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ROMAN MILITARY SIGNALLING ON THE NORTH BRITISH FRONTIERS

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FOR MANY years it was accepted uncritically that there was a necessity for the Romans to have complex signals networks along and behind the frontiers of northern Britain, and of course it was tacitly assumed that the Romans had both the technical expertise and adequate skilled manpower to set up and keep the systems operational. Postulates varied from Sheppard Frere's long-distance signalling by beacon from Croy Hill¹ to Sir Ian Richmond's system of a combination of seven bright lights capable of transmitting complicated coded messages from Four Laws.² In recent years, however, some healthy scepticism has been voiced on some of the entrenched beliefs. Malcolm Todd has underlined the climatic difficulties for lateral signalling along Hadrian's Wall,³ R. A. H. Farrar raised the problems of intervisibility and the spacing of optical relay posts in an article on Stainmore Pass,⁴ and David Breeze has called into question the long-held belief that remains strung along Gask Ridge comprised a series of signal posts.⁵ Collectively these items do make up a valuable corrective, but a return to first principles and a review of the evidence is required to put the subject of Roman signalling firmly into perspective.

We can safely speculate that the efficiency of the Roman command structure depended on the communication of accurate intelligence, but there has been considerable muddled thinking on how this could have been best achieved. Three essential points have to be made. First, it has to be recognised that there is a vast difference between strategic—long-distance command—communications and tactical—short-range combat—signalling. Messages in the former involve the transmission of high grade, complicated, and often encoded information, whereas in the latter the information is restricted to much simpler local material. Secondly, the modern reader, accustomed to the requirements of contemporary warfare, too often accepts that complex communications were essential to control troops on the ground. Thirdly, the operational effectiveness of visual signalling is frequently grossly overestimated.

Since the Roman period, in spite of the quantum jumps in communications technology, the criteria for the adoption of military signalling systems have not changed. A system must be capable of assimilating and transmitting information accurately and speedily, at all times and in all conditions. In practice certain systems obviously display individual advantages over others, but in the final

analysis the military will give preference to all round reliability, because experience has proved that under active service conditions communications are notoriously susceptible to failure. No system is foolproof, or indeed soldierproof, and ideally there always ought to be a back-up system available for emergencies.

In the field of visual signalling there are in essence three basic categories of system which could have been available to the Romans for use along and behind the frontier defences of Britain.

The first category comprises systems of panels, flags, lights or movable arms linked to a dictionary of phrases. A good example of this category is the Chappé telegraph which was in operation during the French Revolutionary Wars. These systems have a limited corpus of transmittable information, but are in general quite fast and easy to use. Vegetius describes a system which could fall into this category. *Aliquantum in castellorum aut urbium turribus appendunt trabes, quibus aliquando erectis aliquando depositis indicant quae geruntur.*⁶ Regrettably Vegetius' description gives us no indication of the operational range.

The second category embraces those systems of panel combinations, flags, arms or lights which use a specific alphabetic code such as the Morse code or semaphore. A few hybrid systems, such as the naval flag code, fall readily into this category, but they also contain a number of predetermined phrases. These systems are flexible, but require highly skilled operators for them to be effective. They are also very manpower intensive as there is a time limit on individual operator concentration and efficiency.

The final category has a number of simple preselected signals such as the lighting of a beacon or the hoisting of a flag or a beam to convey a single piece of information. A warning of an incursion or the withdrawal of an enemy is easily transmitted by such a method. Clearly in such an arrangement no dialogue is possible, and the operation has more in common with an intruder alarm system than with a communications network. It is not improbable that the passage from Vegetius quoted above merely refers to a simple system within this category.

Since the invention of the telescope the first two categories of systems have been employed in military operations with reasonable, but not with invariable, success. It has to be realised that because of the limits on the power of resolution of the naked human eye the maximum effective range of both categories without the aid of optical instruments is something less than two kilometres even in ideal weather conditions.

The fundamental problem with the final category is that predetermined signals can convey very misleading information. For example a razzia by a mere score of barbarians and a major invasion could evoke precisely the same alarm signal. The attendant dangers of over or under reaction are so obvious that elaboration would be superfluous. In addition, in the event of an error and a false alarm the system would be too inflexible to allow the erring initiator to put the process into reverse.

There is no signalling system which is not manpower intensive. Even if a chain is only intended as an alarm system it requires constant vigilance at every post along its length. In the case of the more complicated systems the reception or transmission of even the simplest message would require the attention of

substantial teams of competent operators at all times. The corollary is that to operate visual communications systems on the scale visualised by modern historians the Romans would have had to be able to deploy large numbers of highly trained personnel.⁷ During specific campaigns, when units and formations were likely to have been brought up to establishment, or somewhere near it, numbers may not have presented an intractable problem, but, during periods of peace or quasi-peace, when the army's operational commitments were minimal, the allocation of not inconsiderable numbers of men to man chains of optical relay posts just to keep the system functioning would have been extremely difficult to justify.

The critical question, however, is not whether the Romans had adequate numbers of personnel of sufficient calibre to set up and support long-distance, permanently operational, strategic visual signalling systems to maintain communications between forward units along the *limes* and headquarters well to the rear, but whether visual networks were superior in terms of reliability, speed and accuracy to a system of fast riding couriers. The effects of inclement weather on visibility, the inevitable dangers of garbling in the retransmission of a message by operators at every optical relay post, and the limitations on the quantity and quality of transmittable information imposed by the nature of the systems available make the written word carried by dispatch rider seem the better alternative by far. It is extremely difficult to believe that the Romans ever resorted to visual signalling to communicate between Hadrian's Wall and York for example.

At the tactical level it is well attested that the Romans controlled units on the battlefield by the use of special calls on the *tuba* and the *cornu*,⁸ and it is reasonable to suppose that calls were used to communicate between watch-towers along the frontiers, indeed the mouthpiece of an instrument has been recovered from the site of a watch-tower on the German *limes*.⁹ What is surprising, however, is that neither the *tubicen* nor the *cornicen* appears in Tarruntenus Paternus' catalogue of *immunes*,¹⁰ but another instrumentalist the *bucinator*, who is nowhere recorded as having a tactical role, does. G. R. Watson's view that Paternus' list was not intended to be exhaustive may be correct,¹¹ and in that case the explanation could be that the *bucinator* was chosen at random as the representative of the musicians. But if an alternative explanation that the other musicians' skills were considered insufficient for them to be included among the *immunes* is correct, then it follows that the ability to transmit acoustical signals was not regarded as particularly difficult or an important attribute and only the very simplest of messages were passed by this method. Almost any soldier could be trained to transmit a few predetermined acoustical signals, and there would be no demands for high quality personnel on that account. If the number of visual signals was similarly restricted, then again non-specialist rank and file could have coped with the communications commitment in the watch-towers. There are really no grounds for believing that the Romans relayed anything more than the simplest local tactical intelligence along the watch-towers/turrets of the north British frontiers, and no extraordinary abilities were required to transmit and receive it.

Before moving on to the sources, there is one remarkable fact which supports our

arguments so far. There is no Latin word for signaller. From this we can reach the categorical conclusion that signalling was not a Roman military specialisation. A further inference must be that the Romans did not use complex signalling networks to command and control their armies.

The sources used as evidence for Roman visual signalling systems comprise the ancient authors Polybius¹² and Vegetius;¹³ the reliefs on the columns of Trajan and Marcus Aurelius; and the archaeological identification of signal posts. Obviously there can be no epigraphical evidence.

Polybius describes a complex alphabetical system using torches, which he personally had perfected. It is commonly accepted that Polybius' system, or something very similar, provided the basis for Roman visual signalling. Although we must respect Polybius' opinion on military matters, he had served as *hipparchus* of the Achaean League in 169–168 B.C. and was in Scipio Aemilianus' entourage during the siege and destruction of Carthage in 147–146 B.C., it is most unwise to effect a simple transfer of what seemed feasible to him in the context of warfare in the Mediterranean theatre in the second century B.C. to the Roman imperial frontiers in northern Britain three hundred years and more later. His system's demands on manpower, the problems of training barely literate operators, the effects of weather on visibility, and its very questionable speed and reliability in comparison with dispatch riders make its suitability, both at strategic and tactical level, seem very dubious indeed.

The information from Vegetius is sparse. In addition to his system of beams already referred to he provides us only with *per noctem flammis, per diem fumo, significant sociis quod aliter non potest nuntiari*.¹⁴ From this we can deduce very little. There is certainly not enough information to give support to the belief that systems of torches, such as that devised by Polybius, were in operation. The most that can be concluded with any degree of confidence is that the Romans, when other means were not possible and given the correct weather conditions, used fire and smoke to transmit predetermined signals.

Although the distinguished scholars Sir George Macdonald,¹⁵ Sir Ian Richmond,¹⁶ and O. G. S. Crawford¹⁷ all used Trajan's column to illustrate the complexity of Roman visual signalling in Britain, it has to be said that the evidence is less than convincing.

The reliefs show a number of watch-towers, some with torches protruding from an upper storey, and close to one a close-packed square pile of logs and what looks like two straw ricks. Macdonald, following von Domaszewski and using the column of Marcus Aurelius as confirmation, concluded that these were beacons ready for lighting, the straw to produce smoke by day and the wood for flames by night.¹⁸ Graham Webster, with singular restraint, has indicated that it would be an odd way of arranging timbers to burn quickly.¹⁹ The ricks, even making allowance for the problems of scale imposed on the sculptor, are far too close to the tower if deliberate ignition was intended. A personal view is that the baulks of timber and the straw were destined for a far more prosaic use. They were in all probability engineer stores, for building and thatching, sited close to the tower for protection.

Scrounging, or looting from one's own side, is a commonplace in armies. Richmond and Crawford both accepted Macdonald's unlikely beacon theories. The unreliability of smoke signals which can be so adversely affected both by visibility and atmospheric pressure almost certainly precluded their use by the Romans in Britain. The use of fire beacons to alert the frontier must have been a last resort, a point conceded by Richmond,²⁰ and it would be a matter for dismay if the authority to light them was vested in junior officers based in watch-towers.

To use the reproductions of *burgi* on Trajan's Column as proof of Roman transmission of complicated messages by torches is at best unsafe. The total evidence comprises three towers with torches projecting from upper storey windows over their doors. A balcony runs around the upper storey of each tower and admittedly a soldier could have detached the torch and manipulated it to signal in any direction he chose. However, we can tell from the frieze that the towers were manned by units of *auxilia* whose signalling skills would have been basic. The towers face the Dacian bank of the Danube and were without doubt integrated into an early warning system. Complicated messages were not necessary. All that was required was to keep a lighted torch visible when all was well and to extinguish it on the advent of danger. But even this interpretation is perhaps going too far. All the torches face the river, they may have been put up to assist navigation. Whatever the true explanation of the sculptures on Trajan's Column may be, there certainly are not enough grounds there to suppose that the Romans used torches for code-signalling,²¹ or that they transmitted ordinary messages by torch,²² or that the towers were designed for signalling,²³ let alone transfer these deductions to the environment of northern Britain.

In any attempt to identify Roman military signalling installations the archaeologist could encounter two distinct categories of edifice. First, buildings designed primarily or solely for communicating information, and, second, buildings for which the signalling role was only secondary. Neither the necessity for nor the desirability of the first category in Britain has ever been proven, and it follows that their very existence must be very much in doubt, but that has not deterred archaeologists from arbitrarily identifying remains as signal posts when no other explanation for their location or function was readily to hand.

With regard to the second category, archaeologists have attributed excessive signalling requirements and capabilities to *burgiturres* along the British frontier defences. Most frontier action must have been low-intensity warfare and surveillance from watch-towers associated with lateral signalling of simple predetermined messages would have enabled sector commanders to deal with local disturbances, but to have relied on chains of watch-towers to warn the army to mobilise for major operations would have been the height of folly. Reaction time would have been far too slow.

From Ammianus Marcellinus we learn that the Romans employed forward intelligence gathering to forewarn their commanders of impending trouble, and he gives us an insight into their methods. He tells us that the *areani* were disbanded for treachery, but what is more interesting is that he spells out their role, *Id enim illis*

*erat officium, ut ultro citroque, per longia spatia discurrentes, vicinarum, gentium strepitus nostris ducibus intimarent.*²⁴ In modern parlance they gathered information by deep penetration reconnaissance. For reasons of security, reliability and speed important strategic information gathered in this way must have been passed backwards and upwards by dispatch rider, it is most unlikely that it ever got into the hands of non-specialist signallers.

In summation, there is absolutely no evidence to indicate more than that military signalling was of a very low priority in the Roman organisation of the frontier defences in Britain.

NOTES

- ¹ S. S. Frere, *Britannia* (2nd ed., London, 1974), 170.
- ² I. A. Richmond, *History of Northumberland* (Newcastle, 1940), vol. 15, 101–102.
- ³ M. Todd, *Roman Britain 55 B.C.–A.D. 400* (Glasgow, 1981), 142.
- ⁴ R. A. H. Farrar. Roman Signal-Stations over Stainmore and Beyond, *Roman Frontier Studies 1979* (Oxford, 1980), 211–231.
- ⁵ D. J. Breeze, *The Northern Frontiers of Roman Britain* (London, 1982), 61–62. His identification of the remains as watch-towers rather than signal-stations is unquestionably correct, but his reasons for that conclusion are equally incorrect. The distance between the buildings was an ideal range for tactical acoustical and visual signalling, and the Danubian analogy is unacceptable.
- ⁶ *De Re Militari* iii, 5.
- ⁷ A representative sample: G. Webster, *The Roman Imperial Army* (London, 1969), 246–248; M. Grant, *The Army of the Caesars* (London, 1974), 299; P. Salway, *Roman Britain* (Oxford, 1981), 570–571.
- ⁸ G. Webster, *op. cit.*, 141–142.
- ⁹ D. Baatz, *Die Wachtürme am Limes* (Stuttgart, 1976), 48.
- ¹⁰ *Digesta*, 50, 6, 7.
- ¹¹ G. R. Watson, *The Roman Soldier* (London, 1969), 76.
- ¹² X, 45–47.
- ¹³ *loc. cit.*
- ¹⁴ *loc. cit.*
- ¹⁵ G. Macdonald, *The Roman Wall in Scotland* (Oxford, 1934), 354–358.
- ¹⁶ I. A. Richmond, Trajan's Army on Trajan's Column, *PBSR*, XIII (1935), 35–36.
- ¹⁷ O. G. S. Crawford, *The Topography of Roman Scotland* (Cambridge, 1949), 51.
- ¹⁸ *loc. cit.*
- ¹⁹ *Op. cit.* 247.
- ²⁰ *Op. cit.* (1935), 36.
- ²¹ G. Macdonald, *op. cit.*, 35.
- ²² I. A. Richmond, *op. cit.* (1935), 36.
- ²³ O. G. S. Crawford, *loc. cit.*
- ²⁴ XXVIII, 3, 8.