

# The Roman Gask system fortlet of Glenbank, Perthshire

D J Woolliscroft and B Hoffmann\*

## ABSTRACT

*A geophysical survey and excavations in 1984 and 1999 confirmed the identification of the suspected Roman Gask system fortlet of Glenbank. The site was extremely poor in finds, but there was circumstantial evidence to suggest that it belonged with the Flavian tower chain rather than the Antonine re-occupation of the Gask forts. A number of nearby ring features seen beside the Roman road from the air were investigated in an attempt to trace the Gask line farther to the south-west, but appeared to be prehistoric in nature.*

## INTRODUCTION

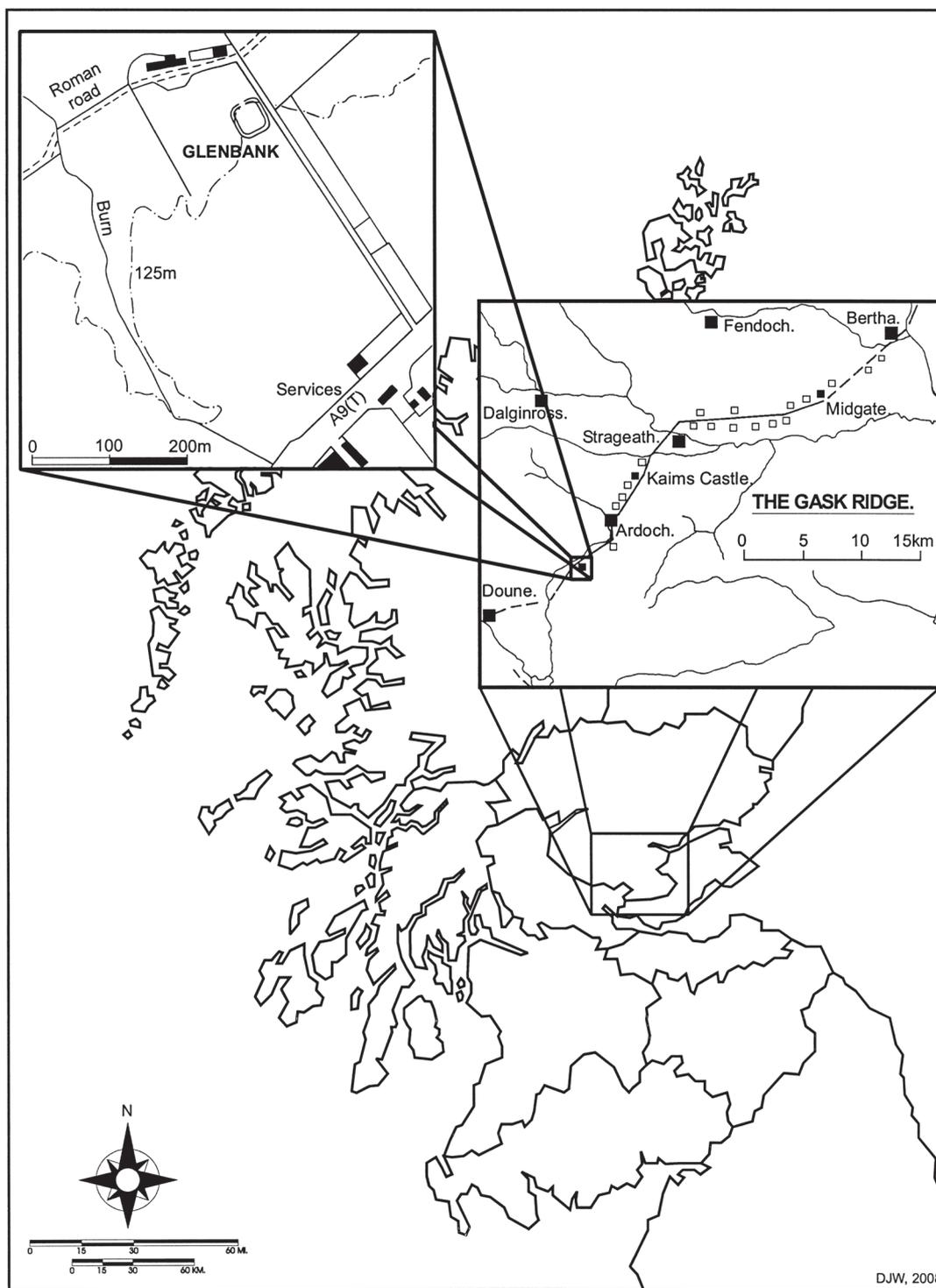
The site of Glenbank lies at NGR: NN 812 057 – close to the ruined farm of the same name – and was discovered from the air by the RCAHMS in 1983 (Maxwell & Wilson 1987, 16). It was quickly recognised as a possible Roman fortlet, belonging to the so-called ‘Gask line’, to complement the two already known at Kaimes Castle and Midgate and, if the identification proved correct, it would be the most southerly installation yet discovered on the line. It is 2.3km south-west of Greenloaning, the southernmost watchtower yet found, and would thus increase the total known length of the system to 37.43km (23.25 miles), measured from the fort of Bertha on the Tay. It is located on the south side of Strathallan, 52m south of the Gask Roman road (still in use here as a farm road) and c 320m north of the modern A9 (illus 1). It occupies a slight mound well above the valley bottom, with excellent views, especially to the north, east and west. To the north-east, it has all of the known Gask installations in sight as far as Kaimes Castle, including the fort of Ardoch, and it has a total of 10.5km (6.5 miles) of the Roman road

in view. The air photographs (eg RCAHMS neg PT15006) showed it to be surrounded by a double ditch, with a single entrance break, facing north-west towards the Roman road – a configuration it shares with the southernmost four towers on the system, which also have double ditches. Excavations conducted by G S Maxwell, the year after the site’s discovery, located gateposts at the entrance and found that the site (like other Gask installations) was deliberately demolished at the end of its service life (Maxwell 1990, 354). The work also produced a number of amphora fragments, which confirmed a Roman date. No detailed report was published, however, and the excavator has very kindly made his records available so that they could be integrated with the authors’ own work on the site.

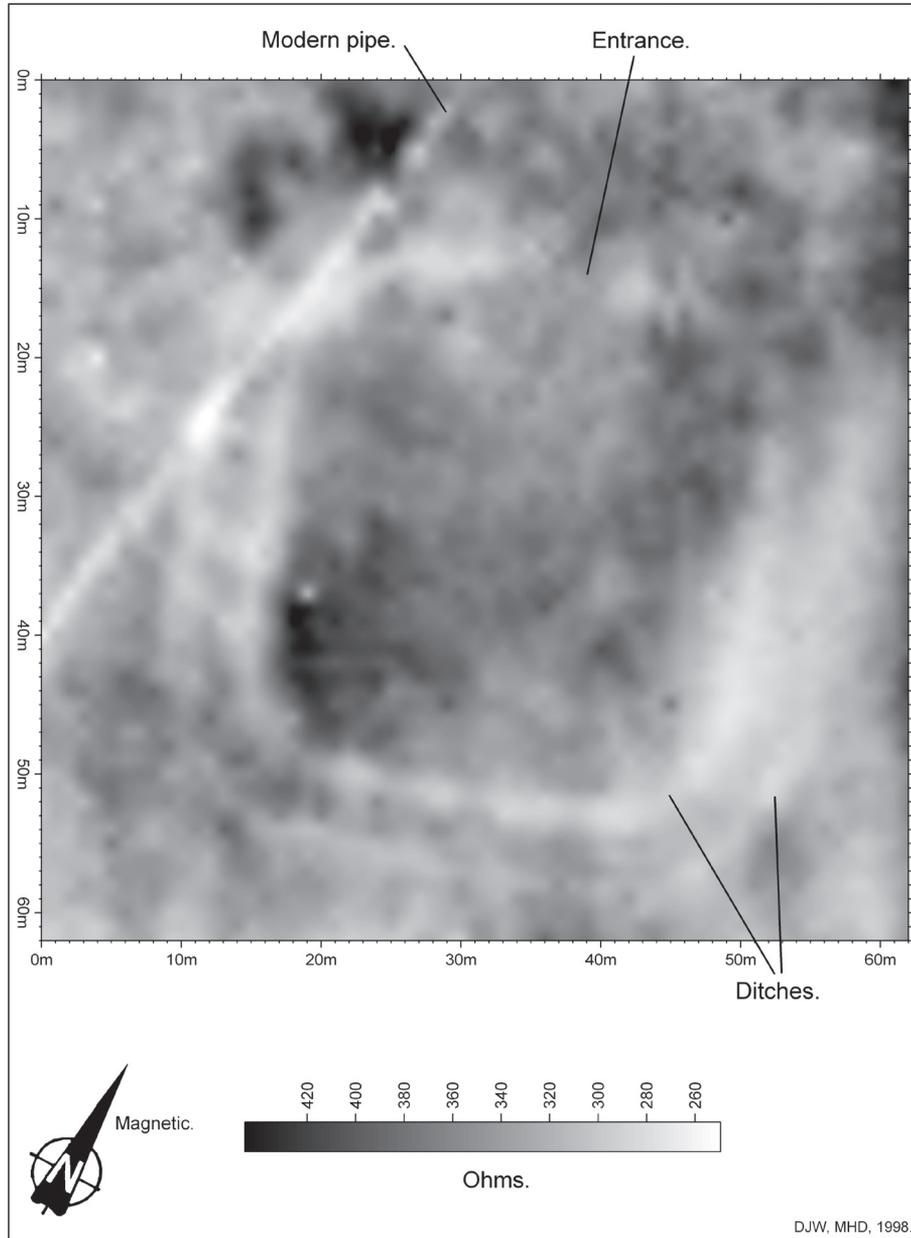
## THE GEOPHYSICAL SURVEY

To acquire more information ahead of larger scale excavations by the Roman Gask Project, a resistance survey of the site was conducted in 1998 (illus 2). The field proved to be reasonably responsive, and both ditches could be made

\* The Roman Gask Project, Department of Archaeology, SACE, University of Liverpool, Liverpool L69 3GS



ILLUS 1 Glenbank, location plan



ILLUS 2 Glenbank resistance survey

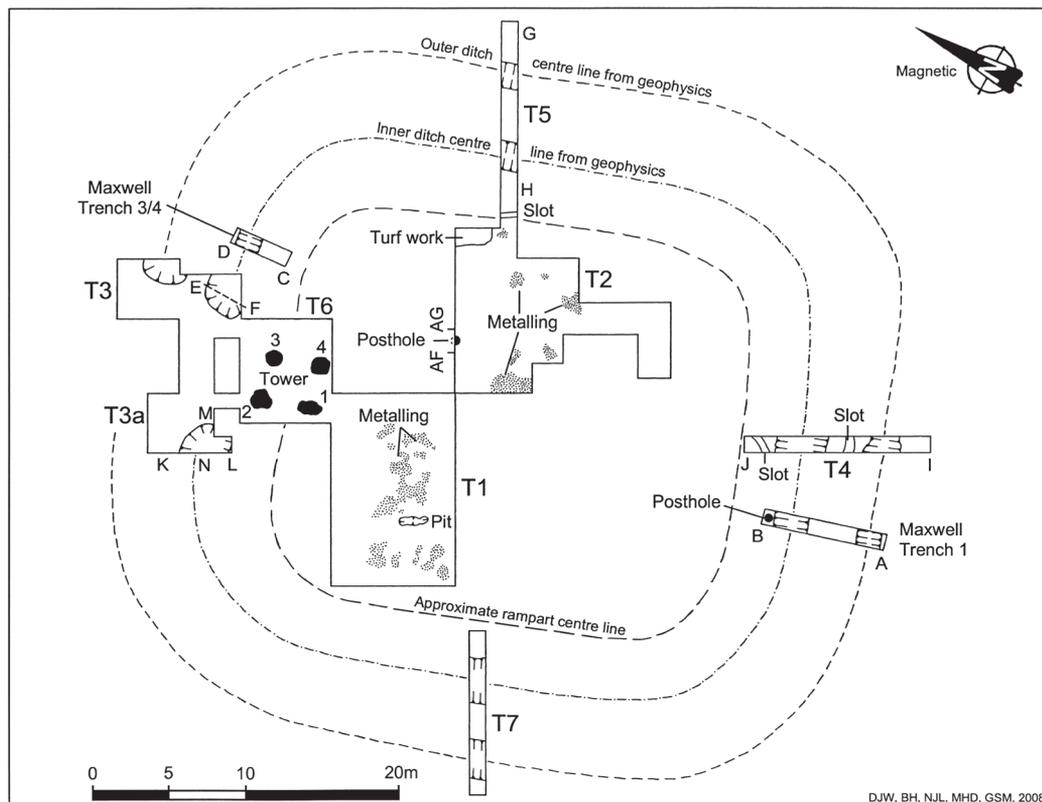
out as clearly separated parallel bands of low resistance around their entire circuits, although the NW corner was crossed by a straight, north/south running, low-resistance feature: probably

a modern pipe. The outer ditch measured c 51m (north/south) × c 49m (east/west) externally, and the inner ditch was c 41m (north/south) × 39m (east/west), with an inter-ditch separation (lip

to lip) of 3–4m. Both ditches seemed relatively slight, with the inner around 2–2.5m wide and the outer noticeably smaller. This is in keeping with the nearby double-ditched watchtowers, which also have unusually small ditches (Woolliscroft 2002, 92). The inner ditch entrance, at *c* 6m wide, was consistent with the 3m rampart entrance found by Maxwell, but the outer ditch entrance looked to be markedly larger: perhaps *c* 10m. This too is consistent with the nearby towers of Greenloaning and Shielhill South (Woolliscroft & Hoffmann 1997 & 1998), but the outer ditch became much fainter in the north-east, which made accurate measurements difficult. There was a hint in the survey image that the two ditches might join on either side of the entrance, rather than coming to separate butt ends, and

this impression is reinforced by air photographs. Resistance and cropmark data can both make ditches seem larger than they really are, however, so these indications were treated with caution. Greenloaning tower produced exactly the same effect but, on excavation, its ditches proved to stay wholly separate (Woolliscroft & Hoffmann 1997, 563ff). Unlike the neighbouring towers, no sign of an external upcast mound was detected, but the spoil may well have been ploughed away or used to backfill the ditches from which it came.

In the interior, two parallel areas of high resistance were visible on the eastern and western sides, which are suspected to be the remains of a rampart or (less probably) internal buildings. However, the features lay on the lines of more



ILLUS 3 Glenbank excavation plan

general bands of high readings, which ran north/south across the whole survey grid, and for which the cause is probably geological. Nevertheless, the entire interior showed a slightly higher resistance than the area outside the site, which suggested that it might have a metallised surface like the interiors of other Gask sites, for example Kaims Castle fortlet (Christison 1901, 20) and Greenloaning tower (Woolliscroft & Hoffmann 1997, 570f).

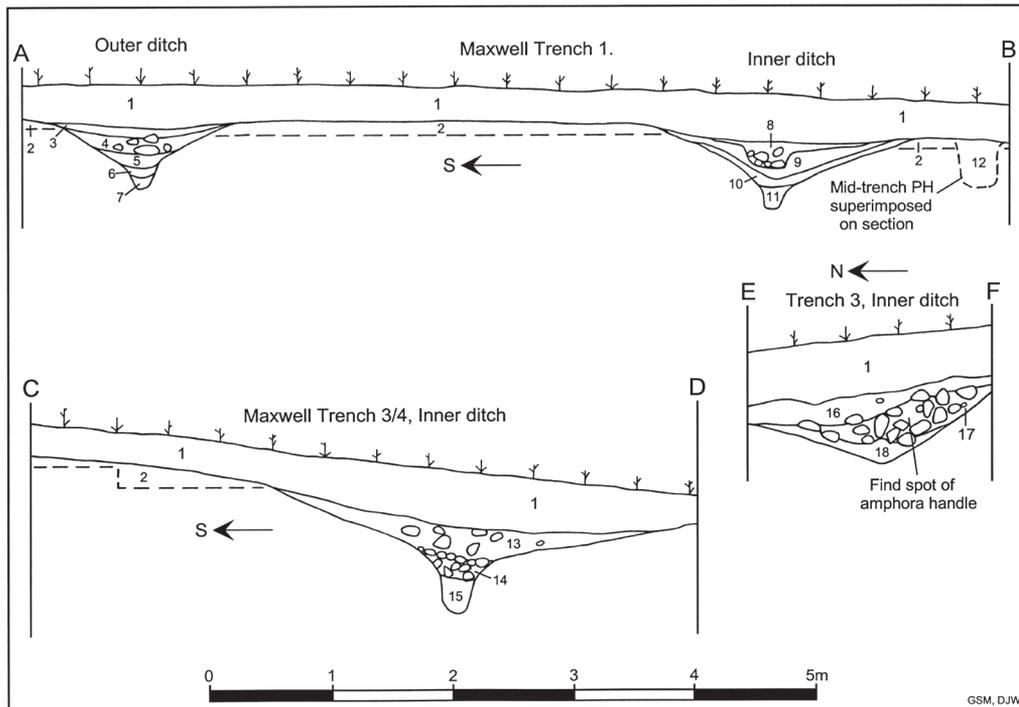
THE EXCAVATIONS

The 1984 excavation cut one section across both defensive ditches and two more across the inner ditch only. It also investigated a small area inside

the ditch entrance to search for a gate structure. The larger scale 1999 work made further studies of the ditch and opened areas in the entrance and interior to investigate the ditch butt ends and look for internal buildings (illus 3).

THE DITCHES

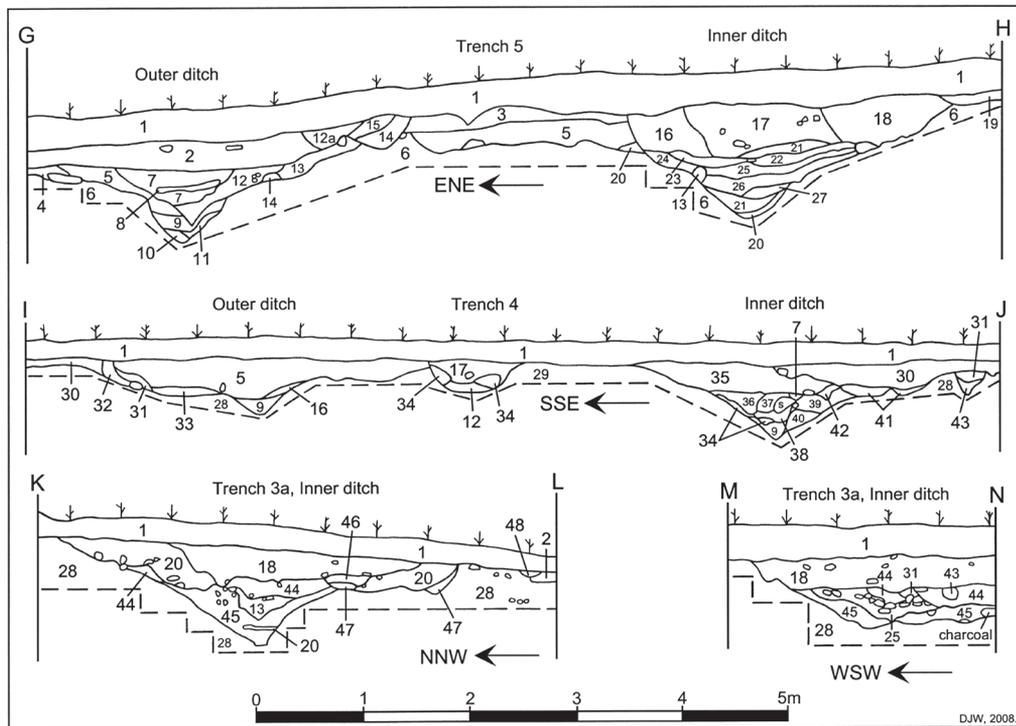
The 1984 section that cut through both defensive ditches was located a little to the west of the centre at the southern end of the site (illus 3 and 4, section A–B). It recorded two roughly V-shaped cuts, with shallow profiles, flared tops and marked, so called ‘ankle breaker’ bottom sumps. The inner ditch was 2.08m wide and 0.56m deep below the base of the modern plough soil (0.97m from the surface),



ILLUS 4 Glenbank: the 1983 ditch sections. 1 Turf and topsoil. 2 Natural gravel. 3 No description given on 1982 drawing. 4 Light red/brown silty loam with stones. 5 Grey loam with stones. 6 Brown gravel. 7 Sandy silt. 8 ? 9 Grey/brown loam. 10 Gravelly silt. 11 Grey sandy silt. 12 No description given. 13 Silty brown/grey sand with turf. 14 Burnt cobbles with charcoal. 15 Grey/brown sandy silt. 16 No description given. 17 Mixed stones (some burnt), turf and charcoal. 18 Silt

whilst the outer ditch measured 1.54m wide and 0.5m deep. The two lay 3.54m apart, lip to lip, or 5.18m at their bottom sumps, which in the case of the inner ditch was offset slightly to the south of the centre line. Their silting patterns appeared straightforward, with no signs of re-cutting or cleaning operations recorded. The only possible exception was a near vertically

sided layer at the top of the inner ditch fills (layer 8), which had the look of a cut feature, but was only 0.22m deep and 0.4m wide. The original drawings do not give descriptions for all of the layers recorded, but show a general progression from bottom silts and gravels, to more loamy layers above. The same trench also found a post-hole, 0.29m in diameter and 0.4m



ILLUS 5 Glenbank: the 1999 ditch sections. 1 Turf and topsoil. 2 Brown/grey gritty clay. 3 Brown clay with gravel. 4 Orange/brown clay. 5 Grey/brown clayey sand. 6 Natural orange sand. 7 Pink/grey clayey sand. 8 Pink/brown clayey sand. 9 Brown silty sand. 10 Pink/brown silty sand. 11 Gravel in pink/brown silty sand. 12 Brownish orange sand with loam. 13 Grey/brown silty sand. 14 Mid-brown silty sand. 15 Grey/brown clay and loam. 16 Orange/brown loam and sand. 17 Dark grey/brown grit and clay with charcoal flecks. 18 Mid-brown gritty clay with orange sand flecks. 19 Mixed topsoil and orange sand. 20 Orange/brown silty sand. 21 Yellow/grey silty sand. 22 Pale orange/brown silt. 23 Mixed orange and brown silty sand. 24 Orange/grey silty sand and gravel. 25 Grey sandy silt. 26 Orange silty sand. 27 Pale orange silty sand. 28 Natural yellow/orange sand. 29 Natural red gritty clay and gravel. 30 Dark grey loam. 31 Mid-brown gritty clay with gravel. 32 Mid-grey sandy loam. 33 Dark grey sandy loam. 34 Gravel in brown sand matrix. 35 Grey gritty clay. 36 Dark grey gritty clay. 37 Orange sand mottled with brown loam. 38 Grey/brown silt. 39 Yellow/orange sand and gravel. 40 Yellow/brown sand and gravel. 41 Dark grey silty loam with gravel. 42 Grey/brown humus rich sandy loam. 43 Dark brown gritty clay with gravel/Mid-brown gritty clay. 44 Orange/brown sandy silt. 45 Brown/orange gritty silt with charcoal. 46 Orange/brown sandy silt with gravel. 47 Orange/grey sandy silt. 48 Orange/brown gritty clay

deep. This lay 0.36m to the north of the inner ditch, but there was no stratigraphic evidence to allow the chronological relationship between the two to be elucidated.

In 1999 a second section, Trench 4, was cut across the two ditches at a slight angle to the 1984 trench and, on average, 4.6m farther east (illus 3 & 5, section I–J). It revealed a similar pair of shallow V-shaped ditches, albeit the outer was rather more flattened in form, and there were no clear ankle breaker sumps. Greater stratigraphic complexity was also evident, however, which makes their exact dimensions less straightforward to determine. Originally, the inner ditch seems to have been around 0.64m deep and 2.72m wide, but at some point after a considerable depth of fill had formed, it was re-cut into a narrower, but slightly deeper form (L7, 9, 34, 35, 36 & 37), 0.71m deep and around 2.13m wide. This version was then cut by a much shallower saucer-shaped ditch (L30 & 41) with a distinct double bottom, 0.3m deep and at least 2.16m wide, although the feature extended beyond the excavated area.

Whether this was a third version of the fortlet ditch was uncertain, but its profile makes it seem unlikely, as does the fact that the inner ditch re-cut appears to have filled completely before it was dug. The same feature had also cut a small V-shaped slot that survived, 0.23m deep and 0.3m wide, and which was seen in plan to curve across the trench from north-west to south-east (illus 3). No relationship could be established between this slot and the fortlet ditch, except that both predated the L30/41 feature. It is possible that it represents the layer 8 vertically sided feature seen at the top of the

inner ditch in 1984. Its projected line would certainly take it close to this point and, if so, it would post-date the fortlet ditch. The two have very different profiles, however, and as no plan survives to show whether and in what direction L8 ran across the width of the 1984 trench, it seems safest not to speculate further. Likewise, it is not possible to say whether there was any relationship between the Trench 4 slot and the 1984 post-hole, although again the slot's projected line would take it close to this feature in such a way that the post-hole would



ILLUS 6 The outer ditch south section in Trench 5

sit slightly inside the curve and therefore might form an associated internal structural element.

The outer ditch was 0.52m deep, which was a close match for its size farther west, but at 3.13m wide, it was more than twice as wide as it appeared in 1984, just a few metres away. This left the ditches just 1.87m apart, lip to lip, but still 4.86m apart at their bottoms. The outer ditch's very flared top, particularly evident where filled by layer 5, appeared to sit ill with the shape of the rest of the profile, but there was no solid evidence that this represented a reworking. It had, however, been cut by a round profiled slot (0.31m deep and 0.89m wide) at some point after it had filled completely. This

feature (L12, 17 & 34) was clearly visible in plan curving across the trench, roughly from east to west (illus 3) and narrowed noticeably towards the east, but its full extent and morphology cannot be estimated except to say that it was not picked up farther west in the 1984 trench.

The 1999 Trenches 5 and 7 (illus 3) examined the eastern and western ditches. Trench 7 in the west uncovered them in plan only and found both to be larger than in the south, with the inner ditch 3.18m across and the outer ditch 2.6m. Trench 5 cut full sections (illus 5, section G–H) and again found the ditches to be more substantial than in the south. Both were flared V-shapes in section, with no bottom slots. The outer ditch (illus 6) measured 0.97m deep (from the plough soil base) and at least 2.87m wide, although the inner lip had been damaged by later activity. The inner was 1.08m deep and at least 2.46m wide, but again the inner lip was obscured. They lay 5.3m apart at their bottoms and approximately 2.6m lip to lip. The outer ditch showed signs of having been re-cut on a rather smaller scale, 0.8m deep and 1.6m wide, but still with a flared V-shape and no bottom sump (layers 7, 8 & 12). This had only been dug after the initial profile had filled to a considerable depth, which suggested that a significant amount of time had elapsed, but no corresponding re-cut was found in the inner ditch. The outer ditch's inner lip had been truncated by a series of shallow groves (layers 12a, 14 & 15) at a point after the fortlet ditch had filled completely. The inner ditch's inner lip had also been cut, this time by a round profiled pit (L18), 1.27m in diameter and up to 0.47m deep, which may itself have been cut into an earlier pit (L17).

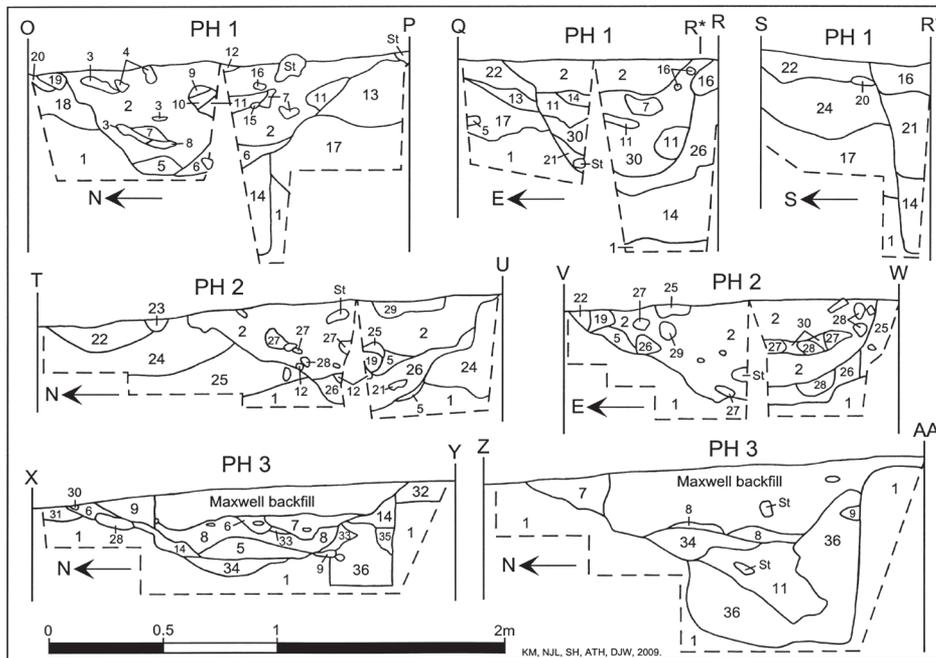
The two remaining 1984 inner ditch sections lay to the east of the entrance in the northern part of the site. The first (illus 3 & 4, section C–D) found a somewhat larger flared V-profile with bottom sump, similar to that seen by the same excavation in the south. It was 3.1m wide and 0.71m deep from the plough soil base. The ground at this point slopes down towards the north and the ditch had obviously been cut perpendicular to

the angle of slope, rather to a level, thus putting the entire feature, and especially its bottom slot, at an 8.5 degree angle to the vertical. There were no apparent signs of cleaning, re-cutting or other stratigraphic complexity, but the upper fills contained turf (L13), burnt cobbles and charcoal (L14) above a silt layer (L15). The upper fills suggest demolition material, and similar deposits have been found at other Gask sites in the area (eg Woolliscroft & Hoffmann 1998, 447ff & Woolliscroft 2002, 71ff). The bottom silt was surprisingly shallow at just 0.28m. By itself, this might suggest a short occupation, but the re-cutting visible elsewhere on the site and the fact that this had generally been done after a significant depth of fill had formed in the initial ditches would appear to contradict this. It is thus possible, although far from proven, that the ditch here was re-cut in a way that completely destroyed its original profile.

The final 1984 section (illus 3 & 4, section E–F) lay much closer to the entrance butt end (1.09m as against 4.55m) and produced a shallower, more purely V-shaped profile with no bottom slot. The inner (southern) face was markedly steeper than the outer. The trench was slightly narrower than the ditch and so missed its southern lip, but the feature was 0.59m deep and its fairly evenly sloping south side allows its width to be extrapolated as *c* 2.02m. Its fills again involved a shallow silt deposit (L18) overlain by turf, burnt stones and charcoal, which may be demolition materials (L17). A Roman amphora handle was found amongst the latter, but cannot now be located.

The 1999 excavation opened a more substantial area over the ditch entrance (illus 7), to investigate the possibilities raised by the geophysical survey, and found the 1984 butt end section exactly where it had been anticipated, which provided a useful check on both digs' surveying accuracy. The ends of both eastern ditches were examined but, on the western side, time only allowed the inner ditch to be uncovered. The resistance plot had hinted that the inner and outer ditches might merge at the entrance, a





ILLUS 8 Glenbank post-holes, part 1. 1 Natural yellow/orange sand. 2 Mixed grey turf, red clay and charcoal. 3 Dark grey/brown loam and sandy silt. 4 Orange/brown gritty clay with charcoal. 5 Orange/brown gritty clay with pea gravel. 6 Grey/brown gritty clay with some pebbles. 7 Clean grey/brown gritty clay. 8 Grey/brown gritty clay with grey inclusions. 9 Grey/brown silty sand with charcoal. 10 Clean grey/brown silty sand. 11 Soft orange/brown sandy silt with pea gravel. 12 Charcoal. 13 Soft grey/brown sandy silt. 14 Coarse orange/brown sand and gravel. 15 Dark grey sandy silt. 16 Soft orange/brown gritty clay. 17 Dark grey/brown sandy silt with light grey inclusions. 18 Loose fine orange/brown sand. 19 Fine grey/brown sandy silt with pebbles. 20 Grey/brown silty sand. 21 Clean orange/brown sandy silt. 22 Dark orange gritty clay. 23 Light brown clean silty sand. 24 Orange/brown gritty clay with pebbles. 25 Pink/grey gritty clay. 26 Grey/orange sandy silt with charcoal. 27 Pale grey turf. 28 Mid-brown gritty clay. 29 Dark brown loam. 30 Mixed mid-and pale grey loam with charcoal. 31 Red/brown silty sand. 32 Pea gravel. 33 Yellow/brown sand. 34 Orange/brown silty sand with grey flecks. 35 Mixed orange/brown clay and sand. 36 Pink/brown silty sand

turfy loam, charcoal and burnt stones, which was interpreted as demolition material. These pits were generally rounded in profile and up to 0.52m deep (eg illus 8, PH 2, section T–U), but the Maxwell excavation found that in PH 4 to be deeper (0.69m) and more V-shaped (illus 9, section AB–AC). These features had cut into the deeper (up to 0.92m) post-holes themselves, which were more rectangular in form, vertically sided (illus 8, PH 1, L14, PH 3, section Z–AA, L36 and illus 9, PH 4, section AD–AE, L8) and

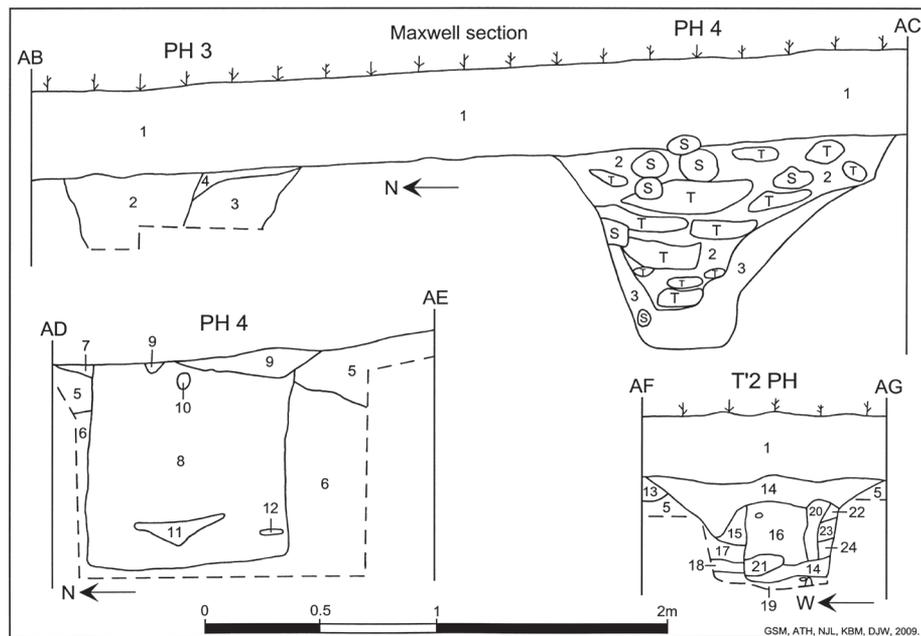
rather narrower (up to 0.86m). Only one showed what might be the remains of a post pipe (illus 8, section Z–AA, L11 & illus 10), but this was much distorted and lay at a c 55 degree angle to the vertical, so that the size and shape of the original timber could not be determined. The overall impression was thus that the posts had originally stood in post pits – packed with earth rather than chock stones – to form a structure of around 9.25 square metres, which was interpreted as a gate tower of the kind generally found in

Roman fortlets. At the end of the site's life, they had then been partially exposed by demolition pits which had been dug around each post to at least half its depth, thus destabilising the timbers enough to allow them to be lifted or rocked out (hence the angle of the PH 3 post pipe). The resulting pits had then been filled in with burnt demolition debris, which included flecks of what appeared to be burnt daub (eg illus 8, PH 1, section O-P, L4), and a great deal of turf that may have come from a rampart. There were no signs that any of the posts had been replaced in service in the manner seen in some of the Gask watchtowers (Woolliscroft & Hoffmann 1997, 572; Woolliscroft 2000, 498ff) and no traces of

*in situ* turf work were found on either side of the structure that could have marked a rampart base.

THE INTERIOR

Two areas were opened in the interior, covering much of the northern half (illus 3, Trenches 1 & 2). These revealed a layer of metalling, much of which had been so badly damaged by ploughing and animal burrows that it had been reduced to little more than a scattered gravel layer. The few surviving intact areas (illus 3) consisted of a mix of heavy gravel and small cobbles (up to 60mm), rammed into a thin clay layer. The



ILLUS 9 Glenbank post-holes, part 2. 1 Turf and topsoil. 2 Mixed turf, stones and charcoal. 3 Sandy loam. 4 Not recorded. 5 Dark natural orange gritty clay with gravel. 6 Natural yellow/orange sand. 7 Brown loam. 8 Fine orange/brown sand with pebbles. 9 Grey/brown sandy silt with charcoal. 10 Brown/grey sandy silt with charcoal and clay flecks. 11 Orange/brown gritty clay with pebbles. 12 Dark grey sandy silt. 13 Rich brown sandy loam. 14 Dark brown gritty clay with gravel. 15 Mid-brown gritty clay with large pebbles. 16 Loose mid-brown gritty clay with charcoal. 17 Light brown gritty clay. 18 Light mid-brown very gritty clay. 19 Soft orange silty sand. 20 Pink silty sand. 21 Dark brown gritty clay with charcoal and pea gravel. 22 Clean dark orange/brown gritty clay. 23 Dark brown gritty clay. 24 Dark pink/brown gritty clay

metalling was later removed in the search for underlying structures, but, despite a careful search, almost no features were found. The only exceptions were a small pit in Trench 1, 1.78m long, but only 0.54m wide and 80mm deep, and a post-hole in Trench 2 (illus 9, section AF–AG) for a square sectioned timber 0.25m wide and set 0.41m below the modern plough soil base (a similar size to that found in the southern 1984 ditch section). However, neither of these features lay under intact metalling. Consequently, their stratigraphic relationship with the fortlet could not be determined, and they may be unconnected with it. Trench 2 was later extended to the south to test for the possibility of a building opposite the entrance along a southern rampart back, but once again, nothing was discovered.

It had been hoped that Trenches 1 and 2 might yield traces of an east and west rampart, despite the fact that Trenches 4 and 6 had failed to find such signs in the north and south. Trench 1 drew a similar blank, as did the eastern end of Trench 7, but the north-east corner of Trench

2 did reveal a thin layer of laid turf. Only a 3.2m (north/south) × 1.23m (east/west) patch survived within the trench, but this was enough to confirm that the site had at least had a rampart. Moreover, the turf sat on a layer of the same clay and gravel metalling seen elsewhere in Trenches 1 and 2, which implied that the interior had been metalled right across *ab initio*, and that the rampart was only constructed once this surface was completed so that it could use it as a base. The turf-work appeared to extend beyond the excavated area so Trench 5 was lengthened to link up with Trench 2, in the hope of determining the rampart width. Nothing more survived in this area, however, except for a straight slot with a rounded profile (*c* 0.2m both wide and deep), whose relationship to the fortlet could not be established. Time and scheduled monument's consent constraints did not allow more of the area to be opened so the exact rampart width and the size of the berm between it and the inner ditch remains unknown. However, it is possible to make



ILLUS 10 Glenbank gate post-hole 3 in section showing original post-hole and demolition pit

estimates. For example, if we assume that the western limit of the Trench 2 turf does at least approximate to the rampart back, this would lie 5.4m inside the ditch's inner lip. If we also assume that the gate tower's north and south ends roughly correspond with the rampart's front and rear faces, this would make them 3.3m apart and so the berm would be *c* 2.1m wide. If these figures are roughly correct and consistent all the way round, the interior would thus measure *c* 24.7m (north/south) × 22.2m (east/west), which equates to dimensions over the ramparts of *c* 31.3m × 28.8m.

## CONCLUSIONS

The principle aim of the 1999 excavation was to study the dating and internal anatomy of a Gask fortlet. The other two known examples, Kaims Castle and Midgate, were excavated over a century ago by David Christison (1901, 18ff & 32ff), but no datable material was recovered. Likewise, no internal structures were found, except for layers of metalling (best preserved at Kaims Castle), although one would normally expect at least one and probably two rectangular buildings, fronting onto an internal road to the gate. Christison did not lift this surface to find out what lay beneath it and, at the time, there was perhaps little reason why he should. We now know far more about what to expect of such sites. Moreover, we know that at least some of the Antonine Wall milefortlets (eg Wilderness Plantation: Wilkes 1974, 57) had their interiors cleared of buildings and cobbled over at some point during their service lives, although occupation of some sort continued, perhaps just the use of the gate tower as a watch post. The present excavation was thus intended to look further into this point. In the event, a badly damaged metalled surface was uncovered to parallel those at the other two fortlets, but nothing was found underneath it, despite the fact that around 40% of the interior was excavated. There was, in fact, no evidence that any kind

of building had ever been raised in the interior, except for a single, relatively small post-hole which, stratigraphically, need not date from the Roman occupation. This is curious to say the least. There are a very few other possible fortlets with no known internal buildings, for example Pen-y-crogbren and Llanfair Caereinion in Wales (Nash-Williams 1969, 142ff), but these have been less intensively studied than Glenbank so features may have been missed. It does seem extremely odd for the Romans to have fortified an empty enclosure and then continued to maintain its ditches. It could be that occupation was intermittent and in tents – something that has been suggested in at least parts of some larger installations (Gechter 2001, 172) – or that there were buildings that, for some reason, are no longer archaeologically detectable. Perhaps they were of mud brick or turf walled construction, or founded on sleeper beams that rested on, rather than cutting into, the surface. In any of these cases the remains may have been ploughed away long ago but, if so, it is still strange that no datable finds were recovered. The Gask watchtowers are notoriously poor in finds, but this is in keeping with Roman timber towers elsewhere. One might, on the other hand, have expected any fortlet that was ever properly completed and occupied to be different. This is largely speculation, however, and all that can be said with certainty is that we still have no evidence to suggest that any of the Gask fortlets had internal buildings, or indeed other occupation features such as hearths.

The issues outlined above raise the question of the site's date. The 1984 excavation found a small number of amphora sherds but, although these do at least confirm a Roman date, they were not more closely analysed at the time and now seem to have disappeared. The 1999 dig, on the other hand, found no datable artefacts, except for a scatter of Mesolithic material (report below), despite the fact that all of the stratified material excavated was sieved. However, the site is manifestly not Mesolithic. Its morphology is clearly that of a Roman fortlet,

and it was presumably built on an area of earlier activity by chance, as were a number of other Gask installations (eg Woolliscroft 2000, 504f; Woolliscroft & Hoffmann 2001, 159). Certainly the site fits well with the two other Gask fortlets. Kaims Castle, for example measures 49m × 58m (externally) over its single ditch, whilst Midgate is 42m × 48m. In theory, Glenbank should not be directly comparable because it has a double ditch, but its outer ditch matches well, measuring 47.6m × 51m. The presence of Glenbank's inner ditch might have been expected to make the fortlet itself smaller than its siblings. After all, the double-ditched towers in this southern sector have outer ditch external diameters not dissimilar to those of the single-ditched examples farther north, but even allowing for their unusually narrow ditches, they still have much smaller interiors (Woolliscroft 2002, 92ff), which suggests that it is the inner ditch and not the outer that is the additional feature. Yet Kaims Castle and Midgate have wider rampart berms, as well as heavier ditches, so the size of the Gask fortlets themselves becomes fairly consistent. Kaims Castle measures 20m × 22m internally, while Midgate is 20m × 23m, and if the estimate given above of *c* 22.2m × 24.7 for Glenbank is at least reasonably accurate, it might even be the largest of the group, however fractionally. It therefore seems likely that all three fortlets are Roman, whilst such uniformity suggests that they are contemporary with one another, but is it possible to date them more closely?

As already mentioned, Christison's work at Kaims Castle and Midgate also failed to produce datable material but this is not unusual for the Gask line. The entire 18-strong tower chain has yielded just a tiny handful of finds (albeit enough to indicate a Flavian date), despite the fact that almost all of the sites have now been excavated, at least to some degree. In the absence of dating evidence, there is no guarantee that the fortlets belong with the Flavian towers at all. After all, the three Gask forts (Ardoch, Strageath and Bertha) were reused in the Antonine Period, presumably as outposts for the Antonine Wall,

as was the Highland line fort of Dalginross (Woolliscroft 2002, 40ff), and recent work by the writers would suggest that even the Gask road itself might be Antonine – at least in the substantial, finely engineered form in which we now find it (Woolliscroft forthcoming). The possibility cannot be discounted, therefore, that we have a Flavian system of forts and towers and an Antonine one of forts and fortlets. Indeed, this appears to be a better balanced, and more attractive, scenario, especially as elsewhere this type of small fortlet tends to be far more common in the 2nd century than the 1st. The lack of internal buildings might raise doubts, given that even the Antonine Wall fortlets had such structures at first. But there is at least one piece of evidence to more strongly suggest that the fortlets were Flavian: the simple fact that Glenbank, like the four towers of the southernmost Gask sector, had a double ditch, whilst Midgate and Kaims Castle, like the northern towers, had only one. This could of course be coincidence, but that does seem rather unlikely given the human lifetime gap between the Flavian and Antonine occupations. It seems more probable that the ditch configurations provide evidence for integration between the two site types, especially as the southern towers also match Glenbank in having their inner ditch rather larger than the outer. The light nature of Glenbank's ditches is also in keeping with the double-ditched towers and with early fortlets (eg Fox & Ravenhill 1966), although the tower ditches are usually more uniform in size around their circuits. Antonine fortlets in Scotland, on the other hand, tend to have more substantial ditches, for example Durisdeer, whose ditch is almost 4.3m wide in places (Clarke in Miller 1952, 125) and Barburgh Mill, whose ditch can be up to 6.7m wide and 2.2m deep (Breeze 1974, 132).

There are also wider parallels that hint towards a Flavian date. For example, the four-post gate tower design sits ill with the milefortlets of the Antonine Wall, whose north gates (like those of Hadrian's Turf Wall (Simpsons et al

1935, 220ff)) generally have more than this (perhaps up to 14 (Wilkes 1974, 55)), set in post trenches rather than independent post-holes (Keppie & Walker 1981, 144f; Bailey & Cannel 1996, 310f). Free-standing Antonine fortlets also tend to have more than four gate posts, for example the six at Barburgh Mill (Breeze 1974, 133ff). On the other hand, the gates of the few known early small fortlets, such as Old Burrow in Devon (Fox & Ravenhill 1966), more closely resemble Glenbank. Likewise, although the site's two ditches come to separate butt ends on either side of the entrance so that the typical Flavian

'parrot beaks' were absent, the flared entrance, in which the entrance gap becomes progressively narrower as one moves from the outer ditch to the gate tower, does still show parallels of intent with that design.

At the forts, the funnelling was probably meant to cause confusion among an ordered rush (Woolliscroft & Hoffmann 2006, 48). An attacking force would have been able to pass through the outer ditch on quite a broad front, but would then find itself rapidly compressed as the inner ditch break was much narrower. Some of its outermost members might even be

TABLE 1  
Tower areas

<i>Gask sites</i>		<i>Other sites</i>	
Glenbank	9.25m <sup>2</sup>	Garnhall Antonine Wall tower	18.67m <sup>2</sup>
Greenloaning	22.31m <sup>2</sup>	Wilderness Plantation Antonine	
Blackhill Wood	12.96m <sup>2</sup>	Wall milefortlet	c 8.45m <sup>2</sup>
Shielhill South	12m <sup>2</sup>	Barburgh Mill Antonine fortlet	7.2m <sup>2</sup>
Shielhill North	15.75m <sup>2</sup>	Milecastle 50 Turf Wall on	
Westerton	9.5m <sup>2</sup>	Hadrian's Wall	17.14m <sup>2</sup>
Parkneuk	10.22m <sup>2</sup>	German Limes tower 1/11	10.03m <sup>2</sup>
Raith	7.54m <sup>2</sup>		
Roundlaw	12.96m <sup>2</sup>		
Kirkhill	8.41m <sup>2</sup>		
Gask House	7.44m <sup>2</sup>		
Witch Knowe	9.18m <sup>2</sup>		
Moss Side	11.23m <sup>2</sup>		
Westmuir	12.25m <sup>2</sup>		
Huntingtower	12m <sup>2</sup>		

pushed into the ditches, but the others would be forced to bunch up, causing confusion at a time when they would already have been under fire from the rampart and gate tower, and they would then become further compressed towards the still narrower gate itself. Whether a small, lightly-manned fortlet was meant to be defended in the same way is arguable, but the basic design philosophy appears to persist. Moreover, there are parallels at fortlets on the Danube, which also tend to be 1st century, for example Nersingen and Burlafingen (Mackensen 1987). Finally, studies of the likely signalling arrangements of the Gask would suggest that the entire system would break down without Kaims Castle, as this is the only installation in visual contact with both Ardoch and Strageath and so able to provide a relay link between the two (Woolliscroft 1993, 295ff).

The end of occupation at the site shows additional parallels with the Gask towers, for they too show thorough demolition, with the resulting materials burnt on site. They also show the same concern with tidiness thereafter with post-holes being neatly filled in (eg Woolliscroft & Hoffmann 1998, 447ff; Woolliscroft 2002, 71ff). The fact that small amounts of what appeared to be burnt daub were found amongst the demolition materials also fits the pattern. Similar material has been found amongst the watchtower remains, suggesting that they may have had wattle and daub side cladding. Even the ground plan of the Glenbank tower fits well with the watchtowers, for many of these are also rectangular, and its *c* 9.25 square metre area falls comfortably within their size range (Table 1). That said, other Roman timber towers have similar dimensions, which means that this is less useful as a dating criterion. Finally, the fact that Glenbank's internal surfacing was primary and laid before its rampart was built, matches a similar progression at the nearest Gask tower, Greenloaning (Woolliscroft & Hoffmann 1997, 570), where the internal surfacing was cut by the ditch. Again this may prove to be a more general feature of minor Roman military sites, for the writers' excavations at the Antonine Wall tower

of Garnhall found evidence that the entire tower was built before its ditch was dug, presumably for convenience of construction (Woolliscroft & Hoffmann forthcoming). The 19th-century excavations at Kaims Castle and Midgate did not test to see whether the same relationship held good there as well. Nevertheless, it does serve to differentiate further the Gask fortlets from those of the Antonine Wall where the internal metalling was clearly secondary.

Whatever its date, Glenbank does not fit the spacing sequence of the southern Gask towers. Over most of the line, the watchtowers are set at seemingly random intervals, but the southern, double-ditched towers show a regular 3/5 of a Roman mile (887m) spacing. The fortlet does not lie on a multiple of this interval, however, being 2.3km from Greenloaning. Instead, there are signs that the fortlets might have their own six Roman mile (8.87km) spacing: it is six Roman miles along the Gask road from Glenbank to Kaims Castle and 12 Roman miles from Kaims Castle to Midgate. Moreover, the six mile point half-way from Midgate to Kaims lies at Raith, where a fortlet has been suggested from aerial indications close to the watchtower excavated in 1901 (Woolliscroft 1993, 297f), although recent geophysical work has caused the writers to doubt this identification (Woolliscroft & Hoffmann 2006, 122f).

The length of the site's service life is also somewhat uncertain. The Gask towers show signs of a surprisingly long occupation, for several now appear to have had their towers rebuilt at least once, as well as having their ditches re-cut (Woolliscroft & Hoffmann 1998). The signs of re-cutting in at least some of Glenbank's ditches also suggest a reasonably long occupation, which is supported by the fact that they were only re-cut after filling to a considerable depth. It has to be said that at least some parts of the Glenbank ditches were cut into sand, which should have speeded their silting rate but, even so, the depth to which the outer ditch in section G-H (Illus 5) had silted before being re-cut still suggests prolonged occupation. On the other hand, there

were no signs that any of the tower posts had been replaced. This counters the evidence from the watchtowers, and might seem odd if the lack of internal buildings is taken to mean that the fortlet was never completed and was reduced to acting as part of the tower chain. But the size of the post-holes would suggest that the timbers involved may have been considerably larger than those used in the watchtowers and, as these should thus have been longer lasting, there may have been less need to replace them during the system's operational life. There is also another potential issue here. The fortlet at Midgate stands right beside one of the Gask watchtowers – indeed the two site's ditches come to within 13m of one another (Woolliscroft 1993, 3023ff; Woolliscroft & Hoffmann 2006, 134ff; but cf Hanson & Friell 1995, 514). There was obviously no need for two installations so close together so the two seem unlikely to be exact contemporaries. Assuming that the fortlets are Flavian, it seems likely that one replaced the other in service. Sadly, the sites are just far enough apart that their ditch upcast does not overlap, so it is impossible to tell which came first, but we are still left with a situation where one installation has been replaced by another of a totally different type, rather than simply having its original form rebuilt. This raises the possibility that the same process might have occurred at the other fortlets. At present there is little or no evidence so the matter remains a case for speculation, but the possibility is still intriguing, and if Glenbank followed the same pattern, it may not have functioned for as long as the watchtowers.

There has long been evidence that the Gask line was constructed in a series of distinct building sectors, characterised by slightly different installation designs and spacings (Woolliscroft 2002, 18ff; Woolliscroft & Hoffmann 2006, 235ff). It is possible, although not proven, that each of these may have been built by a different military unit in a similar way to the construction sectors of other Roman frontiers (eg Hanson & Maxwell 1983, 121ff). Whatever the case, it has

already been said that the southernmost part of the line is characterised by double-ditched towers and that Glenbank shares this configuration. It might thus be another relevant diagnostic feature for such sectors that the fortlets also vary in design. For Glenbank, on the southern sector, has its entrance set in its short axis, while Kaims Castle and probably Midgate have theirs in their long axes.

Finally, the evidence for prehistoric activity on the site should not be forgotten. The Mesolithic artefacts have already been mentioned, but the curving slots in Trench 4 may be roundhouse foundation slots. The relationship between these and the fortlet ditches could not be ascertained and roundhouses in general can date to both pre- and post-Roman times. Nevertheless, one assumes that the fortlet ditches survived as inconvenient surface features for some time after the Roman occupation so a pre-fortlet date seems more likely, although no sense can be gained of the length of time that might have elapsed between the roundhouse and fortlet periods. The two slots themselves appear to be on converging courses and seem unlikely to be exact contemporaries. That said, they might still represent little more than the rebuilding of what was essentially the same settlement. It is impossible to go beyond that without further excavation. It is also not possible to establish what, if any, connection these features might have to the pit in Trench 1 or the post-holes in Trench 2 and the southern 1984 ditch section. At present these features remain completely without a chronological context.

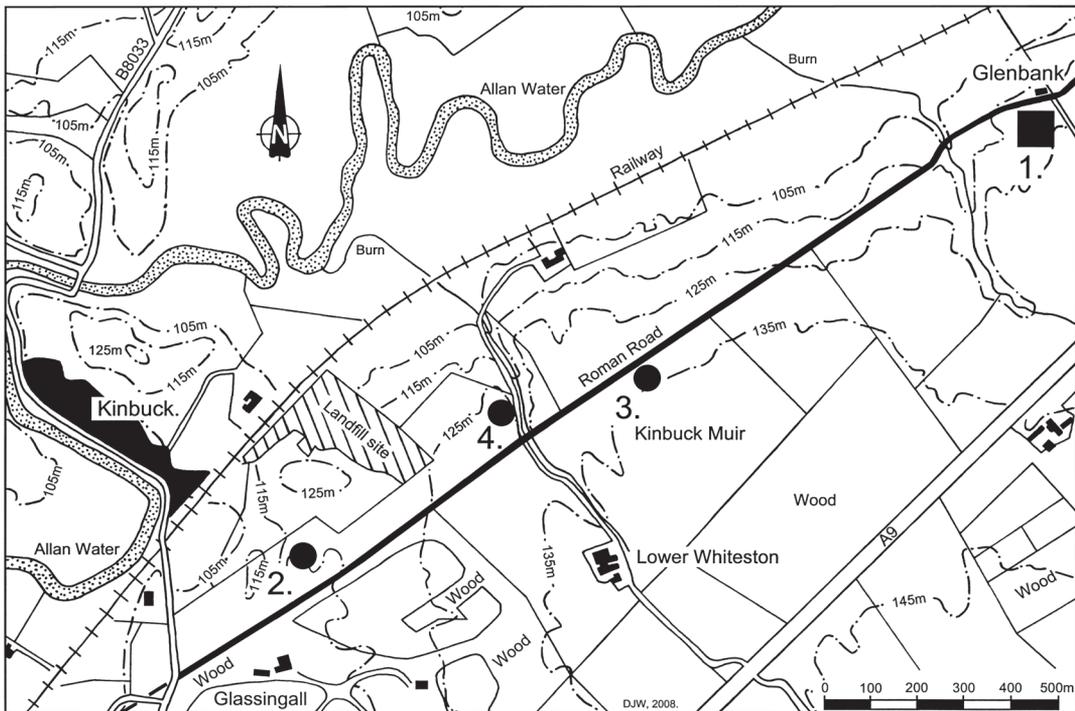
#### GLENBANK AND THE SOUTH-WESTERN END OF THE GASK SYSTEM

Glenbank has remained the southernmost known Gask installation for more than a quarter of a century, but it has always seemed unlikely that it was the real terminus: Roman frontiers almost always end with full-size forts rather than minor installations. They also usually rest on significant features, such as coastlines or

major rivers, whereas Glenbank appears to be in a more or less arbitrary position of no great strategic importance. Certainly the Gask road is known to run farther to the south, reaching at least as far as the fort of Camelon near Falkirk. An intermediate fort is known at Doune. Another has long been anticipated at Stirling and either of these latter positions would make a far more logical end to the system, lying as they do on rivers and the former Forth mosses.

Glenbank's current status might in fact result from a change in the modern farming regime rather than from ancient reality. Ten new Gask installations have been discovered since the Second World War: Glenbank itself and nine towers – all but one of which (Crawford 1949, 52) – were found from the air. As a result, the area to the south-west of Glenbank has long been monitored by air photographic flights, but there are problems which have rendered

the search less effective here. Firstly, although much of the Gask line between Glenbank and Bertha runs through arable land, large parts of the Forth valley and lower Strathallan are in pasture and therefore far less productive of cropmarks. Worse still, Gask installations are always found close to the Roman road, which on the known frontier makes it easy to know where to look for new sites. But there is a long stretch between Kinbuck and southern Stirling where even the approximate course of the road is unknown, and, until it has been traced, the search for more sites will obviously be hindered. There is, though, one short exception: the 1.3km sector between Glenbank (illus 11, 1) and Kinbuck. Here the road line is known with certainty – parts of it are visible on the surface, and much of its surroundings are in at least intermittent arable cultivation. As a result, the writers' own flights have paid close attention to the area and



ILLUS 11 Sites around the Roman road south-west of Glenbank

a number of new sites have emerged as a result. In particular, three ring features have been found at Glassingall, Kinbuck Muir and Lower Whiteston. The latter (illus 11, 4) (NGR: NN 800 051) appears too small to be a tower (Gask Project neg 04CN18#37). Its single entrance faces east, rather than south towards the Roman road (the pattern of all known Gask sites) and faint signs of a central macula may show it to be a ring cist. However, the first two sites seemed more worthy of consideration.

#### GLASSINGALL

The site (illus 11, 2) lies at NGR: NN 796 048, 72m north of the Roman road, here marked by a woodland track, and the discovery air photographs (eg Gask Project neg 06CN12#06) show a clear ring ditch. Only a single ditch could be seen, rather than the two of the southernmost Gask towers, but this is a minor issue because it is possible that Glenbank marks the end of the double-ditched sector just as Kaims Castle marks the end of the northern single-ditched group. Moreover, even in the known double-ditched area, the outer ditches are sometimes very slight and can show poorly from the air. No entrance break could be seen facing the Roman road, but the cropmark was at its least clear on its southern side. Likewise, the fact that the site lies to the north of the road (which one might see as being outside the line) is irrelevant because, unlike many Roman frontiers, the existing Gask installations are positioned apparently at random on either side of the road (Table 2). There was, though, one strong reason to doubt an identification as a tower: although the site lies above the level of the Roman road, there is higher ground to its immediate west and north-east in the form of two low knolls. It would thus have been ill chosen as a watch or signal tower because, although its views would have been reasonable from the likely height of a Roman tower, especially to the west, they would have been dramatically improved had one of the knolls been used. The north-eastern example

would have brought the site into visual contact with the nearest fort, Ardoch, without taking it

TABLE 2  
Distances between Gask sites and the Roman road

<i>Site</i>	<i>Distance from road</i>	<i>Position: inside/ outside the road line</i>
Glenbank	52m	Inside
Greenloaning	11m	Inside
Blackhill Wood	15m	Outside
Shielhill South	15m	Outside
Shielhill North	10m	Outside
Kaims Castle	15m	Outside
Westerton	10m	Inside
Parkneuk	25m	Inside
Raith	170m	Inside
Ardunie	10m	Inside
Roundlaw	20m	Outside
Kirkhill	40m	Inside
Muir o' Fauld	15m	Inside
Gask House	10m	Inside
Witch Knowe	70m	Outside
Moss Side	60m	Outside
Midgate	30m	Outside
Westmuir	40m	Inside
Peel	50m	Inside
Huntingtower	30m	Inside
Average	34.9m	

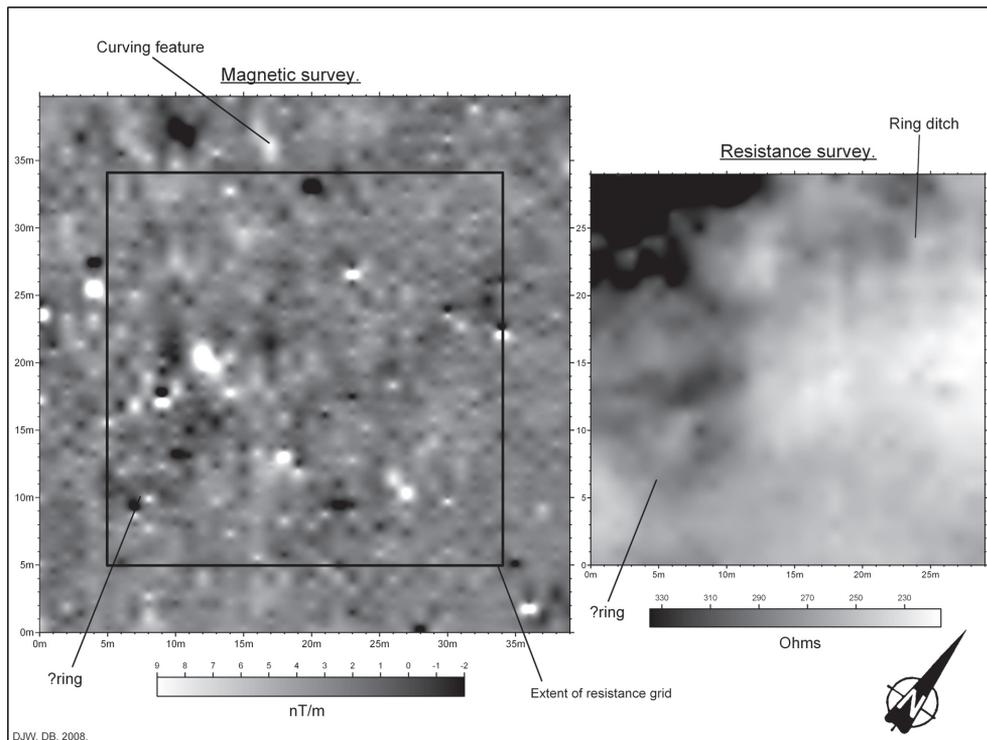
more than 150m from the road. This is still quite a distance, for the average Gask tower is only 35m from the line (Table 2), but it is still less than the tower of Raith, which was built 170m from the road, in order to exploit a similarly advantageous viewpoint.

To gain more information, resistance and magnetic surveys were conducted in 2008 (illus 12 & 13). Neither produced particularly clear data, but the ring ditch was visible as a 1–2m wide band of low-resistance readings (illus 13, A), although it proved to be more ovoid than it had appeared from the air, at *c* 14m in external diameter from west to east, and 17m from north to south. The aerial photographs had shown slight signs of a second, smaller ring *c* 7m to the SSW and this was also visible on the resistance plot. It showed as a *c* 10m diameter ring of high readings with a central low spot

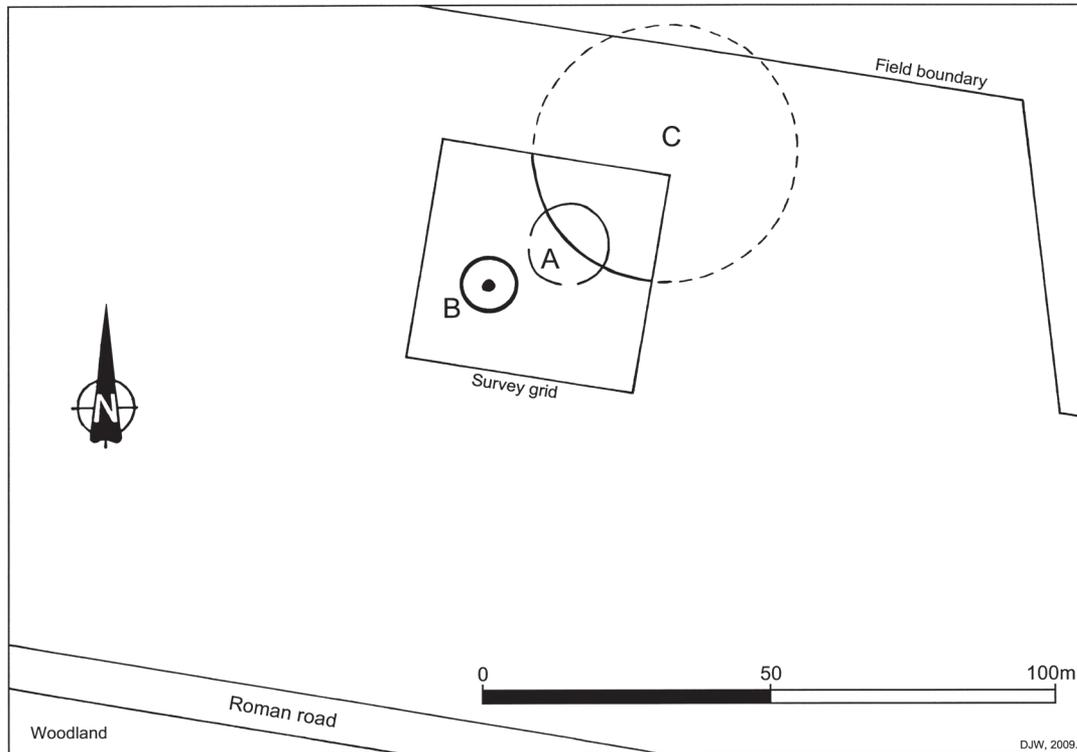
(illus 13, B), despite clearly being a ditch feature from the air. This is a common phenomenon in this area (eg Woolliscroft 2002, 62ff) and usually results from a ditch being backfilled with stones during field clearance.

The main ring feature did not show on the magnetic survey but there was a slight trace of the smaller ring. Perhaps the most interesting magnetic feature, however, was a 1–2m wide curving anomaly, which lay towards the grid's northern corner and did not show at all in the air photographs. The smooth curve suggests that the survey revealed part of a much larger circle, whose circumference would extrapolate to a total of *c* 46m (illus 13, C).

The survey seems to make it less probable that the ring seen from the air is a Roman tower. Its size is not incompatible with the known Gask towers, because the northernmost examples



ILLUS 12 Glassingall geophysical survey



ILLUS 13 Glassingall aerial and geophysical interpretation plan

(Westmuir, Peel and Huntingtower) are all between 15 and 16m in diameter (Woolliscroft 2002, 20). Nevertheless, the markedly oval shape does not sit well with the other known sites. Moreover, there are indications that the ring might have two ditch entrances, something that is unparalleled amongst the Gask towers. One does face south, towards the road, but there are stronger traces of another facing west. The fact that the magnetic survey failed to detect the feature might suggest that there was no burning present. This would also be unusual for a Gask tower, since almost all of the excavated examples have produced evidence that they were eventually demolished and the timber work burned on site (eg Woolliscroft & Hoffmann 1998, 450ff). An alternative interpretation of the feature as a roundhouse might also be threatened by the lack of burning, although it is possible that any trace

could have been ploughed away. Under these circumstances, the ring might best be seen as a barrow. This would also explain why no upcast mound was detected as an external band of high-resistance readings. The ditch or gully around a barrow was not a deliberate construction in its own right: it was simply a ring quarry for the central mound, so the upcast would be thrown inwards and the feature itself might be distinctly intermittent, thus giving the impression of multiple entrances. Even so, it remains possible that any external upcast has simply been ploughed away and the site's identity retains a degree of uncertainty.

The smaller circle (B) seems most compatible with a ring cist, similar to one excavated by the writers some miles to the south-west at East Coldoch (Woolliscroft & Hoffmann 2002, Feature C). If so, the central low-resistance area

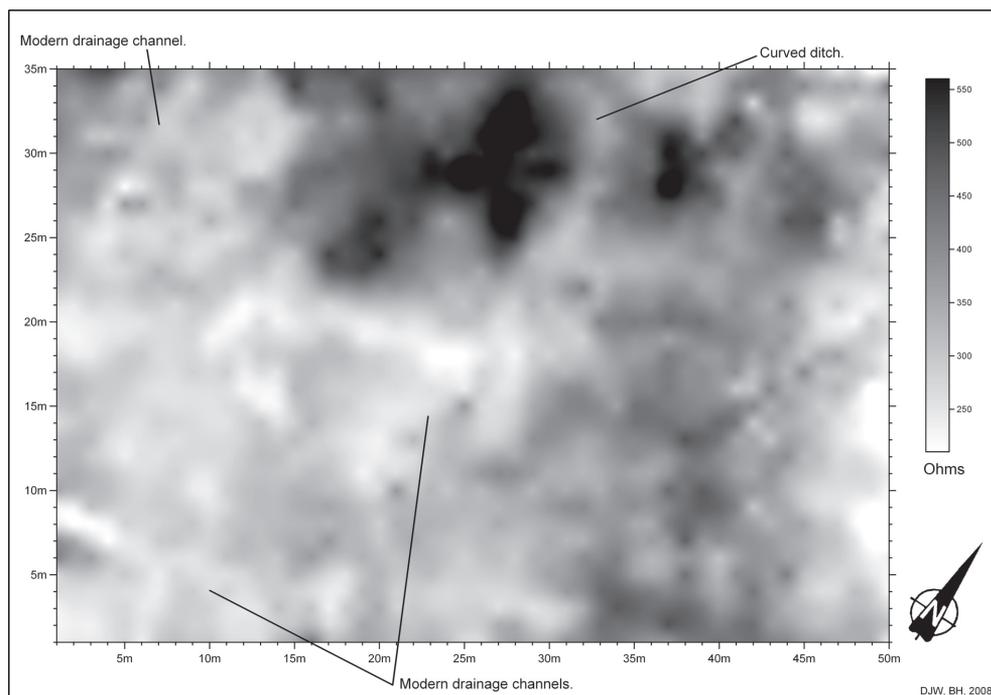
would presumably represent the burial cist itself. On the other hand, the large curving feature found by the magnetic survey would suggest a palisaded enclosure, especially as stones that may be pot boilers and a hammer stone were seen on the surface nearby.

#### KINBUCK MUIR

Air photography (Gask Project neg 08CN18#37) revealed a feature just south of the Gask road on Kinbuck Muir (NGR: NN 803 051), 830m to the ENE of Glassingall (illus 11, 3). The site lies on partly drained mossland and takes the form of a ring, defined by a reed-filled waterlogged hollow. This was truncated in the north by a large drainage ditch just inside the field boundary, which marks the southern side of the Roman road. Both aerial and surface inspection showed that the feature was at least partly made up of natural drainage

channels, crossed by artificial drains that once led to a railway reservoir. Nevertheless, the neatly circular overall shape looked suspiciously artificial, as if the gullies had intersected a ring ditch. The site enjoys superb views in almost all directions, and would have Glassingall and all the known Gask installations between Kaims Castle and Glenbank in sight from the height of a Roman tower. Moreover, it lies very close to a multiple of the southern Gask sector's 3/5 Roman mile spacing interval from the nearest known tower: Greenloaning.

To gain further information, a 35m (SE–NW) × 50m (SW–NE) resistance survey was conducted in 2008. The resulting plot (illus 14) shows the network of drainage features that had been apparent from the air as low-resistance bands. The ring feature was detected as a truncated circuit of low readings, c 2m wide. This surrounded an area of significantly higher



ILLUS 14 Kinbuck Muir resistance survey

resistance than the external background that appeared to grow wider towards the north. The feature was *c* 23m in diameter and more sub-rectangular in form than it had appeared from the air, with the southern part, in particular, being almost straight. As the aerial evidence had suggested, the ring showed considerable interference from the drainage channels, but it did still show signs of an underlying artificial construction, although it is difficult to determine exactly what does and does not belong to this.

The size of the ring feature is compatible with a Gask tower ditch, for the known examples range in diameter from 15m (Westmuir) to 25.55m (Shielhill South). It is not unusual for a Gask tower ditch to have a sub-rectangular plan, and the northern swelling of the central high-resistance area was seen on the surface to be caused by upcast from the modern drainage ditch, not the ring ditch. It thus remains possible that the site is a tower. Nevertheless, there are strong reasons to doubt it. Firstly, the ditch plan deviates more from the circular than any other Gask tower. Secondly, although the site is truncated by the modern drainage ditch, enough survives to allow an extrapolation of its full circuit, and this suggests that it originally extended *c* 5m farther to the north-west. This would have brought it right to the edge of the road, if not slightly farther, and although most Gask towers do lie close to the line, there is usually a separation of at least 10–15m (Table 2). Finally, the high resistance inside the ring is unusually homogenous. Most Gask towers have a turf or earth rampart inside their ditches, with a single break in line with the ditch entrance to give access to the interior (eg Robertson 1974). One would not expect to see either the ditch or the rampart entrance on this site, because they would have faced towards the road and therefore would have lain in the truncated area. One would, however, expect the pattern of internal readings to reflect the shape of the rampart, with a high band surrounding a central area of lower readings. It is also worth noting that other Gask towers have shown

broad external bands of high readings that mark the upcast thrown out from the ditch. No such evidence was detected on this site, even though the damp ground and surface remains both suggest that little ploughing has taken place. On the other hand, the consistent high readings inside the ditch might suggest that the upcast was actually thrown into the interior, in which case the most likely interpretation of the site would be as a barrow, later passed (or impinged upon) by the Roman road, and then truncated by the drainage ditch. This identification remains unproven and the surface feature interior does not stand significantly higher than its surroundings as one might have expected of a barrow. Further evidence might be drawn from the fact that the survey showed signs of two breaks in the ring feature: one faintly visible in the east and another, rather stronger, in the south-west. These do not seem large enough to be deliberate entrances, being no wider than 2m, but again barrow ditches are merely ring quarries from which the material for the central mound was dug, and it is not unusual for them to be intermittent.

## CONCLUSIONS

Of the three ring features found so far to the south-west of Glenbank, none can yet be claimed as Roman frontier installations. Indeed, the geophysical surveys at Glassingall and Kinbuck Muir have made such identifications less, rather than more, likely. The same can be said of the obvious gap between Glenbank and Greenloaning, the southernmost Gask tower yet found, for although a candidate ring ditch has been found from the air at Upper Quoigs (NGR: NN 821 063, RCAHMS neg A64658) part way between the two, excavations by the Roman Gask Project showed it to be a fairly modern sand working (DES 1996, 82). This is not to say that we should abandon the idea that the Gask system continued up to and beyond Glenbank. The basic supposition remains as valid as ever.

But for the moment it must remain an unproven hypothesis that reflects the balance of military probability.

#### ACKNOWLEDGEMENTS

For Glenbank, the writers are grateful to Ardoch Farming Co. Ltd and their factor Mr R H B Smith for allowing access to the site and to Mr G S Maxwell for making his own excavation drawings available. The work was funded by the Society of Antiquaries of Scotland, and we are grateful to our dig volunteers, especially trench supervisors M H Davies, N J Lockett and K B Miller. Miss (now Dr) Davies also assisted with the resistance survey. Elsewhere, the writers are grateful to Mrs Henderson of Faulds Farm and Mr Anderson of Lower Whiteston Farm for allowing access to Glassingall and Kinbuck Muir. We also thank Mr W Fuller for piloting our air photographic flights and Mr D Boddice for his help with the Glassingall geophysical survey.

#### GLENBANK 1999: LITHICS REPORT

Abigail C Finnegan

#### CATALOGUE

- Surface find, 109 – Heated inner flint blade.  
Broken. Retouched along left and right dorsal sides. 27mm × 19mm
- T1, 3, L1 – Secondary, irregular, flint flake.  
Retouched around dorsal edges creating a scraper edge
- T1, L1/2 interface, 63 – Heated secondary flint flake. Unmodified
- T2, 94, L1 – Inner irregular flint flake.  
Unmodified
- T2, 96, L1 – Flint chunk
- T2e, 57, L2 – Irregular quartz flake.  
Unmodified
- T2f, 78, Context 53 – Inner, flint blade. 33mm long × 14mm wide
- T2h, 80, L1 – Inner flint flake. Scraper. 29mm × 24mm
- T2h, 87, L1 – Secondary irregular flint flake.  
Debitage from a regular, direct percussion knapping sequence

- T3c, 103, L1 – Heated secondary flake. Flint scraper. 18mm × 12mm
- T4, 2, L1 (Topsoil) – Irregular flint flake.  
Unmodified
- T4, 35 Inner ditch fill – Irregular agate flake.  
Unmodified
- T4, 40 Inner ditch fill – Heated inner flint flake.  
Unmodified
- T4, 56a, Inner ditch fill – Inner, regular flint flake.  
Debitage from a regular, direct percussion knapping sequence, 26mm × 35mm
- T4, 56b, Inner ditch fill – Irregular quartz flake.  
Unmodified

#### DISCUSSION

The finds suggest Mesolithic activity on the site. It has been demonstrated that Mesolithic communities would often schedule lithic material procurement activities within their annual cycle. In areas where lithic resources were of poor quality, the application of optimal reduction strategies would maximise return (Gleeson 1998). Experiments have shown that heating can produce blades up to four times the length of unheated flint (Bordaz 1970). Finds 103, 109, 63 and 40 all display evidence of heating. This would tie in well with the theory of optimal solutions applied by Mesolithic communities to maximise the potential of the resources available to them. In the absence of any other dating evidence the small size of scraper 103 also suggests a Mesolithic date.

#### ENVIRONMENTAL SAMPLES FROM GLENBANK 1999

Susan Ramsay

Five small soil samples were received for environmental analysis following the excavation of the Roman fortlet at Glenbank. Each was analysed for the presence of pollen and plant macrofossils.

## POLLEN ANALYSIS

A 2cm<sup>3</sup> sub-sample was removed from each of the soil samples and prepared for pollen analysis following the methods outlined in Moore, Webb and Collinson (1991). One slide was prepared from each sample and examined under high magnification (×400) to determine if the pollen concentration was sufficient to make further analysis worthwhile. Unfortunately, none of the samples yielded countable quantities of pollen.

## PLANT MACROFOSSILS

The remaining portion of each of the soil samples was sieved through a 300µm mesh and the residue left to dry before examination. The residues were sorted under low magnification (×8–×40) and plant remains were removed and identified where possible. The results are shown in the table below. Vascular plant nomenclature follows Stace (1997).

## DISCUSSION

Plant macrofossils were found in very low quantities in the samples from Glenbank with all the identifiable material being in the form of charcoal apart from one carbonised seed of *Persicaria maculosa* (redshank). Samples 1, 2 and 3 are all from ditch fills and the mixed nature of the assemblage suggest that the charcoal from these samples came from hearth deposits. The extremely low abundance and the small size of the charcoal fragments in these samples make it impossible to speculate on other possible sources for these remains. Sample 4 came from a turf patch inside the inner ditch and is thought to be part of the base of the internal turf rampart. It contains only oak charcoal but again only a very few, tiny fragments were found. It may have come from a hearth deposit or have been connected in some way to the rampart construction but the charcoal pieces are too few and too small to comment on further. Sample 5

TABLE 3  
Species present

<i>Taxon</i>	<i>Common Name</i>	<i>Sample 1 Trench 3</i>	<i>Sample 2 Trench 4</i>	<i>Sample 3 Trench 4</i>	<i>Sample 4 Trench 6</i>	<i>Sample 5 Trench 2</i>
Charcoal						
<i>Alnus</i>	Alder	–	–	<0.05g	–	–
<i>Betula</i>	Birch	–	<0.05g	–	–	<0.05g
<i>Quercus</i>	Oak	–	<0.05g	<0.05g	<0.05g	0.1g
<i>Salix</i>	Willow	<0.05g	–	–	–	–
Indeterminate	Indeterminate	–	<0.05g	<0.05g	–	0.1g
Other						
<i>Persicaria maculosa</i> (seed)	Redshank	–	1	–	–	–
Coal	Coal	–	–	<0.05g	–	–

came from the top of a large post-hole and is thought to represent a demolition deposit laid down after the post was removed. It contains a mixture of oak and birch charcoal which could have come from several sources including the destruction of a timber structure related to the rampart or simply from a scattered hearth deposit.

It is impossible to speculate on the origins of the environmental remains from Glenbank because of the very low numbers of plant macrofossils in the samples. All that can be said is that the inhabitants of the Glenbank fortlet had access to oak, alder, birch and willow for either fuel or construction purposes, and that the soil conditions have not favoured the survival of pollen on this site.

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