

ART. V – *Signalling and the design of the Cumberland coast system*

By D.J. WOOLLISCROFT

**I**N 1989 the writer published a study of the signalling system of the central sector of Hadrian's Wall<sup>1</sup> which, despite certain objections,<sup>2</sup> appears to have been generally well received. Studies on a number of other Roman frontiers followed, yielding similar results<sup>3</sup> and it now seems right to take a separate look at the Wall's coastal defences on the Cumberland coast.

As Hadrian's Wall and the Cumberland coast are essentially just two different parts of the same system, one might expect their signalling arrangements to be identical. The two share the same regular installation pattern, with the coastal milefortlets and towers corresponding exactly to the milecastles and turrets on the Wall. Both have a series of forts, and it has now even been suggested that the coastal system also had a running barrier,<sup>4</sup> albeit only a (as yet inconclusively dated) timber fence. Nevertheless, there are a number of variations in the design of the coastal sector which make it appear subtly different, and significant gaps in our knowledge also make the sector more difficult to study.

i) Unlike Hadrian's Wall, the coastal defences were built on a rigid spacing system, with the sites almost always set at exact  $\frac{1}{3}$  Roman mile intervals.<sup>5</sup> This means that this part of the line did not use the subtle spacing shifts used on the Wall itself to facilitate signalling.<sup>6</sup> There are signs, however, of a slightly different approach for, in a number of areas, the line itself seems to have been laid out with signalling in mind. For example, in some sectors, such as the stretch between Tr, 3b and MF 5, the frontier sites are set back rather further than usual from the shore line and do not, therefore, enjoy anything like the best possible views over the sea. At first sight this seems irrational, especially if post-Roman coastal erosion here would mean that they would have been even further from the water in Roman times. Yet had these sites been any closer to the sea, they would not have been able to signal to the fort of Bowness, and so the entire line may have been set back to ensure communications, despite the consequent loss of superior observation positions.

On other occasions distinct kinks have been formed in the line and these may also have been partly intended to facilitate signalling, as they allow particular sites to occupy advantageous positions without upsetting the spacing regime. For example, Bellhouse has shown that MF 2 was probably sited at the end of a low headland into the Solway, which has now been eroded.<sup>7</sup> Such a position would, no doubt, have improved its view over the water and, thus, its look-out capability. But it would also have put the fortlet in the unique position of being able to see every other coastal site on the Cardurnock Peninsular, including the fort of Bowness and, as many of the other minor installations in the area are not intervisible with the fort, the milefortlet could, thus, have served as a key relay site.

The potential for signalling would also have been helped by the careful siting of the forts on the system. For, like those of the fort period on Hadrian's Wall, most of the coastal forts are sited in highly visible positions, and Beckfoot and Maryport, in

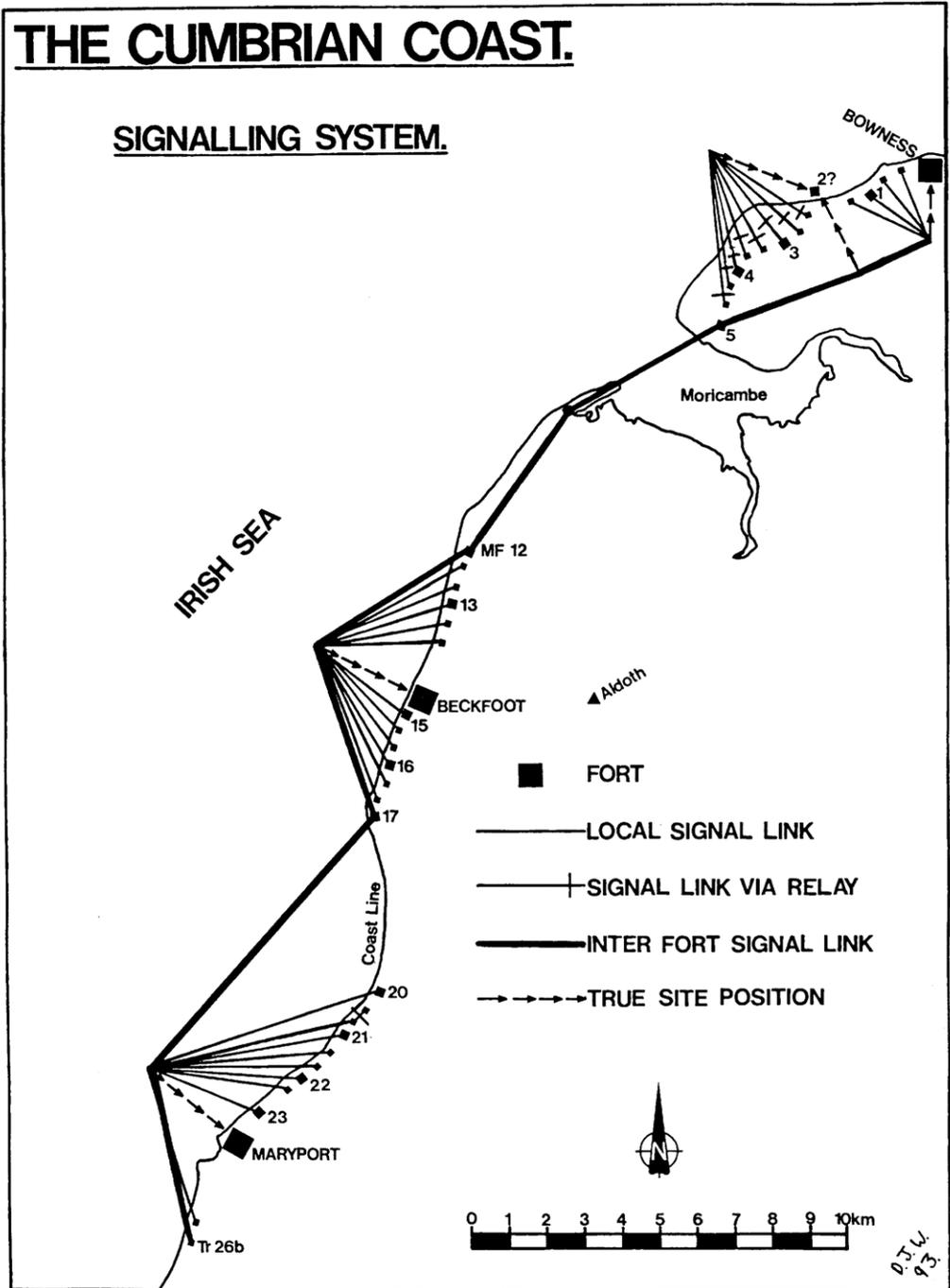


FIG. 1.

particular, can be seen for many miles up and down the coast. Maryport and, to a lesser extent Bowness, also form what might be called visual watersheds because, although they can themselves see and be seen from considerable lengths of the system, they stand on higher ground that almost none of the sites to either side of them can see past.

Despite such instances of thoughtful design, however, the rigidity of the system has been allowed to produce the occasional absurdity and this is nowhere more apparent than on Swarthy Hill (NY 067397). This hill dominates the coast line in its vicinity and is one of the best observation positions on the entire system, for, although it is very close to the shore line, it stands 31 m above the waves. Yet the spacing system decreed that the summit should remain unoccupied. No allowance was made for its special position and instead of occupying the highest point Tr, 20b was built half way up the hill's northern flank, whilst MF 21 lies some way beneath the summit on the southern side. As a result, the two installations cannot see each other,<sup>8</sup> even from their full original height, and neither is in the best observation position. Furthermore, although MF 21 can see the fort of Maryport, Tr, 20b can only do so if we assume a full tower height of 10 m. Had it been just 1 m lower, it would have had to signal back to MF 20 in order to get its signals relayed to the fort.

ii) The second problem in studying the coast is that, unlike Hadrian's Wall, we have yet to determine the full extent of the system. For, at the moment, we simply do not know where it ends. The traditional assumption has been that the line would continue as far as St Bee's Head, where the English coast turns sharply away from Scotland,<sup>9</sup> but there is little evidence to support this. The most southerly minor installation discovered to date is Tr, 26b, to the south of Maryport, although, as the system seems unlikely to have ended with a tower, we might expect at least one more fortlet (MF 27) to lie under the village of Flimby. This is only two thirds of the way to St Bee's Head. Yet searches by R.L. Bellhouse, the discoverer of so much of the system, have failed to find any traces of sites further south and Bellhouse himself has reached the conclusion that the tower and milefortlet chain may have stopped at this point.<sup>10</sup> If so, this would explain a conspicuous change in the way that the forts are positioned further south. For, although a fort chain does continue onwards down the coast, there is a switch away from the exposed but conspicuous positions mentioned above, to more sheltered sites hidden away in the bays. This change cannot be explained by a lack of suitable terrain and must, therefore, have been deliberate, because Burrow Walls and Moresby both have promontories immediately to their north which are just as conspicuous as the one on which Maryport stands. Indeed, had Burrow Walls stood on its promontory it would have been directly intervisible with Maryport.<sup>11</sup> It is true that these high points could have been occupied by relay towers so that the forts could have remained in contact with any surrounding towers and milefortlets whilst, themselves, enjoying more shelter. But such a dramatic contrast with the pattern further north would itself require explanation and, as no such towers have yet been found, the situation would only seem to make sense if the forts no longer had to communicate with a chain of minor installations strung out along the foreshore.

There is, however, one possible hint that the system may have continued beyond either Flimby or St Bee's Head, for T.W. Potter has located a possible fortlet under

the late Hadrianic coastal fort of Ravenglass, which he takes to be of the milefortlet type.<sup>12</sup> Potter also points out another coastal site, *c.* 1 Roman mile further south, as a putative second fortlet and suggests that the system may have rounded St Bee's Head and continued on south. The second fortlet has now been fairly convincingly dismissed by Bellhouse,<sup>13</sup> but the same writer's attempts to dismiss the Ravenglass site, whilst sufficient to give pause for thought, are not so conclusive. Dr Potter would argue that a Ravenglass fortlet cannot have stood alone and, whilst this is not necessarily the case, it is still tempting to wonder whether the system did get this far and, if so, how much further.

Such a lengthy system would, however, have faced major practical problems. For example, the next known coastal fort south of Ravenglass would be Lancaster, at least 40 miles away by the shore line. This means that as the Ravenglass fortlet would already be MF 55 or 56, a system continuing just one fort further would actually be longer than Hadrian's Wall itself. If this seems improbable, still more distant destinations might be considered, now that coastal towers of second century appearance have been found on Anglesey.<sup>14</sup> But, such lengthy systems would have required enormous amounts of man power, especially if they retained the same, three sites per mile, spacing density. Yet, south of Ravenglass, it is difficult to see where these troops could have been accommodated as there were not enough coastal forts to house them.

It is also rather difficult to see what purpose such lengthy defences would have served or how they might have operated. There is obviously little point in a coastal watch system unless, having detected trouble, it is in a position to do something about it. Yet the garrisons of lightly held towers and fortlets could not ensure security by themselves. This required the presence of forts on the system, for which the minor installations would merely have served as eyes and ears. Forts would be the keystones of an effective defence and they would need to be both in communication with the line installations, so that these could summon their help, and frequent enough to ensure that such help would arrive in time. But, again, south of Ravenglass, few such forts were available and besides, if the system did continue further to the south, it seems odd that no trace of it has ever been found.

It is still, of course, possible that vulnerable parts of the coast may have been guarded or provided with observation cover and it is even possible that individual coastal forts might have deployed look out systems on their flanks. But these arrangements need not have been linked to the Hadrian's Wall coastal defences proper. Under these circumstances, it seems unlikely that the Hadrian's Wall system would have extended much further than Ravenglass and, as the coastline towards Flimby has, counter to Potter's assertion,<sup>15</sup> long been the scene of archaeological field work without intermediate stations emerging,<sup>16</sup> the present writer is, as yet, unconvinced that it even came this far.

Having said that, however, it also has to be admitted that neither Tr, 26b nor Flimby seem like particularly logical places to end the system. Bellhouse<sup>17</sup> has suggested that the reason this spot may have been chosen was a change in the nature of the shore line here, from sandy beaches, on which raiders could easily land, to dangerous rocky cliffs. This sounds eminently plausible and might also explain why the forts further south moved into the bays, since these are the only possible landing places. But it cannot be the whole story. For a start, the beaches do not end at

Flimby. Sand beaches continue for another *c.* 5 km to Workington, and even beyond that there are 4–5 km of shingle beach on which landings could still be made. The cliffs only begin to the south of Harrington (NX 986245), although once they do it is certainly not possible to come ashore safely, except at a few clearly identifiable points. Furthermore, the cliff line only extends around St Bee's Head itself and sandy beaches begin again further south. They then run for tens of miles down the coast, extending well beyond Ravenglass, which may have encouraged that fort to maintain its own, possibly separate, lookout system.

A more sensible place to have ended might have been Harrington, with a terminal fort at the harbour town of Workington and, interestingly, Prof. G.D.B. Jones has photographed a site from the air, just to the south of Harrington (NX 98952425), which resembled a fortlet.<sup>18</sup> This feature has now been dismissed by Bellhouse,<sup>19</sup> however, and nothing more can even be hinted at in the area.

Just as telling is the position of Workington's fort: Burrow Walls. The situation here could, as stated, have been identical to Maryport with the fort standing well above a navigable river mouth, in a position to overlook and exchange signals with shore installations over a wide zone. Yet Burrow Walls lies at a relatively low level close to the water, where it has been partly eroded by the sea. Here there would have been little opportunity to signal to anything and, in view of what we have seen of fort positioning further north, this may be an indication that there was nothing to signal to. The known fort has, anyway, only produced 4th century dating material<sup>20</sup> and whilst earlier occupation on or near the site cannot be ruled out, no evidence for it has emerged to date.

If the system did, then, end near Flimby there might be another logic behind it. For example, Tr, 26b stands on the furthest point south to be intervisible with Maryport, apart from the high ground immediately to the east of Burrow Walls. The tower itself has a panoramic view over the beaches to its south and, whilst this would have allowed it to link any additional installations to the fort, it could also have kept a reasonable watch by itself.

Another point that may be relevant here is the southern sector's much increased distance from the Scottish coast, compared to the more northerly parts of the system, but in order to determine the significance of this factor, we must first ask ourselves what the coastal defences were set up to achieve.

Bellhouse has repeatedly cautioned scholars against giving undue attention to the coastal sites' mutual intervisibilities or views along the shore line and, up to a point, he is right. The sites were not designed to watch each other and their rigid spacing means that the details of their fields of view are often largely fortuitous. Likewise, just as on Hadrian's Wall, there was little point in the minor sites signalling to each other, although they would still have needed to communicate with the forts, because they were simply too lightly manned to be able to offer much mutual assistance. Nevertheless, the very fact that the system was continued on the Hadrian's Wall site spacing pattern suggests that the shore installations were not just concerned with watching the sea. This could have been achieved much more economically by means of isolated observation posts on headlands (as on the Yorkshire coast) or by sites on the higher ground a little further inland. The fact that the more densely spaced Cumberland coast system stays so close to the foreshore, often barely above sea level, would suggest that the defences were also watching the shore line to detect any

illicit landings. This was a job that more isolated stations could not have carried out so effectively because it would still have been relatively easy for small raiding parties to slip past them at night or in misty weather.

The further south the system gets from Bowness, however, the further it gets from potentially hostile coastlines. Scotland is still plainly visible from Flimby, at a range of *c.* 40 km, but this is already much further than Bowness where the distance is barely 2 km. Increasing distance does not necessarily lessen the risk of attack by seaborne raiders, as the victims of Saxons, Vikings or other marauders have frequently found to their cost. But it would, at least, make it more likely that the raiders were forced to make part of their sea crossing by day and, on the relatively enclosed waters off Cumbria, this would have given the defences a major advantage.

We do not yet know whether the Romans maintained a naval presence in Cumbria. But we might expect them to have had some means of taking to the water and even if they did not, any raider sailing during the day could have been easily detected at sea and then intercepted as he landed. It is probable, therefore, that raiding parties would want to completely avoid being out on the water by day, at least on the inward journey, unless they were in real force. This would mean that they would want to sail in, acquire booty and get off again in the space of a single night. In darkness, the shore defences would then only have been able to detect them at close range, when they had already virtually landed and the closely spaced coastal works appear to be designed to counter just such a threat. But the limitation of this *modus operandi* would be that the raiders could only operate over comparatively short ranges and, by the time one gets as far south as Burrow Walls, it is likely that such a wholly nocturnal approach would no longer be possible. If so, then the rest of the coast could be protected by a much thinner screen.

iii) The final difficulty with the Cumberland coast is that we know far less about its development than we do for Hadrian's Wall. Despite G.D.B. Jones' work on the western Stanegate<sup>21</sup> and his recent discovery of the tower at Aldoth (NY 136485), behind Beckfoot,<sup>22</sup> there is still no clear sign of an early line backing the system in the way that the Stanegate supported the Wall. Likewise, we still do not understand the chronological relationship between the coastal system and its forts, and no attempt has been made to look for line sites underlying the forts as they frequently did on the Wall.<sup>23</sup> Furthermore, despite the fact that Prof. Jones' work at Tr's 2b and 4b<sup>24</sup> has been offered as evidence that the minor sites had quite a lengthy development, we still do not know if the coast was an original part of the Wall's milecastle and turret chain, or a later addition.

Bellhouse has argued that the southern part of the system, from MF 9 to Tr, 26b, was laid out with reference to Maryport,<sup>25</sup> which implies that the fort was planned or already built when the minor works were set up. This has led him to suggest that the original system may have been based on Maryport and Kirkbride,<sup>26</sup> with the rest of the forts being part of the, so called, "fort decision" which led to the Wall forts of Hadrian's Wall. This still seems plausible, despite the fact that Maryport, unlike Kirkbride, has not yet been shown to be the Trajanic foundation he had assumed.<sup>27</sup> For its square shape is so like that of Trajanic Kirkbride and so unlike the "playing card" shape of the Hadrian's Wall and other coastal forts, that it is more than tempting to see Maryport as pre-dating the rest of the Hadrianic series. Moreover, a

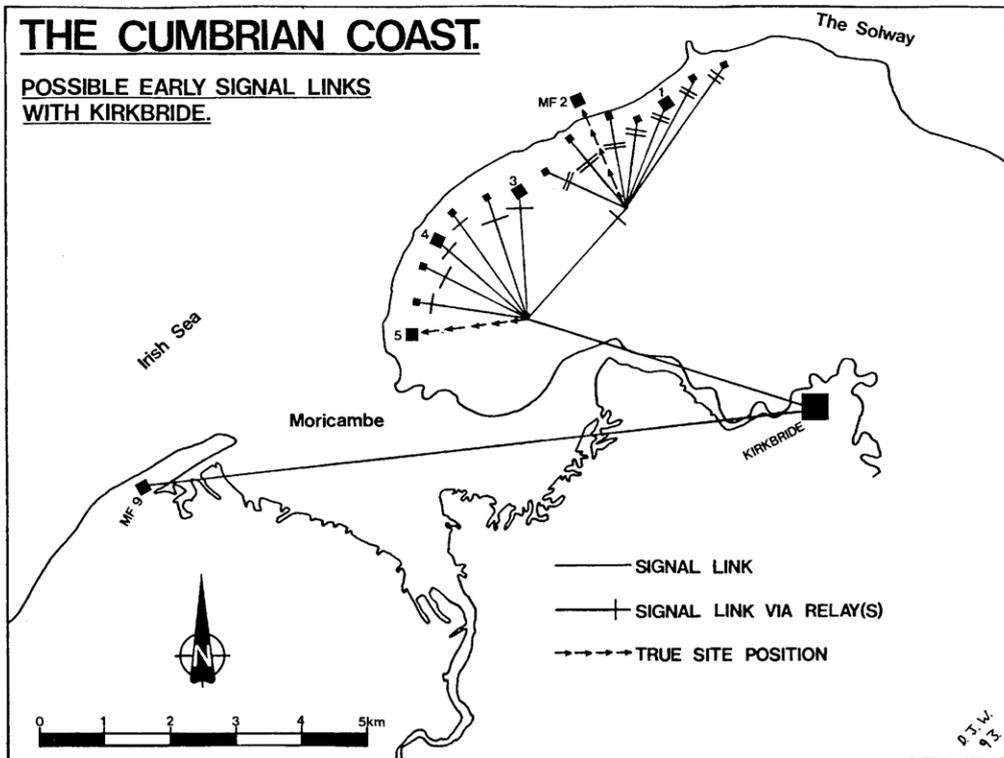


FIG. 2.

second enclosure has now been seen from the air at Beckfoot and, although this could be just a construction camp, the only plan the writer has been able to find<sup>28</sup> shows it as square and of similar size to Kirkbride. It is, thus, possible that it might be an earlier fort and, if so, we might have a primary phase for the coastal system based on Maryport, Beckfoot and Kirkbride,<sup>29</sup> and a post “fort decision” system of Maryport, Beckfoot and Bowness, to parallel the Stanegate and Wall fort periods of Hadrian’s Wall.

Whatever the truth of such theories, it is certainly hard to believe that the coastal system ever stood without forts. One of the persistent problems with the study of Roman frontiers is in trying to gauge what sort of threats they faced. One assumes that the Cumberland coast was designed to prevent barbarian raiding parties outflanking the Wall and/or seeking booty in the hinterland and it has often been tempting to see such raids as being all rather petty. But just how big was a raiding party? The answer is that we simply do not know but we might be able to gain some idea by replying with further questions such as: “How big were Saxon, Viking or Medieval reaving raids?”. Put like that, the answer to the first question becomes “Quite big enough to be dangerous”. Yet, the coastal towers and milefortlets are not, in themselves, capable of dealing with anything more than the smallest of threats and we must assume, once again, that their role was merely to detect trouble

and not to suppress it. If so, they would have been utterly useless without forts and, as there is little point in an observation post that cannot tell anyone what it observes, signalling links to these forts would be vital.<sup>30</sup>

## The Signalling System

In view of the problems outlined above, the present survey will confine itself to the sectors between Bowness and Flimby. Chronologically, it will also largely confine itself to the known, finished form of the system, although a brief description will be offered of the Cardurnock area during a hypothetical period in which Kirkbride was occupied and Bowness was not.

During both periods, the signalling system appears to have been broadly similar to that of Hadrian's Wall. For the bulk of the sites are directly intervisible with a fort, and those that are not can all communicate with a fort via simple, one stage, relays. For example, if we begin at Bowness (Fig. 1), all the sites as far as MF 2 have a direct view to the fort.<sup>31</sup> If we then accept that Bellhouse is correct in locating MF 2 on a vanished projection into the Solway,<sup>32</sup> the milefortlet, being intervisible with every site on the peninsular, could have linked Bowness with everything between Tr, 2a and MF 5. It would also explain the, previously mentioned, odd line of the system between Tr, 3b and MF 5, because had these sites been closer to the shore line, they would have dropped out of sight of this relay.

Between MF's 9 and 12,<sup>33</sup> on the opposite side of Moricambe, the sites are unknown, but everything between MF's 12 and 17 can see Beckfoot. MF 9 cannot see the fort, but its signals could have been relayed via MF 12, along with those of the missing intermediate sites and, as MF 9 can also see MF 5, Bowness and Beckfoot could, themselves, have been linked by a four stage relay via MF's 2, 5, 9 and 12.<sup>34</sup>

Finally, Maryport can see everything currently known, or even suspected, between MF 17 and Tr, 26b, except for the likely position of Tr, 20a, whose signals could have been relayed to the fort via either of its neighbours. Maryport can also be linked to Beckfoot by means of a simple one stage relay via MF 17.

On any hypothetical pre "fort decision" system, the situation south of MF 9 would have been virtually unchanged, especially if there was already a fort site at Beckfoot. The only major differences would have been on the Cardurnock Peninsular (Fig. 2), where the signalling system would now have been oriented on Kirkbride. Again, however, everything would have worked perfectly so long as MF 2 was where Bellhouse has predicted. MF 5 can see Kirkbride (as can MF 9) from its known position, although again it could not have done so from nearer the shore. No other site on the peninsular has a view to the fort, but MF 5 can see everything from MF 3 to Tr, 4b and can also see MF 2. MF 2 could, thus, again have served as a relay for the remaining sites on the sector and so every Cardurnock installation could have had signals relayed to Kirkbride.

## Notes and References

<sup>1</sup> D.J. Woolliscroft, "Signalling and the Design of Hadrian's Wall", *AAAS* 17 (1989), 7-19.

<sup>2</sup> J. Crow, ("A View of Current Research on the Turrets and Curtain of Hadrian's Wall", *Britannia* 22

(1991), 62f and Fig. 5) has recently tried to cast doubts on some of my conclusions on Hadrian's Wall by disputing the usual interpretation of Turret 45a. This has long been put forward as a formerly free standing, Stanegate period tower, later incorporated into the Wall. Dr Crow suggests that, in fact, the site fits into the normal, regular spacing pattern of turrets and milecastles and that, although its superstructure is known to be un-bonded with the Wall, recent clearing of its footings has shown that it is bonded into the Wall foundations and, thus, was built as a Wall installation from the start.

If Dr Crow is correct, then my own hypothesis would certainly be undermined, although, the fact that the turret seems to have been completed in a hurry before the Wall to either side of it, would, at least, suggest that it was considered to be of unusual importance. A number of factors would argue against his interpretation, however. Firstly, the turret does not, in fact, fit the normal spacing pattern. It is c. 100 m off its measured  $\frac{1}{3}$  mile position. Secondly, the primary excavation report for the site (C.C. Woodfield, "Six Turrets on Hadrian's Wall", *AA4* 43 (1965), 162–9) contains a very similar drawing (168) to Dr Crow's, at a larger scale. This appears to show the Wall's foundations simply riding over those of the tower, which were slightly wider than the superstructure. The tower was excavated down to bed rock and the excavator was perfectly confident that the tower and Wall foundations remained not only totally separate down to this level, something that can, in fact, still be seen on the north side of the turret, but also of very different construction. This, and the extremely awkward angles at which the Wall abuts with the turret's east and west sides makes the present writer very reluctant to accept Dr Crow's interpretation as does the tower's unusual design.

- <sup>3</sup> D.J. Woolliscroft, "The Outpost System of Hadrian's Wall", *CW2*, lxxxviii, 23–8; D.J. Woolliscroft and B. Hoffman, "Zum Signalsystem und Aufbau des Wetterau-Limes", *Fundberichte aus Baden-Württemberg* 16 (1991), 531–43; D.J. Woolliscroft, "Signalling and the Design of the Gask Ridge", *P.S.A.S.*, forthcoming.
- <sup>4</sup> G.D.B. Jones, "The Western Extension of Hadrian's Wall: Bowness to Cardurnock", *Britannia* 7 (1976), 236ff; G.D.B. Jones, "The Solway Frontier: Interim Report 1976–81", *Britannia* 13 (1982), 283ff; N.J. Higham and G.D.B. Jones, *The Carvetii* (Gloucester, 1985), 30ff. But cf. R.L. Bellhouse, "Hadrian's Wall: The Limiting Ditches in the Cardurnock Peninsular", *Britannia* 12 (1981), 135ff and R.L. Bellhouse, *Roman Sites on the Cumberland Coast: A New Schedule of Coastal Sites* (Kendal, 1989), 5ff.
- <sup>5</sup> R.L. Bellhouse, *Roman Sites on the Cumberland Coast: A New Schedule of Coastal Sites* (Kendal, 1989), 1f.
- <sup>6</sup> D.J. Woolliscroft, *op.cit.*, note 1, 7f.
- <sup>7</sup> R.L. Bellhouse, "Roman Sites on the Cumberland Coast 1966–67", *CW2*, lxix, 69ff and fig. 3.
- <sup>8</sup> This does, at least, give the lie once again to the idea that Roman frontier signals were passed via a strictly linear chain from tower to tower along the system, although Mr Bellhouse informs me that MF 21 is, in fact, slightly north of its measured position.
- <sup>9</sup> E. Birley, *Research on Hadrian's Wall* (Kendal, 1961), 128.
- <sup>10</sup> R.L. Bellhouse, "Roman Sites on the Cumberland Coast: Milefortlet 20 Low Mire", *CW2*, lxxxi, 12f.
- <sup>11</sup> Although, as yet, only 4th-century occupation is known at Burrow Walls. See R.L. Bellhouse, "The Roman Fort at Burrow Walls Near Workington", *CW2*, lv, 30ff.
- <sup>12</sup> T.W. Potter, *Romans in North West England* (C.W.A.A.S. Research series 1) (Kendal, 1979), 14ff.
- <sup>13</sup> R.L. Bellhouse, *op.cit.*, note 5, 61ff.
- <sup>14</sup> The Holyhead tower has been dated by pottery to the fourth century but this pottery was not a stratified find within the tower, it was merely found in a context close to it, P. Crew, "Holyhead Mountain", *CBA 2, Archaeology in Wales* 20 (1980), 42 and P. Crew, "Holyhead Mountain", *CBA 2, Archaeology in Wales* 21 (1981), 35f. See also P. Crew, "Pen Bryn Yr Eglwys", *CBA 2, Archaeology in Wales* 21 (1981), 66; S.I. White, "Capel Eithin, Cefn Du Llanfihangenscefiog", *CBA 2, Archaeology in Wales* 20 (1980), 12 and S.I. White, "Capel Eithin Cefn Du", *CBA 2, Archaeology in Wales* 21 (1981), 17ff.
- <sup>15</sup> T.W. Potter, *op.cit.*, note 12, 18.
- <sup>16</sup> R.L. Bellhouse, *op.cit.*, note 5, 63f.
- <sup>17</sup> See note 10.
- <sup>18</sup> G.D.B. Jones, "The Solway Frontier: Interim Report 1976–81", *Britannia* 13 (1982), 296.
- <sup>19</sup> R.L. Bellhouse, *op.cit.*, note 5, 57f and Personal Communication regarding fieldwork.
- <sup>20</sup> R.L. Bellhouse, *op.cit.*, note 11, 30ff.
- <sup>21</sup> N.J. Higham and G.D.B. Jones, *The Carvetii* (Gloucester, 1985), 26ff. G.D.B. Jones and K. Maude,

- "The Solway Frontier: Roman Frontier Studies", *Manchester Archaeological Bulletin* 1 (1987), 3ff and G.D.B. Jones, "The Emergence of the Tyne Solway Frontier", in V.A. Maxfield and M.J. Dobson (ed), *Roman Frontier Studies 1989, Proceedings of the XVth International Congress of Roman Frontier Studies* (Exeter, 1991), 98ff.
- <sup>22</sup> A.S. Esmonde Cleary, "Roman Britain in 1992", *Britannia* 24 (1993), 286 and fig. 12. My thanks to Professor Jones for providing additional information and for giving me sufficient advanced notice of the excavation to allow me to make a site visit.
- <sup>23</sup> C.M. Daniels, *The Roman Wall*, 13th edition of J. Collingwood Bruce (Newcastle, 1978), 110f, 139f, 180ff, 200 and 204 plus bibliography.
- <sup>24</sup> For Tr, 2b my thanks to Professor Jones for providing information. For Tr, 4b: G.D.B. Jones, "The Solway Frontier: Interim Report 1976–81", *Britannia* 13 (1982), 288ff, but see also R.L. Bellhouse, (*op.cit.*, note 5, 18–29 and R.L. Bellhouse, review: "G.D.B. Jones: 'The Solway Frontier: Interim Report 1976–81', *Britannia*, xiii, (1982)", *Britannia* 15 (1984), 232–4) who doubts that the tower found was actually the Roman coastal tower.
- <sup>25</sup> R.L. Bellhouse, "Roman Sites on the Cumberland Coast 1968–1969", *CW2*, lxx, 42.
- <sup>26</sup> R.L. Bellhouse, *op.cit.*, note 5, 50ff. For Kirkbride see: R.L. Bellhouse and G.G.S. Richardson, "The Roman Site at Kirkbride Cumberland", *CW2*, lxxv, 58ff and R.L. Bellhouse and G.G.S. Richardson, "The Trajanic Fort at Kirkbride; The Terminus Of The Stanegate Frontier", *CW2*, lxxxii, 35ff.
- <sup>27</sup> M.G. Jarrett, *Maryport, Cumbria: A Roman Fort and its Garrison* (CW Extra Series 22) (Kendal, 1976).
- <sup>28</sup> R.L. Bellhouse, *op.cit.*, note 5, 39, fig. 3.
- <sup>29</sup> The presence of the presumably, pre-Hadrianic sites of Brackenber (G.D.B. Jones and K. Maude, *op.cit.*, note 21, 5ff) and Bowness, Old Police House (G.D.B. Jones, "Old Police House Camp, Bowness-on-Solway", *Britannia* 23 (1992), 230.) should not be forgotten, but their exact dates and nature remain uncertain.
- <sup>30</sup> It is true that a tower like Aldoth might have been able to link the system with forts further inland. But, as this site is undated, it may not relate to this period and, even if it does, the help that it summoned would have taken too long to arrive.
- <sup>31</sup> The sector from MF 1–2 can no longer see Bowness because of the embanked approach to the former Solway railway bridge, but would have been able to do so in Roman times.
- <sup>32</sup> See note 7.
- <sup>33</sup> Milefortlets 6–8 do not, of course, exist. At one time it was thought that Moricambe had not yet formed in Roman times and R.L. Bellhouse, in his original schedule of coastal sites (in E. Birley, *op.cit.*, note 9, 129ff) allowed for a continuation of the system across what is now the mouth of the inlet. Bellhouse himself soon exploded this myth, however, by showing that the inlet was much older than had previously been thought (R.L. Bellhouse, "Moricambe in Roman Times and Sites on the Cumberland Coast", *CW2*, lxii, 56ff.). This means that MF 9 should, strictly, be MF 6 and that all of the sites further south have been similarly mis-numbered. Nevertheless, the numbering system is still a useful frame of common reference and, as Bellhouse has said, it is probably too late to alter it now. More seriously, it has recently been suggested (C.M. Daniels, "How Many Miles on the Cumberland Coast? Bellhouse, R.L., *Roman Sites on the Cumberland Coast. A New Schedule of Coastal Sites*", *Britannia* 21 (1990), 403ff.) that, even within this numbering system, the most southerly installations may be wrongly numbered and that Trs 26a and b should really be Trs 25a and b. Bellhouse would dispute this, however, and until the matter is settled, I propose to continue using the established nomenclature.
- <sup>34</sup> Beckfoot may, just, be visible from MF 5, at a range of c. 10 km. But the writer has been unable to confirm this on the ground.