Underway Meade, Combe St Nicholas
Geophysical Survey, May 2018

South Somerset Archaeological Research Group

Report no: SSARG/GS1022

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1.0 Introduction

The survey was carried out at Combe St Nicholas in the field Underway Meade (NGR 330800 110900) as part of a village project to research the history and development of the village. Underway Meade is an L-shaped field situated to the southeast of the village on the plateau of a steep hill where the land drops sharply away to the south (figs 1 & 2).

Underway Meade was chosen as a target for surveying as it contains a number of slight linear earthworks running northwest – southeast and roughly north – south across the field. The survey took place in the southern part of the field covering the earthworks and also included a small strip-field to the southwest, separated from the main field by hedging. The total survey area was approximately 0.75ha.

Combe St Nicholas is situated approximately 5km from the town of Chard in Somerset. The geology of the site is Upper Greensand Formation Sandstone (British Geological Survey website www.bgs.ac.uk/discovering Geology/ geologyofbritain/viewer.html Accessed 20th August 2018).

The survey was carried out by members of the South Somerset Archaeological Research Group.

1.1 Equipment

Fluxgate gradiometer – Bartington Grad 601-2

The Bartington Grad 601-2 is a dual system gradiometer, a form of magnetometer. It comprises two sensor rods carried on a rigid frame, each sensor including two fluxgates aligned at 90° to each other, one set 1m above the other. It measures variations in the magnetic field between the two fluxgates, recorded in *nanoTesla* (nT) at each sampling point within a grid. The manufacturer claims a depth range of approximately three metres. The instrument is most effective when carried at a consistent height, not exceeding 0.3m above the ground.

Magnetometers are especially effective for discovering thoroughly decayed organic materials, such as those which accumulate in ditches and pits, and matter exposed to intensive firing, including industrial areas, hearths and larger ceramics. All of these are likely to give a positive magnetic response, sometimes with a negative halo, giving a dipolar effect. Non-igneous stone features, such as walls and banks, are usually perceived as negative anomalies against a background enhanced by decayed organics.

Software – Geoscan Geoplot 3.00v

Geoplot 3.00v allows the presentation of data in four graphical forms: dot-density, grey scale, pattern and X-Y (or *trace*) plots. The latter are particularly effective when used in conjunction with other graphical modes to emphasise ferrous magnetic anomalies or other distortions which show as accentuated peaks or troughs. The programme supports statistical analysis and filtering of the data.

1.2 Field method

Area 1 *(fig 2):* The area was divided into 20m squares aligned with the Ordnance Survey Grid. Readings were logged at 0.25m intervals along east to west traverses set 1m apart in a zig zag pattern.

Area 2** (fig 2)**: The area was divided into 20m squares aligned with the northwest – southeast field boundary. Readings were logged at 0.25m intervals along southeast to northwest traverses set 1m apart in a zig zag pattern.

1.3 Processing method

Preliminary processing revealed some interference from modern ferrous magnetic features, characterised by sharp dipolar fluctuations ranging from approximately 30nT to over 3000nT. The first two processing sequences were carried out to mitigate the impact of modern ironwork.

1) Readings exceeding 30nT either side of 0 were replaced by null (dummy) entries.
2) Any anomalous isolated readings were similarly replaced.
3) Typical regular error due to the zig zag operation of the gradiometer was removed.
4) The mean reading for every traverse was reset to 0.
5) The asymmetric data collection pattern was mitigated by the positive interpolation of data points along the Y axis using the calculation of sin(x)/x.

2.0 The survey area (fig 2)

The grid comprises 19 contiguous whole and partial squares covering the southern part of Underway Meade and the whole of the small strip-field to the southwest. The fields are bounded by hedges with wire fencing on all sides.

Visible ferrous magnetic disturbance was provided by the wire fencing. A well cover is located near the southern entrance into the field but this was not covered by the survey.

3.0 Results (figs 3, 4, 5 & 7)

Area 1: The survey has detected the linear earthworks visible in the field, plus other possibly intersecting linears on differing alignments.

There is also general scatter of non linear anomalies across the site. Although some of these could be due to modern agricultural practice, it is possible they could also indicate archaeological features such as cut features/deposits containing thermo remanent material or occupation debris. A clipped colour plot (fig 4) shows the nature of the spread of this material, where readings higher than 4.0nT and lower than -4.0nT are included in the maximum and minimum red and blue colour bands.

Area 2: The results for this area are inconclusive apart from one major ferrous magnetic anomaly (**A**, fig 7).

3.1 Positive anomalies (fig 7)

A Major ferrous magnetic anomaly within a range of 47 to 3000+nT. The strength of the anomaly has rendered the results for the rest of Area 2 inconclusive.

This anomaly appears to correspond with a possible structure on the 1946 aerial photograph (fig 6) although it is difficult to make out what this feature could be. The unprocessed survey data (fig 5) reveals that **A** comprises six individual dipolar responses, apparently arranged in a circular formation. This distinction is lost after data processing where readings exceeding 30nT either side of 0 have been replaced by dummy entries in order to negate the effect of the ferrous response which can adversely affect any surrounding weaker archaeological anomalies.

The large scale Ordnance Survey map in fig 7 shows an unidentified circular feature to the

northwest of **A** suggesting a possible association with **A**. There is no visible surface feature to account for the readings in **A** or the feature on the OS map or the 1946 aerial photograph.

B Two parallel linear anomalies within a range of 1 to 2.3nT. Location suggests an association with negative magnetic anomaly **D** (***3.2*** below). The readings in **B** are within normal range for ditches/gullies, but could also could be caused by an accumulation of decayed organic material which has collected alongside **D**.

C Short linear anomaly within a range of 0.5 to 2.5nT. Within normal range for a ditch/gully. Alignment and position suggests a possible intersection with **B/D.** .

3.2 Negative anomalies *(fig 7)*

D Linear anomaly within a range of –1.5 to –2.5nT. Within normal range for a bank. Corresponds with a low linear earthwork visible in the field.

E Series of intermittent and irregular weak linears, generally within a range of –0.5 to –2nT, located on the slopes of a significant bank which rises steeply upwards to the southwestern field boundary. The anomalies in **E** would appear to represent slight ridges running parallel along this bank. Possibly caused by natural erosion, however the anomalies at the foot of the western end of the bank are clearly visible as earthworks in the field.

4.0 Conclusion

The degree of confidence in identified anomalies is moderately high for Area 1. The survey has picked up anomalies which correspond to the slight linear earthworks visible in the field plus other possibly related linears. In Area 2 the results are dominated by major ferrous anomaly **A**, fig 7 to the extent that the results for the rest of this area are inconclusive.

Bibliography

Standard and Guidance for Archaeological Geophysical Survey. Amended 2016. CIfA Guidance notes. Chartered Institute for Archaeologists, Reading.

Geophysical Survey in Archaeological Field Evaluation. Historic England, Swindon, 2008.

British Geological Survey website www.bgs.ac.uk/discovering Geology/ geologyofbritain/viewer.html Accessed 20th August 2018).

Fig 1: Location of survey

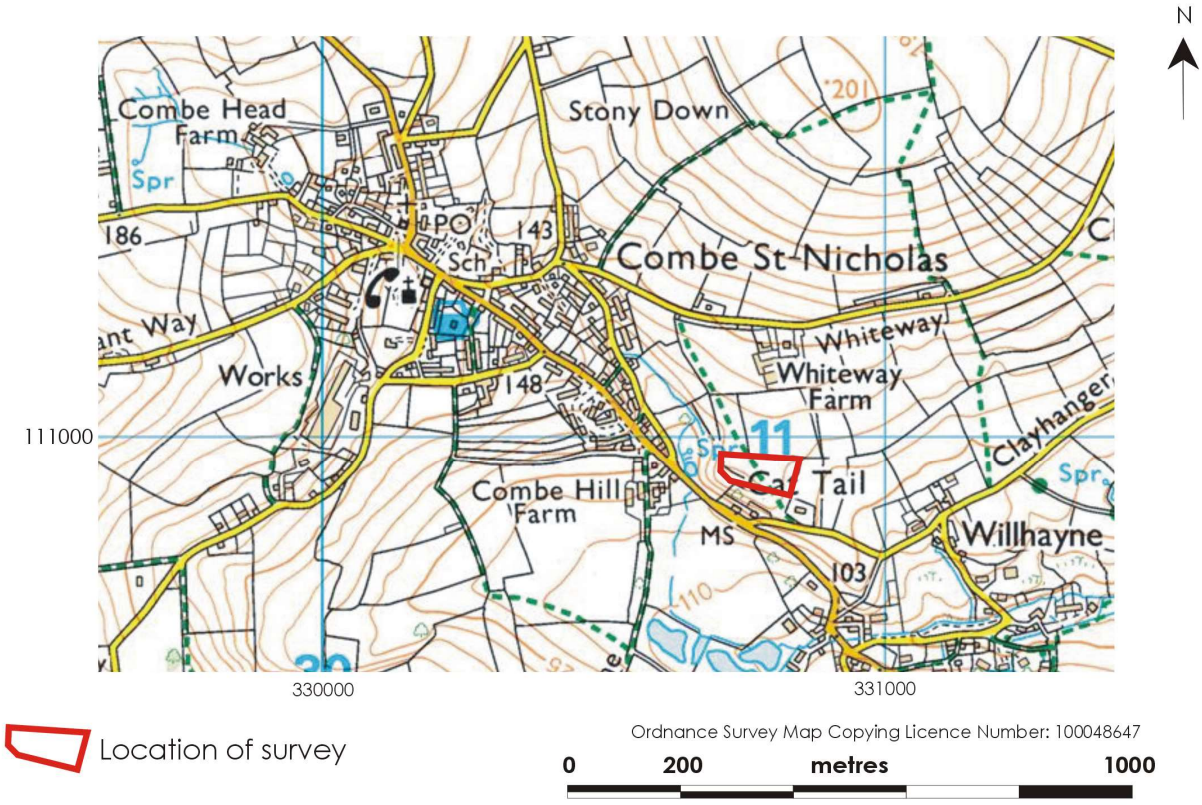


Fig 2: Location of survey - detail

Fig 3: Survey results

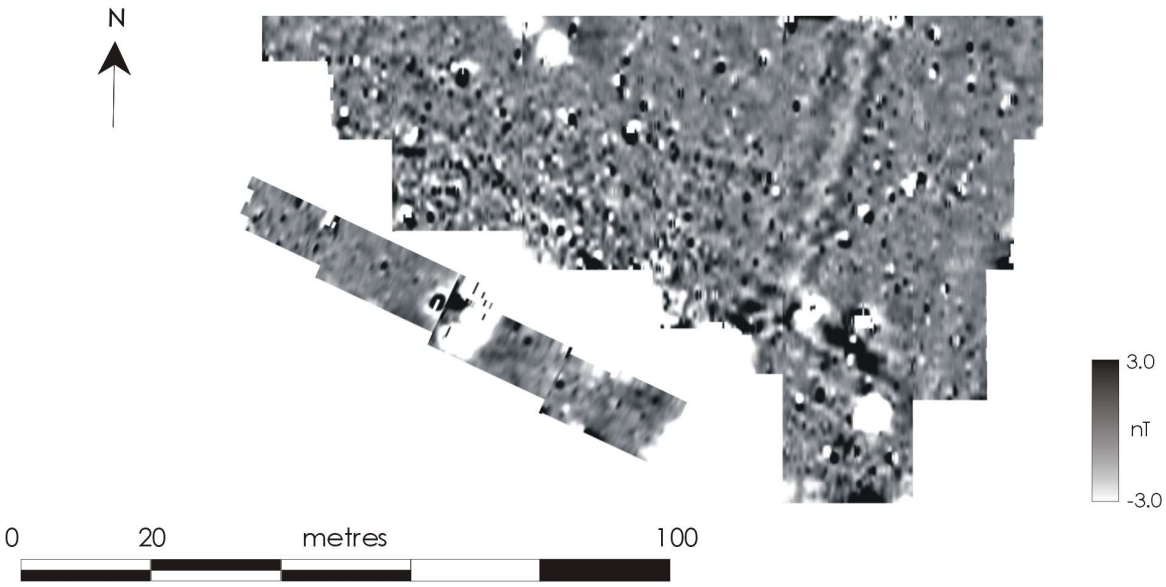


Fig 4: Highlighted survey results

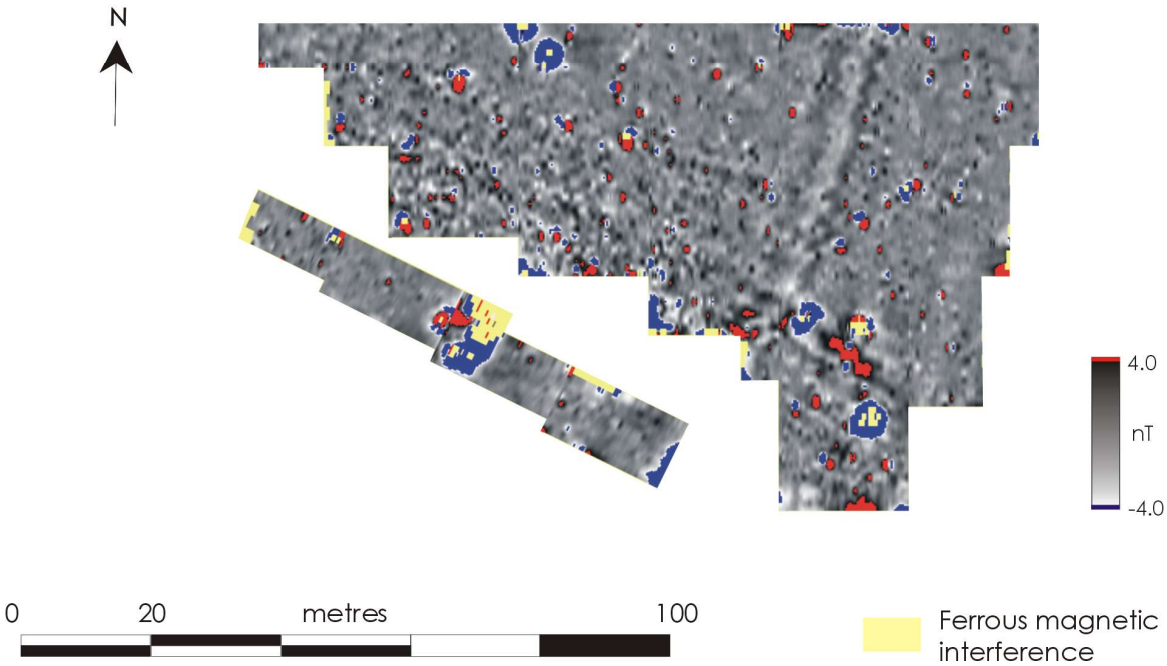


Fig 5: Unprocessed data

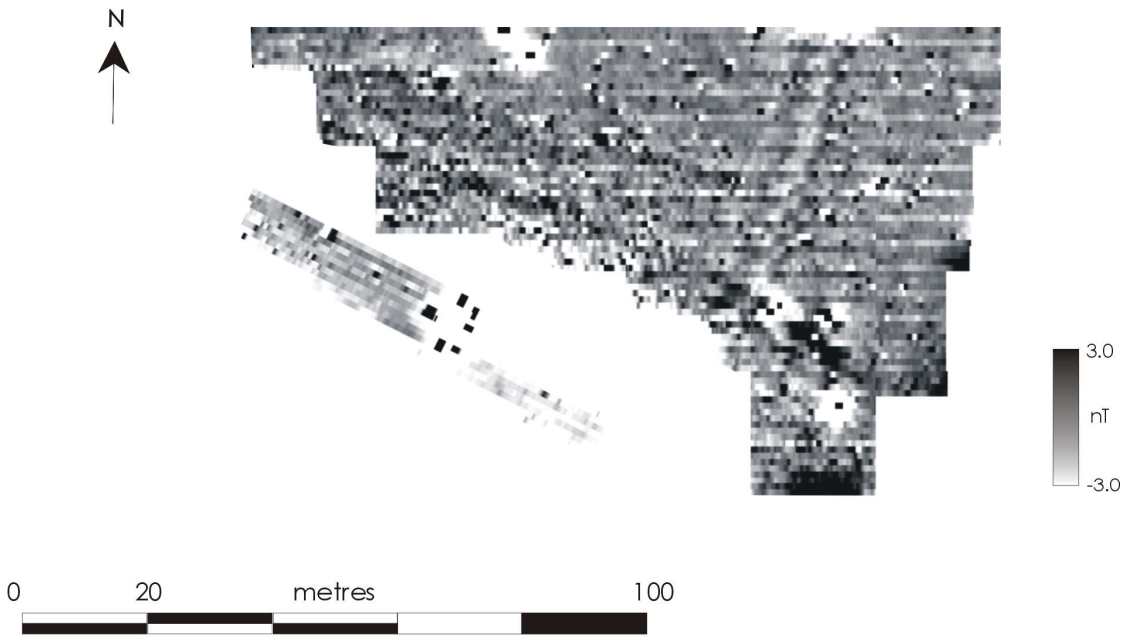
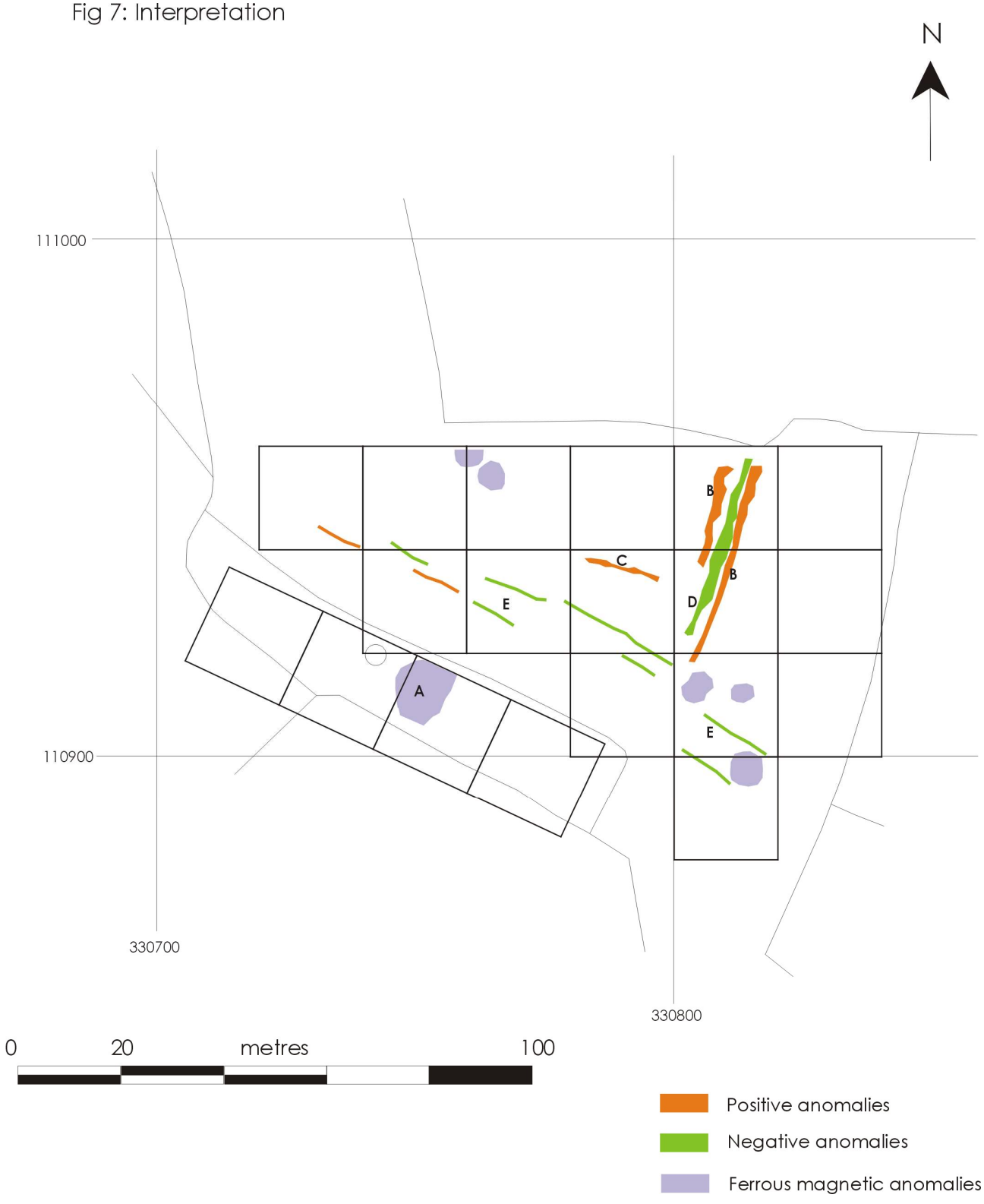


Fig 6: 1946 Aerial photograph

Somerset Historic Environment Record

Fig 7: Interpretation



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