

The Roman Gask System tower at Greenloaning, Perth & Kinross

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ABSTRACT

Excavations at the Roman Gask tower of Greenloaning revealed an abnormally large timber tower surrounded by a double ring-ditch. The tower had at least two structural phases, but no absolute date for either could be determined.

THE SITE

Greenloaning lies at NGR: NN 831 072, immediately to the north of the Braco exit of the modern A9 (illus 1) and 2.7 km (1.89 Roman miles) south of the fort of Ardoch. It stands on the 120 m contour, to the south of the Allan Water, with good views in all directions, especially to the north and west, and is in visual contact with Ardoch and the fortlets of Glenbank and Kaims Castle.

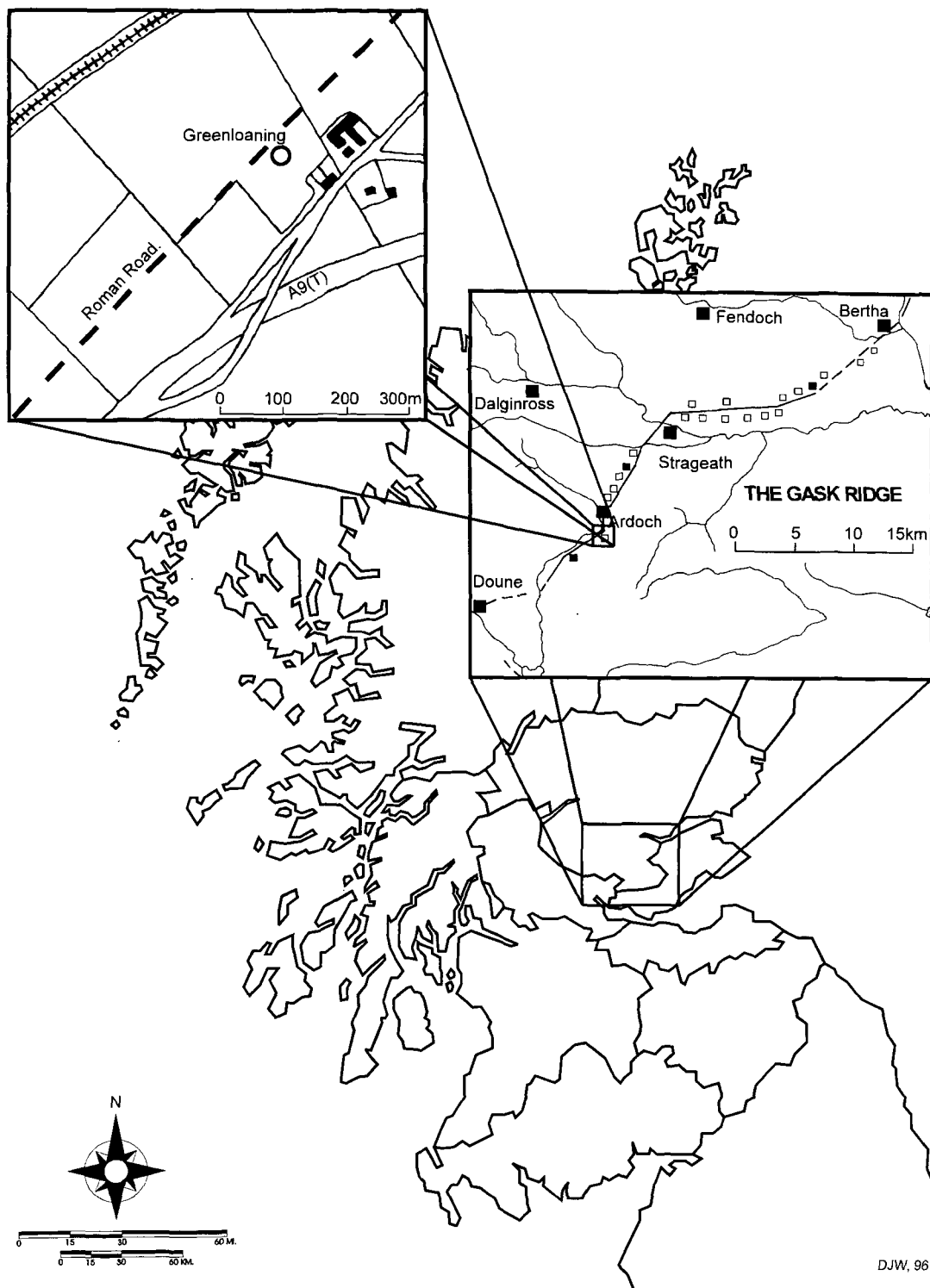
The site was discovered from the air in 1985 by the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS), as an indistinct ring-ditch cropmark, c 11 m south of the Roman Ardoch road; its single entrance break faced towards the road (Negative A36934). In the following year the road failed to show as a cropmark in aerial photographs, but a much clearer image was obtained of the site itself (illus 2, Negative A28898). This revealed that it had a double ring-ditch similar to those of the southern Gask towers of Shielhill North and South (St Joseph 1976, 22) and Blackhill Wood (St Joseph 1977, 135 & fig 8), all of which are also in sight. The site thus appeared to be a further member of this series, the southernmost example yet known.

SURVEY WORK

In advance of the excavation, a resistivity survey was conducted over an area measuring 40 m by 40 m to look for features outside the planned excavation area and to gather additional information, especially concerning a number of anomalous aspects of the aerial photographs. In particular, the photographs appeared to show the inner and outer ring-ditches joining on each side of the entrance, rather than coming to separate butt ends (illus 2). This would be an unprecedented ditch pattern for a Roman tower, but the survey (illus 3) did nothing to dispel this impression. Both ditches produced bands of low resistance around the greater part of their

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ILLUS 1 Greenloaning, location map. (Based on the Ordnance Survey © Crown copyright)

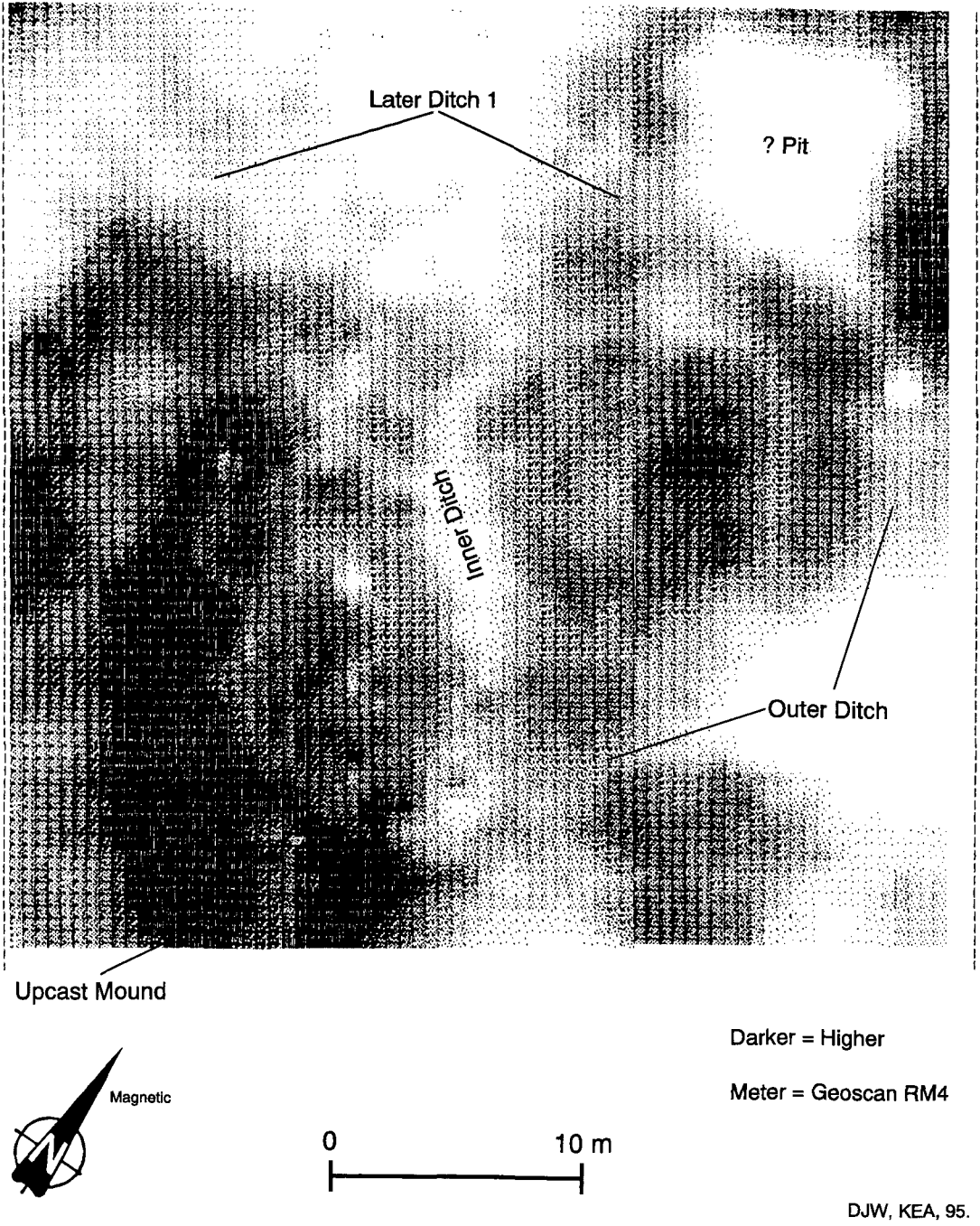


ILLUS 2 Cropmarks at Greenloaning (RCAHMS Neg A28898 © Crown copyright)

circuits, with the inner ditch showing more clearly than the outer, and the two did indeed show some signs of coming together, especially on the western side of the entrance.

The survey identified a ditch system with a total diameter of c 25 m. Outside the outer ditch, to the south-west, was an additional broad band (12–13 m wide) of high resistance, running parallel to the ring-ditches. This area was not excavated, but the feature presumably represents an upcast mound. If so, the total diameter would increase to c 50 m, although the survey did not extend far enough to the south and east to confirm that the high readings continued right round the site. St Joseph (1976, 25) has commented on the lack of such mounds amongst the southern, double-ditched Gask towers (although they are well known on the more northerly Gask Ridge sites) but, since all of these sites lie on land that is, or has been, long under the plough, it is hardly surprising that they have not been located in the past. They are easily ploughed down. They do not show well on aerial photographs. Excavators rarely if ever look outside ring-ditch systems and, although they can be revealed by resistivity (eg Woolliscroft 1995, 67 & fig 3), so far as the writers are aware, this is the first geophysical survey ever undertaken on the Gask System. Under these circumstances, if confirmation were needed, the presence of an upcast mound here can probably be taken to indicate that all four southern towers had them.

Finally, the aerial photograph showed a roughly square dark patch, c 11 m across, immediately to the north of the eastern side of the entrance break (illus 2), and this was reflected by a similarly shaped area of very low resistance (illus 3). Time did not allow this feature to be excavated, but given the proximity of the Roman road and the fact that the field proved to



ILLUS 3 Greenloaning: resistivity survey

contain a stratum of gravel aggregate very close to the surface, it probably represents a quarry pit.

THE EXCAVATIONS

The excavations were directed by the first writer and carried out by volunteers, and students of the Universities of Manchester, Freiburg and Warsaw.

THE DITCHES

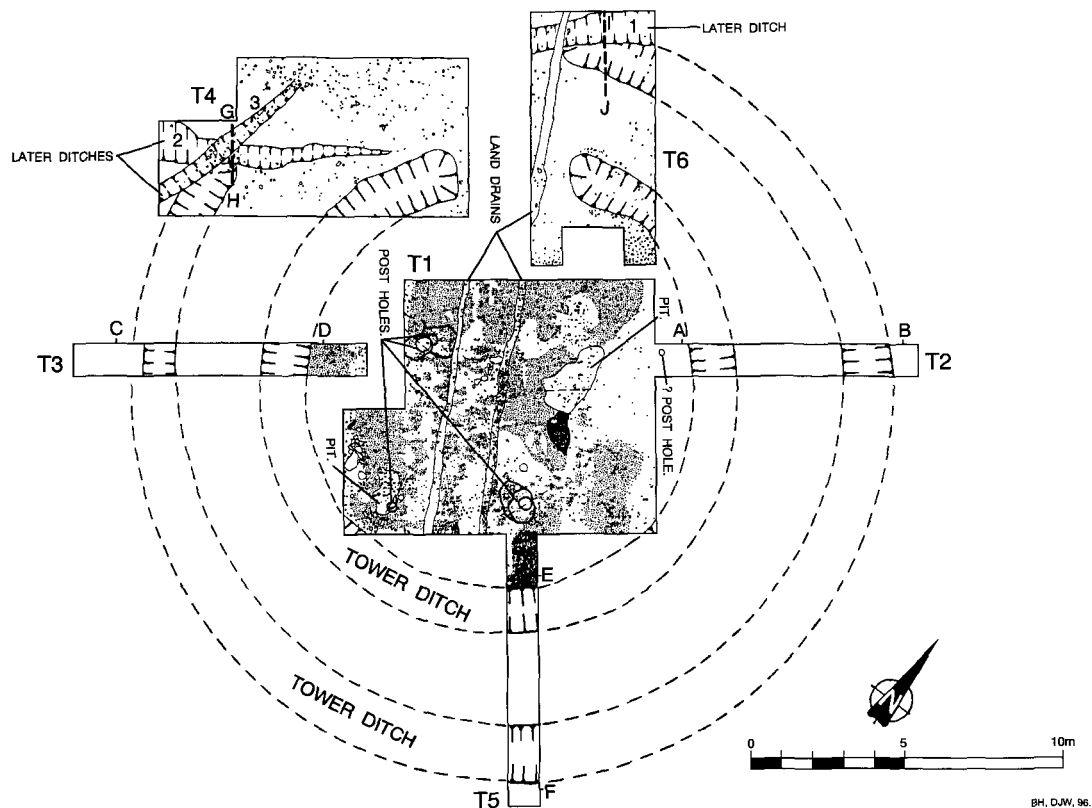
The ring-ditches were investigated via three full section trenches through both lines (illus 4 & 5, Trenches 2, 3 & 5), while most of the entrance area was opened in plan (Trenches 4 & 6). In all cases both ditches proved to have the normal Roman V-profile, although neither showed much sign of the usual 'ankle-breaker' sump, and both, especially the outer ditch, were rather smaller than is normal on a Roman tower site. This may, however, be a typical feature of the southern Gask area, for the ditches recorded during St Joseph's excavations at the Shielhill towers (Maxwell 1974, 13) seem to have been similarly slight. As with all of the Gask towers so far examined, no traces of palisades were uncovered, despite a careful search, either inside, between or outside the ditches. The only possible exception was a single tiny square pit feature at the south-west end of Trench 2 (illus 4), which was only 0.16 m wide and 0.09 m deep and whose very identification as a post/stake-hole was highly uncertain.

The inner ditch was 1.91 m in average width and 0.52 m in average depth. Its average outer diameter was 15.54 m and it enclosed a central area with an average diameter of 12.5 m. Its centre line was a near perfect circle (not a difficult achievement given a stick and a length of string), which is a common pattern on Roman tower sites.

The outer ditch was rather slighter, explaining its fainter appearance on the resistivity plot. It was 1.45 m in average width, with an average depth of 0.4 m. Its outer diameter averaged 24.7 m and the inter-ditch spacing averaged 3.2 m, or 4.48 m between the ditch centre lines. The outer ditch was rather less circular and its centre lay c 0.5 m to the north of that of the inner.

Both ditches showed similar fill patterns (illus 5), although the inner ditch contained rather more fill layers. Both had only a few centimetres of primary silt in their bottoms (illus 5, layers 7, 11 and probably 8), above which were varying numbers of sharply defined and often very different, fairly loose, silt-free layers, some of which had undulating profiles, unlikely to have been formed by any natural deposition process. All of this would suggest that the ditch fills were largely deliberate backfills rather than natural silts and, thus, that the site had either been abandoned after only a very short occupation or, perhaps more likely in view of the results from the interior, that the ditches had been kept scrupulously clean while in use. This is a broadly similar pattern to that found at the two Shielhill sites (St Joseph 1976, 22), except that Greenloaning showed no sign of ash or turf in its ditches, except for one small lens at the top of the inner ditch fill in Trench 3 (illus 5, layer 12), which contained charcoal in a grey loamy material which might have been degraded turf.

Both ditches, and especially the inner, showed signs that they were initially designed to be larger, for both tended to flare out to become very much wider in their upper parts (illus 5, see especially the inner ditch in Trench 2). This is reminiscent of a process recently encountered by the writers at the Antonine Wall tower of Garnhall, Cumbernauld (Woolliscroft & Hoffmann, forthcoming). Only about half of that site's ring-ditch had ever been fully completed, but a 'marking-out slot' the full width of the finished ditch, and 0.15 m deep, had been dug around at

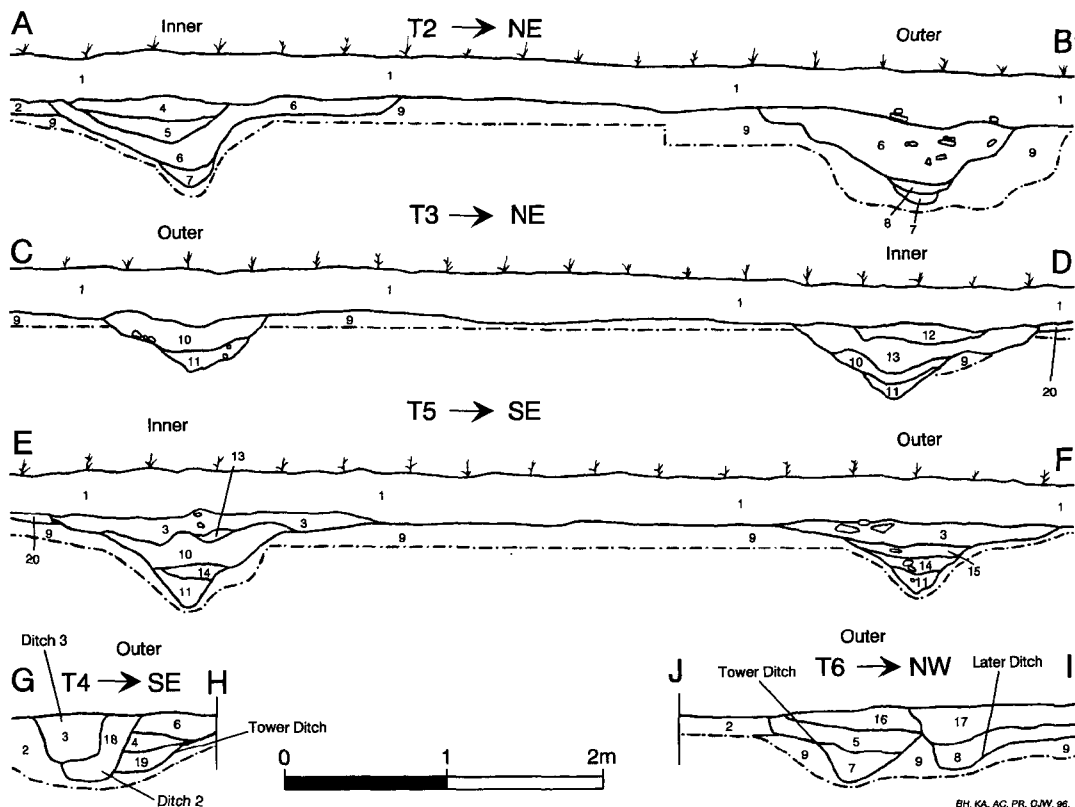


ILLUS 4 Greenloaning: site plan

least part of the rest of the circuit. If the widening around the tops of the Greenloaning ditches began as a similar marking-out slot, the ditches may originally have been intended to be roughly twice their present size, which would have made them far more typical of Roman tower defences elsewhere. Certainly, the flaring does not seem to have been a product of the ditches being backfilled by having their immediate surroundings spaded into them, as there is little former topsoil in the fill. Most of the backfill (illus 5) consists of varying mixtures of loam, sand and gravel similar to the subsoil strata through which the ditches were dug and (remnants of an upcast mound notwithstanding) they were probably largely filled in with their own original spoil. Why the ditches as actually dug were so small remains a mystery, however. The subsoil profile consists of sand and clay, overlying a sand and gravel aggregate and, although the latter is quite hard, it is not particularly difficult to remove with a pick; elsewhere, the Romans were quite prepared to dig full-sized tower ditches into solid rock (eg Woolliscroft & Swain 1991, 22–5).

Entrance

The entrance arrangements are also somewhat unusual. Despite the aerial photograph indications, the ditches do come to separate, if rather flattened, butt ends. The inner ditches leave an entrance break 3.6 m wide and, in the east, the outer ditch stops, as expected, in line with its counterpart. But, on the western side, the outer ditch stops well short of the inner ditch break (c 42 degrees of



ILLUS 5 Greenloaning: ditch sections 1 Turf and topsoil; 2 Coarse brown sandy clay; 3 Rich brown loam; 4 Rusty brown sand; 5 Brown loamy sand; 6 Rich brown sand; 7 Silty brown sand; 8 Brown sand with gravel; 9 Natural gravel aggregate; 10 Red/brown loam with gravel; 11 Brown silty loam; 12 Grey loam with charcoal; 13 Grey brown loam; 14 Plumb red sandy loam with gravel; 15 Yellow Brown loam with gravel; 16 Grey brown silty loam; 17 Grey sand with charcoal; 18 Fine brown sand with gravel; 19 Grey sandy silt; 20 Clay and gravel

arc) to leave a much wider outer entrance 11.1 m across (14.7% of the total ditch circumference), with a centre line orientated c 25 degrees west or anticlockwise from that of the inner ditch gap. It is not unknown for Roman multi-ditched towers to have their entrance breaks slightly askew but, so far as the writers are aware, such a large discrepancy is unique, although aerial photographs of the nearby tower of Shielhill North (eg CUCAP BKE-50) may show a similar pattern there. No sign of any post-holes or other gate structures were found.

Later ditches

The aerial photographic indications that the inner and outer ditches were joined to each other on each side of the entrance were probably caused by a number of later features. In the east, the outer ditch butt end was all but obscured by a small SSW/NNE running ditch which cut into the backfilled tower ditch and ran roughly parallel to the Roman road (illus 4, Trench 6, ditch 1 and illus 5, section I-J). This cannot have been the cause of the pit-like feature described above, which should lie just outside the excavated area and, with hindsight, it is separately, if faintly, visible on the resistivity plot (illus 3). But the illusion of a join in the tower ditches here seems to have been

caused by a modern land drain slot, which runs past both butt ends, cutting both the later ditch and the outer ring-ditch. Ditch 1 had filled to about a third of its depth with a sand and gravel mix (illus 5, layer 8) which is probably a weathering product of the sand and gravel aggregate (illus 5, layer 9) into which it was dug, but the rest of the feature was filled up with a mixture of charcoal and sand (illus 5, layer 17) which resembled fire waste.

On the western side of the entrance, the outer ditch butt end is crossed by two later ditches, both with a U-profile, which actually cross at this point (illus 4, Trench 4 and illus 5, section G–H). The earlier (illus 4, ditch 2) runs essentially SW/NE; it is probably this feature that caused the aerial signs that the ring-ditches joined on this side. The final ditch (ditch 3) could not be followed to the northern limit of the trench. Each of these ditches contained only a single fill. In the case of ditch 2 this was a sand and gravel mix (illus 5, layer 18), which was probably a weathering product from the layers through which it was cut; in contrast, ditch 3 contained nothing but a clean rich brown loam indistinguishable from the overlying modern plough soil.

THE INTERIOR

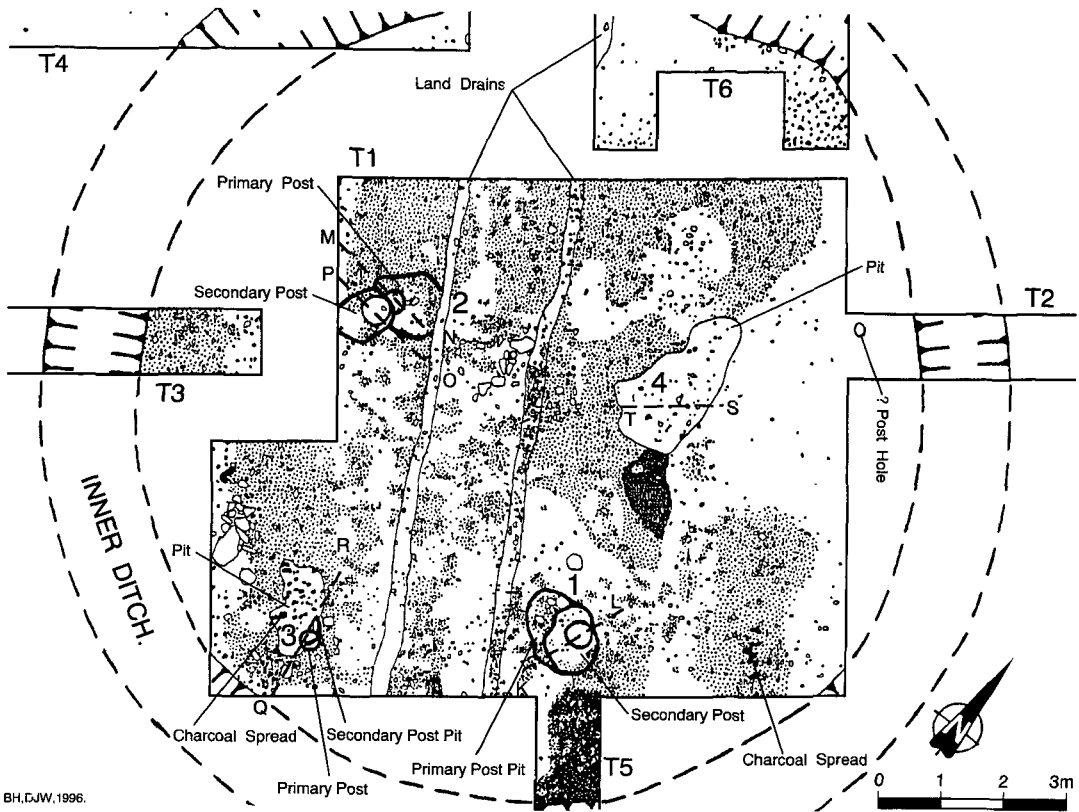
Clay surface

Most of the internal area was examined (illus 6) and proved to have been surfaced with a layer of rammed brown clay, mixed with fine gravel and a few larger stones. Much of this layer had been badly plough-damaged, but considerable patches did survive and here its thickness varied between 30 and 70 mm with an occasional area, up to 170 mm thick, where the layer seems to have been used to level slight undulations in the ground. Two patches in particular had survived in near perfect condition: one immediately to the south of feature 4 (illus 6, pit) and the second at the northern end of Trench 5. The eastern end of Trench 3 also showed it in good preservation and in both Trenches 3 and 5 the inner ditch proved to have been dug through this layer. Both the clay and the gravel used are native to the site, although not in combination, and this surfacing seemed to have been laid onto subsoil, rather than onto the original topsoil. The south-west edge of Trench 1 also produced a pile of small boulders, but these did not form a recognizable feature.

The tower

In all, six post-holes were discovered in the interior; in four of these post-pipes could be identified. These post-holes fell into three distinct pairs (illus 6 and 7, PH1–3) which had clearly formed three of the four corners of a two-phase rectangular structure. The fourth (north-east) corner had apparently been destroyed by a pit (illus 6, feature 4) as, indeed, had much of the opposite or south-west corner (PH3). Within the enclosure, this structure was set slightly south-west of centre, with its northern side 3.5 m inside the entrance. Thus, it sat well to the rear of the internal area, with its south-western corner only 1.15 m from the inner ditch. There was no sign of any feature akin to the ‘ladder platform’ found at the nearby site of Westerton (Hanson & Friell 1995).

As to the post-pits themselves, all four were oval in plan, rather than rectangular as at Shielhill North (DES 1974, 51; St Joseph 1973, 218) and, where it was possible to tell, all had held circular posts rather than the square timbers reported at Shielhill. The secondary posts would appear to have been somewhat wider and shallower than their primary counterparts. It should, incidentally, be noted that, as the post pipes were initially rather difficult to see in plan, thanks to plough damage to the tops of the post-pits, none of the sections quite cut through their exact

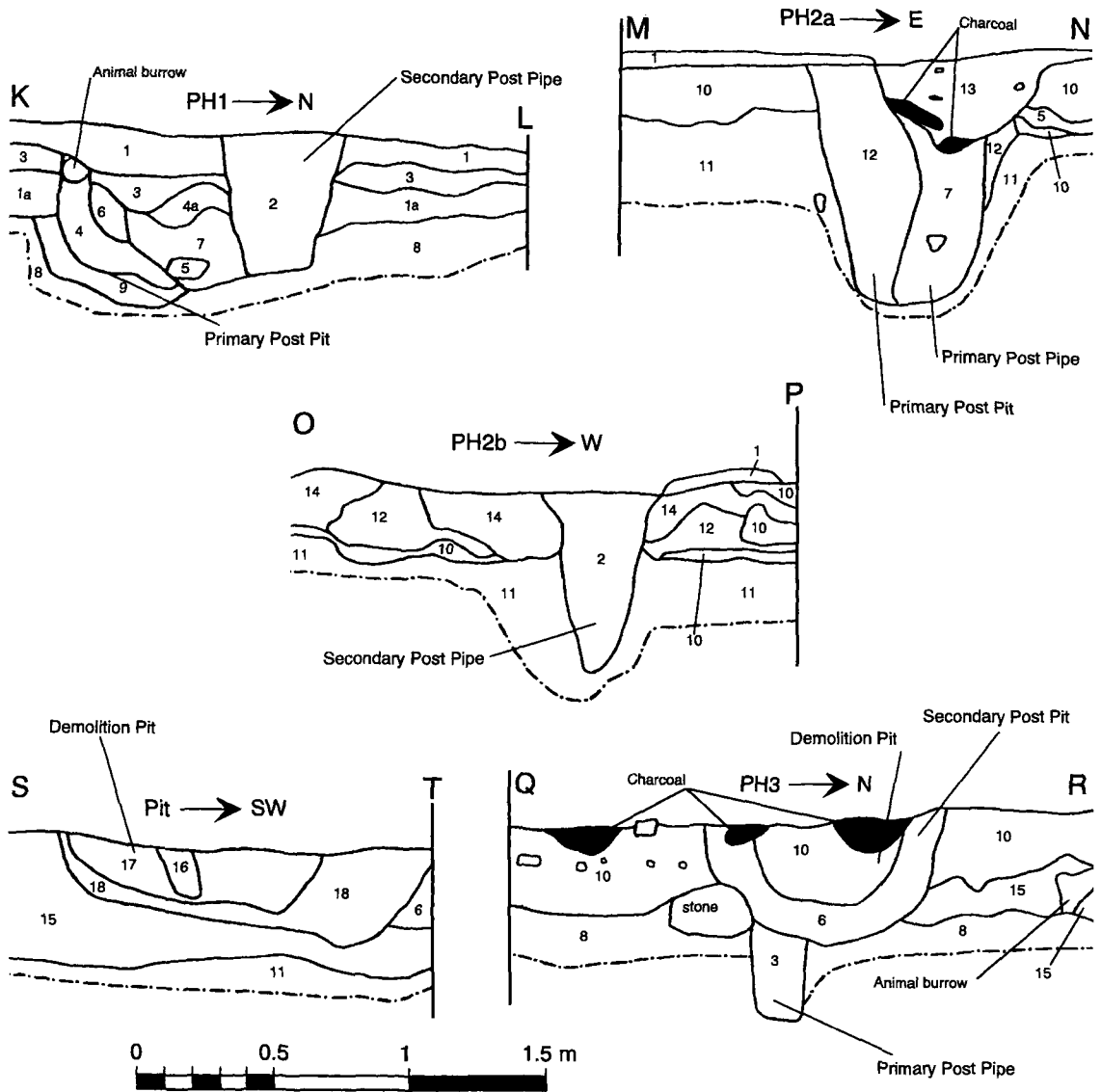


BH, DJW, 1996.

ILLUS 6 Greenloaning: internal area

centre lines, so that their true diameters were only determined while the sections were being dug and were generally somewhat larger — at up to 0.45 m — than the section drawings would appear to indicate (illus 7).

Due to an accident of survival, it is not possible to give exact dimensions for structures founded on these posts in either of the two building phases. For, although PH2 did produce a post pipe from both structures, PH1 yielded only a second phase timber, and PH3 only a first phase post. This means that we have dimensions only for a long axis of the first building phase and a diagonal line of the second. Nevertheless, as the post-pits intersect, both designs seem to have been much the same size, which would make both about 5.25 m (north/south) by 4.25 m (east/west). Both structures were, thus, unusually large for free-standing Roman timber watch towers. Indeed, so far as the writers are aware, Greenloaning is the largest four-post tower ever found. It is certainly much larger than the tower (3.35 m by 3.35 m) found by St Joseph (1976, 22) at Shielhill South and is even larger than some 12-post towers, such as Johnson's Plain in Cumbria (Woolliscroft & Swain 1991, 25–7). Also, at Greenloaning, both the first- and second-phase structures seem certain to have been far from perfect rectangles. The angle of the corner at PH3 is about 76 degrees, suggesting a parallelogram with opposing corners of 76 and 104 degrees.



AC, PR, MD, AGK, DJW, 96.

ILLUS 7 Greenloaming: post-hole sections 1 Rammed brown clay and gravel; 2 Brown loam with charcoal; 3 Dark Brown gritty loam; 4 Pink Clay; 5 Dark brown gritty clay; 6 Light brown sandy loam with gravel; 7 Brown loam with clay; 8 Dark brown compacted sand; 9 Dark Brown sandy loam; 10 Orange/brown sand; 11 Natural gravel aggregate; 12 Gravel with brown clay; 13 Disturbed brown clay with charcoal; 14 Light brown sandy clay; 15 Grey/brown clay; 16 Grey/orange loam; Orange sandy loam with gravel; 18 Orange sand

Building sequence

There was little sign of any prolonged interval, or abandonment phase between the two phases. There are no separate demolition pits for the removal of the primary posts (unless layer 4 in PH1 is interpreted as a backfilled demolition feature); nor are there signs that the posts either burned or rotted *in situ*. Indeed, the secondary post-holes may initially have acted as the primary

structure's demolition pits. Moreover, PH1 (illus 7, layers 1 and 1a) preserved evidence that the internal clay and gravel surfacing was repaired once the second phase post was installed and, although there was a thin layer of a brown gritty loam (layer 3) between the primary and secondary surfacing, this type of material seems more likely to have come from the digging of the secondary pit than from trample or natural deposition. It would thus seem more likely to represent a demolition/re-building layer rather than a first phase occupation or abandonment deposit. No traces of burning could be found in association with the demolition of the primary structure.

As with the first phase, there was little evidence for the length of occupation of the secondary structure, since plough damage had removed all traces of occupation deposits from the internal surfacing. There was, however, one possible hint that it may have been more than transient. For layer 4 in PH1 (illus 7) provides tenuous evidence for a third structural phase. This feature had clearly been cut through the primary surfacing and through layer 9, which is all that remains at this point of the presumed primary post-hole. But it was itself cut by the final post-hole, which might, therefore, as already stated, be tertiary. Since the layer consists of clean, redeposited clay, it certainly seems more likely to belong to a construction rather than a demolition feature but, alternatively, as no parallel evidence was found at the other two surviving corners and only two layers of internal surfacing were found, it may be that this particular post simply required re-setting for some reason during the construction of the secondary building or, perhaps less probably, maintenance at some phase during its subsequent use.

The evidence for the demolition of the secondary structure is less ambiguous. The secondary post-hole at PH3 had been all but destroyed by what is presumably a demolition pit (illus 7, layer 10), and the pit shown as feature 4 (illus 6), probably marks the destruction of the north-eastern corner, although it seems somewhat large for the purpose. It is certainly in the right place, but time did not allow it to be completely emptied to allow a search for residual features beneath it. Posts 1 and 2b, on the other hand, show flared tops which suggest that they were rocked out of position (illus 7).

Once the posts had been removed, the remains of the building appear to have been burned. The entire internal area bore traces of charcoal and scorching, most notably towards the south-eastern corner of Trench 1 and in the area around PH3; the demolition pits themselves were filled in, largely with sand (illus 7, layers 10, 17 and 18), probably before the burning took place. Such a demolition pattern is normal on the Gask system, although there were no traces of burned daub at Greenloaning to parallel those found at Shielhill North (St Joseph 1976, 23).

There was no trace of an internal rampart to parallel those found at a number of the northern single-ditched Gask towers; but this is hardly surprising since, with the tower so close to the inner ditch, there would not have been much room for one.

POTTERY

No closely datable material was found in the ditches, but a total of eight body sherds of a red coarse ware were located in the overlying plough soil. Another fragment of the same red coarse pottery was found in the interior (just south of PH2). These sherds were all badly abraded and Dr J P Wild, who kindly examined them, was only able to describe them as 'possibly but not definitely Roman'.

ENVIRONMENTAL REMAINS

Environmental sampling by Dr Susan Ramsay, of the University of Glasgow, found no organic material surviving in the free-draining upper fills of the ditches or in the basal silt layers, and no

surviving charcoal fragments were large enough to attempt either a species analysis or a radiocarbon date.

DISCUSSION

Despite the lack of dating evidence, there seems no reason to doubt that this is a Roman tower of the Gask series but, as ever with this system, its exact date is open to question. So far, outside of the forts, only two firmly datable finds have ever been made on the Gask: a fragment of Flavian mortarium found unstratified at Gask House tower (Robertson 1974, 20f) and a sherd of Flavian Samian ware from a beam slot at the road side enclosure of Cuiltburn, 600 m to the south of Strageath (Woolliscroft forthcoming). In addition, a piece of what may possibly have been first-century mortarium comes from an unpublished context at Westerton (Hanson & Friell 1995, 506). Finally, the Blackhill Wood tower, just north of Ardoch, is earlier than a large temporary camp (130 acres; this is evidently the latest of the series of camps around the fort and is usually seen as Severan) whose rampart partly overlies its south-eastern defences (St Joseph 1977, 135–8 & fig 8).

Two scraps of datable pottery, from dubious contexts, is not much evidence with which to date an entire military system at least 38 km long, and Greenloaning can only add a further eight, still more questionable sherds. So, although the present consensus is that the system is Flavian, this cannot yet be regarded as proven beyond reasonable doubt. It should not be forgotten that the forts on the system, while Flavian foundations, show clear signs of Antonine re-occupation, and the fortlets, none of which has produced published dating evidence, are of a type that is more often seen in the second century than the first. Timber towers, it is true, do tend to be more of a first than a second-century phenomenon. But this is not an absolute, for there are a number of known Antonine timber sites, such as Garnhall (Woolliscroft & Hoffmann, forthcoming) on the Antonine Wall. For the moment, we cannot even guarantee that the southern twin-ditched Gask towers are contemporary with the single-ditched group further north and it might, thus, be prudent to withhold judgement until more evidence can be obtained.

As to the site itself, a number of areas require comment, in particular, the discovery of more than one structural phase. It is not, of course, difficult to think of reasons, perhaps an accident or poor initial construction, why one individual site might have required re-building in service while its neighbours did not (although fire can be ruled out as the cause of destruction of the primary tower). But the site is not now as unparalleled as it might have seemed a few years ago, for a closer inspection does reveal signs of re-building elsewhere. At Midgate, for example, a tower was replaced by a fortlet (or vice versa), and the first writer has recently suggested that air photographs show a similar sequence at Raith (Woolliscroft 1993, 302–8 and 297–9). Lastly, at Moss Side, Christison (1901, 29 & fig 7) found beam slots linking the tower's corner posts. These could, of course, be interpreted as bracing to strengthen the tower by locking its uprights together, or as foundations for wattle and daub side cladding (or both). But, although the latter would be consistent with the burnt daub found at Shielhill North, no such foundations have ever been found anywhere else on the Gask. Moreover, the excavator specifically says of Moss Side that at least one of the corner post-holes had been backfilled to make room for these beams, which means that this tower too may have been replaced, presumably this time by a beam founded structure. Certainly Christison's plan shows the beam slots to be unusually large (c 0.6 m wide) to support simple side panels and, although they were not set deep enough to have carried a tower by themselves, they would have made a perfectly adequate foundation for a lower structure, such as a block house. The near total absence of small finds on the Gask towers has hitherto been taken

as denoting a very brief service life. But such finds are notoriously rare on Roman timber towers everywhere, and these growing signs of structural complexity may require us to re-assess this impression. Further evidence is needed before we can tell if such re-building was a more general, let alone systematic, phenomenon. For now, it would be dangerous to argue a negative from the silence of the other excavated sites on the line, since none of the towers so far published has been dug in a comprehensive fashion. The phasing at Greenloaning was only confirmed by the removal of parts of the interior surfacing, and the sectioning (sometimes more than once) of all of the features discovered and, so far as the writers are aware, no tower on this system has ever been examined in such detail before.

Another aspect of the site is also without parallel on the Gask: the surfacing of the interior area. Again, this may be due to the way in which timber towers have generally been dug in the past, for the clay and gravel layer was badly damaged and fragile and could easily have been removed un-noticed during excavations elsewhere. Partial parallels can, however, be found on other sites in northern Britain. For example, at Garnhall the tower stood on a slightly raised rectangular, clay and gravel platform (Woolliscroft & Hoffmann, forthcoming), while at Beattock Summit (Maxwell 1976, 36 & fig 2), at least the floor and doorway of the tower itself had been surfaced. But the writers have yet to locate an exact parallel for a tower site having its entire central area surfaced, with no distinction being made between the tower itself and its surroundings.

The internal surfacing also produces another possible problem, for the inner ring-ditch was cut through it. We have already seen that the two ditches have slightly different centres and so it is possible to argue that the two may not have been dug at the same time, but that the inner ditch is somewhat later. As well as explaining why a ditch should have damaged laid surfacing, such a scenario would also have other advantages. For example, the outer ditch has much the same diameter as the single ditches of the more northerly Gask towers, suggesting that in the double-ditched examples it was the inner and not the outer ditch that was the addition. An early single-ditched phase would also have had room for a northern-style internal rampart and, if this was later removed, it might explain the strong geophysical traces for an upcast mound, when the ditches seem to have been largely backfilled with their own original spoil. There is also, however, contradictory evidence. For a start, the outer ditch seems far too slight and to have had too wide an entrance break ever to have stood alone. Once again, the explanation may come from the tower at Garnhall (Woolliscroft & Hoffmann, forthcoming), for this installation produced (albeit tenuous) evidence that Roman towers may sometimes have had their interiors constructed before the ditches were dug. This seems an eminently sensible arrangement, given that access would then have been very much easier and, if Greenloaning was built in this order, it would be less than surprising if the ditch diggers clipped some internal surfacing. Again, it is best to withhold judgement, for there is not enough evidence either way. Time did not allow an examination of the upcast mound and all traces of stratigraphy between and immediately outside the ditches had been ploughed away. On balance, the ditches do seem more likely to be contemporary, but the writers cannot guarantee it.

Finally, some comment is needed on the three later ditches towards the northern end of the site, all of which were dug after the tower ditch had been backfilled. No particular function could be assigned to the two in Trench 4 (2 & 3), although they may be connected with drainage, but the example at the north end of Trench 6 (ditch 1) appears to run parallel to the Roman road (at a range of 10–11 m). It had been intended during the excavation to run a trench further north at this point, to examine the road and quarry pit and to look for a parallel for a rectangular timber building found immediately outside the entrance at Garnhall. Time pressure caused this part of

the work to be cancelled, but conditions elsewhere on the site suggest that a stratigraphic link with the road is unlikely to have survived in any case. Nevertheless, it is at least possible that ditch 1 was dug as a side-ditch for a later refurbishment of the road. If so, and if we assume that the Gask towers are in fact Flavian, the ditch would presumably be Antonine or even Severan in date.

ACKNOWLEDGEMENTS

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