

Roman campaigns north of the Forth-Clyde isthmus: the evidence of the temporary camps

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The major problem involved in the interpretation of temporary camps is that of chronology, for temporary occupation *sub pellibus* rarely leaves much that can be detected archaeologically. Attempts have been made over a number of years to place the numerous Scottish camps into groups on the basis of their size, shape and gateway construction, the groups in turn being assigned to a particular campaign because of their distribution and size relative to what is known of that period from other sources, and their relationship to more readily datable structures. These attempts have centred on those camps N of the Forth-Clyde isthmus, since that area has proved extremely productive in their discovery, and the number of possible historical associations is more limited than elsewhere in the province. The groupings defined have all been assigned to the campaigns of either Agricola (AD 80–4) or Severus (AD 208–11). Other possibilities do not appear to have been seriously considered, yet there are several. The Antonine occupation of Scotland, even if it were a walk-over, must have involved campaigning at least as far north as the Tay, and probably much further if the establishment of permanent installations is any guide. Considerable trouble erupted on the northern frontier later in the second century with the crossing of a wall and killing of a general resulting in aggressive campaigning by Ulpus Marcellus between 180 and 184/5. It is now generally accepted that the wall referred to was Hadrian's, but it is difficult to equate the implications of trouble so far south with the apparent speed and ease of conquest of Lowland Scotland by both Agricola and Lollius Urbicus. Furthermore, the archaeological evidence indicates the concentration of trouble at the eastern end of the Wall, yet the Votadini seem to have been basically pro-Roman, or at least non-belligerent, on the basis of native settlement studies. The involvement of the Caledonii, whose territory lies N of the isthmus, is implied in a reference to their failure to keep promises during the governorship of Virius Lupus as if the conditions of an earlier treaty had been broken (Dio 75, 5, 4). The find-spots of three coin hoards ending with Commodus at Rumbling Bridge, Kinross; Leuchars, Fife; and Muthil, Perth, may lend support to the geographical implications of the literary sources, although it is impossible to say whether the hoards represent booty from raids further south, money paid to secure peace or deposition by soldiers on campaign (Robertson 1975, 417).

Nor are the alternative possibilities confined to the 2nd century. After almost a century of peace following the campaigns of Severus, the northern tribes, collectively referred to as the Picts, were again a source of trouble. Constantius Chlorus campaigned successfully against them in AD 305 apparently penetrating deep into their territory (*Pan Lat Vet* vi (vii) 7, 1–2). Trouble, apparently involving the *areani*, was sufficient to provoke an unexpected imperial visit in the

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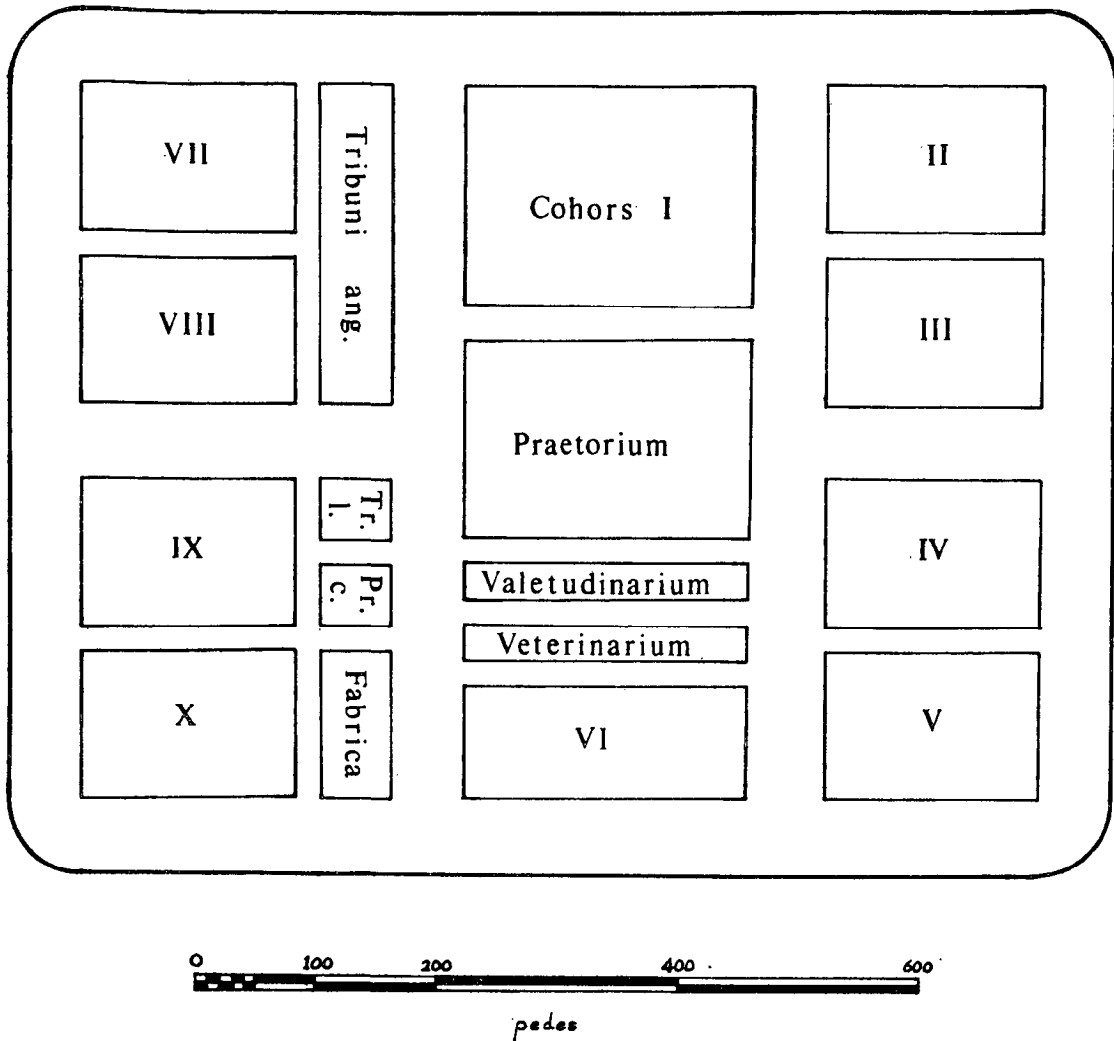
winter of 342–3, but what action was taken is not known (Ammianus Marcellinus xx, 1, 1; xxviii, 3, 8). Lupicinus campaigned, presumably successfully, against the Picts in 360 though this did not prevent their resurgence in 364, and, of course 367–8 (Ammianus Marcellinus xx, 1, 1; xxvi, 4, 5; xxvii, 8). Thereafter, there are further brief references to campaigns against the Picts and Scots by Magnus Maximus in 382 and Stilicho in the late 390s (Chron Gall 452; Claudian *de primo consulatu Stilichonis*, II, 247–55). There are dangers in laying too much stress on the ethnographical and geographical accuracy of these diverse sources, but, at least before the restoration of Theodosius and abandonment of the long-established Roman control of Lowland Scotland,¹ the source of hostility must have lain N of the outpost forts on Dere Street and probably N of the isthmus in the region designated as Pictish in the early Historic period. The minor peak in the coin list for Scotland in the early 4th century, represented N of the isthmus by some 20 individual coins and the hoards from Fort Augustus, Inverness and Covesea, Morayshire, would seem to provide some archaeological support for the suggested location of the centres of hostility. The precise causes of loss or deposition are again impossible to ascertain but it seems unlikely that they represent an increase in trade between Rome and the natives at a time of heightened unrest, and they cannot all be modern losses (Robertson 1975, 391 & 419). Thus the overall historical picture of campaigning N of the isthmus would appear to be far more complex than our present interpretation of the temporary camps.

Before going on to examine each of the groups of camps represented in northern Scotland, there are certain basic principles of camp construction while in hostile territory which must be clarified. That it was standard practice for a Roman army on the march to construct a fortified enclosure each time it stopped to encamp is well known (Josephus *B J* iii, 76; Sallust *Jug*, 45; Vegetius *epit rei mil* iii, 8). The site was selected by an advance party taking into consideration the availability of water, forage and firewood (Vegetius ii, 7; iii, 8; Hyginus *de met cast*, 57). It is unlikely that any of these requirements would be in short supply in northern Scotland; on the contrary, the abundance of the latter may have presented some problems, for Caledonian forest seems to have become a stock phrase to describe the local environment (Tacitus *Ag* 25, 1; Pliny *N H* iv, 102; Herodian iii, 14, 10; Cassius Dio 76, 13, 1; *Pan Lat Vet* vi (vii) 7, 1–2)². It is difficult to resist the conclusion that encampment may have involved some clearance of forest or scrub, particularly for the larger camps, especially bearing in mind the provision of a cleared space outside the camp for security (Hyginus *de met cast*, 57). It seems hardly credible that so much effort should be expended on what might be little more than an overnight stop, yet Josephus implies that the army were prepared even to level the ground (*B J* iii, 77), and several of the scenes on Trajan's Column illustrate the felling of trees apparently in advance of camp construction, though there are difficulties in some cases in distinguishing permanent from temporary installations (Cichorius 1900, scenes LVI, CXXVII, CXXIX). The troops were trained in camp construction (Vegetius *epit rei mil* i, 21) and, under normal circumstances, the whole process was achieved with amazing speed (Josephus *B J* iii, 84) so that the availability of sufficiently large open areas need not have been a predominant factor in site selection, though this is not to suggest that camp sites were carved out of dense forest. During a campaign, sites would be occupied possibly for several days while investigation of the locality was being made, so that the construction process need not have occurred each night.

It becomes important, then, to consider whether the above considerations affected the re-occupation of a site or even the refurbishing and re-use of the defences to save time and effort either on the return journey from enemy territory or during a subsequent campaign. Re-occupation of the site seems to be more common than refurbishing of the defences, though the expansion of the small camp at Ardoch from 13 to 30 acres may indicate its later re-occupation by a

larger force, the camps at Dunblane possibly illustrating the reverse situation.³ The re-use of the site but not the actual defences, as attested at Ardoch and Ythan Wells for example, seems to be the more usual occurrence reflecting a consistent choice of siting based upon favourable topography and possibly the military attitude whereby since the men are used to constructing a camp from scratch, it is administratively easier to let them do so. Nor should we assume that the Roman army was necessarily always the epitome of efficiency. It seems to be almost a commonplace of army life that inessential tasks are performed at unnecessary length with undue frequency. Josephus tells us that on breaking camp it was destroyed partly to prevent the enemy making use of it, but also simply because it was easy to construct another when necessary (*BJ* iii, 90), although since a number of camps survive to this day camp demolition cannot always have taken place. There is, however, a further factor which militates against the re-use of an area already utilised during that campaigning season. Despite the organisation and general tidiness of the Roman army even during a campaign as illustrated by the neat rows of rubbish pits occasionally detected within temporary camps, as for example at Inchtuthil, Dalginross and Bochastle, the fouling of the ground and especially the water supply by thousands, if not tens of thousands, of men and animals would make the site unusable for some considerable time thereafter (*Vegetius epit rei mil* iii, 2).

Finally, some consideration of the relationship between the size of the camp and the number of men it contained must be attempted, although the salutary lesson gained from the study of permanent establishments should not be forgotten (Breeze & Dobson 1969, 15f). Calculations are based either on the literary sources, mainly Polybius and Hyginus, or on Richmond and McIntyre's survey of the camp at Rey Cross. By tracing in the probable street lines from gate to gate, Richmond and McIntyre suggested that the camp had probably been intended to provide accommodation for a legion and associated troops, that is approximately 6,000 men (1934, 50-8). The irregular layout of the camp seems to have caused some problems in calculating its precise internal area, almost exactly 20 acres, which gives a presumed density of 300 men to the acre,⁴ Roy's calculations (1793, 52-3), based upon the detailed account of the army of the late Republic provided by Polybius, led him to suggest that a legion could be housed in an area just over 23 acres which gives a density of approximately 240 men to the acre, but it is not certain to what extent any such figure can be applied to the Imperial army of the 1st- to 4th-centuries AD. In the latest edition of Hyginus' *de metatione castrorum* Grillone attempts a reconstruction of the camp to contain the hypothetical army of approximately 40,000 men (1977, xi-xvii). The whole army is fitted into an area 1620 by 2320 *pedes* which gives a density of almost 480 men to the acre. The date of this military handbook, though disputed, is closer to events here under consideration, but it too is not without its problems, for the assembled army is a highly improbable one. By taking the basic data on the size and disposition of tents for a century, the width of roads and intervallum space, it is possible to estimate the optimum size of encampment for a single legion (fig 1). The hypothetical camp would be 700 by 920 *pedes*, that is 14.35 acres which gives a density of approximately 380 men per acre. It is extremely difficult to reconcile these various calculations. Both Richmond and Roy seem over-generous in the provision of space yet it would be in the interests of both security and efficiency to keep the size of the camp to a minimum. On the other hand Grillone's hypothetical camp seems rather cramped. There are three additional considerations which must be allowed for when dealing with a large force: firstly, the larger the camp, the smaller proportionately would be the area occupied by the larger main roads and intervallum space; secondly, a large force is likely to include a much greater element of cavalry than is present in a legion and consequently decrease the average number of men per acre; and finally, all these hypothetical calculations do not take into account the problems in some areas of finding



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FIG 1 Hypothetical reconstruction of a legionary camp

sufficient suitable ground. This might result in a more intensive use of available space and, thus, a decrease in the size of the camp, or the inclusion of 'dead' ground and an increase in the area enclosed. Nevertheless, as a rough guide a density of 350 men per acre does not seem an unreasonable estimate.

The most recently identified grouping of camps is that represented at Dunning and Abernethy just to the S of the Tay. Both camps are similar in size (114 and 116 acres respectively), in shape and in the distribution of their gateways each with *titulum*. Despite the dangers of chronological interpretation on the basis of a single sherd of pottery, the presence of a fragment of late 1st century samian from the bottom of a ditch section at Abernethy argues strongly for a Flavian date, and a possible association with Agricola's third campaign *usque ad Taum*, although further camps could still come to light N of the Tay. It has been suggested that the two camps some 10 miles apart on the northern slopes of the Ochils are heading for Carpow where a further camp has been

defined beneath the Severan legionary base (St Joseph 1973, 220-3). Clearly this provides a Severan *terminus ante quem*, and in so far as comparison is possible given the very slight remains of this camp at Carpow, general dimensional similarities with Dunning and Abernethy have been noted; yet, despite extensive excavation in and around the fortress, no trace of Flavian material has come to light (information from Prof J J Wilkes).

A group of smaller camps known as the Stracathro-type are defined on the basis of their distinctive double clavicular gateway and named after one well-defined example (St Joseph 1958, 92). These occur both N and S of the isthmus and are normally attributed to the sixth campaign of Agricola when the army was divided into three columns (Tacitus *Ag*, 25). This dating is reinforced by the generally early context of the clavicula-style gateway⁵ and their close association at five sites with known Flavian permanent establishments. The circumstantial evidence for their date is quite strong, but such is their variation in size – from 5 to 60 acres – that their association with a single campaign is highly unlikely as St Joseph has recognised (1973, 229). Even the examples from N of the isthmus vary sufficiently in size (from 23.5 to 39 acres) to make their association with any one campaign difficult to justify. Perhaps some of the examples adjacent to permanent establishments were construction camps as St Joseph has suggested at Menteith (1970, 177), though in general they seem unnecessarily large.

A second group of small camps with *titulum* gates averaging approximately 30 acres in size is also attributed to Agricola's sixth campaign since the camps are complementary in size and distribution to the Stracathro-type, and the example at Ardoch was shown to be early in the sequence there (St Joseph 1969, 114). The average acreage quoted, however, gives a false impression of regularity for their variation is almost within the same limits as that seen in the Stracathro-type N of the isthmus, while the camp at Ardoch is an extension of an earlier 13-acre camp, and at Dunblane the 34-acre camp contains within it an apparently contemporary 15-acre camp (but see note 3). Much is made of the division of Agricola's army into three parts in his sixth campaign, but the implication of the narrative is that this occurred late in the season after the war had been pushed forward simultaneously by land and sea presumably at least as far as Montrose Basin where a small coastal camp has been discovered at Dun,⁶ which has produced a fragment of late 1st-century samian (St Joseph 1973, 225). Yet, only two examples of the 30-acre group are known N of the South Esk and both are only tentatively ascribed to this series. Furthermore, if an army is advancing in three columns the intention is to provide for greater versatility and coverage of an area while maintaining close contact in case of danger. It is not meant to aid the enemy on the principle of divide and conquer. Thus one would expect the camps related to Agricola's sixth campaign to be grouped comparatively closely together, half a day's march at maximum which in uncharted and difficult territory could be as little as 5 or 6 miles and probably closer. Such an interpretation is supported by Tacitus' account of the night attack on the IXth Legion at the end of the season when Agricola was able to come to its aid with the rest of the army by dawn (*Ag*, 26). Given that he first had to be advised of the attack and then break camp and march by night, the distance separating the encamped legions cannot have been great. The closest distance between any 30-acre camp and a Stracathro-type camp is over 6 miles between Dornock and Dalginross which also involves a river crossing. The other examples are all considerably further apart. So not only are the 30-acre camps doubtful as a group, their association with the Stracathro-type is unsupported. On the basis of excavations at Ardoch the 30-acre camp there was seen as earlier than the 63-acre camp and thus pre-Severan (St Joseph 1970, 169), yet the intersection of the two camp ditches was not examined. The chronological sequence was based upon a second deliberate back-filling of the ditch of the smaller camp beneath the putative line of the larger camp's rampart. Such a deliberate infilling could, however, have taken place at any time after the construction of

the camp, and need have no bearing on its relationship with the 63-acre camp on the same site. The relationship must therefore remain not proven.

The four northernmost examples of St Joseph's 120-acre group of camps have been hived off to form a separate group of 110-acre camps, and the remainder re-christened 130-acre camps. The latter retain their Severan attribution but the former are now assigned to the final campaign of Agricola. This well illustrates the limitations of the criteria used to define groups or series of temporary camps. The apparent similarities in average axial-proportions and provision of gates previously quoted to define the 120-acre group and associate them with the 63-acre series are no longer seen as significant for the more northerly examples. The re-dating of the smaller group is based upon their similarity in size to the camps at Dunning and Abernethy, and their distribution in the NE which is complementary to the two smaller series of 'Agricolan' camps (St Joseph 1973, 231-2). Further supporting evidence was provided by the discovery of a unique camp at Durno, which is, at over 140 acres in extent, the largest camp N of the isthmus. This, it has been argued, represents the site of the battle of Mons Graupius, that being the unique occasion when such a large army was assembled. It is suggested that the forces housed in the two nearest groups of camps, the 110-acre and the Stracathro-type, combined for the battle and produced this unique camp (St Joseph 1977, 144). But the supporting evidence is little more than circumstantial. The similarity between the 110-acre camps and the Flavian 115-acre camps is restricted to size and does not extend to morphology. The association of the 110-acre camps and the Stracathro-type camps is based largely upon their complementary distribution, but how much weight is laid upon this depends to some extent upon how much one believes in the dictates of topography. Further south, camps of apparently different periods often occur quite close together, though it could be argued that the possible routes north through Strathearn and Strathmore were more obviously restricted by the local geography. The 110-acre camps and the Stracathro-type cannot both be related to Agricola's final campaign for at Ythan Wells an example of the former overlies one of the latter (St Joseph 1970, 177; 1969, 113). Moreover, it was originally concluded that the ditch of the Stracathro-type camp had silted up to the angle of rest before the rampart of the 110-acre camp was built across it; clearly there are dangers in attempting to draw any chronological conclusions solely on the basis of the nature of the ditch fill. One cannot dispute that the camp at Durno is at present unique, but it is no less likely that a whole series of such camps remain to be discovered than that a series of 110-acre camps S of Normandykes have similarly gone undetected for so long (St Joseph 1977, 144). If Durno is Agricolan it might represent the last camp of Agricola's combined forces before they were split into smaller battle groups towards the end of the sixth campaign, but it could just as readily fit into a Severan or a Constantinian context, as could the 110-acre camps, if we can rely at all on the accuracy of the literary sources (Dio 76, 13, 3; *Pan Lat Vet* vi (vii) 7, 1-2) or the coin evidence indicating the extent of Roman penetration into northern Scotland at other times. In fact, the very size of Durno makes it an unlikely candidate for the site of Mons Graupius. According to Tacitus (*Ag*, 35-7) Agricola had a force of 13,000 auxiliary troops at the battle, though nowhere does he state the number of legionary troops present. It is possible that all the legions in the province were with Agricola on campaign, although none were at full strength since vexillations from all four had been sent to Germany in 83 (*ILS*, 1025 & 9200). Certainly the IXth and XXth were present, and the tripartite division of the army in the sixth campaign hints at the presence of a third or possibly vexillations from the other two. Thus, a maximum of 30,000 would be a reasonable estimate of the total number of troops present at Mons Graupius. Even using the most generous of the estimates of troop density within a temporary camp this force could be housed in an area of 125 acres, which would be reduced by half if the opposite extreme calculation were applied.

By far the most complete series of camps found N of the isthmus so far, is that referred to by

their average size of 63 acres. The group is defined not only because of the size of the camps, but also on the basis of general morphological similarities; the number and position of the gates each with a *titulum*, the consistent rectangular shape and in several cases the presence of a small additional enclosure or annexe (St Joseph 1958, 93; 1969, 114). The camps are generally attributed to the campaigns of Severus because they appear to follow a line of march through Carpow where a Severan legionary base is well attested, and beneath which lies a large polygonal enclosure. Such an interpretation requiring a crossing of the Tay at Carpow seems to be supported both by the existence of a possible bridgehead fort at St Madoes and the bridge of boats depicted on a coin of Caracalla issued in 209 AD (St Joseph 1969, 114-18). Confirmation of a post-Flavian date was provided by excavation at Ardoch, although, as already discussed, the relationship there established is not certain. While on recent evidence the most likely context for this series of camps is Severan, this should not be expressed with quite the degree of certainty recently adopted (Reed 1976, *passim*).

The last group, the re-defined 130-acre camps, follow the line of Strathearn and Strathmore from Ardoch north as far as Kair House, and considering their large size, the variation in acreage from camp to camp is minimal. The general morphology of the camps and the position of their gateways is seen as reminiscent of the 63-acre series. These similarities combined with a distribution which is complementary to the 63-acre group led to the suggestion of a Severan date, presumably representing two campaigns since an example of each group overlapped at Ardoch (St Joseph 1969, 116). Confirmation of a late date for the 130-acre camp at Ardoch has been provided by its relationship with a signal or watchtower and, more recently, with a smaller temporary camp both of which it overlay (St Joseph 1976, 19; 1977, 135-8). Excavation of one of the points of intersection between the 130 and 63-acre camps indicated that the former was the later, since its ditch stopped short of the 63-acre camp ditch which in turn seemed to have been deliberately back-filled beneath the probable line of the 130-acre camp's rampart (St Joseph 1970, 168-71). Unfortunately, this interpretation directly conflicts with the observations of earlier field-workers. General Roy specifically states that at the then-surviving northern intersection of the two camps the larger was the earlier, although his published plan does not indicate this relationship (1793, 63 & pl x). Furthermore, in the NW corner of the annexe to the fort at the point of intersection with the surviving rampart and ditch of the 130-acre camp, the ditch of the former clearly cuts the latter (Roy 1793, 63; Crawford 1949, 33; Breeze 1970, 126), although traces of a causeway continuing the line of the rampart of the temporary camp can be seen in the annexe ditch at the second point of intersection. If the more obvious relationship between the two earthworks were to be accepted this would provide a Severan *terminus post quem* for the annexe and thence the fort, yet there is no evidence either structural or artefactual which would support a suggestion of permanent occupation of the fort in the third century or later.

It was decided, therefore, to investigate the second intersection of the two large camps in the hope that the apparently contradictory evidence from Ardoch might be reconciled (see fig 3 for trench location). The farmer, Mr Rowe, very kindly granted permission and excavation took place over two long weekends in September, 1977 with the aid of students and technical staff from the Department of Archaeology at Glasgow University. The intersection of the two camps' ditches was detected at a depth somewhat greater than anticipated (0.5-0.6 m), the line of the smaller camp running immediately to the north of the raised trackway which divides the field and embodies the rampart of the camp, which continues in use as a field boundary. Some difficulty was experienced at first in precisely defining the edges of the 63-acre camp ditch which was covered by a layer of compacted small cobbles. This difficulty accounts for the slightly odd position of the E-W section line (see fig 2). The ditch of the larger camp, however, was readily detectable as a

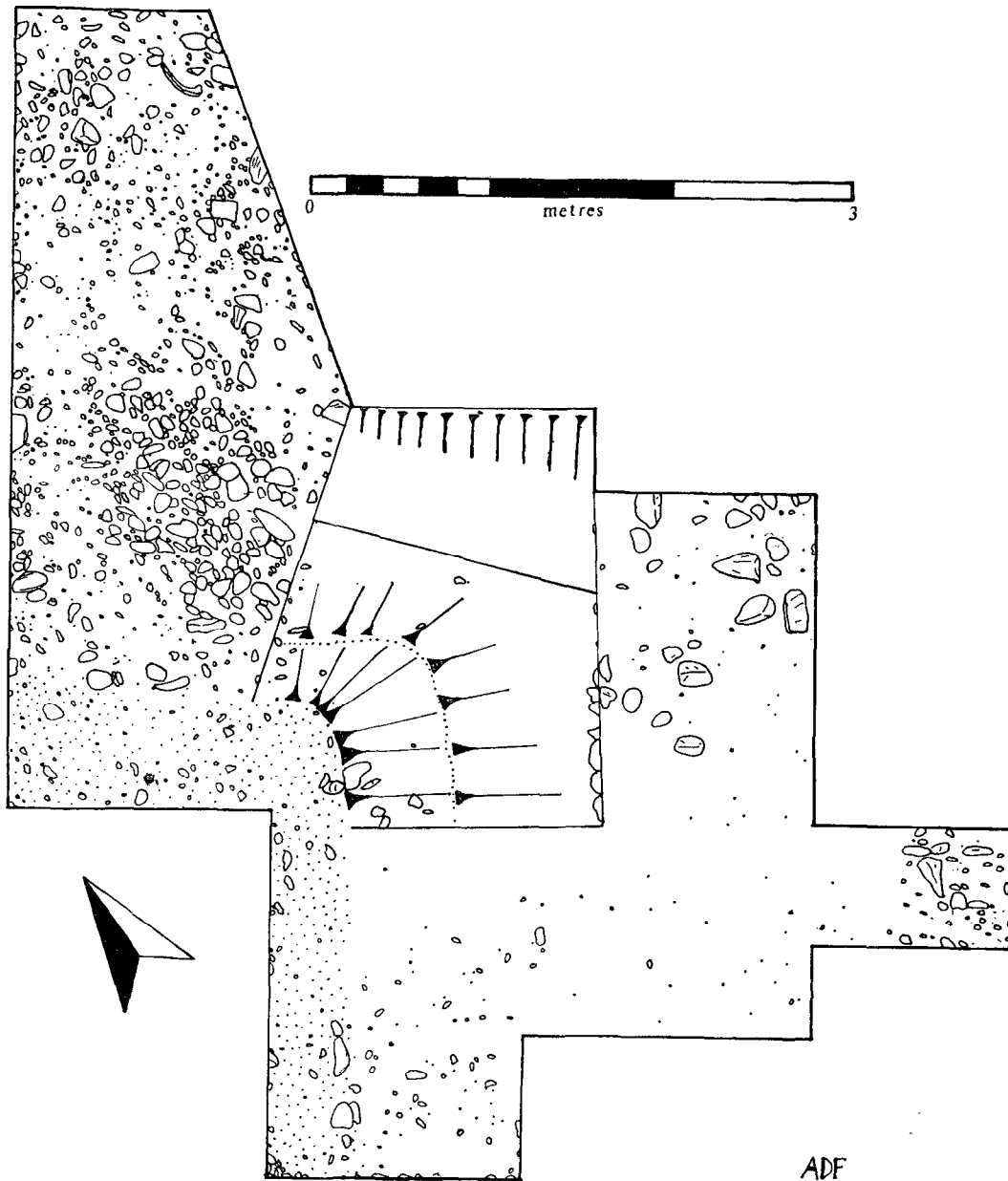


FIG 2 Ardoch 1977 – northern intersection of 63 and 130-acre camps

spread of soft, grey, silty loam some 3 m wide. The immediate conclusion was obvious: the ditch of the 63-acre camp had been deliberately backfilled and the surface consolidated with stones before the ditch of the 130-acre camp was dug through it. But such an easy solution was rapidly denied by the discovery beneath the cobbling which dipped and spread over the projected line of the 130-acre camp ditch of a fragment of late medieval pottery.⁷ As the removal of the SW quadrant of the ditch intersection progressed a thick layer of black humic material was encountered

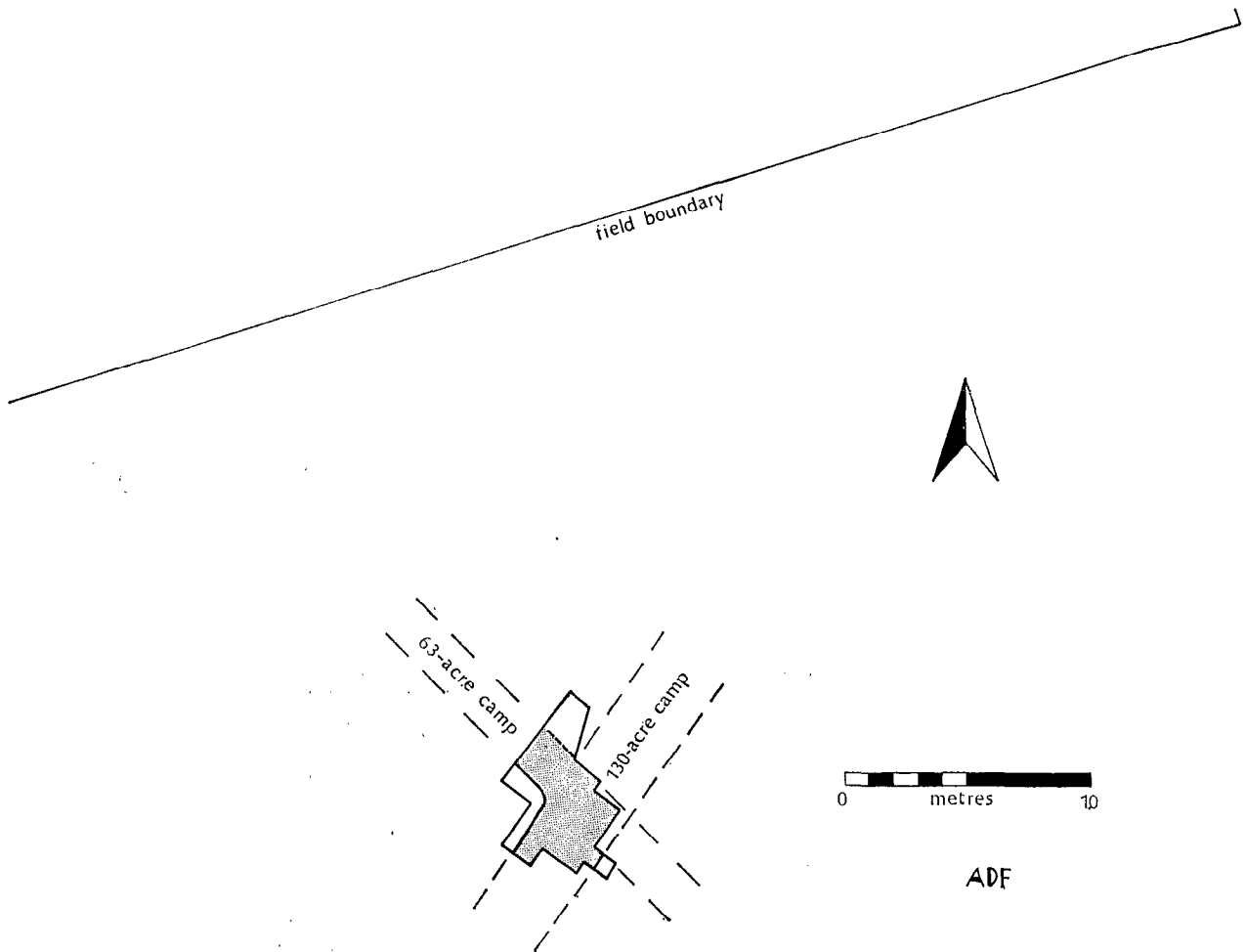


FIG 3 Ardoch 1977 – trench location

which clearly cut both ditches. By this stage hope of defining the chronological relationship between the two ditches was beginning to evaporate, for they had been much disturbed in post-Roman times, presumably related to the use of this spot as a means of access from the nearby farm buildings to the fields demarcated by the surviving rampart and ditch system indicated on Roy's plan (1793, pl x). Fortunately, on completion of a full section across the ditch of the 63-acre camp it was evident that the natural subsoil was undisturbed on the northern side of the ditch. Thus, the 130-acre camp ditch was not continuous, but stopped short of the ditch of the smaller camp on one side in the same way as was seen at the southern intersection. It would surely be too much of a coincidence for the 63-acre camp ditch to pass through gateways at both of these intersections, so that the later dating of the larger temporary camp must be confirmed. Confidence in this interpretation is further provided by an examination of an original drawing of Roy's plan of the area in which at the northern intersection, the larger camp is clearly depicted as cutting the smaller (British Library, Map Library K Top L 79-2a). The annexe to the fort must now be seen either as a post-Roman feature or as earlier than the 130-acre temporary camp. The former

possibility seems unlikely for it is hard to envisage a purpose for such a feature attached to an 'ancient monument' whereas its interpretation as an annexe is well paralleled at other Roman sites. The ditch on the west side of the annexe must have been recut at some time after the Roman evacuation of Scotland, presumably to serve as a field boundary, a function it was performing by the time of Roy's survey of the area (1793, pl x).

It has not been the aim of this paper to substitute one dogma for another, but rather to illustrate that the generally accepted interpretation of the dates and associations of the temporary camps in Scotland is by no means the only possible solution and is in general based upon evidence of a largely circumstantial nature. Each year aerial reconnaissance reveals still more new camps and there is a danger that these will be forced into a simple framework when the situation is undoubtedly very complex. The study of Roman temporary camps in Britain, where more examples are known than in any other province of the Empire, can shed considerable light on not only the history of Roman attempts to subjugate the island but also the nature and organisation of one of the most successful fighting forces in history. But if we are to make any further progress towards assigning absolute dates to these works this must be based upon the discovery of artefactual evidence. Datable finds from sections through temporary camp ditches are rare discoveries, but no one has yet examined any of the lines of pits within the camps which are occasionally revealed on aerial photographs. Herein may lie hope for the future.

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NOTES

- 1 The interpretation here follows Mann 1974, 34f.
- 2 For a discussion of the problems of estimating forest cover during the Roman occupation, see Hanson 1978, 291-3.
- 3 The excavator concluded that the two camps were contemporary (Robertson 1969, 36), although a similar plan can be seen at Longthorpe resulting from the reduction in size of the vexillation fortress (Frere 1974, 2). This similarity combined with the presence of rock-cut ditches at several points around the perimeter of the 'camps' at Dunblane might prompt a re-assessment of the temporary nature of the occupation there.
- 4 The area is not calculated in the original article, but is referred to as 26 acres by Richmond (Ogilvie & Richmond 1967, 62). Frere quotes an area of 20.1 acres (1974, 270, fn 10).
- 5 Frere 1974, 253 and St Joseph 1958, 93. Claviculae are, however, known in later contexts: on Trajan's Column (Cichorius 1900, scene XXI) relating to the Dacian campaigns at the beginning of the second century and referred to by Hyginus (*de met cast* 55) whose *floruit* is normally assigned to the later second century. See also Wilson 1974, 343, gfn 14.
- 6 Although at 8 acres this camp does not seem large enough to have been anything other than a defended stores dump. It can hardly have held both the army and marines (Tacitus *Ag*, 25).
- 7 I am indebted to Mr E J Talbot for commenting on this sherd.

REFERENCES

- Breeze, D J 1970 'Excavations at Ardoch 1970', *Proc Soc Antiq Scot*, 102 (1969-70), 122-8.
 Breeze, D J & Dobson, B 1969 'Fort types on Hadrian's Wall', *Archaeol Aeliana*, 47 (1969), 15-32.

- Cichorius, C 1896-1900 *Die Reliefs der Traiansäule*.
- Crawford, O G S 1949 *The Topography of Roman Scotland*.
- Frere, S S 1974 *Britannia*.
- Grillone, A (ed) 1977 *Hygini de metatione castrorum*.
- Hanson, W S 1978 'The Organisation of Roman Military Timber Supply', *Britannia*, 9 (1978), 291-303.
- Mann, J C 1974 'The Northern Frontier after AD 369', *Glasgow Archaeol J*, 3 (1974), 34-42.
- Ogilvie, R M & Richmond, I A R (eds) 1967 *Tacitii de vita Agricolae*.
- Reed, N 1976 'The Scottish campaigns of Septimius Severus', *Proc Soc Antiq Scot*, 107 (1975-6), 92-102.
- Richmond, I A R 1937 'Ardoch', *Archaeol J*, 93 (1936), 312-14.
- Richmond, I A R & McIntyre, J 1934 'The Roman Camps at Reycross and Crackenthorpe', *Trans Cumberland Westmorland Antiq Archaeol Soc*, 34 (1934), 50-61.
- Robertson, A S 1969 'The Roman Camps on Hillside Farm, Dunblane, Perthshire', *Glasgow Archaeol J*, 1 (1969), 35-6.
- Robertson, A S 1975 'The Romans in North Britain: the coin evidence', in Temporini, H (ed) *Aufstieg und Niedergang der römischen Welt*, II, 3.
- Roy, W 1793 *The Military Antiquities of the Romans in Britain*.
- St Joseph, J K S 1958 'Air Reconnaissance in Britain, 1955-57', *J Rom Stud*, 48 (1958), 86-101.
- St Joseph, J K S 1969 'Air Reconnaissance in Britain, 1965-68', *J Rom Stud*, 59 (1969), 104-28.
- St Joseph, J K S 1970 'The Camps at Ardoch, Stracathro and Ythan Wells: Recent Excavations', *Britannia*, 1 (1970), 163-78.
- St Joseph, J K S 1973 'Air Reconnaissance in Roman Britain, 1969-72', *J Rom Stud*, 63 (1973), 214-46.
- St Joseph, J K S 1976 'Air Reconnaissance of Roman Scotland, 1939-75', *Glasgow Archaeol J*, 4 (1976), 1-28.
- St Joseph, J K S 1977 'Air Reconnaissance in Roman Britain, 1973-76', *J Rom Stud*, 67 (1977), 125-61.
- Wilson, D R 1974 'Roman Camps in Britain' in Pippidi, D M (ed) *Actes du IX Congres International d'Études sur les Frontières Romaines*.