



Planning, Transport
and Environment

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Scheme Title A65 / A660 Burton-Ln - Wharfedale Bypass, West Yorks.	Details Gradiometer Survey
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A65/A660
Burley-in-Wharfedale Bypass,
West Yorkshire

Gradiometer Survey

August 1993



West Yorkshire
Archaeology Service

**A65/A660 Burley-in-Wharfedale Bypass,
West Yorkshire
SE162469**

Gradiometer Survey

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A65/A660 Burley-in-Wharfedale Bypass, West Yorkshire SE162469

Gradiometer Survey

1. Summary

Client

Anthony Walker and Partners, 5 North Hill Road, Headingley, Leeds LS6 2EN.

Objectives

To determine whether any significant archaeological features were present prior to the completion of the A65/A660 Burley-in-Wharfedale Bypass.

Method

Readings were taken at 0.5m intervals on traverses spaced 1m apart using a Geoscan FM36 Fluxgate Gradiometer and ST1 sample trigger.

Conclusions

The gradiometer survey located three linear features. Two probably represent old field boundaries whilst the third is probably caused by a buried ditch of unknown date and origin. Faint anomalies, which respect the orientation of mid 19th-century field boundaries probably represent the vestiges of ridge and furrow ploughing.



2. Introduction

2.1 A gradiometer survey was carried out by two officers of the West Yorkshire Archaeology Service on behalf of Anthony Walker and Partners. The fieldwork took place between 27th July and 30th July 1993.

2.2 The site lies immediately north-east of the A65 trunk road on the flood plain of the river Wharfe (SE162469). The 700m long corridor represents part of the proposed route of the upgraded Aire Valley trunk road. The site comprised three discrete areas in four different fields (see Fig. 1). Two fields were under rough pasture whilst the remaining two had been recently mown. The area surveyed measures roughly 4ha and is situated at about 70m OD. The underlying geology consists of Namurian Millstone Grit overlain by second terrace gravel and boulder clay.

2.3 Archaeological information pertaining to areas adjacent to the site can be obtained from the results of fluxgate gradiometer surveys carried out to the south and east of Area 3 in 1992 (Boucher, 1992a) and also to the south of the A65 at Manor Park, Burley in the same year (Boucher, 1992b). Both surveys identified isolated linear features, probably ditches, of unknown date and origin, as well as evidence for ridge and furrow ploughing. However, no known sites of archaeological interest have been identified within the area of the survey. Nevertheless, its position on the upper terraces of the River Wharfe make this area one of archaeological interest as two major Mesolithic sites have been identified on the terraces to the north-east of Otley, while Neolithic artefacts have been recovered on the river bank immediately to the north (see Fig. 1).

3. Instrumentation

3.1 The survey was carried out using a Geoscan FM36 Fluxgate Gradiometer combined with a ST1 sample trigger. The results were then transferred to a portable Compaq laptop computer and later processed on an Elonex PC-433.

3.2 All surveying was done by Anthony Walker Land Surveys. Independent grids were established for each of the three areas. These were tied in to a local grid on site and later to the national Ordnance Survey grid.

4. Method

4.1 Magnetic readings were recorded at 0.5m intervals spaced 1m apart on NW-SE zig-zag traverses in Areas 1 and 2 and on SW-NE zig-zag traverses in Area 3. This provided a total of 800 readings per 20m grid square.

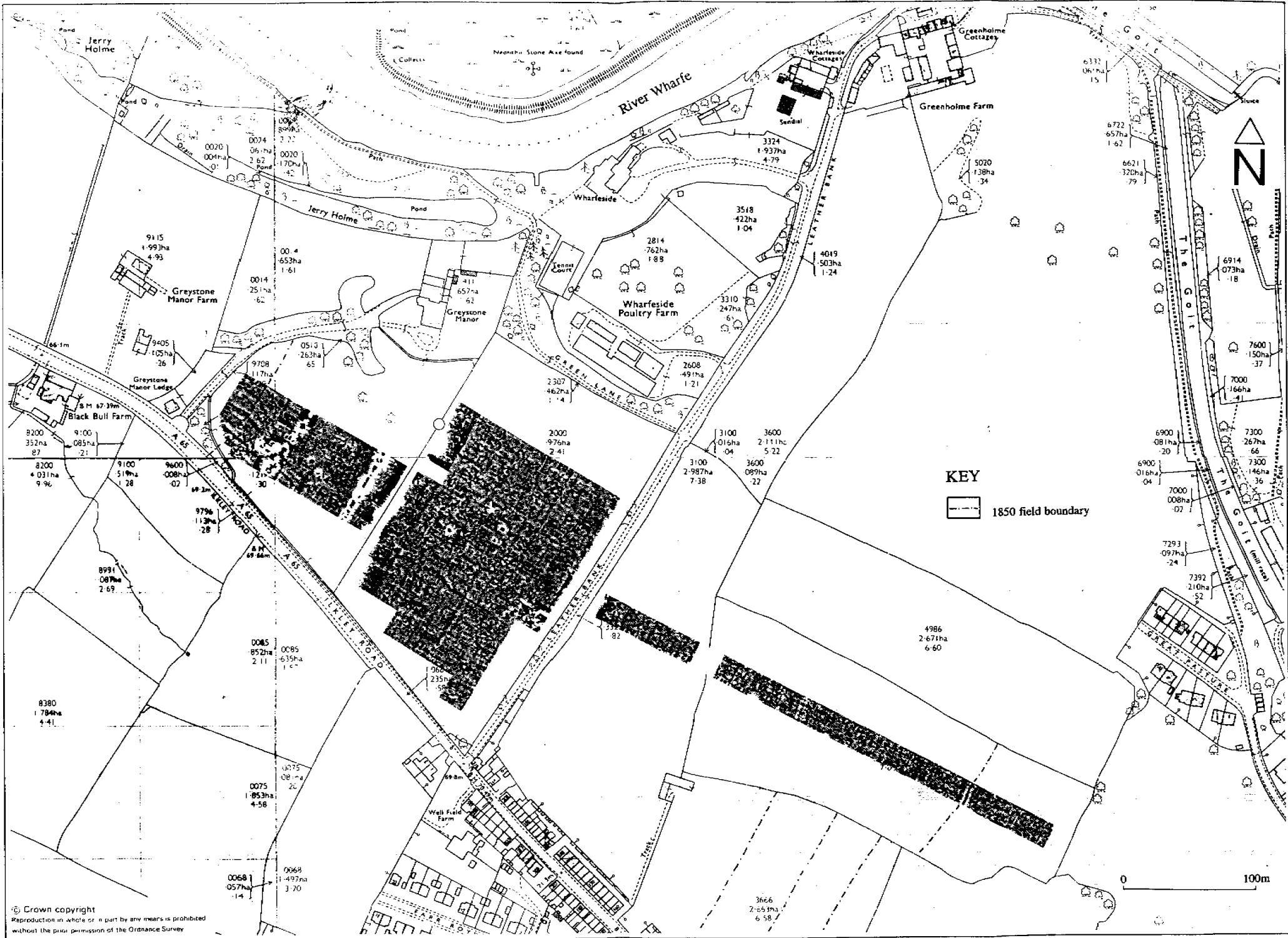


Fig.1 Site location showing approximate grid position

4.2 For presentation purposes the computer software interpolated the data between the measured traverses so that 1600 readings per grid were obtained, and the spacing between readings effectively became 0.5m in both directions.

4.3 The whole (100%) of Areas 1 and 3 were surveyed together with a 75% sample from Area 2. The sample was designed such that as few grids as possible were surveyed adjacent to field boundaries which often contain ferrous objects that can mask responses from anomalies with a low magnetic responses.

5. Results

5.1 Presentation of the results

The results are presented in Figure 2a as a 1:2500 colourised grey-scale plot with an interpretation below it (Fig. 2b). It should be noted that the distances between, and relative positions of, the three areas is not accurate. Accurate Ordnance Survey co-ordinates can be obtained from Anthony Walker Land Surveys. Larger scale plots of the three areas (both grey scale and dot-density) are included as Figures 3 to 6 at the end of the main report.

Other possible forms of data presentation include X-Y plots and 3D mesh plots. The latter is a particularly useful tool for differentiating between responses due to buried ferrous metal and those caused by an area that has been subjected to heating (a kiln or hearth for example); responses that may appear similar when viewed in only two dimensions. X-Y plots are a good method of illustrating features on sites where the general background magnetic responses are low in comparison to the features themselves and where there are few iron "spikes" to mask the features. It was thought that no additional information could be obtained from either of these presentation formats on this particular site.

5.2 The anomalies detected in the survey can be divided into six categories.

1. Anomalies due to relict field boundaries.
2. Anomalies caused by ridge and furrow ploughing.
3. Anomaly due to underlying archaeological feature.
4. Anomalies caused by modern services.
5. Anomalies caused by iron fencing.
6. "Spikes" in the data due to discrete buried iron objects.

A large number of anomalies can be disregarded in assessing the archaeological importance of the site. These include the anomalies along the edges of Areas 1 and 2 which are caused by iron fencing and the large area of high magnetic disturbance on the eastern edge of Area 2.

*POOR
ORIGINAL
DOCUMENT*

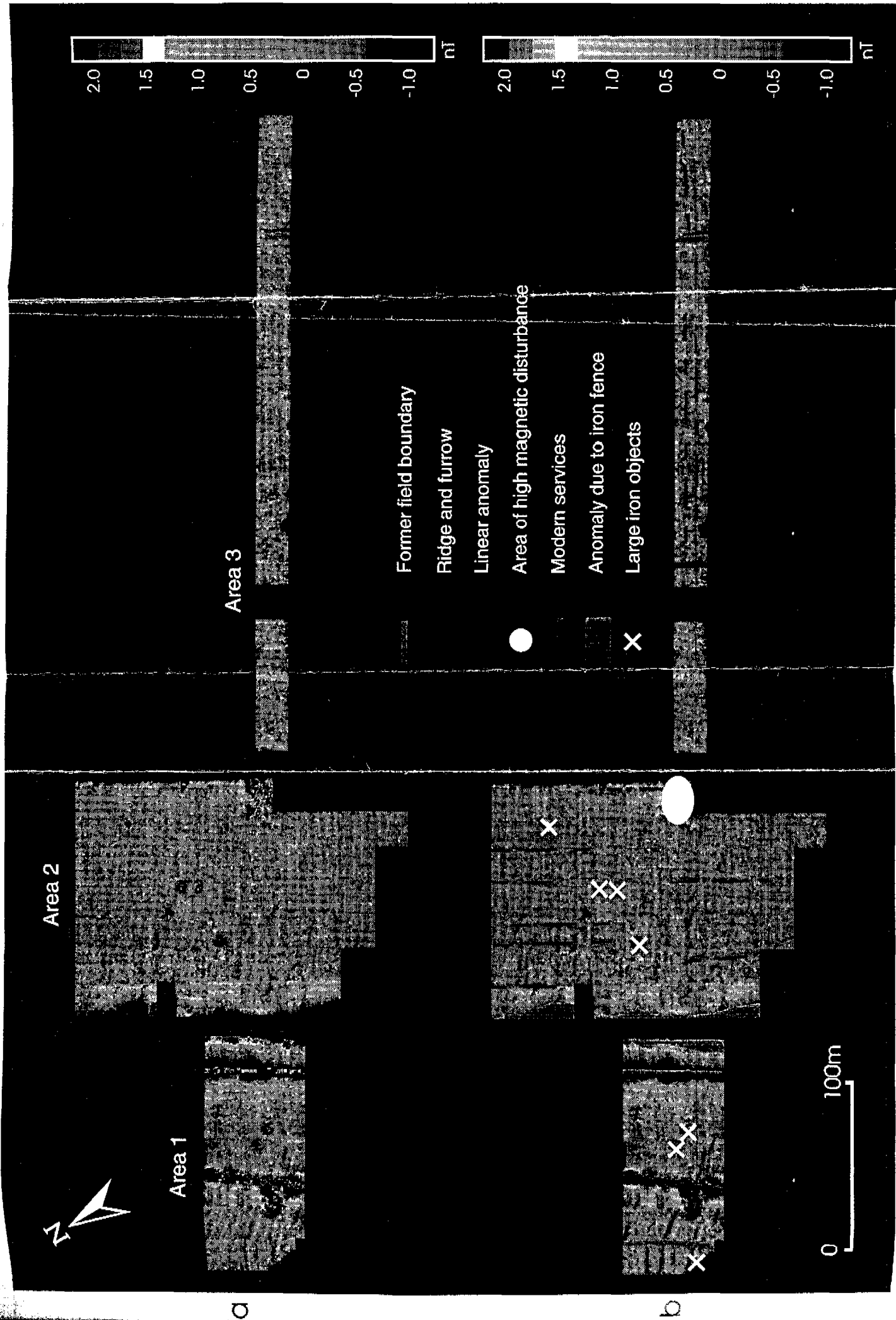


Fig. 2 A plot of the results of the gradiometer survey (a) and their interpretation (b)

Other anomalies caused by buried pipes or other services are easily identifiable and can also be disregarded. The ubiquitous "spikes" in the data also require no further mention as individual iron objects will be, for the most part, recent in origin.

5.3 The first of the two linear anomalies attributed to field boundaries (both are marked on the first edition Ordnance Survey map of 1851 but are no longer extant - see Fig. 1) is at the western end of Area 1 (see Figs 2a and 2b). The dog-leg in the course of the road at the same point as the change in alignment of the ridge and furrow (marked either side of the boundary anomaly) provides additional weight to the interpretation of this anomaly as a relict field boundary.

A second anomaly running NE-SW approximately 65m from the eastern end of Area 3 is also interpreted as a former field boundary.

5.4 Other faint linear striations attributed to the former agricultural practice of ridge and furrow ploughing can be seen in both Areas 1 and 2. In Area 2 they run NE-SW and in Area 3 roughly W-E, in both cases respecting the long axes of the present field layout.

5.5 One faint linear anomaly with a magnitude of 2nT can be observed running NE-SW in Area 3 (see Figs 2a and 2b). This has been identified as being due to a buried archaeological feature, probably a ditch.

6. Discussion

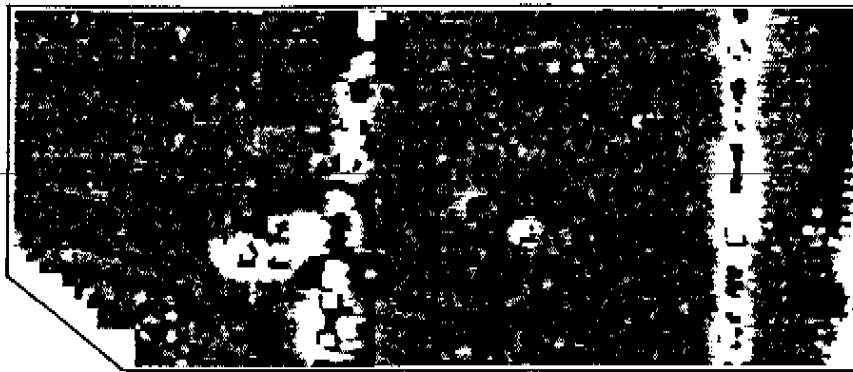
Too little can be seen of the extent or morphology of the linear feature interpreted as a ditch to draw any firm conclusions. A similar linear feature on the same alignment was detected approximately 80m SE of the eastern end of Area 3 (Boucher, 1992). It may be that both features form part of a pre-1850 enclosure system whose size and extent remains unknown.

Bibliography

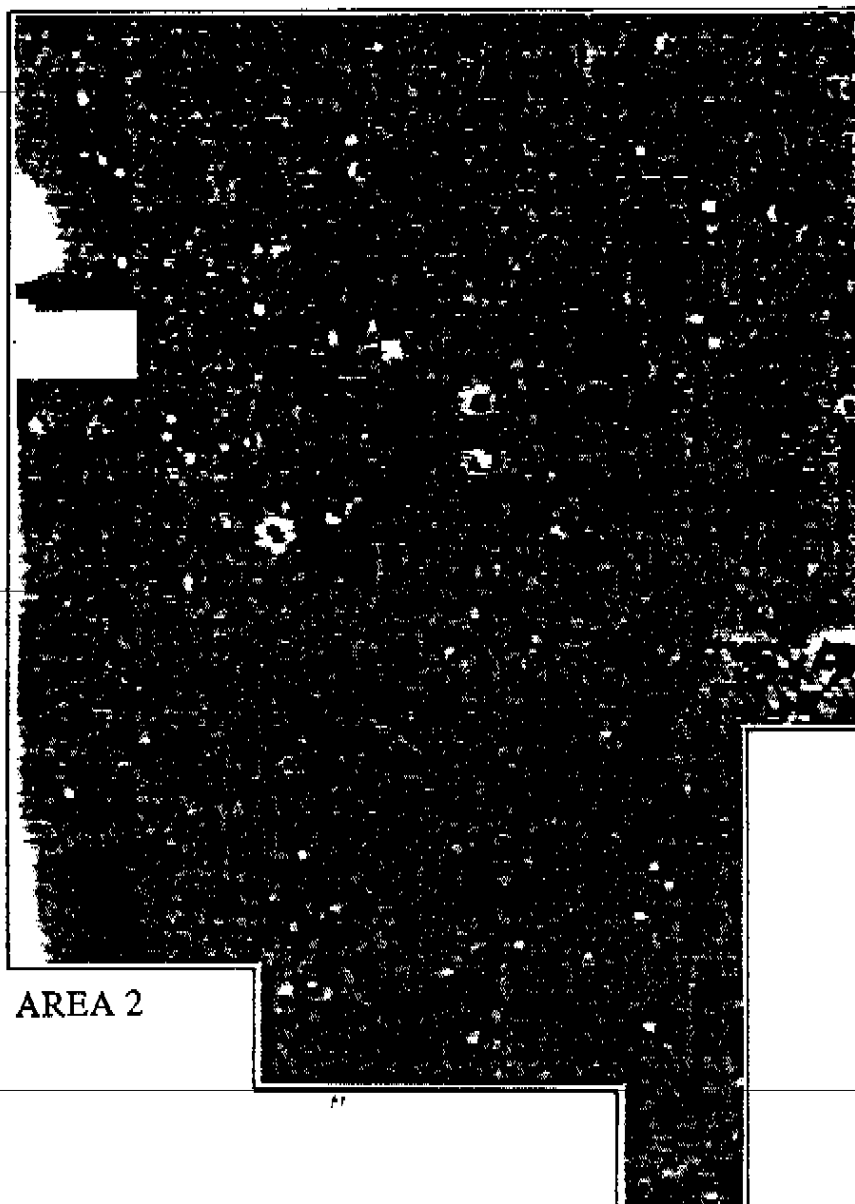
Boucher, A., 1992a, 'Land to the North of Main Street, Burley-in-Wharfedale Gradiometer Survey', West Yorkshire Archaeology Service Report 86.

Boucher, A., 1992b, 'Manor Park, Burley-in-Wharfedale Gradiometer Survey', West Yorkshire Archaeology Service Report 54.





AREA 1



AREA 2

0 50m



AREA 3



Fig. 4 Grey scale plot of magnetic data from Area 3 (-3nT to +3nT)

2

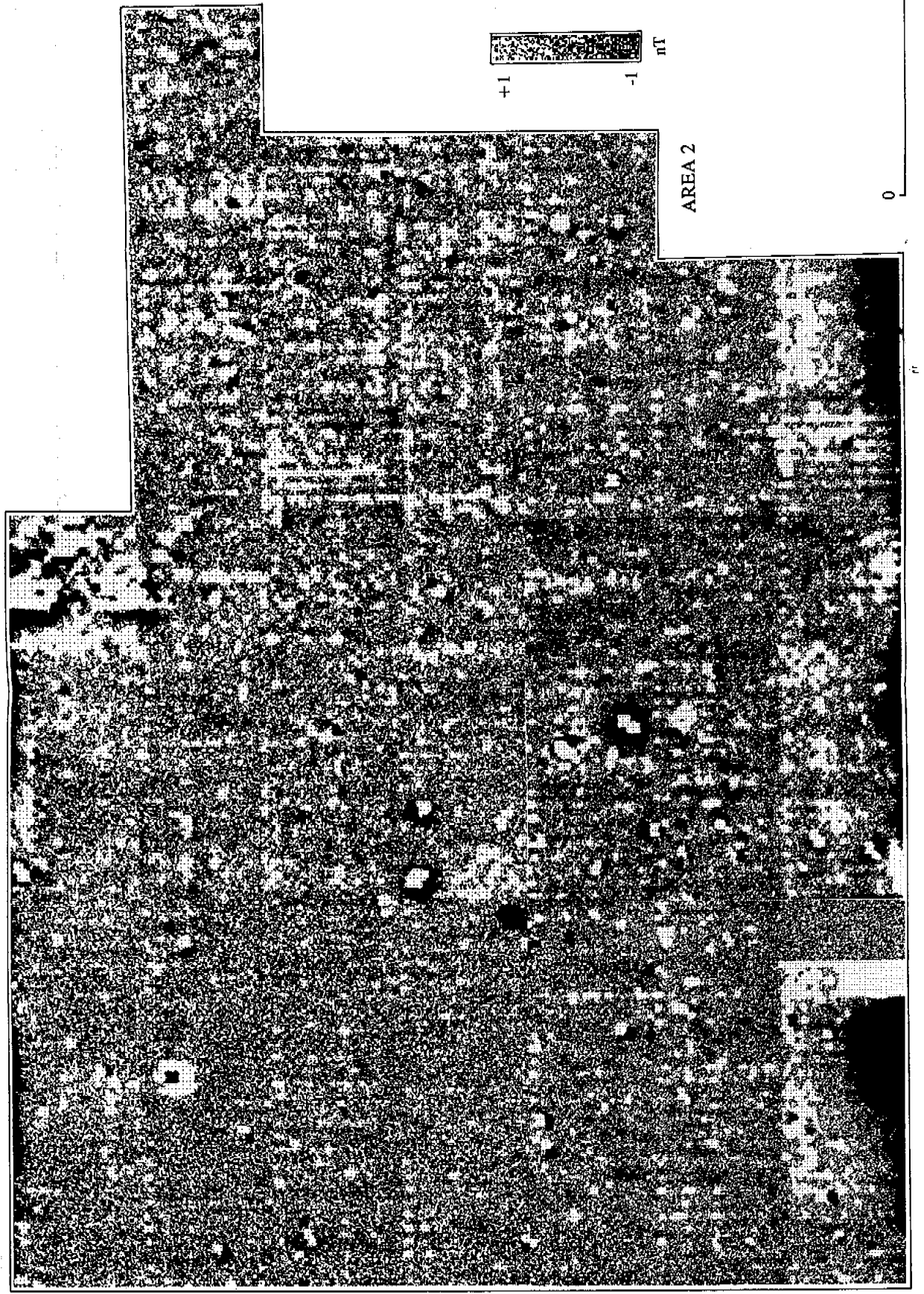
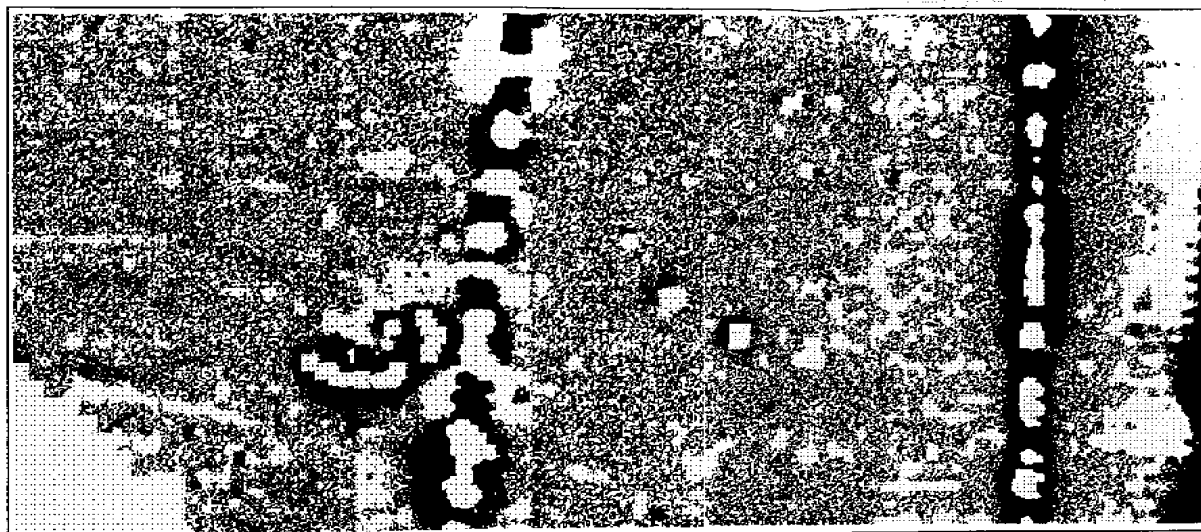
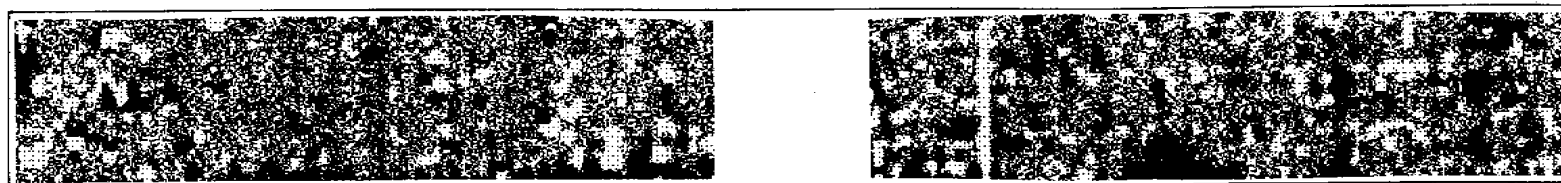
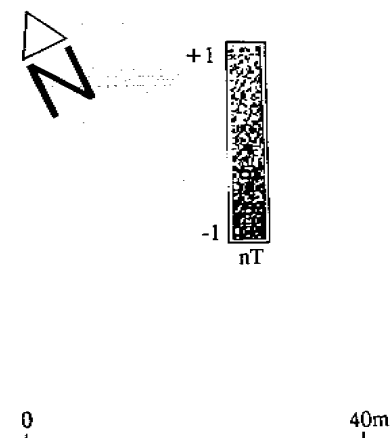


Fig.5 Dot density plot of magnetic data from Area 2



AREA 1



AREA 3

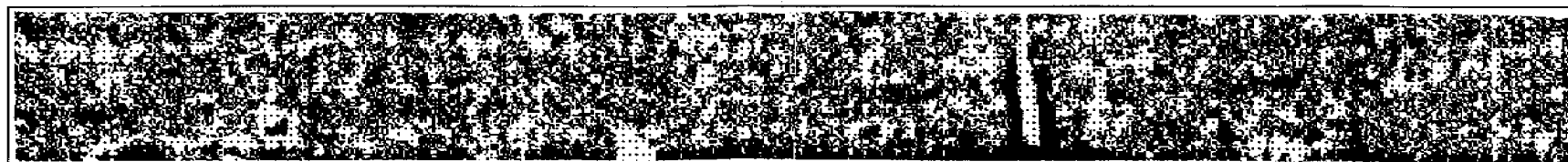


Fig.6 Dot density plot of magnetic data from Area 1 and Area 3

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