HER:

EVENT: 2331

SOURCE: 4992

HENGROVE FARM, STAINES

Report on Archaeogeophysical Survey 1997

SMR 5069-70.

A.D.H. Bartlett

Surveyed by:

Bartlett-Clark Consultancy

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for:

Surrey County Archaeological Unit
25-27 West Street
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Hengrove Farm, Staines

Report on Archaeogeophysical Survey, 1997

Introduction

This survey was commissioned by the Surrey County Archaeological Unit as the first stage of an archaeological evaluation which is being undertaken by the Unit on behalf of Henry Streeter (Sand and Ballast) Ltd, who propose to extract gravel from the site. The area investigated occupies a large field at Hengrove Farm (centred at NGR TQ 053 720), together with a smaller field (Area A8) to the south. The site lies immediately to the south of the A30 London Road, which follows the line of a Roman road, and is close to the eastern edge of Staines.

A number of nearby sites are listed in the County Sites and Monuments Record, as noted in the project proposal document prepared by SCAU. These include a former earthwork embankment near the south east corner of the site (SMR 883), and cropmarks which appear to indicate a system of ditches or enclosures within the site (SMR 614). There may also be the possibility of finding cemeteries or other evidence of Roman activity at a site of this kind which lies alongside a Roman road and near to a major settlement. The geophysical survey was therefore undertaken to supplement the proposed trial trenching, and to test for evidence of any detectable archaeological features or remains as suggested by these possibilities.

The field work for the survey was carried out in the week of 22 September 1997, and an interim summary of the findings with data plots as reproduced in this report was supplied for use during the subsequent trenching. The results are now summarised here for the record, taking note of the excavation findings as described in the interim report on the evaluation prepared by SCAU (1).

Survey Procedure

The choice of surveying technique was influenced by the location and geology of the site, which has a Brickearth subsoil above River Terrace Gravels. Magnetic anomalies on gravel sites near London are sometimes weak, with the consequence that archaeological features may be difficult to distinguish from minor geological or other background variations. This causes particular difficulties in an unrecorded magnetometer scan of the kind which is sometimes used for the initial assessment of a large site. A full recorded magnetometer survey of a site containing substantial remains of ancient settlement or industrial activity will usually produce some identifiable variation in the strength or distribution of magnetic anomalies, even on a relatively unresponsive soil, but an alternative technique is required in these conditions to identify areas for such detailed investigation.

One technique commonly employed for this purpose is magnetic susceptibility surveying, which can provide an initial general indication of areas in which burnt material or other debris associated with past human activity has become dispersed in the soil. Susceptibility readings may also be influenced by geological variations and modern activities or interference, and the findings therefore often require further investigation by detailed magnetometer surveying or trial trenching before being accepted as archaeologically significant.

The procedure followed for this survey was therefore a full initial magnetic susceptibility survey of the area of interest, together with limited magnetometer surveying. Susceptibility readings were recorded on a 10m grid using a Bartington MS2 meter and MS2D field detector coil, giving results as shown on plans 1 and 2. Detailed magnetometer surveys were carried out in the vicinity of the cropmarks (Area 1 as noted on the plans), and in an additional small area (Area 2) which was surveyed as a test of the susceptibility findings. Magnetometer results are shown on plans 3 and 4. The susceptibility survey in the remainder of the site was followed by the extensive trenching undertaken by SCAU.

The susceptibility and magnetometer surveys were located by reference to a 100m grid of marker pegs, as indicated by red crosses on the plans. These were measured to the site boundaries, and left in place for use during the subsequent trenching.

Results

Susceptibility Survey

The susceptibility readings from the main field were of sufficient strength for any variations caused by detectable archaeological features to be readily apparent. (Mean of data = 35 x 10^{-5} SI/kg, standard deviation = 10.4; volume susceptibility readings.) Plan 1 represents the initial readings in the form of shaded squares of density proportional to their values, and plan 2i shows the same readings as a graphical plot, indicating their range of variability. Plans 2ii and 2iii are alternative representations (as a grey scale plot and shaded contours of the positive anomalies) of the readings after filtering, in which a mean of neighbouring values is subtracted from each reading in turn. This allows localised variations to be seen against a uniform background and emphasises smaller features which may be archaeologically significant.

Features and anomalies visible in the susceptibility plots include an area of high readings (A) at the north west of the site. (Anomalies are labelled on the contour plot 2iii.) This lies close to the existing farm buildings and so may well be a result of recent activities. A linear feature (B) follows the raised trackway which extends to the east from the farm, but it is again not unusual to see susceptibility variations close to and associated with existing or recent field boundaries. Anomaly B meets a strong and irregular series of linear variations which extend from the vicinity of the cropmarks in area 1 of the magnetometer survey at C to near the south east corner of the field at D. The significance of these anomalies is difficult to assess in isolation but broad linear patterns may well be natural, and perhaps associated with concealed channels or ridges in the surface of the gravel

subsoil. The magnetometer findings (below) provide further support for the possibility that this may be the case for the features noted in the susceptibility survey at C.

The anomaly at D in the south west corner of the site is particularly distinct and lies in a part of the site in which archaeological features were identified in the trenching. It may therefore be the case that archaeological effects have contributed here to the response in a part of the site where soil conditions are locally more favourable than elsewhere for susceptibility detection.

Other smaller susceptibility anomalies visible in the plots include the anomaly E, which is the strongest feature at the north of the site near to the Roman road. This anomaly was tested by the magnetometer survey of area 2.

Other susceptibility anomalies including F, G, H and the high readings J at the southern edge of the field lie within the area of archaeological interest as defined by trial trenching and noted in the interim report (1). Excavation findings from this area include ditches, pits and post holes with finds of pottery and tile of Romano-British date. Slag and burnt clay were also seen, suggesting the presence of a Romano-British settlement with some industrial activity. A site of this kind would usually be expected to produce a distinct susceptibility anomaly corresponding to the spread of debris around the site, but in this case only comparatively weak and localised anomalies were seen. The reason for this limited response appears to lie in the depth of burial of the deposits, which were covered by 0.25 to 0.35m of ploughsoil, and sealed beneath an additional 0.1 to 0.2m of brown clay subsoil. More recent features cut through this layer, which must therefore be of post-Roman deposition. Susceptibility readings relate only to the magnetic properties of the exposed topsoil, which does not usually prevent the detection of deeper features providing there has been mixing of soil layers through cultivation. A susceptibility survey will not, however be fully effective at a site where archaeological layers are sealed beneath later deposits at a depth beyond the reach of ploughing.

Area A8

This small field gave lower susceptibility readings than the main site, which is probably a consequence of land use (pasture here and arable in the main field). The readings increase uniformly across area A8 towards the south, with some higher readings in the corners of the field which are likely to result from modern disturbances. The broad variation across the field is probably a natural effect, with any archaeological features sealed at depth as in much of the larger field.

Magnetometer Survey

Area 1

The survey plots (plan 3) indicate numerous small magnetic anomalies which are likely to be caused by magnetic stones in the soil, as are often encountered on glacial gravels. These disturbances are most concentrated in a band corresponding to the area of raised susceptibility readings, which further suggests that the susceptibility anomaly C, and

perhaps others, are of natural origin, as proposed above. Both the magnetometer and susceptibility effects could result from the presence of gravel near to the surface, and the absence, or a reduction in the thickness of, the clay deposit which seals the site elsewhere.

Some possible weak linear anomalies are marked by dotted lines on plan 3i, but there is no clear pattern of ditch-like anomalies which would confirm the presence of subsurface features corresponding to the cropmarks. The background of natural magnetic disturbance as seen in the survey plots provides a further indication that conditions at this site would be unfavourable for investigation by unrecorded magnetometer scanning.

Area 2

This trial 30m square was surveyed to test the response in the vicinity of one of the stronger of the susceptibility anomalies seen at the northern end of the site near the Roman road. The survey produced only small scale magnetic anomalies probably caused by magnetic stones in the gravel as seen in area 1. The trenching also indicated few archaeological features in this part of the site.

Conclusions

A Romano-British occupation site of the kind identified here by trenching usually responds well to magnetic surveying techniques, but in this case the susceptibility survey produced only weak and localised anomalies. The reason for this limited response appears to be that archaeological features are covered at depth by a later deposit of clay subsoil, and so have little influence on the magnetic properties of the topsoil. Recorded magnetometer surveys of the susceptibility anomalies would probably have detected at least some of the features seen by trenching, but a site of this kind with weak magnetic anomalies and a high natural background noise level does not provide favourable conditions for rapid unrecorded magnetometer scanning.

The lack of findings from the detailed magnetometer survey of area 1 is consistent with the trenching results and supports the view as noted in the interim report on the evaluation (1) that the cropmarks in this area are unlikely to be of archaeological significance.

Report by:

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cont/

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17 November 1997

B. Turton MA assisted with the fieldwork for this survey.

Reference

(1) An Archaeological Evaluation at Hengrove Farm, Staines: An Interim Report. G. Hayman, Surrey County Archaeological Unit, 5 November 1997.

Based upon site plan by
Land Information Consultants

Hengrove Farm, Staines, Surrey
Geophysical Survey 1997
Plan 1: Magnetic Susceptibility Survey

Surveyed by:
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for:
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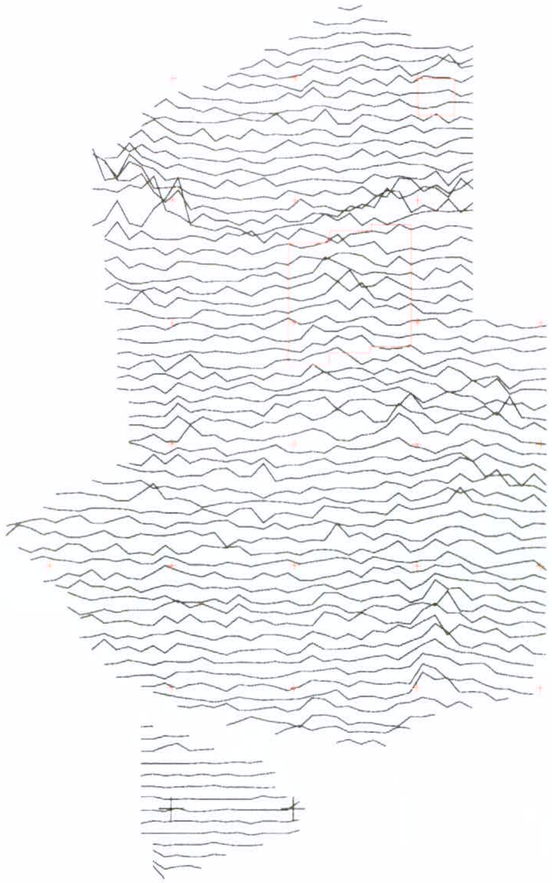
Scale 1:2500

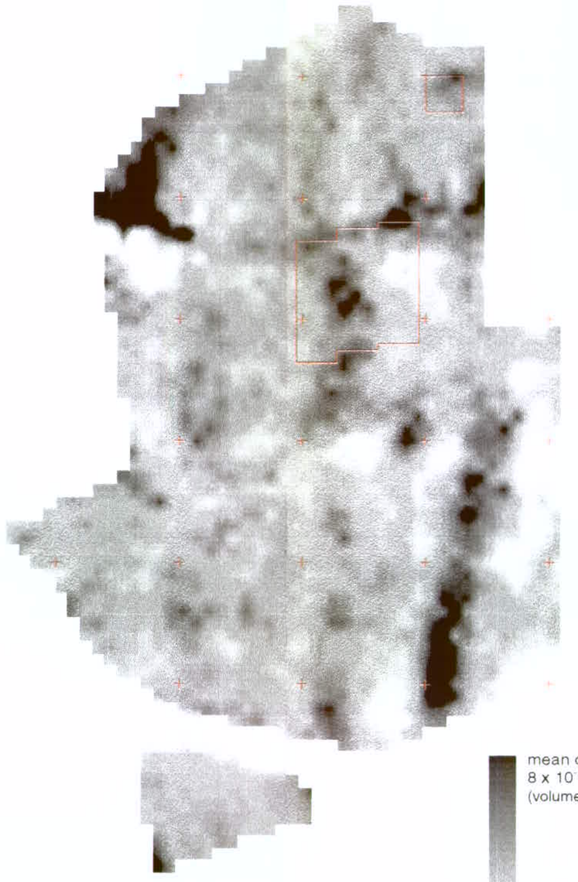
Date Nov 1997

Plan No. 1

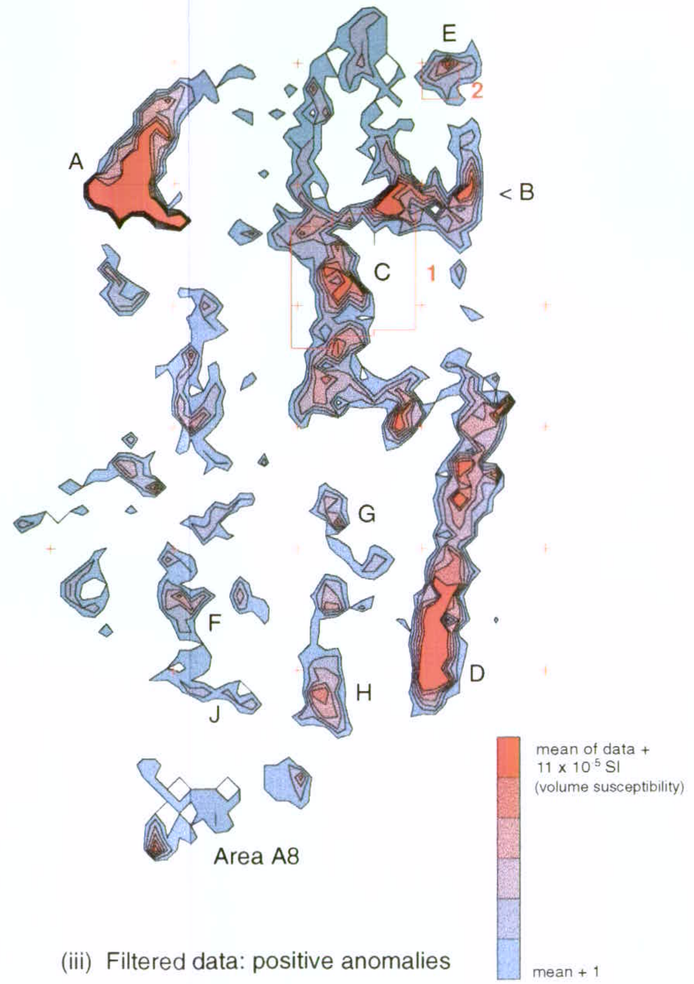
N



(i) Initial data



(ii) Filtered data



(iii) Filtered data: positive anomalies

location of magnetometer survey

0 100 200m

Hengrove Farm, Staines, Surrey
Geophysical Survey 1997
Plan 2: Magnetic Susceptibility Survey

Scale 1:5000

Date Nov 1997

Plan No. 2

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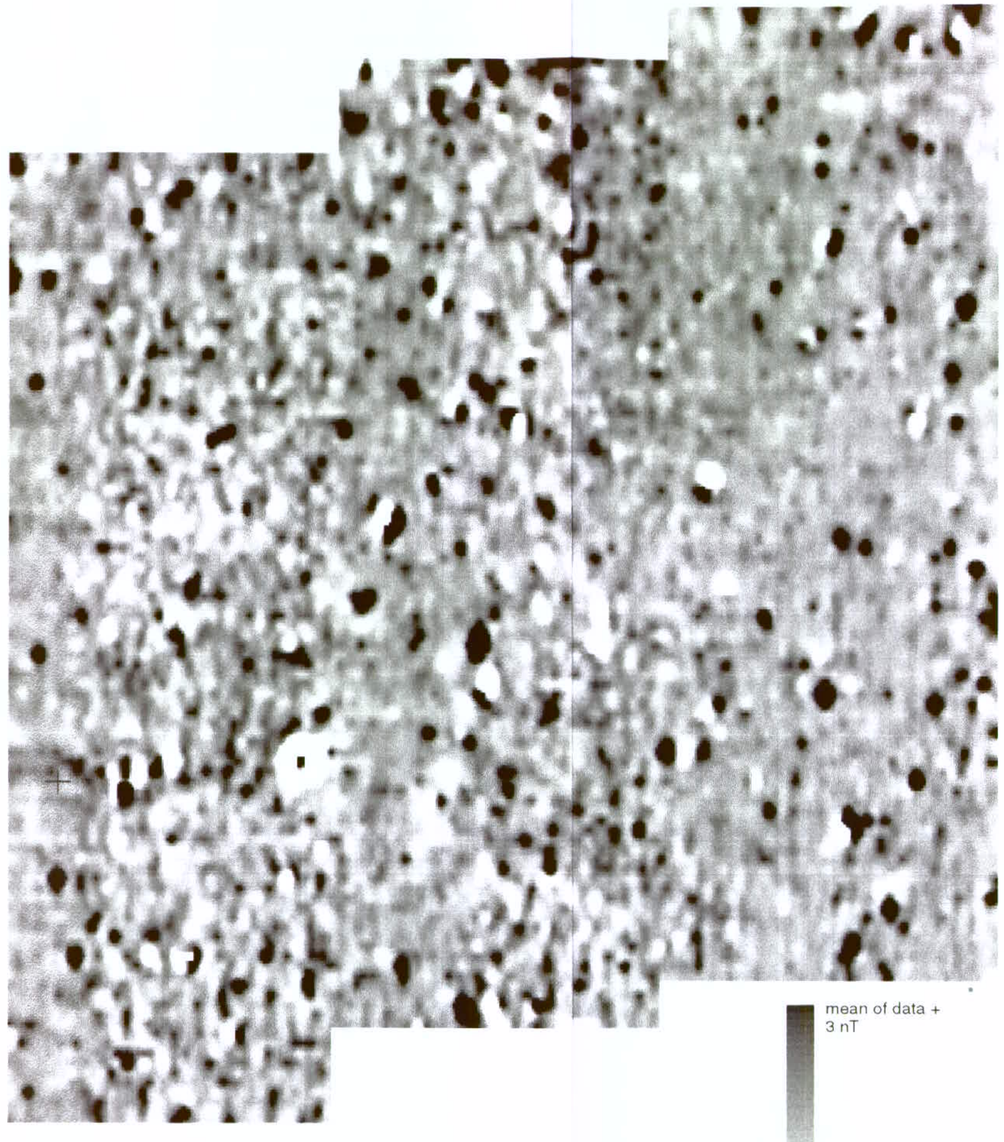
(i)



(ii)

magnetic anomalies ?

0 30m

Hengrove Farm, Staines, Surrey
Geophysical Survey 1997
Plan 3: Magnetometer Survey: Area 1

Scale 1:625

Date Nov 1997

Plan No. 3

Surveyed by:
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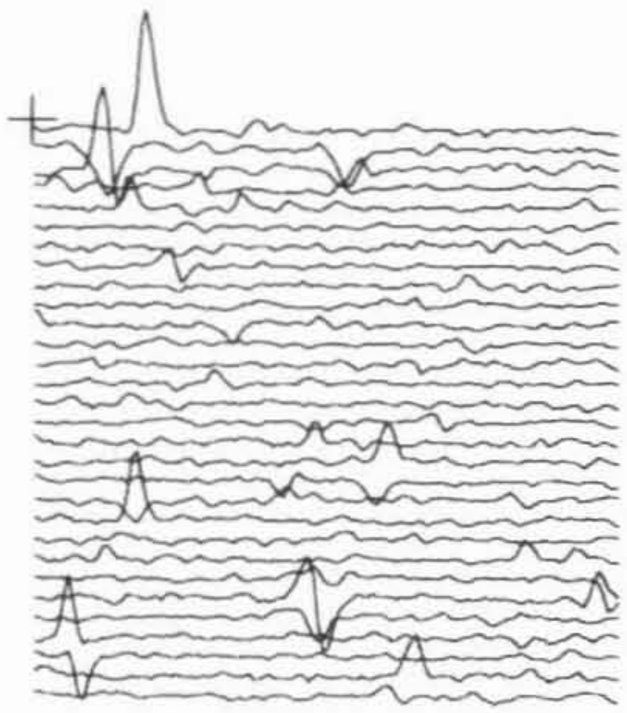
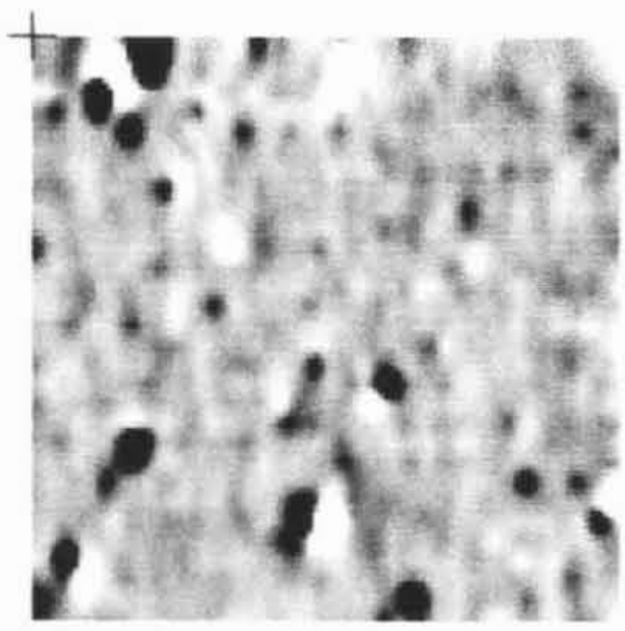
N



34 nT

(i)



mean of data +
3 nT

mean - 2.5nT

(ii)

0 30m

Hengrove Farm, Staines
Geophysical Survey 1997

Plan 4: Magnetometer Survey: Area 2

Bartlett-Clark Consultancy

1:625

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P A Stockden Esq
Henry Streeter (Sand & Ballast) Ltd
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2 December 1997

Dear Mr Stockden

Hengrove Farm: Archaeological Evaluation

I am pleased to enclose a copy of th final version of the geophysical report on the above site. I hope that the contents are clear, but of course I shall be happy to clarify any aspect. Please note that while it supercedes the interim version sent with the report with my letter of 10 November 1997, it does not require any alteration to the recommendations in our earlier report. I shall copy this letter and the report to the Principal Archaeologist at Surrey County Council.

Yours sincerely

Archaeological Unit Manager

Cpy to DS

Geophys produced some positive results. See interim report.