

# The provision of fort-annexes on the Antonine Wall

Geoff B Bailey\*

## ABSTRACT

*This paper suggests that temporary bathhouses were provided in the Antonine Wall forts until such time as a planned Vallum could be completed behind the Wall. The protracted construction period caused many of these bathhouses to be modified to provide the utilities required during this prolonged interval. The Wall had been built to Bearsden before the concept of a Vallum was abandoned and consequently annexes were attached to each fort. At this stage it was then possible to demolish the internal bathhouses and to build larger bathing complexes in these enclosures.*

## INTRODUCTION

This paper is an attempt to provide an explanation of several perplexing phenomena connected with the Antonine Wall: Antonine Wall forts are extremely unusual in the western Empire in possessing internal bathhouses (Johnson 1983, 194); they have annexes rather than a Vallum like that of Hadrian's Wall (Salway 1965, 158); most of them apparently had their defences 'slighted' c AD 155 (Steer 1964); and they have different ways of attaching the annexes according to their location along the Wall (Breeze 1984, 61).

## THE BUILDING SEQUENCE ON THE WALL

The forts of the Antonine Wall vary considerably in size and each has its own individual internal layout. Yet, there is a significant degree of consistency in their planning, enough to indicate a unified scheme. Of the 16 known forts all appear to face north with the exception of Cadder (which faces east owing to the local topography) and the two terminal forts which both face away from the Wall. The principal buildings of these forts – the *principia*, granaries and commanding officer's house – all lay in the central range (except at Bearsden) and in most cases had stone foundations. The location of the granaries within this central range is particularly regular, with one on each side of the *principia* when there were two, or at one side of it when only a single granary was provided (see note 1). This situation is typical of the Antonine occupation of Scotland and may also be seen in the forts of Newstead and High Rochester. This is in sharp contrast to the forts of the Flavian period when the granaries were usually paired together and placed near to one of the principal gateways (eg Elginhaugh, Fendoch, Pen Llystyn). In the interval between these periods their locations had been quite varied (Gentry 1976). It is this variety which is displayed on Hadrian's Wall but is lacking on that of Antoninus Pius (cf Breeze & Dobson 1970).

\* 412 Bank Street, Slamannan, Falkirk FK1 3EZ

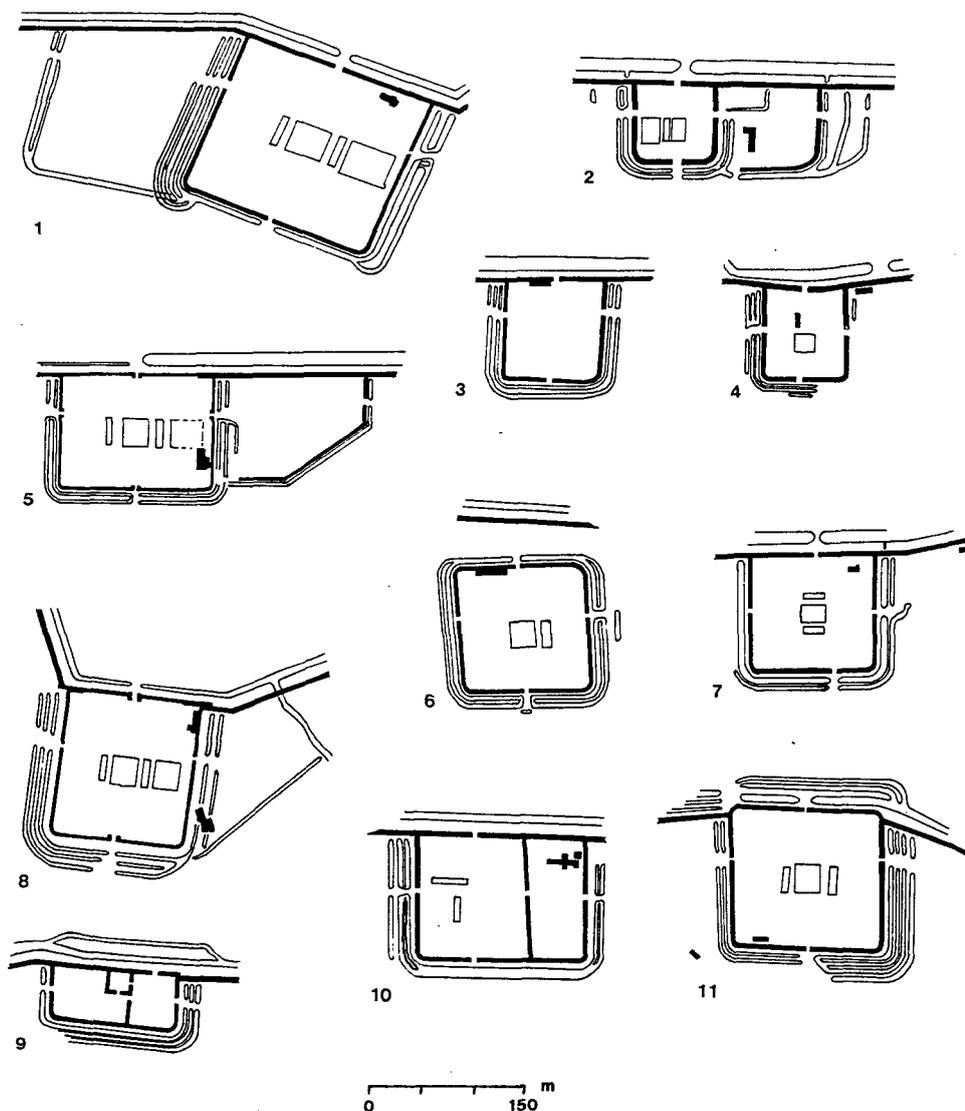
This Antonine arrangement of granaries within the fort is also known in Germany (Gentry 1976). What is even more unusual about the Antonine Wall forts is the coherent provision of internal bathhouses (illus 1; Johnson 1983, 194). In most cases these lay between the intervallum road and the rampart, the result probably of shortage of space, although at Cadder, where space seems to have been plentiful, the bathhouse occupied the angle between the north and east rampart streets. The bathhouses were built after the ramparts, but in every case where they have been examined they are believed to be contemporary with the other fort buildings. Elsewhere in Roman Britain internal bathhouses are only found in secondary contexts, normally of a late period. The elaborate bathhouse complex in the fort of Haltonchesters, for example, was a fourth-century imposition (Daniels 1978, 86), and similarly, the internal bathhouses at the Welsh forts of Brecon Gaer and Caernarfon were not original features (Jarrett 1969, 51, 169). An unusual local example is provided by Strageath where a second-century bathhouse occupied a position next to the rampart similar to those on the Antonine Wall. Here, the building was clearly an insertion as it lies at a strange angle to the rampart and street, partly blocking the latter (Frere & Wilkes 1989, 98). Normally bathhouses were built outside the forts, often in an annexe as at Gelligaer (Ward 1909).

The known internal bathhouses on the Antonine Wall all began life as very simple structures, essentially consisting of three rooms in a row, representing the changing room (*apodyterium*), the warm room (*tepidarium*) and the hot room (*caldarium*). These bathhouse blocks were characterized by an entrance at one end and a hypocaust flue at the other (illus 2). Their size, location and simplicity all suggest that each may have been intended as a temporary measure, lasting perhaps only a few years. This indicates that the decision to provide internal bathhouses was made at an early stage in the building programme of the Wall.

On Hadrian's Wall the fort bathhouses lay outside the forts by convenient sources of water, often some distance away. They were not enclosed by the protective shield of an annexe, but they did gain security by their emplacement within the military zone bounded by the Wall to the north and the Vallum to the south. In effect, the Vallum acted as a giant annexe extending along the whole length of the Wall (Salway 1965, 158). As Hadrian's Wall most probably provided the model for the Antonine Wall we must ask whether or not it was the intention, in the original scheme, to provide the latter with a similar Vallum? Were the temporary internal bathhouses to be replaced by more permanent external bathhouses at a later date once a Vallum had been dug?

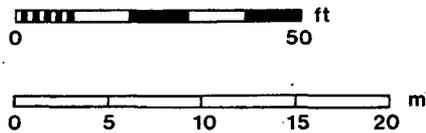
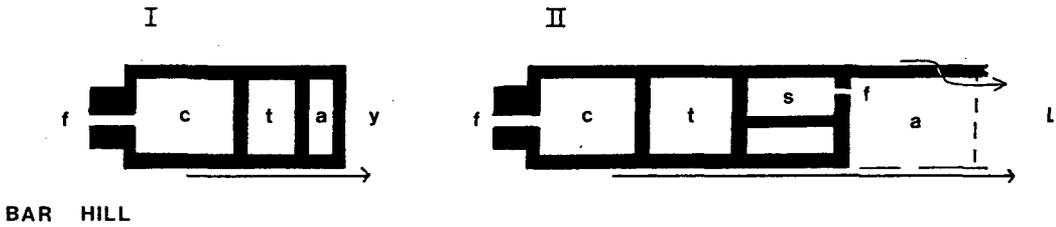
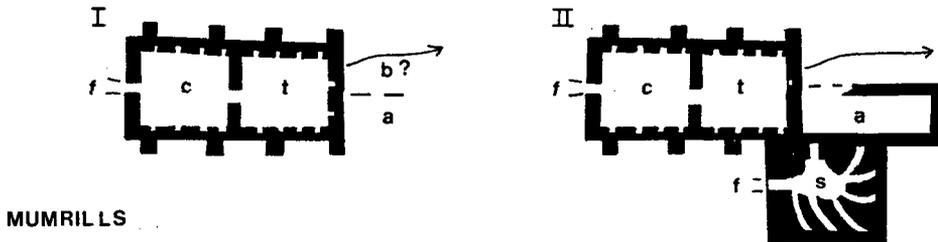
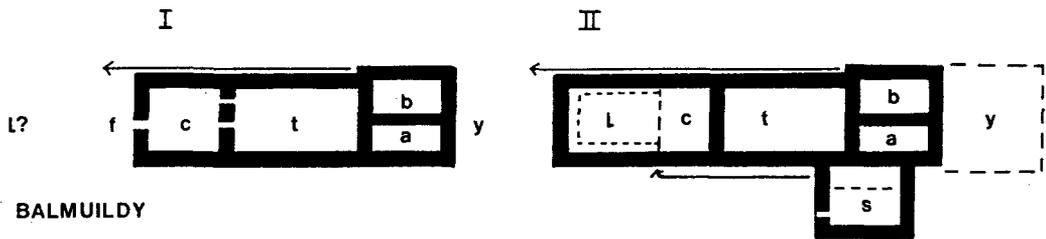
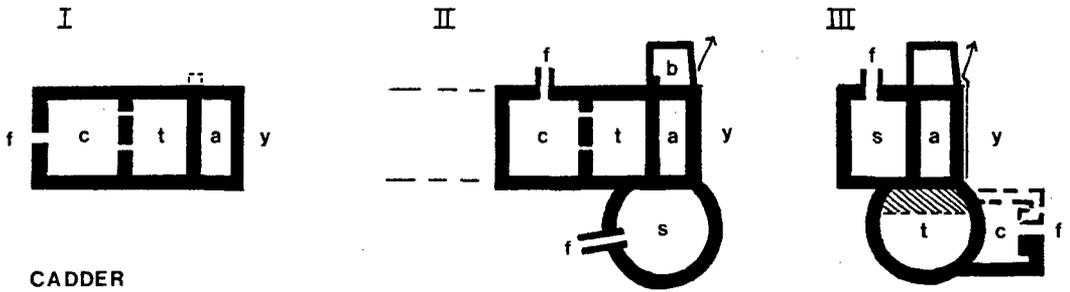
Light can be thrown on these questions if one looks at the bathhouses which replaced those inside the forts. These were much larger and more sophisticated bath suites and were placed in the fort-annexes. These annexes may therefore provide us with another means of testing the building sequence of the installations which form part of the Antonine Wall frontier, from which it may be possible to determine the place of the Vallum in the initial building programme.

Were the annexes an afterthought? They almost all lie on the side of the fort which is away from, or upstream from, an adjacent burn or river. (A notable exception to this was Inveravon, where the probable annexe lies on an area of ground prone to flooding and thus unsuitable for the fort itself.) Could these locations have been a consequence of the original position chosen for the isolated fort: the strongest location topographically, next to its drinking water? The fact that the Antonine Wall curtain forms the northern rampart of the annexes shows that they have to be either contemporary with the Wall or later, whereas the northern ramparts of many of the forts can be shown to be earlier than the Wall curtain. (At Cadder the annexe is usually placed to the south of the fort, but this is not certain and the location of the external bathhouse makes it unlikely.) At Mumrills, Rough Castle, Castlecary and Duntocher the annexe ditches respect the line of the Wall curtain, even though they sometimes get a little close (illus 1). At Bearsden the eastern ditches fall well short of the Wall. Only at Rough Castle has it been possible to examine the junction between



ILLUS 1 Plans of the Antonine Wall forts; bathhouses are shown solid 1 Mumrills; 2 Rough Castle; 3 Castlecary; 4 Westerwood; 5 Croy Hill; 6 Bar Hill; 7 Cadder; 8 Balmuildy; 9 Duntocher; 10 Bearsden; 11 Old Kilpatrick; north is to the top

the stone foundation of the Wall curtain and that of the annexe rampart. Unfortunately the evidence is ambiguous. Although the southern kerb of the Wall curtain continued uninterrupted, a 12-in. (0.3 m) culvert placed alongside of it makes it impossible to determine whether or not the annexe rampart was contemporary with it, or later. Unfortunately the answer was not obtainable from the superstructure at this point (Christison, Buchanan & Anderson 1905). Earlier features, however, were found under the south rampart of the annexe (Macdonald 1933, 253).



ILLUS 2 Plans of the internal bathhouses showing their development

Fortunately, the relationship is clarified by an examination of the forts' ditches. Starting in the east and proceeding westward we may look at each in turn. At Mumrills the annexe ditch cuts the fort's three outer ditches (Steer 1961, 89). At Rough Castle the same sequence may be judged to have occurred, but no details of the ditch fills are given in the original report, nor are there any sectional drawings at this point (Christison, Buchanan & Anderson 1905). At Balmuildy the annexe ditch stops well short of the fort's south ditches, indicating the latter's prior existence. At the west end of the Wall the situation is different. Duntocher has no fort ditches within the annexe, instead they sweep around the south side of the fort to envelop the annexe. Here the fort and annexe must be contemporary. Bearsden, lying between Duntocher and Balmuildy, presents an even more peculiar situation where the annexe seems to have been carved out of the fort itself shortly after the building programme there had been started (Breeze 1984, 61).

An inspection of the ditch fills is illuminating and shows that the fort ditches were backfilled along the sides where the annexes were added. At Mumrills the three outer ditches of the fort were deliberately filled in, as is shown by the nature of the soil used and the statement that, of all the ditches, the only significant amounts of pottery came from 'those which defended the western front of the Antonine fort – and none of the others yielded any pottery to speak of' (Macdonald & Curle 1929, 419, 502; Steer 1961, 91). These redundant ditches would have made a fitting receptacle for the fort's rubbish which would have included such pottery. As part of the construction work on the new annexe, gravel was extracted from the area around the ditches and waste from this process was used partly in the backfilling operation. Further material was obtained probably by recutting the inner ditch on this side and the ditches on the other sides of the fort (Macdonald & Curle 1929, 417). Some of the gravel obtained from the area would have gone into the new roads laid out over the infilled ditches (*ibid.*, 420) and throughout the annexe. These alterations thus brought the fort at Mumrills into line with other forts, with lesser defences on the side of the annexe (eg Pen Llystyn: Jarrett 1969, 102).

The recent excavations at the fort at Falkirk have demonstrated a similar occurrence. At least two of the three eastern fort ditches which were available for examination had been deliberately infilled with clean sand containing some pottery fragments. This clean sand must have been derived from newly dug features in the vicinity, most probably the new annexe ditches. Over the unconsolidated fills of the redundant fort ditches the timber buildings and roads of the annexe were laid out, and a kiln was built over a now superfluous defensive slot (Bailey forthcoming b).

At Castlecary it is also clear that the two outer ditches of the fort, on the side to which the annexe was added, were filled in. Here again, the excavators noted that only these outer ditches had produced pottery, and again a road was led across them (Christison & Buchanan 1903). By contrast, the inner ditch was found to contain dressed stone possibly derived from the collapsed or demolished fort wall, and this ditch would thus seem to have been retained. (The retention of the inner ditch and the infilling of the outer one at Rough Castle is suggested by the OS plan produced before the 1903 excavations: Christison, Buchanan & Anderson 1905, 449.)

Balmuildy has even more dramatic evidence, for not only were the two fort ditches (which were now in the annexe) filled in, but a bathhouse was built over them with a drain along the top of one (Miller 1922). The late date of the annexe, and hence the bathhouse, ties in with the theory previously advocated, that the internal bathhouses were only temporary. As in all the other known instances, the annexe bathhouse was larger and better constructed than its predecessor.

That the internal bathhouse at Balmuildy did not remain in use as long as the fort was recognized by the excavator, for one of the rooms later had a street laid over its demolished remains (Miller 1922, 46–7). The walls of the other rooms were levelled and rubble and clay were dumped into the disused hypocaust system. At Cadder it was suggested that the internal bathhouse

structure was adapted to change the function of the building; part of it was demolished and the remainder was altered to form a clubhouse (Clarke 1933, 59). There are also hints that the internal bathhouse at Bar Hill did not continue in use to the end of the fort's life (Keppie 1985, 64). The same pattern is repeated at Mumrills, where the internal bathhouse was not in use during the final phase of occupation, although the site of the external bathhouse is not known for certain (Macdonald & Curle 1929, 462, 501). At Croy Hill, by contrast, an external bathhouse has been located (Macdonald 1932). Here the dispute must be over the identification of the internal one (see note 2). Likewise, a building identified in the original report for Old Kilpatrick as a latrine (Miller 1928, 28) may actually have been a bathhouse (see note 3). Here the external bathhouse was cut through by the Forth & Clyde Canal (Miller 1928, 32). It lay in the annexe, near to the south-east corner of the fort. The fort's corners are all rounded, indicating that it was built before the annexe. It is therefore extremely unlikely that the external bathhouse was an early feature, and may be seen as a replacement.

The known duplication of bathing facilities seen at Cadder and Balmuildy (and possibly at Croy Hill and Old Kilpatrick) may be very tentatively put forward at Falkirk. Excavations in 1993 located the main sewer outlet where it crossed the fort's ditch-system at its south-west corner. The fill of the middle ditch produced a fragment of a hypocaust tile which presumably was from a nearby bathhouse associated with the latrine block. If so, then this would make it the second bathhouse at Falkirk, for the external one was found some distance away at Kemper Avenue (Keppie & Murray 1981). Undoubtedly future research will bring to light more examples of this phenomenon.

The situation at Castlecary is not properly understood as the internal bathhouse was not fully explored (Christison & Buchanan 1903), but in any case the known bathhouse was probably part of the commanding officer's house. Bearsden, once more, provides evidence of the point at which all these radical changes appear to originate. Not only was the annexe carved out of the fort before the fort was completed but the internal bathhouse, which was then under construction behind the rampart, now found itself inside the annexe (Breeze 1984b, 61). Instead of being finished as a simple internal bathhouse it was expanded into a larger and more sophisticated one of the annexe type. The work that had been done was abandoned and a new complex was constructed at right angles to the rampart (Breeze 1984b, 55).

At Bearsden the life of this proto-internal bathhouse was extremely short, demonstrating that the builders were willing to abandon such small but well-constructed structures. However, most of the other examples display signs of extension or improvement before they too were abandoned. If the postulation of planned obsolescence is correct, it suggests that for some of the forts a considerable time elapsed before the annexe was added. The same conclusion is reached by noting small alterations that were made to the fort ditches at Falkirk before they were filled in during the provision of the annexe. The outermost ditch had had its square shaped butt-end backfilled for a distance of 4 m and a new rounded butt-end was dug; in addition, at the north-east corner of the middle ditch a cleaning slot at its base had been filled in and a new floor of clay was placed at a higher level (Bailey forthcoming b). Falkirk was not alone in this, for the whole of the north-eastern ditch was redug at Balmuildy before the annexe was created (Miller 1922, 5).

Dating evidence from the backfilled ditches at Mumrills suggests a date of c AD 155–60 there (Steer 1961, 98). This would agree with the date of AD 155–60 given for a Samian stamp which provides a *terminus post quem* for the phase I occupation at Inveravon fort (Armit & Dunwell 1992). The nature of this phase, an iron-smelting establishment, indicates that it represents the initiation of the annexe and not of the fort (*contra* Armit & Dunwell; nor do the subsequent phases on the site give any reason to hint that this area did not remain part of the fort's annexe).

These late dates, some 10 years and more after the work on the Wall had begun, reflect how long it took to evolve the final form of the frontier. Construction work on the Wall curtain and on the forts had begun in the east, probably at Watling Lodge (Bailey forthcoming a), and had gradually progressed westward. Shortly after work had begun at Bearsden it would seem that the plan to adopt annexes was initiated. Both the nature of the annexe and bathhouse at Bearsden point to this conclusion. Further west, at Duntocher, the annexe was contemporary with the fort which replaced a freestanding fortlet. Only once the Wall had been completed through to Old Kilpatrick would it have been necessary to start providing the forts to the east of Bearsden with annexes to house their replacement bathhouses, and there was also the Wall curtain to complete from Watling Lodge to Carriden. In this last respect it is interesting to note that the superstructure of the annexe rampart at Duntocher may have been of clay and not of turf (Robertson 1957, 63), that the superstructure of the annexe rampart at Rough Castle contained earth (Christison, Buchanan & Anderson 1905, 468), and that that of the Wall curtain to the east of Watling Lodge was of earth retained by clay cheeks. Perhaps the new construction materials were being used for speed, or due to shortages of suitable turf towards the end of the building programme.

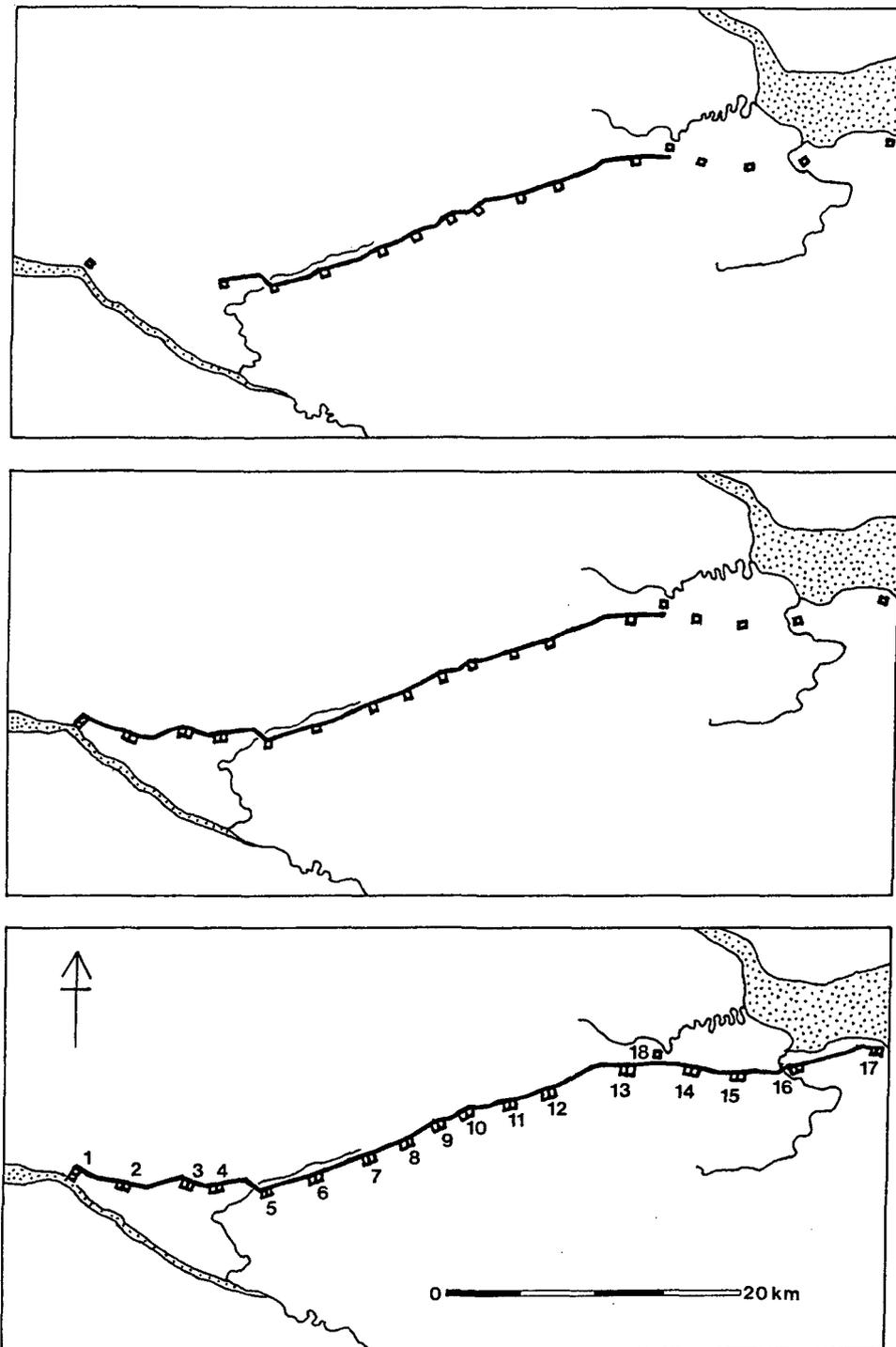
It should not surprise us that it took so long to complete the Antonine frontier system in its final form. Work had continued on Hadrian's Wall from c AD 122 to beyond AD 136. Indeed, there is good reason to believe that the true development of the Antonine Wall is far more complex than that laid out here. The decision to attach annexes to each fort, rather than to add a feature akin to the Vallum on Hadrian's Wall to the whole 38 mile (60 km) length of the Antonine Wall, would have resulted in a significant saving of labour during the construction phase, and would have eased manning problems thereafter. It might also have avoided difficulties in removing the indigenous population and in the utilization of the land thus engulfed. (In the war against the Chatti in AD 83 Domitian had ordered that compensation should be made for crops that had been included in his fortifications: Frontinus *Strategemata* II,11,7.)

The suggested sequence also points us to the conclusion that the secondary forts at Bearsden and Duntocher were constructed at the same time as the Wall curtain. Had this not been the case, then they too could have been given annexes at a later stage, as was done with the primary forts built before the curtain (Gillam 1975).

## USES OF ANNEXES

Annexes are very poorly understood. In the 1969 edition of *The Archaeology of Roman Britain* they were noted as a special feature of the Antonine Wall forts, as being rare to the south of Hadrian's Wall, and as being used for civilian dwellings (Collingwood & Richmond 1969, 89). Such a view cannot now be held. Few Roman forts in Britain lacked an annexe as is clearly demonstrated by recent discoveries, especially those made through aerial reconnaissance (Wilson 1984; Maxwell & Wilson 1987). The problem rather has been one of over-concentration of archaeological investigation on the fort itself to the detriment of work on the fort's environs: aerial photographs have been useful in redressing this imbalance. In the past, annexes have been discovered on the ground only during the excavation of a fort's ditch system, or where a surface scatter of artefacts has attracted interest. There is now a general recognition that annexes, like *vici* and other peripheral features, require further work. Even so, Anne Johnson's near-definitive book on Roman forts, published in 1983, fails to discuss annexes.

If we accept the equation of the military zone of Hadrian's Wall, as defined by the Vallum, with the annexes of the Antonine Wall forts, then the original use of the annexes was certainly military (Salway 1965, 156–8). Indeed, the defences of the annexe are often as strong as those of



ILLUS 3 Suggested building sequence for the Antonine Wall. The forts are numbered as follows: 1 Old Kilpatrick, 2 Duntocher, 3 Castlehill, 4 Bearsden, 5 Balmuildy, 6 Cadder, 7 Kirkintilloch, 8 Auchendavy, 9 Bar Hill, 10 Croy Hill, 11 Westerwood, 12 Castlecary, 13 Rough Castle, 14 Falkirk, 15 Mumrills, 16 Inveravon, 17 Carriden, 18 Camelon

the fort to which they are intimately connected. Yet in most cases on the Antonine Wall, as elsewhere, they remained separated from the fort by a ditch, as befitted their secondary importance. That this separation was not always necessary is shown by the lack of ditches at Duntocher, Bearsden, and in the last phase of Balmuildy. The ramparts of the annexe and fort appear to have been interconnected at Bearsden, although this may have been an accident of circumstance. All of the annexe ramparts on this frontier were attached to the Antonine Wall curtain and hence to a northern corner of the forts. Unfortunately, the junction of the southern ramparts of the annexes and those of the forts has never been clarified. At Duntocher it had already been destroyed before excavation (Robertson 1957, 64), whereas at Rough Castle it was probably destroyed by the form of archaeological exploration. The retention of the inner ditches at Mumrills and Castlecary does not mean that the annexe ramparts did not join those of the fort at their southern corners. A parallel may be drawn with Gelligaer where the fort ditch was filled in at this point in its circuit to take the annexe rampart across it (Ward 1911, 80). However, even here the rampart then seems to have stopped 1.2 m short of the fort's own rampart, suggesting that there may have been a wooden bridge-like structure at the level of the patrol walk. The annexe was thus effectively an extension of the fort.

As so few annexes have been excavated, and even fewer on any appreciable scale, it is not possible to attribute a definitive function or set of functions to them. They were not empty open spaces for they contained a large number of timber buildings. In general they are associated with semi-industrial activities which might have provided a health hazard had they been conducted adjacent to the comfort of the barracks. The unit's bathhouse was placed in the annexe as it probably presented a fire hazard.

In the Falkirk and Inveravon annexes there is evidence, in the form of slag, for iron-smelting (Bailey forthcoming; Armit & Dunwell 1992, 179), and the large furnaces at Camelon may have served a similar function (Maxfield 1979, 31). An adjacent area in the Camelon annexe showed that any iron thus produced would have been reworked on the site in smithing hearths. Similar hearths, possibly associated with blacksmithing, have been found in the annexes at Falkirk (Bailey forthcoming b), at Mumrills (Robertson 1942, 119; Keppie & Walker 1989, 144), and the Flavian fort-annexe at Elginhaugh (Frere 1988, 429). Numerous examples are also to be found in England (eg Melandra Castle: Goodburn 1978, 432) and in Wales (eg Gelligaer: Ward, 1911, 74). Eighteenth- and 19th-century ironstone mines are common in the vicinity of the Antonine Wall; they were presumably working the same mineral deposits as the Romans had exploited. Coal too was readily available and has been found in small quantities in most of the annexes of the Antonine Wall forts.

Although there is no native lead available near the Antonine Wall it does occur in workable deposits in its hinterland. An ingot of lead weighing 38 kg was found in association with Roman pottery to the north-west of the fort at Camelon during the construction of the Midland railway there in 1848. A second pig was found in 1849 in the same area (Wilson 1863, 64). It weighed 102 kg and was stamped IMP.CAES.HADRIANI.AVG.T.M.L.V. A further pig was found at Kirkintilloch. The Camelon pigs probably lay in an outer annexe where they may have been intended for reworking, or they may have been landed at the nearby harbour as raw material for working elsewhere. One of the sites where this secondary processing could have taken place is Rough Castle where a stone mould for pewter was found (Christison, Buchanan & Anderson 1905, 495). Copper, as well as lead, was worked in the annexes at Newstead (Jones, pers comm) and there are many instances of copper working in annexes from further south.

At one time it was thought that brick and tile manufacture was confined to the legions: the work compound of the XX Legion at Holt can be seen as the epitome of an industrial annexe

(Grimes 1930), with separate enclosures for the accommodation of the workforce paralleling the role of the auxiliary fort. A detached enclosure was found to the east of the fort at Mumrills (Steer 1961, 96), but the tile kiln to its north must be connected to the auxiliary fort (Macdonald 1915). Confirmation of the role of auxiliaries in the manufacture of tiles is provided by the similar kiln at Gelligaer (Ward, 1913) and by the occurrence of tile stamps which name auxiliary units (Hassall 1979, 264).

Pottery production can also be considered to be an activity undertaken by the auxiliaries (Breeze 1986). A kiln was discovered inside the fort at Bar Hill (Keppie 1985, 60), and another outside that of Croy Hill (Hanson 1979, 20). Wasters indicate similar production at Duntocher (Gawthorpe 1980, 17), whilst fabric analysis suggests further local pottery manufacture at Inveresk (Thomas 1988), at Bearsden (Hird forthcoming), Westerwood (Webster forthcoming b) and at Falkirk (Webster forthcoming a). So far, though, only a kiln in the annexe at Falkirk may be associated with the manufacture of these.

The numerous pits found within the annexes demonstrate the need to discard large quantities of organic material. In general, inorganic waste does not require burial. Slag and burnt clay or pottery can be used for surfacing paths. At Camelon, for example, the whole surface of one path had been made up from amphorae sherds (Maxfield 1979, 31). The recent work at Newstead has suggested that zonation was employed. Metal-working was carried out in the south annexe where over 10 strip-buildings have now been plotted; glass may have been worked to the east, whilst organic materials may have been processed to the west. These organic materials would have been quite varied: wood, bone, leather, animal organs, animal fats, glue, food-processing, textiles, etc. The army's demand for such organic provisions must have been immense; unfortunately they are not easy to detect in the archaeological record. Leather-working has been deduced at the Welsh sites of Brithdir (White 1978, 42) where a huge tank and a cistern were examined immediately outside the fort, and at Caernarfon where a separate compound lay 200 m north-west of the fort (White 1985). The evidence from the latter site included numerous leather off-cuts. In both instances these 'ordnance depots' were associated with other industrial activity: furnaces at Brithdir, and a tile kiln at Caernarfon. Environmental evidence at Vindolanda, in the so-called *fabrica*, also indicates leather-working in an auxiliary fort (Birley 1977, 123). While the hides of the animals were used for leather the remainder of the carcass would have been fully utilized. Debris found in a deep pit outside the east defences of the south camp at Camelon consisted of 'black sooty soil, containing broken pottery and collections of animal bones, teeth, and pieces of deer horn. In many cases the bones formed layers, and were much decayed, while the teeth and horn were well preserved' (Christison & Buchanan 1901, 368). The animals which provided the raw material for so many of the processes carried out in the annexe may have been detained in pens within the annexe awaiting use (Caruana 1992).

It would thus seem that the auxiliary soldiers stationed along the northern frontiers would have joined their more illustrious companions, the legionaries, in the economic exploitation of the mineral resources of the area and of any raw materials furnished by the local population through taxation in kind. In this way they would have contributed to the supply of materials and products demanded in vast quantities by the Roman garrison of Britain (Breeze 1984a). The various specialists involved in the Roman army are well known but bear repeating here. There is literary evidence for farriers, master-builders, shipwrights, pilots, ballista-makers, glaziers, smiths, arrow-makers, coppersmiths, helmet-makers, millers, wagon-makers, roof-tile-makers, swordcutters, water engineers, trumpet-makers, joiners, bow-makers, plumbers, blacksmiths, masons, lime-burners, woodcutters, charcoal-burners, butchers, huntsmen, grooms, tanners and cobblers, to which we might add brewers, weavers and dyers (Davies 1989, 40). While, for some time, there

has been abundant archaeological evidence for this, it is only with the discovery of the Vindolanda tablets that we have written confirmation that the auxiliary units contained a large part of this diverse range of skills (Bowman 1994, 43–7).

Many of these crafts did not require specialist buildings in which they could be undertaken. The open-ended strip-building, so commonly found in the neighbourhood of Roman forts, would be adequate. At the Flavian fort of Elginhaugh such buildings lined the main road through the annexe to the fort gate (Frere 1988, 429). In general, timber buildings seem to have been numerous within annexes, with considerable density in some instances. At Inveravon there were three phases of timber structures, each structure occurring quite close to its neighbour with narrow lanes fronting them (Armit & Dunwell 1992). A similar situation, with even more rebuilding, was recorded in the south camp at Camelton (Maxfield 1979), and in the north annexe five superimposed timber-framed buildings were found (McCord & Tait 1978, 156). A large area containing sleeper beam trenches was also noted at Cadder during sand quarrying (Clarke 1933, 61). These appear to have been of several phases. The irregularity of setting and form that such buildings could take was demonstrated in the limited excavations within the annexe at Bearsden. The buildings, separated by cobbled areas, form no obvious pattern, p73 but do occupy much of the available space (Breeze 1984, 47). Overcrowding of the relatively small annexe at Balmuildy was given as one possible reason why the bathhouse had had to be constructed over the infilled fort ditches – not a desirable course of action (Miller 1922, 56).

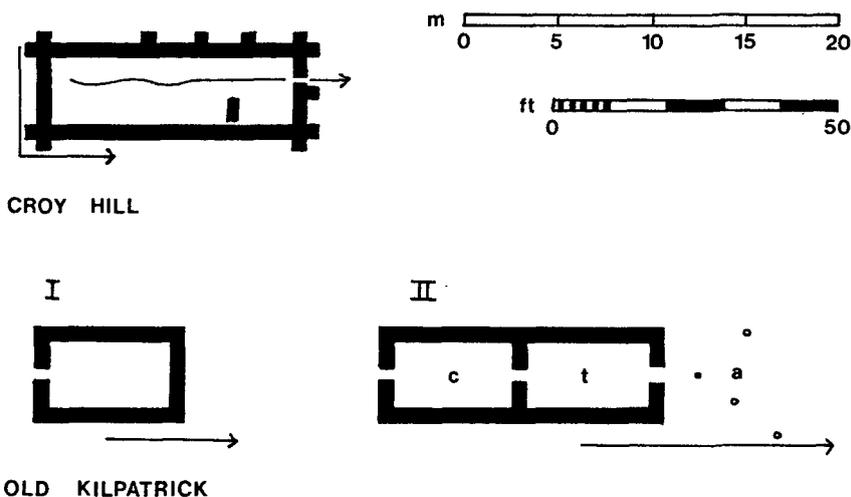
The problem of identifying timber structures in trial trenches is clearly shown at Duntocher where occupation layers and pits were found in the annexe, but the associated buildings could not be defined (Robertson 1957, 66). The same problem was encountered at Mumrills; the annexe was trenched by Macdonald who located post-holes, streets and a large ‘boulder area’ (Macdonald & Curle 1929), and trenched again by Steer who did find at least one timber building (Steer 1961, 93). By contrast, despite considerable post-Roman damage to the site, numerous timber structures were found in the open area excavation at Falkirk (Bailey forthcoming b). A variety of foundations were used, including sleeper walls of stone; post-holes; beam slots; and, probably, sill beams resting directly upon the ground. All the floor levels had been removed, and only fragmentary traces of the road system which had serviced the buildings survived. Similar roads were found in the earlier excavations of the annexes at Mumrills (Macdonald & Curle 1929, 500), Rough Castle (Christison, Buchanan & Anderson 1905, plan), and Castlecary (Christison & Buchanan 1903, 328), implying the presence of considerable activity if not of timber buildings in these areas.

Two other types of buildings should be mentioned in connection with annexes. A wooden shrine or temple, with a tile roof, is evidenced at Balmuildy by the finding of sculptured figures of Victory and Mars (Miller 1922, 56). The second type of building is known as a *mansio*, a kind of official guest-house for government personnel and members of the imperial post. None of these are known from the Antonine Wall (unless the hypocausted building at Kemper Avenue, Falkirk, was one; building XV in the south camp at Camelton, with its *opus signinum* floors should also be mentioned).

Too little work has been done on the annexes, partly owing to the lack of structures found in the early excavations. However, the negative results have tended to come more recently from negative approaches. Trial trenches are not sufficient. Another problem has arisen in distinguishing between military annexes and civilian *vici*, a difficulty emphasized by Davies in Wales (Davies 1990) and by Thomas in Scotland (Thomas 1988). Both an annexe and a *vicus* can contain evidence of industrial activity, timber-framed buildings, large quantities of Roman-style objects, and occupation phases which coincide with those of the fort. They can be of equal proximity to the fort and neither needs to be regularly planned. The dispute over the first phase of the settlement to

the west of the fort at Vindolanda is a good illustration of the problem. It has a regular plan which incorporates the fort bathhouse, a possible *mansio*, and a copper-working centre. Furthermore, the whole of this is surrounded by a large clay rampart (Birley 1977, 70). All of this is consistent with an annexe and broadly similar arrangements can be found at Melandra Castle (Wilson 1970, 285) and Prestatyn (Frere 1986, 365). The latter site has a bathhouse within a defended enclosure, and evidence of copper-working in two of the six known buildings. (Moulds for brooches, crucibles, hearth linings and scrap bronze were found.) Yet the excavator at Vindolanda has identified phase I as a *vicus*, and indeed it is followed on the same site by an unenclosed settlement of less regular plan. Similar confusion occurred at Castleford where the area around the large stone bathhouse was initially interpreted as a *vicus*, but has subsequently been called an annexe – an all too common mistake. At Slack and Bainbridge claims have also been made for defended *vici* (Hartley & Fitts 1988, 65). (A good discussion of the possible status of annexe-type *vici* is given with reference to the defended enclosures around the special site of Ribchester: Olivier 1987.) Sommer's solution to this particular problem was to adopt the somewhat ambiguous term 'military *vicus*' for these enclosures and to postulate the existence of a class of seconded civilians, sometimes known as 'camp followers'; in which case it would have been these quasi-military personnel, protected by the military whom they served, who were responsible for supplying the army's needs (Sommer 1984).

It does seem, therefore, that forts with annexes were probably the norm, and that they were multifunctional with specialized production zones. In this case we ought to be questioning the usual identification of one of the buildings in the central range of forts as a *fabrica*: the regimental workshop. Few of these buildings have produced direct evidence of the manufacture of equipment and most can at best be regarded as repair shops (Johnson 1983, 186). Nor are these buildings sufficient in size to cope with the regimental demands for tools or weapons. How, for example, could a single building, less than one-third of the area of the central range of a fort, hold the 343 men (12 of them shoemakers) who are attested at the workshops at Vindolanda (Bowman 1994, 106)? Their identification as *fabricae* rests largely upon the analogy with the layout of the ideal temporary camp described by Hyginus, and upon excavated examples within legionary fortresses. Neither of these situations can be directly compared with the auxiliary fort. Indeed, it would seem rather odd for a fort to have a large defended annexe specifically to locate such industrial activities, and then to place a solitary workshop in the centre of the fort amongst the administrative and living quarters. Most of the excavated buildings that have been called *fabricae* would have been much better suited to the function of storage of the finished articles rather than to their production. This would make sense, as the fort was a more secure location and such supplies would be needed in large quantities should the garrison find itself besieged. Items such as tools, weapons, armour, textiles (blankets and uniforms) and pottery could have been stored separately and this may explain why many of these buildings have subdivisions. Amongst the weapons would be the *ballistae* which had to be kept dry if they were to be of any use. Several building inscriptions in the north of Britain point to such covered stores for catapults (*ballistarium*) and also indicate that they occupied part of the central range (Donaldson 1990, 211). *Armamentaria* (general weapon stores or magazines) are mentioned in several inscriptions from within forts. That from Lancaster (RIB 1092) records that 'principia et armamentaria conlapsa restituit' (restored the derelict *principia* and *armamentaria*); this, together with the finding of military equipment in and around the *principia* of other forts has led to the identification of the courtyard rooms of the *principia* as the pertinent stores (Johnson 1983, 108). However, the wording of the Lancaster inscription indicates that a separate structure may have been involved, and an *armamentarium* is



ILLUS 4 Plans of the 'granary' at Croy Hill and building XII at Old Kilpatrick

mentioned on its own at Leiden-Roomburg (Bishop & Coulston 1993, 199). The building adjacent to the *principia* within the central range would therefore be quite appropriate. Indeed, if we did not identify these buildings as such we would be troubled to explain why such stores were absent.

### ACKNOWLEDGEMENTS

I would like to thank David Breeze, Gordon Maxwell and Richard Hingley for commenting on a draft of this article. The Walnuts have lived with the theories herein advocated and have helped with their gestation. Errors remain my own.

### NOTES

- 1 The buttressed building to the north of the *principia* at Croy Hill is usually interpreted as a granary. However, there are a number of problems with this. It is only 14.3 m long externally and it went out of use long before the rest of the fort. No traces of sleeper walls were found in the interior although there was (unusually) a drain, and there was possibly a lateral entrance near the south-west corner. Unfortunately, it is not known whether there were granaries in the *latera praetorii*, though the excavator thought this probable (Macdonald 1936, 60). The building resembles the internal bathhouse at Mumrills (cf illus 2 & 4), except for the lack of any remains of a hypocaust system. The buttresses on the bathhouse at Mumrills can also be found at Camelon on buildings 17 and 18 (Christison & Buchanan 1901, 371), usually interpreted as bathhouses, and on the first bathhouse at Bearsden.
- 2 Like the internal bathhouses mentioned, the building in note 1 went out of use before the end of the fort and was cobbled over to create an open square in front of the *principia*. An external bathhouse is known from this site, but insufficient is known of it to be certain that it was a replacement.
- 3 Again the interpretation of a stone building within a fort is difficult, owing to the degree of demolition that occurred in the Roman period. The size of the structure at Old Kilpatrick is indicative of a bathhouse and there is a gap in the foundation of the original cell in the centre of the north wall which could have

served as a flue. With the addition of another room to the south a similar gap occurs in the foundation wall between the two rooms. This may have been a communicating hot-air channel. A third passage occurs in the south wall of the addition. The sub-floor contained no trace of a latrine channel around its walls; the whole basement had been filled in with rubbish and rubble once the building had gone out of use (Miller 1928, 28). This suggests that the floor may have been supported on pillars which have subsequently been removed for use elsewhere. Like the other known internal bathhouses, and the structure at Croy Hill, this building was also cobbled over.

## REFERENCES

- Armit, I & Dunwell, A 1992 *Excavations on the Antonine Wall Fort at Inveravon, near Grangemouth*. Edinburgh.
- Bailey, G B forthcoming a 'The Antonine frontier in Callendar Park, Falkirk; its form and structural sequence'.
- Bailey, G B forthcoming b 'The Roman Fort on the Antonine Wall at Falkirk'.
- Bailey, G B & Keppie, L J F forthcoming 'Recent work on the Antonine Wall'.
- Birley, R 1977 *Vindolanda: A Roman Frontier Post on Hadrian's Wall*. London.
- Bishop, M C & Coulston, J C N 1993 *Roman Military Equipment*. London.
- Boon, G C (ed) 1978 *Roman Sites*. Cardiff (= Cambrian Archeol Assoc Monogr, 1).
- Bowman, A K 1994 *Life and Letters on the Roman Frontier*. London.
- Breeze, D J 1975 'The abandonment of the Antonine Wall: its date and implications', *Scott Archaeol Forum*, 7 (1975), 67–80.
- Breeze, D J (ed) 1979 *Roman Scotland: Some Recent Excavations*. Edinburgh.
- Breeze, D J 1984a 'Demand and supply on the northern frontier', in Miket, R & Burgess, C (eds), *Between and Beyond the Walls: Essays on the Prehistory and History of North Britain in Honour of George Jobey*, Edinburgh, 264–86.
- Breeze, D J 1984b 'The Roman fort on the Antonine Wall at Bearsden', in Breeze, D J (ed), *Studies in Scottish Antiquity presented to Stewart Cruden*, Edinburgh, 32–68.
- Breeze, D J 1986 'The manufacture of pottery in Roman Scotland', *Proc Soc Antiq Scot*, 116 (1986), 185–9.
- Breeze, D J & Dobson, B 1970 'The development of the mural frontier in Britain from Hadrian to Caracalla', *Proc Soc Antiq Scot*, 102 (1969–70), 109–21.
- Breeze, D J & Dobson, B 1987 *Hadrian's Wall*, 3 edn. London.
- Burnham, B C & Davies, J L (eds) 1990 *Conquest, Co-existence and Change: Recent Work in Roman Wales*. Lampeter (= *Trivium*, 25).
- Caruana, I D 1992 'Carlisle; excavation of a section of the annexe ditch of the first Flavian fort, 1990', *Britannia*, 23 (1990), 45–109.
- Christison, D & Buchanan, M 1901 'Account of the excavation of the Roman station of Camelon, near Falkirk, Stirlingshire', *Proc Soc Antiq Scot*, 35 (1900–1), 329–417.
- Christison, D & Buchanan, M 1903 'Excavation of Castlecary fort on the Vallum', *Proc Soc Antiq Scot*, 37 (1902–3), 271–346.
- Christison, D, Buchanan, M & Anderson, J 1905 'Report on the Society's excavation of Rough Castle on the Antonine Vallum', *Proc Soc Antiq Scot*, 39 (1904–5), 442–99.
- Clarke, J 1933 *The Roman Fort at Cadder (near Glasgow)*. Glasgow.
- Collingwood, R G & Richmond, I 1969 *The Archaeology of Roman Britain*. London.
- Daniels, C M 1978 *Handbook to the Roman Wall with the Cumbrian Coast and Outpost Forts*, 13 edn. Newcastle.
- Davies, J L 1990 'Military Vici: recent research and its significance', in Burnham, B C & Davies, J L (eds), 1990.
- Davies, R W, Breeze, D J & Maxfield, V A (eds) 1989 *Service in the Roman Army*. Edinburgh.
- Donaldson, G H 1990 'A reinterpretation of RIB 1912 from Birdoswald', *Britannia*, 21 (1990), 207–14.
- Frere, S S 1986 'Roman Britain in 1985; sites explored', *Britannia*, 17 (1986), 364–427.

- Frere, S S 1988 'Roman Britain in 1987; sites explored', *Britannia*, 19 (1988), 416–84.
- Frere, S S & Wilkes, J J 1989 *Strageath: Excavations within the Roman Fort 1973–86*. London (= Britannia Monogr Ser, 91).
- Gawthorpe, S 1980 'Roman pottery from the Antonine fort and fortlet, Golden Hill, Duntocher', *Clydebank Hist J*, 1 (1980), 15–18.
- Gentry, A P 1976 *Roman Military Stone-built Granaries in Britain*. Oxford (= Brit Archaeol Rep, 32).
- Gillam, J P 1975 'Possible changes in plan in the course of the construction of the Antonine Wall', *Scott Archaeol Forum*, 7 (1975), 51–6.
- Goodburn, R 1978 'Roman Britain in 1977; sites explored', *Britannia*, 9 (1978), 404–72.
- Grimes, W F 1930 *Holt, Denbighshire: The Works Depot of the Twentieth Legion at Castle Lyons*. London (= Y Cymmrodor 41).
- Hanson, W S 1979 'Croy Hill', in Breeze, D J (ed), 1979, 19–20.
- Hanson, W S & Maxwell, G S 1983 *Rome's North-west Frontier: The Antonine Wall*. Edinburgh.
- Hartley, B R & Fitts, L 1988 *The Brigantes*. Bath.
- Hassall, M W C 1979 'Military tile stamps from Britain', in McWhirr, A D (ed) 1979.
- Hird, L forthcoming 'The coarse Pottery' in Breeze, D J *The Roman Fort at Bearsden*.
- Jarrett, M G 1969 *The Roman Frontier in Wales*, 2 edn. Cardiff.
- Johnson, A 1983 *Roman Forts*. London.
- Keppie, L J F 1985 'Excavations at the Roman Fort of Bar Hill, 1978–1982', *Glasgow Archaeol J*, 12 (1985), 49–81.
- Keppie, L J F & Murray, J F 1981 'A Roman hypocausted building at Falkirk', *Proc Soc Antiq Scot*, 111 (1981), 248–62.
- Keppie, L J F & Walker, J J 1989 'Some excavation along the line of the Antonine Wall, 1981–1985', *Proc Soc Antiq Scot*, 119 (1989), 143–59.
- McCord, N & Tait, J 1978 'Excavations in the northern Annexe of the Roman Fort at Camelon, near Falkirk, 1961–3', *Proc Soc Antiq Scot*, 109 (1977–8), 151–65.
- Macdonald, G 1915 'Some recent discoveries on the line of the Antonine Wall', *Proc Soc Antiq Scot*, 49 (1914–15), 93–138.
- Macdonald, G 1932 'Notes on the Roman forts at Old Kilpatrick and Croy Hill', *Proc Soc Antiq Scot*, 66 (1931–2), 219–76.
- Macdonald, G 1933 'Notes on the Roman Forts at Rough Castle and Westerwood, with a postscript', *Proc Soc Antiq Scot*, 67 (1932–3), 243–96.
- Macdonald, G 1934 *The Roman Wall in Scotland*, 2 edn. Oxford.
- Macdonald, G 1936 'A further note on the Roman fort at Croy Hill', *Proc Soc Antiq Scot*, 71 (1935–6), 32–71.
- Macdonald, G & Curle, A O 1929 'The Roman Fort at Mumrills near Falkirk', *Proc Soc Antiq Scot*, 63 (1928–9), 396–575.
- MacMullen, R 1967 *Soldier and Civilian in the Later Roman Empire*. Harvard.
- McWhirr, A D (ed) 1979 *Roman Brick and Tile*. Oxford (= Brit Archaeol Rep, S 68).
- Maxfield, V A 1979 'Camelon 'South Camp': excavations 1975–79' in Breeze, D J (ed) 1979, 28–32.
- Maxwell, G S 1972 'Excavation at the Roman Fort of Crawford, Lanarkshire', *Proc Soc Antiq Scot*, 104 (1971–2), 147–200.
- Maxwell, G S & Wilson, D R 1987 'Air reconnaissance in Roman Britain 1977–84', *Britannia*, 18 (1987), 1–48.
- Miller, S N 1922 *The Roman Fort at Balmuildy (Sumerston, near Glasgow) on the Antonine Wall*. Glasgow.
- Miller, S N 1928 *The Roman Fort at Old Kilpatrick*. Glasgow.
- Olivier, A C H 1987 'Postscript: the nature of the Ribchester civil settlement', in Edwards, B J N & Webster, P V (eds) *Ribchester Excavations, Part 2: Excavations in the Civil Settlement 1969–1980*, Cardiff, 117–26.
- Owen-John, H S 1990 'Recent excavations at the Roman auxiliary forts at Loughor and Neath, West Glamorgan', in Burnham, B C & Davies, J L (ed), 1990, 40–8.
- RIB Collingwood, R G & Wright, R P 1964 *The Roman Inscriptions of Britain* 1. Oxford.

- Robertson, A S 1942 'A Roman oven at Mumrills, Falkirk', *Proc Soc Antiq Scot*, 76 (1941-2), 119-27.
- Robertson, A S 1957 *An Antonine Fort: Golden Hill, Duntocher*. Edinburgh.
- Salway, P 1965 *The Frontier People of Roman Britain*. Cambridge.
- Sommer, C A 1984 *The Military Vici in Roman Britain*. Oxford (= Brit Archaeol Rep, 129).
- Speidel, M P 1987 'The Chattan War, the Brigantian Revolt and the loss of the Antonine Wall', *Britannia*, 18 (1987), 233-7.
- Steer, K A 1961 'Excavations at Mumrills Roman fort 1958-60', *Proc Antiq Scot*, 94 (1960-61), 86-132.
- Steer, K A 1964 'John Horsley and the Antonine Wall', *Archaeol Aeliana*, 4 ser, 42 (1964), 1-39.
- Thomas, G D 1988 'Excavations at the Roman civil settlement at Inveresk, 1976-77', *Proc Soc Antiq Scot*, 118 (1988), 139-76.
- Ward, J 1909 'The Roman Fort of Gelligaer: The Baths', *Trans Cardiff Naturalists' Society*, 42.
- Ward, J 1911 'The Roman Fort of Gelligaer: The Annexe', *Trans Cardiff Naturalists' Society*, 44.
- Ward, J 1913 'The Roman Fort of Gelligaer: Discoveries made in 1913', *Trans Cardiff Naturalists' Society*, 46.
- Webster, P V forthcoming a 'The pottery' in Bailey, G B forthcoming.
- Webster, P V forthcoming b 'The pottery' in Keppie, L J F forthcoming *The Roman Fort at Westerwood*.
- White, R B 1978 'Excavations at Brithdir, near Dolgellau 1974' in Boon, G C (ed) 1978, 35-62. p73
- White, R B 1985 'Excavations at Caernarfon 1976-77', *Archaeol Cambrensis*, 134 (1985), 53-105.
- Wilson, D 1863 *Prehistoric Annals of Scotland*, 2nd ed. Edinburgh.
- Wilson, D R 1970 'Roman Britain in 1969: sites explored', *Britannia*, 1 (1970), 269-304.
- Wilson, D R 1984 'Defensive outworks of Roman forts in Britain', *Britannia*, 15 (1984), 51-61.