BATH AND COUNTIES ARCHAEOLOGICAL SOCIETY

Lansdown Environs Archaeological Project (LEAP).
Season 2. January 2019

Monument Field, Lansdown

John Oswin and Janet Pryke.
Bath and Counties Archaeological Society

Abstract

This geophysical survey was set on Monument Field on Lansdown, Bath and North East Somerset, immediately south of the Grenville Memorial, centred on Grid Reference ST 724 703. The field is approximately 400 m north-south by 400 m east-west. It is at about 225 m above Ordnance Datum, rising to over 230 m on a small ridge towards its northern edge. The survey was carried out in January 2019.

Part of the field is a scheduled monument and was surveyed under Historic England licence. The whole field is part of the scheduled battlefield of the Battle of Lansdown.

The area amounted to about 10 hectares. Within the limited time of access, magnetometry and magnetic susceptibility surveys were completed, and a twin-probe resistance survey covered about one third of the area, but this included almost all the area where the magnetometry had indicated targets.

The field did not have LiDAR coverage, and resources were not available for a detailed contour survey. Height data could only be extracted from Ordnance Survey freeware low density data.

The survey complements a geophysical survey carried out by BACAS in March 2018 in Settlement Field, immediately to the east (Holley 2018).

The magnetometry survey indicated the extent of the pre-historic/Romano British settlement found in the south-west corner of Settlement Field and showed that it extended under the wall some 150 m westwards and 150 m northwards from the south-east corner of Monument Field. This was supported by evidence from magnetic susceptibility and twin-probe resistance. Ground disturbance extending north-west from the settlement appeared to relate to the Battle of Lansdown, fought in this field in July 1643. A number of long lines of straight sections joined at angles probably relate to practice trenches dug in World War 1 (1914-1918).

The survey also showed a former pond, an area which may have also been a pond, but may be a small henge, and a probable barrow.

Lansdown Environs Archaeological Project (LEAP)
Season 2, 2019.
Monument Field

John Oswin and Janet Pryke

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Photography provided by Rick Buettner.

Assistance with mapping provided by John Richards.

Cover picture: Looking south from near the monument, down the Swainswick Valley towards Little Solsbury Hill. (J Oswin)

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Preface

This was our second season of geophysical survey on top of Lansdown, with thanks to landowners Mr and Mrs Bravin. Monument Field adjoins Settlement Field (the target of the first season) to the west. Conditions were generally more benign than in 2018 (we only had one snow flurry to stop proceedings) but there was a much larger area to cover, approximately 10 hectares, and three weeks in January to cover it. We decided to concentrate on a complete magnetometer survey, which we achieved with one day to spare, while twin-probe resistance survey covered approximately one third of the area.

The work was covered under an extension of the Section 42 licence issued by Historic England in 2018. Approximately half the field was scheduled archaeologically, while the whole field is a scheduled battlefield.

Acknowledgements

We are most grateful to Mr and Mrs Tom Bravin for allowing us access to the field, and to Historic England for extending the section 42 licence.

We are grateful to Bath Archives for allowing us to take copies of the papers by Thomas Bush in *Proceedings Bath & District Branch, Somerset Archaeological and Natural History Society*, 1905-1912.

Thank you to Mike McQueen for using his GPS system to lay out the initial grid pattern for us in advance. This saved us a significant amount of time.

Thank you to John Richards for preparation of some maps for this report.

Thank you to Rick Buettner for photographic work.

Thank you to Dr John Wroughton for advice that there was World War 1 archaeology within the field, as well as prehistoric, Roman and Civil War material.

Thank you to the anonymous visitor who advised that a Hawker Hurricane had crashed in the field during World War 2.

Thank you to Bob Ford for bringing a civil war canon ball. This proved to have a much lower magnetic signature than expected.

Thanks in particular to all those volunteers who turned out in mid-winter to make a success of this survey:- Robert Arkell, Rick Buettner, Steven Drew, Elizabeth Duru, Mick Edmunds , Bob Ford, Isobel Gleave, Heather Greenwood, Sandra Heward, John Knapper, Tim Lunt, Fiona Medland, Michael Ocock, Sharn Pepperell, Ian Perkins, Wendy Russ, John Samways, Lawrie Scott, Annie Somers-Hall, Bernadette Stanley, Oliver Stanley, Catherine Sulzmann, Allan Summerfield, Gill Vickery, Dave Whitlock, Roger Wilkes, Paul Willetts, Roger Underhill and John Richards.

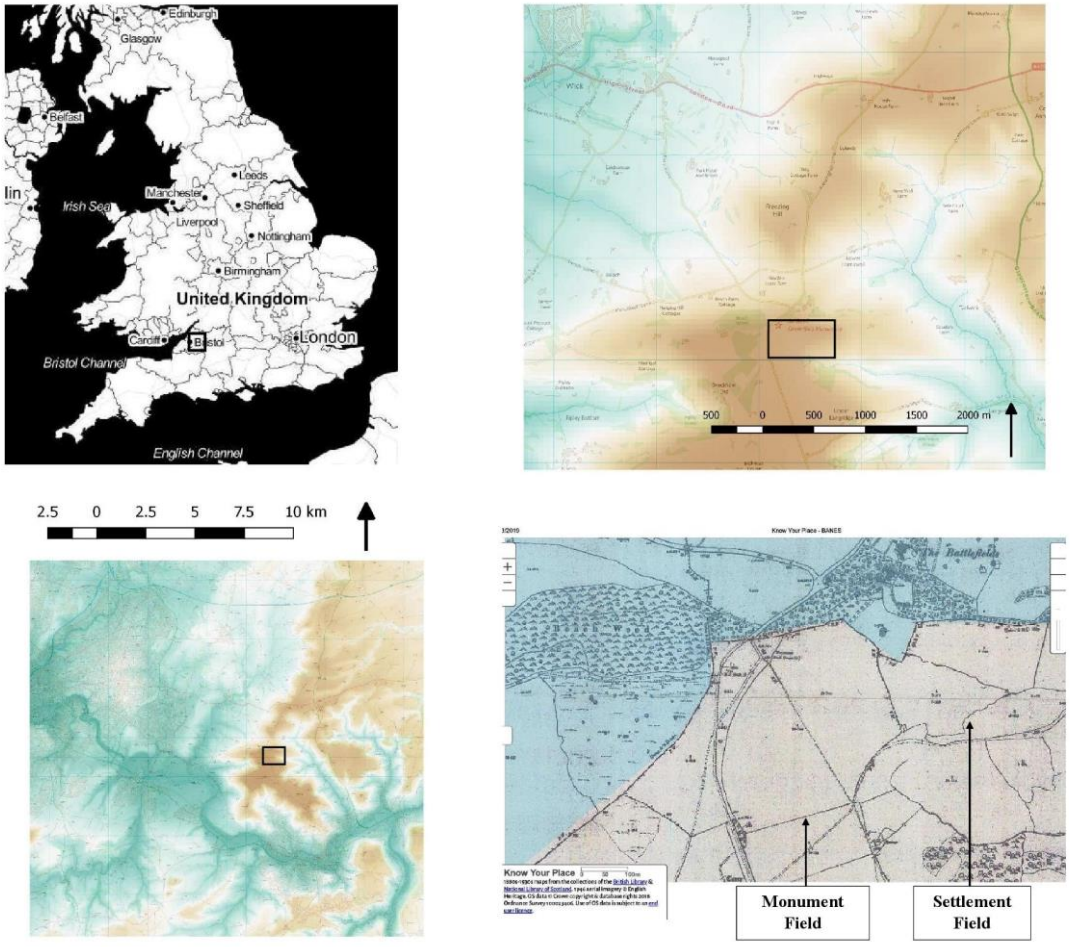
1 Introduction

1.1 Location

Monument Field is at the extreme northern end of the Lansdown Plateau, which extends north from Bath, central grid reference ST 724 703. It lies within the parish of Langridge in Bath and North-East Somerset (BathNES) unitary authority.

The field is approximately 400 m north-south by 400 m east-west. It is named from the monument to Sir Bevil Grenville (of Civil War fame, died 1643) which is sited on the hill-edge a few metres north of the field's northern boundary. The field is immediately west of Settlement Field, the target of the 2018 survey, and this report combines the results.

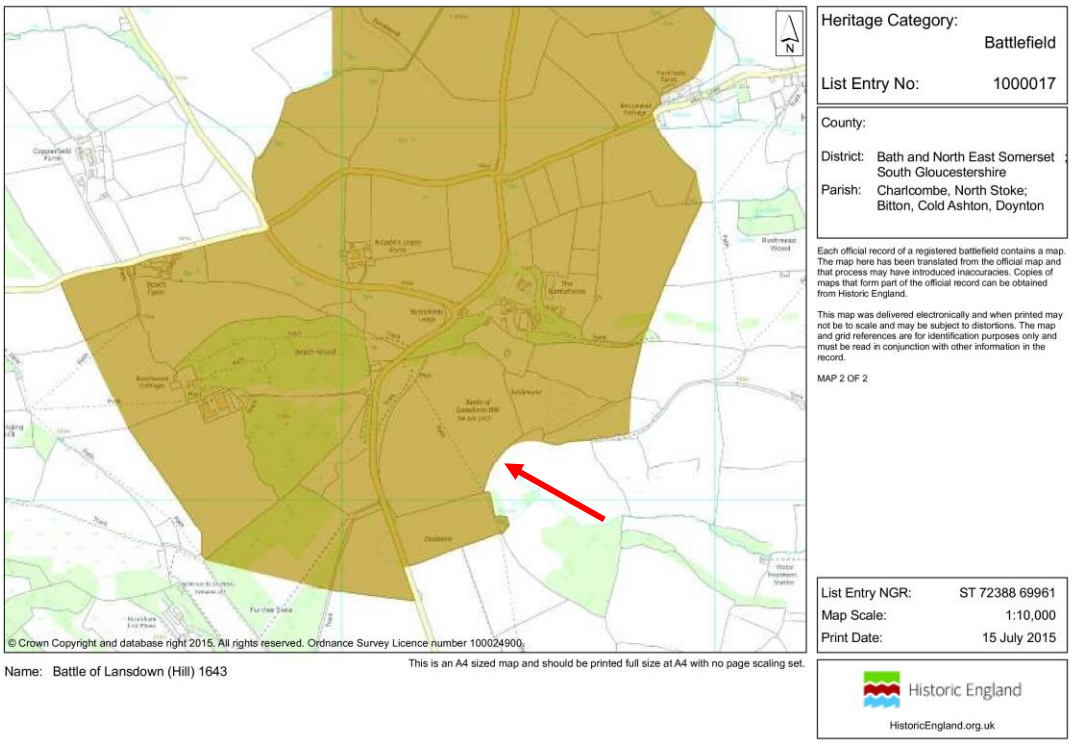
A location map is shown in figure 1.1.



Dorset Explorer, Ordnance Survey Open Data © Crown Copyright reserved, Know Your Place (BathNES)

Figure 1.1. Location maps: left, national; right, local. Topography has been included.

Part of the field is scheduled, with known archaeology extending from neighbouring Settlement Field, surveyed in March 2018. Both of these surveys were covered by Historic England Section 42 licence AA/07581/5, Monument 1004527. The whole of Monument Field also falls within the scheduled battlefield area of the Battle of Lansdown, 1643. The scheduled battlefield area is shown in figure 1.2.



Historic England.

Figure 1.2. Scheduled Battlefield, Battle of Lansdown, 1643. Monument Field arrowed.

1.2 Dates

The survey was conducted between Sunday January 6th and Friday January 25th, 2019. Conditions were generally benign for winter, but a half day was lost to rain and a half day was lost to snow. On some days, hill fog led to very poor visibility, which hindered but did not stop work. The dry weather led to the field being firm underfoot, being under short grass.

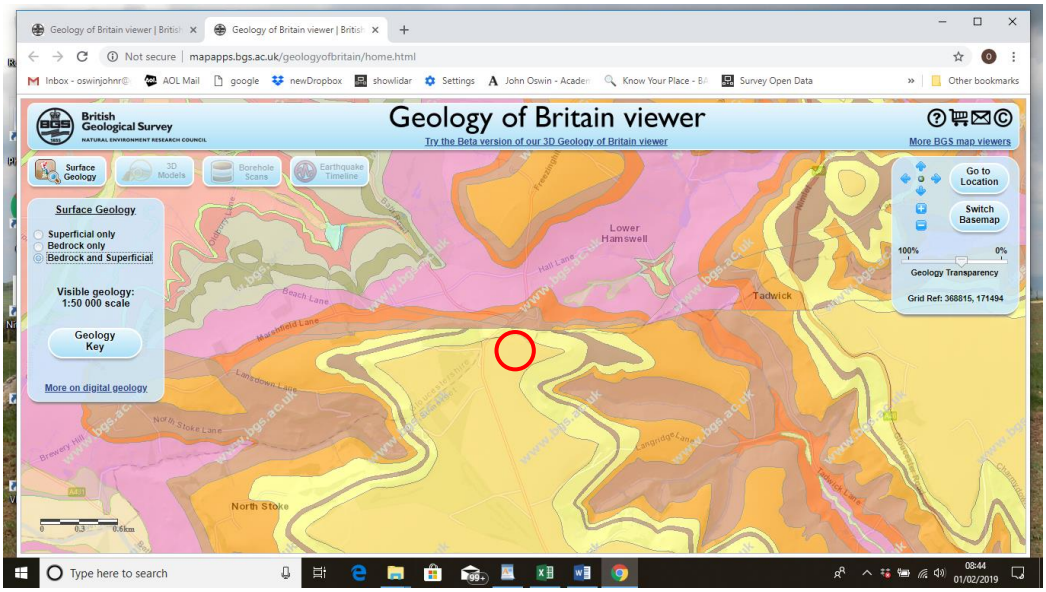
1.3 Personnel

The project was organised and led by Janet Pryke for the Bath and Counties Archaeological Society (BACAS), with John Oswin providing technical expertise. A good number of volunteers from the society took part in the survey. They are listed in the acknowledgements.

1.4 Geography and Geology

Monument Field sits on the northern extreme of the Lansdown plateau, at 220-230 m above Ordnance Datum. The plateau extends further to the west; to the south, Lansdown continues for some kilometres above the 200 m contour. The topography is shown in figure 1.1. To the east sits Settlement Field, a narrow promontory at similar height. The northern edge of the field starts to slope down to the north, to the edge of woodland and then the ground falls away very steeply northwards into the col of Lower Hamswell.

The underlying geology is Great Oolite, with Fullers Earth around the skirts of the hill. The scarp to the north results from a fault. The geology is shown in outline in figure 1.3 below.



Contains British Geological Survey materials © NERC 2019.

Figure 1.3. Geology of the northern Lansdown plateau. The red circle marks the site of Monument Field.

The view to the north, towards the incomplete hillfort of Freezing Hill, is now obscured by a hanging wood. To the west, the ground rises a little, whereas a view along the Lansdown plateau opens up to the south. To the east, the view is across the Swainswick Valley to the next ridge to the east (the route of the A46). The viewshed from the high point of the field is shown in figure 1.4.

Whereas the soil in Settlement Field was very black, that in Monument Field is much more orange in colour, although with darker patches. The top soil was very stony.

The field was under short grass, with no livestock present.

Based on Ordnance Survey open source data © Crown Copyright Reserved.

Figure 1.4. Viewshed from Monument Field, highest point. Yellow dot indicates location. Visibility indicated by lighter patches.

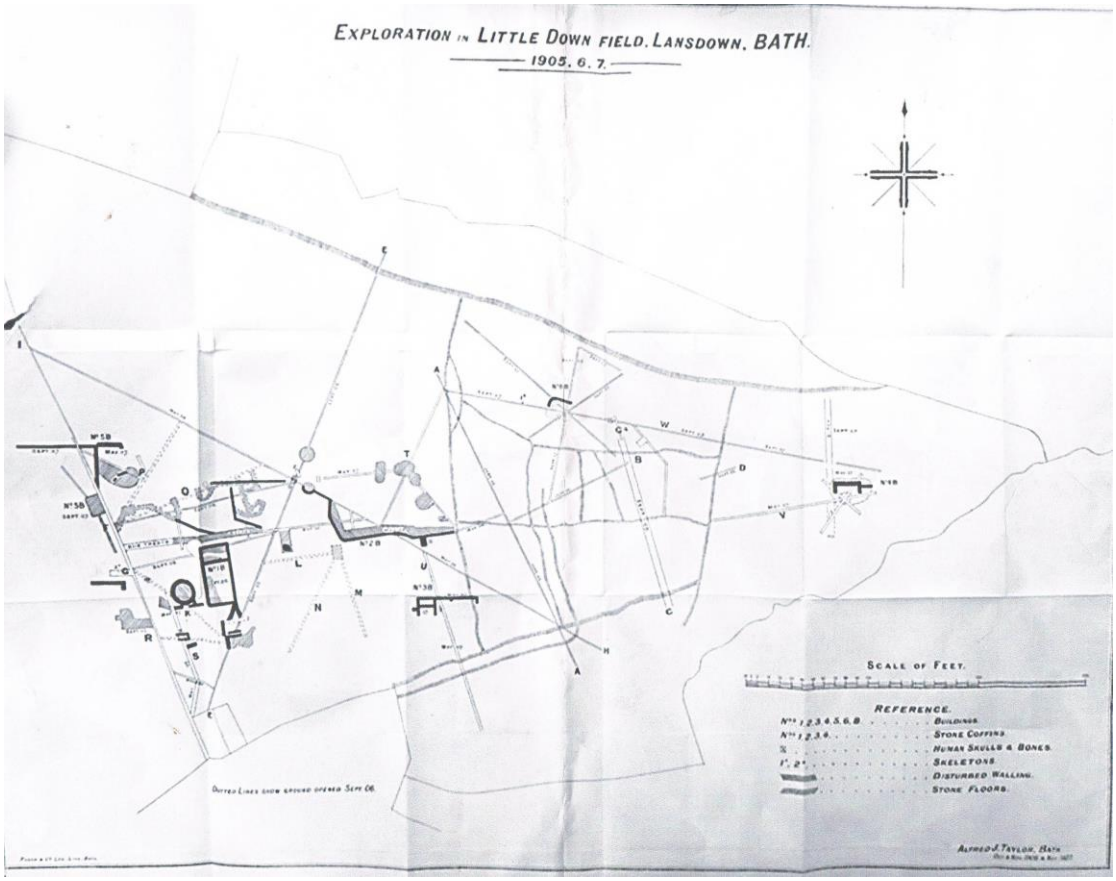
1.5 Historical Background

Earthworks from prehistoric and Roman times are visible in neighbouring Settlement Field, and there were excavations in this area in 1905-8 led by T.S. Bush which made up one section of a many-sited investigation on the plateau of Lansdown. The excavations here were mainly in the adjacent field, Little Down Field, now known as Settlement Field. They led to the description of the remains of a settlement of prehistoric use that was taken over and developed further into Roman times. Their finds showed the domestic and industrial use of the site and indications of metalworking and many pewter moulds were found. This field was the area further investigated in the BACAS geophysics project in 2018 (Holley 2018).

Bush planned to extend the excavations into Monument Field, and work was continued across and to the west of the boundary wall in September 1907. Their work followed the remains of a wall extending out from the boundary wall for 44ft and then following the requirements of the tenant, they restricted the excavations to a few trenches close to the wall. Building remains and a pit were found in this area as well a burial.

When they wanted to continue this work in September 1908 the tenant objected to any further excavation on the land, so it could not be continued. There was some further investigation by a team from Kingswood School, Bath in the 1960's. The project described here has the extra benefit of adding to and complementing this earlier unfinished work in providing further geophysical descriptions of the settlement area.

Bush's plan from the excavations is shown below in figure 1.5. Note how the excavation was generally by long trench, and that trenches did appear to go through the wall dividing the fields, with a 6ft length demolished and rebuilt.



Proceedings, Bath & District Branch, Somerset Archaeological and Natural History Society (Bush 1907)

Figure 1.5. Plan of excavations, 1905-7.

The field also suffered extensive use in the Battle of Lansdown, 1643, when Royalist troops eventually established themselves on the northern part of the field and then bombarded the Parliamentary troops who retreated behind the southern wall of the field. Remains of ordnance could be found in this wall until recently, and there are signs that portions of it were demolished and rapidly rebuilt.

The field was also used for trenching practice during the First World War (1914-1918). Thomas Bush (1915) recorded:

> "For several months this year, parties of about 100 men of the North Somerset Yeomanry, under Major A. H. Gibbs, have been employed twice weekly in carrying out interesting and instructive military work on the site of the battle of Lansdown. At the early stage some of these men were engaged in digging trenches and making a bomb-proof shelter while the others were being drilled, then those digging were relieved in succession by the others, so all had a turn with pick and shovel. The main part of the earlier work was carried out on the right of the road within a short distance of the Grenville Monument. Here the ground had not been previously disturbed, and, as usual on the Down, rock was usually met with at about 18 inches below the surface. Major Gibbs was present during the operations and was not oblivious to the fact that antiquities might be brought to light, but nothing was discovered on this site."

Bush goes on to describe how the exercises moved to another field on the opposite side of the road, where digging uncovered parts of two Roman columns which were sent to the Literary and Scientific Institution, Bath.

There are also reports that an aircraft, a Hawker Hurricane, crash landed in the north-eastern area of the field during the Second World War (1939-1945).

1.6 Scope

This report's principal purpose is to describe the geophysical survey carried out on Monument Field in January 2019, along with sufficient background material to provide the context.

The report also adds the Monument Field results to those obtained in 2018 in neighbouring Settlement Field to provide a wider picture of the archaeology.

Settlement Field and the eastern half of Monument Field are scheduled ancient monuments, and the survey was carried out under Section 42 licence number 1004527, provided by Historic England.

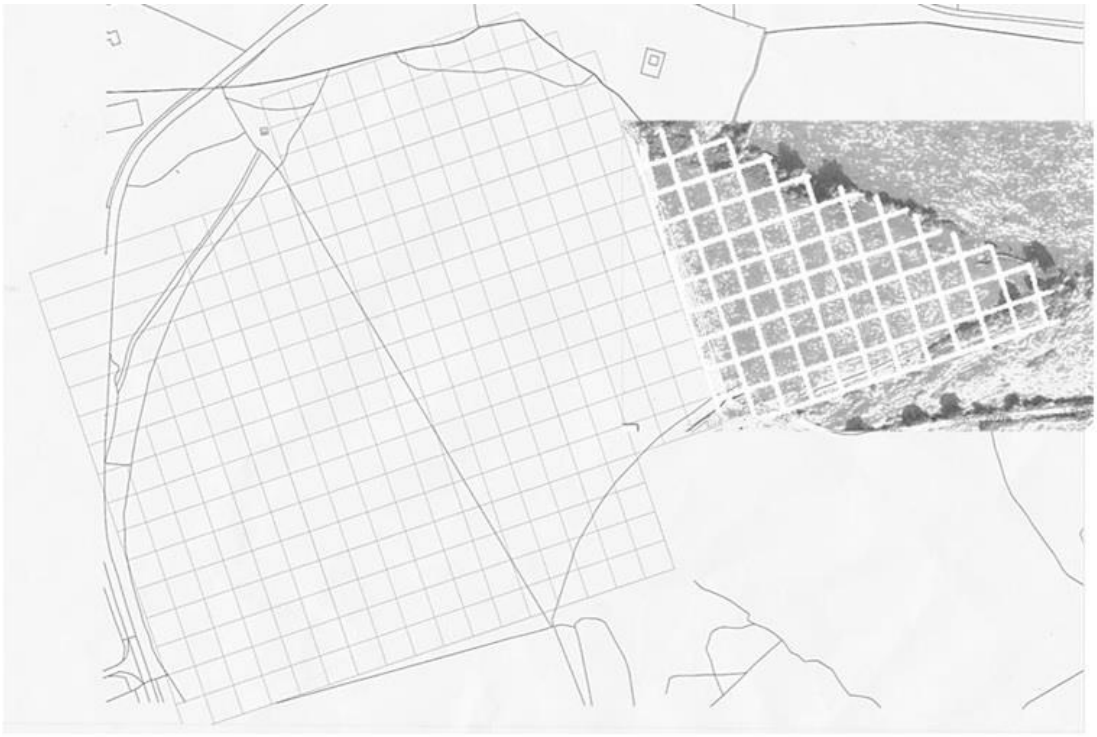
Both fields are also part of the scheduled battlefield area related to the Civil War Battle of Lansdown in 1643, as indicated in figure 1.2.

2 Method

2.1 Gridding out

The field was gridded out in 20 m squares. This was started by Mike McQueen using GPS total station for automatic setting of the 20 m spaces in plan. This covered six lines (north-south), and after that to the west, the grid squares were laid out over ground using tapes. Given that the slopes were quite gentle, there was little discrepancy between plan and over-ground distances.

The grid layout as planned is shown in figure 2.1. It was not fixed to the grid used in 2018 as that was unsuitable for translation into Monument Field, but it was approximately parallel to it, displaced approximately 10 m north-south. The origin was set at the blue 'Cotswold Way' finger post just outside the field by the southern stile, with the grid running approximately 0.5 m west of the southern section of the north-south wall.



Map produced by Mike McQueen and Janet Pryke

Figure 2.1. Gridding arrangement intended for Monument field, showing its offset from the 2018 Settlement Field grid. In practice, the grid's eastern edge was contained within Monument Field.

2.2 Magnetometry

The magnetometer was a Bartington 601-2 dual fluxgate gradiometer, set to take four readings per metre along traverses one metre apart, giving 1600 readings per full 20 m grid square. The magnetometer is shown in figure 2.2.

Photo: Rick Buettner

Figure 2.2. Magnetometer. Note that the rising ground partly obscures the monument beyond.

2.3 Magnetic Susceptibility (magsus)

Magnetic susceptibility of the field surface was measured using a Bartington MS2 with 20 cm diameter coil. Susceptibility was measured as a ratio of SI units. As the device had no logger, and had a very small detection footprint, measurements were taken randomly or at grid corners. The location of each reading was recorded on a hand-held GPS device and all points plotted versus five-figure Ordnance Survey grid location. The hand-held device was only accurate to 2-3 m, but this was sufficient for mapping over a large area. The meter is shown in figure 2.3.

Photograph: Rick Buettner

Figure 2.3. Magnetic Susceptibility (magsus) meter.

2.4 Twin-probe Resistance

Two meters were used for the resistance survey, both with half metre probe separation; a TR/CIA device (silver) and a Geoscan RM15 device (black). Both were set to take two readings per metre along traverses one metre apart, giving 800 readings per full 20 m square. The meters are shown in figure 2.4 below.

Photographs: Rick Buettner

Figure 2.4, Twin-probe resistance meters. Left: TR/CIA; Right: Geoscan RM15

2.5 Resistivity Profiles

The TR/CIA resistance meter could be converted to make resistivity profile (electrical resistance tomography, ERT) measurements, using a line of 32 probes. In all cases here, a probe spacing of 1 m was used to give line lengths of 31 m and set to take depths up to 3 m, although some of the profiles illustrated have been truncated once they have indicated bedrock. Figure 2.5 shows the profiler.

Photograph: Rick Buettner (2018)

Figure 2.5. Resistivity profiling

2.6 Software

The Bartington magnetometer was downloaded to a computer via RS232 cable using Bartington proprietary software. It was then processed using a BACAS proprietary zero-median de-stripe program before importing into INSITE for mapping.

The magsus has no data or download facilities, so results were written down and transcribed to Excel spreadsheet before mapping in DPlot software.

The two twin-probe resistance meters were downloaded via RS232 link and BACAS proprietary software and then imported into INSITE for processing and mapping.

Resistivity profiles were downloaded from the TR machine via RS232 link, reformatted using TR proprietary software and processed using RES2DINV software full version.

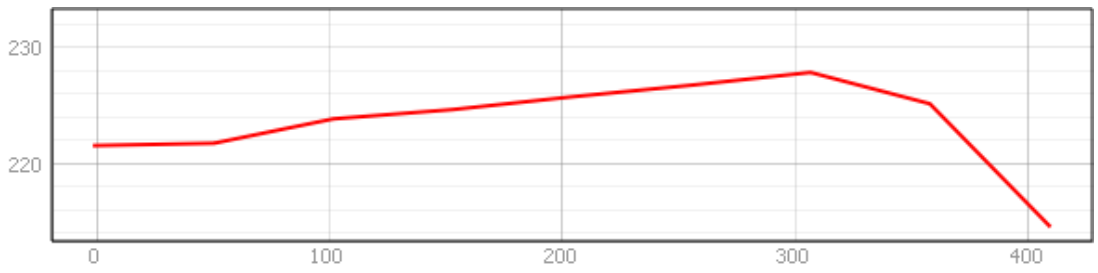
Overlays were set up using Adobe Photoshop, and maps were worked using QGIS freeware software.

2.7 Constraints

The principal constraint was time, with only three weeks available, working five days a week. Only two half days were completely lost to bad weather and conditions were generally benign for winter. The time was just sufficient to complete the field in magnetometry, but it was only possible to survey about one third of the field by resistance. The resistivity profiler was only available for the last two days, and profile targets were chosen at short notice. Ideally, the magsus survey would have covered 50% more points, but there was sufficient to give an acceptable picture.

Where plots of magnetometry and resistance have been overlaid with Ordnance Survey grid references, these should only be regarded as accurate to 5 m, allowing for the limitations of hand-held GPS and of lining up grid corners while doing overlays.

LiDAR coverage of this field was very poor, although it covered the neighbouring Settlement Field. There was a large gap in that early (2 m resolution) survey right over the eastern portion of the field, and no more modern survey has been published to date. We did not have time or resource to conduct a survey by total station, so we have been unable to produce a fine detail contour map of the field, which would have been very useful in the analysis of results. It has been possible to provide an approximate north-south section through the field using Ordnance Survey open source data, but height data were only available at 50 m intervals. This necessarily coarse section is shown below in figure 2.6. It indicates the ridge at the northern end of the field, with the ground falling steeply beyond it to the north. The vertical scale has been exaggerated for clarity.



Derived from Ordnance Survey open source data © Crown Copyright reserved.

Figure 2.6. Section through the field from south (0 m) to north along ST 72350 E line. Heights above Ordnance Survey Datum at 50 m intervals only.

3 Results

3.1 Magnetometry

The magnetometry is shown in figure 3.1 below, set out in National Grid coordinates.

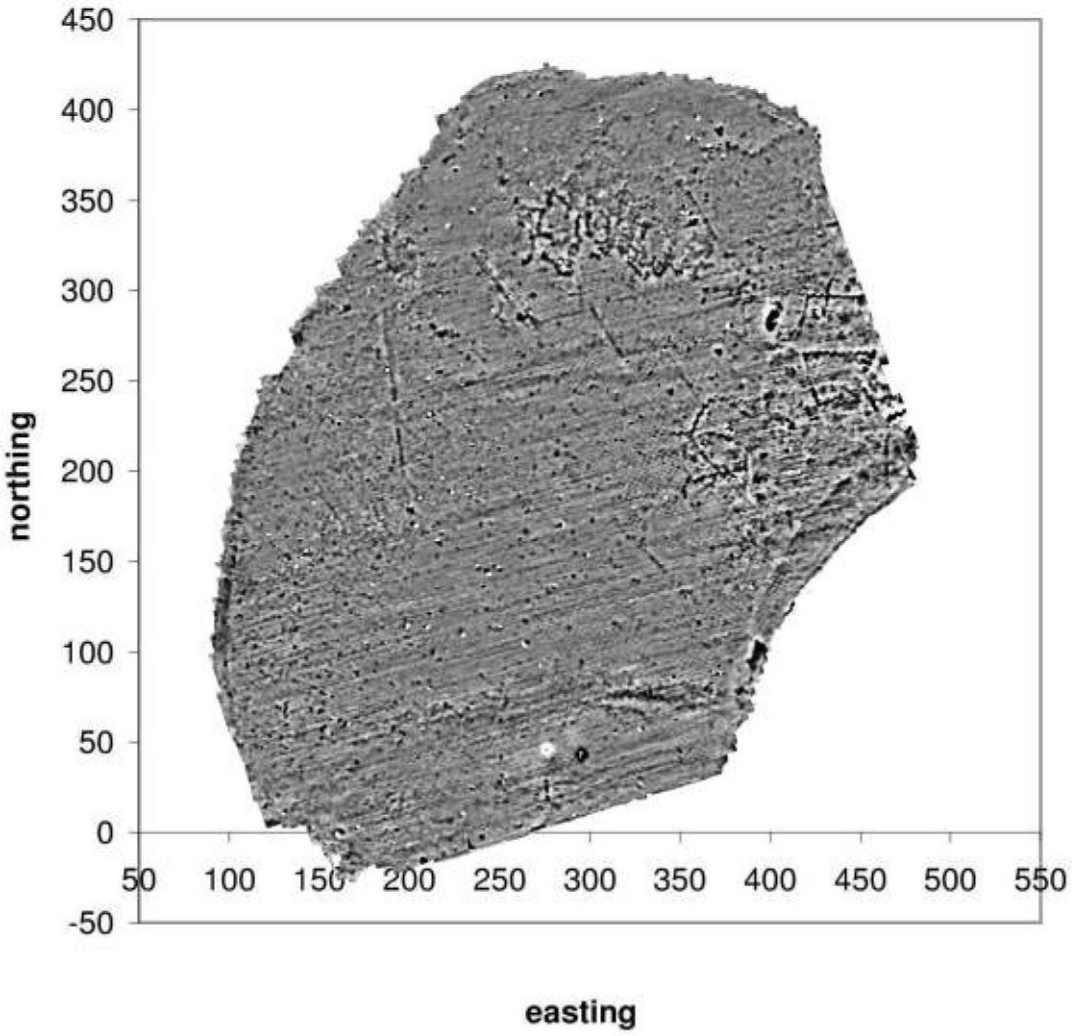


Figure 3.1. Magnetometry plot.

The grid references are given with initial values of ST 72___ 70___, so these should be added as prefixes to the ordinate and abscissa. For that small area where the northings went below ST 70000, the values have been indicated as negative numbers in order to avoid showing long numbers on the graph.

There are two principal groups of features and other areas of interest within the plot. These are shown on a separate plot below, figure 3.2.

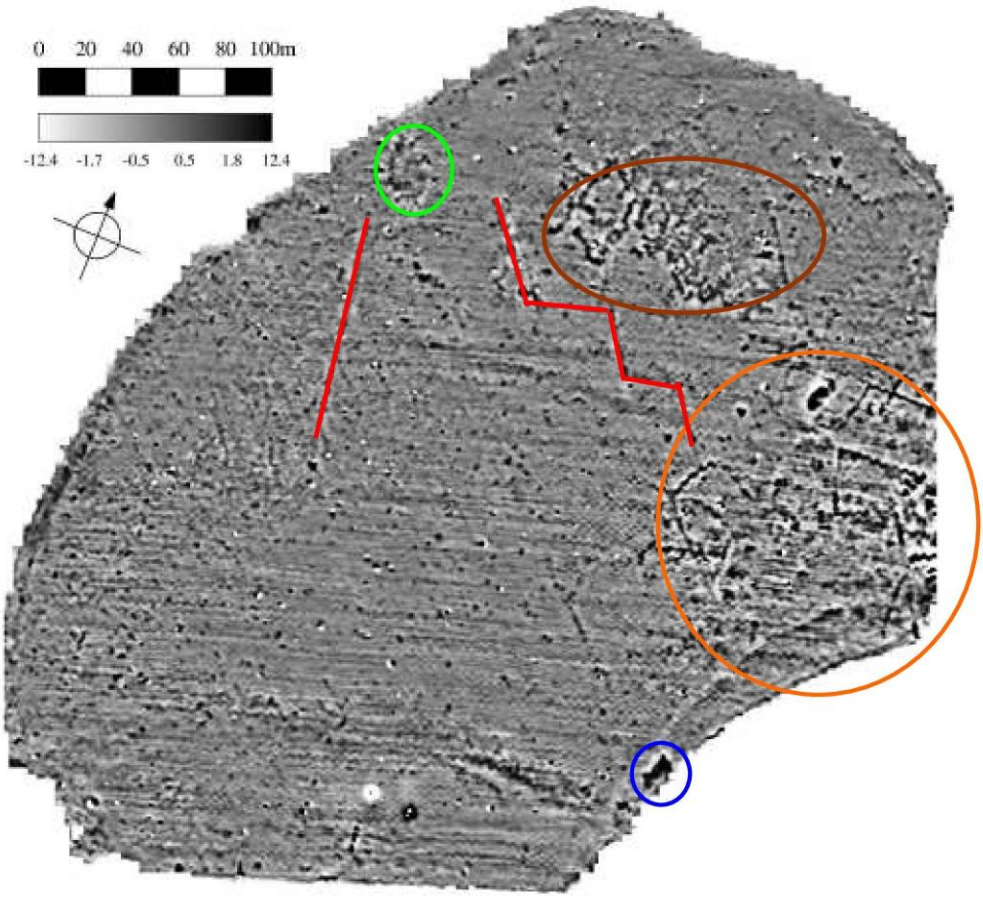


Figure 3.2. Marked up magnetometry plot.

The area of most interest in on the right, circled in orange. This shows the area of prehistoric / Romano-British occupation continuing through from Settlement Field to the east. This will be discussed further in Chapter 4. There are signs of considerable activity here, but no features stand out clearly as recognisable entities. Some well-defined straight lines and corners in the north of this orange-marked area could represent structure, and the very strong signal just to the west of this may be a deep pit or may indicate burning.

The blue circle picks out a depression in the ground which is probably a pond. Immediately to the north-west of this is a small raised area, only 20 cm high and 20 m diameter, and this does not show on the magnetometry map.

The area encircled in brown shows strong signals, but these make confused patterns. These appear to connect with the settlement area in the south-east, but there is no direct link. It is possible that these marks relate to the Battle of Lansdown in 1643. They occupy a ridge of high ground, figure 2.6, or background in figure 2.1.

The feature circled green may also relate to the Civil War, but it could also be a small henge, 30 m by 15 m, or other prehistoric entity. Nothing is visible on the ground. This may also be the site of a mound dug by Bush, reported in 1912.

The red lines may well be the traces of practice trenches dug during the First World War. We know from Bush's description that the trenches were to the right of the road and within a short distance of Grenville's monument. The signals are quite faint, suggesting a short time before they were filled in. The bedrock is relatively shallow (Bush says about 18 inches), and it may be that the trenches did not go down to a full working depth.

There are possible obliterated field boundaries in the south and south-east. The central and south-western areas are generally somewhat blank apart from a scatter of small ferrous targets. Some metal litter was observed on the surface, but otherwise there could be some response from Civil War ordnance. The two large spot targets in the south of the field may be ordnance, although experiments with a locally found cannon ball (most likely cast iron) showed it to have a relatively small magnetic signature, invisible at 3 m and only causing saturation at a few cm from a sensor.

3.2 Magnetic Susceptibility (Magsus)

The magsus plot is shown below in figure 3.3.

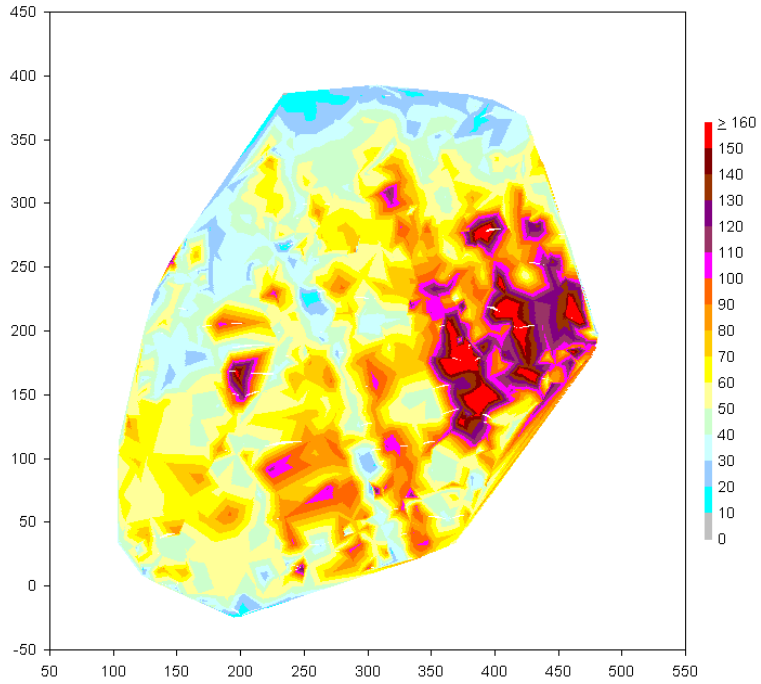


Figure 3.3. Magnetic Susceptibility plot

The Romano-British settlement is plainly evident from the high readings (as were seen in the neighbouring field). The brown-encircled area (figure 3.2) north-west of this does not stand out strongly like the settlement area. There are also areas of relatively high susceptibility in areas to the south where the magnetometry is blank.

Few areas of the field exhibit low values, except to the north.

3.3 Twin-probe resistance

The survey area was beyond completion by resistance in the time available, but approximately 100 grids, one third of the area, was done, and this covered most of the area where magnetometry had found targets. The comparison of completion of the two methods is shown with Ordnance Survey coordinates in figure 3.4 below.

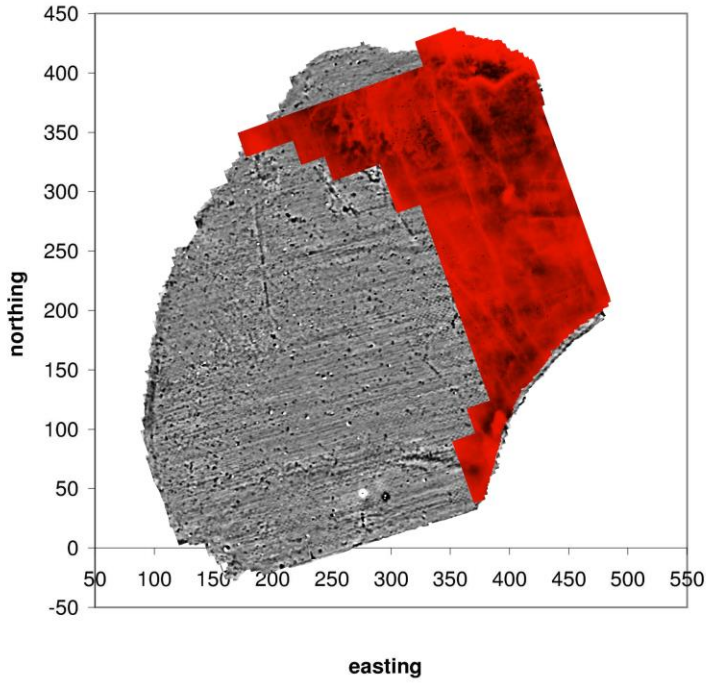


Figure 3.4. Resistance survey completed (red) overlaid on magnetometry (grey).

The resistance plot is shown for analysis in figure 3.5. The plot is shown in two versions: the normal plot where dark represents high values; the plot is also given in reverse where dark represents low values. This is beneficial as the survey has been very good at detecting ditches as lines of low resistance. This can indeed be better than the magnetometry plot.

Some areas, particularly in the north-east, show areas of high resistance, which are most likely because the underlying rock is shallow.

One area of interest here is the effect like ‘rubbing out’ of high readings in the northern part, corresponding to the brown-circled area of figure 3.2. The irregularity of this suggests that the area has been scooped out rapidly only where necessary, where speed has mattered more than thoroughness. This would support the idea that this is a product of the Battle of Lansdown. The regular but zig-zag trench through rock in the far north-east could also relate to this activity, or may also be part of the training activities in the First World War.

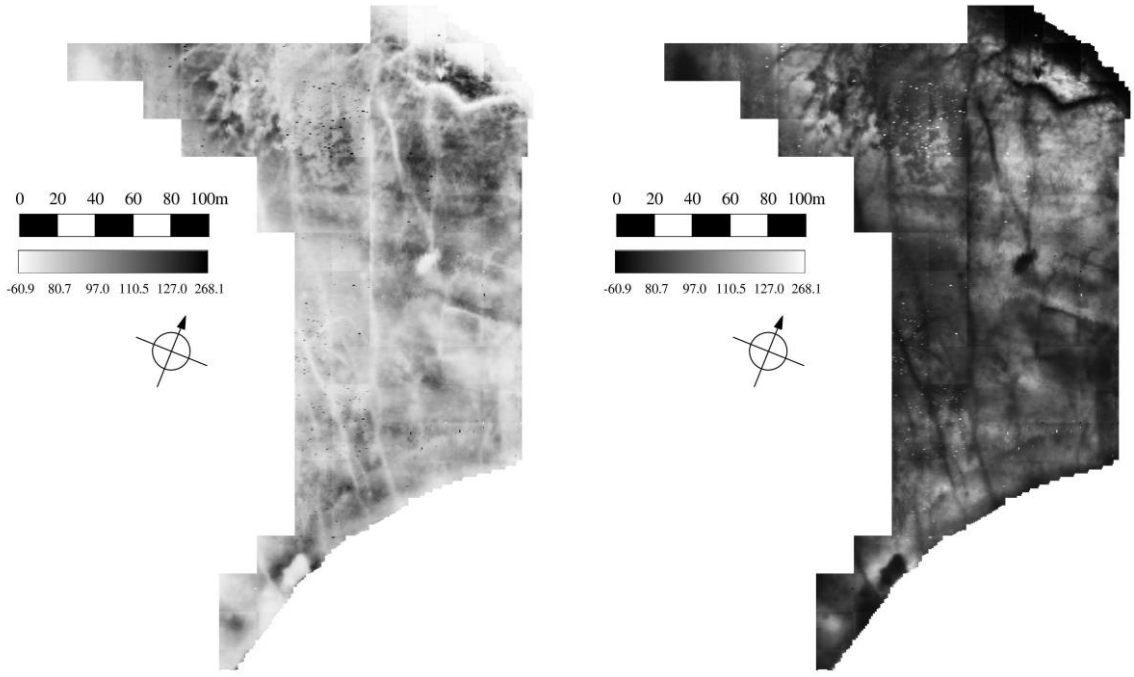


Figure 3.5. Resistance survey. Left: normal scale; right: scale reversed.

There is a possible masonry structure in the far north-east, to the north of the strong low-resistance 'W'. Indeed, that feature has cut away its southern side. It appears to have a semi-circular apse on its north front, but this may possibly be an artefact of the processing and display.

The westernmost grid square at the north end shows low resistance. This is the northern end of the monument circled in green in figure 3.2. Time on site ended at that grid, so there was no opportunity to survey the grid immediately to the south, but the low resistance suggests it is more likely to be a pond than a henge.

There is a possible east-west structure emerging from the eastern wall, mid-way along, some 30 m long and 12 m wide. A large pit which showed as a strong magnetic anomaly is towards the eastern end of this. Immediately to the south of this rectangle, and under it, low resistance lines map out an area which has been much worked, but it is not obvious what this was for. To the south of this, lines continue, coinciding with the area of high magnetic activity, both in magnetometer and magnetic susceptibility.

To the west of this settlement area, a continuous but not straight low resistance line extends from north to the southern extremity of this field. There are similar lines to the west. As the plot was not extended to the northernmost edge of the field except in the far east, it cannot be affirmed that the lines did not extend the whole length of the field, but they appear to terminate on the ridge 50 m south of the northern edge. This suggests that they are related to drainage (probably more recent) rather than forming a barrier to cut off the peninsula to the east. These lines do not show in the magnetometry.

As there is no large defensive barrier across here to defend the promontory to the east, that settlement cannot be considered as a hillfort in any form. There is a promontory on the western edge of the plateau, also confusingly called ‘Little Down’ which appears to be an incomplete hillfort, and there is an incomplete hillfort on Freezing Hill facing the edge here from the north, on Tog Hill opposite. Note that the settlement is further to the south below the ridge and out of sight of Freezing Hill.

Towards the southern end, the depression shown as a positive magnetic anomaly (circled blue in figure 5.2) appears as a low resistance patch, supporting the idea that it is a pond. The low mound immediately to its north is not clearly visible, although there are signs of a circular ditch. This is about 12 m diameter, but with a branch heading south by the ‘pond’. There is insufficient evidence here to call it a barrow, although it is on a false crest and commands a view down the Swainswick Valley to Little Solsbury Hill.

In the far south of the resistance survey is a small high resistance circle, some 5 m in diameter. Its regularity suggests that it is a man-made feature, but it does not show in magnetometry and appears isolated. Its function is not known.

Although the resistance survey could not be completed in the time available, it covered most of the areas where the magnetometry survey indicated the presence of archaeology. Although it would be desirable to complete the area, that would be a major task and it is unlikely that much benefit would be gained.

3.4 Resistivity profiles

The profiling kit only became available on the penultimate day of the survey. Nevertheless, eight profiles were completed. All of these used one metre probe spacing to attain the most length coverage, albeit at the expense of greater detail. This arrangement provided depth coverage down to 3 m, although in most cases, the bedrock was at about 1 m depth. The plots have been truncated at 2 m so that the bedrock values do not dominate the plot. All resistivity scales have been set to the same linear range, and the scale is shown below in figure 3.6, and should be referred to when examining the profiles.

Figure 3.6. Resistivity scale in ohm-metre

Profiles 1 and 2 were overlapped and subsequently concatenated into a single profile which will be referred to as Profile 1-2. Note also that all profiles are shown as level as there was not sufficient time to take the differing heights of the probes and LiDAR was not available to provide height data. Slopes are generally gentle so this is not of great consequence in interpreting the results.

The locations of the profiles are shown below in figure 3.7. They have been overlaid on the gridded magnetometry plot to indicate the anomalies to which they are adding a third dimension.

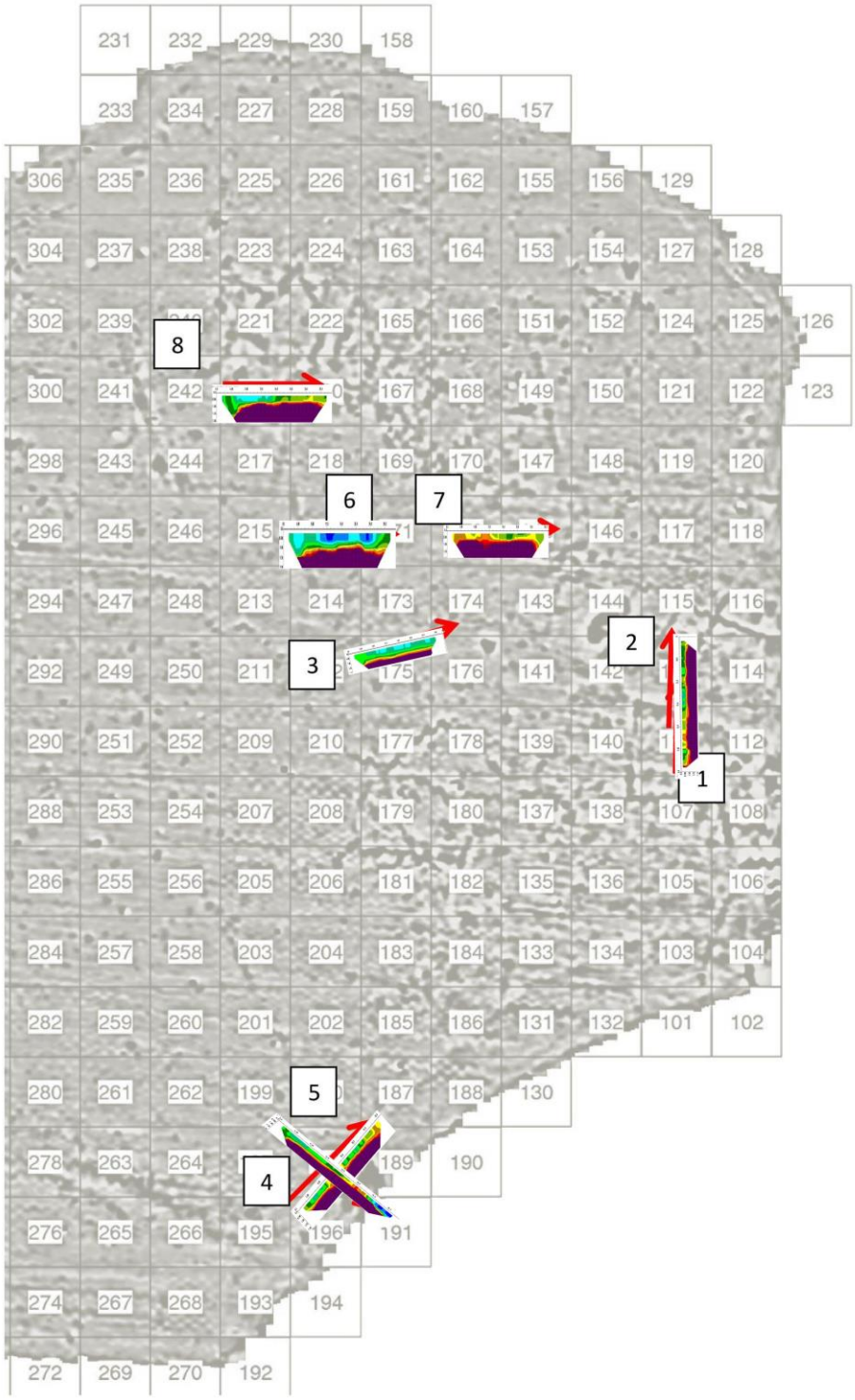


Figure 3.7. Location of the profiles overlaid on magnetometry grid map

Profile 1-2 is oriented north-south, with zero at the south. It is shown as a flat projection, but the ground actually rises between 1 and 2 m over the length of it. There is approximately 1 m of soil over the underlying rock. There appears to be a pit or trench dug down a little way into the rock at 7 m, with a slight platform between 8 and 19 m. This is also delineated by possible wall lines at 9 and 18 m, with more major stone structure at 12 m. There is also structure showing at 33 m, and possibly again from 38 m to 45 m. The profile is shown below in figure 3.8.

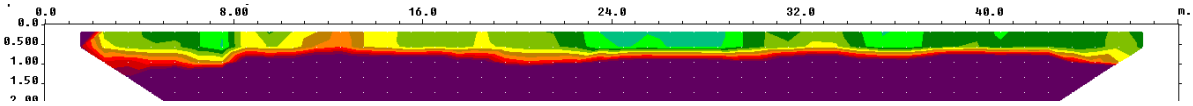


Figure 3.8. Profile 1-2. Zero is south.

Although buildings cannot be made out clearly in either magnetometry or resistance at this area of the plots, there are high levels of activity shown, and this profile does suggest the presence of buildings, particularly towards its southern end.

Profile 3 is some 80 m to the west of profile 1-2 and is oriented north of east-west, with zero at the western end. It crosses the line of a north-south anomaly, which was considered to be part of the World War 1 training trenches. Two possible areas of ditch show at 8 to 12 m and 14 to 19 m. Neither cut down into the underlying rock. No other conclusions can be drawn from this profile. It is shown below in figure 3.9.

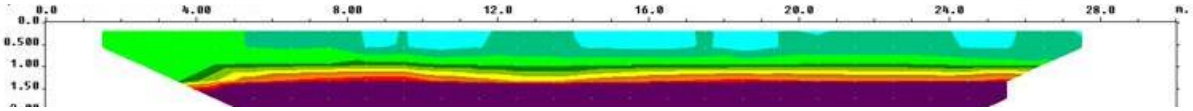


Figure 3.9. Profile 3. Zero is west.

Profiles 4 and 5 cross each other over the low mound in the south-east corner of the field. They cross at their mid-points. Profile 4 heads north-east from zero, profile 5 heads south-east from zero and continues across the depression thought to be a pond. The profiles are shown as flat projections, although both rise in the centre by about 20 cm and profile 5 sinks by 50 cm at its south-east end.

The two profiles are shown below in figure 3.10. These are centred with respect to the grid rather than on the mound, so their crossing point is not the centre of the mound. Each shows different features separately. Profile 4 shows possible stony features at 10 and 14 m, although nothing significant shows on the resistance plot, figure 3.5. It also shows a wall-like structure at 26 m, with the bedrock dipping away beyond it. This would seem to correspond to high and then low signatures on the resistance, possibly relating to a re–alignment of the south-eastern boundary wall and the pond.

Profile 5 shows a large stony feature at 20 – 23 m, followed by a very wet feature (the pond) from 25 m onwards. The stony structure does have a regular form, so does possibly represent some form of cist under what would have been a large mound. It does not look like a random pile of rubble. It is possible that such a mound starts at 13 m and ends at 24 m, although its abrupt ending may be a result of digging the pond.

Given the location right at the head of a valley with superb sightlines, it does suggest that this mound is the remains of a barrow.

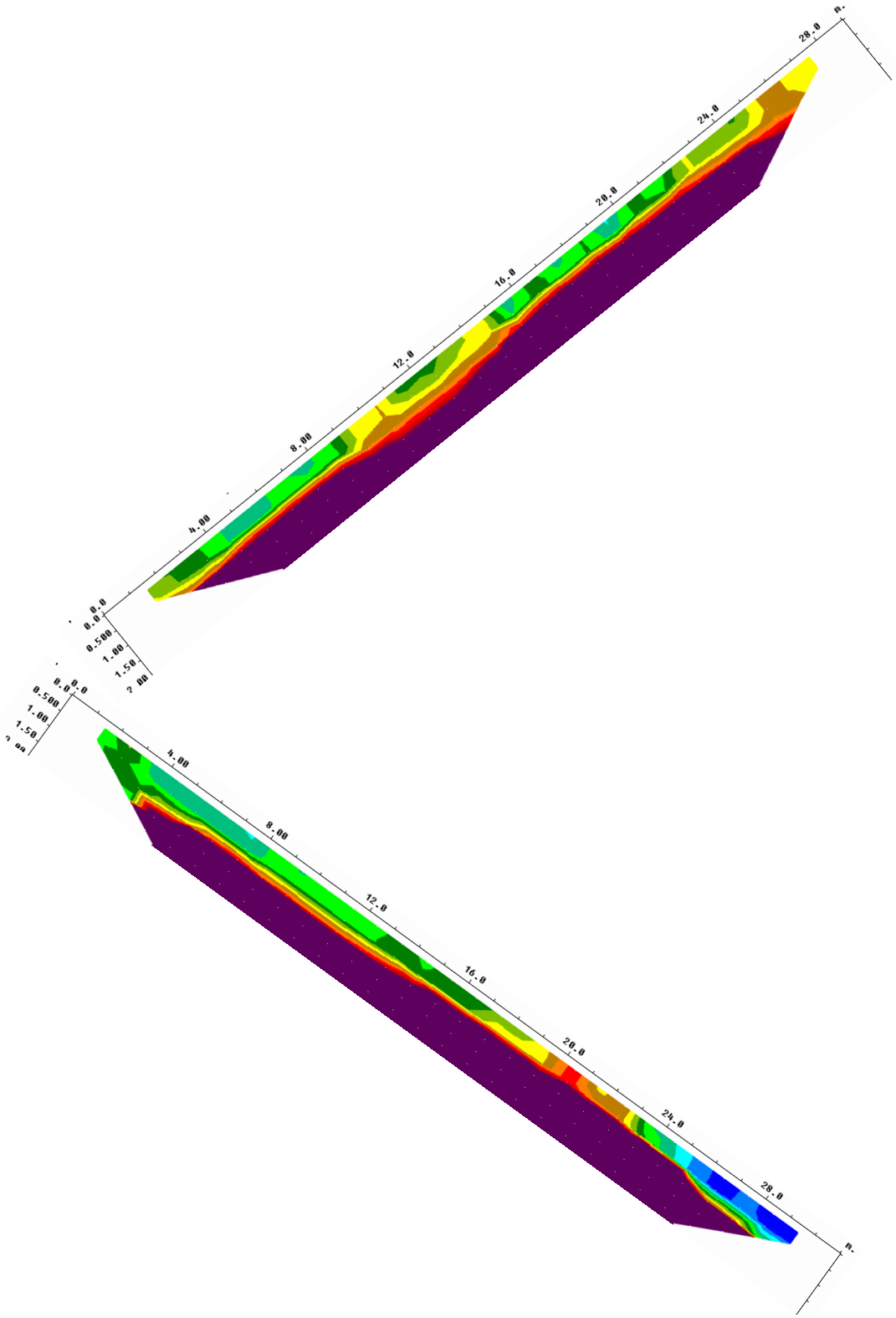


Figure 3.10. Profiles 4 (top) and 5 (bottom). Orientations are approximate. Profiles cross at their centre points. North to top, west to left.

The view down the valley towards Little Solsbury Hill and beyond from this point is shown in figure 3.11 below. This would make it a typical barrow location on the false

crest when seen from below. This further supports the notion that this mound might be the ploughed-out remains of a barrow. Note also the depression in the foreground, which is taken to have been formerly a pond.

Photograph: Rick Buettner

Figure 3.11. View down to Little Solsbury Hill from the possible barrow. Possible pond in foreground. Solsbury Hill is clearly visible but below the skyline.

Profiles 6 and 7 are on the same east–west alignment, but with 20 m separating them. These cover the eastern portion of the field mid-way up the slope. Profile 6 seeks to cross a linear anomaly in the magnetometry thought to be a World War 1 practice trench while profile 7 is in the area between what is definitely settlement and the marks that may relate to the Civil War.

Profile 6 is shown in figure 3.11 below. There are signs of a cutting at the western extreme, confirming the anomaly, but it does not cut deeply into the underlying rock. If it was a practice trench, it did not reach functional depth. There are no clear signs of activity to the east of it.

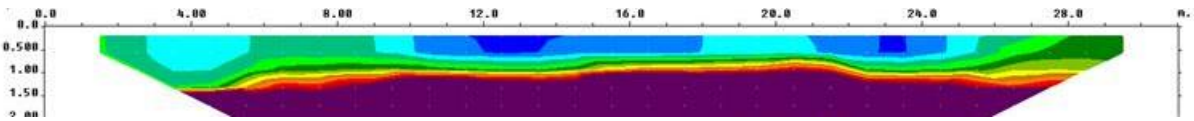


Figure 3.12. Profile 6. West to left.

Profile 7, figure 3.12, shows significantly more signs of structure, particularly at 4 and 11 m. There may also be further structure at 24 m, but this is less well defined. This profile does suggest that this is part of the settlement area.

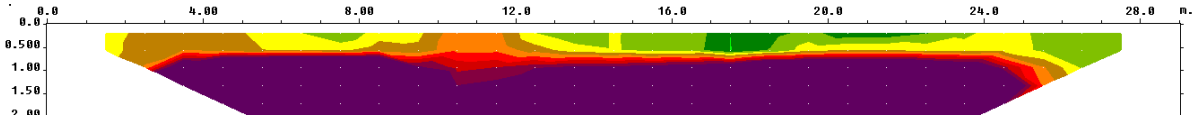


Figure 3.13. Profile 7. West to left.

Profile 8 was taken some 40 m to the north of profile 6, in the area where the magnetometry is busy but does not show good patterns. There are areas of higher resistivity to the east of 16 m but there is no obvious pattern. There would appear to be a cutting into the bedrock at the far west of the profile, but higher resistivity above it, and then followed by a large area of low resistivity, possibly a pond, but this is not a very suitable position for one. The magnetometry does indicate a possible large pit or pits in this area. The profile is shown in figure 3.13.

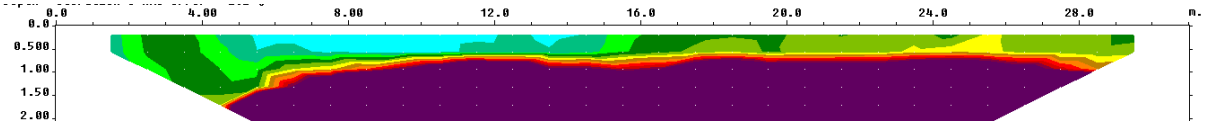
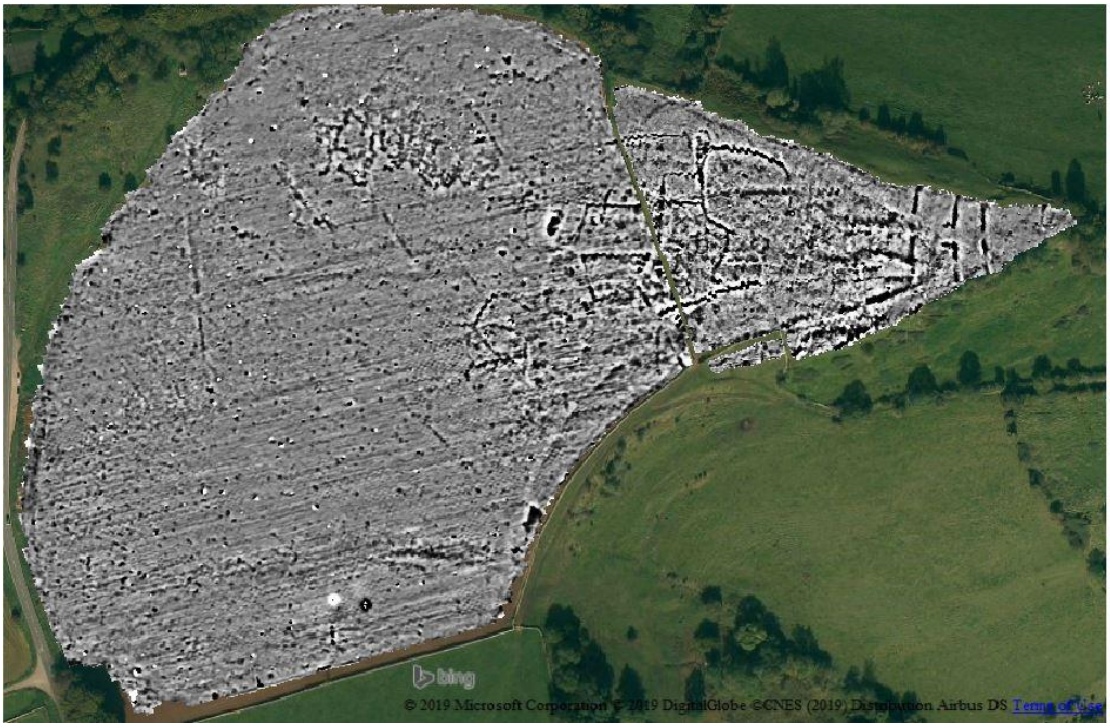


Figure 3.14. Profile 8. West to left.

Ideally, half-metre spacing could have provided more detail with less dominance of bedrock, but coverage was considered more important given the time available.

4 Adding Settlement Field

The 2019 project here needs to be added to the results of the 2018 survey in Settlement Field to the east, separated only by a stone wall. Soil and survey conditions were very different but there is continuity between the geophysical features, as shown in the combined magnetometry, figure 4.1.



Prepared by John Richards

Figure 4.1. Magnetometry for Monument Field and Settlement Field combined. North to top.

The peninsular form of Settlement Field shows clearly, with its steep sides, and its eastern termination at a sharp point. The area of settlement can be seen extending either side of the field division. The marked difference between the orange soil of Monument Field and the black soil that pervades Settlement Field is therefore surprising. Note also that the ground level drops by about 30 cm crossing the wall from west to east. The settlement forms a discrete area some 150 m by 100 m to the east of the visible earthworks in Settlement Field. It forms part of the Monument Field magnetometry, but other features are considered to be later in date, either Civil War or First World War, apart from the possible henge in the far north-west. There are also scars in the magnetometry to the south-east and south which suggest field boundaries have been reset to increase the field size, although the southern wall is considered to have archaeological features attributed to the Civil War.

The combined magnetic susceptibility plot also picks out the settlement area by the very high readings there. However, there are areas with moderately high values which do not show features in magnetometry or resistance. The plot is shown in figure 4.2.

Note that the plot edges have been trimmed where the automatic routine has inserted values to smooth the plot.

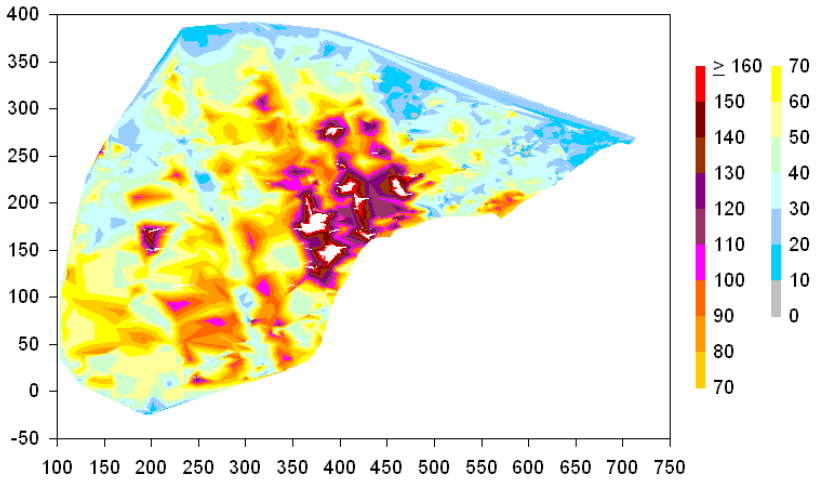
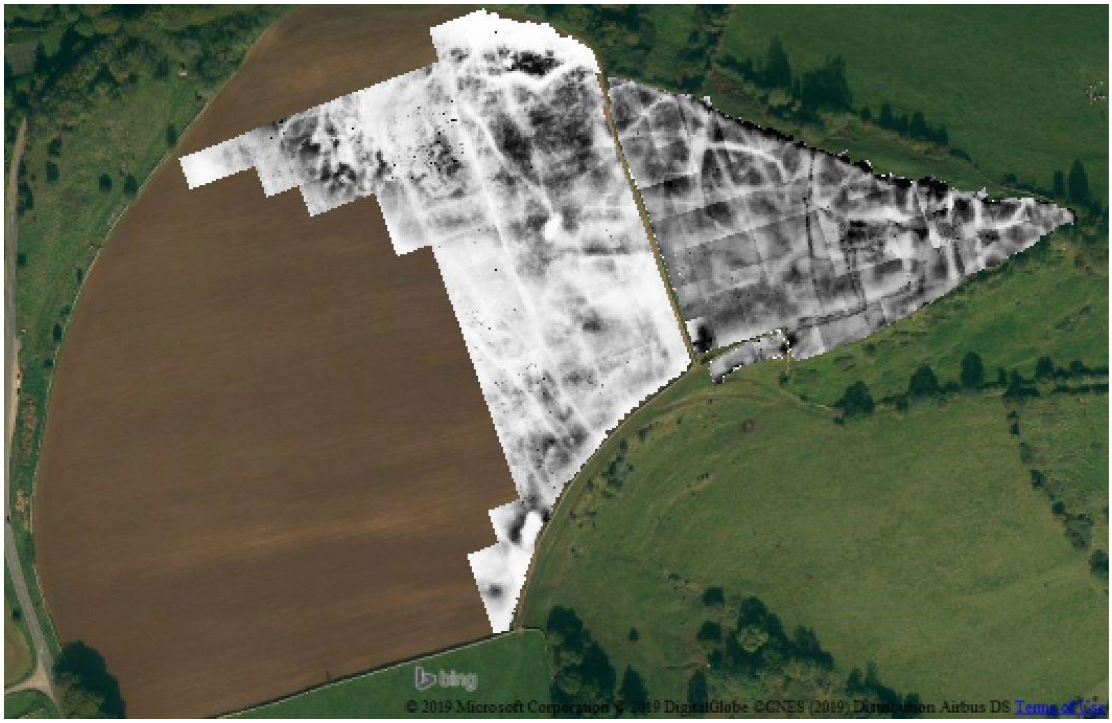


Figure 4.2. Magnetic Susceptibility combined for the two fields.

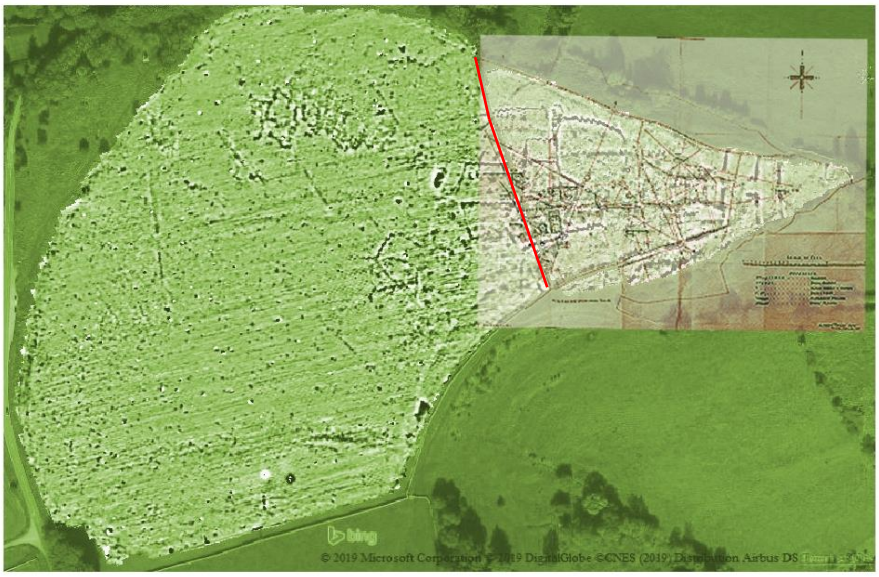
The combined resistance plot is given as figure 4.3. This is less informative as the two parts were optimised to each field, so there is less compatibility. However, the settlement area does not show well in either plot: ditches seem better defined than structures in both of these plots.



Prepared by John Richards

Figure 4.3. Twin-probe resistance plots for the two fields combined.

As the excavations in the early twentieth century straddled the dividing wall between the two fields, an overlay is shown in figure 4.4. As the magnetometry has picked up features more clearly, this is used for the comparison.



John Richards, Proceedings SANHS

Figure 4.4. Bush excavations plan overlaid on magnetometry, both fields. The red line marks the position of the wall between fields.

The overlay has been done as accurately as the two plans allow, but there does not seem to be very good correspondence between outlines. The red line marks the line of the wall between the fields. Bush's explorations to the west of the wall seem to have been minimal. The settlement appears to continue well beyond the bounds of Bush's exploration, although we should note that the tenant prohibited extension of the work into this area.

5 Comment and Conclusions

One of the purposes of the 2018 survey of Settlement Field was to produce a modern comparison with Bush and Gray's excavations of 1905 onwards, and the 2019 survey of Monument Field has extended this to find the limits of the settlement they excavated partially. In this sense, the survey succeeded, but it needs a modern study of their finds and reports to complement this work.

The survey also revealed a number of other features, with dates probably from prehistoric through Civil War (Seventeenth Century AD) to First World War (Twentieth Century) and possibly beyond. There are also signs of a possible pre-modern re-alignment of the field boundaries in the south and south-east areas. These can be listed as:-

- A possible henge in the north – west and a possible barrow in the south -east corner (prehistoric, c 2500 – 1500 BC).

- The Iron Age / Romano-British settlement which extended through into the south-east corner from neighbouring Settlement Field, and occupying a defined, limited space, although individual features within this area were not clearly defined (period c 500 BC to 500 AD).

- Scars in magnetometry apparently indicate changes from the present alignment of stone walls in the south-east and south. These run some 10 to 20 m within the current field bounds, and the pond in the south-east would probably have lain outside if there at the time. Given that the present walls have been related in past work to the Civil War battle descriptions, this would suggest an earlier realignment, possibly connected with an open field arrangement (period c 1000 to 1500 AD).

- Scars and scratches appearing in the geophysics along the ridge towards the north of the field probably relate to the Civil War battle. It is within the '400 yards range' of the southern wall which sheltered the Parliamentarian forces and a suitably commanding position for artillery. This ridge is also the position the Royalist Army would have to reach to command the field, rather than the present northern bound where it meets the woodland and steep slope (date 1643 AD).

- North–south lines across the centre of the field with occasional sharp changes of direction, and a short line with sharp angles in the north-east corner are probably remains of World War 1 practice trenches cut in the field, although they do not go down into the underlying rock, which is as little as 0.5 m down (dates 1914 -1918 AD).

- There is also tale of a Hawker Hurricane crashing in the field during World War 2 and leaving debris in the north-east area. There are also lines of low resistance (wet) showing in resistance but not in magnetometry which appear

to represent modern drainage, as they start on the north ridge and head south (1940 AD onwards). These do indicate that there was not a defensive ditch cutting off the promontory.

- There are also large areas which are blank, apart from a thin scatter of ferrous signals, particularly in the south – west corner of the field. This is worthy of remark as the next field to the south contains half an enclosure visible on aerial photographs (the other half is across the road to the south – west). It would appear that the half enclosure and its appurtenances are entirely contained in the neighbouring field. It is hoped to survey this field in future as part of the current project.

Given more time and resources, the area covered by resistance could have been increased, and a contour survey could have been undertaken in lieu of available LiDAR data. The resistance survey appeared however to cover most of the targets found within magnetometry, and helped to define these targets. The contour survey is the item missed most, as the topography of the field is integral to the understanding of its archaeology. It has at least been possible to draw a north-south profile of the field using low-resolution Ordnance Survey data, and this at least indicates how the settlement was a little sheltered from the north, and the ridge that the Royalist Army needed to gain to control the field.

This survey should not be seen in isolation, but as part of a continuing sequence along the top of Lansdown as part of LEAP, the Lansdown Environs Archaeological Project, and it was a successful contribution to that programme. Apart from geophysics of further areas, there is also a need separately to re-analyse and report the findings of Bush's excavations.

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Appendix A Grid Layout

A1 Grids

Initial gridding was by Mike McQueen using high accuracy GPS. This provided the first six rows of grid posts starting from the eastern wall, with the origin set at the Cotswold Way finger post just outside the field by the southern stile. After that, grids were laid out using tapes. Although one method lays out in plan and the other over ground, these were sufficiently close as there were no steep slopes.

Most, but not all, grid corners were measured in using hand-held GPS (Garmin Elonex), precise to 1 m but only accurate to 2-3 m. This is sufficiently good for mapping. Note that only the last three digits of northing and southing are included here, so ST 72343 70108 for instance is shown as 343, 108 on the map. In the far south-west corner, the northing slipped below 70000, and the values here are recorded as negative numbers, so ST 72183 69985 for instance is mapped here as 183, -15.

Figure A1 shows the map of grid corners.

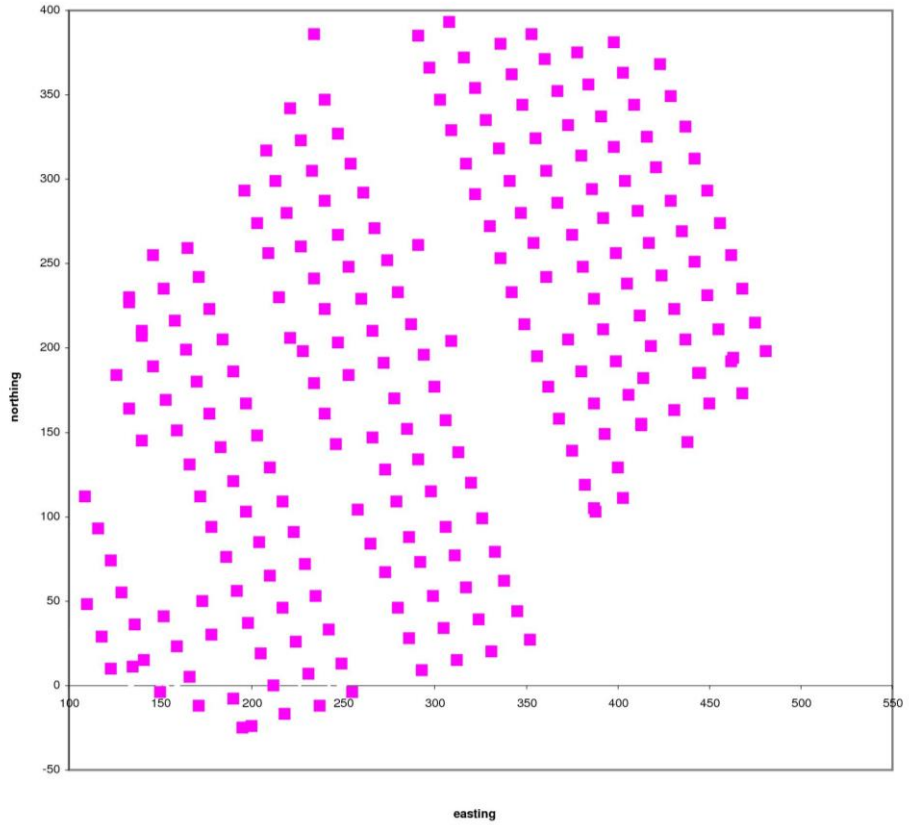

Figure A1. Mapped grid corners. Note that a number were missed out, but their locations could be inferred from this plan.

A2 Magnetometry

The Bartington 601-2 magnetometer was set to 4 readings per metre on traverses one metre apart, giving 1600 readings per full 20 m grid square. All grids were started in the south-west corner, heading north on the first traverse. As usual practice, the first traverse started 1 m east of the corner, 0.25 m above baseline.in accordance with figure 5.8c, p111 of Oswin (2009). Grids were surveyed in pairs initially heading north starting from the east side of the field.

The magnetometry grid plan is shown in figure A2. Note that for this season, grid numbering started at 101. Grids 107, 108 were inadvertently repeated as 109, 110 so these are missing from the plot.

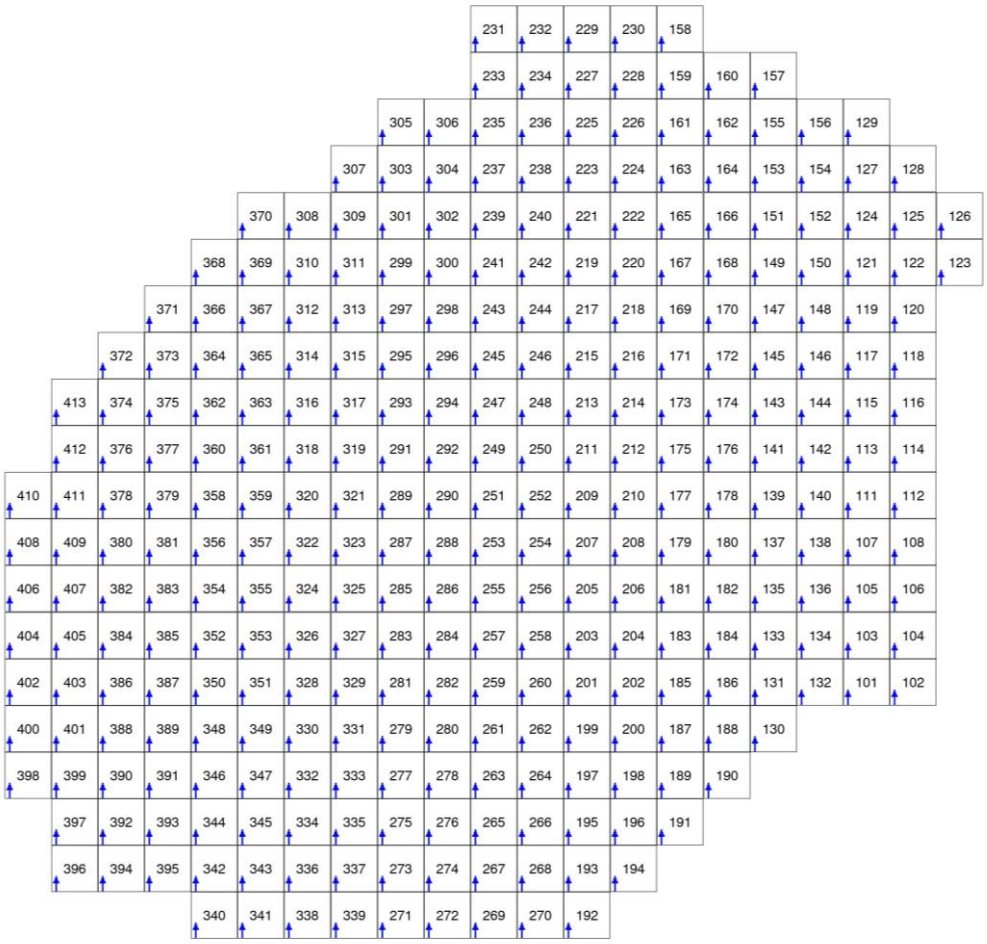

Figure A2. Magnetometry grid pattern.

A3 Magnetic Susceptibility

The Bartington MS2 magsus given to the society is of considerable age and has no form of data logging. Readings, along with hand-held GPS locations, were written down on paper and transcribed to Excel spreadsheet for subsequent mapping in DPlot software as a colour-band contour map.

Readings were taken at grid corners, and sometimes between, and also on random walks around the field. Ideally, there should be a reading every 10 m or so, but there are some gaps in the coverage. In all 993 readings were recorded. Figure A3 indicates the points where readings were taken, both mauve (grid corners) and blue (random points). As in section A1, the three-figure coordinates are the last three digits of the five-figure Ordnance Survey (OS) coordinates. The negative numbers on the Northing in the south-west corner are where the full OS value drops below 70000.

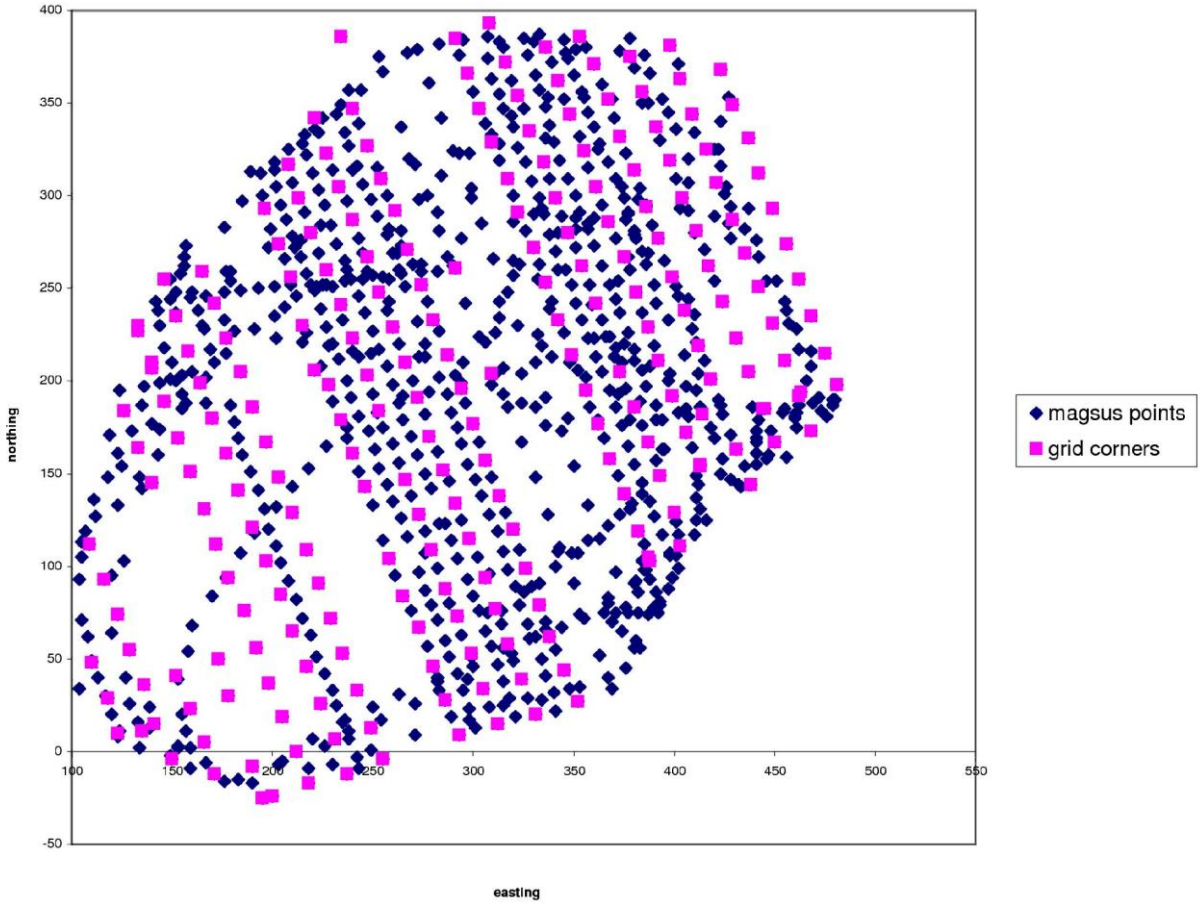

Figure A3. Map of magsus data points

A4 Twin-probe resistance

All resistance grids were done at 2 readings per metre along traverses 1 m apart, giving 800 readings per full 20 m grid square. On the first day, owing to a misunderstanding, grids were started in the south-east corner heading west on the first traverse. Thereafter, the more normal pattern of starting in the south-west corner heading north on the first traverse was adopted. INSITE could cope with this change in direction; other analysis software may not be able to.

The RM15 downloaded data in zig-zag fashion, indicated by the red crossed arrows in figure A4, while the TR device downloaded data in parallel fashion, indicated by the blue arrows in the figure. Note that for this season, grid numbering started at 101.

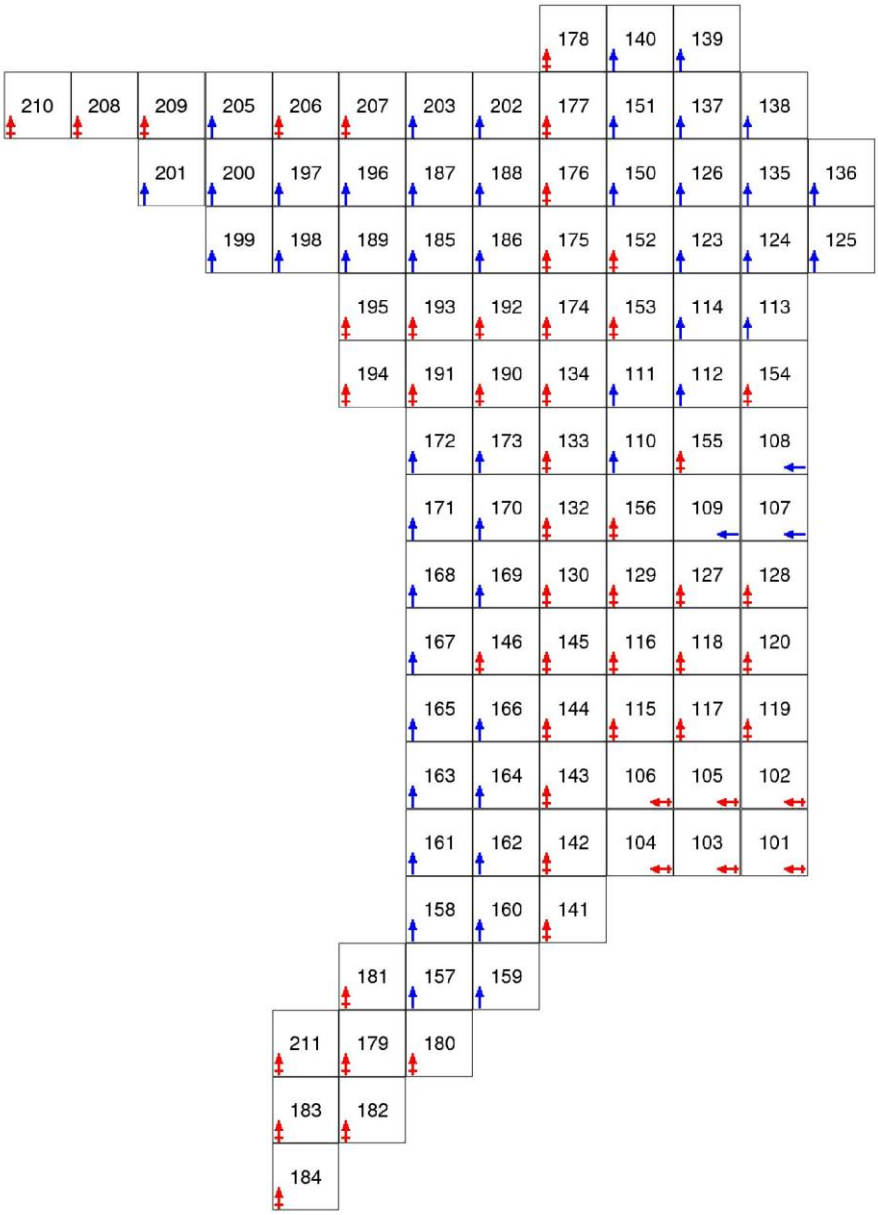

Figure A4. Twin-probe resistance grid map.

A5 Resistivity profiles

A total of eight profiles were taken, each with 32 probes spaced 1 m apart. Profiles 1 and 2 were concatenated together to produce a single longer profile. The locations of the profiles are shown overlaid on part of the magnetometry grid in figure A5, with the arrows pointing from probe 0 to 31.

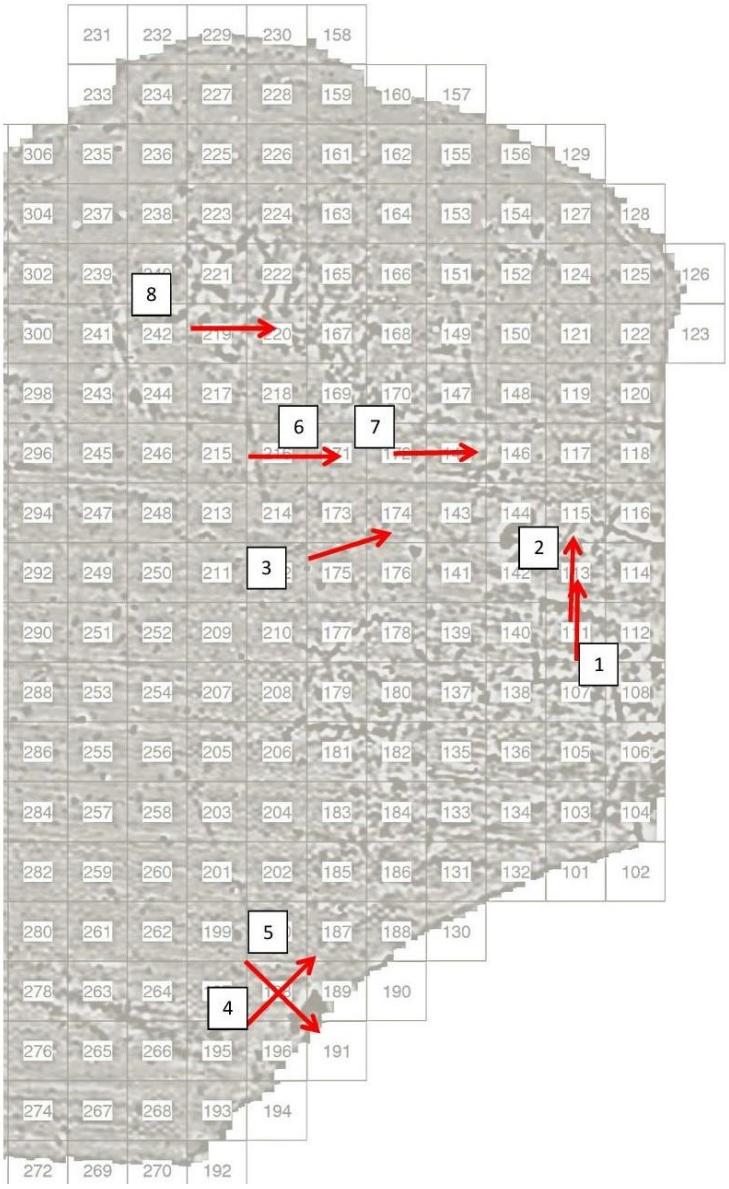

Figure A5. Location of the resistivity profiles on the magnetometry plot