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‘Plundering the Territories in the Manner of the Heathens’: Identifying Viking Age Battlefields in Britain

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‘Battle’ is a word often associated with the Viking Age in England and there are numerous references in the Anglo-Saxon Chronicles to the conflict that took place as the Anglo-Saxons fought to keep Viking incursions at bay. There is no doubt that hostile encounters between the two sides were violent and bloody, with the Anglo-Saxons fighting to hold on to territories that were now not only under threat from other Anglo-Saxon kingdoms, but also from ‘heathens’ and foreign enemies who were set on conquering England for their own. These battles were to take place for over two and a half centuries from the first recorded raid at Lindisfarne, Northumbria, in 793 until the famous Battle of Stamford Bridge in 1066.

Archaeology as a discipline knows relatively little of how these people fought each other for possession of English soil and wealth. There are numerous contemporary references to battles in The Anglo-Saxon Chronicle, but these state little more than there being a ‘great slaughter’ at a certain location, with the victor occasionally being named. We are not sure of the size of the battles both in terms of area and the number of combatants, nor are we sure of the tactics used.

This article will attempt to construct a theoretical model for Viking Age battlefields, utilising a synthesised approach of literary and historical evidence alongside archaeology from a number of different time periods, including prehistory. The study of the Early Medieval period and the Viking Age cannot be undertaken simply from a historical, literary or archaeological viewpoint, but a combined approach has the potential to allow a much more comprehensive view of warfare in the period.

Studying the Viking Way of War

The Viking Age (793-1066AD) is a generally lesser studied period of British history, the Vikings being 'as elusive to us today as they were to their contemporaries' (Clarke 1999:36). Relatively little has been written on Viking warfare and the widely held view of them as invading, heathen barbarians has meant that warfare has always been taken for granted as part of Viking daily life. This is probably due to a lasting reputation that began with the Christian monks who reported the 'ravages of the heathen men' (Swanton 2000:57), associating this with famines and 'terrible portents... [of] immense flashes of lightning and fiery dragons... flying in the air' (Swanton 2000:55). It is not surprising therefore, that this fear and bias against the Vikings has permeated through time.

The Vikings had a profound effect on British history and the development of the English state, the conflict between them and the Anglo-Saxons not only aiding the unification of the English under Alfred of Wessex, but also by 'bringing the population into carefully laid out villages' (Hall 2007:104). Furthermore, the Vikings expanded the existing Anglo-Saxon trading network beyond the boundaries of Europe to the Far East – a resource that had not been available since the collapse of the Roman Empire.

Though most sites at which conflict took place are unknown to archaeologists at present, the few that are known are frequently under threat. These often important and influential sites deserve to be recognised and protected where possible – an example of this comes from the site of the famous 1066 Battle of Stamford Bridge. This battle was instrumental in shaping English history, as it not only brought about the end of the Viking Age in England, but it meant that the Anglo-Saxon king, Harold Godwinson, had to defeat the Viking force before marching south to intercept William the Conqueror, who had just invaded England with a claim to the throne. Despite the historical value of this battlefield, it now lies beneath a housing estate.

Identification of Sites

The identification of Viking Age battle sites can be hindered in a number of ways. Firstly, the distinct lack of documentary evidence means that locations of battle are often disputed, as there is simply no evidence to tie the conflict to a specific location. Place-name analysis cannot always be instrumental in identifying a location due to the many ways that place names can be interpreted. The Battle of Brunanburh, fought in 937AD, is one such event with theorised locations ranging from Lancashire to Dumfries and Galloway. As a result, the number of battles that can actually be pinpointed to a specific locality within a region are small.

Even where there is enough evidence to pinpoint the locality of a battle, there can also be a number of possible locations as to where the conflict took place. The site of the 1066 Battle of Fulford has been debated even though the battle is known to have been fought near to the settlement, which lies just to the South of York (Figure 1). This is a relatively well documented battle, as it is mentioned not only in the Anglo-Saxon Chronicle (Swanton 2000:196), but also Snorri Sturlason's *Heimskringla* (edited by Mosen (1932)). This book, written in 13th Century Iceland by the poet and historian tells the stories of the Norwegian kings from the first, legendary dynasty of the Ynglingas to King Magnus Erlingson, who died in 1177 (Mosen 1932:709). Whilst due caution must be exercised when utilising the sagas for archaeological means, Sturlason's Saga of Harald Hardrade has been used alongside place-name evidence and references in the Anglo-Saxon Chronicle to establish a location for the battle (Jones 2008a) via the topographic features that are included in the account as part of the saga. Despite this, there are still possible alternatives for the location of the battle (Jones 2008b) and it is archaeological work that has helped strengthen the case for the battle taking place at Germany Beck which lies to the South of Gate Fulford.

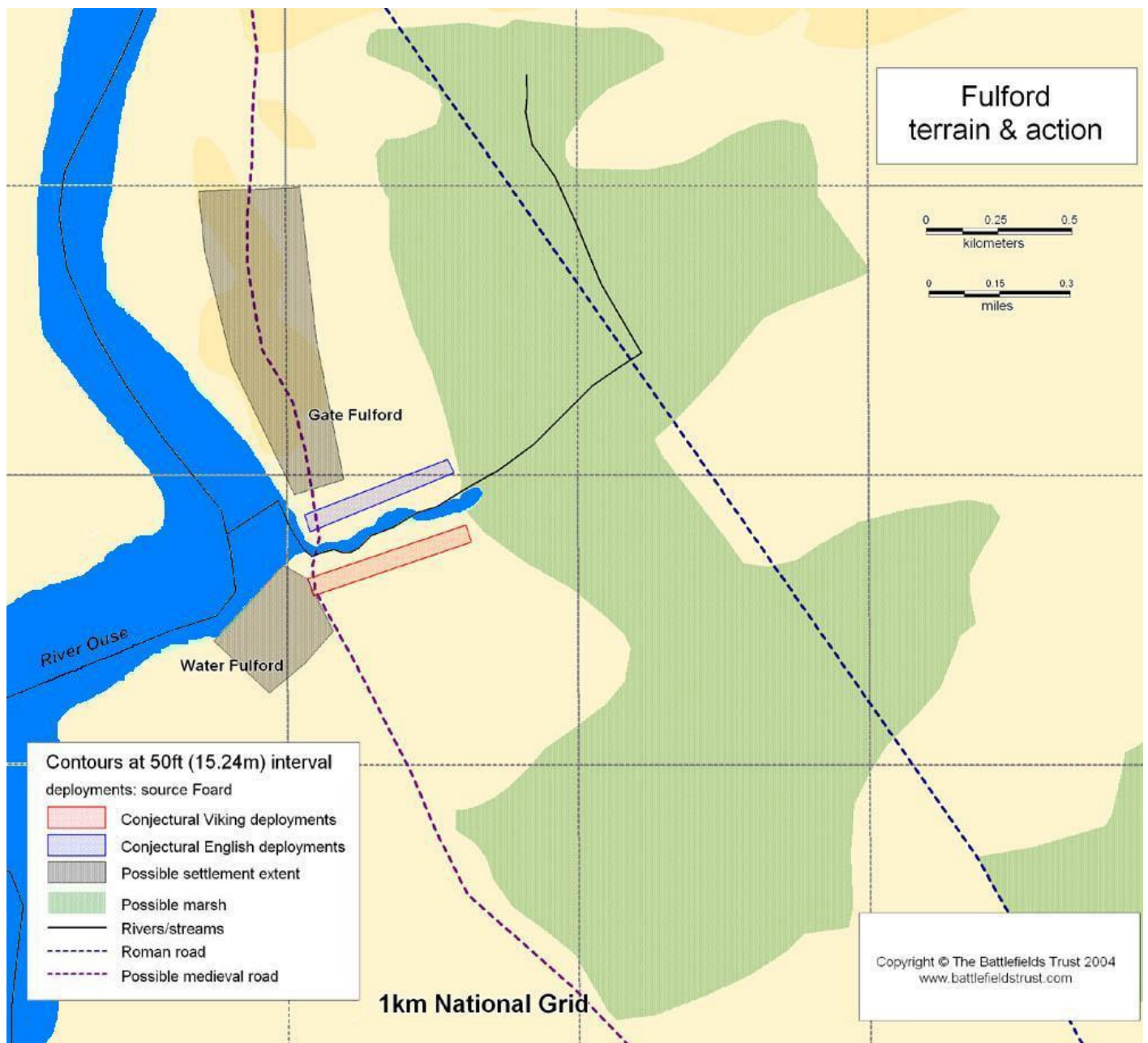


Figure 1: The commonly accepted deployment of Anglo-Saxon and Viking forces at the battle of Fulford. The black line separating the two forces is Germany Beck. Image Adapted From: The Battlefields Trust.

The location of another site that has been debated is that of a hypothesised 917AD Viking riverside fortification (generally referred to as a 'longphort') and battle site on the south bank of the River Great Ouse at Tempsford, Bedfordshire (Figure 2). The fortress, mentioned in the Anglo-Saxon Chronicle (Swanton 2000:101), was subject to a siege by Anglo-Saxons in retaliation for a raid on Bedford, with the resulting battle taking the lives of a Danish king and a number of jarls (military commanders), making it an extremely important

battle in the Viking wars. Edgeworth (2008) believes that he has identified the site at a previously unconsidered location on the strength of place-name evidence and comparison with other suspected longphort sites. Edgeworth (2008:8-9) goes on to highlight no less than five other sites in the local vicinity that may be the location of the fortification and battle.



Figure 2: The Tempsford site shown on a 1945 aerial photograph. Edgeworth believes the D-shaped area that survives as a crop-mark just south of the River Great Ouse (highlighted) to be the longphort, though the D-shaped field surrounding this area may mark an outer fortification. Photo courtesy of: The Heritage and Environment Service, Bedfordshire County Council.

Obviously it would be unwise to rely on historical and documentary sources alone in the identification of sites – whilst they can prove useful, as *Heimskringla* demonstrates, over reliance on them can easily provide a skewed view of the past. Griffith (1995:172), for example, attempts to utilise the sagas, due to their numerous references of wounds to the lower legs, in his discussion of the types of leg armour worn in battle. This reliance could be misleading, as the multitude of references to leg wounds could be the result of a desire to highlight the athleticism and skill of the heroes who have the ability to jump deadly blows in battle – Kári accomplishes such a feat by jumping

over a spear that is thrown at him in part 91 of *Brennu-Njáls Saga* (OMACL 2009). However, Griffith (1995:30) rightly states that we must at least take these sources into consideration, as 'it is only by piecing together dozens of similar cases that we can begin to get even a general idea of what sort of actions may have been normal'. Indeed, the Saga of Harald Hardrade in *Heimskringla* mentions that King Harald wore a chain mail coat that was so long that it stretched half way down his legs (Monsen 1932:566), so perhaps there may have been a real concern with attack to the legs. Without sufficient archaeological evidence however, this remains a matter of speculation.

Landscape analysis is a tool that must be utilised by the archaeologist when attempting to locate a battlefield. Whilst the landscape will undoubtedly have changed since the time that conflict took place, a general idea as to the suitability of a site can be gleaned from analysing the topography of the modern day landscape. This has been accomplished at Fulford with the use of LiDAR (Light Detection and Ranging) to identify the palaeo-channels that once drained the south-east corner of the site (Jones 2008c). If these channels had been active at the time of the battle they may have created a form of bottle-neck through which the Viking army had to advance in order to prevent traversing the marshy ground that would have been present. This would have created a perfect point at which to mount the Anglo-Saxon defence.

Even when landscape analysis has taken place further archaeological investigation is essential to identify sites of battle. Investigations have been conducted both at Fulford and Tempsford and investigations at the former have been instrumental not only in the efforts to identify the site as the battlefield, but also in highlighting post-battle activity. However, it would be prudent to first discuss the difficulties faced in identifying evidence of Viking Age conflict.

'Battlefield Signatures'

Battlefields do not necessarily have to be in a large, open space and in some cases can be extremely small – a feature that may in fact be common for Viking Age conflict. 'Vikings were fighters by vocation rather than profession, in that they did not constitute standing armies' (Clarke 1999:37) and for a single raiding group 'going-a-viking', 'the number may never have been more than ten' (Griffith 1995:124).

However 'for the first time, heathen men stayed through the winter on Thanet' (Richards 2004:30) in 850AD. The force over-wintering on Thanet was the first of a number of larger armies, which may have constituted several thousand men. They were, however, much smaller than the Roman armies which had invaded Britain eight hundred years earlier and were much smaller still than the armies that participated in the great battles of the medieval period only three hundred years later. The significance of this is that the areas in which battles were taking place in the Viking Age were most probably small, with formal, set piece battle probably being a rare experience. These small scale and potentially frequent episodes of conflict were probably more akin to what we in the modern day would see to be skirmishes rather than battle proper. It is well known that the Vikings used horses on the march, giving them the means to quickly strike a target and then withdraw before the local levies were able to muster in opposition to them. The logic behind this practice lies in the fact that they were outnumbered in a hostile country and 'as foreigners, without ready access to reinforcements, they had more to lose from an open fight' (Christiansen 2002:188). However, with the invading armies of the late 9th Century onwards, the occurrence of formal battle must have intensified, as the Viking armies were looking to fully establish themselves in England.

Evidence of conflict from any period may survive at the scene at which the conflict took place as a 'battlefield signature'. This term, coined by Sutherland (2005), essentially describes the identifiable remains and artefacts at the site that can give an indication as to the deployment of forces and their movements during battle (Sutherland 2005:25). For the Viking Age this may

be extremely difficult to identify due to the recovery and re-use of discarded and damaged material. As weapons and armour were no doubt expensive commodities the victorious forces may well have stripped the battlefield of much of the debris from the fighting. This certainly seems to be the case at Fulford where ferrous objects and metal working hearths have been discovered within the battlefield itself. With the Viking army moving on to Stamford Bridge very quickly after the battle, these may have been left behind. It is indeed interesting to note the stripping of bodies on the Bayeux Tapestry, which may also be indicative of this practice. Thus the battlefield signatures of Viking Age battles may be extremely hard to spot archaeologically.

The scale of the engagement taking place will also ultimately affect the battle signature. Skirmishes, perhaps being fought as 'flashpoint' battles between small groups of opponents (for example an incidental encounter between foraging parties), would have a battle signature perhaps only metres across, and consist only of very small finds such as shards of blades or chunks of chain mail.

Large 'battles' involving hundreds or even thousands of troops would be spread across a larger area and would presumably have a much more visible signature. Whether these battles would also include a baggage train, which may add to the extent of the battlefield signature, is a subject open to discussion. The personal view of the author is that these would not exist very often as the Vikings are often reported to construct fortifications whilst on campaign (for example at Reading in 871). These would be used as base camps from which raiding parties and contingents of the army could march. The Anglo-Saxon fyrds (militias called up from districts under threat of attack) would only be raised to counter a Viking attack and thus not need the baggage train which is more suited to campaigning armies. A baggage train, furthermore, would slow down armies on both sides, which would have been undesirable considering that victory for the Vikings often involved the ability to quickly retreat from a target before local levies could be mustered against them. The same theory applies for marching camps in that the Viking forces

may not have been away long enough from their base camp to bother with such constructions. It is entirely possible that both the Anglo-Saxons and Vikings on the march simply relied on pickets and sentries to warn of attacks during the night. It is important here to not attempt to construct similarities with professional armies such as the Roman legions, which would have had both the manpower and a standard military doctrine in place to enable them to construct marching camps every night.

Sieges (military blockade of a fortification with the intention of defeating the force inside by attrition or direct assault) would perhaps be the easiest type of conflict to locate due to the references to them in the Anglo-Saxon Chronicle. Furthermore, sieges can potentially last for long periods of time, which would allow the archaeology of the besieging army to accumulate over this period. This archaeology would not only include occupational debris but possibly siege-works such as additional ditches and banks. One would also expect to find evidence of destruction and/or burning if the besiegers managed to gain entry to the fortification.

Evidence of all Viking Age battle signatures may survive in the form of objects too small to see with the naked eye, or deemed unworthy of recovery. Obvious examples of this are missiles, which can be instrumental in identifying battlefields in that they generally fall in the vicinity of the target. At Olynthos, Greece, the ability to distinguish between Olynthian and Macedonian slingshots from the 348BC Macedonian siege of the city means that it is possible to roughly trace the positions of the defending and attacking forces during the battle (Lee 2001:11). In the Viking Age weapons that would have avoided post-battle recycling were most probably arrow and javelin heads. These will be further discussed below, as well as other possibilities by which Viking Age conflict could be identified.

The Viking Use of the Bow

The Vikings are most famously known for wielding battle axes during combat and the use of archery remains open to debate. The bow was obviously a weapon used in hunting, so one can assume that there would have been at least some within the Viking armies invading England who knew how to handle a bow. Griffith (1995:162) goes as far as to say that 'archery was inseparable from Viking combat' and it would not be unreasonable to assume so – by the Viking Age the bow had long been used in conflict. As far back as the Mesolithic period there is evidence from sites such as Tévéc, France, where missile points are lodged in the vertebrae of massacre victims (Frayer 1997:183). Arrowhead evidence from the Neolithic enclosure at Crickley Hill, Gloucestershire, shows that this particular enclosure may have come under heavy, sustained arrow attack which focused on the palisades and gates (Dixon 1988:82). Evidence that the defending forces were either defeated at, or driven from, the palisades and gateways may be interpreted from the fact that trails of arrowheads can be seen leading into the enclosure (Figure 3). At the 10th Century Viking Trelleborg fortresses, Denmark, arrowheads embedded within the fortresses turf walls suggest that this site also came under attack.

An obvious concern with this theory would be that Viking bows were simply too weak to be used in a battlefield context and that archery was not employed en masse in medieval warfare until the advent of the war bow. This bow is most famous for its performance at the great battles between the English and the French at places such as Agincourt, there is no reason to suggest that similar bows had not been in use long beforehand. A surviving bow uncovered at the Viking settlement of Hedeby 'has an estimated draw weight of 45kg' (Williams pers. comm. 2007) or 99lbs. Whilst this falls short of the 150-180lbs draw weight of some of the longbows uncovered from Medieval contexts such as the Mary Rose warship, Rogers (2000:90-91) states that the average draw weight of the longbows on the ship was about 100lbs.

Another concern is the 'honour' aspect of using archery in battle. During the medieval period the bow was regarded as a peasant's weapon and battles such as Crécy showed the flower of French chivalry – the mounted knight – to be heavily defeated by English peasants. However, the sagas do suggest that the bow was not strictly a peasant's weapon. In the 'History of Olav Trygvason' it is mentioned that an archer named Einar has his bow broken and the king throws his own for him to use instead (Monsen 1932:213). A king would not have used a weapon that was deemed 'dishonourable' (at least from the Scandinavian point of view) which therefore suggests that this may not have been a concern.

Saga evidence for archery is extensive, for example in the Saga of Harald Hardrade King Harald 'was wounded in the throat by an arrow' (Monsen 1932:567) and died as a result at the Battle of Stamford Bridge. Documentary evidence includes the famous scene from the Bayeux Tapestry detailing a man (possibly King Harold Godwinson) with an arrow in his eye (Reading Borough Council 2004a). Though lacking archaeological evidence, these sources do indicate that people made use of the bow in warfare.

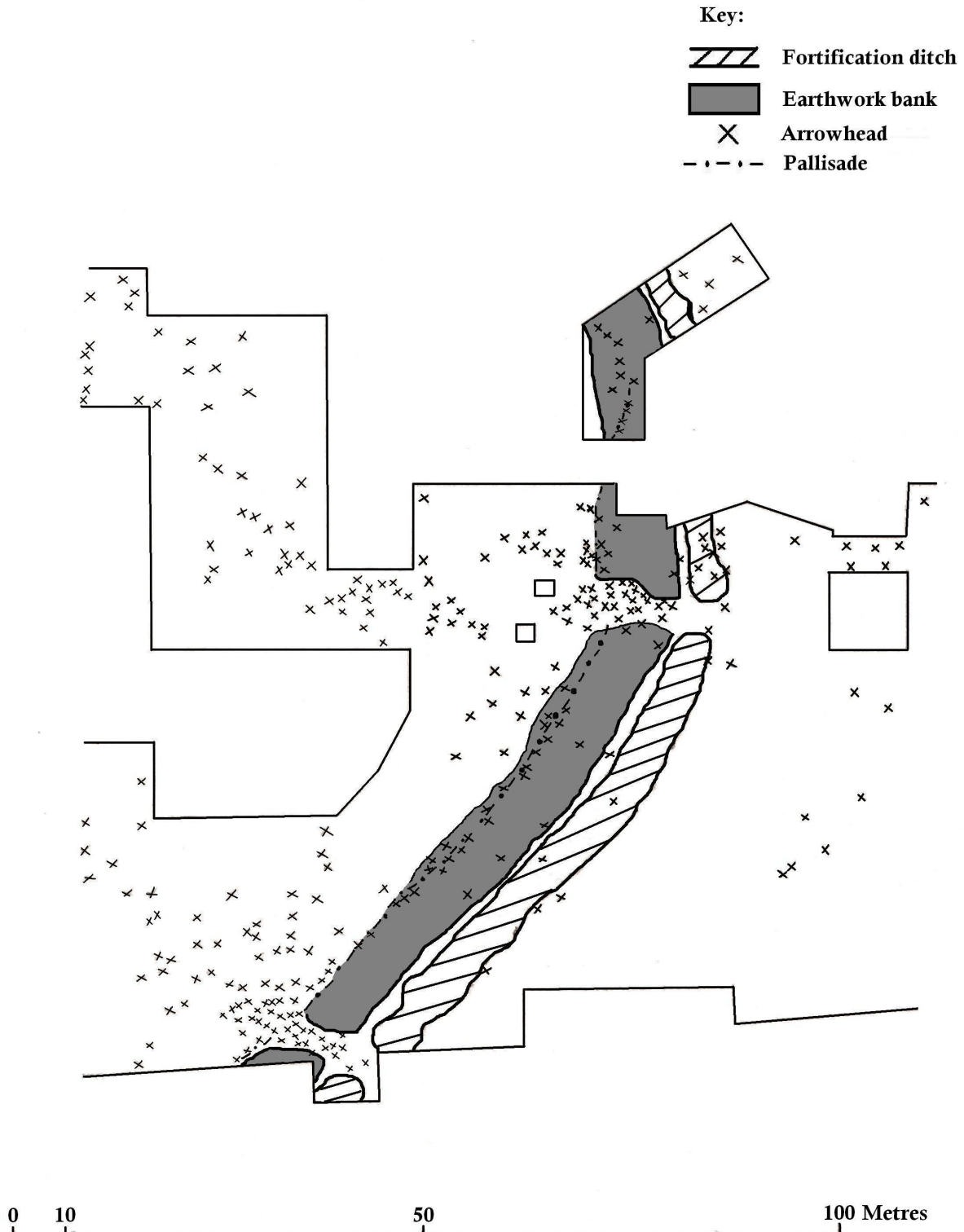


Figure 3: The Neolithic enclosure at Crickley Hill, Gloucester. Each 'X' marks an arrowhead find, showing that this particular enclosure came under heavy attack. Image adapted from Dixon (1988: 82).

It would therefore not be unreasonable to hypothesise that Viking armies (and their Anglo-Saxon counterparts) could have had the opportunity to use archers in combat if they chose to. However, as yet, there has not been sufficient fieldwork to identify a battlefield signature based upon such evidence. Though investigations at Fulford have yielded ferrous finds, the damp nature of the site means that the majority of evidence may have corroded beyond recovery and recognition. Edgeworth's site at Tempsford, with its possible defensive nature, could well yield such finds if it is indeed the site of the 917AD siege, as archery is especially useful during siege warfare. During the often long periods of inactivity involved, the only means for the isolated defenders to harm the attackers would be via archery and vice versa.

The use of archers in Viking Age warfare would significantly enlarge the battlefield due to the long range at which combatants could engage each other. This would lead to a larger battlefield and thus the better chance of establishing where conflict took place, in addition to increasing the likelihood of finding artefacts such as arrowheads, since their small size would increase their chances of surviving post-battle recycling. However, this would also mean that there would simply be a larger area requiring investigation in order to recover smaller artefacts. Whether this dichotomy is beneficial or not is, ultimately, a question of opinion and depends on the site itself. It is also reasonable to assume that other small items may have been missed during any post-battle recovery of materials, such as small chunks of chain-mail and shattered pieces of blades.

Methods of Waging War

Another unknown factor that could significantly alter the perception of a Viking Age battlefield signature are the tactics used in battle, such as combat formations and the use of cavalry.

Little evidence survives of the tactics employed in battle by armies during the Viking Age. It is widely accepted that the main battlefield formation was the shield wall – indeed it is portrayed on the Bayeux Tapestry (Reading

Borough Council 2004b). This involved combatants overlapping their shields to present a solid wall to the enemy. Following a period during which insults and missiles were exchanged the two shield walls would advance. Fighting was hand-to-hand, with combatants attempting to force a breach in the oppositions' shield wall, until one side was routed and fled. Thus we can expect the nucleus of a Viking Age battlefield signature to be compact, dense and perhaps little more than a couple of hundred metres wide and the same in length. Artefacts would be strewn along a relatively narrow front, perhaps with a trail of artefacts leading away from the main line of engagement as one side was routed, dropping equipment or being hewn down in the process.

It must be noted however that not all military engagements ended in a rout – the battle of Maldon in 991AD for example ended with an unsuccessful stand by the Anglo-Saxon thegns after their leader, Byrhtnoth, was killed. With Byrhtnoth's death that the majority of the Anglo-Saxons fled and a contemporary poem (translated by Griffiths (1991:62)) states that the thegns rallied around the body of their lord, thus occupying the Vikings whilst the rest of the army fled. It must also be considered that some battles ended in stalemate, with both sides bloodied but unwilling to continue fighting. It is interesting to note the Anglo-Saxon Chronicle often makes a point of stating whether one side or another had possession of the field at the end of the battle (compare Swanton (2000:94) and Swanton (2000:78)). It could be entirely possible that in some cases, a mutual agreement to withdraw was arranged.

It is also theorised that armies at the time utilised two other formations – the 'boar snout' or 'wedge', used to attack and break the oppositions' shield wall, and the 'shieldburg'. In this formation the ranks behind the front rank raise their shields above their heads and form a protective shield against missile attack, similar to the Roman 'testudo' or 'tortoise'.

The use of cavalry by both the Anglo-Saxons and Vikings is another issue open to debate. We know that the Vikings used horses on the march, and they were so valued that in 866AD the Anglo-Saxons of East Anglia gave

horses to the Vikings over-wintering there in exchange for peace (Swanton 2000:68). There is no reason that the Vikings or Anglo-Saxons could not utilise cavalry in battle, although in 1055 an Anglo-Saxon mounted Fyrd fled a battle against the Welsh as they were ordered, against their custom, to fight on horseback. It seems that whilst combatants may have travelled to the site of conflict on horseback they then dismounted in order to fight.

The first 'true cavalry', however, had been developed in North and Western Europe by c.500BC (Hobby 2002:9) and the numerous horse burials across Europe indicate that the Scandinavians and Anglo-Saxons must have been knowledgeable of the powers of cavalry; indeed Swedish war chiefs 'had been mounted like Persian or Roman heavy cavalry even in the seventh century' (Christiansen 2002:174) AD. One would assume that cavalry were at least used to chase down fleeing enemies. If the use of cavalry could be established it would most certainly enlarge the battlefield due to the mobility of horsemen and the potential of expansive cavalry actions.

Burials as Battlefield Indicators?

Burials, in particular mass graves, are a useful indicator that conflict has taken place nearby, as one would assume that they were dug close to the place of conflict in order to save the effort of transporting corpses over long distances. Sites from prehistory such as Talheim (Germany), Herxheim (Germany), Schletz (Austria) and Crow Creek (USA) exemplify this, where victims of settlements were massacred and dumped in the fortification ditches of the settlement (Wild *et al* 2004, Zimmerman 1997). Other examples however, such as the mass grave associated with the 1461AD Battle of Towton, are located at a distance from the battlefield – in this particular case about a mile (Knüsel & Boylston 2000:186). These soldiers however may have been killed during the bloody rout that followed the collapse of the Lancastrian battle line. A further example refers to the Battle of Fulford, where skeletons, bearing violent injuries, have been recovered in the city of York itself. These individuals may have died of their battle injuries, although whether they were taken alive back to York before dying is open to speculation. Therefore,

although the presence of a mass grave may or may not indicate that conflict took place nearby, the possibility should be considered. It is once again interesting to note Edgeworth's site at Tempsford, as there are traces of a mound in a field to the south (part of the crop-mark complex recorded as BEDS HER 615) that certainly deserve investigation (Edgeworth 2008:12-13).

Analysis of the victims within the graves may also aid identification of Viking Age battlefield signatures. The location of projectiles within the skeletal remains and the damage caused by them could testify to the use of bows in conflict, and osteological analysis could yield information on whether individuals in the grave were trained in the use of heavy poundage bows – the skeletons within the Towton mass grave for example displayed *Os acromiale*, a condition involving the incomplete ossification of the scapula. This condition can be related to 'adaption to joint reaction forces in the shoulder during growth and development in relation to strenuous movements of the shoulder' (Knüsel 2000:115), such as repeatedly drawing on a heavy poundage bow.

Further caution must be exercised when investigating mass graves, as they are not always indicative of conflict between armed forces. The prehistoric mass graves at Talheim, Herxheim and Schletz for example seem to have been the mass killings of non-combatants and the burial at Herxheim in particular is regarded by some as a possible change in burial rites at the end of the Linearbandkeramik period (Wild *et al* 2004:380). The individuals buried at Talheim in particular seem to have been attacked without warning and made no attempts to defend themselves with weapons – osteological analysis suggests that individuals were attacked from behind as they were standing or lying down and some were shot in the back with arrows, most probably whilst trying to escape.

Conclusions

It seems that in attempting to locate possible sites of Viking Age conflict, there are many factors that need to be taken into account. The most important is an interdisciplinary approach to conflict, utilising both historical, literary, place-name and archaeological resources. Any further study could be potentially shortened by the proper analysis of the former three sources of information. It must be remembered that historical and literary sources will inevitably contain both bias and errors, but will be beneficial to the archaeologist if used in context. It is important to reiterate that Viking Age warfare was not fought in the same way that we in the modern day would typically expect medieval warfare to have occurred. The relatively small size and mobility of forces means that formal battle was a rare occasion and conflict may have been more akin to that which occurred during the Mesolithic or Neolithic periods.

It must be accepted that locating Viking Age battlefields will be an arduous task and will necessitate an effective research strategy utilising not only archaeological investigation but also the responsible use of metal detectors via an approach such as that implemented by Scott *et al.* (1989) at the Little Bighorn. The battlefield signature would almost certainly comprise of a dense nucleus of artefacts along the battle line where the shield walls met. Additionally there would perhaps be a less dense trail of artefacts leading away to the rear of one side of the combatants as they fled after being routed, although it must be stressed that this would not always happen. We could expect to recover only small items such as arrow and javelin heads, pieces of chain mail and shards of blades. Missile weapons should also be looked for in the wider vicinity, especially in the areas immediately behind the battle lines. Any arrow heads and horse equipment found could shed further light on Viking Age warfare.

Burials can be indicative of scenes of battle, although it must be considered that they may not be sited upon the battlefield itself. However, their analysis could be useful in discovering the different means by which war was waged in the Viking Age.

The Need for Future Fieldwork

Presented in this article is a hypothesised model which would benefit from future fieldwork in order to test and develop it. The model is in no way definitive and invites change. The use of prehistoric material in the arguments is due to the severe lack of evidence that prevails at this time and the author hopes that with future research, this evidence can be substituted with evidence from the Viking Age to present a standardised model for locating battlefields. There are many unknown factors that may have influenced prehistoric conflict including whether participants were hunter-gatherers or sedentary farmers. Aspects of warfare that have been observed ethnographically (for example warfare and the spread of agriculture in Borneo (Beavitt 1997)) suggest that violence may well have been socially and ritually engrained within groups of people in prehistory. This therefore stresses the need for further research if we are to replace the prehistoric evidence included in this article with that which is more contemporary with the Viking Age.

There is also much scope in future work to incorporate GIS (Geographical Information Systems) into battlefield archaeology. Indeed such an approach has already been utilised for the Battle of Sedgemoor, which took place in 1685 during the Monmouth Rebellion. Foard (2003:8) states that maps registered in GIS were supplemented by aerial photographs so as to locate battlefield features and this 'has been most successful with locating the 'rhynes' or drainage dykes'. Similarly, the result of landscape analysis and any investigation (either above-ground or intrusive) could be incorporated into GIS. It would be possible to identify the most frequent locations for battle, the type of terrain favoured by opposing forces, whether the topography was utilised tactically (the use of marshes and rivers to defend flanks for example) and thus construct models from this. Any finds uncovered during fieldwork could also be integrated into the model in order to analyse the distribution of finds and the possible deployment and movement of forces during engagements.

The two theorised Viking Age battle sites in this article – Fulford and Tempsford, both deserve further investigation and the identification of a battle signature would be instrumental in ensuring that the sites, which are under threat from development and gravel extraction respectively, survive. It is hoped that further study takes place so that the model presented can be contested and altered. From this we can begin to better understand the Viking way of war and the effects that this had on the evolution of warfare in the British Isles.

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