ANCIENT MONUMENTS LABORATORY

GEOPHYSICAL SURVEY AT DRAX ABBEY, N. YORKS, 1982

Survey no. G 30/82 Dates of fieldwork: 2-5 Nov 1982

NG SE 669284 Field no. 8634

Plans enclosed:

1. Location of survey grid, 1:2500
2. Magnetometer plot, 1:500
3 & 4. Resistivity survey (graphs and contours), 1:500

The field surveyed lies south of the large drainage ditch (reported to have been dug in the 1940s) which now crosses the scheduled site. A grid based on 30m squares as shown on plan 1 was marked out and tied to the field boundaries (measurements given on plan 2), and readings were taken using a fluxgate magnetometer and resistivity meter. The large field north of the ditch was also scanned briefly with the magnetometer.

The magnetometer responds in most conditions to silted ditches or pits, and also to the presence of occupation debris, especially when magnetically enhanced through burning. A resistivity survey will respond to ditches or earthworks, but also to buried masonry or wall footings.

The main survey area is some distance from the large mound marked as the site of the abbey church on the 1:2500 OS map (plan 1), but there is another smaller mound shown on the old 1:10560 map which is faintly visible on the copy inset in plan 1. This mound was cut through by the drainage ditch but the remains of it lie partly in square 4 of the survey. The field surveyed is divided by a line of trees, and to the east lies the site of an old walled garden, now demolished.

The geology of the site is alluvium over sandstone. Tests with a 1m hand auger showed a clay soil to a depth of about 50cm and then sand. There was a loamy topsoil within the old garden.

Magnetometer survey

Traverses were recorded at 1m intervals to give the plot as reproduced in plan 2. The results show some possibly significant variations in the nature of the response between different parts of the site, but no individually identifiable magnetic anomalies representing features of clear archaeological significance were found.

To the east of the line of trees the brick foundations of the garden wall are clearly visible and are outlined on the plot. There is also a strongly disturbed N-S strip through the centre of the garden. This could be caused by a garden path with a strongly magnetic surface such as cinders, or perhaps by a pipe. Apart from these easily recognized features and other localized peaks in the traces probably caused by pieces of iron or scattered bricks the general background in this half of the field appears undisturbed. There is some increase in activity at the east of the field (square 16) but this is closely associated with disturbance caused by the garden wall.

In squares 1-6 to the west of the line of trees the plot appears to be more generally disturbed and there is an increase in small-scale background noise in comparison with the area to the east. The effect cannot be clearly demarcated, but some areas where it is noticeable are shaded on the plot.

Ditches or other subsurface features of the kind detectable by a magnetometer might be absent from a monastic site, but the lack of any magnetic anomalies more distinct than the widespread noise could also be due to soil conditions. The response to such features on alluvial soils can be uncertain because the magnetic contrast between the topsoil and fill and the subsoil on which detection usually depends is less reliable than on sites with a near-surface bedrock. The magnetic susceptibility of the topsoil is however well within the range at which suitably differentiated features should be detectable (21×10^{-8} SI units/kg).

The locations (marked X) of auger borings made to test the disturbed areas and other possible features are shown on plan 2. Charcoal, brick and mortar were found in holes 3 and 8; charcoal and brick at 5 and 7; mortar with charcoal at 4, and with brick at 6. These materials were found at all depths to 90cm distributed in both the upper clay soil and the sand beneath. To the east of the trees glass, mortar and brick were found in hole 1 in the central disturbed strip through the garden, but only clean natural clay and sand outside the garden at 2.

Material of the kind seen in the auger holes could reasonably be accounted for by former domestic activity on the site. Some could be extraneous if perhaps the site had been subject to cultivation and manure spreading at some time, but there is no evidence for this and the quantity and dispersal of the material suggest an archaeological origin. The areas of magnetic soil noise would not be explained by small amounts of imported material, but might indicate something of the distribution of archaeological debris.

Resistivity survey

The magnetic survey was followed by limited resistivity testing in case this produced evidence of structures or of ditches not visible to the magnetometer in the clay soil. A full survey with readings taken on a 1m grid was made of square 4 where there is both a rise in ground level and considerable magnetic disturbance. Traverses at wider intervals (but with readings at 1m separation) were made elsewhere. (All readings were taken using twin electrode configuration and 0.5m probe spacing.) The results are plotted as graphs in plan 3 and as contours showing positive anomalies (squares 1-6 only) in plan 4, together with an enlarged plot of square 4.

Plan 3 shows a number of features in square 4, and weaker anomalies which might well indicate only slight natural variations in soil conditions in squares 5 and 6, and in square 1. (The several sections of plan 3 are plotted at different vertical scales.) The contour plot shows little pattern in the distribution of these features. This apparent lack of response from squares 1-3 and 5-6 could be due in part to the damp and conductive topsoil which could obscure any deeper features present.

The anomalies in square 4 are of a strength which could indicate the presence of masonry, but might also be no more than the effect of the higher ground. In the 1:250 scale contour plot the data was treated to emphasise narrow features but no clear plan was obtained. If any structural remains are present they must therefore be incomplete. Squares 4,5 and 6 all show high readings at the east where there is a slight bank below the trees.

Higher and more variable readings were obtained from the less clayey soil east of the trees (traverses I - IV, plan 3). The garden wall was detected, and there was a more uniform response from the former cultivated garden soil than from the soil outside.

Magnetic scanning

Field 7349 across the ditch from the main survey was tested by scanning with the magnetometer. This showed quiet and noisy areas similar to the plotted survey, with the response nowhere very much stronger. No pattern was immediately apparent in their distribution. There were disturbed areas on the slopes of the large mound and towards the ditch. The ground to the south and west was quieter, but not consistently so.

Conclusions

The magnetometer survey produced evidence that at least the half of field 8634 which lies to the west of the trees has been subject to disturbance. Magnetic anomalies representing individually identifiable features were lacking, but both the archaeological and geological conditions were such that these might not have been detectable. The larger field to the north of the ditch (7349) appeared to give a similar response.

Debris found in auger borings indicated that the magnetic activity could well be associated with past occupation of the site.

The resistivity survey failed to resolve any structural remains, but gave readings which would be consistent with their presence at least in square 4. Soil conditions over part of the site were again unfavourable.

The significance of these rather incomplete findings might be easier to assess in relation to further work on the rest of the site. This could show whether structural remains survive clearly anywhere, and whether areas of magnetic activity are distributed in an intelligble manner throughout the site as a whole.

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Report: A. Bartlett

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DRAX ABBEY

MAGNETOMETER SURVEY

1 — 30m grid squares

1 : 2500

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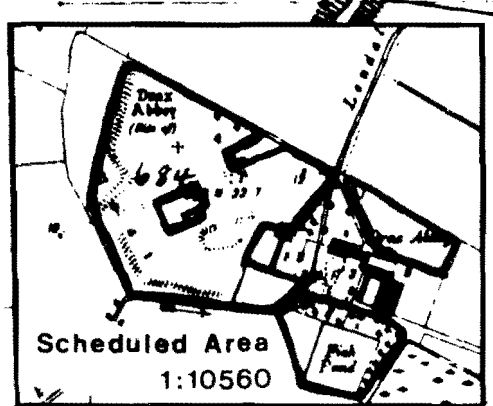
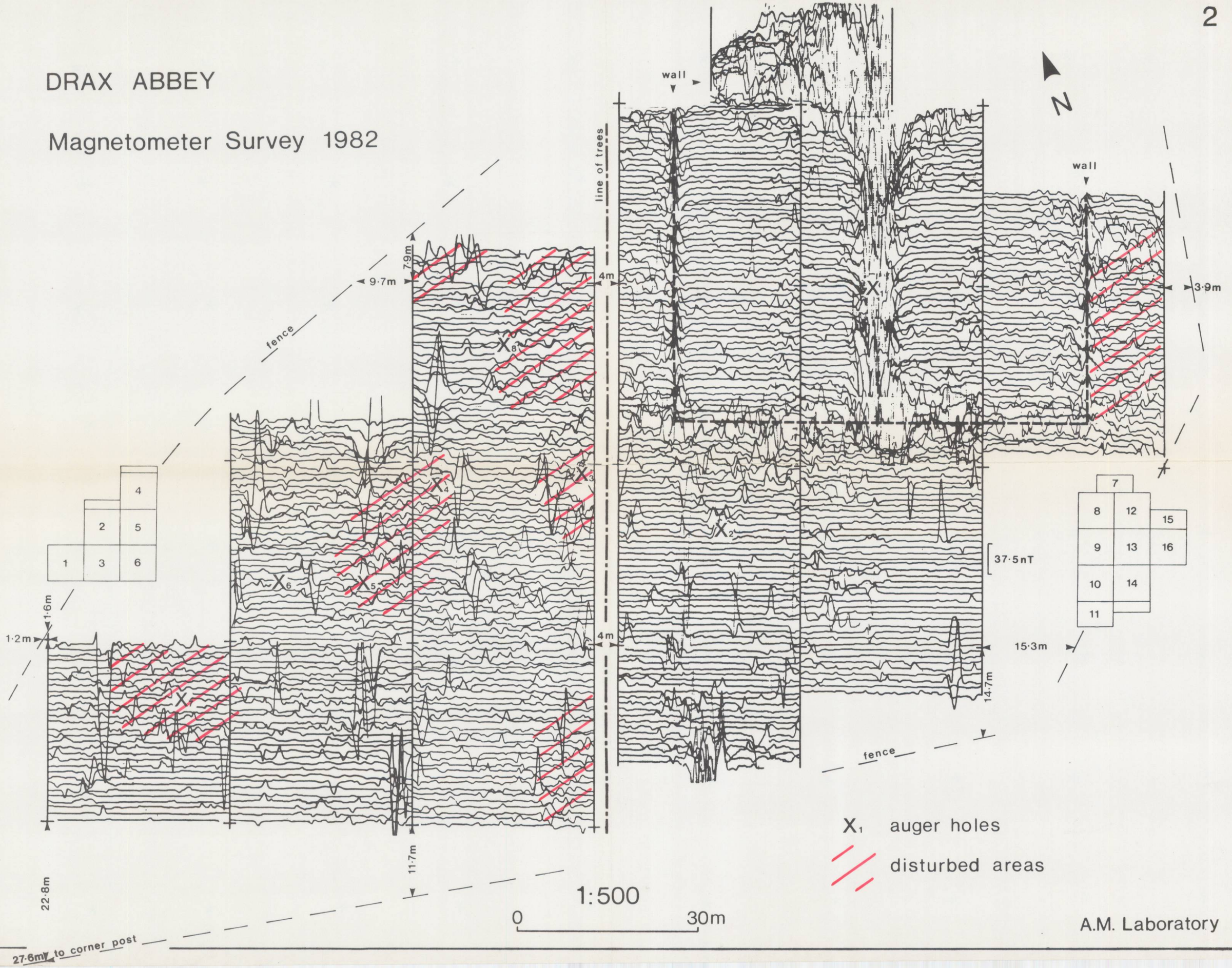


DRAX ABBEY

Magnetometer Survey 1982



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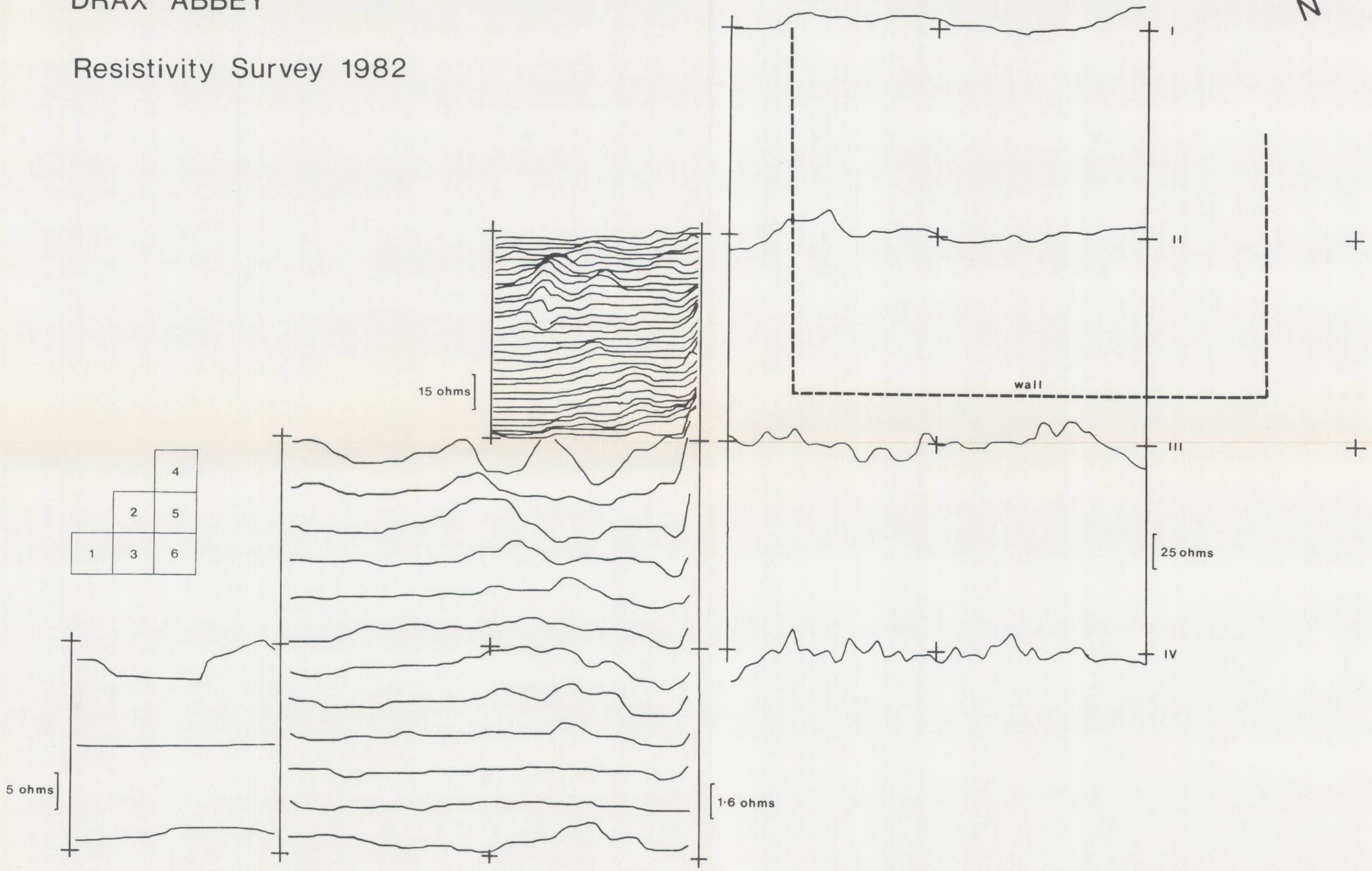
Resistivity Survey 1982



1:500

0 30m

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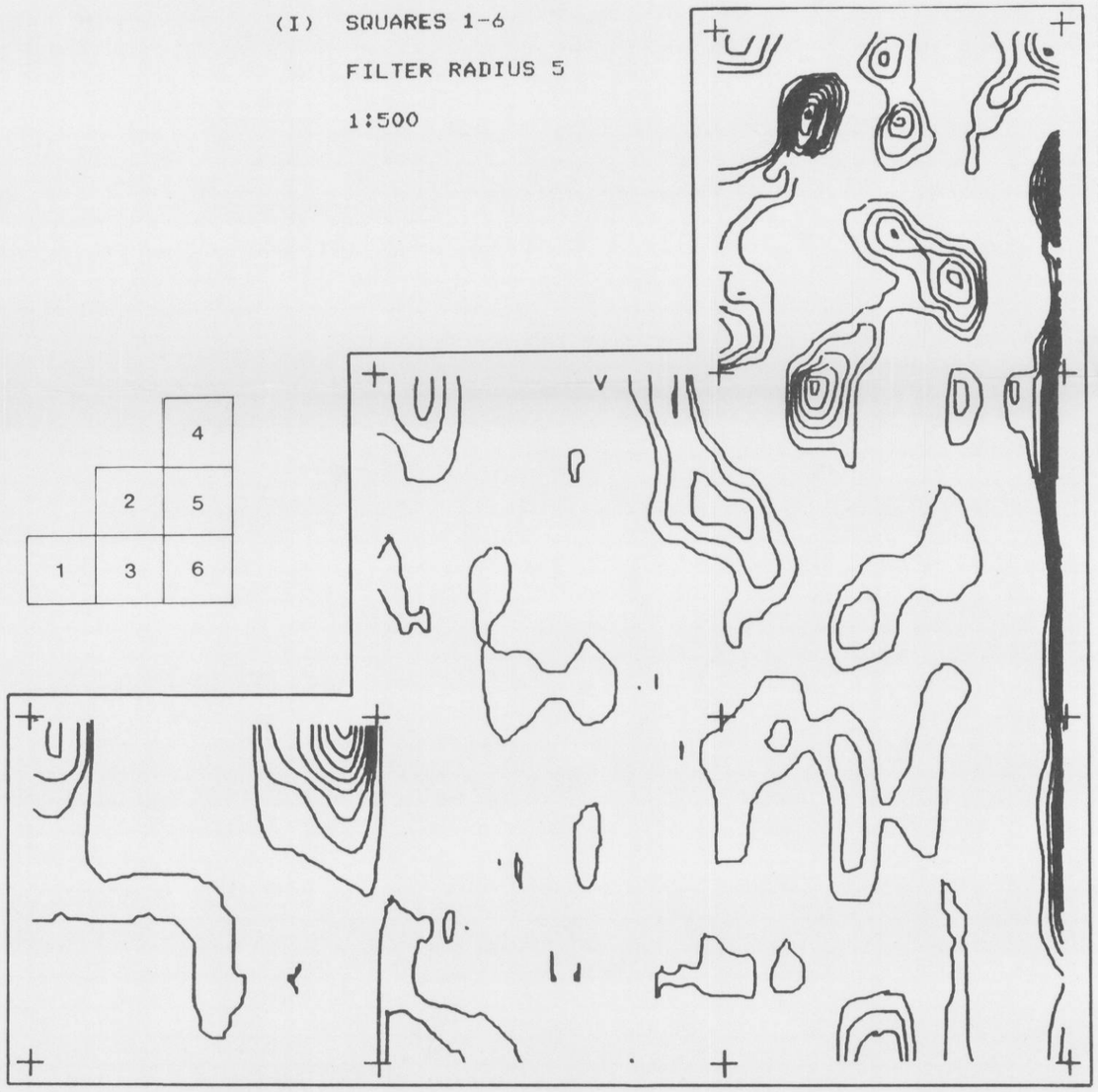
DRAX ABBEY

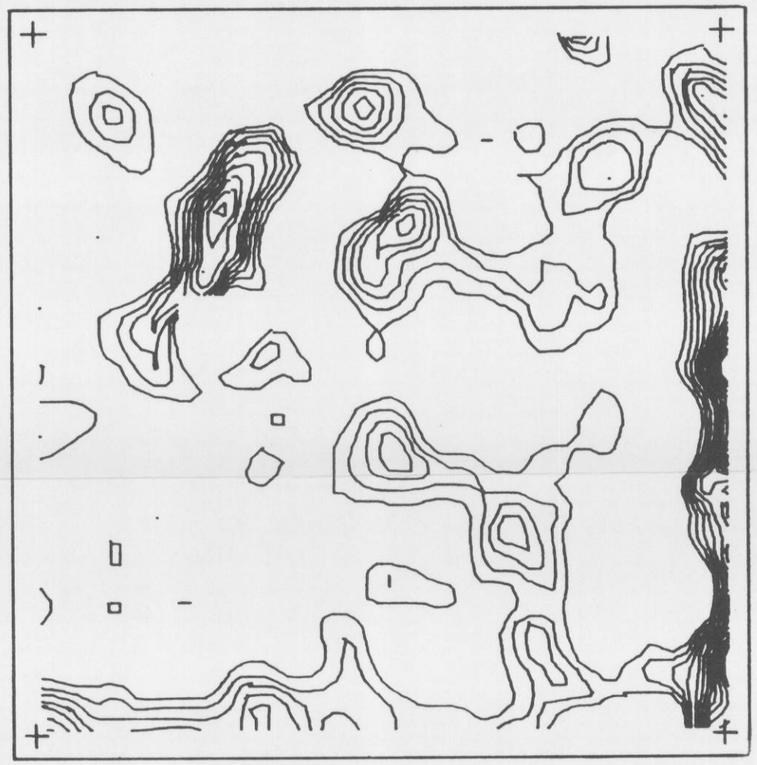
Resistivity Survey 1982

(I) SQUARES 1-6

FILTER RADIUS 5

1:500





(II) SQUARE 4

FILTER RADIUS 2

1:250

CONTOUR RANGE: MEAN - MAXIMUM

CONTOUR INTERVAL: 1/2 STANDARD DEVIATION (PLOTS I & II)

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