

Excavations on the Roman temporary camps at the Three Bridges, Camelon, Falkirk

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with contributions by C Dickson, J Miller & PV Webster

ABSTRACT

A series of small-scale excavations was carried out in the 1990s on an area of ditched enclosures some 500 m west of the Roman fort at Camelon. The complexity of perimeter ditches indicates the expansion and probable contraction of activity in the first and second centuries AD. A significant part of this activity was of a semi-industrial nature and may relate to the supply of the army over a wider region.

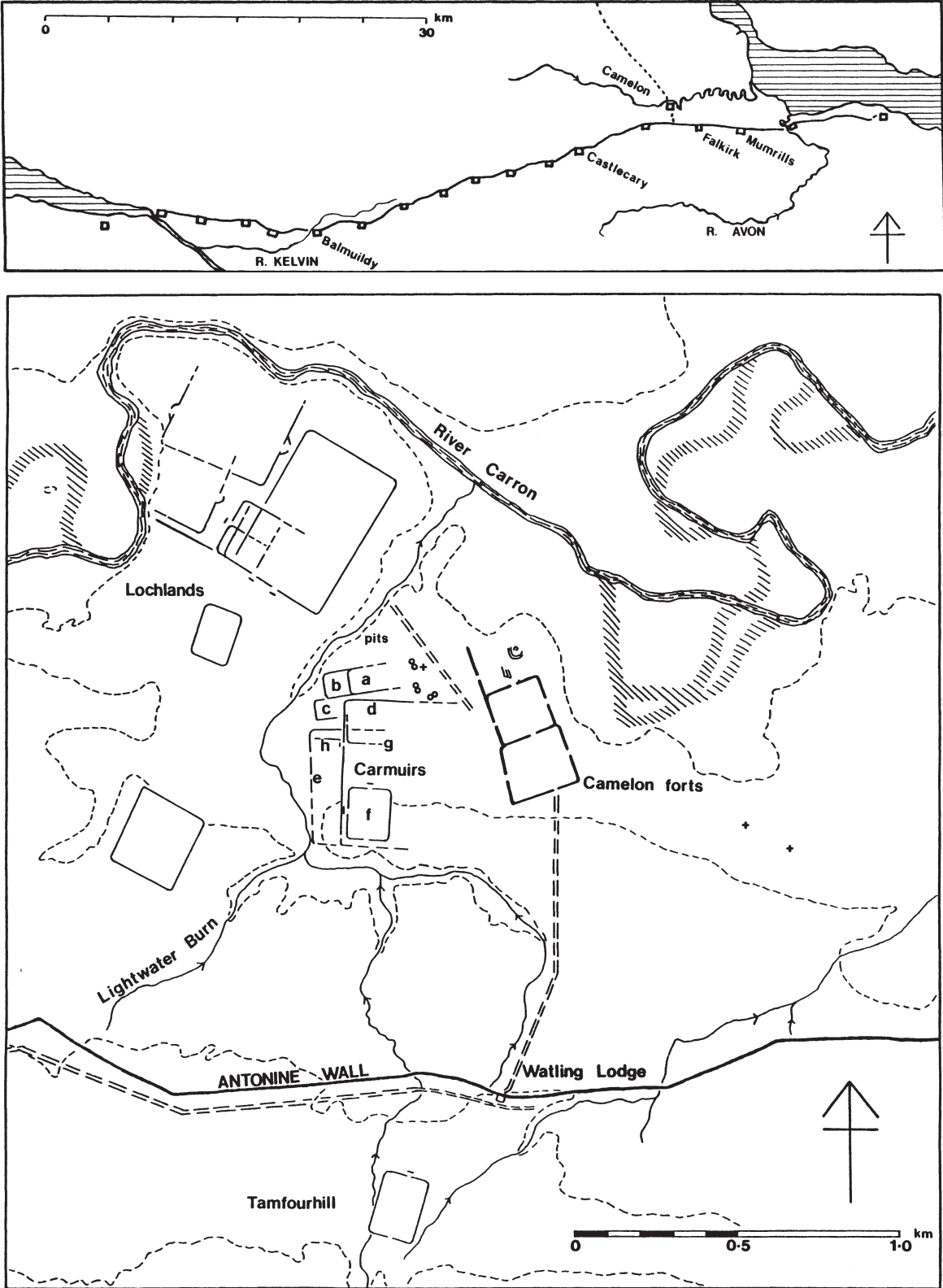
INTRODUCTION

Late in 1992 it was reported to Falkirk Museum that the topsoil had been stripped off a field adjacent to the railway at the Three Bridges, to the west of Camelon, in an area known to contain Roman temporary camps. The cleared area had been zoned for light industry in the Falkirk Local Plan and, with the permission of the owner, the museum consequently undertook a five-day excavation in the affected area (at the end of August 1993) in order to assess the condition of the archaeological levels (NGR: NS 857 808).

The area concerned is bounded on the north and west by the curving line of the railway from Glasgow to Falkirk Grahamston; on the south by the A803 Glasgow Road; and on the east by the offices and enclosures of Scottish Power. The area thus defined is approximately triangular, measuring some 130 m by 100 m. In 1987 a car salesroom had been constructed in the south-east corner of the site and a shallow north/south ditch was located at that time. This was identified as the remnant of the west ditch of a large temporary camp (Frere 1988, 427). The Roman camps are known from cropmarks in the field to the north of the railway (illus 2), recorded on numerous occasions by the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS 1963, 108) and the University of Cambridge. Their continuation within the present site has not been manifest as cropmarks due to the nature of the vegetation, the field not having been cultivated for some time. This group of camps (Carmuir *a–h* on illus 1) evidently consists of several phases although no sequence has been worked out.

The western ditches of camps *d* and *e* clearly extended southwards into the area available for investigation. A district map also shows two additional ditches in this area (OS & FDC 1983), plotted using aerial photographs taken by the Royal Commission. Potentially therefore, there were four ditches running into the field from the north and it was decided to excavate a wide

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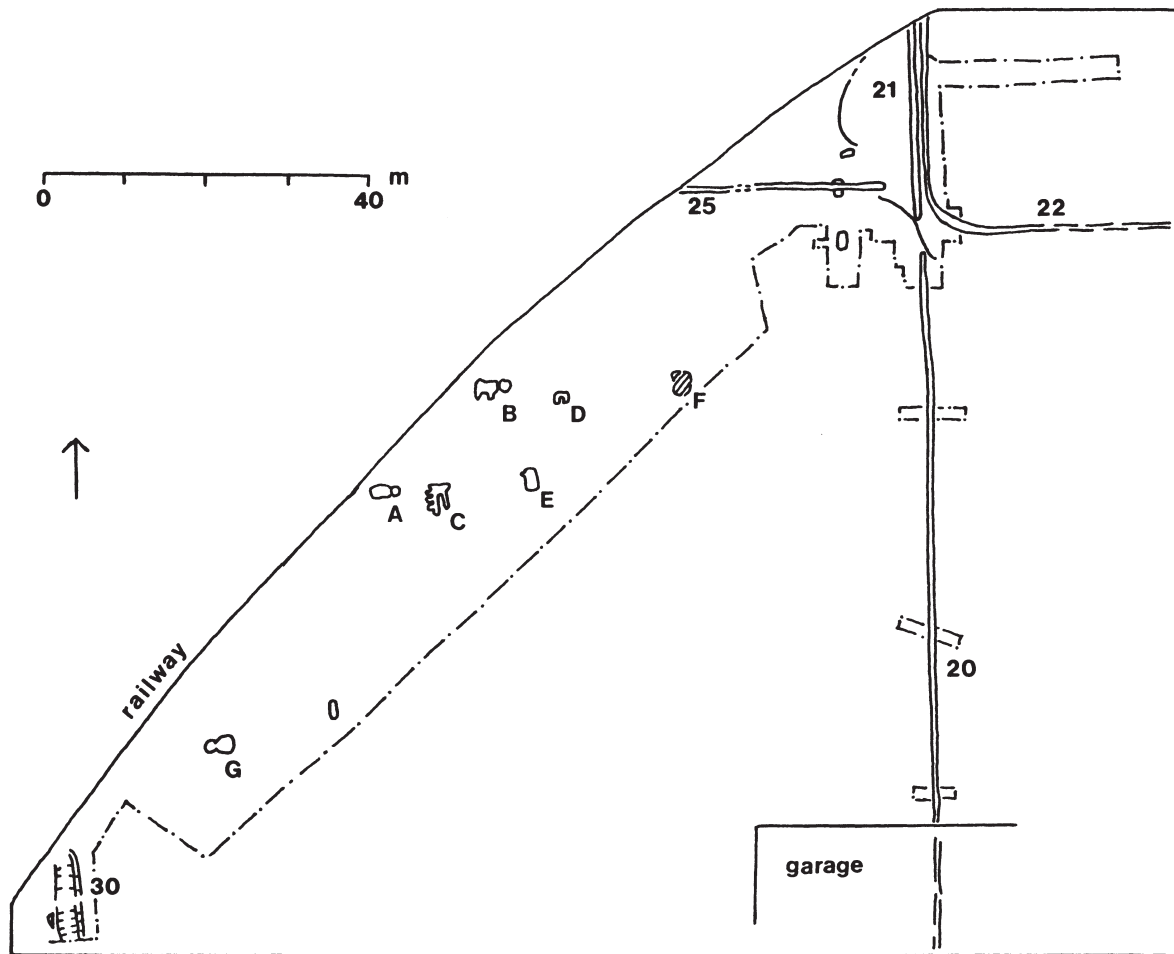
ILLUS 1 Camelon and its temporary camps. The area of the excavations is east (right) of cropmark *h*; Roman burials are marked as + and fire-pits as ∞. (Based on the Ordnance Survey map © Crown copyright)



ILLUS 2 Aerial view of the temporary camps at Camelon. The area of the excavations was in the dark, triangular field, south (below) of the visible cropmarks and west (left) of the industrial buildings. (AP 45/03/84 Royal Commission on the Ancient and Historical Monuments of Scotland © Crown copyright)

trench along the northern boundary in order to locate them and their associated ramparts on the ground and to take in an arbitrary area of the camp interiors.

In the event, the two extra ditches depicted by the Ordnance Survey did not appear and an examination of the aerial photographic evidence suggests that the shadows of the potential features thus identified were in fact of geological origin. The two ditches defined by the Royal Commission were found. The eastern one had a second ditch alongside it, and a third ditch turned up rather unexpectedly at right angles to these. The decision to sample the interior of the large camp was further vindicated by the discovery of pit groups or ovens (illus 3).



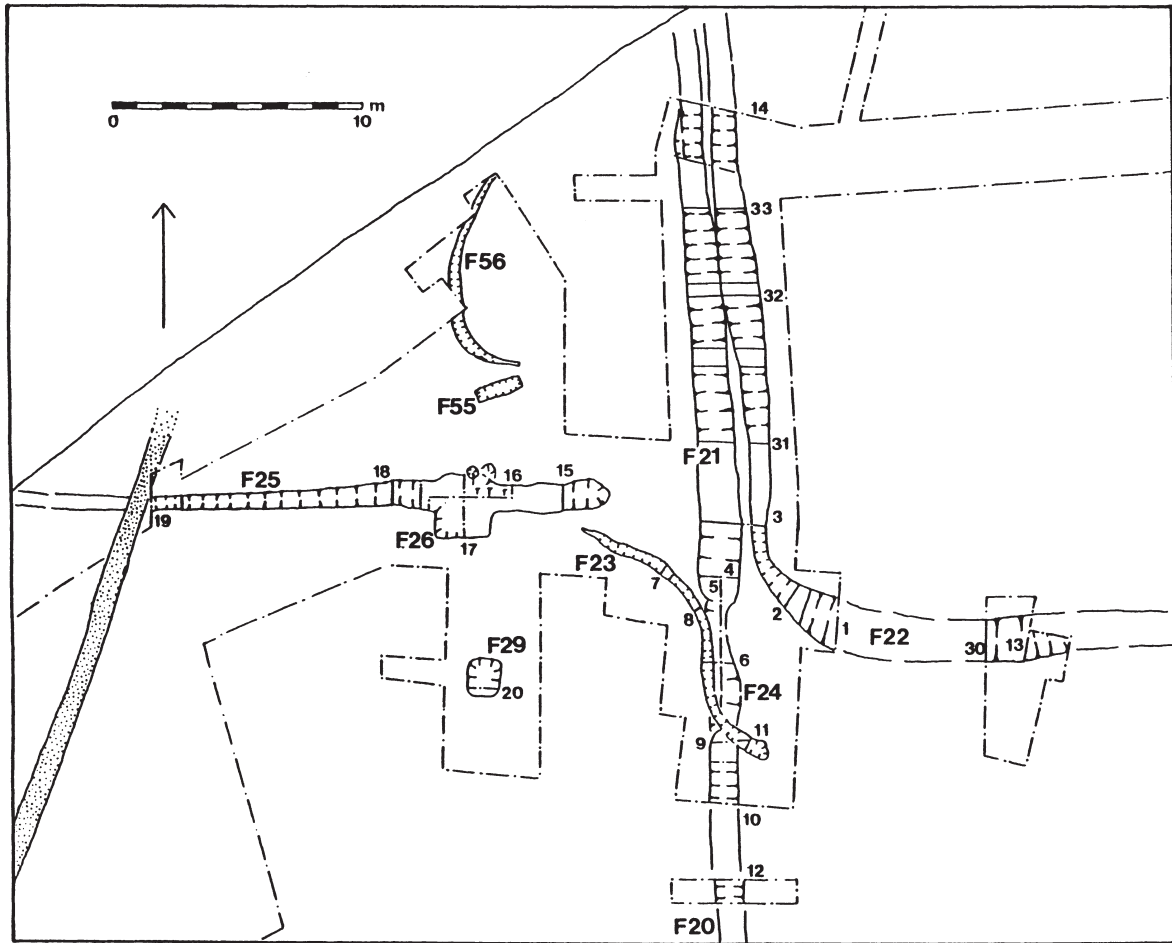
ILLUS 3 General plan of the area of the excavations showing locations of the main features: ditches (numbered) and pit groups (lettered)

As it happened, the car salesroom was the only building erected on the site. It was enlarged in 1995 and, although no features were found in the area of the extension, the opportunity was taken to increase the coverage of the previous investigation. This demonstrated the poor survival of features on the southern part of the site, but also located more ovens and hinted at the possibility of more of them to the south. These were located in September 1997 when unauthorized sand extraction demonstrated how vulnerable the remainder of the site had become. The latter two seasons of excavations were carried out in conjunction with the Falkirk Local History Society.

EXCAVATIONS

SOIL PROFILE

The subsoil in the western quarter of the site was composed of deep deposits of gravel, which give way to extensive deposits of sand throughout the remainder of the area. Above this was an orange-brown loamy sand, representing an old cultivation horizon, and above this again was the modern humic topsoil. Most of this modern material had been removed, leaving between 0.1 m and 0.4 m of the older soil on top of the natural. It was not possible to distinguish cuts for the



ILLUS 4 Plan of the excavated ditch complex

ditches through the old cultivation layer and we can assume that this soil had been heavily worked in the post-Roman period. This means that the original depths of the Roman features cannot be ascertained.

DITCHES (ILLUS 3–6)

Unfortunately, none of the ditches actually intersected. Thus their sequence has to be deduced from their lateral association and cannot be directly verified by any section. On topographical grounds the earliest ditch would appear to be no 22. It was picked up as it cleared the railway line, where it was 0.8 m wide and had been cut 0.55 m into the natural subsoil. It ran south for a further 17 m before turning east. As it negotiated the turn, its dimensions decreased to only 0.4 m wide and 0.2 m deep. Immediately thereafter they increased, the base diving sharply to a depth of 0.7 m, and the top broadening out to 2.0 m. At 9 m beyond the corner the ditch was identified as it entered the shrub land to the east. This rapid variation in the scale of the ditch is not surprising at a corner, and may also partly be attributed to the unevenness of the ground when the ditch was dug. The fills of the ditch varied, but suggest that some lengths, at least, were deliberately backfilled after only a small amount of silting. No trace was encountered of the associated rampart that must have lain on the inside of the curve.

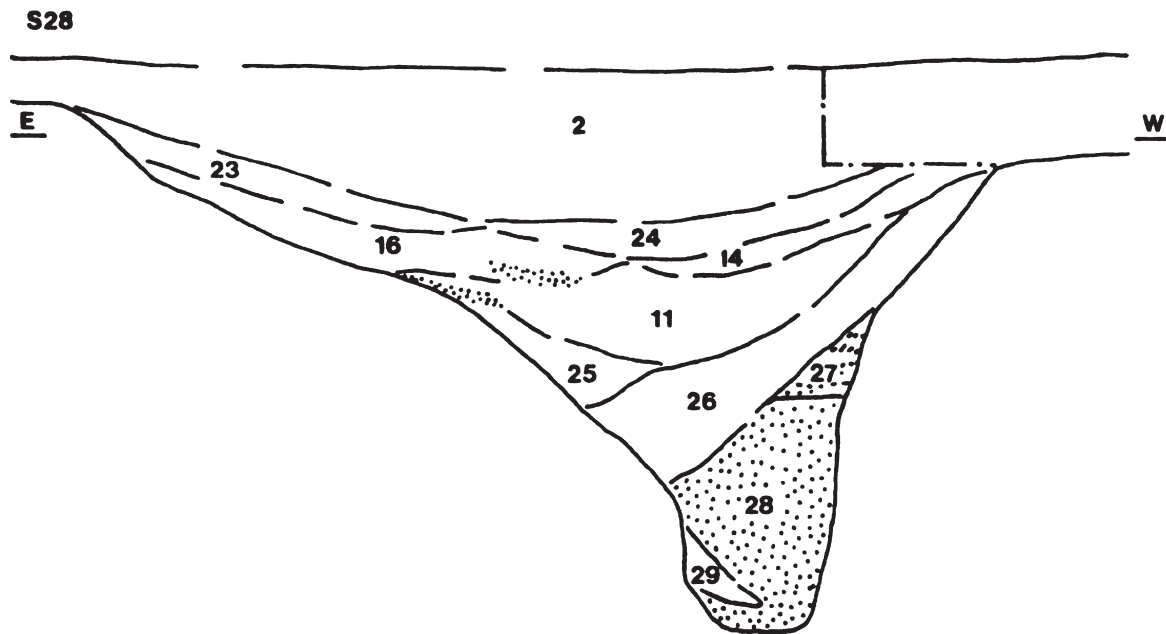


ILLUS 5 The partly excavated fills of the ditch complex from north; the curving ditch on the left is number 22, forming the corner of camp g

Another ditch, number 21, was dug parallel and adjacent to ditch 22. It lay to the west of ditch 22 and had about the same proportions. At the northern end of the excavated section it had a distinct shelf on its western side, suggesting that it had been recut at least once. It was eventually backfilled, and a mortarium rim was found embedded into the side by the shelf. Ditch 21 came to a butt end almost in line with the corner of number 22. From this point it continued as a shallow feature, F24, which after an initial narrowing regained the same width as the ditch. The depth of this feature was only 0.17 m, whereas the ditch itself had been 0.5 m deep approaching the butt end. After a distance of 4.8 m, F24 connected with the butt end of another ditch, number 20. This had the same general dimensions as ditch 21. It was traced for 66 m on the same line to the south, gradually diminishing in scale as it proceeded. Beyond this it disappeared under the car salesroom, but had previously been located there in 1987 (Frere 1988, 427).

The gap between ditches 21 and 22, connected by the shallow feature F24, was evidently an entrance. A truncated oblong pit (F29), only 0.16 m deep, was located 8.2 m to the west. This may have been a remnant of a traverse protective ditch or *titulus*. If this were the case, then the rampart would have lain to the east of the ditch system, but no trace of it remained.

A fourth ditch, number 25, had been dug at right-angles to ditch 21. It commenced 3.6 m to the west of that ditch, 4 m north of the entrance already mentioned. There was thus a gap for a second entrance, this one leading into the latest extension. Near to its butt end, the ditch was 1.2 m wide and 0.5 m deep; westward, it diminished to 0.5 m wide and 0.3 deep. A sector of about 20 m of the ditch was traced before it was cut by a modern pipe and then by the railway embankment. Its fill contained a thick layer of yellow sand indicating that it had been deliberately backfilled.



ILLUS 6 Section record of ditch 30, showing the Punic profile of its base

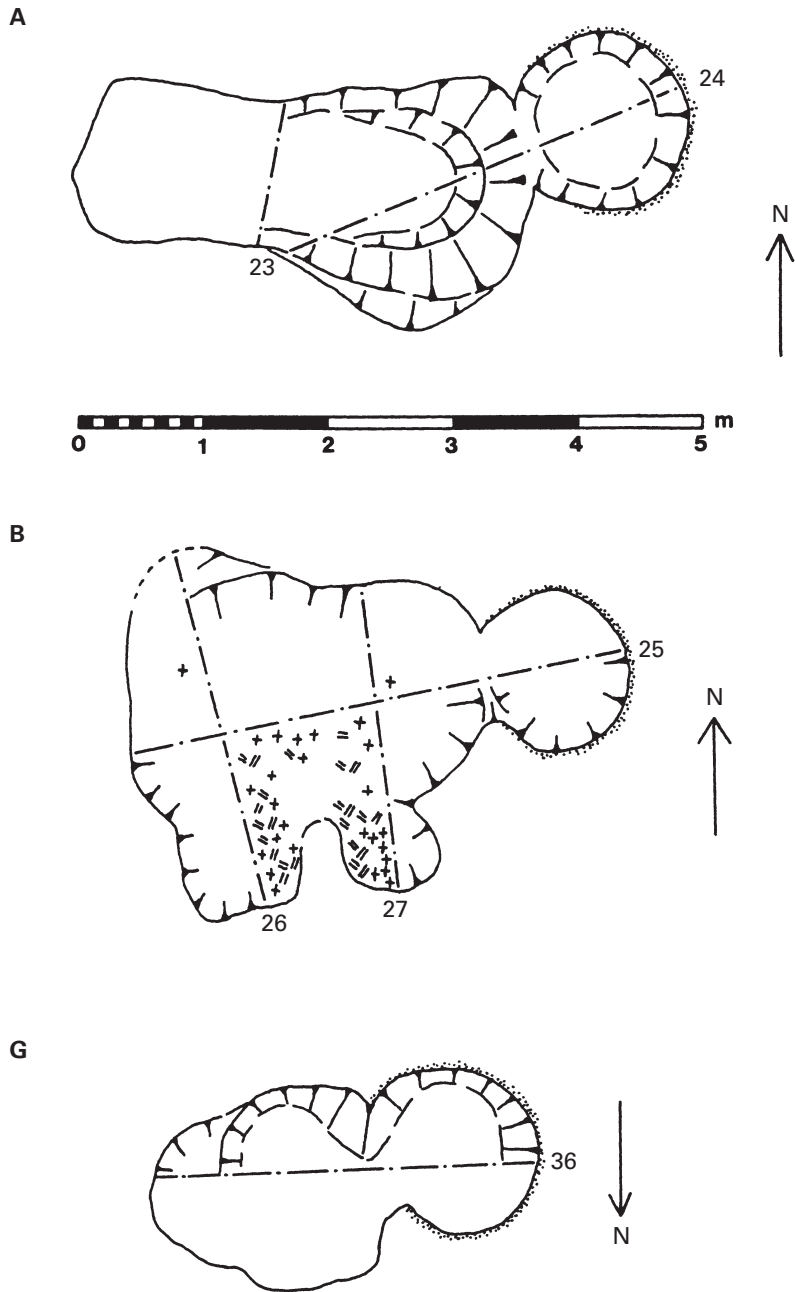
At 5 m west of the butt end of ditch 25 it was cut by a large rectangular pit, F26. The pit had relatively vertical sides and a flat bottom. It appeared to be later than the ditch and was 2.6 m long on its north/south axis, by 2.2 m wide, but only 0.28 m deep. Along its northern edge was a post-hole, 0.25 m in diameter and 0.25 m deep.

Perhaps the most intriguing feature in this area took the form of an inverted S-shaped gully or palisade slot (F23), placed across the two entrances. On the south it began 1.2 m east of ditch 20 and then cut across the butt end of that ditch. It continued along the western side of the shallow linear entrance feature (F24) and diverged from it near the butt end of ditch 21. It then curved towards the butt end of ditch 25. The shape of the gully varied considerably over its length, though for the most part it was a flat bottomed slot averaging 0.3 m wide and 0.3 m deep. At its north-western end it gradually shallowed having first become V-shaped.

Another curving gully (F56) occurred to the west of ditch 21. Although similar to number 23 in plan, its profile was of a different character. It was only 0.08–0.15 m deep and was more rounded. The northern end was lost under the railway.

The last feature to be described in this area lay near the southern end of the curving gully. This was a rectangular pit (F55) measuring 1.85 m in length, 0.65 m wide and 2.4 m deep. It was filled with the same clean sand through which it had been dug. The sides were vertical and it clearly had not been open to the elements for any length of time.

At 105 m to the west of the north/south ditches 20 and 21, another ditch was found on approximately the same alignment. It lay at the extreme western end of the field, not far from the railway bridge. A section 4 m long was opened up. The ditch, number 30, was larger than any of the others, being 3.9 m wide and had been dug 1.2 m into the gravel. It was V-shaped, with a wide shelf on its east side at a depth of 0.5 m. This shelf contracted significantly at the northern end of the trench, possibly indicating the position of the ditch terminal. Unfortunately, this could not be further investigated due to the proximity of the railway. Here too, the fill is consistent with the ditch having been backfilled deliberately at an early date. Nor was there any sign of the associated rampart. Another section was placed across this ditch in 1997. This produced the same general



ILLUS 7 Pit groups A, B & G

profile, but at 1.0 m deep and 2.7 m wide, it was on a reduced scale. However, at this point a deep slot in the base of the ditch took it to a full depth of 1.4 m and gave it a classic Punic profile with a steep outer or western face (illus 6). This part of the ditch was full of fine grit that had evidently been washed in from the sides soon after the ditch was dug and this gave the superficial appearance of a re-cut.

PIT GROUPS (ILLUS 7-11)

The long excavation trench cut along the inside of the railway was a disappointment in that it failed to locate any of the ditches of the temporary camps. However, two sets of pits did appear.

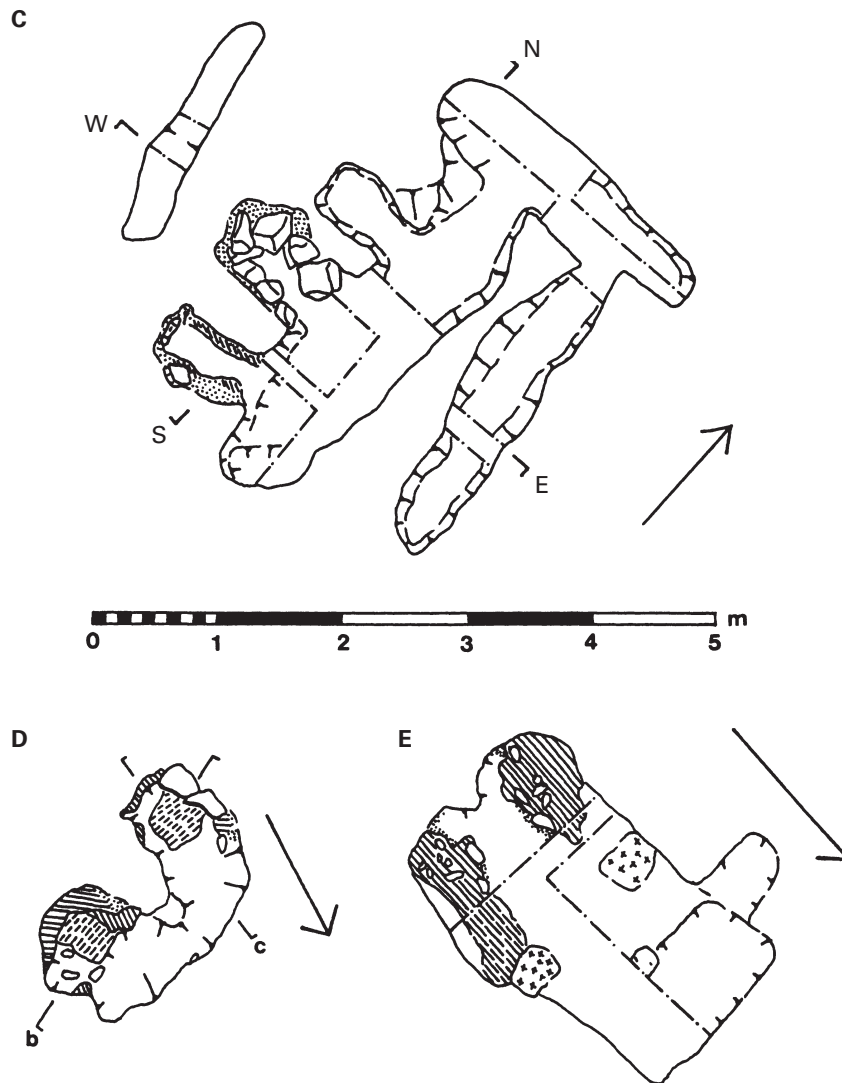


ILLUS 8 Pit group G, half-section, from south

The western of these, group A (illus 7), consisted of a sub-rectangular pit (F31) intersected on its eastern side by a shallower circular pit (F32). The rectangular pit was 3.5 m long, 1.2 m wide and 0.6 m deep, whilst the circular one was 1.4 m in diameter and 0.35 m deep. Both pits showed signs of intensive heat on their bases. A section (illus 11) shows that the two features were contemporary, and indeed were probably part of the same structure. The lateral section across F31 had distinct lenses of charcoal and burnt sand in it. The fill contained small pieces of burnt clay, and the lowest charcoal level contained a charred grain. The charcoal was from several species, including alder, oak, heather, and willow (see Dickson & Miller, below).

The eastern pit group, group B (illus 7), likewise consisted of a circular eastern pit attached to a more rectangular one. Here, the second pit was more amorphous, with two small projections on its south side. Both these pits had been dug into the natural sand and showed signs of burning *in situ*. The circular pit (F33) was 1.5 m in diameter, and the sub-rectangular one (F34) was 2.8 m long by 1.8 m wide. The fill contained quantities of burnt and raw clay, which must have been imported to the site. No artefacts were associated with either pit group, and so their dating must rely upon analogy and location.

In 1995 an extension was built onto the east end of the car salesroom and this afforded another opportunity to explore the general area. No archaeological features were found in the area of the extension, but after discussion with the landowner it was agreed to double the width of the 1993 trench to determine the existence of further pits. This search was in part necessitated by the use of the area that had been stripped of the topsoil as a BMX bike course by children, causing localized erosion. The discovery of pit groups C and D led to further work in 1997, which added groups E and G as well as an oval pit (group J) and a superficial area of burning (group



ILLUS 9 Pit groups C, D & E

F). As the work proceeded southwards the survival of the archaeological features became progressively poorer. An extensive search beyond the features just mentioned failed to locate any significant deposits.

Group C proved to be the most interesting of the new features (illus 9). Three linked linear slots formed an open rectangle 3.8 m long by 2.5 m wide. The slots averaged 0.14 m deep and 0.6 m wide and were filled with a dark black sandy loam indicating the presence of a large amount of comminuted charcoal (illus 11). The largest of the slots, that on the west, had three channels branching off from its west side. These were about 0.8 m long by 0.5 m wide. That on the south had almost vertical sides lined with a yellow clay that had been hard baked *in situ*. The natural sand behind the lining had been oxidized, and between the two was a fine lens of charcoal. The central chamber was lined with angular sandstone cobbles, also reddened by heat. The north chamber possessed no lining and its fill was noticeably more mixed than the other two. These chambers were evidently small furnaces opening off a common stokehole. To the west of them was a shallow detached slot, only 0.06 m deep. It lay parallel with the stokehole.



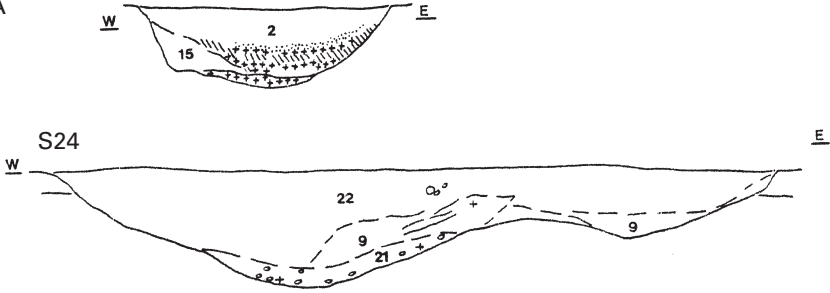
ILLUS 10 Pit group C, with partly sectioned fills, from south

Little survived of the group D features (illus 9). The maximum depth of the features here was a mere 0.16 m where they had been cut into the natural sand. This depth was achieved in a short east/west slot, from either end of which arms branched off towards the south. A very compact fired clay, greenish in colour, formed the bases of both arms. Fragments of angular sandstone and red clay showed that the arms had functioned as separate lined chambers. The clay sealing the stone lining was less well fired than that forming the base. The features were filled with a dark brown and black sandy loam containing small pieces of burnt clay and charcoal.

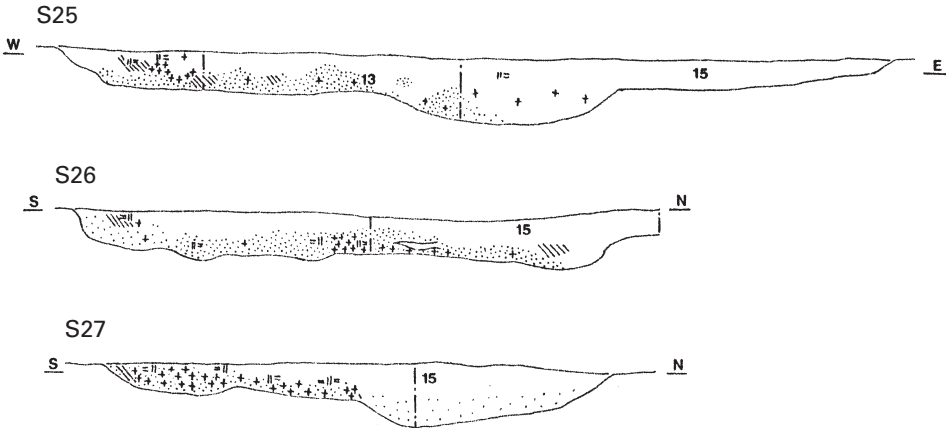
Group E consisted of a shallow rectangular pit, very slightly expanded at its southern end (illus 9). Here the sides had been lined with clay containing small pebbles, burnt *in situ*. At either end of the clay lining, on the central axis of the pit, were patches of comminuted charcoal. These extended 0.04 m below the base of the remainder of the pit. They may therefore have either contained posts, or stones that had been removed at an early date and their voids replaced by adjacent material. There was also a shallow pit (F74) under the north end of the larger one. Its fill of red/brown sand was quite distinct from that associated with the features just mentioned. Two flint flakes were recovered from the lower pit.

The two interconnected circular pits of group G were similar in plan to those of group A (illus 7). They had been cut 0.4 m into the natural, which here was also gravel. The two pits were contemporary and contained several lenses of charcoal, buff/orange clay loam and brown sand (illus 8). Charcoal from this deposit was identified to species (Miller & Dickson, below) and used to obtain a radiocarbon date (Table 2).

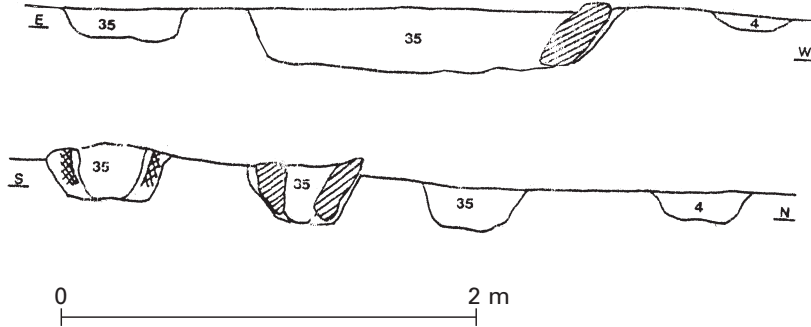
Pit group A



Pit group B



Pit group C



ILLUS 11 Sections of pit groups A (top), B (middle) and C

A large area of burnt ground, represented by the oxidized upper surface on the natural sand and a thin layer of comminuted charcoal, was found to the east of the group D features (F on *illus* 3). There were no associated finds and it contained no features cut into the natural. During the course of the excavation unauthorized sand extraction by persons unknown removed much of this feature and amply demonstrated how vulnerable the exposed site had become.

The final feature to be found was a flat-bottomed oval pit, 11 m east of pit group G (*illus* 3). It was 1.9 m long by 0.8 m wide and only 0.2 m deep. A small cluster of sandstone cobbles lay in the south end, associated with two pieces of second-century pottery. There was no evidence to suggest that the pit had any connection with the heat processes associated with the features mentioned above. Instead, the fill was of a dark orange/brown sandy clay loam.

SPECIALIST REPORTS

POTTERY

P V Webster

Although pottery finds were scarce, as one would expect from a site of this type, such as were recovered are likely to be Flavian in date and need not date later than the first Flavian advance into Scotland. The only exception to this was a flagon and sherds of BB1 from the oval pit that lay east of group G.

Catalogue (not illus)

- 1 Mortarium in cream fabric with grooving internally and over the rim. The trituration grit consists of quartz and some dark grey and black fragments that spread up over the rim. The mortarium belongs to Hartley group I (Hartley 1977, fig 2.1, 1e; see also Usk: Hartley 1993, fabrics 11–12, fig 185, no 10). The source is Gallo–Belgic, with a date range of c AD 55–85. Clearly in the Scottish context this implies a Flavian site. Found pressed into the side of ditch F21.
- 2 Fragment of mortarium, Gillam 1970, Type 238. For a discussion of the class, see Hartley 1977, Group II and Hartley 1993, 398. The overall dating of the class is c AD 65–90/100. In a Scottish context this implies a Flavian site. From F02, topsoil.
- 3 Sherd of a red-orange mortarium from near the rim. F02, topsoil.
- 4 Broken spout of a mortarium in orange–buff fabric. The filler includes mica, mixed angular sand (?) and an iron-rich soft material. The rim is incomplete but the flattened rounded profile would suit a Flavian or Flavian/Trajanic date.
- 5 Two fragments of Dressel 20. Topsoil.
- 6 Samian rim, Dragendorff 18R South Gaulish. Flavian. Topsoil near entrance.
- 7 Samian base, part of a small cup probably Drag. 27, South Gaulish. Flavian or Flavian–Trajanic. Topsoil near entrance.
- 8 Base and body sherds of a grey–brown jar heavily sooted externally. From F30, the westernmost ditch.
- 9 A small sherd in orange fabric. F03, subsoil.
- 10 A larger sherd of soft grey fabric with orange exterior, probably second century. F03, subsoil.
- 11 Small body sherd white fabric, flagon. F70, oval pit.
- 12 Base sherd of a Black Burnished Ware 1 jar. F70, oval pit.
- 13 Rim of a flanged bowl in a fabric now dark grey with a creamy white surface. The vessel could be one of the common Flavian/Trajanic flanged bowl series. However, there is green lead glaze under the

flange which, if not the result of accidental burning with lead, would make a Roman date improbable. Topsoil.

- 14 Base and several sherds of thin-walled vessel in soft orange fabric, with a foot ring. F68, subsoil in hollow over pit group G.
- 15 A small body sherd in white fabric with black exterior orange inclusions, probably 14th century. F03, subsoil.
- 16 Body sherd of a green-glazed pot with hard orange fabric, 17th century. F68, subsoil in hollow over Oven G.

STONE

A number of small fragments of igneous stone (lava derived) were found in the subsoil immediately above and around the eastern end of ditch 22. Occasionally they occurred elsewhere on the site near the interface with the natural levels. They appear to be the much fragmented remains of Roman quernstones.

Three struck flints were also found. They are evidently residual objects, probably post-Mesolithic, and may reasonably be assigned to the late Neolithic or Bronze Age.

Chipped stone catalogue (not illus)

- 1 A burnt struck flake of flint that has lost its distal end. 16 mm diameter. F003, topsoil near entrance.
- 2 Struck flint flake with a prepared faceted striking platform. There is a small amount of retouch but the flake is too thin to have been a scraper. Perhaps used as a knife. 21 mm long by 24 mm across. Early cut F74, underlying pit group E.
- 3 Unmodified struck flint flake, mostly cortex. 55 mm long. F74, pit below the Roman oven.

CHARCOAL

C Dickson & J Miller

A bulk sample of charcoal, stones, and sand of estimated one litre volume was taken from F35, the eastern half of pit group G. It was wet sieved and examined by Jennifer Miller. A total of 70 fragments was sub-selected from the sample to give an accurate representation of the range of wood types present; a range of sizes was selected to minimize the risk of over-representation of any particular type. Six different wood types were identified from the charcoals in this feature (Table 1). Charcoal from a second sample was examined by Camilla Dixon. This was 250 ml sample from pit F31 of group A. Again, several species were present, though the number of charcoals was small.

The range of wood types present in this sample assemblage is entirely consistent with a natural open scrub woodland, with trees which all could have grown locally. Oak would have been common in this variation of the original wildwood, with alder and willow present in the wetter areas, and hazel, birch, and blackthorn denoting the scrubby, open nature of the woodland. The presence of hazel in this assemblage implies areas of better soil, while heather denotes heathy places. The high levels of round wood suggest the burning of the young branches and may be a further indication of the open nature of the scrub woodland, perhaps as field margins by stream valleys. It is likely that either few large trees were available for use, or else wood from large branches was specifically not selected in favour of younger round wood. The roundwood fragments could represent kindling.

TABLE 1

Charcoal from pit groups G and A

Feature	Species	Description
Pit group G (F35)	<i>Alnus</i> (alder)	2.0 g; 4 frags; one roundwood piece with knot; 14 mm diam
	<i>Betula</i> (birch)	1.05 g; 3 fragments, none round
	<i>Salix</i> (willow)	2.7 g; 7 fragments, including 2 round, 6 mm and 10mm diam; 4 and 12 growth rings respectively
	<i>Corylus</i> (hazel)	5.9 g; 19 fragments, including 4 roundwood; 6 to 12 growth rings visible; 7 mm, 10 mm, 14 mm and 15 mm diam
	<i>Prunus spinosa</i> (blackthorn) type	1.4 g; 5 fragments, none round
Pit group A (F30)	<i>Quercus</i> (oak)	15.3 g; 32 fragments including 9 roundwood, 10–17 mm diam; 6–10 growth rings visible
	<i>Alnus</i> (alder)	Roundwood 2–5 mm diameter
	<i>Calluna</i> (heather)	
	<i>Corylus</i> (hazel)	Includes one fragment of roundwood of 15 mm diameter
	<i>Quercus</i> (oak)	
	<i>Salix</i> (willow)	Roundwood 8 and 15 mm diameter

TABLE 2

Radiocarbon date

Feature	Sample material	Yrs BP	$\delta^{13}C\%$	Calibrated (1 sigma)
Pit group G (F35)	<i>Quercus</i> (oak) charcoal	1990 \pm 50	-25.4%	43 BC–AD 70

INTERPRETATION

DITCHES

It is difficult to tie the multiplicity of ditches found in the excavation to those identified through cropmark evidence with any degree of confidence. The westernmost ditch, number 30, clearly belongs to the western side of camp *e*, whose north-west corner and part of the northern ditch are known. The size of this camp cannot now be determined as much of it lies under the Carmuir's housing estate. Its western side appears to have been deliberately positioned near the top of the valley scarp of the Lightwater Burn, imparting a good defensive situation. This stream is formed by the confluence of three burns, two of which take their rise to the south-east beyond the Antonine Wall. Their valleys, now infilled and landscaped, would have limited the extent of the camp to the south, and would actually have made an ideal location for the southern side. The western side could not, therefore, be any longer than 420 m. If the inturn of the shelf on this ditch does indeed represent a butt end, then it would imply an entrance only c 80 m from the north-west corner. The camp may either have possessed two entrances in this side, or have been considerably shorter than the terrain suggests. The large scale of the excavated portion of the west ditch might even demonstrate that we are dealing with a different phenomenon, such as an annexe, or even a putative fort. Certainly the 1997 section shows that it may have been recut on at least one occasion.

Ditch 20/21 can be equated with the western side of camp *d*, whose north-west corner and part of the northern side are likewise known. This we know to be a large camp, c 420 m long (north/south). The small entrance found in the excavation would have been c 100 m from the corner, a position perhaps dictated by a road alongside the earlier camp *g*. It is unusually narrow for the entrance to such a large camp, as would suit its secondary nature.

Ditch 22, and hence camp *g*, is a new discovery. It was not possible to distinguish it from ditch 21 at the level of the background natural subsoil and, consequently, it is only to be expected

that they should appear on aerial photographs as a single cropmark. How far northwards this coincidence continued is not known. The two camps, *g* and *d*, may have a common north-west corner. Camp *g* would then be of the same general form as *b*, *c* and *a*. This is a type also seen at Lochlands, immediately to the north-west, where they are embedded into a complex sequence on the south side of the camp, identified by Gordon Maxwell (pers comm). These might have been practice camps given their size and numbers, and the prominence of corners and entrances. Alternatively, they could have formed enclaves associated with specific activities, as discussed further below.

Ditch 25 provides yet another problem. It is too far south to correspond with the northern side of camp *e*, and can not be associated with any of the other known cropmarks. It appears to be attached to either *d* or *g* (its gate was blocked by the palisade trench F23 at the same time as the gate to *d*) and so there would be no eastern side. Westward, it could have turned south onto the line of ditch 30, where it would have been obliterated by this later feature. However, it is more probable that it turned to the north and attached itself to *c* as an annexe.

PIT GROUPS

The pit groups found inside camp *e* had evidently been heavily truncated, with the severity increasing to the south and east. They contained no internal dating evidence and a lateral relationship could not be obtained with any other feature in the area. A radiocarbon date obtained from a sample of *Quercus*, taken from the eastern half of group G, produced a one sigma calibrated date of 43 BC–AD 70. This, together with the regularity of the spacing of the pits, suggests a Flavian date for the whole group.

The pit groups fall into two broad categories or types. The first consists of two intersecting pits: one circular and the other elongated. This is represented by groups A, B and G. The second type is more elaborate and hence more varied. One to three rectangular chambers, lined at the end and sides with fired clay and sandstone, open onto a linear stokehole set at right-angles. The burnt clay associated with both types suggests that they formerly possessed a superstructure. Their plans, too, can be interpreted as representative of a stokehole, flue, and fire chamber. No useful finds were recovered and their function remains enigmatic: they might have been associated with cooking, pottery production, or metal working for instance. The lumps of clay in the fill and lining of the pits had been fired to varying temperatures. In the case of group C this had been high enough to blacken the back of the lining and vitrify some of the stone. Elsewhere the clay was still green.

There is a striking resemblance between the pit groups of the first category and the ‘surface kilns’ found at the military work-depot at Longthorpe (Dannell & Wild 1987). There, the circular pit was identified as the fire chamber and the larger, irregular, pit as the stokehole. These kilns were associated with pottery production. An even closer parallel comes from another temporary camp, at Bromfield in Shropshire, where four ‘figure-of-eight ovens’ were located on a line close to the rear of the rampart (Hughes 1992, 6). Later geophysical survey has indicated that further examples occur in that camp. This camp may have been occupied for several months and the ovens were seen as part of the provision of cooking facilities. Another field oven was identified within the interior of the temporary camp at Kintore: it also produced one carbonized grain and traces of alder and oak charcoal (Shepherd 1986, 207; Keppie 1998, 376). Further Scottish examples occur at Pathhead (Keppie 1998, 380), Inveresk I & II (Frere 1985, 265), Dalkeith (Keppie 1996, 402) and Beattock V (Keppie 1995b, 337–9). Closer to hand, a ‘field oven’ measuring 3 m long by 1.2 m wide, and consisting of two circular pits with a large flat stone

bridging the short gap between them, was found immediately behind the ditch of the large temporary camp that forms the south-east corner of the Lochlands complex. In this position it must have been dug into the back of the associated rampart (Glendinning 1998).

These pits can be usefully compared with other pits in the general area. The aerial photographs show a large number of pits inside camp a, particularly towards its eastern side. A little further east, six 'fire-pits' were recorded under rescue conditions in the 1970s (Breeze & Rich-Gray 1980). These were very similar to those at the Three Bridges. Although much damaged, they consisted of a circular pit 1.45–1.9 m in diameter and 0.25–0.75 m deep. Each contained lenses of charcoal and burnt sand, with burning on the sides and base. No artefacts were found to date these pits, but a radiocarbon date also placed them in the first century AD. Given the little information available, they were interpreted as cremation pits, several Roman burials having been found in the vicinity (Breeze *et al* 1976). However, they bear only a superficial resemblance to the 'busta' of continental cemeteries (eg Valkenburg: Dierendonck *et al* 1993, 31); nor do they possess any of the artifactual evidence normally associated with byres (eg Hogg 1949, 34–6, for Beckfoot fort).

At the Three Bridges the type one pit groups — or simpler, conjoined pairs — occur on the western part of the site, where the natural deposits are of gravel rather than sand. This may therefore be the result of structural requirements, though we cannot rule out spatial separation on functional grounds. Such differentiation would represent zoning of a kind often found on industrial sites in Roman Britain. There is also a distinct east/west alignment of the features, individually and collectively. This may be due to the regular allocation of the plots upon which the ovens or kilns were erected, or simply due to the presence of a path on the same alignment. The furnaces of group C appear to have stood in a simple rectangular shed or shelter of wood, constructed on sleeper beams. It was probably open to the south. Unfortunately, the shallowness of the beam slots makes it impossible to say with confidence that the other pit groups did not possess similar structures, as they had been more heavily denuded.

ENTRANCES

The incidence of temporary camps with attached annexes is surprisingly high. They are frequently grafted on to one of the corners of the existing camp. The camp at Little Kerse is particularly interesting in this respect because the entrance to the annexe is placed next to that of the camp, like that at the Three Bridges (Feachem 1956). At Little Kerse the annexe defences conceal the camp entrance, making the latter's *titulus* redundant. Camps were also frequently extended from two of their corners, or contracted by placing a new ditch across their interior. In the case of the expanding camp, the corner where the extension was added became a suitable location for an additional entrance to serve both the old and the new parts. For an example of this we need look no further than Lochlands (Thomson 1967). The two entrances at the Three Bridges are unusually narrow for temporary camps at only 4.8 m and 3.6 m. These may be compared with the 9 m gap at Lochlands (*ibid*) and Garnhall (Keppie & Bailey 1995, 637–9); 11 m at Eskbank (Maxfield 1974); 15.5 m at Dunning (Keppie 1993, 277). In size the Three Bridges entrances are reminiscent of a curious secondary entrance at Castledykes which is only 4 m wide but lies adjacent to the 10 m wide northern entrance (Keppie 1995a). This juxtaposition suggests that the secondary entrance at Castledykes was a gap left for a protruding arm of the rampart to cover the left flank of the *clavicula*. It is possible that ramparts ran through the 'entrance' gaps at the Three Bridges, but in each case this would reverse the arrangement deduced from the direction of the camp's corners.

Another point of similarity with the Castledykes entrance is the later slot closing off the causeway. This feature was also found at Eskbank where the slot or gully occurs slightly forward of the ditches behind a *titulus* (Maxfield 1974), stopping short of one of the ditch terminals. In both of these examples the excavator has argued against a drainage function for the slots as they sloped in the wrong direction and had been cut through free-draining gravel and sand deposits. Maxfield suggested that the Eskbank slot might represent temporary hurdling erected each night to exclude animals as well as to impose a curfew on soldiers. Yet it is difficult in such a case to see why a small trench should be needed, and how it could be negotiated during the day with the hurdling removed. The trench hints at something more permanent and the location militates against this being a palisade, which would have been placed on line with the rampart. One alternative suggestion would be that they were for defensive stakes or *stimulata*. Sharpened stakes embedded in a trench would act as a deterrent, but they could easily be removed if the guard decided to reopen the gateway. This phenomenon is not restricted to temporary camps. At the nearby fort at Camelon the road to the northern annexe gate had a 'palisade trench' cut across it on line with the ditch system (Christison & Buchanan 1901, 356).

The shape of the 'defensive' trench (F23) at the Three Bridges shows that it was designed to block both entrances simultaneously. The south-eastern end might have extended right up to the rampart associated with ditch F20. The north-western end, however, like that at Eskbank, terminates in front of the ditch there.

DISCUSSION

The term 'temporary camp' has been applied to a wide range of defensive enclosures but certainly has its problems. It is quite ambiguous. Just how long does a camp need to have been occupied for it to qualify as permanent? After all, some forts were very short-lived and were probably intended as such: for example, three forts occur at Roelcliffe, North Yorkshire, between AD 71 and 85, while the best site was being decided on (Bishop 1993). And Bishop & Freeman (1993) ask whether even the winter quarters of a campaigning army should be seen as temporary.

What were temporary camps for? The most obvious category are the 'marching camps' constructed by the army on the move and intended to accommodate the troops under canvas. Then there are the 'construction camps', many of them built close to the Antonine Wall, which housed the labourers who toiled on the Wall for months on end. Some of these camps are also found adjacent to forts. Of a slightly more substantial nature would be the 'winter quarters camp', temporarily occupied between campaigning seasons.

Maxwell (1980) draws a distinction between the tactical role of such groups as opposed to the strategic purpose of a fort. Yet, the two are frequently to be found in conjunction. Some of these latter camps may have served as night halts, or 'transit camps', for units traversing the country to take up station elsewhere.

The large concentration of camps found around such forts as Castledykes, Glenlochar, Ardoch, Newstead and Camelon stresses the strategic value of such locations. Newstead appears to have served as a nerve centre for military operations by the Roman force of occupation in southern Scotland, and Camelon evidently had a regional role in central Scotland (Maxwell 1991). The very existence of an independent fort so close to the Antonine Wall demonstrates the importance of the Camelon site. What was it that made it so significant? The main road north from the Antonine Wall passed through Camelon to an important crossing of the River Carron at Larbert. This vicinity has played a notable part in the military history of Scotland over the years. It was the area where Wallace made his stand against Edward I in 1298; Charles II held

Cromwell at bay at the river in 1651; and Charles Edward Stuart was expected to defend the river in 1746, taking the enemy completely by surprise when he forsook this advantage and attacked them at Falkirk. The site was important as a bridgehead, but it had a further advantage that made it special.

A barrier to landward communication, the River Carron none the less afforded access to the Firth of Forth and the favoured eastern coast shipping routes (Bailey 1992). A port at Camelon thus had the potential to supply land-based forces campaigning at some distance from their home bases and operating throughout the central belt of Scotland. In the Antonine period it would also have had the capacity to service most of the Antonine Wall. The goods transported would include foodstuffs and military equipment (Breeze 1984), as well as raw materials that would require further processing by the garrison. Most materials are easier to carry in a semi-processed state than when finished. We know, for example, that lead was brought to Camelon as pigs. At least three of these were found just to the north of the Three Bridges site (Grosart 1851; Wilson 1863, II, 64), and half a ton of lead was discovered in the immediate neighbourhood (Gillespie 1868, 39). The camps around the fort and port at Camelon may therefore have functioned as ‘stores depots’, a use which was also suggested for a camp at Dun (Maxwell 1980, 45).

Some of the lead landed at Camelon was probably sent on to the forts along the Wall to be worked. Much of it, however, must have been worked on the spot. There is no direct evidence here for the working of lead, but the processing of iron is well known from excavations in the south annexe (Maxfield 1979). Numerous pits were also found during the construction of the railway link from Falkirk to Larbert, inside and just to the north of camp *a* (Grosart 1851). These pits were ‘from eight to ten feet diameter, and generally about twelve feet deep. The pits uniformly contain a black greasy mould, intermixed with fragments of bones, charcoal, and portions of tanned skins’. These may well have been tanning pits. To these we can now add the ovens found at the Three Bridges, described here, as well as the fire pits recorded in the 1970s by Breeze & Rich-Gray (1980).

By the time that the Roman army came to Scotland, however, such kilns were excluded from the defensive perimeter of the forts (Dannell & Wild 1987, 64). This leads us on to yet another possible function of the Camelon camps, as ‘work-depots’. The proportions of enclosures *a*, *b*, *c*, *g*, and *h* are suggestive of industrial precincts. The industrial enclave at Caernarfon lay at some distance from the auxiliary fort (White 1985), as did the tilery at Brampton (Hogg 1965). Other examples can also be found, but these are sufficient to illustrate the association of forts and military production areas.

Camelon was not alone in central Scotland in producing goods (Bailey 1994). At the Antonine Wall forts of Falkirk, Mumrills and Inveravon there is evidence for iron-smelting, and the iron produced might easily have been shipped at Camelon for England, along with the leather and other materials.

What is clear from the Three Bridges site is that many of the Camelon camps were far from transitory. At least three phases were discovered, each building upon the earlier, followed by the blocking of two gateways. Work at Lochlands indicates the same complexity (G S Maxwell pers comm). Insufficient dating evidence was found to say how long these camps spanned. Flavian pottery was found in the ditch of camp *d*, and on the ground surface nearby. The radiocarbon date is not precise enough to show that the ovens were built at the beginning of the Flavian occupation, though this is a reasonable supposition. Antonine reuse of the area must be assumed and would provide the best context for a coarseware sherd from the topsoil in 1995, as well as the two sherds from the solitary pit lying east of group G.

The military zones around the Flavian and Antonine forts at Camelton were extensive. The camps, annexes and precincts are so numerous that they could have served all the purposes outlined above. It is to be hoped that the far more extensive work of the Newstead Research Project (University of Bradford) will provide us with an interesting parallel.

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