Park, Low Ham Gradiometer Survey, August - October 2014

South Somerset Archaeological Research Group

Report no: SSARG/GS1011

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1.0 Introduction

The survey was carried out in two adjacent fields northwest of Park between Somerton and Low Ham (O.S. grid ref 345000 130400). The site is the location of a stone-lined hole (figs 2 and 7 - 9), approx 0.45m diameter opening but widening into a bell shape (approx 0.6m diameter) 0.6m below ground. Current depth is approx two metres, although its original depth is uncertain. The Somerset HER also records crop marks (HER ref 54823), in the adjacent field (Barker's Field), identified as a Neolithic cursus or mortuary enclosure. The aim of the survey was therefore to investigate the crop marks and to ascertain whether there were any structures associated with the stone-lined hole. *Note:* The site is also located approx 0.25km north of the site of a Roman Villa (fig 1).

The fields are situated on flat open land on the outskirts of the Somerset Levels north of West Wood ridge. The geology of site is Mercia Mudstone Group - Mudstone And Halite-stone.

The work 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

The fields were divided into 20m squares orientated according to the Ordnance Survey grid. Readings were logged at 0.25m intervals along north to south traverses set 1m apart in a zig zag pattern.

1.3 Processing method

Preliminary processing revealed some impact from modern ferrous magnetic features, characterised by sharp dipolar fluctuations ranging from approximately 30nT to over 3000nT. 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 *(figs 1 & 2)*

2.1 Furlong. The grid comprises 65 contiguous whole and partial 20m squares covering the whole of the field (fig 2). It was bounded by hedges and wire fencing on all sides. Visible ferrous magnetic disturbance was provided by the wire fencing in the hedges, and a shed situated to the northwest of the field (**Z**, fig 6).

2.2 Barker's Field. The grid comprises 92 contiguous whole and partial 20m squares covering the whole field (fig 2). It was bounded by hedges and wire fencing on all sides. Visible ferrous magnetic disturbance was provided by metal fencing in the hedge.

3.0 Survey results *(figs 3 - 6)*

The results are dominated by a network of linear and curvilinear anomalies, suggesting multi phase occupation of the site (figs 5 & 6). The prevailing linear trend is on a roughly northwest – southeast orientation apparently in a co-axial relationship with southwest – northeast linears. Three or possibly four major systems are distinguishable by their orientation (fig 5). Similarities in their alignment suggests they could possibly respect or incorporate earlier systems or features, which is suggestive of continuity in occupation over subsequent time periods. The readings are generally consistent with those for trackways and enclosures.

The survey results also reveal a number of other linear anomalies across the field which are of differing alignment to each other and to the systems mentioned above (figs 5 & 6). There is also a general scatter of non-linear anomalies across the survey area which are within the range for pits/cut features or deposits of thermo remanent/organic material. A clipped colour plot (fig 4) shows the nature of the spread of this material, where readings higher than 3.0nT are included in the maximum red colour band. Some of these appear concentrated in and around specific linears, suggesting an association.

The systems in fig 5 are identified by their similarity of alignment and the apparent relationship between major linear anomalies. Although some information about chronological sequence can be inferred from the character of their intersections and overlaps, the grouping of the anomalies is of necessity based on horizontal stratigraphy and orientation.

3.1 System 1 (fig 5)

Characterised by a series of intersecting linears possibly representing more than one occupation phase with possible associated enclosures and trackways.

1A Irregular, parallel linear anomalies, generally within a range of 6 to 15nT. Within normal range for ditches/trackway containing strongly thermo remanent deposits.

1B Long, slightly curvilinear anomaly within a range of 10 to 12nT, rising to 23nT towards the western end. Within normal range for a ditch containing thermo remanent residues. Readings and location suggest a possible continuation of **1A**.

1C Linear anomaly abutting **1F**, within a range of 1.5 to 5nT, weakening as it heads north. Within normal range for a ditch. Parallel alignment with intermittent anomalies in **1D** suggests a possible association, possibly forming part of an enclosure.

1D Intermittent linear anomaly generally within a range of 1.5 to 6nT. Within the normal range for a ditch. Alignment suggests an association with **1C** and **1F**.

1E Parallel linear anomalies within a range of 8 to 17nT. Within the range for ditches/trackway with strongly thermo remanent fills. Ovoid anomaly at the western end of **1E** is within a range of 8 to 18nT, suggesting localised deposit of highly thermo remanent/ferrous magnetic material.

1F Three contiguous linears which together with **1A** appear to form an enclosure. Generally within a range of 4 to 14nT but rising to 18nT in place. Within normal range for ditches containing strongly thermo remanent localised deposits.

1G Three contiguous linears which appear to form part of an enclosure. Within a range of 4 to 12nT.

1H Discrete area of weak, parallel and intersecting linears, within a range of 1 to 2.5nT. Despite weakly magnetic readings when compared with the rest of System 1, the anomalies in **1H** are included in this System as their location and character suggests they could be associated with this particular occupation phase. Their weak magnetic signature could be due to a change in the geology of the field around this point, from drier more sandy soils to the north to wetter clays to the south. (See ***3.5, J*** below).

1I Parallel linears which appear to start to converge as they head southeast. Generally within a range of 1.5 to 4nT. Possible association with **1J**.

1J Weak, converging linears within a range of 0.5 to 1.5nT. Alignment suggests a possible continuation of **1I.** The weak magnetic character could be due to weaker fills or the change in geology discussed in **1H** above.

3.2 System 2 *(fig 5)*

Major anomaly which dominates the survey results. Although it does appear to align and/or intersect with linears from other systems, any direct correlation is uncertain.

2A Major U-shaped linear anomaly, generally within a range of 6 to 10nT but rising as high as 20nT in places. Within the range for a ditch with strongly thermo remanent fills. Appears to be a major enclosure with the southeastern end obscured by the hedge.

2B Small curvilinear anomaly within a range of 2 to 4.5nT. Although located at the northwest end of **2A** it is not possible to say if they are contemporary.

3.3 System 3 *(fig 5)*

Weak linear system on a parallel northeast- southwest alignment. Readings are within the range for ditches with weak organic fills. Slight difference in alignment to System 4 suggesting possible continuity of landscape division over different occupation phases. Appearance and weakness of the readings suggests possibly an early occupation phase to Systems 1 and 2.

3A Three contiguous linears within a range of 1 to 2nT. Within normal range for small ditches or gullies.

3B Weak linear anomaly within a range of 1 to 3nT.

3C Parallel linear anomalies with apparently with three abutting linears on a northwest – southeast alignment, although these do not appear to continue to the southeast of the modern hedge. The proximity of these anomalies to ferrous interference from the field boundary limits confidence in their integrity. All within a range of 1 to 3nT.

3.4 System 4 *(fig 5)*

Major linear system on a northeast – southwest alignment. Appears to possibly underlie Systems 1 and 2. There is a slight difference in alignment to System 3 (see above). Readings are consistent with those for ditches with organic and weakly thermo remanent fills.

4A Three contiguous linears generally within a range of 1 to 4nT. Within normal range for ditches.

4B Short linear within a range of 1.5 to 4nT. Although appears to abut **2A**, readings and appearance are very dissimilar, suggesting they are unlikely to be contemporary.

4C Long, generally weak linear within a range of 1 to 2.5nT, but strengthening significantly as it heads southeast to as high as 7nT. Within the range for a ditch containing thermo remanent deposits to the southeast.

4D T-shaped linear generally within a range of 2 to 7nT. Alignment suggests possibly continuation with **4E** to the southeast.

4E Short linear, alignment suggesting a possible association with **4D**. Within a range of 4 to 7nT, indicative of thermo remanent deposits.

4F Weak Linear trend within a range of 1 to 3nT. Alignment suggests a possible association with linears in System 4.

3.5 Other major linear anomalies *(fig 6)*

The survey results also reveal a number of other linear anomalies across the fields which are of differing alignment to each other and to the systems discussed above. These are highlighted in fig 6. Major anomalies are discussed below.

3.5(i) Positive anomalies

A Two intersecting curvilinear anomalies within a range of 1.5 to 5.5nT. Possible bedding trenches for circular structures, possibly with associated strongly thermo remanent internal anomalies. A third curvilinear anomaly appears on the field boundary to the west.

B Slightly curving linear anomaly within a range of 1 to 3.5nT. Within the range for a ditch with organic and low level thermo remanent deposits.

C Group of amorphous anomalies generally within a range of 3 to 14nT. Possibly disturbance associated with the gateway into the field.

D Amorphous linear anomaly generally within a range of 2 to 6nT but rising to 12nT at its eastern end. Within the range for a ditch or cut feature with strongly thermo remanent local deposit.

E Weak elliptical anomaly within a range of 1 to 2nT. Within normal range for a ditch or gully. Possible association with negative anomaly **P**.

F Diffuse, amorphous linear trend, generally within a range of 2 to 7nT. Possible former trackway although appearance is more geological than archaeological is suggestive of a possible former water course.

G Major linear anomaly within a range of 2.5 to 5.5nT. Within the range for a ditch with organic and lower range thermo remanent deposits.

H & I Two areas of amorphous anomalies within a range of 5 to 17nT interspersed with strong dipolar responses. Indicative of thermo remanent material and ferrous magnetic deposits. **I** could possibly have an association with major anomaly **2A** in System 2 (fig 5). **H** could possibly be indicative of building rubble from a structure adjacent to the stone lined hole (see figs 2 & 7).

J Area of diffuse, amorphous positive and negative anomalies. Corresponds with a change in ground conditions to wetter, clayey soils, as opposed to drier, sandy soils to the north. It would appear that this has had a detrimental affect on the survey results in this area.

K - N Four distinct systems of weak linears running across the northern part of both fields and the centre of Furlong. Possible plough marks.

3.5(ii) Negative anomalies

O Two short negative linear anomalies within a range of –2 to –4nT. Within the range for a stone bank/wall or stone filled ditch or gully. Could possibly form part of a small enclosure.

P Two negative linear anomalies within a range of –1 to –3nT. Within the range for a stone wall/bank or stone filled ditch or gully.

4.0 Conclusion

The degree of confidence in identified anomalies is generally fairly high. There are demonstrably archaeological features suggesting at least two possible phases of activity. The phasing of the different overlapping systems is complex and test pitting is recommended to ascertain precise dating and chronology. The settlement area clearly continues beyond the boundaries of these two fields, and a geophysical survey of the surrounding fields is also recommended.

The survey has revealed that the stone lined hole or well is not in isolation and also challenged the HER interpretation of the crop marks (see **1.0 Introduction**).

Acknowledgements

Many thanks to all the people that made this survey possible by allowing SSARG access to their land and for all their support: Sharon & Steve Groves, Mike Trubridge, Ron Skeet, John Vigar and Stephen Fuller.

Fig 1: Location of survey

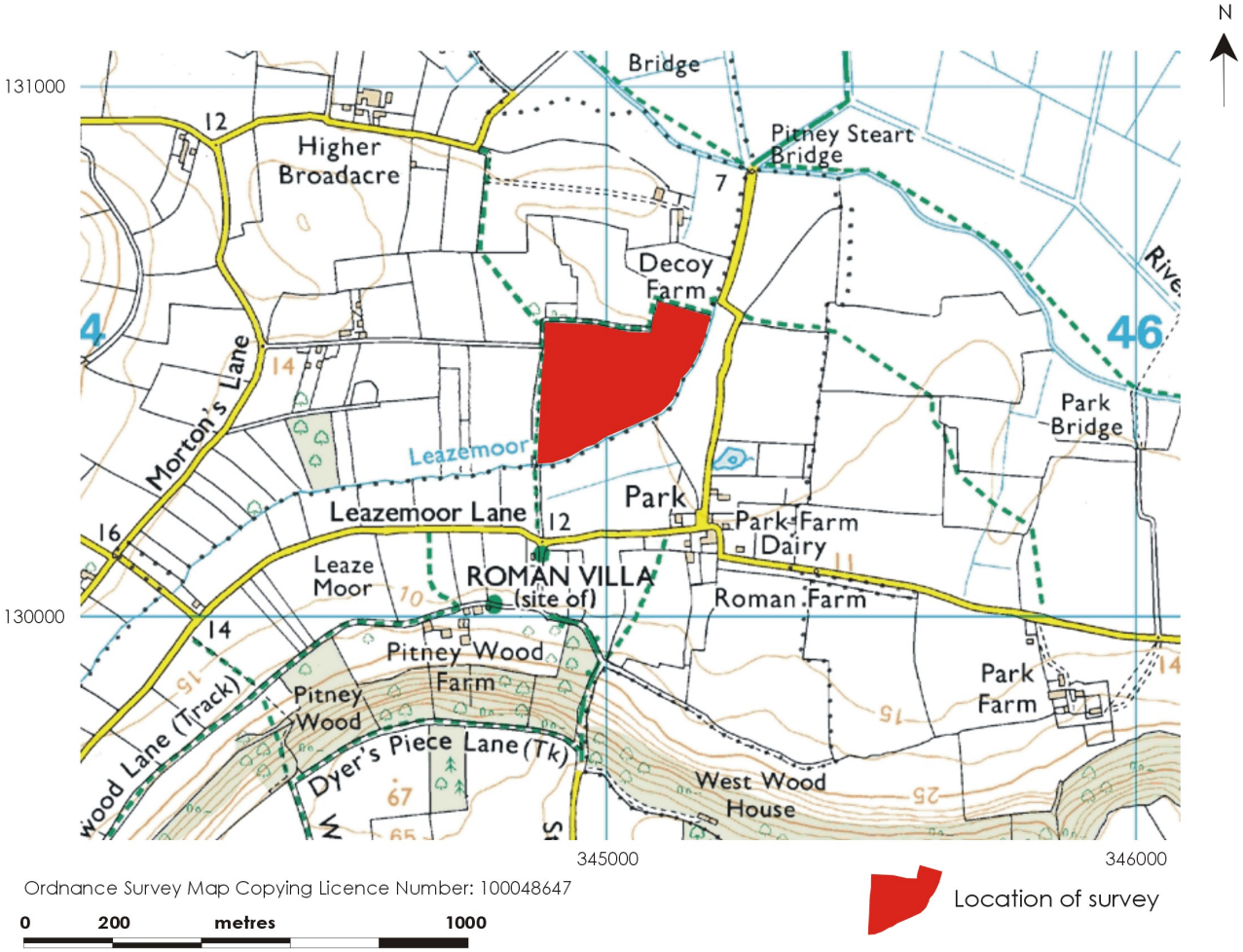

Fig 2: Location of survey - detail

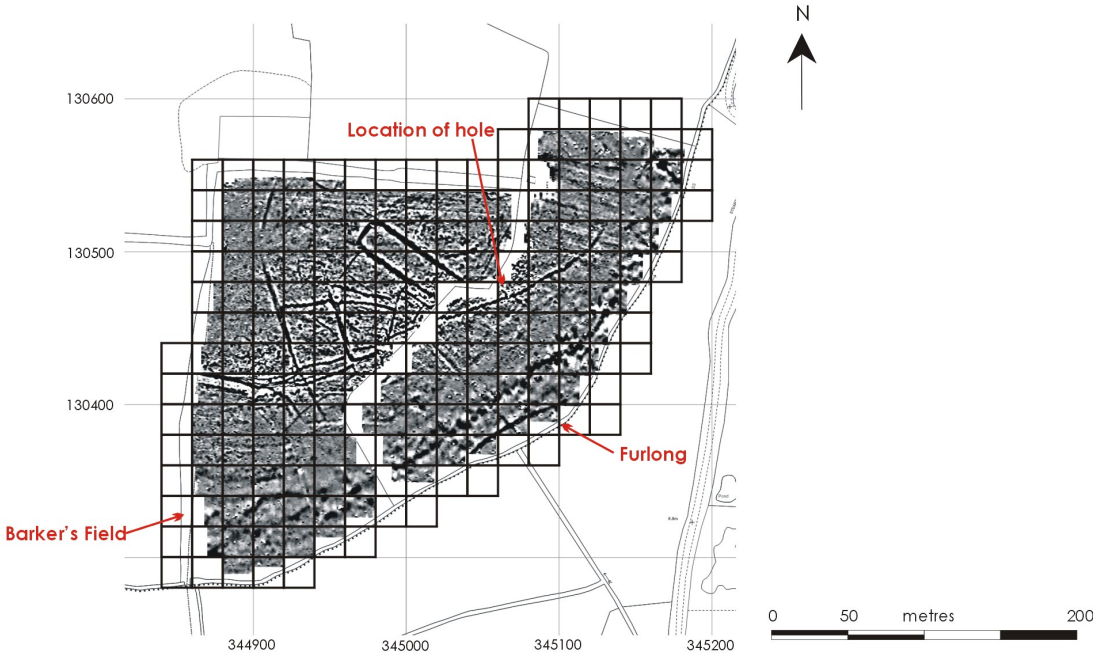

Fig 3: Survey results

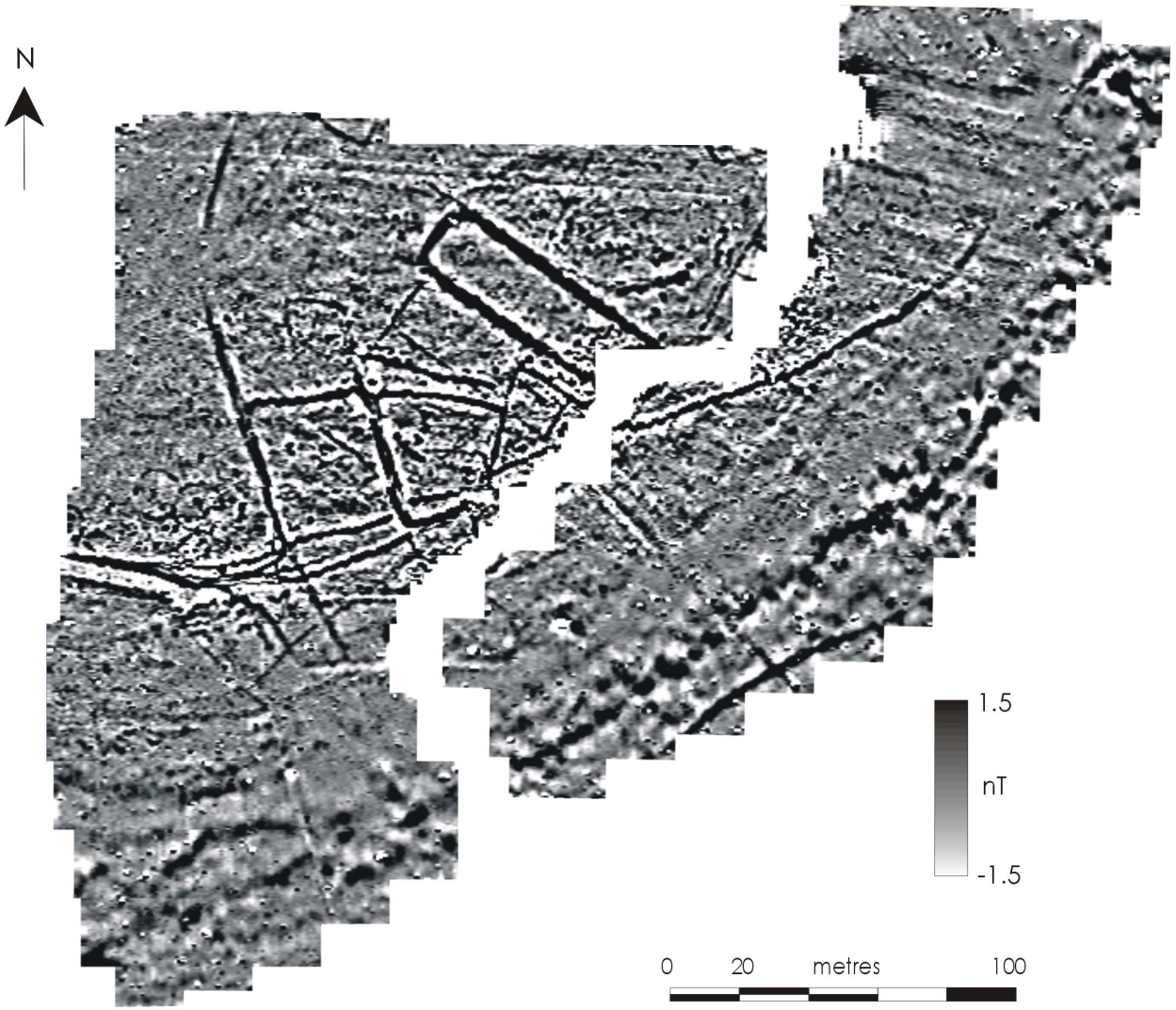

Fig 4: Highlighted survey results

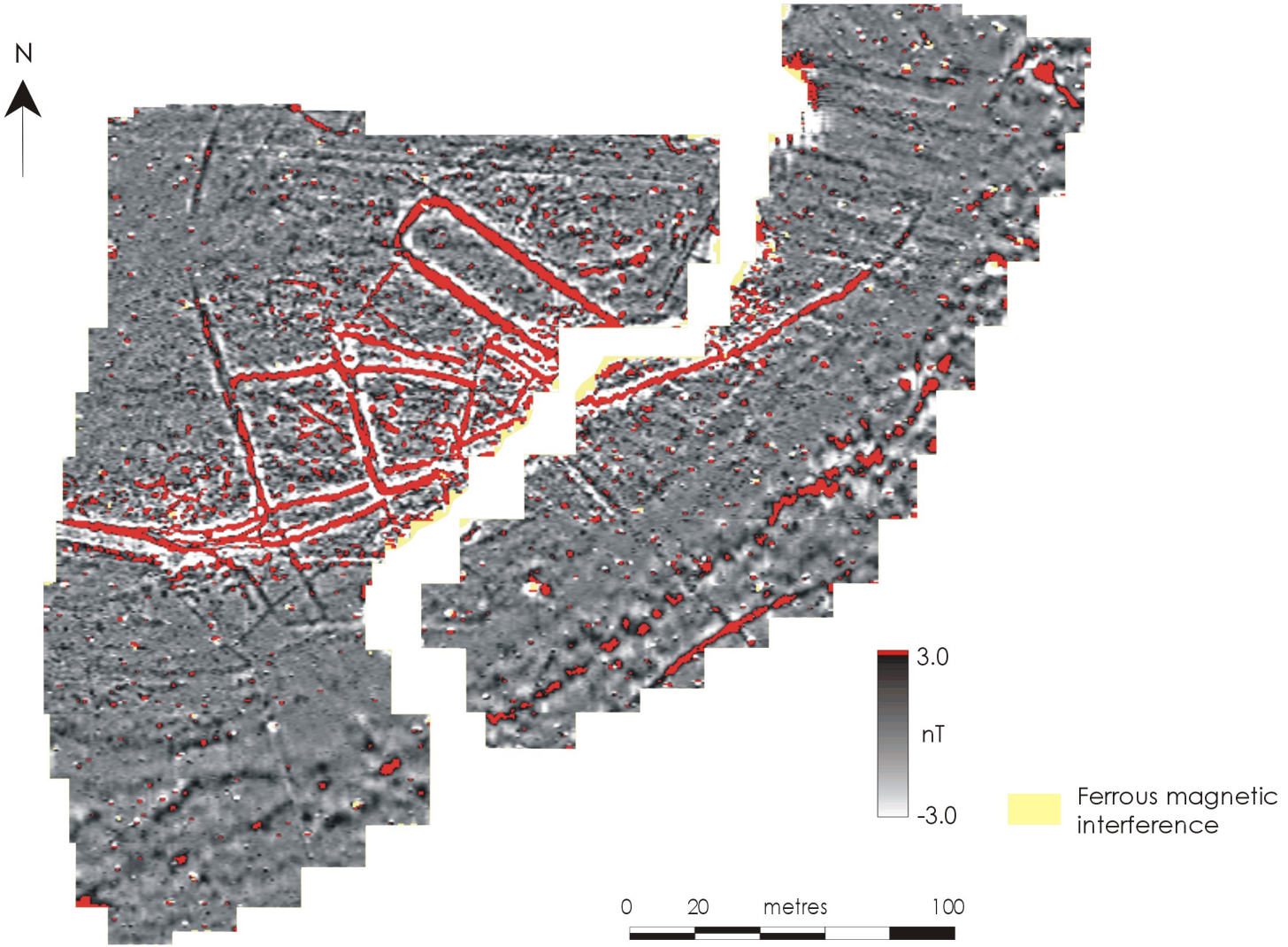

Fig 5: Hypothetical main linear systems

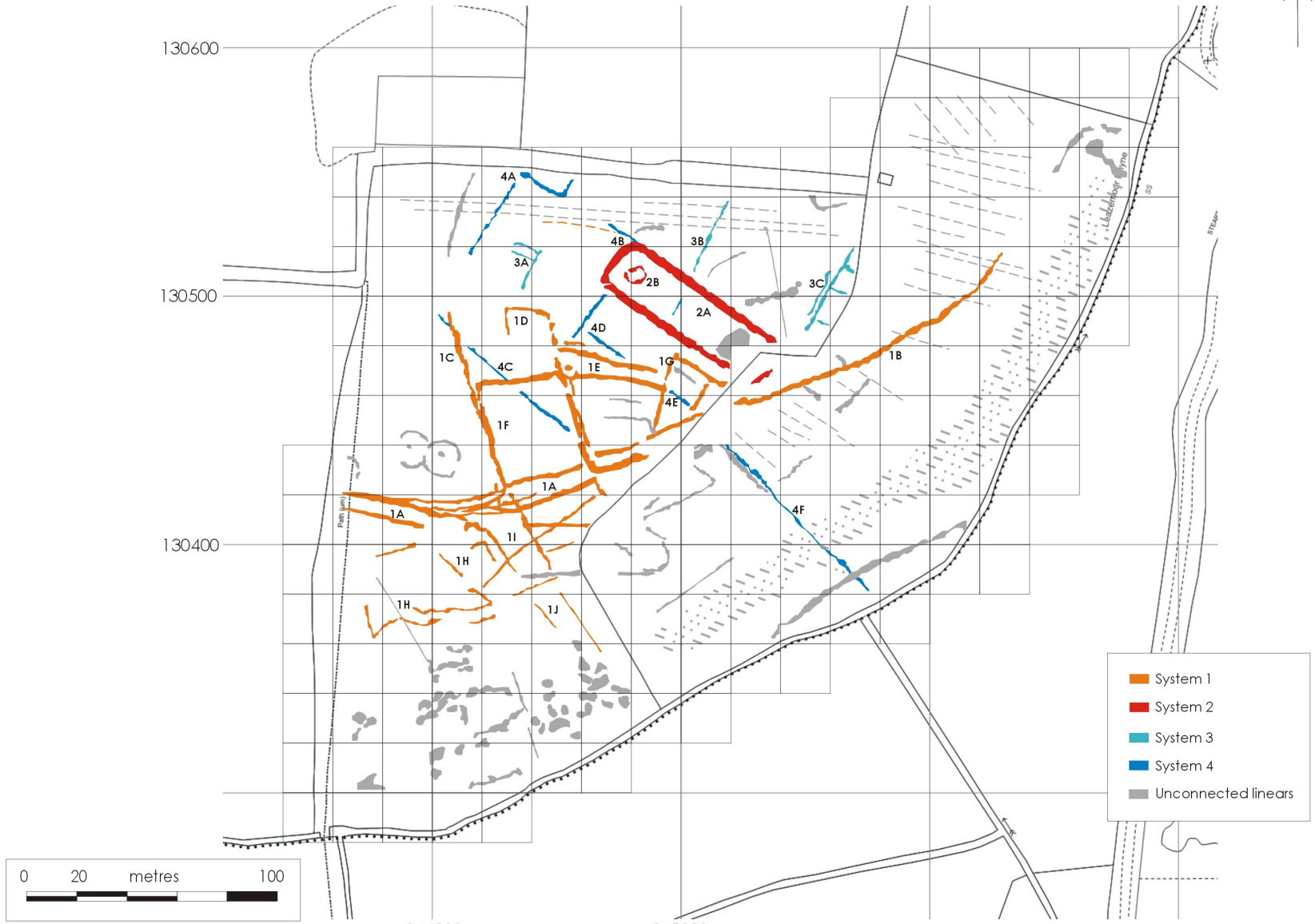

Fig 6: Interpretation

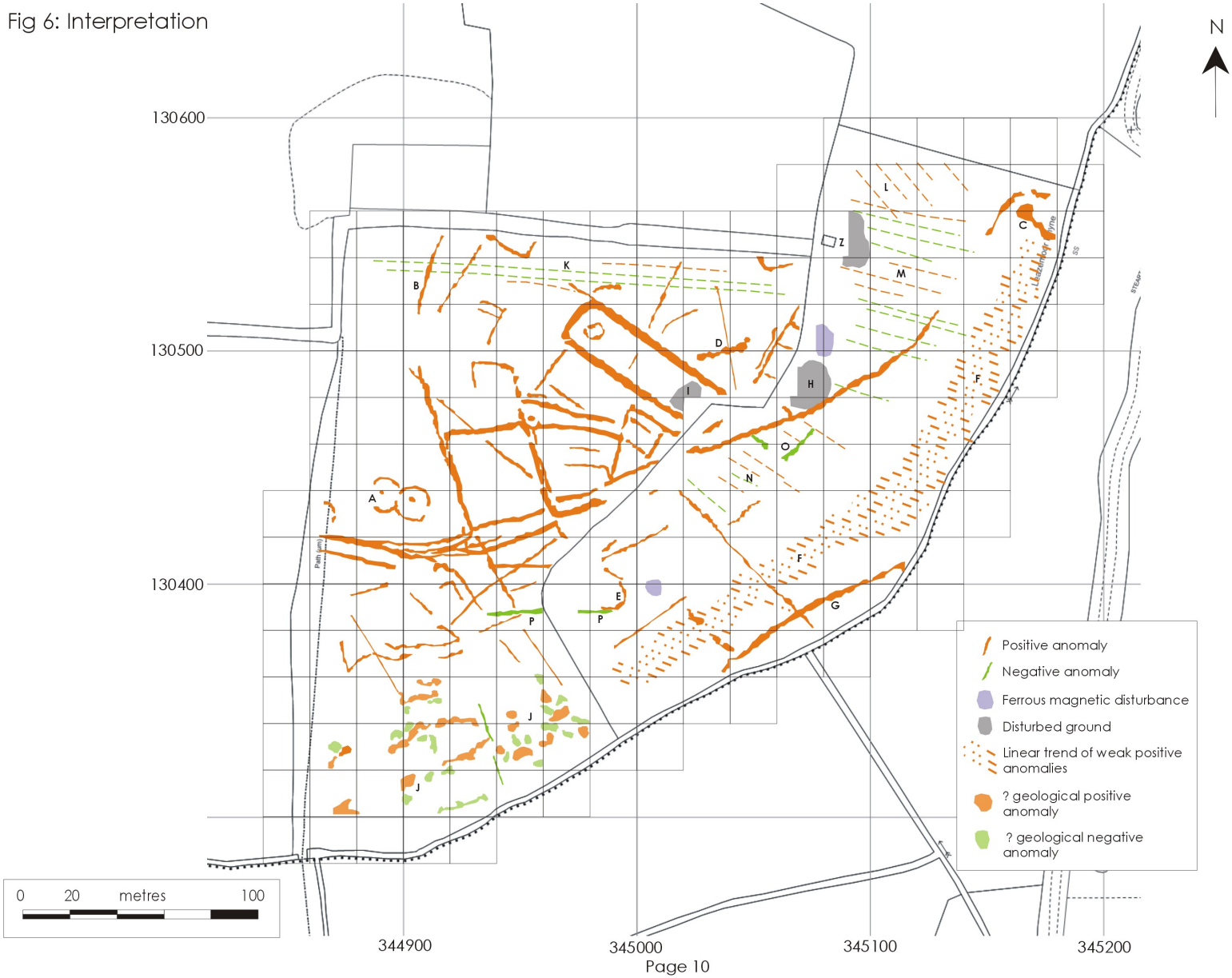

Fig 7: Location of stone lined hole

Fig 8: Entrance of hole looking north

Fig 9: Interior of hole

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