

# History from the Field

## The Edgehill Battlefield Survey

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On Sunday 23<sup>rd</sup> October 1642 the army of the Earl of Essex, the parliamentary Lord General, and the army of Charles I clashed in the first major action of the Civil War in England. They fought in the open fields between the villages of Radway and Kineton in Warwickshire. The battle of Edgehill was intended to be the one great battle to decide the war. Although it is often viewed as indecisive, the king actually gained an important advantage. Essex failed to break through to the capital and had to retreat to the security of the parliamentary garrison at Warwick, leaving Banbury and Oxford to fall to the royalists. More importantly it left the enemy in command of the road to London, and control of the capital was the key to the war. Had this advantage been exploited immediately, as Prince Rupert urged, then the Civil War might have been ended within a few days of Edgehill.

*Figure 1: The battlefield is seen here, just beyond Radway village in the Vale of the Red Horse, viewed from the Castle Inn on Edgehill.*

### **A brief narrative of the battle**

Essex deployed in the open fields of Kineton, forcing the royalists to descend from the heights of Edgehill, where the army had its rendezvous that morning. Essex placed his army in a defensive formation, though the exact detail is subject to dispute. The vast majority of the parliamentary cavalry were placed on the left wing under the command of Ramsey, covering a wide frontage to prevent the royalists outflanking them on that side. These cavalry were interlined with about 400 musketeers to provide extra firepower, while a forlorn of about 300 musketeers were positioned along the hedgerow to the fore and to the left. Some artillery pieces were also deployed in support. Essex had clearly learned a lesson from the defeat at Powick Bridge: that the royalist cavalry were a dominant force and his cavalry avail themselves of whatever protection the terrain offered. On the right wing Balfour was extremely weak in cavalry. This was in part because some units had not yet reached Kineton but, as we shall see later, it was also probably a response to the limitations, or opportunities, provided by the terrain. Here again Essex took advantage of the hedged enclosures that flanked the field on this side, deploying 700 dragoons to line these hedgerows to the fore, in support of Balfour. The presence of these enclosures, narrowing the frontage on that side, allowed Essex to deploy a small number of his troops of horse behind the foot. This was a decision which was to prove a key factor in the battle as it protected them from Wilmot's cavalry charge and enable them to play a crucial role later in the action. In the centre the parliamentary infantry were deployed in two lines according to Dutch tactics.

In the royalist battle array Rupert commanded the right wing of cavalry, where the bulk of the horse were placed, while on the royalist left Wilmot had well under 1000 horse. In the centre the infantry were deployed, according to Prince Rupert's wishes, in the more complex Swedish formation. Even with the excellent plan of the royalist deployment, drawn up some years after the battle for Rupert by de Gomme, there is still some dispute about the detail of the royalist battle array. Some reconstructions show three battalions in the front line with two in support in the second line, whereas other authors suggest five and four battalions respectively. The new book by Scott et al suggests yet another alternative for both armies. Of perhaps 1000 royalist dragoons, two regiments were on the left and one on the right wing.

After an initial artillery exchange, Rupert used dragoons to clear the enemy musketeers from the hedgerows on his right flank, allowing him to mount his all important cavalry attack. His troopers charged home without halting to fire their pistols. Having taken a highly defensive stance on the top of a slight ridge, behind hedgerows, the parliamentary cavalry seem to have stood to take the royalist charge instead of meeting it at the charge. The royalist troopers cleared the hedgerow and burst in amongst Ramsay's men who turned and fled. The parliamentary infantry brigade adjacent to the cavalry was also swept away, weakening Essex's position even further.

On the royalist left the terrain was far more difficult, with far more hedgerows held by parliamentary musketeers. But again dragoons, riding to the field and then dismounting to fight on foot, were used to clear the enclosures. This allowed Wilmot's cavalry to charge, with a similar result to that achieved by Rupert on the right wing. But, as at key points in later battles during the Civil War, the royalist horse seconding both cavalry wings failed to exploit the dramatic advantage that Rupert and Wilmot had given the royalist army. Instead of turning their divisions of horse against the unprotected flanks of Essex's infantry, both Byron and Digby followed in the pursuit. The royalist horse chased the fleeing parliamentarians in a destructive execution for at least the 1.5 miles to Kington. Some probably pursued well beyond the village but many, probably funnelled north westward by the enclosures east of Kington, abandoned the pursuit and attacked Essex's baggage train when they reached the town. Meanwhile, on the battlefield, just a handful of horse on both sides managed to regroup in support of the infantry. In this situation Balfour's troops of parliamentary horse, who had been protected between the infantry lines, probably just as Essex had intended, would come into their own, helping to turn back the tide of the royalist infantry advance.

As the cavalry charge went in, the royalist infantry had advanced to within musket shot and the fire-fight began. The parliamentarians held their position on the higher ground, the division on the left side probably protected behind the same hedgerow that Ramsey's men had used on the left wing. But Essex's infantry were immediately at a disadvantage, for in the cavalry action the front brigade on the left flank and the reserve on the right had been swept away. In response reserve forces were quickly brought in to hold the line, as the front lines came to push of pike. While at this stage of the war the royalists had superiority in cavalry, Essex's infantry were by far the best equipped and trained on the field. This, combined with a limited advantage in the small numbers of cavalry still on

the field, enabled Essex to hold the royalists after initially being driven back. His cavalry mounted a flank attack on the royalist infantry while they were fully engaged and two of the royalist regiments were broken by the combined cavalry and infantry assault. Those not killed or captured fled back towards Edgehill. Balfour's cavalry charge carried him right through to the royalist artillery where he disabled several pieces. For a time, with support from the King's Lifeguard of Foot from the reserves, the royalist left held the combined infantry and cavalry attack, but they finally broke and ran when Balfour's cavalry also attacked from the rear. Only on the right did the royalist regiments hold their own, as the centre and left fell back in disorder. The few royalist horse remaining on the field, under Lucas, attempted their own charge but were countered by other parliamentary horse. As the light started to fade the royalists were pushed back to their artillery. But they retained their cohesion, thanks largely to the presence of a ditch which they were able to defend, and the support of very effective artillery fire. This enabled their left wing, which had given most ground, to reform.

***Fig 2: The monument beside Graveyard Coppice, now within the compound of the MOD's Edgehill depot, lies close to the site of a mass grave, according to Burne. It seems likely that this was where Essex halted the initial royalist infantry advance.***

The royalist horse, occupied in the pursuit and plundering, had eventually found themselves faced by parliamentary reserves marching to the battle. Some of these troops, under Hampden, engaged the royalist and drove them off, but it was now too late for these fresh parliamentary forces to influence the battle. Nor indeed could the royalist cavalry affect the outcome as they finally returned to the field, despite causing some problems for the parliamentary infantry as they passed by. It was now too late in the day to mount any sort of offensive cavalry action. As the light failed and the powder and ammunition began to run low, the battle subsided into a stand off. The parliamentarians had pushed the royalist infantry back and apparently stood all night where the king's forces had formed their initial battle array, within musket shot of the enemy. Early that morning the royalist withdrew up onto Edgehill and then the parliamentarians back towards Kineton. After dawn Essex once more drew up his army in battle array in Kineton field but the royalists had gone from Edgehill. In response Essex withdrew his men to Kineton, where they rested while the dead were buried, then marched on to Warwick.

## **Previous studies**

The standard work on Edgehill since 1967 has been that by Young, supplemented in 1995 by the English Heritage Battlefields Register report and by the local detail provided in Tennant's important study of the war in Warwickshire.<sup>1</sup> In addition there are a number of articles dealing with specific aspects of the battle or the armies, and several antiquarian

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<sup>1</sup> English Heritage, "Battlefield Report: Edgehill 1642," (1994), Peter Young, Edgehill 1642 : the campaign and the battle (Kineton: Roundwood Press, 1967). Philip Tennant, Edgehill and beyond : the people's war in the South Midlands 1642-1645, The Banbury Historical Society ; v. 23 (Stroud: Alan Sutton, 1992).

contributions.<sup>2</sup> In the last three years two new books have appeared on the battle of Edgehill.<sup>3</sup> Each has much to commend it for the general reader, with Roberts & Tincey for example providing a valuable discussion of the Swedish and Dutch tactics employed by either side, while Scott et al present important new evidence on the parliamentary casualties. Yet, like so many of the books on battles in Britain now being produced, they do not fundamentally advance understanding of the events. They do suggest interesting alternative re-interpretations of the deployments and action, but it is all still based squarely on the long known documentary sources for the battle that were exploited so extensively thirty year ago by Young. If we are to make substantial advances then wholly new data must be brought to bear.

Young himself, following Burne,<sup>4</sup> understood that battle archaeology could assist in the interpretation of battles and here, at Edgehill in 1967, he attempted the first recorded metal detecting survey on an English battlefield, with the assistance of the Ministry of Defence. Unfortunately they had little success, recovering only a handful of artefacts, none of which could be securely associated with the action.<sup>5</sup> Scott et al also discuss the importance of exploring the battle archaeology and of reconstructing the historic terrain of the battlefield, yet they advance these aspects of the study little further than Young. It is true that they summarise both Walford's antiquarian records from the 19th century and Grant's metal detecting survey results of the late 1970s, the true potential of that data is not realised in their reinterpretation. In contrast, the *Two Men in a Trench* TV programme did carry out new work on the battle archaeology, with what appear to be useful results, particularly in the possible area of the clash over the parliamentary baggage train, though the detailed results are as yet unpublished.

But there is other wholly unpublished work that raises serious questions about the standard interpretation of the battle. Pannet, who conducted a study of the historic map data for the region in the 1970s, realised the significance of his mapping for the interpretation of the battle. His plan of the battlefield suggests that the location and extent of the initial deployments of the two armies may have been substantially different to that suggested by Burne, Young and all subsequent authors.<sup>6</sup>

## **The potential of the battlefield**

A fairly detailed picture of the battle can be built up from the wide range of documentary accounts but, as Pannet's work makes clear, there are serious questions as to the accuracy of the placing of this action within the landscape. Work at Naseby has also shown how reconstruction of the historic terrain combined with intensive metal detecting survey can enable fundamental reinterpretation of a battle.<sup>7</sup> Not only at Naseby but also at Marston

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<sup>2</sup> A detailed bibliography is provided in Christopher L. Scott, Alan Turton, and E. E. Gruber von Arni, *Edgehill: The Battle Reinterpreted* (Barnsley: Pen & Sword, 2004).

<sup>3</sup> Keith Roberts and John Tincey, *Edgehill 1642*, ed. David Chandler, vol. 82, Campaign Series (Oxford: Osprey, 2001), Scott, Turton, and Gruber von Arni, *Edgehill: The Battle Reinterpreted*.

<sup>4</sup> Alfred Higgins Burne, *The Battlefields of England* (London: Methuen & Co., 1950).

<sup>5</sup> Young, *Edgehill 1642: the campaign and the battle*. 330-1;

<sup>6</sup> Pannet's unpublished plan is in the English Heritage Edgehill Registered Battlefield file.

<sup>7</sup> Glenn Foard, *Naseby: The Decisive Campaign* (Whitsable: Pryor Publications, 1995).

Moor, Cheriton and elsewhere metal detectorists have shown that there is an extensive archaeology of English battles, though their work has generally not realised the full potential of the evidence. Where such potential has been realised is in the archaeological study of battlefields in the USA, with work such as that by Scott at the Little Bighorn, Haecker on the battlefields and skirmish sites of New Mexico and Texas, Sivilich at Monmouth battlefield and Pratt at Fallen Timbers. It has long been clear that the application of such intensive systematic survey techniques to battlefields in Europe offered the potential for major advances in the understanding for sites of the mid 16<sup>th</sup> onwards, where there are extensive scatters of lead bullets.<sup>8</sup>

At Edgehill the survey by Grant in the 1970s demonstrated the presence of large numbers of bullets, while the research by Two Men in a Trench has confirmed this exists over an even wider area than Grant explored.

Up to April 1979 Grant recovered 52 musket balls from the battlefield. His survey is exceptional for its time, because it includes not only apparently highly accurate mapping of finds at 1:10560 and 1:2500 scale, but also records the amount of survey time spent in each area or on each transect. This enables one to consider with his data the degree to which absence of evidence may genuinely represent evidence of absence.

***Figure 3: Captain Grant's survey of Edgehill battlefield, based on records in the Warwickshire SMR.***

Grant's survey seems to support Pannett's suggested re-interpretation of the initial deployments. His major shot concentration probably reflects the royalist initial advance and main infantry engagement in the centre. In contrast the cavalry action on the parliamentary left wing seems to have produced almost no evidence, as one might expect, because Rupert's royalist cavalry were instructed to not stand to fire their pistols but to charge home immediately. However the absence of any evidence of the documented firing by parliamentary musketeers on this wing might be considered surprising. But the intensity of his survey on this wing was considerably lower than in the centre of the battlefield, where the main concentrations have been recovered. The absence of finds from the northernmost survey area may simply be because it remains wholly under ridge and furrow and hence has not been ploughed since 1757 or 1792. In such situations it appears that bullets all tend to gravitate to the bottom of the plough soil and thus are very difficult to locate with a metal detector.

## **The new survey**

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<sup>8</sup> An overview of potential is provided in Glenn Foard, "The Archaeology of Attack: battles and sieges of the English Civil War," in *Fields of conflict: progress and prospect in battlefield archaeology*, ed. Freeman, BAR international series (2001), 87-103. and in Glenn Foard, *English Battlefields 991 - 1685: A Review of Problems and Potentials*, ed. Douglas D Scott, M. Haecker Charles, and Larry Babbitts, *Fields of Conflict III* (Nashville: forthcoming).

Edgehill is the largest site on the English Battlefields Register and it is clear from contemporary accounts that the fighting spread over a wide area. There were several discrete actions behind the parliamentary lines in addition to the main phases close to where the two armies first engaged. This makes it a challenging site to survey, difficulties that are compounded by the fact that the archaeology of the battle and battlefield has been extensively damaged, by the construction in the 1940s of a major ammunition depot which was rebuilt in the 1990s with even more destructive effects in the heart of the battlefield.

The objective of the Battlefield Trust's Edgehill Survey, begun in August 2004 and running over two years, is to both reconstruct the historic terrain as it was in the mid 17<sup>th</sup> century and to recover a detailed, consistent picture of the distribution of battle related artefacts across the whole battlefield. It is hoped that this combination of data will enable the primary sources for the battle to be reinterpreted to place the initial deployments more accurately within the reconstructed terrain. It may also yield a new hypothesis as to the course of the action, developed from the well known primary accounts but viewed in the context of the newly revealed terrain of 1642. This interpretation can then be tested with the evidence produced by the systematic survey of the battle archaeology. This approach is part of a programme of wider research to develop a methodology for systematic investigation of battlefields that can be applied across the UK, to achieve a degree of consistency and comparability between investigations of different battlefields. Because of the dependence in Britain upon amateur metal detecting in achieving almost all battlefield survey, the metal detecting programme aims to produce a simplified but effective fieldwork method which, because it exploits relatively standard new technology and uses basic survey methods, can be easily and cheaply applied by individuals as well as survey teams with the minimum of professional archaeological support.

## **The historic terrain**

All the historic maps for the parishes of Kineton and Radway, together with relevant maps from all the other parishes which impinge upon or abut the battlefield, are being examined. Relevant data is then accurately transcribed onto a 1:10,560 scale Ordnance Survey map base of the 1880s in a computer based mapping system, using a method previously described in a study of the Sedgemoor battlefield.<sup>9</sup> Where maps have not survived, particularly for Great and Little Kineton, then the Enclosure Awards are being used to reconstruct the extent of ancient enclosure and of open field strip cultivation in the 18<sup>th</sup> century, immediately prior to enclosure. To date this work has only reconstructed the pattern of open field, hedges and ancient enclosures in the century or so following the battle. When this initial stage of mapping is completed then earlier written documents will be searched in an attempt to demonstrate which of these hedges and enclosures already existed in 1642. What is already certain is that land which was still open field in the 18<sup>th</sup> century will have been open in 1642. The other important element of the landscape reconstruction is coming from the archaeology. Edgehill has by far the best

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<sup>9</sup> Glenn Foard, "Sedgemoor 1685: Historic Terrain, the 'Archaeology of Battles' and the revision of Military History," *Landscapes* 4, no. 2 (2003): 5-15.

earthwork evidence of any English battlefield for the strip field system, which was still functioning across most of the battlefield in the mid 17<sup>th</sup> century. Though over most of the battlefield these earthworks have been destroyed by ploughing in the last 50 years, they are preserved in dramatic detail on the RAF vertical air photos of 1947. Computerised mapping of this data will provide the detail not only of the strip fields but also of any small areas of unploughed meadow or pasture, typically alongside the small streams. In many cases it also reveals the course of the streams before they were straightened and depended, in the 18th century or later, to improve drainage of these sticky clay soils which are still waterlogged in winter.

***Figure 4: The earthwork remains of the strip field system has been destroyed over much of the battlefield during the last 50 years, but it still survives in some peripheral areas, as here on the slopes overlooking the battlefield.***

The interim results of this mapping show that the land of Great and Little Kineton and of Radway remained largely under open field at the time of the battle. However by the early to mid 18<sup>th</sup> century, and almost certainly already in the mid 17<sup>th</sup> century, most of the surrounding areas in adjacent parishes abutting these open fields had already been enclosed in hedged fields and converted to pasture. In addition, and of great significance in the decisions taken by Essex in deploying his forces, there appears to have been a long hedge and an area of small enclosures along more than half of the parish boundary between Kineton and Radway. While the vast majority of the open fields will have been under arable, as the ridge and furrow demonstrates almost all of this land had been in the medieval period, it is possible that limited areas had been put down to grass. A small extent may even have had furze bushes, as one of the battle accounts suggests. However we have not yet conducted the detailed study of the written documents that might reveal the presence and exact location of such pasture and furze, or indeed of other isolated hedges within Kineton open fields.

***Figure 5: Only a handful of hedgerows in the heart of the battlefield existed in 1642. This is probably one of them, the reverses 'S' alignment reflecting the fact that it was laid out along the furrow of an open field strip. Here we are looking along the line of the royalist initial advance from the stream towards the parliamentary infantry deployment, which was along the top of the slope. Bullets, some of them incoming fire from the parliamentary musketeers at the beginning of the battle, lie all across this gently sloping ground.***

It would seem that the choice of battlefield was determined, in part at least, by the potential to exploit cavalry in this open landscape. The exact location of the parliamentary deployment was probably determined by Essex's wish to anchor his flanks on the enclosures to north east and south west, to make it difficult for the royalists to outflank him. The long hedge is almost certainly that which Essex lined with musketeers to provide cover in front of his left wing of cavalry. Although most contour mapping available for the battlefield is too coarse to reveal the fine detail of topography, there are very clear if slight slopes in the centre of the field which will have provided important dead ground in which Essex could deploy his infantry, out of view from the

royalist lines and protected from their cannon fire. On the left however the rising ground lay just behind the long hedge, which Essex lined with musketeers, and it is likely that the artillery he deployed on this wing was placed on this higher ground. His cavalry, interlined with musketeers, could also have been positioned here. On this rise the cavalry would have been sufficiently far back from the hedge to be able to meet the enemy at a charge, if and when the latter cleared the long hedge. On the parliament right however the ground is more level, only rising north westward towards Graveyard Coppice and the Oaks. Here the long hedge may have stopped, leaving a wholly open area that gave Essex's men no particular protection until the enclosures were reached on the far right, in the parish of Tysoe. Though Young shows Essex's right wing deployed up on the heights of The Oaks, this seem much too far back. Instead he must surely have exploited the hedged enclosures of Tysoe to anchor his right flank, placing his musketeers and dragoons along these hedge lines. The analysis of the fine detail of the terrain of the battlefield, in association with the historic mapping, is being facilitated by Getmapping, who have donated a copy of the relevant area of their new 5 metre UK digital terrain model for the use of the Edgehill survey. So a much more sophisticated analysis than that presented here should soon be possible.

*Figure 6: An interim plan of the historic terrain, also showing Young's suggested deployments together with the alternative first proposed by Pannet on the evidence of the ancient enclosures.*

## **Surveying the battle archaeology**

To date in the UK all surveys of the battle archaeology of whole battlefields have been undertaken by one or two individuals over a decade or more, attempting to recover 'all' the artefacts by intensive survey. This is not a practical approach to the study of battlefields nationally. What is required is a sampling methodology which enables more rapid and consistent recovery of broad patterning, to establish the extent of the action, followed up by more intensive sampling in specific areas to reveal the detail of elements of the action. The Edgehill survey is initially using 10m spaced transects across the accessible area in an attempt to recover a consistent picture of the distribution of battle artefacts, mainly lead bullets, across the whole battlefield. 'Hand held' GPS units, the type of satellite navigation equipment typically used by fellwalkers, are being used for recording purposes in the survey. Each detectorists originally carried a GPS unit on their belts or on a lanyard, but it was found that occasionally their body would shield the GPS and cause a loss of signal, so now they are attached to each metal detector with plastic cable ties. GPS is being used to record both individual find locations and to collect 'track' information every 15 seconds, to record the exact location and intensity of survey by each detectorist. A second stage of work will later re-examine sample fields, again at 10m intervals, to determine how consistent the results are with the 10m transect survey under different conditions and in different years. Finally there will be more intensive survey work, covering all the surface area of particular fields, to again test the consistency of the battlefield wide survey and hopefully to provide a much larger sample of bullets for study.

***Figure 7: Since August 2004 a team of six or seven metal detectorists have been out almost every Sunday systematically searching the battlefield.***

Work began across the core of the battlefield, in the area where terrain and documentary evidence suggested the two armies initially deployed. After covering most of the frontage we are now working back in either direction until the distribution of bullets fades out. The most basic of survey methods are used to lay out the transects. Four ranging poles, one with right angle sighting slots, are used to lay out two parallel baselines close to either end of the field. A 100m tape is then used to measure along the baselines for laying out the 10m spaced transects. These are marked on the baselines with 4ft long canes, prepared with coloured flags, rotating between two colours from one transect to the next and with a third colour to mark the 6th or 7th transect, depending how many detectorists are working that day. A minimum of 2 other similarly coloured flags are positioned by eye at the field edge at either end of each transect. These allow the detectorist always to be able to check the accuracy of his path along the transect by sighting along the flags. In this way a fairly consistent sample of about 15% of the surface area of the field is detected, distributed evenly across the field in parallel transects. Whether 15% coverage proves adequate to recover a representative sample of the artefacts has yet to be established. However, with such an extensive area to survey it was felt to be the most sensible sampling level at which to start if the whole battlefield was to be covered in the survey period.

Recording of find locations is using GPS, which generally claims an accuracy of better than  $\pm 5\text{m}$ , except where view of the sky is obscured, usually only experienced at Edgehill when within about 10m of a dense belt of woodland. The one problem with the GPS has been the additional error added by the algorithms which most type of software use to convert the satellite data to the National Grid coordinates and an error correction has to be added to resolve this.<sup>10</sup> Every find is dug by the detectorist immediately it is located and is put into a separate bag which is marked with the finders initials and the GPS waypoint number. This enables the exact location of each artefact to be mapped once the data has been downloaded from the GPS into the computer mapping software.

***Figure 8: 'Garmin Etrex Venture' GPS units, now costing well under £150 each, with their essential protective cases, are attached to each of the metal detectors. They are used to record the 'waypoint' location of every find and to record the track followed by the detectorist. The data is then downloaded using 'GPS Utility' software and imported into 'MapInfo' GIS for mapping and analysis.***

All detecting is being undertaken in discrimination mode to exclude iron, as far as practicable, without discarding signals for smaller non ferrous artefacts such as pistol balls. All previous surveys of battle archaeology on Civil War sites has recovered a very small percentage of ferrous objects. The vast majority of finds are always lead bullets. As the initial objective of the thirty year ago. present survey is to recover, as rapidly as

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<sup>10</sup> The problems and the solutions are discussed in Stuart Ainsworth, Bernard Thomason, and Heritage English, *Where on earth are we? : the Global Positioning System (GPS) in archaeological field survey* (Swindon: English Heritage, 2003).

possible, an overall pattern representing the distribution of action across the whole battlefield, so it is appropriate to focus primarily on lead bullets. The vast number of ferrous artefacts, mainly of post battle date, present on the field would render extensive all-metal detecting impractical. It is however intended in 2005-6 to return to selected areas with the densest bullet distributions but where there is the lowest density of later debris, to conduct intensive survey in all metal mode. This should show if a significant number of battle related ferrous artefacts can be recovered from the area of most intense infantry action. If positive results are achieved in the sample areas then further all metal sampling will be considered.

By February 2005 the survey has covered some 1.7 square kilometres and recovered over 200 bullets, with a recovery rate of about 120 minutes per ball. When calculated by hectare it can be seen that this varies from 16 minutes per bullet in the areas of most intensive action to over 110 minutes in the least dense areas, with many peripheral areas producing no bullets at all. This compares to 121 minutes per bullet for Grant's survey as a whole and 21 minutes per ball in the densest area. Almost all the certainly battle related artefacts recovered are lead bullets. These projectiles fall into three main classes: lead ball, lead slug (7 items) and what appear to be lead case shot (11 items, of which several are musket calibre ball and the rest irregular pieces of lead). In addition there are 6 pewter caps from powder boxes and 1 priming flask top, all from musketeers' bandoliers. There are also 4 possible lead wrappers, which were used to protectively hold a flint in the jaws of the cock of the lock of a flintlock musket. In addition there are various coins and other artefacts of the 17<sup>th</sup> century, such as buckles and buttons, which may relate to the battle. However these other items could just as easily have been domestic in origin, deposited with the manure carried out to the fields in the mid 17<sup>th</sup> century from the village middens, for a large part of the battlefield was probably still under arable cultivation in the 1640s.

***Figure 9: Lead bullets of varying calibre, fired in their tens of thousands during the battle, are the main archaeological evidence for the action.***

***Figure 10: The pewter top with spout, from the priming flask of a musketeer's bandolier.***

***Figure 11: An example of an original 17<sup>th</sup> century powder box with a pewter cap (said to have been discovered in a house in York). If lost during the action the leather covered wooden box would have decayed in the ground, but the pewter cap will have survived. A number of these caps have been found during the survey.***

***Figure 12: The typical equipment of a musketeer of the 1640s, armed with a matchlock musket and a sword. From his bandolier hang wooden powder boxes, in this case with pewter tops though many will have been wholly of wood. Each box contained a single charge of gunpowder. The priming flask hangs beneath the bullet bag on his right side.***

*Figure 13: This mid 17<sup>th</sup> century coin, found on the battlefield, might have been lost during the action, but could just as easily have been deposited on the fields along with manure from the middens in Kineton village.*

Each bullet is being weighed to an accuracy of circa  $\pm 0.05$  gram with electronic scales and its maximum and minimum dimensions measured with electronic callipers. Even where a bullet has been distorted by an impact, the original calibre can be calculated from its weight. They range in calibre from 11 bore to 45 bore (the few lesser items are quarter balls or other oddities). There is a high concentration on 12 bore, but with distinct groupings apparently relating to pistol and carbine as well as musket. These bullets are also being analysed for detail of manufacture (spew, spew snip and mould line or 'flash'), whether they have been fired (for which a range of distinctive attributes are present to greater or lesser degree on a large proportion of the balls) and whether they were impacted. In addition there are a small number showing evidence of having been bitten or heavily chewed. Discussion of the results of this more detailed analysis must however await recovery of far larger numbers of bullets.

*Figure 14: This graph of the proportion of bullets of each calibre shows three distinct groupings which broadly correspond to pistols, carbines and muskets.*

Assuming a windage of circa 1.5 – 2mm, we can interpret the calibre of the Edgehill bullets by reference to the bore of the Littlecote collection of surviving 17<sup>th</sup> century firearms, now in the Royal Armouries. Although close inspection of the Littlecote collection and various documentary sources makes clear that a simple association between calibre, weapon type and type of troops cannot always be assumed, some general conclusions can be drawn. Pistols will probably rarely be above 28 bore, though Blackmore quotes records of 1670 and 1630 giving 24 bore pistols.<sup>11</sup> The carbine (580 – 800 mm length) ranges in calibre from 26 – 19 bore. The muskets (above 914mm length) include a few weapons between 26 – 17 bore, more 16-13 bore and with the vast majority being 12 bore. There are just a handful of 11 bore and above, representing what have been suggested as blunderbuss or dragons, at 11 – 10 bore. The Edgehill data, as seen in the graph, fits reasonably well with these three major groupings of musket, carbine and pistol.

## **Initial conclusions**

We have already seen that the reconstruction of the historic terrain suggests need for revision in the location and width of frontage of the two armies. The battle archaeology can be seen to provide strong supporting evidence for this reinterpretation, once one takes into account the gaps in the pattern, caused mainly by the destruction resulting from construction from the 1940s onwards of silos and railways of the MOD munitions depot. An more intense central distribution of bullets represents the infantry engagement. To the north there is a fall off in the number of bullets as one moves into the cavalry action, but

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<sup>11</sup> Data on the bore of the weapons in the Littlecote Collection was provided from the catalogue in the Royal Armouries. David Blackmore, *Arms and Armour of the English Civil Wars* (London: Royal Armouries, 1990).

there are still bullets here which might relate to the action of the musketeers on this flank. Towards the southern end of the frontage any such division is obscured by the extensive destruction caused by the modern depot, although by the time one gets to the south of the depot the density is very low, again suggesting that here, in close proximity to the enclosures of Tysoe, we are into the cavalry action once more. Within the depot most of Graveyard Coppice does survive undisturbed and it is hoped that it may be possible at some time during the survey to examine this area, as the one remaining sample of the very core of the infantry action. The action against the baggage train may be represented by the bullets recovered on the edge of the ancient enclosures of Little Kineton, on the north western edge of the map. Although we have so far only examined two small fields in this area, the Two Men in a Trench team recovered more bullets further to the north west, within the enclosures. It is our intention, if possible, to explore all these pasture fields later during the survey.

***Figure 15: An interim plan showing the distribution of bullets in relation to the areas surveyed and the areas of destruction where no archaeology survives.***

It is in the centre of the field that the greatest potential may exist for the interpretation of the detail of the action from the bullets and other military artefacts. Although we have too few bullets at present, there are initial clues. For example, two groups of case shot may suggest the location of artillery pieces. The density of the bullets tails off to the west, suggesting we may have found the western edge of the infantry action, indicating that it was indeed in the area of Graveyard Coppice or just to its west that the parliamentarians held the royalist infantry advance. To the east of the long hedge intense distributions of bullets on the east side of the stream, not yet added to our maps, may identify the location of the intense fire-fight with which the battle ended in the autumn twilight, with the stream being the ditch referred to in the contemporary accounts. However other as yet unmapped bullets lie in a rather isolated grouping in the area of hedgerows further east and these may in fact eventually prove to be the location of this last phase of the battle.

What we have described here is just a taster of what is to come. The evidence is suggestive of various new interpretations of the location, character and intensity of the action, but far more evidence needs to be collected.

This is an exciting project in which to be involved. There is the anticipation of a story being revealed before your eyes as the hedges and the bullets progressively appear on the computer screen. There is the satisfaction every time you find another bullet to add to the pattern, not to mention the friendly competition between everyone in the detecting team to see who finds the first or the most bullets, silver coin or other notable artefact on a particular day. Everyone involved in the survey, whether looking at maps and documents, antiquarian reports, air photos, scanning artefacts, counting hedgerow species or collecting bullets - each have their own perspective on the survey and each get their own particular satisfaction from the work they are doing. All play a valuable part in an important new study. But, over the coming months, when you look out of the window on a cold, wet or windy Sunday morning, give a thought to the small but dedicated team of metal detectorists out there at Edgehill, looking for the most tangible and evocative

evidence of one of our most important historic battles, a history that in at least a small way their work is beginning to rewrite.

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