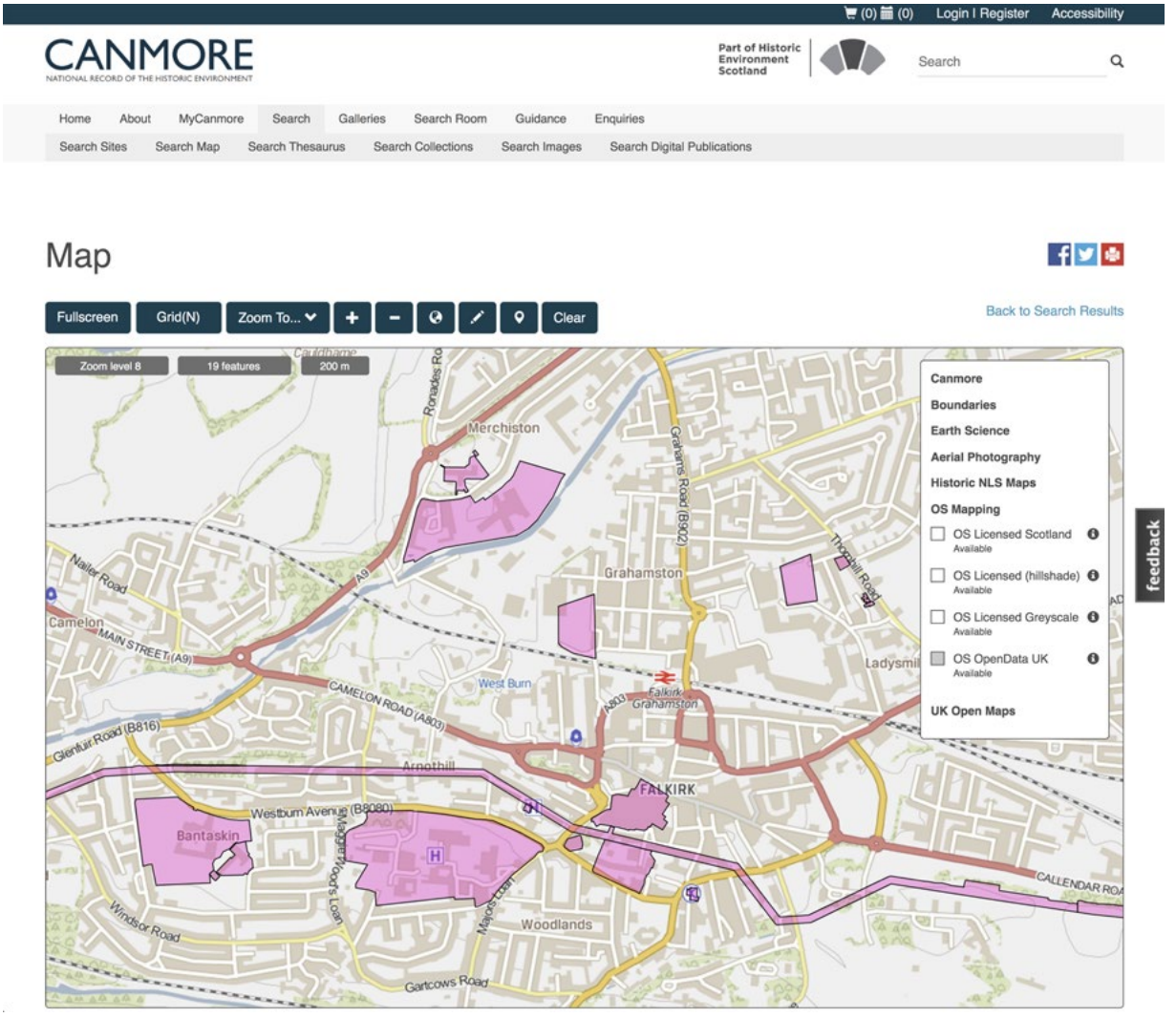

Figure 29.6. The course of the Antonine Wall to the west of Callendar House, Falkirk, displayed against OS Open data mapping as published on Canmore.

Technological advances have transformed how we survey and record positions. Differential Global Positioning Systems (dGPS) receive satellite signals to map archaeological detail accurately, independent of the map control previously essential to locate features in relation to the map base.

It is also now possible to publish map content though Application Programme Interfaces (API), Web Map Services (WMS) and Web Feature Services (WFS), independent of the map-base. These services can be consumed remotely in web maps, such as PastMap and Canmore (Figure 29.6), or viewed and used remotely directly in a desktop GIS.

Technological advances may not always be viewed positively. Introduction of OS Landline in the late 1980s and then OS MasterMap from 2003 both reduced the carefully crafted hachure depictions of the

archaeological earthworks to mere lines. Linge considered the results as 'the appalling and distancing effect of digitized mapping on antiquity detail' (2004: 166). The move to a digital platform also exposed accuracy issues in some OS maps, at 1:2500 scale, introduced during the transformation from county series projections to a single national projection. This was addressed through a programme of Positional Accuracy Improvement (PAI) between 2001 and 2006. As the 1980 survey revision was at mostly at 1:1250 scale, depiction of the Antonine Wall was largely unaffected except for a small upland section (at Croy Hill) mapped at 1:2500 (see Jones and McKeague 2011: 148). Changes were implemented in the OS databases and rolled out to customers (including RCAHMS) who, in the case of PAI, received instructions on how to transform their own data. However, there was no imperative to revise the depiction of the archaeological content. Although stylised maps of the frontier were produced for the World Heritage Site nomination documents, the maps were never intended to update the OS depictions.

Time for a new survey?

Looking back at the production of the Macdonald (1934), the OS 1954 to 1957 and OS 1980 folios, each systematic revision was framed by external circumstances over archaeological need. It is unknown how Macdonald's communications on the accuracy of the Antonine Wall would have been received without the appointment by the OS of O.G.S. Crawford as Archaeology Officer, charged with improving the quality of the archaeological depiction on the maps. The 1954 to 1957 revision was necessitated by the switch from the county series Cassini projection to the Transverse Mercator projection, and the published depictions of the frontier drew heavily on Macdonald's observations. The 1980 survey was undertaken in a pessimistic climate as the last major revision undertaken in-house by the OS.

It is now almost 40 years since the last systematic review of the depiction of the Antonine Wall was revised by the Ordnance Survey in 1980. Since that date new information continues to be reported through *Discovery and Excavation in Scotland*, and latterly OASIS, with the periodic publication of compilation articles.

What has changed are the advances in digital technologies, transforming how people work. Yet, we have been slow to capitalise on the opportunities presented by GPS and GIS solutions for capturing and manipulating data. Creation of the event layer for the Antonine Wall established a benchmark for mapping investigations along the frontier, but without a framework insisting that spatial data adhering to agreed standards forms part of a project deliverable, the mechanisms to maintain and update that layer are lacking. Despite the clear benefits offered by the technology, the record remains largely descriptive with survey and site plans fossilised within the project reports. Locked into the page, the mapped detail cannot easily or accurately be added to the GIS layers used to document interventions along the frontier.

The technological advances discussed so far offer opportunities to collect, standardise and publish data from different projects to help our understanding of the frontier. However, the availability of high resolution LiDAR/Airborne Laser Scanning (ALS) data, captured at 0.5m resolution from Historic Scotland's Scottish Ten project (Wilson *et al.* 2013; Hannon *et al.*, this volume), offers an opportunity to reassess the frontier in its entirety. Visualisations of highly accurate Digital Terrain Models (DTMs) derived from the ALS survey can help reveal the most subtle archaeological features to inform a new base map suitable for the digital environment we work in. This approach has been applied to the

0.5 m resolution HES ALS data and 1 m resolution Environmental Agency data along the Antonine Wall as part of *The Hidden Landscape of a Roman Frontier* PhD research project undertaken by Nick Hannon (2018). An interpretative layer, highlighting the possible and definite archaeological features, can be produced from analysis of the visualisations of the ALS data. Although the techniques are new, information provided from analysis of ALS data, is simply another unique series of observations, or events, that help inform our understanding of the course of the frontier.

As Linge observed 'the inexorable increase in excavation and aerial photographic (AP) evidence that had accumulated since the 1950s .... had the obvious benefit that more dots of information could be joined up to form an improved survey at large scale' (Linge 2004: 163). However, he also cautioned that 'A map is far more than the joining of separate points into a whole: like the Wall itself, it has to have its own logic and cohesion, and in this case represent and relate to a landscape both ancient and modern'. The ALS data should form the basis of a systematic revision, including a re-assessment of the evidence from nearly forty years excavation and geophysical survey along the frontier to confirm or challenge the existing depiction of the course of The Antonine Wall. The results of that analysis then need to be forwarded to the OS for inclusion on their large-scale maps and derived products. To undertake this task requires a comprehensive reassessment of the evidence through peer review, particularly of any results produced through analysis of the ALS data. This is no small task as the precision of the ALS data may refine the position of existing mapped features whilst the visualisations may reveal subtle traces of the earthworks, otherwise imperceptible to the human eye. It is also essential that the OS are receptive to implementing change to their existing base mapping. In 1980 the OS could draw on expertise from the Inspectorate of Ancient Monuments, RCAHMS and Glasgow University to provide the archaeological insights to their revision programme (Linge 2004: 163). In a modern context any revision could be coordinated under the auspices of the Antonine Wall World Heritage Site Management Plan.

Even without a full-scale revision of the depiction of the frontier, technology now allows data to be shared over the Internet. More ALS data for the central belt of Scotland is available to download from the Scottish Remote Sensing Portal (https://remotesensingdata.gov.scot/) from which users can create and analyse their own visualisations from the data. Users can browse modern and historic OS maps online, though perhaps being unaware of the importance of understanding projection systems, map revision cycles and their impact on how researchers located their fieldwork. With the availability of alternative, inferior or out-of-date mapping solutions, there is a real danger that information collected in the field is inaccurately located.

Amongst this uncertainty authoritative datasets depicting the World Heritage Site boundary with buffer zone and Scheduled Monument extents are available to download as Shapefiles and as Web Map and Web Feature services from the Historic Environment Scotland Spatial Downloads Portal (https://portal.historicenvironment.scot/spatialdownloads). For the ALS data, preferred visualisations of a DTM of the frontier and its environs should be available for GIS users and viewable through online web browsers such as Canmore. Both the DTM and interpretative analysis should be shared ideally as Web Map and Web Feature Services (as applicable) so that other data owners can assess the implications of re-alignment of the frontier on their datasets, in particular the scheduled monument extents and the World Heritage Site Management Plans. The technology is there to 'ensure that decision making is informed and that sound evidence-based information is available at all levels of decision making' (Scottish Government 2014: 9).

Acknowledgements

I am very grateful to Alex Adamson, John Linge and the editors of this volume for their constructive comments and advice on this article. I would also like to thank Derek Smart for providing the photographs from the historic OS map folios and Georgina Brown for reproducing a sample image based upon the World Heritage Site nomination maps.

This paper would not have been possible without the inspiration provided by John Linge's thorough discussion of the working practices of the Ordnance Survey in his 2004 article *The Cinderella Service: the Ordnance Survey and the mapping of the Antonine Wall.* The paper serves as a reminder about the challenges and complexity past and present mapping systems present to using data. With the ubiquity of digital data today it is all too easy to accept data unquestioningly without understanding the data capture processes involved.

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30. Connecting museums and sites
Advanced *Limes* Applications – a Creative Europe project

Erik Dobat

On the history of independent multimedia production

At the beginning of the new millennium we started to create documentaries on archaeology and history. Earlier (in the 1990s) it was very difficult to create content independently. The financial demands for professional equipment were really high and thus the gatekeepers, such as public and private broadcasting companies, controlled the production of content. Therefore only topics that promised a certain financial return were produced. But on the verge of the digital age things began to change rapidly. New affordable digital video cameras capable of producing high quality images changed the game. Also the development of personal computers allowed a new way to handle and create multimedia files. Thus creating film and multimedia was democratized and it became possible for anybody with the technological knowledge to start producing content. Within these circumstances we started working on a three-part DVD series about the Roman Frontiers in Europe (Hadrians's Wall/Antonine Wall, The *Limes* in Germany, The Danube *Limes*). The first DVD in this series was about Hadrian's Wall and the Antonine Wall (Dobat and Walkshofer 2004). For this we had the privilege of meeting Prof. Lawrence Keppie. We got a lot of scientific input for the script and we fondly remember the interview about the Distance Stones produced in the Hunterian Museum in 2003.

With the creation of these documentaries we always wanted to tell the stories of the Roman frontiers for a public audience in a comprehensive way. We not only went to the museum to get footage from finds, we also accompanied Lawrence Keppie and David Breeze on public field trips to the Antonine Wall. There we discovered that the connection between sites and finds was sometimes difficult to grasp for the public audience as naturally these two things are seldom available together (except for during excavations on site, of course). For the documentaries we are able to solve this dilemma in the editing suite. With the help of technology it is then possible to create a virtual connection between physically separated objects. Within the Frontiers of the Roman Empire project we were able to follow this idea and it became possible to document the Roman frontiers in Europe and the Near East. The created DVD was probably our most complex project to date as it used all the possible multimedia features the DVD standard was capable of. It was also our most successful DVD produced on Roman frontiers with more than 70,000 copies distributed (Walkshofer and Dobat 2008).

Exploring a new world

Already in the years after 2005 it slowly became apparent that the distribution of physical media objects (DVDs/CDs) had a termination date. At that time the star of YouTube started to rise and one of our next projects about the Roman frontier along the river Main in northern Bavaria was created only for online distribution. The possibilities and the ease of distribution was apparent and when presenting the short documentary we depicted an outlook into the future. The film was not only

presented with a projector, but also on a mobile device called iPod Touch. We expressed the idea that it might be possible to present multimedia files on mobile devices on location in the near future. With the new iPhone and GPS capabilities it seemed even possible to guide users in the landscape. In the following coffee-break the Bavarian Savings bank and the Landesstelle für die nichtstaatlichen Museen in Bavaria outlined a test project for the future and we were asked to develop this idea into a prototype project. At that time app programming was not really common and it was actually difficult to find people programming the software. In the end after about 18 month of development the first application for iOS was published in July 2011 and presented by the Bavarian minister for sciences (Dobat *et al.* 2011). *Mainlimes Mobile* was quite successful with about 2000 downloads in its first year. Therefore a further project in Bavaria has been started about the Roman frontier in Middle Franconia. The app was published in 2013 as *Limes Middle Franconia Mobile.* Both apps were created in German and English. They made full use of the capabilities of smartphones at that time. It became possible to display video, audio, text and pictures on a mobile device. All of the content was geo-referenced and the map modules allowed users to tour the Roman frontiers in Bavaria with the help of GPS and get interesting information while on location (Flügel and Schmidt 2013). The idea to migrate content to a mobile had become reality.

The process of creating and presenting the Roman frontiers with the help of smartphones was always communicated to international colleagues (Dobat *et al.* 2013). For the *Limes* congress in Ingolstadt in 2015 both applications received moderate updates to meet the new standards requested by Google and Apple. Already at that time we were in touch with colleagues from Scotland. The idea was to migrate the app framework created in Bavaria to Scotland and compile an application for the Antonine Wall. As technology moves swiftly these days we anticipated an enhanced version for the Antonine Wall based on the Bavarian applications. The vision was that new functionalities created for the Antonine Wall finally might be re-imported to Bavaria as well.

The ALAPP project

The initiative was pursued by Historic Environment Scotland (HES). A formal agreement with the Bavarian Savings Bank and the Landesstelle was signed in Edinburgh in 2015. During the *Limes* Congress in Bavaria in Ingolstadt three countries (UK, Germany and Austria) agreed to apply for a Creative Europe programme to enhance the Bavarian application and bring it to the Antonine Wall. Historic Environment Scotland took the lead partnership in the project and in 2016 the Advanced *Limes* applications project (ALAPP) was accepted by the Creative Europe programme.

ALAPP became a three year project (2016-2019) and started in May 2016. The first meeting actually defined the ideas and aims for the Antonine Wall application (Figure 30.1).

The basic concept of the application is mapping that provides access to the World Heritage Site. It should facilitate orientation with the help of GPS and it also enables access to all information and content. The map view is divided into an overview map that includes clickable icons for sites. These sites then have a more detailed map that provide Points of Interest (POIs). The clickable POIs provide the information as video, audio, text and/or picture files. This is more or less the framework of the older Bavarian *Limes* apps. Within the ALAPP project we wanted to take everything a few steps further.

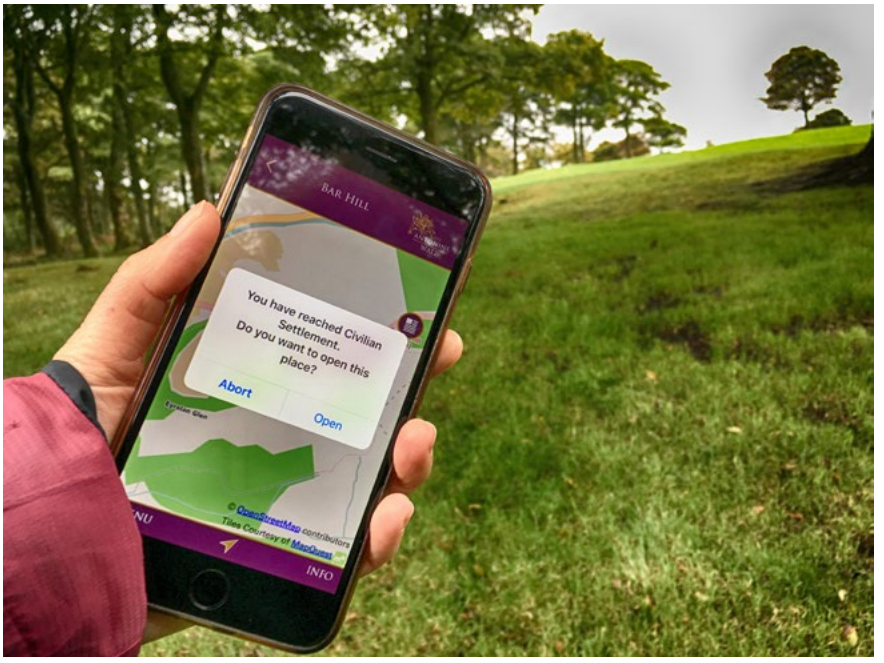

Figure 30.1. Using the Antonine Wall application at Bar Hill fort.

First of all the mapping now provides real map data from Open Street Map – in contrast to the older apps that only used geo-referenced map pictures. Thus the maps now provide more detail and the zoom level can be adapted if needed. For the content a sub-category has also been introduced. Earlier it was only possible to link one content to one POI, but often there is so much more information available. Therefore we introduced sub-POIs that can be attached to a POI. That way on the first level of information it is now possible to display basic information about the archaeological site and provide more detailed information and/or different types of media with the help of the sub-POIs. We also learned quickly that with the possibilities to integrate much more content with the sub-POIs it would be necessary to introduce data management. Therefore one of the major outcomes of ALAPP is the integration of a content management system (CMS). We were able to separate the whole content from the actual application programming. Now the application is looking for the online data base on start-up and it is checking the data base for new information. This introduced the possibility of permanent updates of all contents without the need to upload a new version to the app stores. It is a big advantage for the content managers and curators as new developments in science or simply corrections may be integrated quite rapidly. As the Antonine Wall application makes use of many multimedia files we also decided to make offline content available. Therefore the user is prompted to download the data for a site before accessing it for the first time. Once the data is downloaded the user is not dependent on the signal strength of the smartphone and also performance of media files is a lot better.

The computing power of smartphones is already incredible today and it is constantly improving. As the aim of ALAPP has been the enhancement of the capabilities of the app platform, new types of content have been introduced:

- Rotatable 3D objects and 3D sites
- 360° degree views of a reconstructed landscape
- Augmented reality to enrich the camera view with information

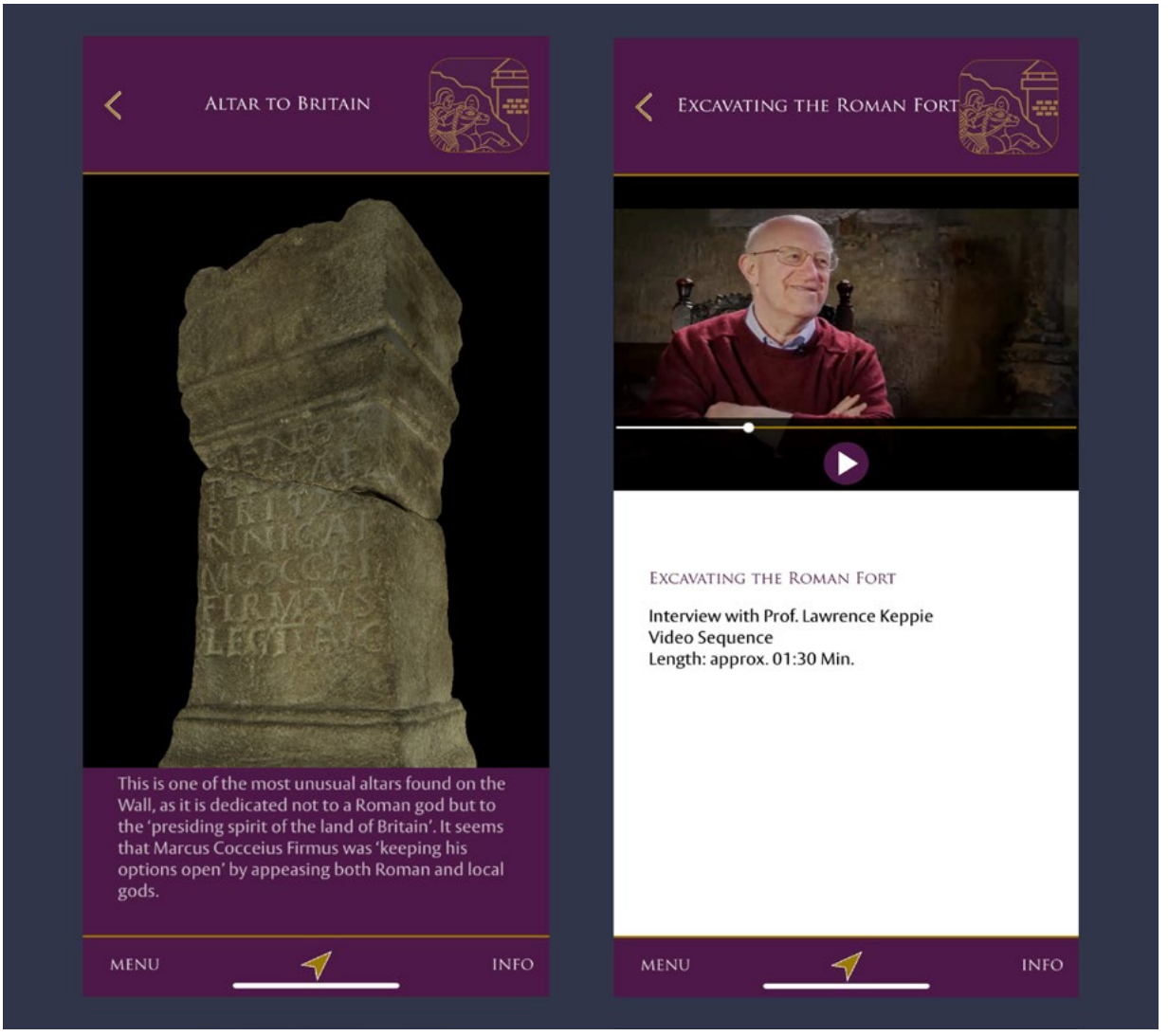

Figure 30.2. Screenshots of the Antonine Wall app: 3D object of a scanned altar (left), interview with Prof. Lawrence Keppie on Bar Hill (right).

HES had already been working on the digitisation of artefacts for some time. We now decided to integrate these high quality 3D scans of artefacts into the application and reunite finds and sites with the help of ALAPP (Figure 30.2). The integrated 3D objects can be zoomed in and are rotatable in any direction with the use of your fingertips. When exploring the Antonine Wall in the landscape it is now possible to see an accurate 3D replica of an artefact on site that is actually located in the museum. The rendering of these 3D objects requires a lot of computing power and only in the last few years have smartphones been able to display these high quality 3D scans reasonably. Many objects have been scanned and integrated into the Antonine Wall application and into the *LIMES* mobile application.

Also sites have been reconstructed in three dimensions on the computer. In recent years HES has created 3D reconstructions for many forts and fortlets along the line of the Antonine Wall. In

Bavaria we created a 3D reconstruction of the temple district on the Weinberg mountain in the Eining region. We got accurate scientific input and the work on the 3D reconstruction actually resulted in a re-interpretation of the Weinberg as a small temple district (Krieger *et al.* forthcoming). For the 3D reconstruction we tried to stick to our proposals to ensure transparency (Dobat 2015). Unfortunately a second different 3D reconstruction of the Weinberg buildings was not possible within the budget of ALAPP. For both applications these 3D reconstructions were used for different types of media content. Of course we rendered video sequences that are integrated into the apps. But we also explored new approaches, such as 360° degree views. That way it is possible for users to dive into the world of virtual reality (VR) with the help of ALAPP. If you visit the fort of Bar Hill, for example, you can use your smartphone to explore reconstructed barracks. With the help of the compass and the gyroscope in the smartphones you can actually look around and discover the reconstructed barracks on site.

Although 3D objects and reconstructions are sophisticated and expensive to produce the outcome is quite versatile. We have already seen that 3D elements have been used as content in many different ways (rotatable objects, video sequences, 360° degree views). Additionally these elements are also of great use for Augmented Reality (AR). The AR technology is considered to be one of the key technologies for the future by Apple, Google and many other players in the industry. Therefore one of the most important aims within the Creative Europe project has been the implementation of that technology into the ALAPP framework (Dobat *et al.* 2019). The idea is to open the camera module within the app and, with the help of image recognition algorithms, defined objects are detected and an overlay with information is displayed. It is not only possible to display 2D objects such as typography or videos. We also experimented with the 3D model of Kinneil fortlet. On site we defined the information panel as the trigger and connected this to the 3D object. If a user chooses to open this POI on site, the camera module opens and starts scanning its surroundings. As soon as the information panel comes into the camera frame the display of the 3D object is triggered. As it is a 3D object the user may have a look at the fortlet from different angles. The experiences from Kinneil have been used for an AR experience on the Weinberg in Bavaria as well. Here we created a special panel for AR with the excavation ground plan. That way it is possible to display the 3D reconstruction exactly onto the excavation data. As a user you have the information of the ground plan on the panel and by scanning it with the app you get the 3D reconstruction displayed correctly on the panel (Figure 30.3).

With the integration of these new types of content as described above, the ALAPP framework is currently able to display almost any kind of media. The functionality of the application has been greatly improved and we were forced to think about the graphical user interface. We needed to integrate to drop 'up' menus in the tab bar (at bottom of the screen) to reflect all the new functionalities. For the user the main MENU is on the left which allows access to all important modules, such as the map view or a list view where all content is displayed in a searchable list. The INFO menu helps the user to get information on the application itself (help, contact information, about...) and it is also meant to set your preferences and organize the content on your device. The Antonine Wall application provides enormous amounts of data, but with all sites downloaded this might be just too much for the valuable data storage on mobile devices. Therefore it is possible to download data for certain sites and it is also possible to delete data later. That way the application stays slim in terms of data.

Figure 30.3. Augmented Reality: ground plan of Eining-Weinberg scanned with a phone (left), screenshot of AR displaying the 3D reconstruction onto the image panel (right).

Final thoughts

For us the final outcome of ALAPP is actually the vision from 2009 come true. It is now possible to provide geo-referenced information in a variety of ways everywhere on the Antonine Wall in Scotland and along the *Limes* in Bavaria. Curators are able to update content at any time. Currently the application feels like a geo-located documentary and the user is actually the director him- or herself. And personally for us one of the best features still within the application are interviews with the specialists explaining an archaeological site on site. And so the circle closes: at the beginning we mentioned an interview with Prof. Lawrence Keppie on the Distance Stones in the Hunterian museum more than 15 years ago. Concerning the ALAPP project it is time to say thank you again! We are grateful for the support and the interview about Bar Hill fort for ALAPP (Figure 30.2).

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More information and download links are available at www.antoninewall.org and www.edufilm.at/alapp/

31. The Antonine Wall as a World Heritage Site: People, priorities and playparks

Patricia Weeks

In 2008, the Antonine Wall was inscribed as a World Heritage Site, joining its Partners, Hadrian's Wall (inscribed 1987) and the Upper German Raetian *Limes* (inscribed 2005) in the Frontiers of the Roman Empire World Heritage Site (Macinnes 2015). This brought full circle the Wall's international relevance; from its first role as part of an extensive Roman empire in the 2nd century, to its current one as partner in a UNESCO designation in the 21st century.

Inscription also saw the Wall become more than a military frontier. UNESCO World Heritage designation is about people as much as preservation. The Global Strategy which the World Heritage Committee adopted in 1994 '*goes beyond the narrow definitions of heritage and strives to recognize and protect sites that are outstanding demonstrations of human coexistence with the land as well as human interactions, cultural coexistence, spirituality and creative expression.*' In the case of the Antonine Wall, it became about individuals and communities: the people who built and lived on the Wall, who were dominated or liberated by it; the people who live, work and play along it today; the people who currently curate it and those generations that will inherit it.

UNESCO World Heritage Sites need to have documented Management systems: in the United Kingdom this is done through the creation of partnership Management Plans, usually reviewed and updated every five years. The priority during the development of the second iteration of the Antonine Wall Management Plan (running from 2014-2019) was to engage communities along the Wall, to make them more aware of the site and to involve them appropriately with its management and promotion. To improve physical and intellectual access, a considerable amount of work has been done in the last decade on interpretation for the Wall. At the Hunterian Museum, a key development saw the Antonine Wall gallery redisplayed (Figure 31.1). This allowed improved access to many of the finds, given the excellent collections held by the Museum, and paved the way for a suite of digital projects to enhance interpretation through technological as well as traditional approaches. A three-year European Union Horizon 2020 funded project is just completing which uses stories from the Antonine Wall to trial digital emotional storytelling tools (https://emotiveproject.eu/ accessed 6th November 2019).

Out on the line of the Wall itself, interpretive panels at all Historic Environment Scotland (HES) sites have been refreshed and use the Antonine Wall branding – a Roman cavalry man from the Bridgeness Distance Stone – that was developed after the Wall was inscribed on the World Heritage list (Figure 31.2). This unifies not only the HES sites but also many of the local authority managed sites where it has been adopted as well. It offers visitors a seamless experience across the full length of the Wall, creates a clear 'brand identity', and offers a consistent and understandable narrative.

Figure 31.1. Antonine Wall Gallery at the Hunterian (Crown copyright © Historic Environment Scotland).

Figure 31.2. Interpretation panel using new Antonine Wall branding (Crown copyright © Historic Environment Scotland)

A new website (also using this branding) was developed jointly by HES and the five local authorities that manage the World Heritage Site as Partners (www.antoninewall.org, accessed 6th November 2019). While this has not yet gone as far as Hadrian's Wall in hosting a digital Management Plan, it has offered a platform for linking the Antonine Wall with both its international Partners and its international visitors. As well as information on accessing the Wall and on its history and archaeology for general visitors, the website includes research resources for schools and early career academics. There are 3D artefact and site models, an objects database that includes material from several museums (not comprehensive by any means but offering a good introduction to the typical material culture of the Wall) and downloadable worksheets and learning materials for pupils (Figure 31.3).

Much of the material showcased on the website was developed as part of the international 'Advanced Limes Application Project', with the full project discussed elsewhere in this volume by Erik Dobat. This €200k project, funded by the European Union's Creative Europe programme, saw partners in Scotland, Germany and Austria collaborate on the development of a new app for the wider Frontiers of the Roman Empire World Heritage Site (also see Flügel 2018). Content on each of the sub-apps includes video, text and images, 3D models and augmented reality. It brings the Antonine Wall firmly into the 21st century, offering self-led tours around the key forts and sites. Crucially it reunites on screen the sites and the artefacts found there, but which are now often displayed many miles away (Figure 31.4).

The 3D models used in the app were created by scanning the artefacts held at the Hunterian, Kelvingrove, and Falkirk Museums as well as at the National Museum of Scotland. Once processed, they could be repurposed in the app, on the website, in Sketchfab, and to create elements within a digital

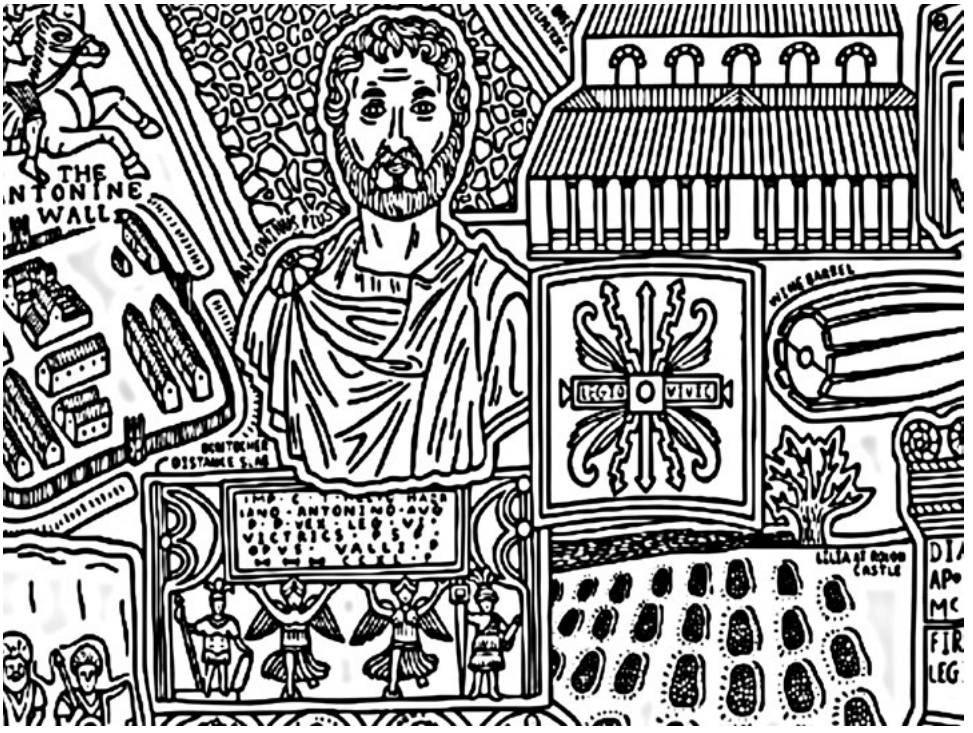

Figure 31.3. Worksheet created to showcase the Antonine Wall (Crown copyright © Historic Environment Scotland).

Figure 31.4. Examples of different content available in the Antonine Wall app (Crown copyright © Historic Environment Scotland).

game 'Go Roman'. This was specifically designed to appeal to 8-12 year olds and forms part of a suite of education resources to engage school pupils with the Antonine Wall and try to promote wider Roman studies. It is quest-based and uses digital site models and 3D scans of the original artefacts, plus motion capture for characters, to recreate elements of life in Bar Hill Fort (Figure 31.5). It is accompanied by a set of handling boxes that contain replicas of the artefacts depicted in the game, supplemented by worksheets and further information (Figure 31.6). This forms a comprehensive range of educational

Figure 31.5. One of the characters/scenes showing artefacts in background (Crown copyright © Historic Environment Scotland).

resources that enable teachers easily and accurately to teach about the Antonine Wall, and the Romans in Scotland, reducing reliance on generic Roman history resources.

Figure 31.6. A worksheet that forms part of the handling resources (Crown copyright © Historic Environment Scotland).

While all these new products and materials have proven popular and greatly expanded visibility of the Antonine Wall with specific targeted audience groups, it was becoming clear to the partners in Scotland that more was needed to fully embed the meaning of the Wall in the communities through which it ran. In 2017, work began on developing a significant project proposal, 'Rediscovering the Antonine Wall', that would bring together many of the communities along the Wall and particularly those in some of the most deprived areas, as recognised by the Scottish Index of Multiple Deprivation (https://simd.scot, accessed 6th November 2019). What was envisioned was a co-development and co-curation model; communities being supported to develop and deliver their own projects, with academic and project support offered as needed. It was an ambitious idea, but by 2019 £2.1 million in funding was secured from the National Lottery Heritage Fund, LEADER and a range of other funders, and four key project staff were appointed. Running for three years, the project delivers capital projects that aim to regenerate areas in these deprived communities, while offering opportunities for volunteering, skills training and wider project involvement. The Wall develops new meaning as part of the project; as well as being a key historical feature and global icon, it also becomes a symbol and measure of local identity.

This sense of developing local ownership underpins the methods by which all elements of the project are delivered. The five Roman themed playparks that are being constructed have all been developed in association with local primary school pupils. They were tasked with designing their ideal play equipment; subsequently this has been translated by play companies and design teams into a playpark 'trail' of five distinct parks, one in each of the Partner local authority areas (Figure 31.7). Child-centric

Figure 31.7. Children's design and a completed playpark at Callendar House Falkirk in August 2019 (Crown copyright © Historic Environment Scotland).

Figure 31.8. The replica Bridgeness distance slab (Crown copyright © Historic Environment Scotland).

interpretation is included around the park to add to the 'learning through play' approach, the aim being to inspire the next generation of ardent archaeologists, historians and Romanists!

Integrating academic research into the projects is also vital to ensure they remain of the highest quality and value. In another capital strand, the replication of four Distance Stones is being supported both by 3D capture of the stones themselves and by current research by Dr Louisa Campbell into the original paint colours on them (discussed in detail elsewhere in this volume). In collaboration with digital students from the City of Glasgow College, watertight 3D models have been created which will be re-colourised using the paint research, enabling the stones to be seen as originally intended. Further work with the stonemasonry department will then see these four stones created as life size replicas to be installed at key locations along the Wall. These will join the replica Bridgeness Stone, a project driven and delivered by the community of Bo'ness with Falkirk Council in 2012 (Figure 31.8), as a series of additional visitor attractions along the line of the Wall.

The three-year 'Rediscovering the Antonine Wall' project is also giving those who would not normally access the Wall the oportunity to become more engaged with it. A specific programme looking at street art is designed by and for the 16-24 age group. It will see international artists collaborate to create installations at key regeneration sites (Figure 31.9). As with large elements of the project, this is not a typical approach to studying or understanding the Wall. Instead, it is a deliberate prioritisation on

Figure 31.9. Example of trial street art with Antonine Wall themes (Crown copyright © Historic Environment Scotland).

Figure 31.10. Engaging with the Wall at the Glasgow Mela (Crown copyright © Historic Environment Scotland).

engaging harder to reach audiences to widen interest in the Wall both as structure and concept; to regenerate not just physical spaces but also public interest in Roman heritage and study.

Expanding audiences and integrating communities is a critical driver for the project. Of the thirty community projects that are being funded, all have been suggested by the communities themselves, and many involve non-traditional audiences. There is a specific programme addressing heritage with refugees and asylum seekers along the Wall, many of whom have travelled from the same areas as those soldiers from the Roman Empire nearly two millennia before; from Syria, from north Africa, from the wider reaches of Europe. It is hoped that by sharing experiences, communities will connect, both nationally and internationally. The Wall, in its historical context, supports the project in exploring issues affecting contemporary society such as identity, multiculturalism, conflict, barriers and movement of peoples (Figure 31.10).

What once divided peoples is now used to unite them, developing new understandings of the heritage of the Antonine Wall and its significance and meaning today. At a community level the overarching

aim is to create an enhanced sense of pride and ownership in the area – driven by increased, but sustainable, use of the World Heritage Site. Critically, actions flowing from the Management Plan aim to raise awareness of the Antonine Wall as a rich cultural asset that can inspire and stimulate a wide variety of engaging learning and participatory activities. True protection comes from a strong sense of ownership; the long-term aim is to ensure that the Antonine Wall is not just a length of turf and stone, but a living Wall.

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32. 'Then 'twas the Roman, now 'tis I'[1]

Iain Gordon Brown

A.E. Housman's line from his famous musings upon a storm-tossed Wenlock Edge and at the Roman site of Wroxeter, which occurs in his *A Shropshire Lad* (1896: XXXI), has a resonance for all who have imagined ancient precedent for contemporary sentiment or circumstance.

A Scottish antiquary of the eighteenth century, Sir John Clerk of Penicuik, with his classical education and archaeological interests, his 'Roman' outlook and all-pervasive adherence to the life-style of a modern Roman, and (moreover) his staunch belief in the Union and the benefits of Augustan civilization as opposed to the barbarism – as he saw it – of Highland life and society, had little difficulty in identifying with the ancient Roman 'civilizers' of ancient Caledonia. On a West Highland excursion in 1748, for instance, Clerk could compose a remarkable 'Roman' inscription in praise of the military prowess and civil engineering achievements of the British Army in first subduing and then holding down the Highlands. (NRS, GD18/ 4538, 5069; Brown 1980a: 133, 344). He saw these acts of Hanoverian Government authority as akin to those of Ancient Rome. Modern Englishmen, together with their Lowland Whig 'clients', were acting the 'Roman' part. Clerk, who had ornamented his own Midlothian estates with Classical inscriptions that stressed the parallelism of his life with that of Horace or Pliny, now devised an inscription to be cut upon a commemorative 'pillar' to be erected beside the new highway on Loch Lomond-side. The tone is one of praise for the recent subjugation of the Jacobite Highlands and of hope that, in time, the wild clansmen might submit themselves to the arts of civilization. The feelings are both Tacitean – in the idea of making a desert and calling it peace – and Virgilian – in the pointing up of the Roman (and English) mission to war down the proud. Fabrications such as these tablets matched the genuine Roman inscriptions from Hadrian's and the Antonine Walls preserved in Clerk's collection and published in the 1720s and 1730s by Alexander Gordon and John Horsley.

A typescript memoir of the First World War, now in the National Library of Scotland (Acc. 12284), offers a later example of the comfort and appeal that thinking of modern events in Roman terms might afford men of sensibility. This account informs us of the making of 'Roman' inscriptions by a Scottish unit of Royal Engineers specifically inspired by ancient Roman precedent and example on the Antonine Wall, and with its famous Distance Slabs in mind.

'Some Private Recollections of a Base Wallah, 1914-1919' is far from being the caricature memoirs of a Great War staff officer that the title may suggest. Colonel Charles Louis Spencer, CBE, DSO, TD (1870-1948), was an able administrator and (as his memoir demonstrates) a perceptive diarist. As a major in the Territorial Army, and an officer of long standing in the old Lanarkshire Royal Engineer Volunteers, he found himself, on the outbreak of war, placed in command of the 1st Highland Field Company,

[1] A version of this article appeared in the Newsletter of the Society of Antiquaries of Scotland in September 2007 (Brown 2007), but with omissions and many errors caused by technical glitches beyond the control of the author, who did not see proofs. The opportunity is now taken to present the paper as originally intended.

Royal Engineers (T), which was attached to the 51st (Highland) Division. His account, written in 1933, takes his story from mobilization in Glasgow on 4 August 1914 to his return to the city on 26 March 1919 and his 'changing into mufti, and feeling queer after four and a half years in uniform'. Promoted Commander, Royal Engineers (CRE) of the Division, he went to France in May 1915. After some time in the front line, he served mostly at stores bases in the Pas de Calais and, paraphrasing a famous historical saying, he mused that 'if a post mortem is held of me, the word "Calais" will be found on my heart, but seared, not written'.

Spencer's Field Company was encamped at Bedford during the early months of the war before going aboard on active service. He describes the effect the kilted soldiers of the Highland Division had on the local population.

> Very few people in Bedford had ever seen Highland troops, and at first were rather nervous, possibly from legends of the 'Forty-Five. The men, however, of the Highland Division were of a very superior class, and the people took them to their hearts.

These men, or at any rate their officers, were also classical scholars. Spencer describes how he has been inspired to ask a local stonemason to cut 'Roman' inscriptions to commemorate the construction by his sappers of three rifle-ranges. As a Glaswegian, he explains that he had thought of Roman soldiers building the Antonine Wall, and had decided that he should immortalize for posterity the labours of his men. Form was given to Spencer's whimsical notion by the excellent Latinity of his nephew and fellow-officer, Lieutenant John Spencer Muirhead, RE, later to be Brigadier Sir John Muirhead, DSO, MC, TD (1889-1972), Glasgow and Oxford classicist, academic (Roman) lawyer, solicitor, distinguished soldier in both World Wars and in the intervening peace, President of the Law Society of Scotland, and general big-wig. A similar exercise was later repeated by Spencer and Muirhead in France.

Spencer notes that news of his enterprise reached the ears of the Camden Professor of Ancient History in the University of Oxford. This was none other than the eminent Francis John Haverfield (1860-1919), doyen of British studies in Roman epigraphy. Haverfield, who had many scholarly contacts in Germany through, *inter alia*, his work on the *Additamenta* to the Berlin *Corpus Inscriptionum Latinarum*, was greatly distressed by the war, with its consequent destruction of lives and the severing of fruitful or promising academic connections. He will certainly have been comforted, or at any rate distracted, by the intelligence from Bedford. In *The Oxford Magazine* for 26 February 1915 there is a note by Haverfield (1915). He wrote:

> I have been asked several times whether the recruits who are practising the excavation of trenches in many parts of England have reaped any archaeological discoveries. This week I have received rubbings of two Roman inscriptions from the works of a North British unit of Royal Engineers near B------, [the place-name was suppressed for reasons of war-time security] which show that it at least is alive to the archaeological possibilities of its operations. Every one, I am sure, will read them with pleasure... I should add that the lettering seems, by the rubbings, to be very much better than is always the case in such inscriptions.

Half tongue in cheek, half with finger in the pages of his beloved Berlin *Corpus*, Haverfield transcribed the pseudo-Roman 'texts', ensuring that they were printed in a typeface that would be familiar to scholars of the genuine article. To Spencer's evident delight, Haverfield told Muirhead, in a private

letter, that even the expert might have been deceived by these inscribed stones had it not been for the inclusion of the (invented) Latin word for 'rifle-range'.

As 'Some Private Recollections of a Base Wallah' informs us, Spencer had taken Muirhead's manuscript texts to a monumental mason in Bedford.

> I showed him the inscriptions and asked him to cut them with old-fashioned Roman lettering as far as possible. He was professionally solemn, not to say sombre, and evidently thought I was a bereaved relative ordering memorial stones. I asked him if he understood the Latin. It then turned out that he was just about as deaf of his Latin ear as I was. When I showed him the translations he hastily looked round to see that nobody could hear him and then burst out into most unprofessional laughter.

Haverfield printed two of the three Bedford inscriptions (the first and third), but cut short the text of the first. Interestingly, he omitted the stone bearing the modern Latin term for the rifle-range; and he chose to excise two lines from the first inscription which alluded to the German Emperor, perhaps out of a feeling of *weltschmerz* and the loss of his pre-war Prussian scholarly connections. Spencer's typescript, however, supplies the deficiency, and the full texts of all three 'Roman' stones appear below. The translations (which are not quite literal) are those given by Spencer beside the Latin versions. A few minor annotations of mine are inserted in italics within square brackets.

I

COHORS · FABRVM · PRIMA

MONTICVLTRIX · IMA

TERRARVM · ARAVIT

ET HOC PRÆPARAVIT·····

VOS BENE VTAMINI

WILHELMI · SOLAMINI

'The First Highland Field Company

[cohort of workmen]

Ploughed the Bowel of this Hill...

Friends use it well: 'twill comfort soon

Imperial Bill'

[The Kaiser: Emperor Wilhelm II]

II

COH · FABRVM · I

MONTICVLTRIX

PIENTIS

HOC · FVSILARIVM · FECIT

'The First Highland Field Company

The Very Pious

Made this Rifle Range'

III

COH · FABR · I

MONTICOLARVM

PIENTISSIMA

INNVMERIS SACRAMENTIS

EFFODIT

'[The First Highland Field Company

The Very Pious

With Unnumbered Oaths

Dug this'

By May 1916, with Spencer engrossed in a complete 'Base Wallah'-world of supplies and stores in depots at or near Rouen, diversion by any means was welcome. His memoir tells the tale.

> While we were working at Petit Quevilly Depot we dug up a large boulder of, I think, chert. I got Major Muirhead to give me an inscription, and one of the military prisoners [i.e., British soldiers sentenced to labouring duty as a result of disciplinary offences] being a stone-cutter I set him on to cut it on the boulder, and when it was finished we set it up at the west end of the ammunition depot. I wonder if it still survives.

Spencer gives the text as follows. His then superior officer, Colonel G. H. Harrison, RE, (whom he greatly liked and respected) was Assistant Director of Works for the area, and Spencer himself was, at the time, Senior Works Officer in this part of the Seine valley.

VICTORIÆ · SOCIALI

ET · GENIO · HVIVS · LOCI

VEXILLAT · COHORT · FABRVM · BRITANN ·

SVMMA · DILIGENT · ADIVVANT · MILITIBVS

EXPEDITIONIS · GALLICÆ · QVEI

HVC · OB · IMMODESTIA · RELEGAT · FVERE

HÆC · ARMAMENTARIA· PORTVS · VIAS ·

BELLI · CONTRA · BARBAROS · APHORMAM ·

PERFECTA · SVNT · ID · MAI · D · N ·

G · QVINT · REG · IMP · V ·

G · ARRIDE · PRÆ · F · FABRVM

C · L ·S · RIPÆ · VLTER · CVRARORE ·

‘To the Victory of the Allies

And the Genius of this Place.

A Detachment of *[British =]* Royal Engineers

With the diligent help of

Men of the *[Gallic=]* British Expeditionary Force *[in Belgium and France]*

Sent back here for offences against discipline

These *[Armaments]* Depots, Wharves and Roads

(Constructed) as a starting-off point

For the War against the Barbarians.

They were finished about the middle of May

in the fifth year *[of the reign of]* our Lord, King and Emperor

George V,

G. Harrison being *[Prefect of Engineers =]* A*[ssistant]* D*[irector of]* W*[orks].*

and

C. L. S. being *[Curator=]* S*[enior]* W*[orks]* O*[fficer]* of the Further Bank’

As a postscript to this story of Great War Royal Engineers claiming kinship with their Roman predecessors, and finding inspiration in the Antonine Wall Distance Slabs, we may recall a famous instance in Scottish literature of the making of 'inscriptions' which were subsequently taken as Roman. The episode is, of course, that of Mr Jonathan Oldbuck at the Kaim of Kinprunes, in Walter Scott's *The Antiquary*, when the eponymous Antiquary is deflated in his archaeological theorizing by the appearance on the scene of Edie Ochiltree (Scott 1995: 27-31; Brown 1980b: 18-19). The Bedesman tells Oldbuck, in no uncertain terms, that his would-be ancient Roman camp, with its much-vaunted *praetorium*, is no more than a 'bourock' (mound) made as a 'bourd' (joke) at a country wedding. Furthermore, Ochiltree confides, if Oldbuck cares to 'howk up' the soil he will be sure to find a stone on which the local 'mason-callants' had cut the letters A.D.L.L., this inscription standing for 'Aitken Drum's Lang Ladle'. Oldbuck had, by perfervid excavation, already found this stone – the letters on which he had been overjoyed to interpret as 'Agricola Dicavit Libens Lubens', or 'Agricola willingly and happily dedicated [this]'. As he had told his guest, Lovell, the stone had been carried with pride to his seat of Monkbarns, and a 'Paris plaister' cast had been taken of the inscription. This had become one of Oldbuck's main arguments in his wished-for establishment of the Kaim of Kinprunes as the very site of the battle of Mons Graupius.

Walter Scott based this hilarious fictional episode on a true story concerning Sir John Clerk and his misidentification of a sheepfold as a Roman camp, in which notion this prototype of the fictional Antiquary had been disabused by the appearance on the scene of a rustic who had actually made the earthwork himself with his 'flaughter spade'. And surely Scott, in introducing the ludicrous instance of the specious Agricolan dedication stone, also parodies Alexander Gordon's laborious readings of Roman inscriptions in the Advocates' Library (Brown 1989: 166-7). Scott – and even the targets of his wit among the 'anticks' of eighteenth-century Scotland – would have been amused by the whimsicality demonstrated so delightfully and learnedly by Muirhead and Spencer. One can but wonder whether, in Scott's day, and in the face of threatened French invasion, troops encamped in Britain under commanders equally steeped in Classical learning, had not been similarly inspired to pass an idle moment in fancying themselves Roman soldiers, handy with the chisel.

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The Antonine Wall, the Roman frontier in Scotland, was the most northerly frontier of the Roman Empire for a generation from AD 142. It is a World Heritage Site and Scotland's largest ancient monument. Today, it cuts across the densely populated central belt between Forth and Clyde.

In *The Antonine Wall: Papers in Honour of Professor Lawrence Keppie*, nearly 40 archaeologists, historians and heritage managers present their researches on the Antonine Wall in recognition of the work of Lawrence Keppie, formerly Professor of Roman History and Archaeology at the Hunterian Museum, Glasgow University, who spent much of his academic career recording and studying the Wall. The 32 papers cover a wide variety of aspects, embracing the environmental and prehistoric background to the Wall, its structure, planning and construction, military deployment on its line, associated artefacts and inscriptions, the logistics of its supply, as well as new insights into the study of its history. Due attention is paid to the people of the Wall, not just the officers and soldiers, but their womenfolk and children.

Important aspects of the book are new developments in the recording, interpretation and presentation of the Antonine Wall to today's visitors. Considerable use is also made of modern scientific techniques, from pollen, soil and spectrographic analysis to geophysical survey and airborne laser scanning. In short, the papers embody present-day cutting edge research on, and summarise the most up-to-date understanding of, Rome's shortest-lived frontier.

The editors, Professors *Bill Hanson* and *David Breeze*, who themselves contribute several papers to the volume, have both excavated sites on, and written books about, the Antonine Wall.

THE HUNTERIAN

THE ANTONINE WALL

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