The Bartlow Hills in context: a Roman funerary landscape

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The Bartlow Hills in context: a Roman funerary landscape

Introduction

Hella Eckardt

The barrows at Bartlow (Cambridgeshire) are the largest surviving Roman burial mounds in Western Europe. When excavated between 1815 and 1840, a rich collection of grave goods, all dated to the late 1st and 2nd century AD, was found. Imported vessels and organic remains such as flower petals and incense evoke the funerary feast and reflect the wealth and status of the people buried here. The dead were cremated and placed into large wooden chests or brick chambers, which appear to have been lit by lamps. The 19th - century excavations were published in the journal *Archaeologia* (Gage 1834, 1836, 1840, 1842) and further burials and structures were discovered when the Great Eastern Railway line from Cambridge to Mark's Tey was cut in 1865 (Brocklebank 1913, 254). Recent landscaping in nearby Bartlow Park was accompanied by a rescue excavation (Beauchamp & Macauly 2004) which also yielded evidence for burials, but with the exception of this small watching brief, no detailed archaeological work has been carried out on the mounds and their immediate vicinity since the 19th century.

Despite their international importance, there is therefore no modern detailed plan of these monuments and their surrounding landscape. It is known from antiquarian explorations that a villa was located nearby and further villas are known from within a mile of the site. A substantial rectangular earthwork, possibly enclosing further barrows, is also mentioned in the antiquarian reports. Between Barrows II and IV, a 4th - century flint platform (possibly a monumental tomb) was excavated in 1834 and there are suggestions that the barrows continued to be modified in the later Roman period. The antiquarian evidence thus clearly suggests long-term ritual use and high status settlement activity in this area.

Many unanswered questions also remain about the construction of the mounds: no ditches are visible today which, together with the steep sides of the barrows, suggests ancient revetments. These were not identified by the antiquarian excavators who did, on the other hand, note that the mounds were made up of distinct layers of chalk and soil.

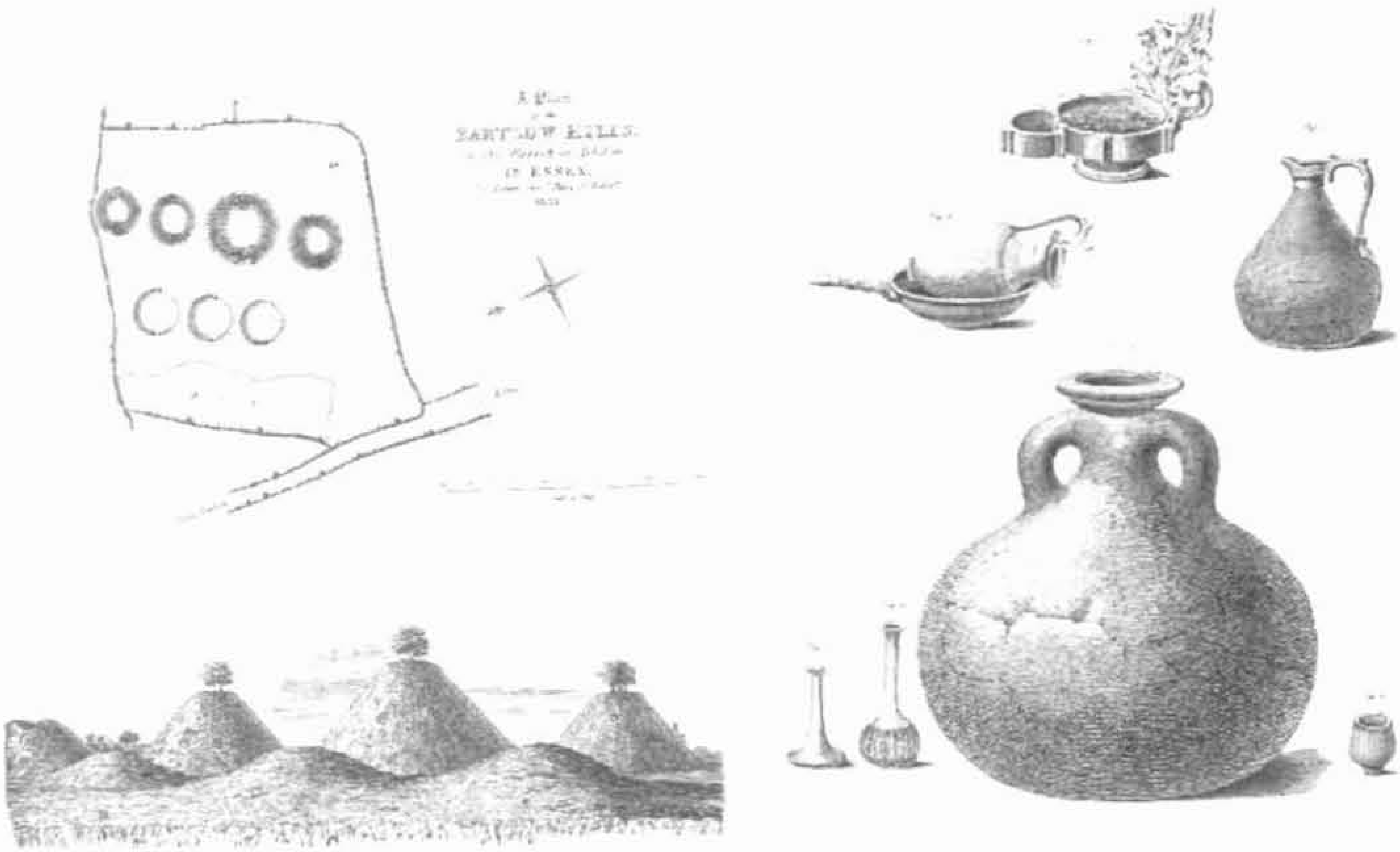


Fig. 1: View and plan of the Bartlow Hills (after Gage 1834, p. 2) and some of the finds made in the largest barrow (Gage 1836, p. 304).

Given the significant gaps in our knowledge of these important Romano-British monuments and their context, in its first year this project had 3 main goals:

- To conduct a topographical survey and produce the first detailed modern plan and elevation of the mounds and their immediate vicinity.
- To carry out a geophysical survey of the flat (and not wooded) areas surrounding the mounds to identify the flint platform and any other features.
- To conduct a 3-D electrical resistance survey of all four large mounds. The use of 3-D tomography on large burial mounds will be innovative, and contribute to methodologies of archaeological prospection as well as address the specific research questions of this project.

The work was funded by a Small Research Grant from the British Academy and involved a team of archaeologists both from the University of Reading (Dr Timothy Astin, Amanda Clarke, Lucy Cramp, Dr Hella Eckardt & Dave Thornley) and the University of Southampton (Sophie Hay). All fieldwork was carried out with permission of the landowners (Major T. Breitmeyer & Mr Gunnell), Cambridge County Council Archaeological Unit and English Heritage during two weeks in December 2004 and April 2005.
This report will present the results for each of the three research aims in turn and will end with an outline of future research proposals, focusing in particular on the earthwork surrounding the mounds.

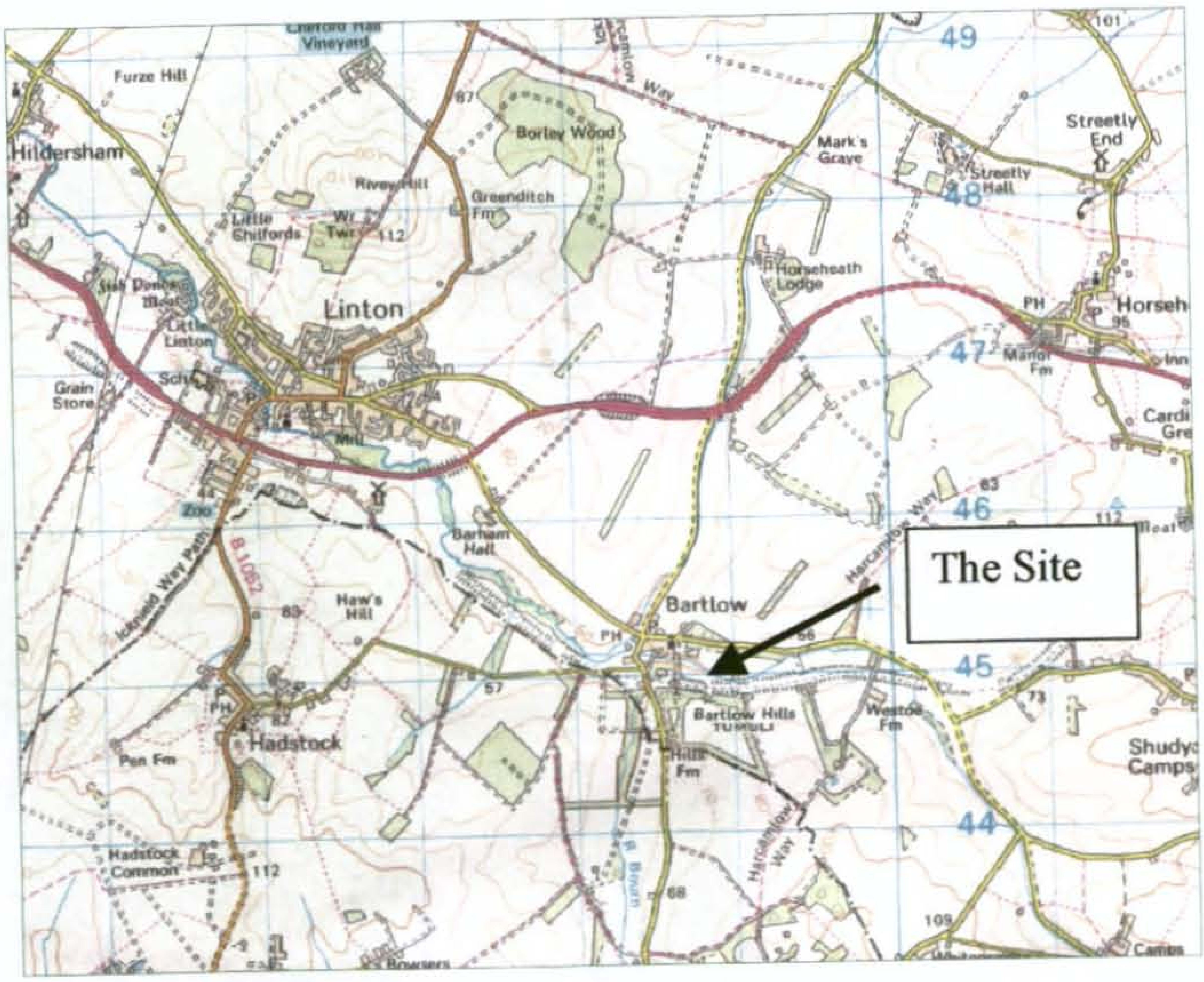


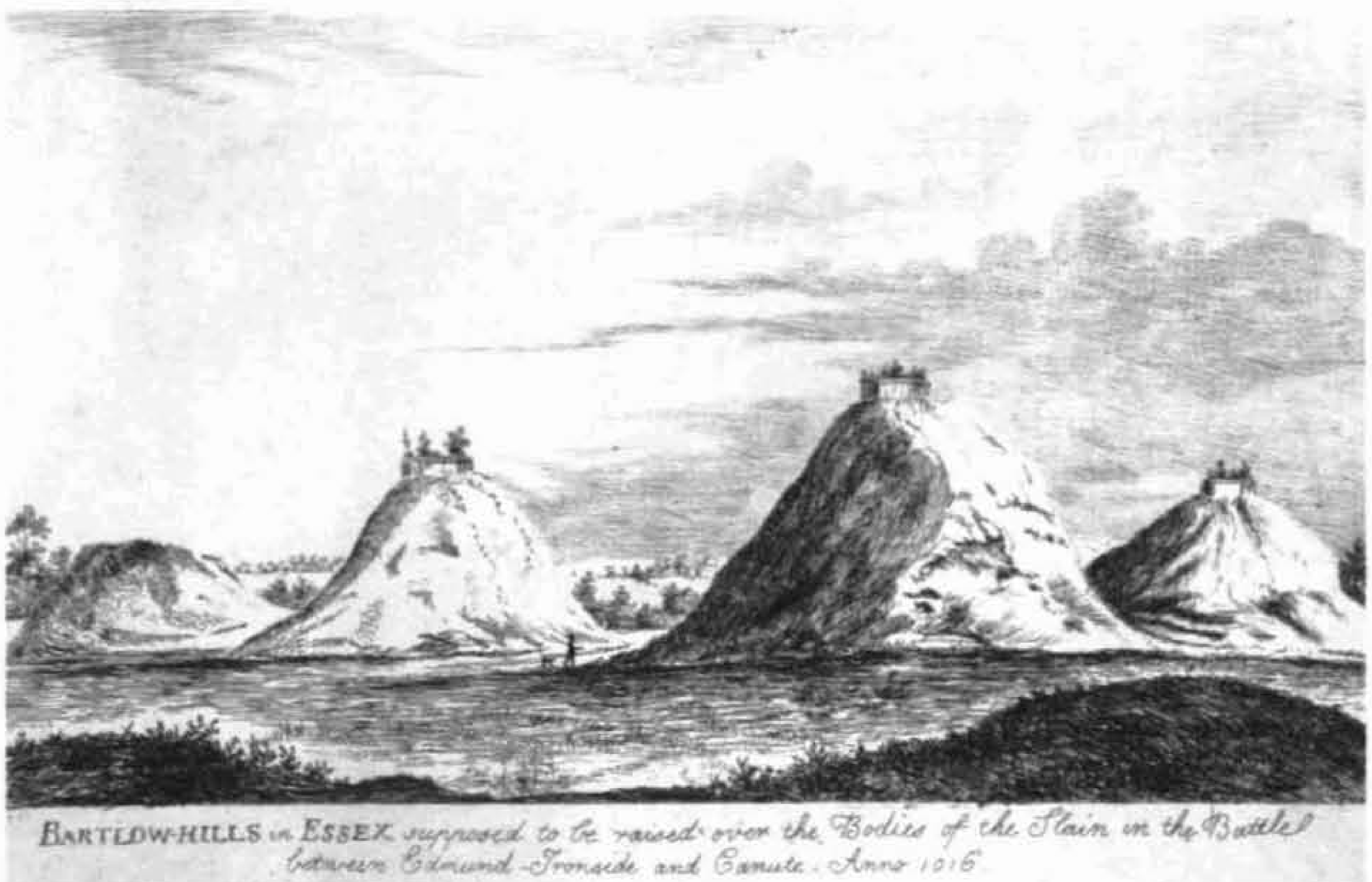
Fig. 2: Location map of Bartlow, Cambridgeshire

Topography

Existing information

Hella Eckardt

Bartlow is located in the parish of Ashdon, ca. 5 miles east of the Roman town of Great Chesterford. The surrounding geography is mainly chalk, with a band of alluvium and gravels located near the three streams which join in the village to form the river Granta. The countryside slopes gently from about 100m in the north-east to about 50m where the village is located in a valley, and then rises again to the south (Taylor 1998, 18). The burial mounds (TL 586 449) are on a rising slope, overlooking the land to the north and east. While earlier views show the hills in open farmland, this landscape context is now difficult to appreciate due to the plantation of dense private forest in the early 20th century.



BARTLOW-HILLS in ESSEX supposed to be raised over the Bodies of the Slain in the Battle between Edmund Ironside and Canute. Anno 1016

Fig. 3: 19th century view of the Bartlow Hills. (Pers.comm. S. Esmonde-Cleary)

The Bartlow Hills have always represented a notable feature of the local landscape, and indeed the very name 'Bartlow' is thought to be derived from the 13th century *Berklawe* 'the mounds of the birch trees' (Taylor 1998, 18). Local tradition associated the mounds with the battle of Assandune which took place in 1016 between the Danish King Canute and Edmund Ironside (Goddard 1899, 349; cf. Holinshed, Chronicle 1585) and this belief is reflected in the caption of a 19th century engraving of the site (fig. 3).

Fig. 4a: View of the Bartlow Hills in 1782. The same image appears in the Universal British Traveller 1777. Cambridgeshire Collection Postcard.

Fig. 4b: 19th century view (www.cambridgeshire.gov.uk/. ../0/bartonhills.jpg)

The 19th century images (fig. 3, 4 a-b) show generalised and often idealised views of the four large mounds, with the three lower mounds already much denuded by ploughing and eventually excavation. A drawing published in 1779 in the Universal British Traveller (fig. 4a) appears to show five (rather than four) large mounds and there is some confusion in the very early sources about the number of mounds and the discovery of stone sarcophagi supposedly from Bartlow (VCH Essex 1963, 39; cf. Camden & Holinshed). While more recent excavations (Beauchamp & Macauly 2004) have confirmed the presence of a Romano-British cemetery surrounding the barrows, the fifth barrow on the engraving of 1779/1782 (fig. 4a) is almost certainly a mistake. Sedwick's sketch of the site (see fig. 23 below) shows a fourth low barrow but as this is hardly a detailed drawing of the site it again is difficult to ascertain its relevance. The early drawings are clearly not to be taken as accurate records of the site but they nevertheless are useful as indicators of the overall shape of the mounds, and many show the presence of trees and fences which will be of relevance when discussing the results of the electrical resistance tomography (see below).

The first detailed plan and perspective view of the Bartlow Hills was produced in 1832 by the surveyor J.G. Lenny (Gage 1834, p 2; see fig. 1 above). In 1836 Gage (1836, p. 301) published a more accurate plan and elevation of the four large hills (fig. 5), accompanied by detailed measurements.

A simple section drawing of the mounds was published by the RCHM (Essex I, 1916, p. 4; see fig. 6) and more recently a basic survey of the three publicly accessible mounds was carried out by a Cambridge University Continuing Education student (Rachel Fosberry n.d.)

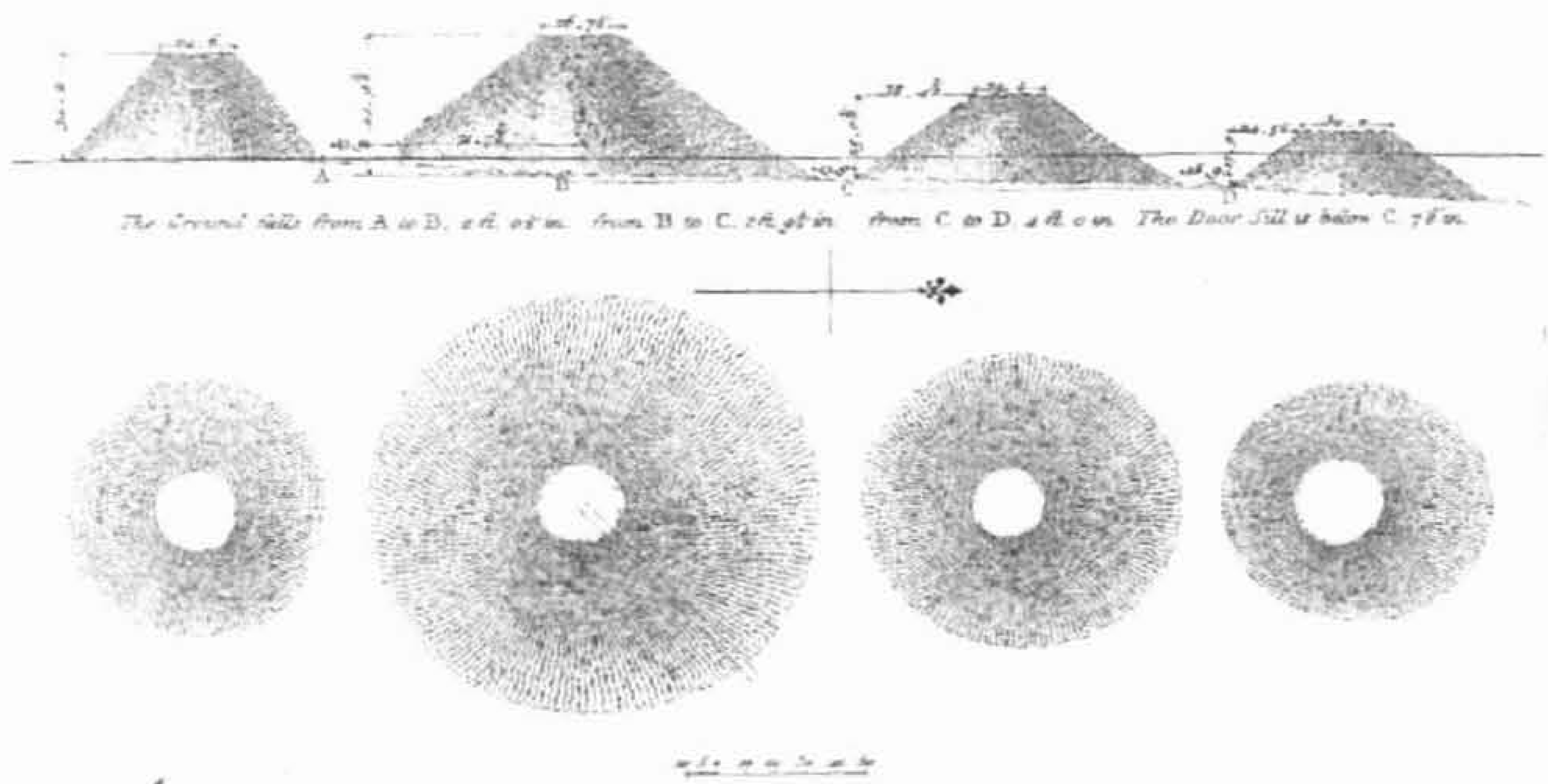


Fig. 5: Section view of the Bartlow Hills (Gage 1836, fig.1)

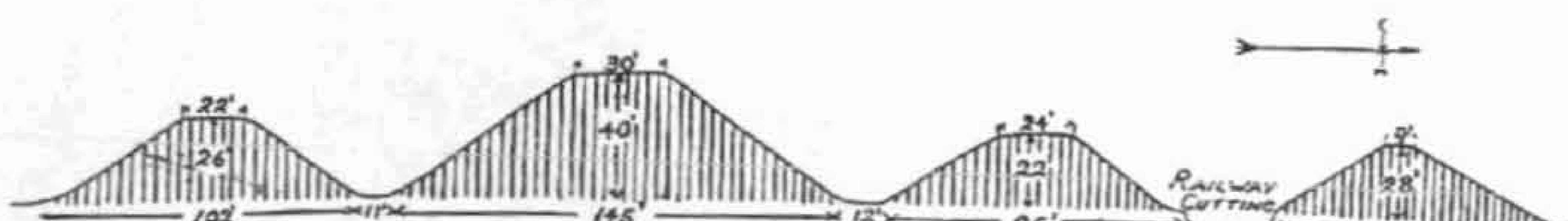
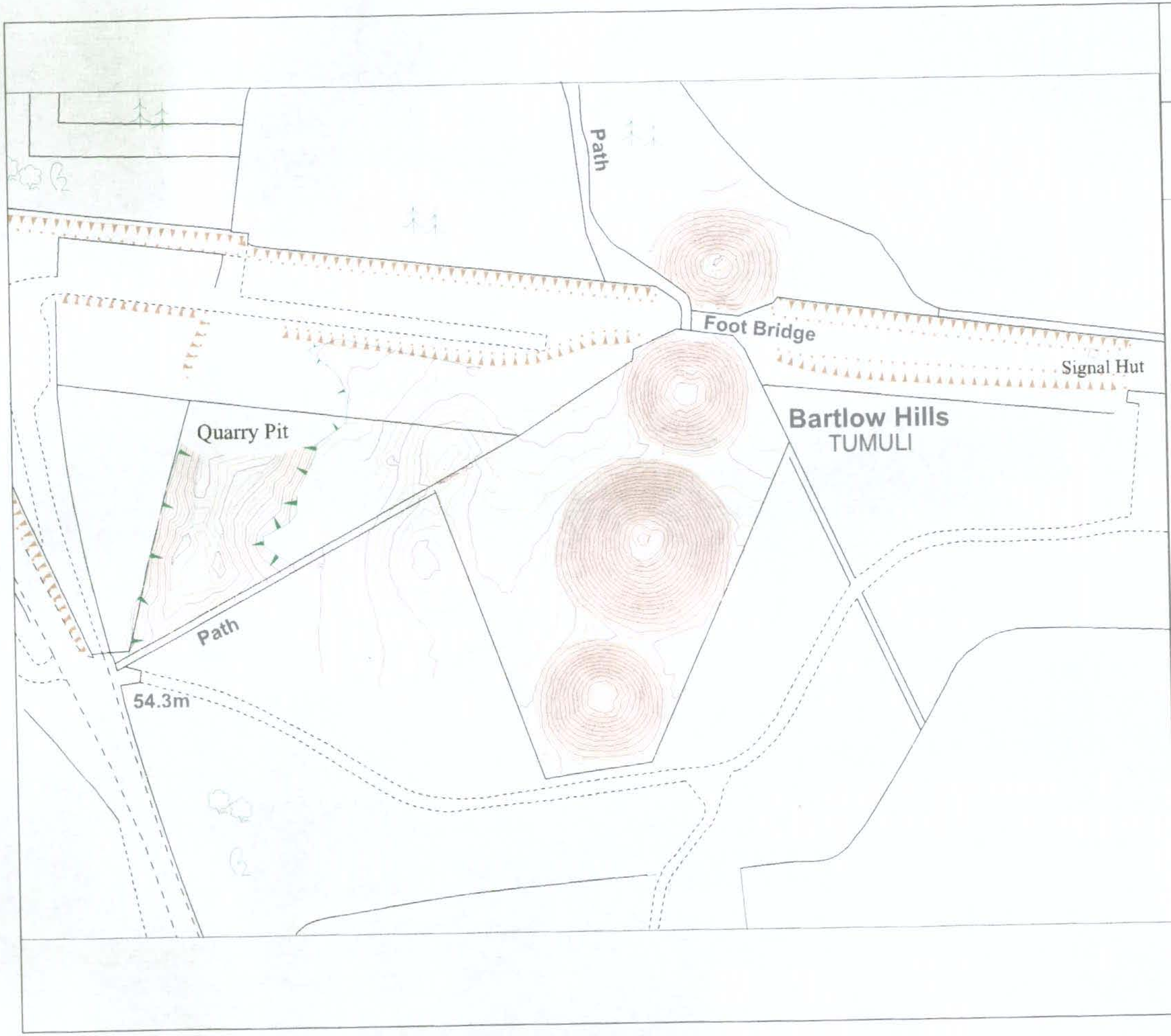


Fig. 6: Section view of the Bartlow Hills (RCHM Essex 1916, p. 4).

Bartlow Hills, Cambridgeshire

April 2005
Topographic survey



The 2004/5 survey

Sophie Hay & Hella Eckardt

The topographic survey was carried out by Sophie Hay using a Leica TC 805 total station. At the time of the survey, the area around the mounds was covered in dense forest with significant undergrowth and that has some obvious implications for the results. Nevertheless, this first detailed topographic survey of the site (fig. 7) clearly shows the location of the two remaining smaller barrows. Barrow III was destroyed by the cutting of the railway and both Barrow I and II are affected by the public footpath running from the site to the road. The lower mounds were cleared by Cambridgeshire County Archaeology Unit and re-fenced after our survey was completed and are now accessible to the public.

An interesting feature of Lenny's 1832 plan (see fig. 1 above) is the 'quarry pit'. On his plan, this is a large irregular feature located between the lower mounds and the road, to the west of the large mounds. While this feature may represent one of the many 19th century gravel, chalk and sand extraction pits in the area, Gage (1834, 2) suggests that material from the pit and from the nearby brook side was used to construct the mounds. This seems likely, given the volume of the mounds but can now not be demonstrated given the significant modern infill of the feature. The pit is cut to the north by the railway embankment and has clearly been filled from that end.

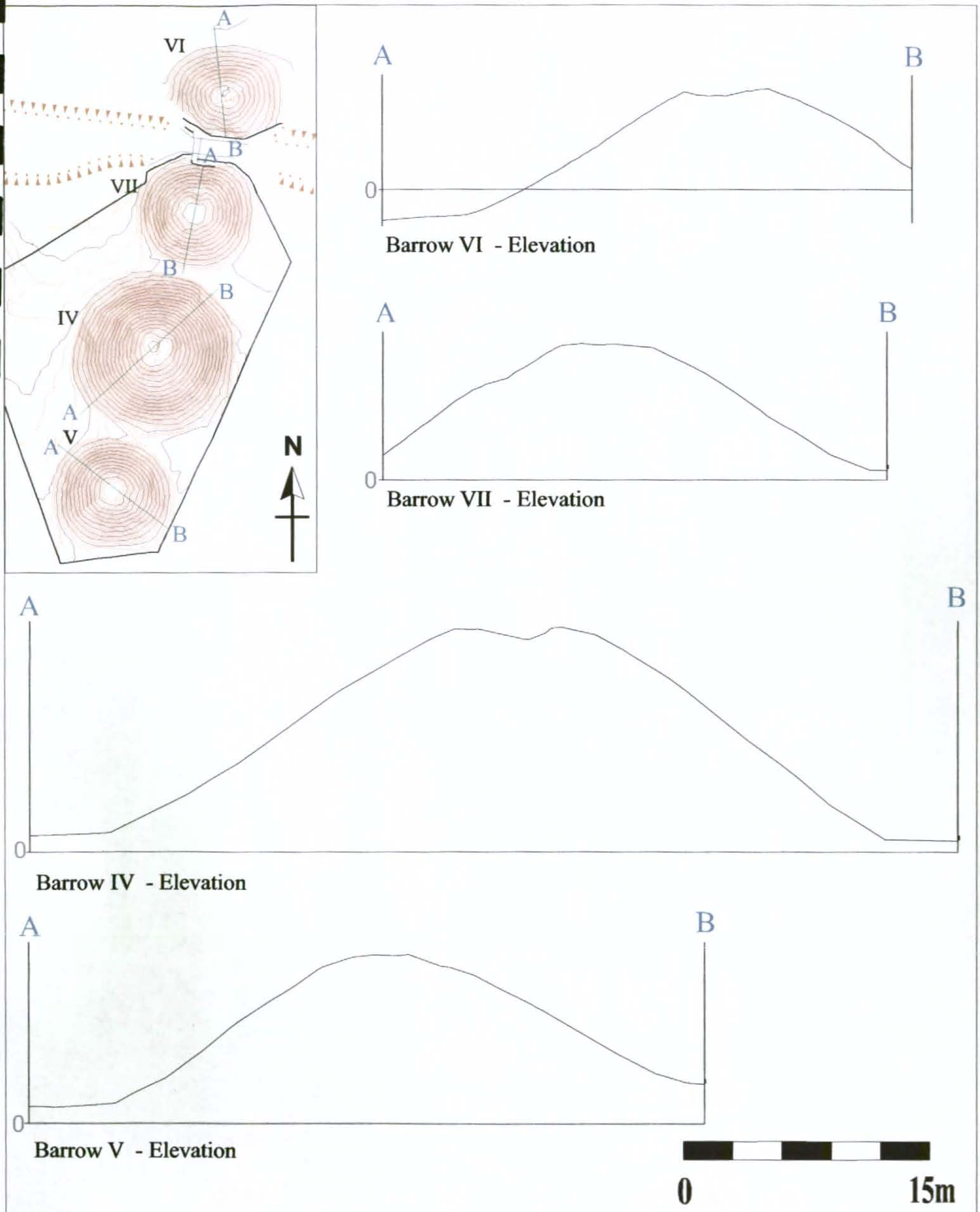
One of the key aims of the topographical survey was the production of section views of the mounds to aid the interpretation of the Electrical Resistance Tomography (see below) but this data can also be compared to the earlier section drawings of the large mounds.

The large barrows through time: modification of the tops

While all the earlier section views show essentially an idealised profile, this survey for the first time provides a detailed picture of the profile of individual mounds (fig. 8) and provides an opportunity to review the evidence for the continued modification of the Bartlow Hills. While some of the changes must simply be due to erosion, there is also evidence for the deliberate adding of soil, the use of the large barrows for defensive purposes, extensive excavation and repeated landscaping.

There is some evidence that the mounds were added to during the very late Roman or early Medieval period. Thus Allison Taylor (1998, 19) points to the discovery of 4th century pottery from the top of Barrow IV and VCH Essex (1963, 42) records for Barrow VI that in January 1930 after Gage's tunnel fell in C.G. Brocklebank found a "skeleton, lying on its back, surrounded by flints" in the fill of the collapse. This may well represent an Anglo-Saxon secondary burial, especially as another possibly Anglo-Saxon burial is known from Bartlow Park (Taylor 1998, 19). At present, there is no specific evidence for medieval or post-medieval changes to the mounds although continuous ploughing affected the three smaller mounds.

The 19th century excavations clearly had a major impact on the structure and shape of all the barrows. The lower mounds were excavated by cutting trenches across, and this combined with the plough damage means that they are hardly visible today (see fig.



Profiles of Barrows VI, VII, IV and V

Archaeological Prospection Services of Southampton

7). Perhaps the most extensively damaged large barrow is the northern mound (Barrow VI, now in Bartlow Park) which appears as much lower and with a markedly flattened top in the 19th century images (e.g. Fig. 3 & 4b). This is the barrow that had been excavated by Sir Busick Harwood in 1815 and then again by Gage in 1840 and it must have been reconstructed following a collapse of the earlier tunnel in 1930 (VCH Essex 1963, 39, 42). This largely unrecorded infilling and landscaping of Barrow VI may be reflected in the ERT survey (see below).

In his explorations, Gage appears to have excavated the larger mounds by either digging horizontal tunnels (e.g. Barrow IV) or digging down from the top (e.g. Barrow VI). There is also some later archaeological activity which is largely unrecorded such as Brocklebank's 12ft deep section cut through Barrow VII after a hollow appeared at its top (VCH Essex 1963, 43).
All the large mounds have significant depressions at the top and these may have been created by the removal of large trees that were growing on top of the three southern large mounds in the 19th and early 20th century (fig. 9 a & b; cf. figs. 3 & 4).

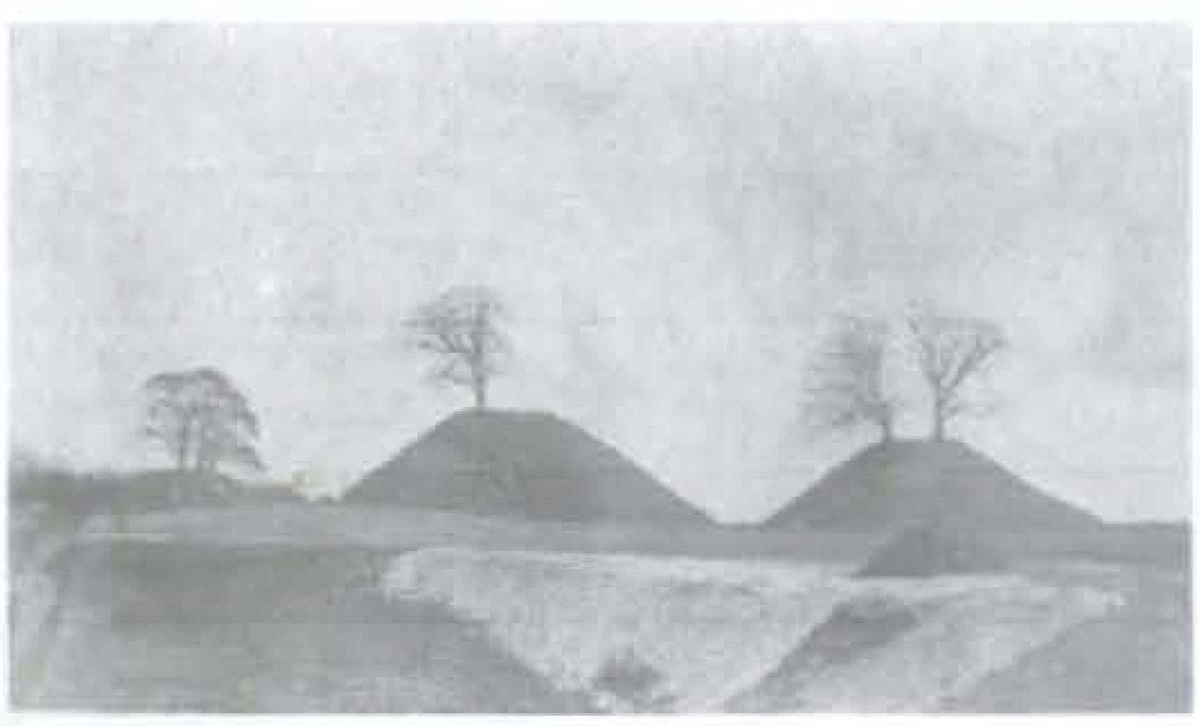



Fig. 9 a: View of the Bartlow Hills in 1904, with prominent trees on top (Camb. Coll. Y Bartl.K4) and (b) view of depression on top of Barrow IV.

During World War II an ammunition dump was located along the railway line just to the east of the barrows and troops (231 Royal Engineers & Queen's Own Bays) were stationed in Bartlow Park House (pers.comm. Mrs C. Ogilvy). Gun stations were located on several of the mounds (VCH Essex 1963, 39), but it is no longer known which ones. Mrs Ogilvy suggests that a gun station was located on the largest barrow (Barrow IV) but there is also a significant hollow a few metres below the top on the northern slope of Barrow VII, which would have overlooked both the railway line and the footbridge (see fig. 10). The presence of possible concrete and iron military structures does of course have implications for the interpretation of the Electrical Resistance Tomography results (see below).

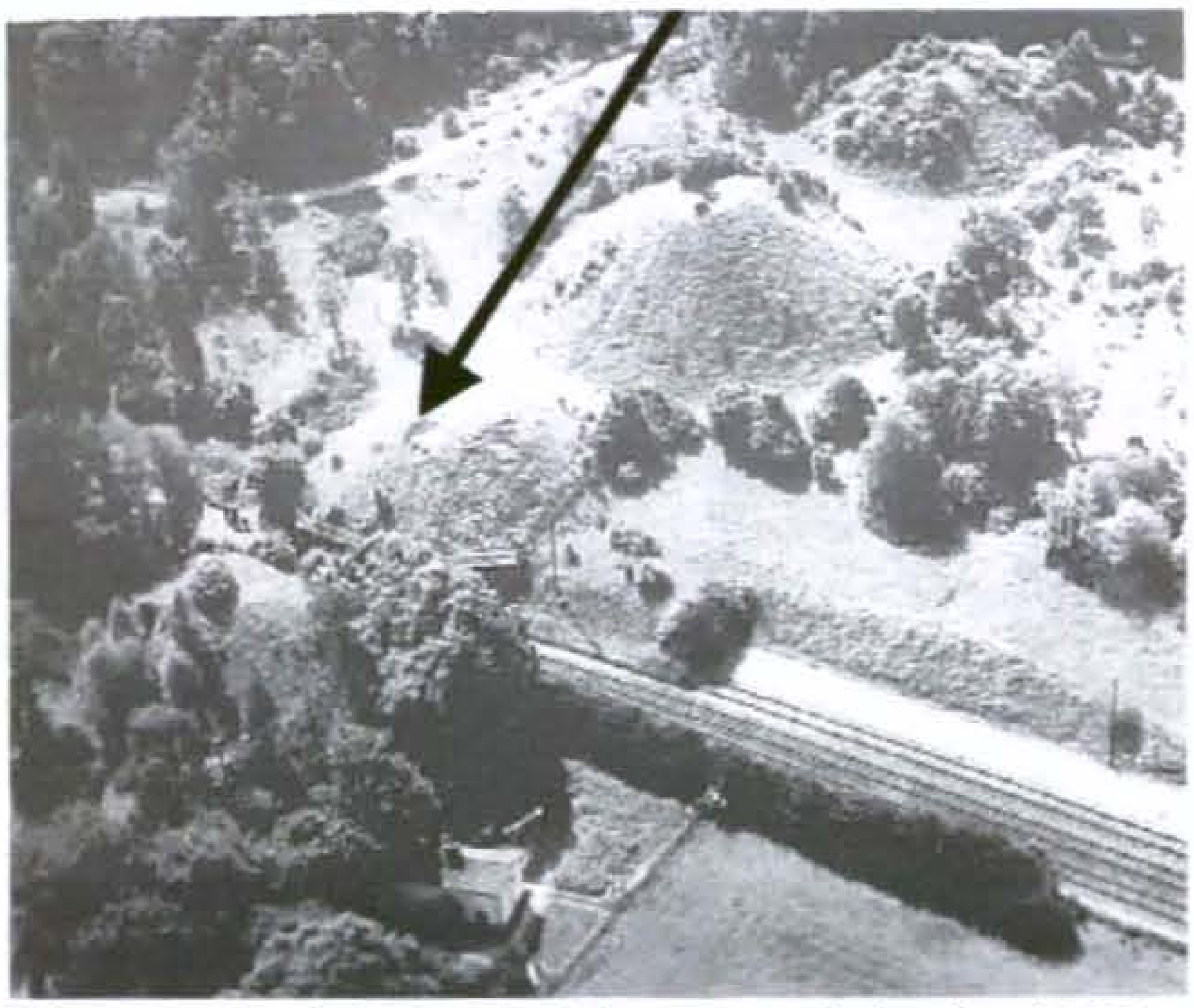
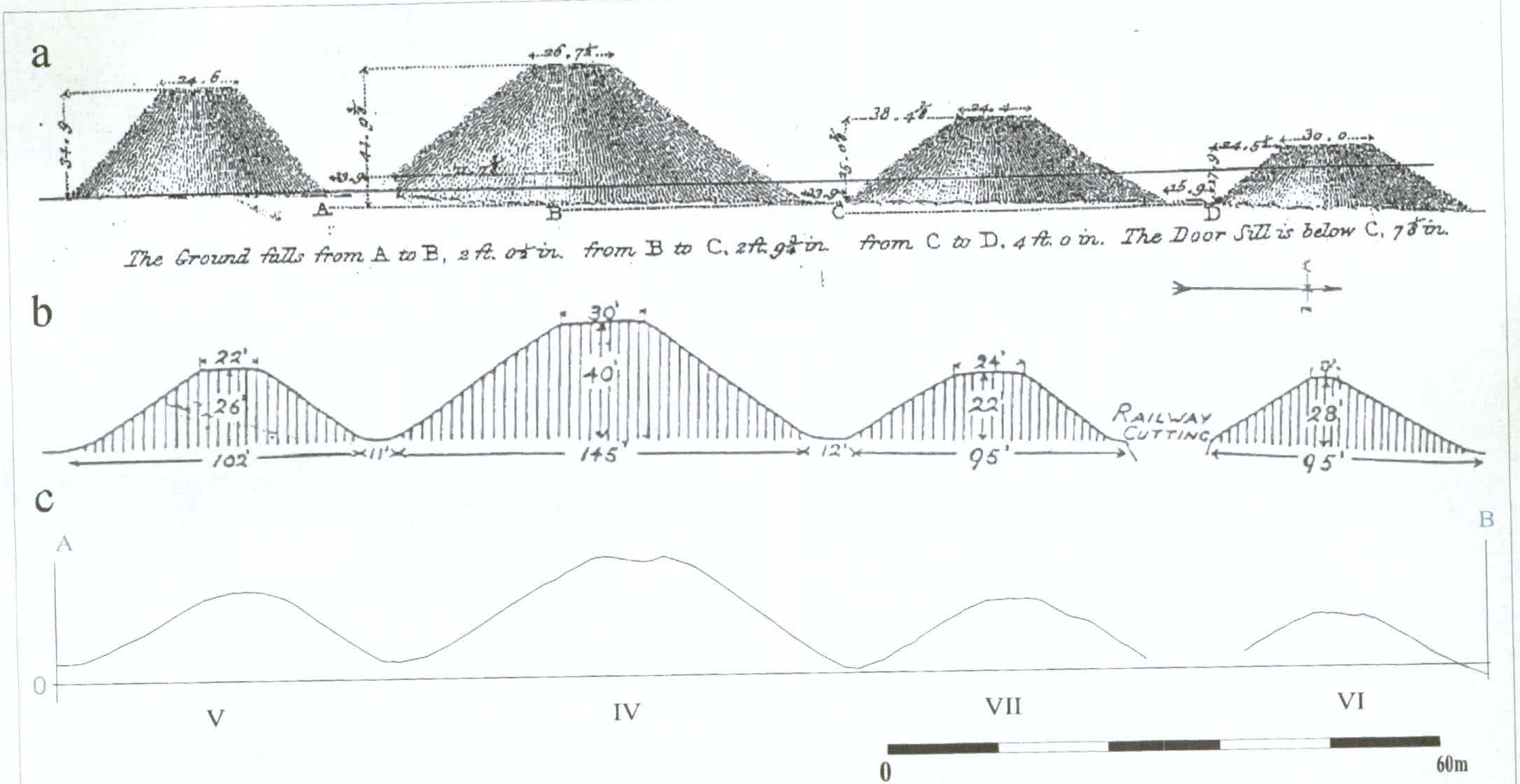
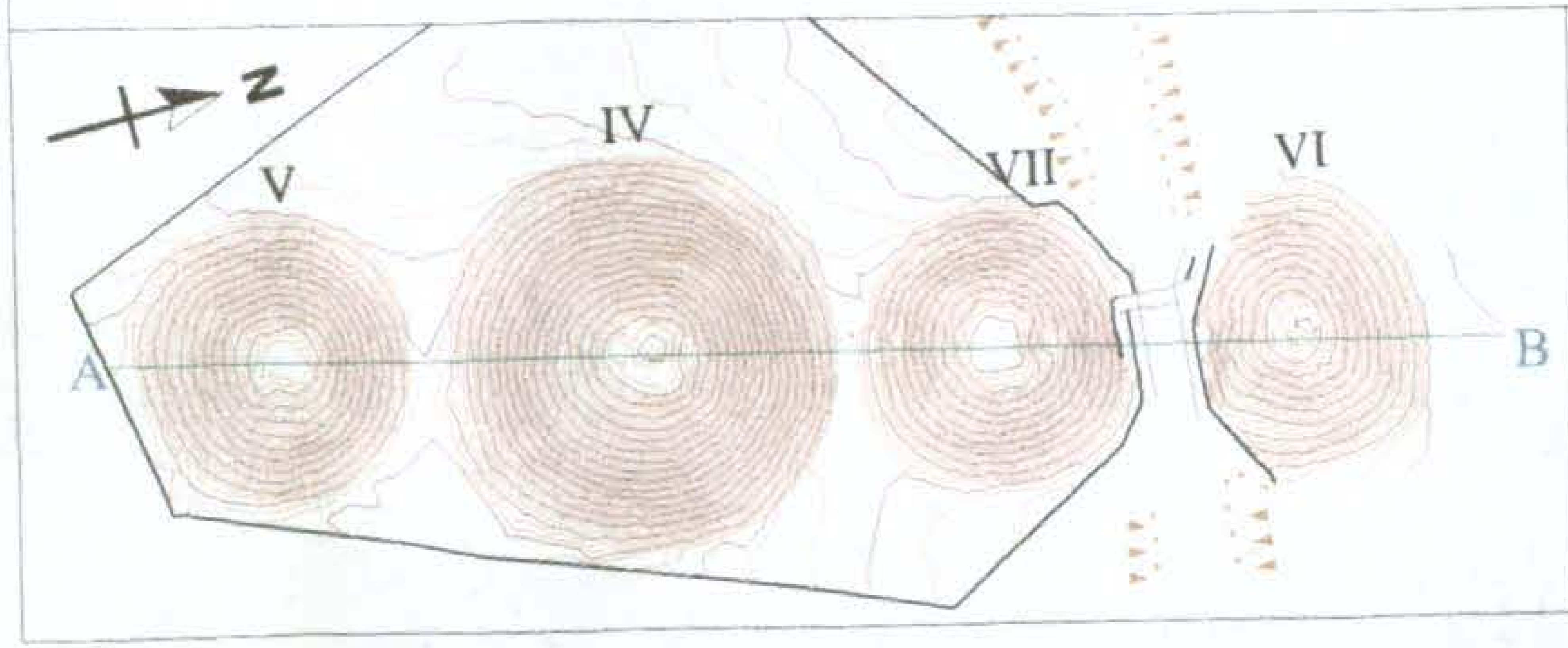


Fig. 10: Aerial view of the mounds in the 1950s, with the railway still in service. Note the prominent hollow on Barrow VII.
http://www.stedmundsbury.gov.uk/sebc/visit/images/Bartlow.jpg

The overall profile of mounds

The profile of some mounds (e.g. on the western side of Barrow IV) show slight changes in the angle of slope, but none are marked or consistent enough to indicate the existence of revetments. Comparison of the overall profile of all large mounds in 1832, 1916 and 2005 (fig. 11) appears to show a number of gradual changes. The barrows are slightly lower, less conical and have less sharply defined and wider platforms. Conversely, the gaps between barrows are becoming narrower; both trends are likely to be the result of gradual erosion.





Long Profile of Barrows V, IV, VII and VI in a) 1832, b) 1916 and c) 2005

Image of Bartlow Hills in 1832
Gage 1836, Plate XXXI.

Image of Bartlow Hills in 1916
RCHM, Essex 1916, p. 4

Geophysical survey of the areas immediately surrounding the mounds

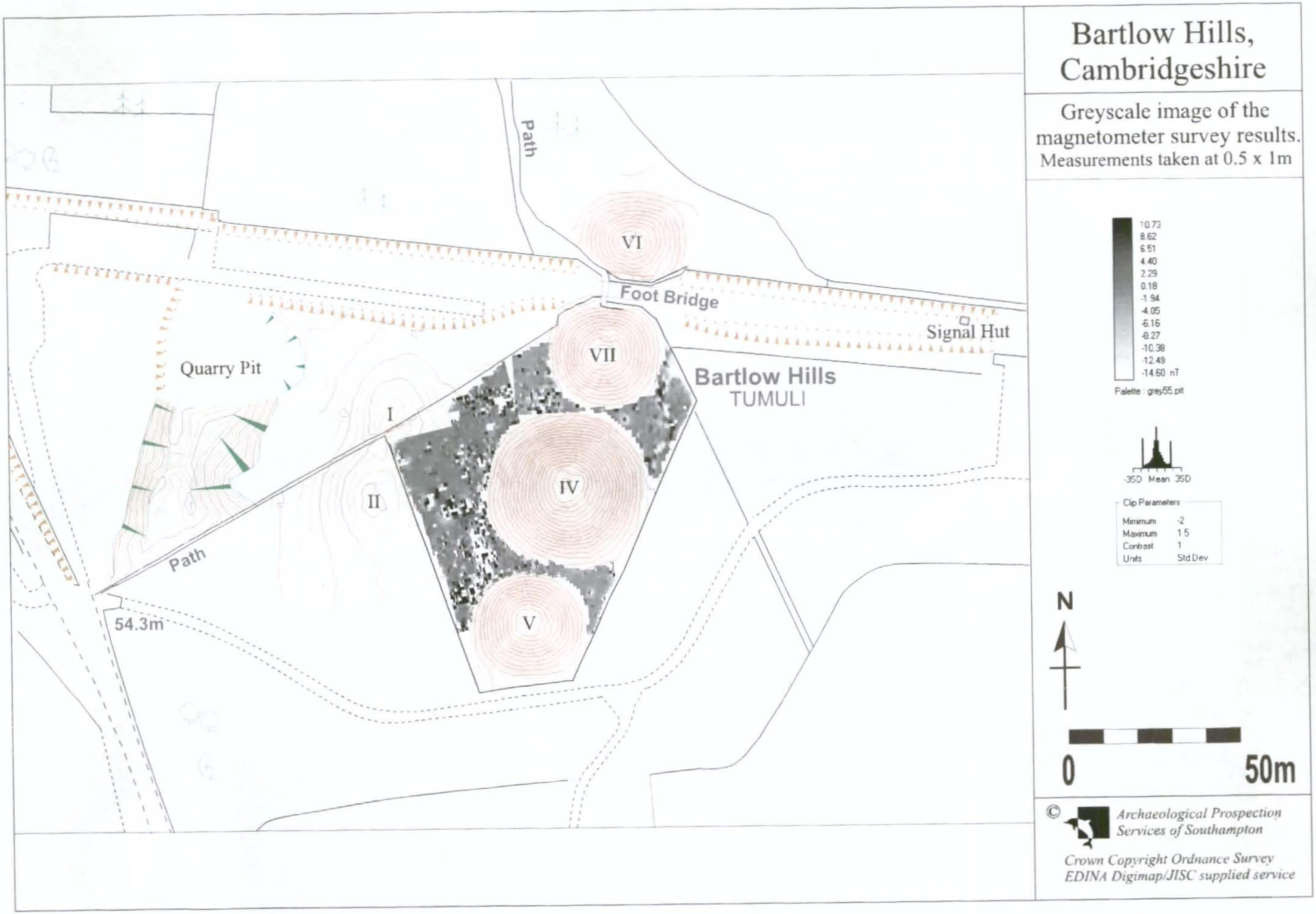
Sophie Hay

The aim of carrying out a geophysical survey of the flat open areas immediately surrounding the mounds was to assess the archaeological features thought to exist in this area. These may include Roman ditches or enclosing walls for the large mounds, further burials or other ritual monuments. Of particular interest is the flint platform located between barrows IV and II (Gage 1836). When excavated, this platform was found to measure 30 feet by 10 feet and the layer of flint was up 2feet 8 inches deep. This substantial feature was located 1 foot below the surface by Gage (1836, 463) and if it has not been removed should be identifiable through geophysical survey. Results are likely to be affected by modern remains such as fences and information signs in the very small accessible area.

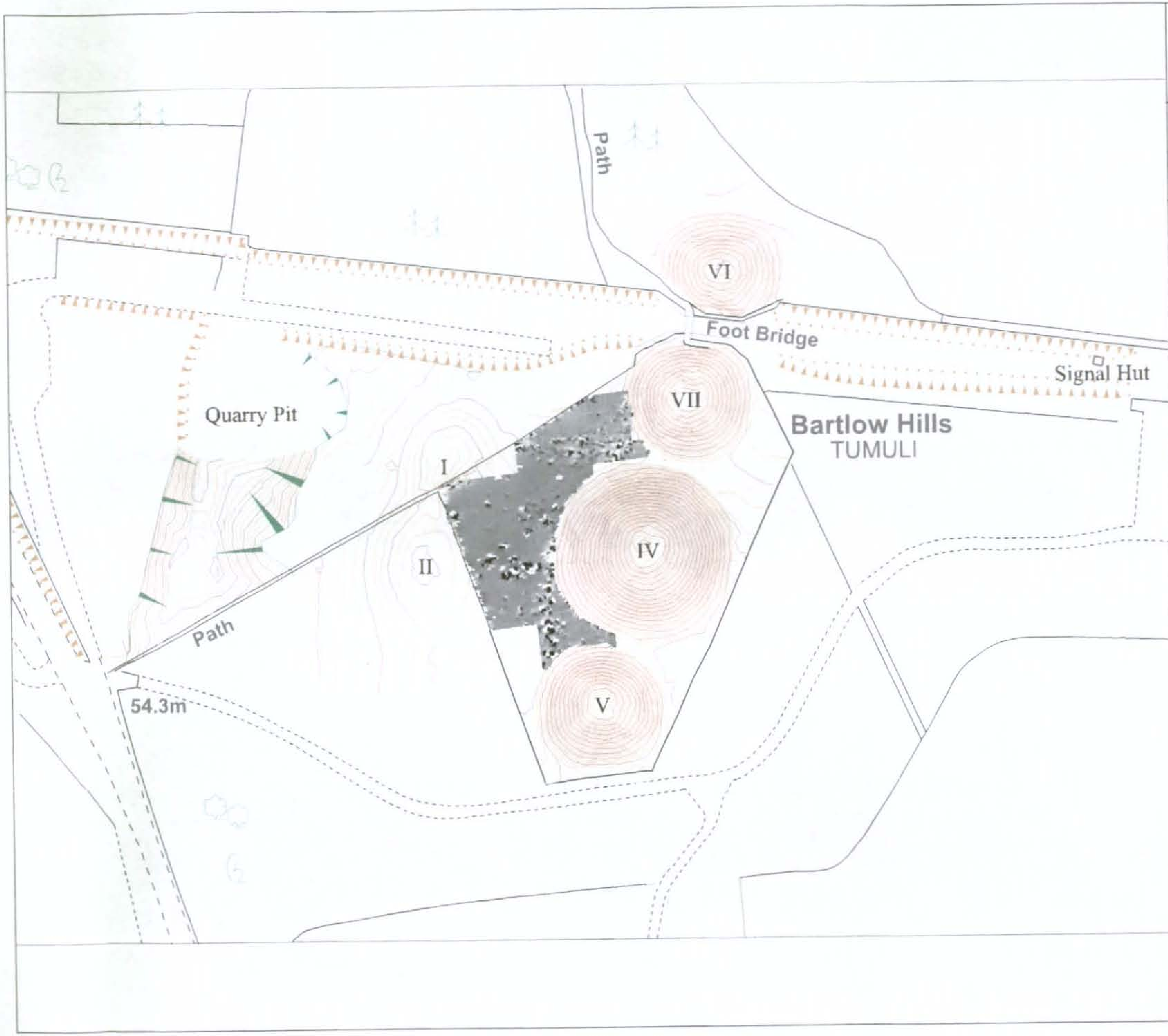
Method & results: Magnetometry

A magnetometer survey was carried out on all the available areas surrounding the mounds. Magnetic prospection of soils is based on the measurement of differences in magnitudes of the earth's magnetic field at points over a specific area. The method was chosen as a relatively quick and efficient survey technique, suitable for detecting hearths, kilns, ditches and walls. The results are, however, severely restricted in areas of modern disturbance and by the presence of ferrous material (Geoscan research 1996a; Scollar et al. 1990, 362 ff.).
Grids of 20m by 20m were set out using a Geotronics Geodolite 504 Total Station. The grids were orientated to ensure that the survey traverses crossed the line of potential archaeological features at an angle of approximately 30 degree. The magnetometer survey was undertaken using a Geoscan research FM36 Fluxgate Gradiometer. Readings were taken at 0.5m intervals along traverses every 1m (fig. 12a). An automatic encoder trigger was used to initiate the readings, allowing the survey to be conducted more rapidly. The depth to which the Geoscan research FM36 Fluxgate Gradiometer can take readings varies with the geology but is usually up to 1m. In the areas where the initial survey and the antiquarian reports had highlighted features of particular interest, 0.5m by 0.5m intervals were used (fig. 12b). In general, significant levels of iron and concrete debris were noted in the area surrounding the barrows, and the presence of modern fences has clearly also had an impact on the results.

Dominating the magnetometer survey results (fig. 13) are curvilinear positive anomalies (m1 & m2); these features probably trace the lines of earlier footpaths and fences. By contrast, the possibly rectangular anomalies m3, m4 and m5 may represent archaeological features.
Closer examination of the magnetometer survey in the most promising area between the large Barrow IV and the smaller Barrow II (fig.14) can be described as follows. The linear feature almost certainly represents a fence line (=m1), probably of an earlier enclosing fence around the large Barrow IV. m3 may be an archaeological feature or, together with the northern end of m1 may also represent an earlier fence or footpath. m4 is the most likely candidate for the antiquarian flint platform and m5

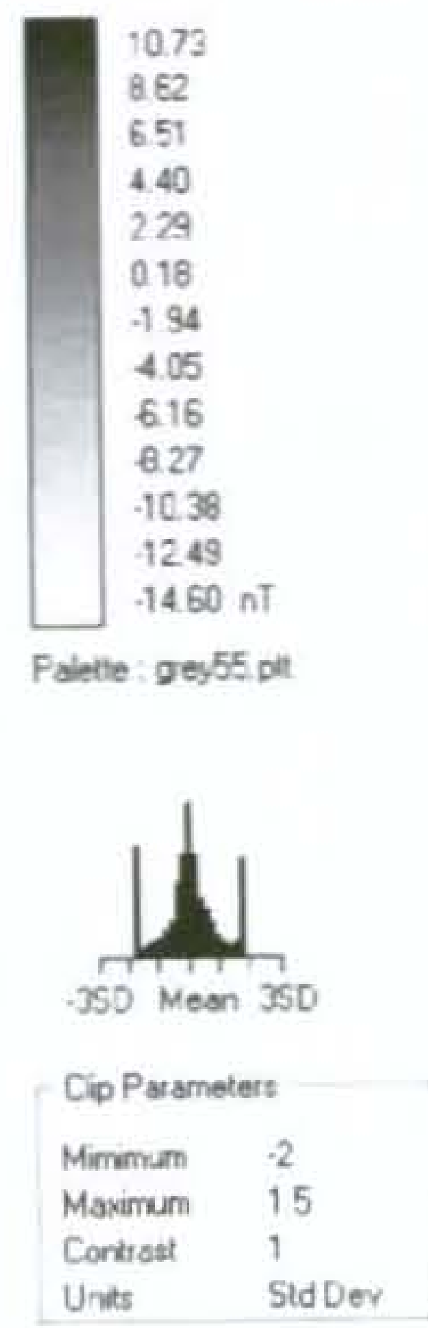


Bartlow Hills, Cambridgeshire
Greyscale image of the magnetometer survey results.
Measurements taken at 0.5 x 1m
10.73
8.62
6.51
4.40
2.29
0.18
-1.94
-4.05
-6.16
-8.27
-10.38
-12.49
-14.60 nT
Palette : grey55.plt
-3SD Mean 3SD
Clip Parameters
Minimum -2
Maximum 1.5
Contrast 1
Units Std Dev
N
0
50m
Archaeological Prospection Services of Southampton
Crown Copyright Ordnance Survey EDINA Digimap/JISC supplied service
Path
VI
Foot Bridge
Signal Hut
VII
Quarry Pit
Bartlow Hills
TUMULI
I
II
IV
Path
54.3m
V



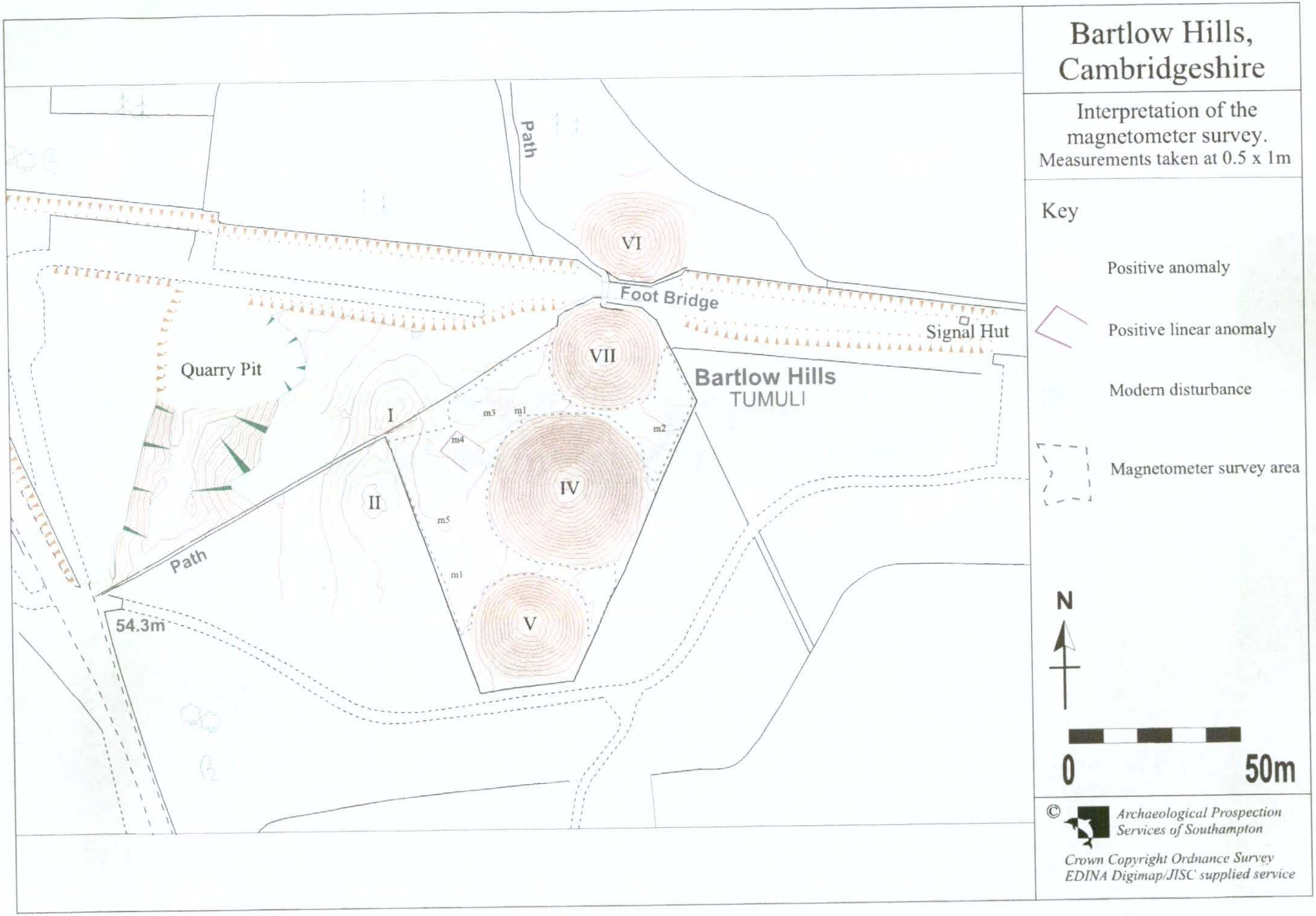
Bartlow Hills, Cambridgeshire

Greyscale image of the magnetometer survey results. Measurements taken at 0.5 x 0.5m

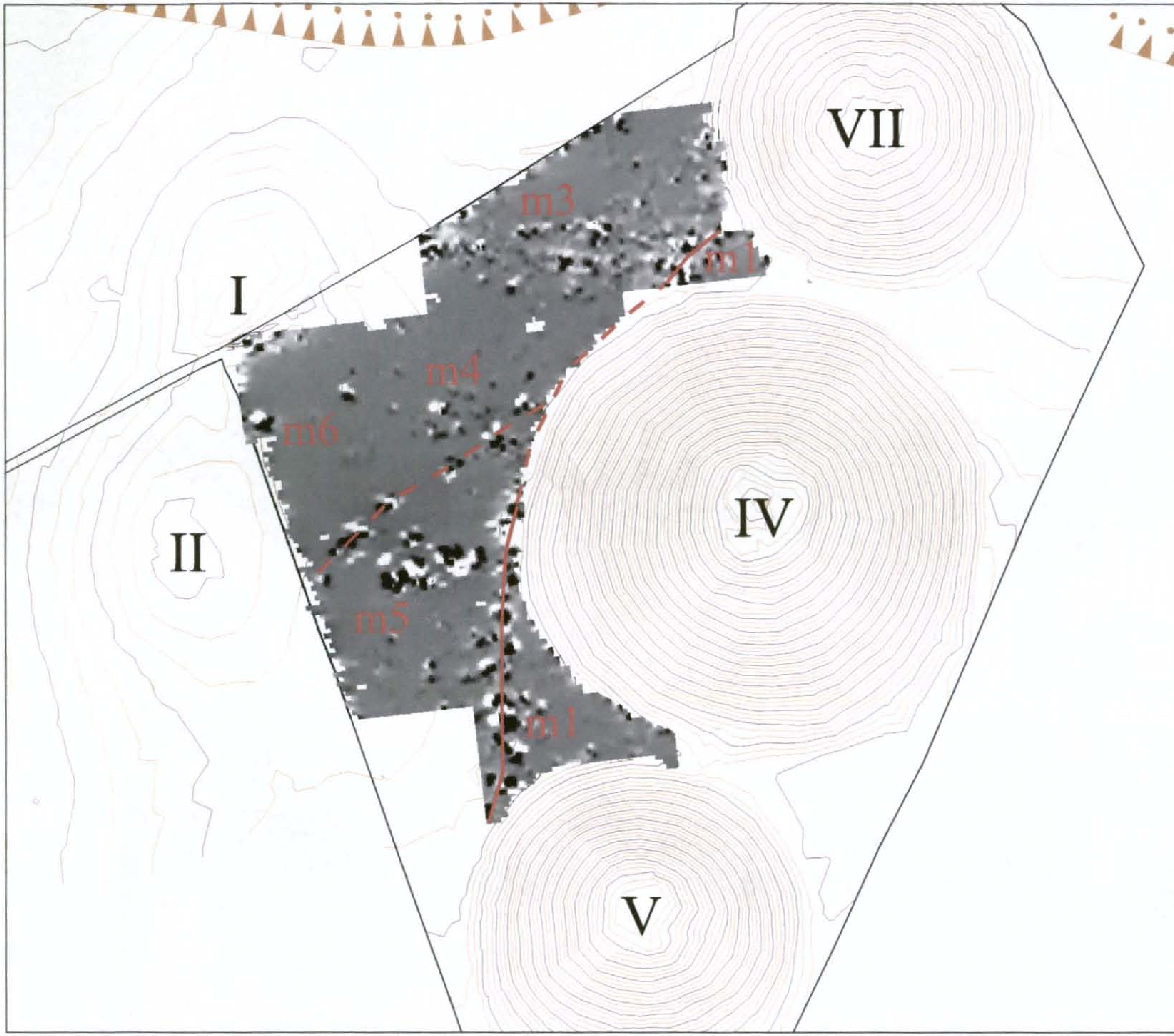


N

0 50m



Bartlow Hills, Cambridgeshire
Interpretation of the magnetometer survey.
Measurements taken at 0.5 x 1m
Key
Positive anomaly
Positive linear anomaly
Modern disturbance
Magnetometer survey area
N
0
50m
Path
Quarry Pit
I
II
IV
V
VI
VII
m1
m2
m3
m4
m5
Foot Bridge
Signal Hut
Bartlow Hills
TUMULI
54.3m



Bartlow Hills, Cambridgeshire

Fig. 14 Interpretation of magnetometer survey (detail) may also represent an archaeological feature. Fig. 14 also shows a curved line running between m1 and m4, which may represent another fence line. Features m4, m5 and m6 also appear in the Resistivity survey (see below).

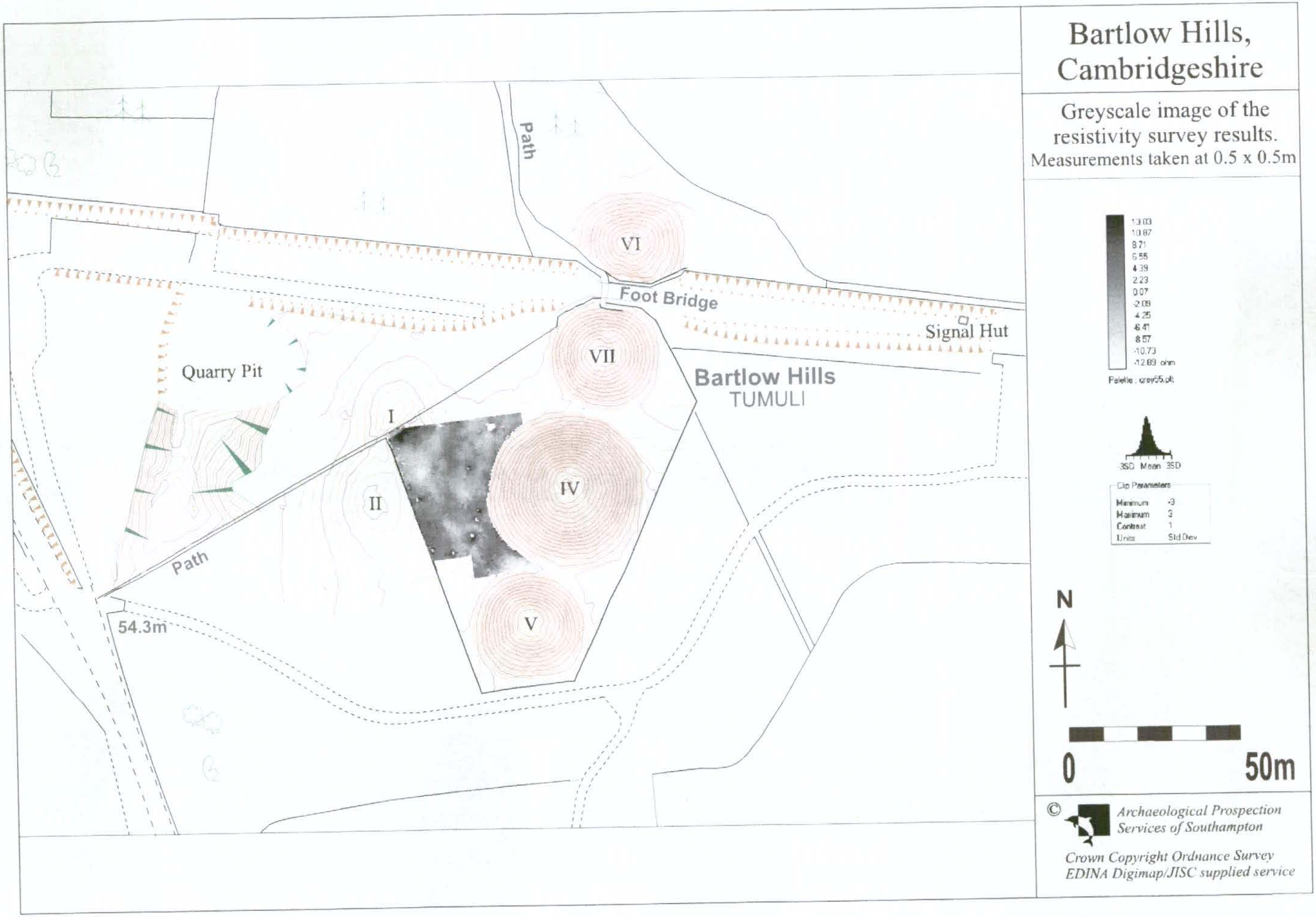
Method & results: Resistivity

Resistivity survey is based on the ability of sub-surface materials to conduct an electrical current passed through them. There are extreme cases of conductive and non-conductive material (Scollar et al 1990, 307), but differences in the structural and chemical make-up of soils mean that there are varying degrees of resistance to an electrical current (Clark 1990, 27). The technique is based on the passing of an electrical current from probes into the earth to measure variations in resistance over a survey area. Resistance is measured in ohms (Ω), whereas resistivity, the resistance in a given volume of earth, is measured in ohm-metres (Ωm). This survey used a Geoscan Research RM 15 with a Twin Electrode Configuration (Clark 1990; Gaffney et al. 1991, 2), undertaken with a 0.5m separation between mobile probes. A number of factors may affect interpretation of twin probe survey results, including the nature and depth of structures, soil type, terrain and localised climatic conditions. Response to non-archaeological features may lead to misinterpretation of results, or the masking of archaeological anomalies. A twin probe array of 0.5m will rarely recognise features below a depth of 0.75m (Gaffney et al 1991). More substantial features may register up to a depth of 1m.

Although changes in the moisture content of the soil, as well as variations in temperature, can affect the form of anomalies present in resistivity survey results, in general, higher resistance features are interpreted as structures which have a limited moisture content, for example walls, mounds, voids, rubble filled pits, and paved or cobbled areas. Lower resistance anomalies usually represent buried ditches, foundation trenches, pits and gullies.

The resistivity survey was targeted on the most promising areas identified by the magnetometer survey (fig. 15 a-b; fig. 16).

The Resistivity survey reiterated the results of the magnetometer survey; again the anomalies are not well defined and modern disturbance has been identified (r1). Traces of a rectilinear high resistance feature (r2) similar both in location and orientation to m4 may indicate the presence of a structure. Surrounding it is an area of high resistance perhaps suggesting a spread of building material. It is this feature which most closely resembles the antiquarian description of the flint platform. The rectangular feature to the south (r3) shares close similarities with feature m5 identified in the magnetometer survey. Also of interest is the small low resistance anomaly (r4) which is in the same location as m6 and which may represent a pit of robbed out stone feature.



Bartlow Hills, Cambridgeshire
Greyscale image of the resistivity survey results.
Measurements taken at 0.5 x 0.5m
13.03
10.87
8.71
6.55
4.39
2.23
0.07
-2.09
-4.25
-6.41
-8.57
-10.73
-12.89 ohm
Palette : grey55.plt
-3SD Mean 3SD
Clip Parameters
Minimum -3
Maximum 3
Contrast 1
Units Std Dev
N
0
50m
Path
VI
Foot Bridge
Signal Hut
VII
Quarry Pit
Bartlow Hills
TUMULI
I
II
IV
V
Path
54.3m
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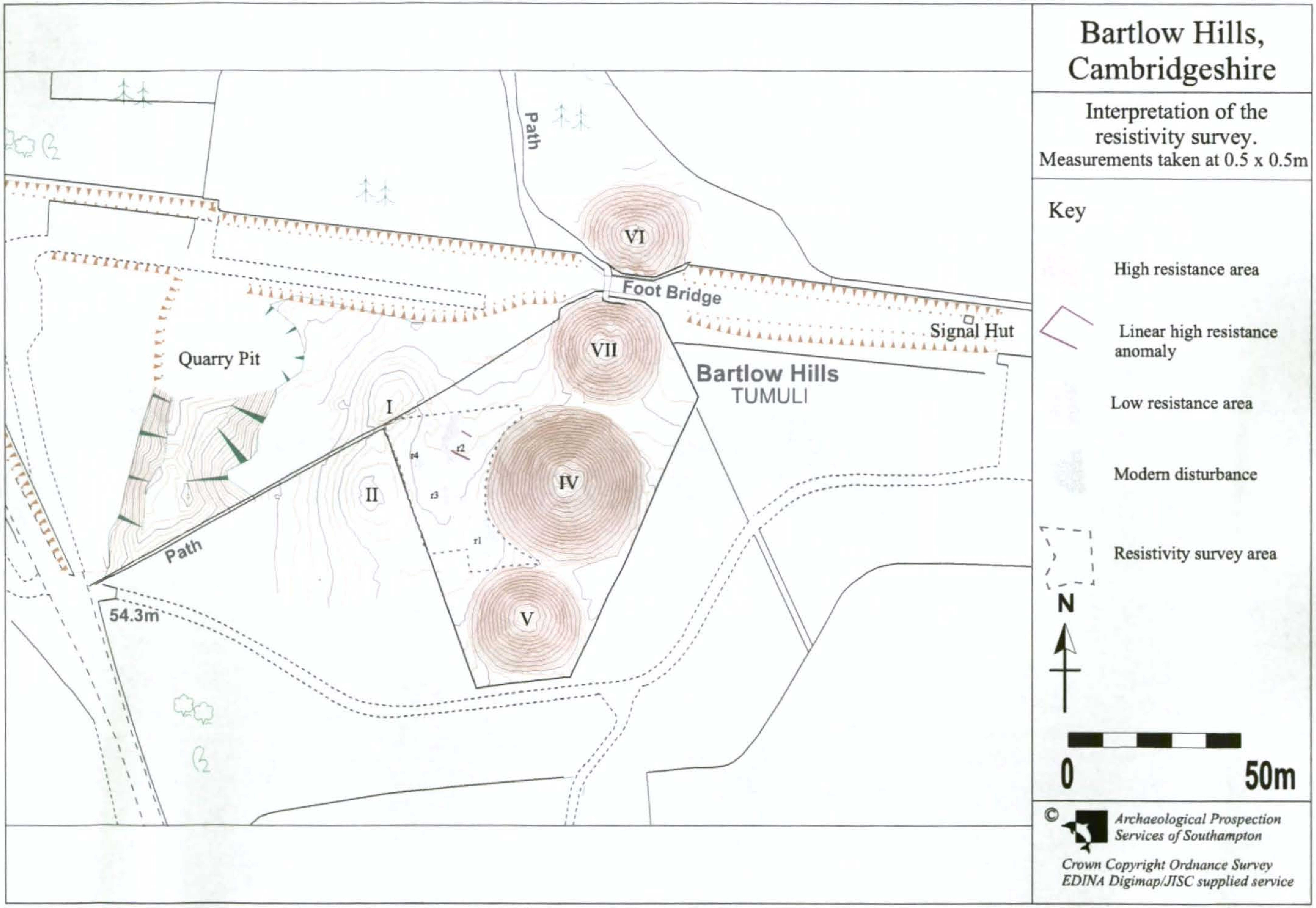
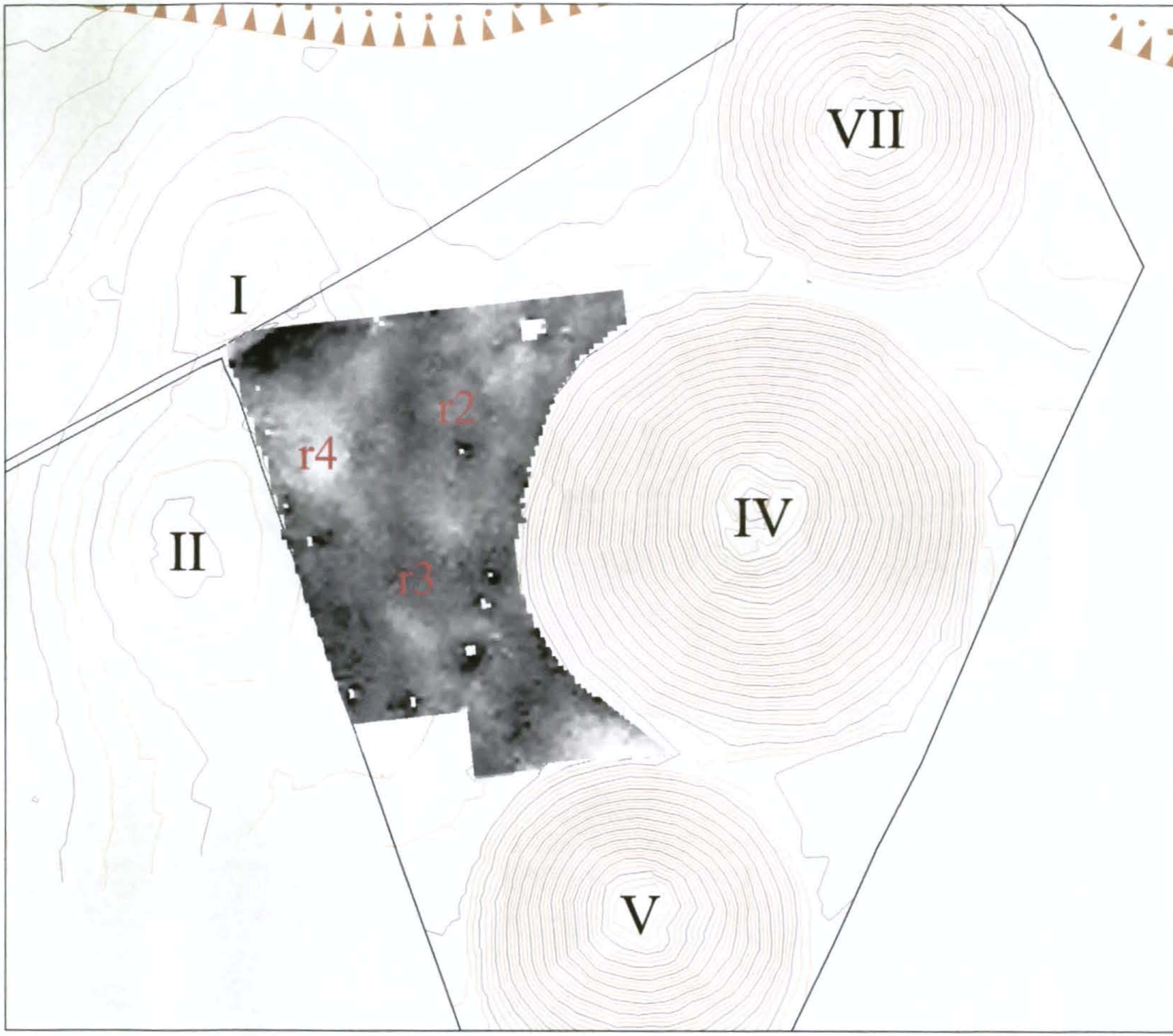

Bartlow Hills, Cambridgeshire
Interpretation of the resistivity survey.
Measurements taken at 0.5 x 0.5m
Key
High resistance area
Linear high resistance anomaly
Low resistance area
Modern disturbance
Resistivity survey area
N
0
50m
© Archaeological Prospection Services of Southampton
Crown Copyright Ordnance Survey EDINA Digimap/JISC supplied service
Path
VI
Foot Bridge
Signal Hut
Quarry Pit
VII
Bartlow Hills
TUMULI
I
II
IV
V
r1
r2
r3
r4
Path
54.3m



Bartlow Hills, Cambridgeshire

Fig. 16 Interpretation of resistivity survey (detail)

Fig. 17: Clearance work on the Bartlow Hills in 1992 (Photo by A. Taylor in Cambridgeshire Collection).

In conclusion, the survey has identified a number of features although the majority appears to be modern. Even some of the features tentatively identified in the area between Barrows IV and II may in fact represent more recent activity, such as the elaborate campfire created in that area during the clearing of the barrows in 1992 (fig. 17). The exact nature of all the features identified can only be determined by targeted excavation (see 'Future Work' below).

2D and 3D Electrical Resistance Tomography

Dr Timothy Astin

An initial pilot study of geophysical methods applied to the internal structure of the four large Bartlow Hills in April 2004 included a trial of Electrical Resistance Tomography (ERT). A single line was obtained across the second most northerly of the four main mounds (Barrow VII). This section showed significant contrasts in resistivity within the mound. As a result, a further trial of ERT on the other three mounds was undertaken in December 2004 and April 2005 (fig. 18).

There were several objectives of this further trial. One was to acquire some data for each of the other three large mounds present. Another was to compare different methods of collection of data across the mounds. On the southernmost mound (Barrow V), three 2-D lines were taken across the centre of the mound at different orientations to test for variation in radial structure.

On the largest mound (Barrow IV), two lines were taken as slices off-centre. These were positioned to be at right angles to the known sub-horizontal passage to the centre of the mound made in the 19th century. A total of twelve lines was taken, at 2 m intervals between them. These lines can be combined to form a 3-D image of this part of the barrow. Because of the pit in the centre of the platform at the top of the barrow, the first line was taken four metres away from the centre line. Lines then extended down to the margin of the barrow.

On the northernmost mound (Barrow VI), one 2-D line was taken across the centre of the mound. A series of seven 2-D lines were taken from the edge of the mound to just beyond the middle. These 'half-lines' were parallel, and together made up a 3-D section through the northern side of that mound.

Method

Data were obtained using a Campus Geopulse resistance meter with up to 50 electrodes deployed, and with electrode switching controlled by a laptop PC. ERT inversions were obtained using the programs Res2Dinv and Res3Dinv. An electrode spacing of 1m was used for most of the 2-D lines. A spacing of 2m was needed for the longer transects across the largest mound, where the lines were up to 76m long.

The inversion modelling takes account of the significant topography present by utilising a finite element model. However, the 2-D inversion assumes that both topography and resistance structure continues uniformly in the third dimension. In reality both the topography, and the resistance structure, vary sideways from the 2-D profiles. The significant variation in topography in the third dimension adds a complication to interpreting the models not usually encountered in 2-D ERT profiling.

3-D modelling incorporates more comprehensive topographic data, but there are still significant variations in topography immediately outside the modelled area. Datasets for 3-D model inversion are constructed by integrating data from 2-D lines. This means that there is rather uneven data coverage, because resistivity measurements have all been obtained with electrode arrays orientated in one direction. Ideally additional measurements would be made in the orthogonal direction, but the time available for data collection prevented this.

A practical difficulty was the extent of vegetation, especially shrubs and small trees, which has grown up on the mounds. These hampered data collection generally. Trees on the southern half of Barrow VI prevented investigation of this part of the barrow. Shrubs on Barrow V inhibited the taking of a fourth line to complete a radial survey of this barrow.

Results

Barrow V

Three lines were taken across the middle of the barrow, in a W-E, NW-SE, and N-S direction (fig. 19).

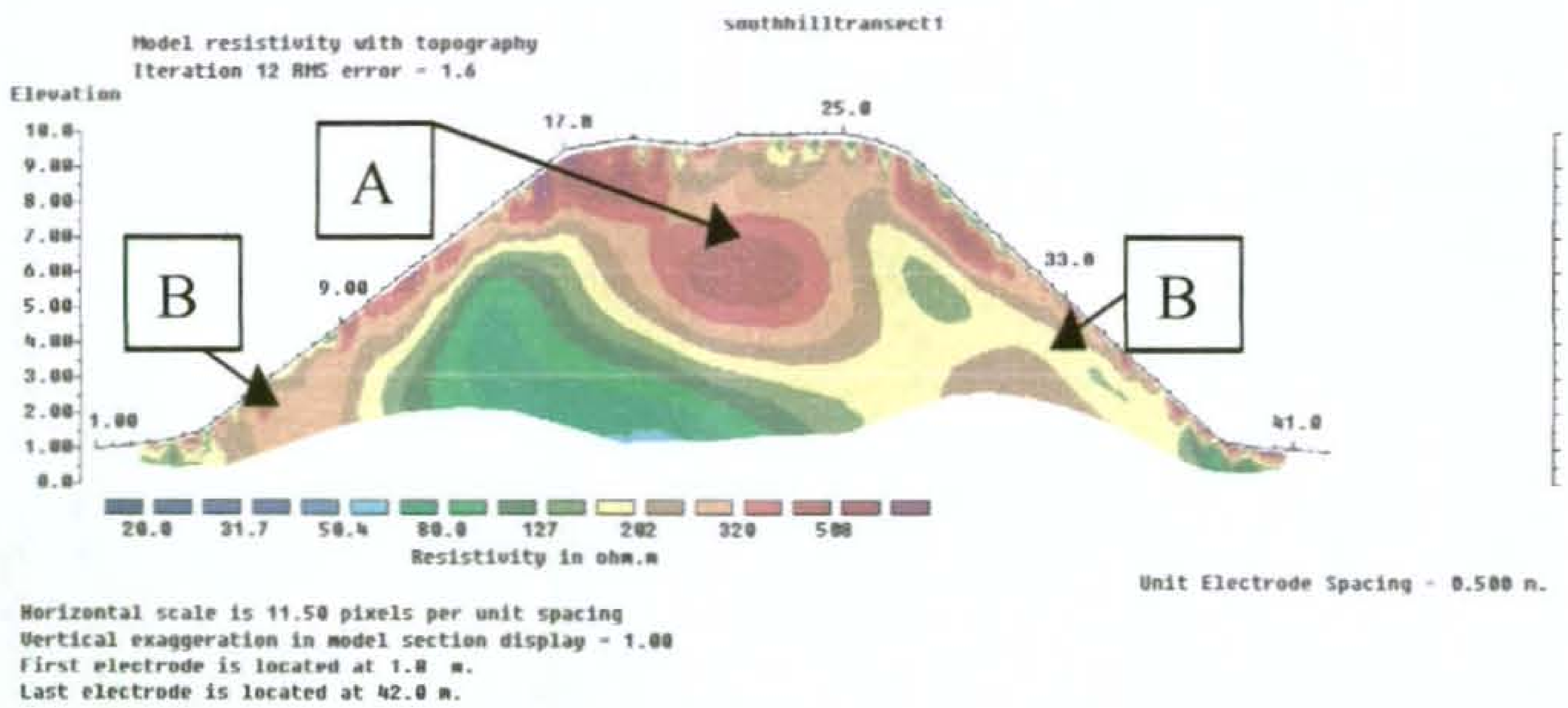


Figure 19 a. W-E section across the southernmost mound (Barrow V).

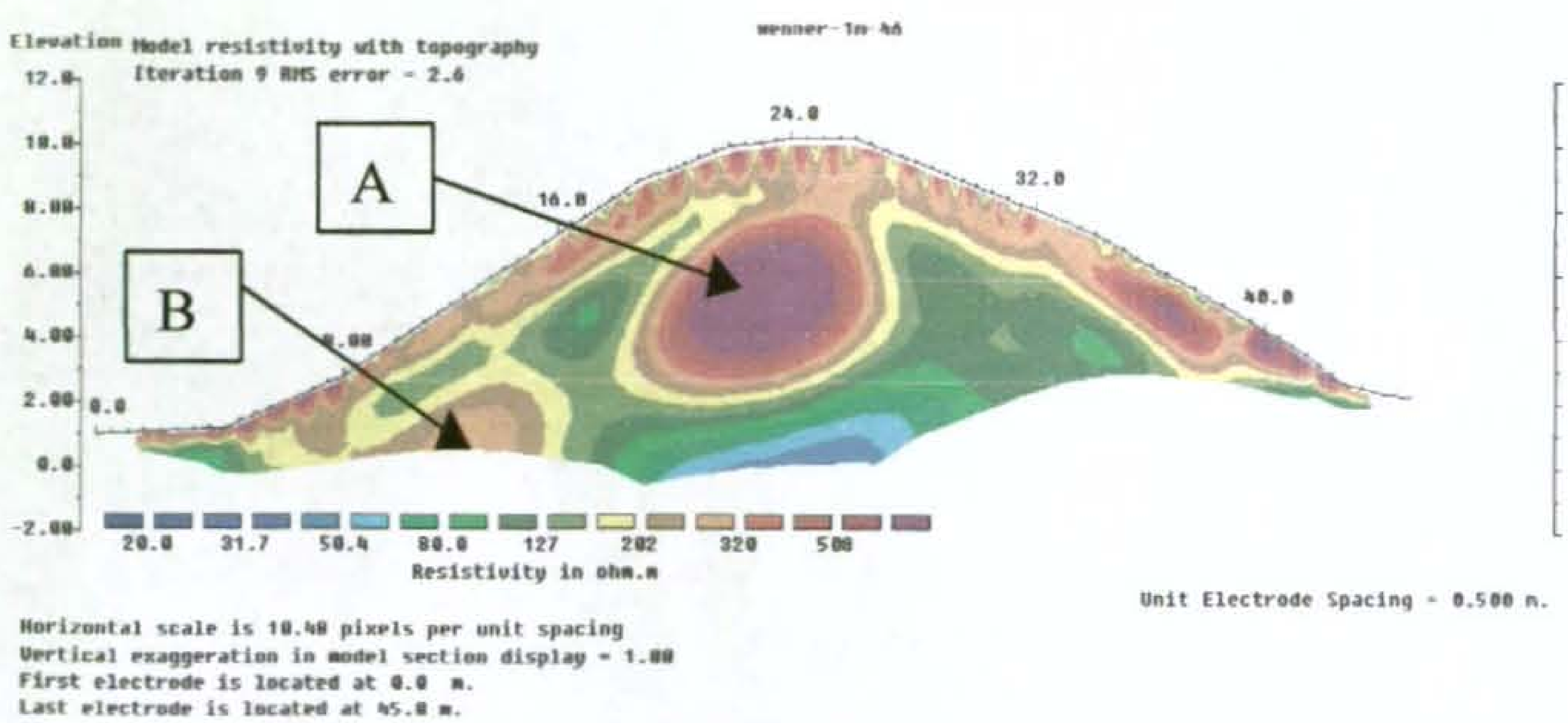


Figure 19 b. NW-SE section across the southernmost mound (Barrow V).

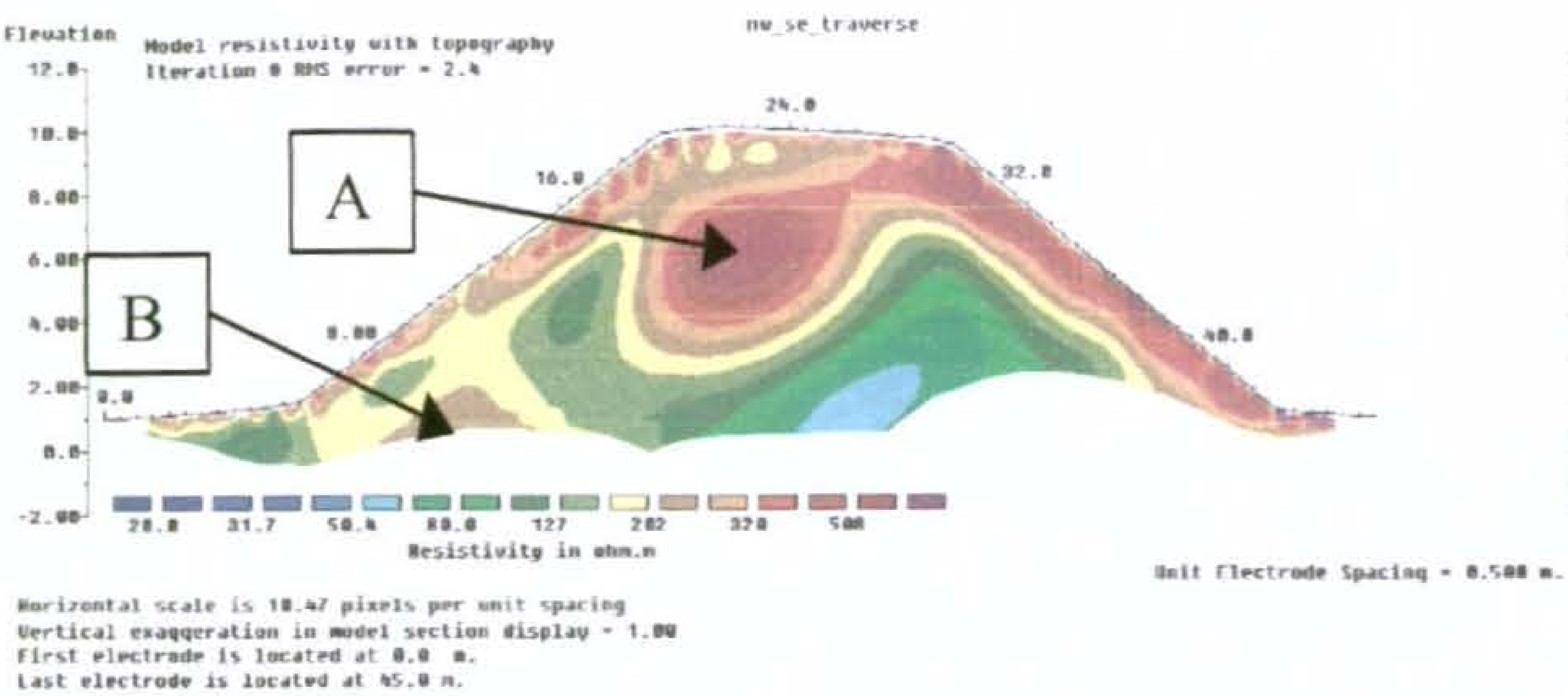


Figure 19 c. N-S section across the southernmost mound (Barrow V).

All three lines show a high resistivity feature located in the centre of the barrow (A). This feature does not extend down to the former ground surface, but sits with its centre four to five metres above the former ground surface. One possible interpretation is of a high resistance fill to an antiquarian excavation. The symmetry of this anomaly would imply an excavation from the top, or near to the top of the barrow, and angled steeply downwards. This could be consistent with the uneven, to gently sloping, topography of the top of the barrow.

The outer surface of the barrow also has high resistivity, as would be expected from an unsaturated zone relating to the vegetation, sub-soil, and localised rabbit burrows of this part of the barrow. Apart from the central high resistivity feature, the majority of the mound has resistivity in the range 50-150 Ohm.m, consistent with partially saturated Chalk, which is the expected material.

There is also a tendency for higher resistivity, over 200 Ohm.m, to occur 2-4 m inwards from the margins of the barrow (B). Tentatively, this could relate to material used for a revetment during construction of the barrow, to help maintain its steep profile.

Barrow VII

This was the first line taken across any of the barrows (fig. 20). The line was taken across the centre of Barrow VII. Actually this line consists of total coverage with a 1m electrode spacing, supplemented with 0.5 m spacing on the SSE side, to see the effect of obtaining Wenner data at greater resolution.

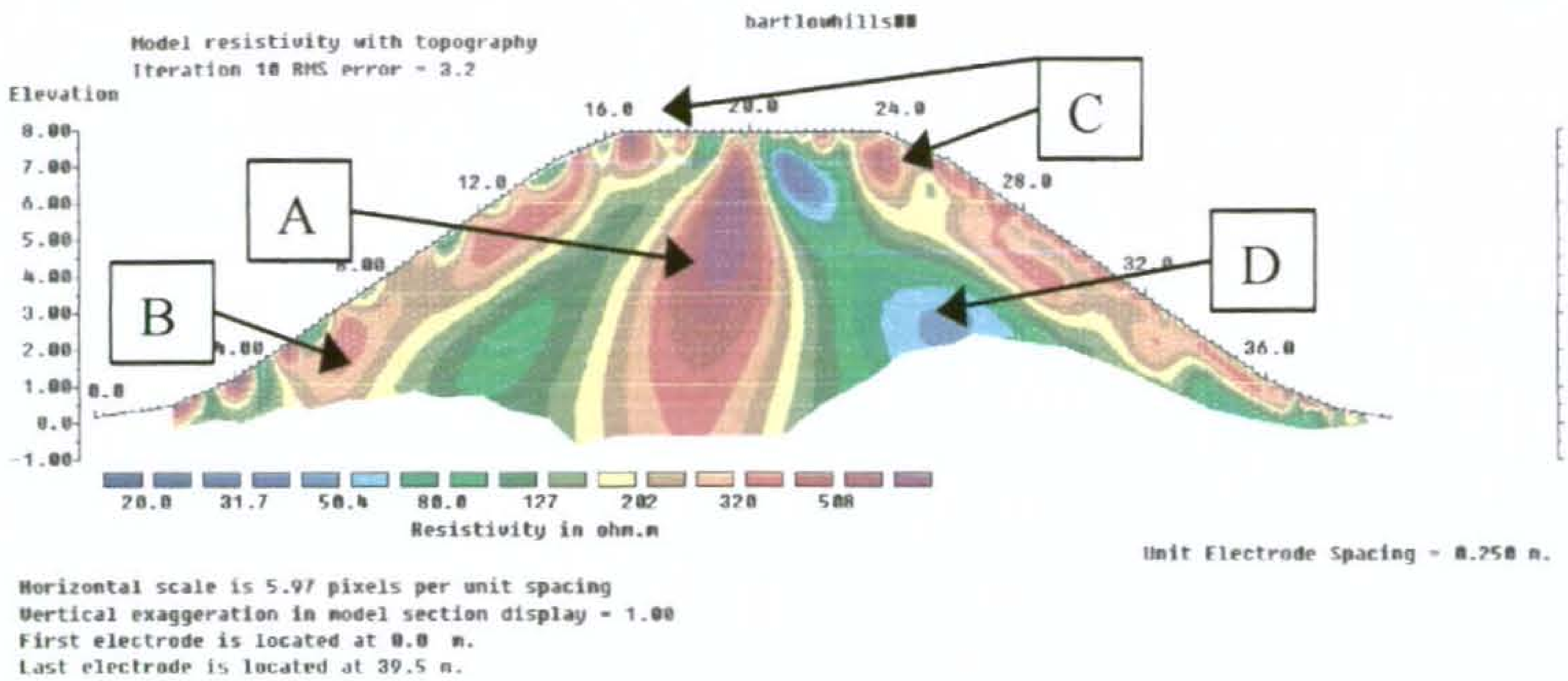


Figure 20: NNW-SSE transect of the north-central mound (Barrow VII).

It was noticed that shallowly-buried chicken wire (D) has been laid along the line of the well-used path to the top of the barrow, presumably to prevent soil erosion. Although the chicken wire did not seem to cross the line of electrodes, this wire inevitably causes a low resistivity feature running down the surface of barrow at about 60^0 to the profile. Its effect is seen projected on to the profile in the low-resistance (under 70 Ohm.m), apparently steeply dipping feature on the SSE side of the profile. This feature should be discounted. Partly because of this chicken-wire, and partly to obtain data from all the main barrows, further ERT profiles were not taken from this Barrow.

The profile also shows a high resistivity feature (A) in the central part of the mound, and extending from near the surface towards the original ground surface. This pattern is comparable to that of Barrow V. It seems likely that this feature is a result of ground disturbance and back-filling during antiquarian excavation, and may imply access was from at or near the top of the mound.

This interpretation is supported by the documentation of a collapse hollow appearing in the top of the barrow in the early 20^{th} century (Brooklebank, VCH Essex 1963, 43). Development of collapse from a void working is way upwards towards the surface, and perhaps subsequently infilled is likely to cause a high resistivity feature. Whether the void developed from an original central chamber, or from uncompacted back-fill of an antiquarian access shaft or tunnel, is unknown.

Again, the mound has a "carapace" of higher resistivity. Within this, there are high resistance (>500 Ohm.m) anomalies towards the outer edge of the flat upper surface of the barrow (C). This might indicate some anomalous material has been used to support the outer edge of this platform, or to support a structure at some time. Just one possibility for a time when the near surface of the barrow might have been modified is the likely use of this barrow for a gun emplacement during the Second World War.

On the NNW side, there is also a higher resistance feature about 3-4m in from the edge of the mound (B). As in Barrow V, this could indicate the construction of a revetment within the barrow. On the SSE side, such a feature is not obviously present, though this part of the image may be affected by the chicken-wire.

Barrow VI

One line was taken across the centre of the barrow (fig. 21a).

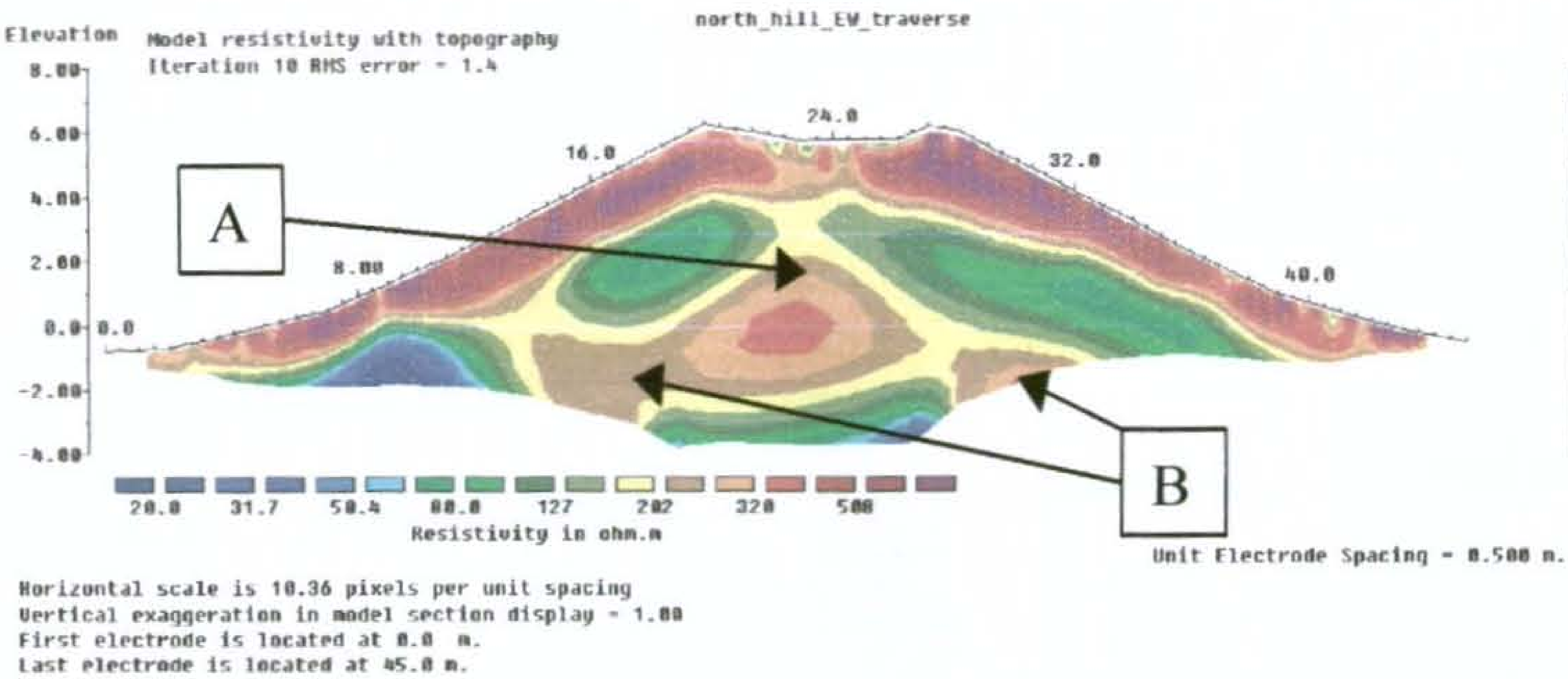


Figure 21a: NNW-SSE transect across the centre of Barrow VI.

This shows a central high resistivity feature (A) at the centre of the barrow, centred on where the central chamber is expected to have been. Lower resistivity, but still higher than the rest of the barrow, extends up towards the central depression in the top of the mound. This depression is likely to result from some combination of the location of a central antiquarian access shaft, or subsidence over an incompletely back-filled access excavation.

There are also near symmetrical high resistance features on about the original ground surface, and about 4-5m from the centre of the barrow, and about 6-7m from the margin of the barrow (B). The symmetry of these strongly suggests these are constructional features, made of more resistive material, (such as stone or brick). Although these features are nearer to the centre of the mound, there is some comparison with the higher resistivity features of Barrow V and VII. These implied structures may also relate to revetment, or reinforcement of the mounds during construction. However, their position nearer to the centre than the margin makes it slightly more likely that they may relate to a possible grave structure buried under the barrow. The other large barrows contained tile or timber chambers but as the original excavation of Barrow VI is largely undocumented, such information is lacking here.

Again there is a "carapace" of high resistivity over the mound. This carapace is thicker, and of higher and more consistent resistivity than on the other mounds. It was noticed that extensive rabbit burrows on this mound penetrated mainly sandy material, which overlay the Chalk rubble of the main part of the mound.

It seems likely that this mound has a more extensive covering of sandy soil material than the other mounds. Whether this is an original feature, or a result of later modification or landscaping, is uncertain. However, the topographic survey showed that this barrow is flatter than the other barrows, perhaps implying some reconstruction. Comparison with 19th century images (e.g. fig. 3 & 4b) also clearly shows that the profile and appearance of this barrow has been extensively modified.

The northern slope of this mound is kept clear of undergrowth, and was selected for a test of ERT lines extending up one side of the barrow (fig. 18 & 21). Seven lines were taken parallel to each other. The idea was to test for the presence of revetment structures towards the margin of the mound. Data was inverted both as individual 2-D lines, and also in combination, as a single 3-D inversion.

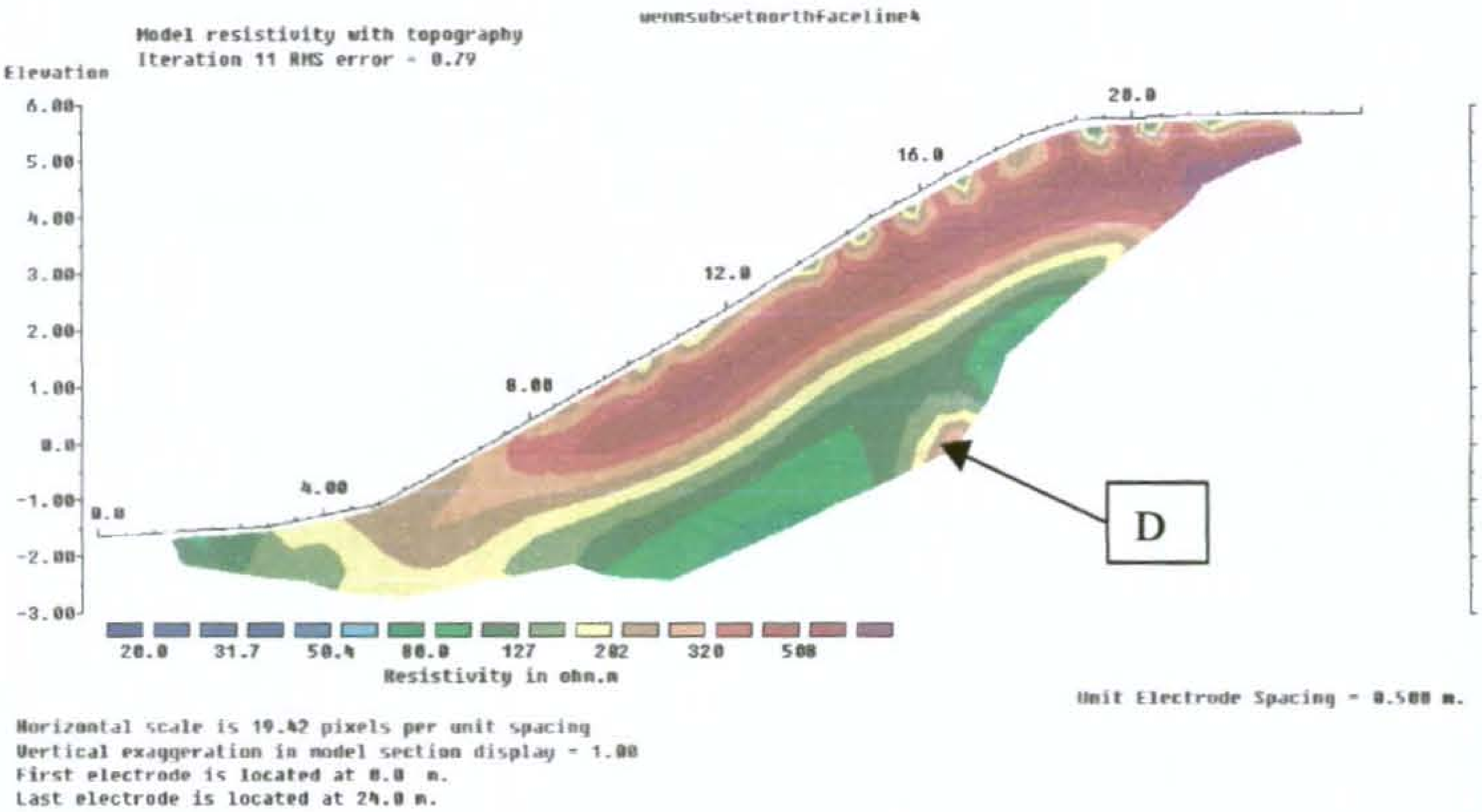


Figure 21b: Example of a typical 2-D inversion from the northern side of Barrow VI.

The 2-D lines show well the "carapace" of high resistivity material. They do not show any clear evidence of a revetment structure. At first sight, there is a high resistivity feature 7-8m from the Barrow margin (D). However, this is increasing towards the bottom apex of the modelled volume, and in this position such a result could be an artefact of the inversion modelling process. Alternatively, this could be pointing to a poorly located higher resistance feature, such as was seen in the complete transect.

Thus, this trial showed that, because of the topography of the barrow limiting the electrode array to one side of the barrow, the array did not penetrate sufficiently deeply to test the critical deeper structure.

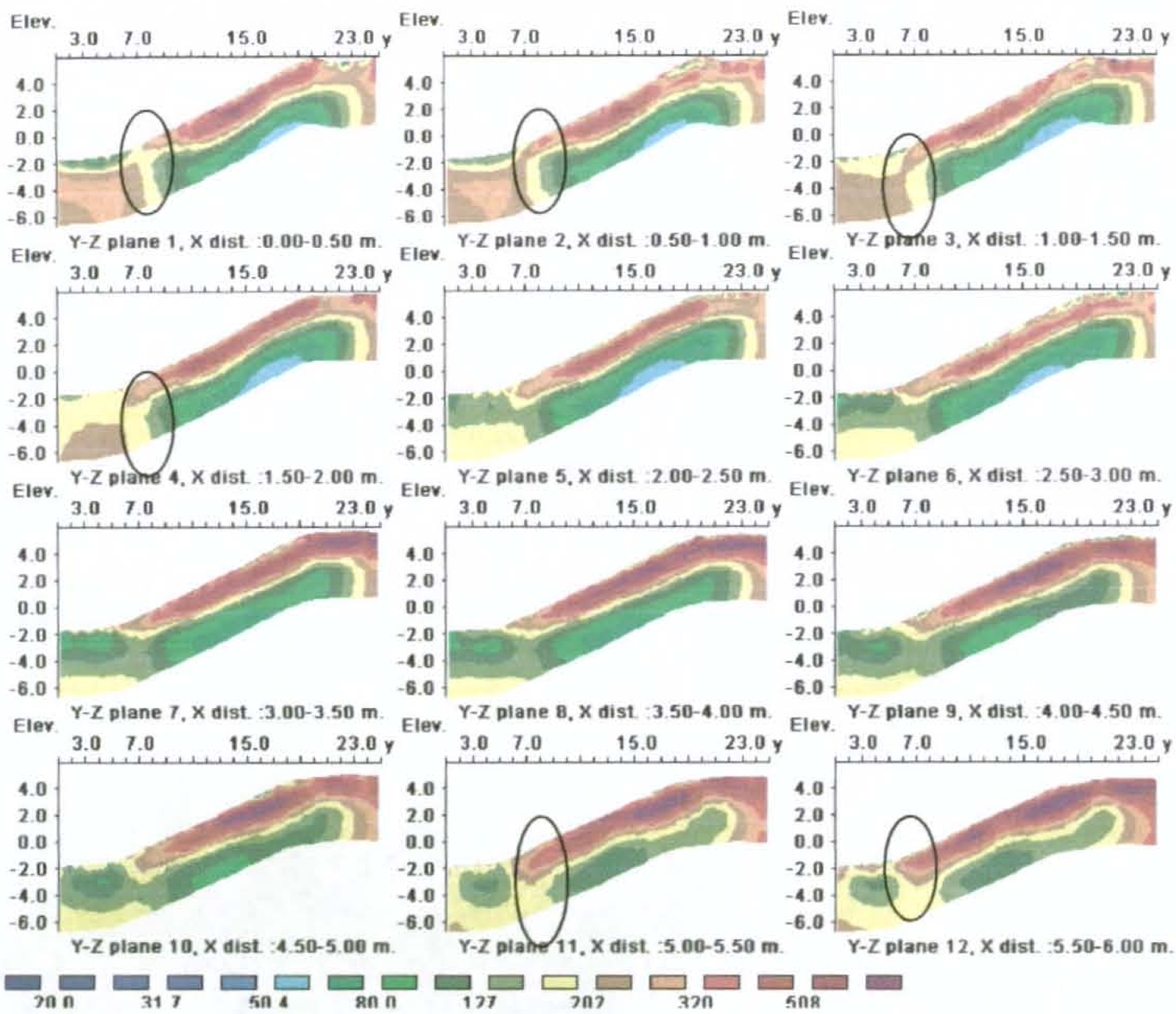


Figure 21c: Cross-sections of the northern part of Barrow VI taken from the 3-D inversion of seven parallel 2-D lines

The 3-D inversion supports this interpretation. The cross-sections of the central parts of the northern side of the mound from this inversion show no evidence of higher resistivity (possible revetment) structures set in from the margin of the barrow. Though again, the data coverage is insufficient to define the deeper structure of the barrow. However, the 3-D inversion does suggest that there is a moderately raised resistivity at the margin itself (typically over 150 Ohm.m against a background of less than 100 Ohm.m), and over about a 2m depth range (fig. 21c). This does suggest a possible revetment, or kerb, at the margin of this barrow.

The 3-D inversion also provides support for the vertical, higher resistivity feature in the centre of the barrow.

Barrow IV

This is the largest mound, and one that was excavated using a horizontal tunnel cut at the height of the natural soil (Gage 1836, 301-302). The tunnel was located on the north-eastern side of the mound (see above, fig. 5) and Gage (1836, 301) describes the construction of the tunnel thus:

> "A section being made into the hill to the extent of sixteen feet, the excavation was continued by a gallery, the mouth of which was secured by a door. The gallery is elliptical, fifty-three feet long to the aperture of the place of sepulchral deposit, six feet two inches high, and three feet wide in the average, until within thirteen feet of the deposit, when the width is increased to seven feet: nearer the centre the aperture takes a semicircular course, which was intended to be pursued in order to give a better opportunity of finding the deposit."

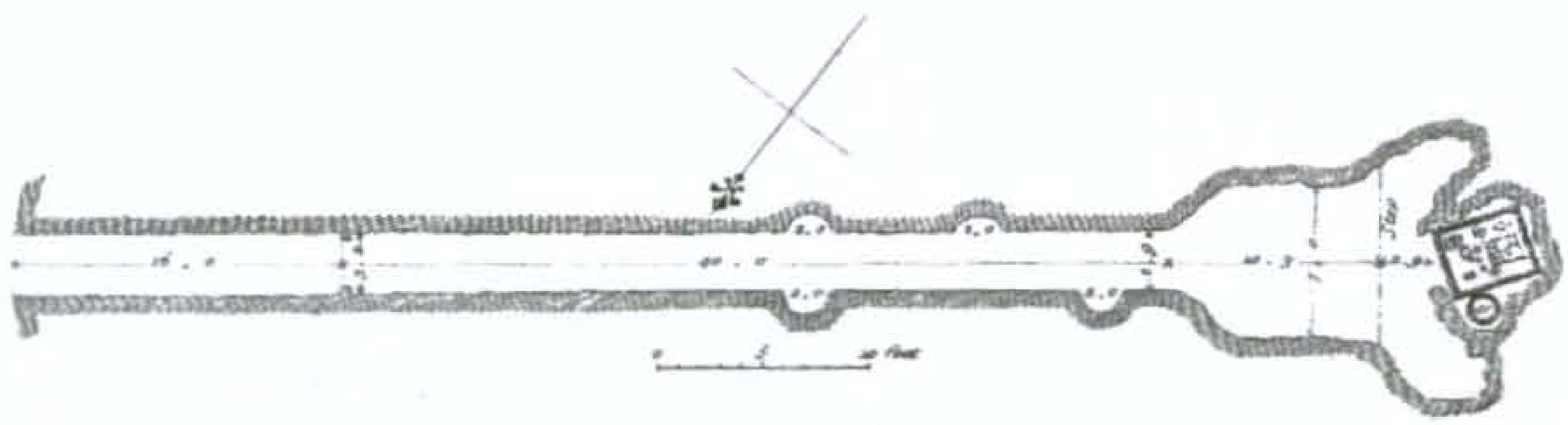


Fig. 22: Plan of the horizontal tunnel dug by Gage into Barrow IV (Gage 1836, fig. 2)

While some shoring appears to have been necessary near the entrance, none was used for the bulk of the tunnel as the mound was found to be of "the firmest consistency" and made up of horizontal layers of earth and chalk, varying in depth from a few inches to a foot or more (Gage 1836, 301). The labourers hit onto a cavity on the tenth day of excavation but the tunnel was locked until the next day, when the landowner and a group of local dignitaries arrived to witness the discovery. Perhaps the most famous of these visitors was the Reverend Adam Sedgwick who sent a letter with an account of his visit to his nephew in April 1840 (Clark & McKenny Hughes 1890, 9-13). Sedgwick (*ibid.*, 11) suggests that he "cannot draw half so well as a pig's foot, which can make its own likeness in mud and clay" but nevertheless includes a sketch drawing which clearly shows the presence of the door at the base of the largest barrow (fig. 23).

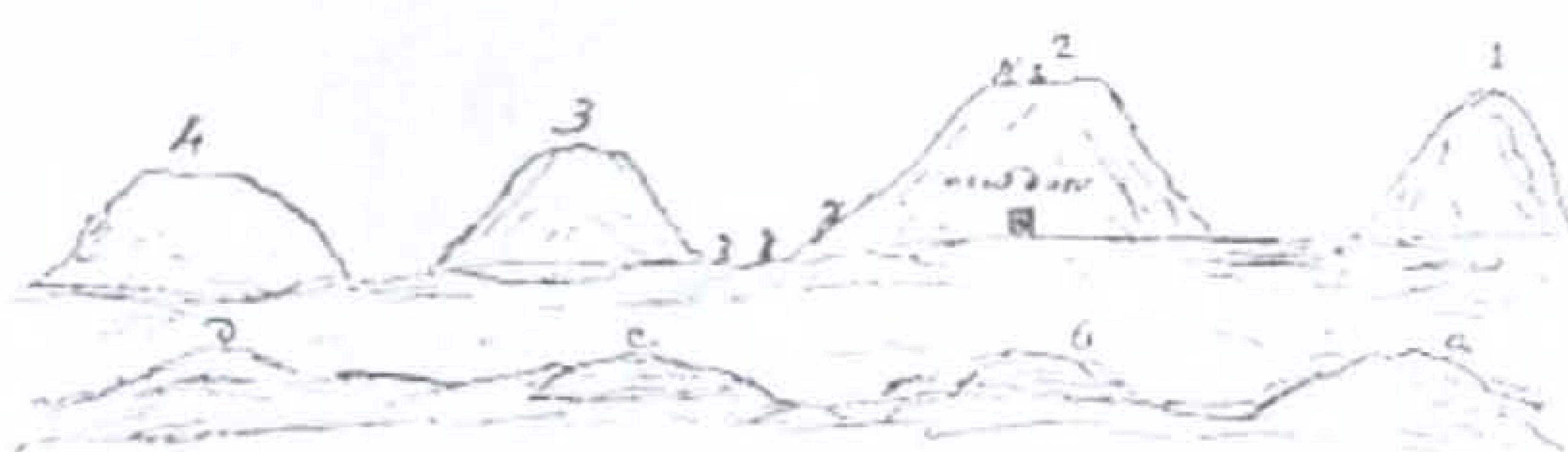


Fig. 23: Sketch by The Rev. A. Sedgwick (who was present at the opening of Barrow IV) of the tunnel door. After: Clark & McKenny Hughes 1890, p. 11).

Figure 24 a: NW-SE transect of the mound.

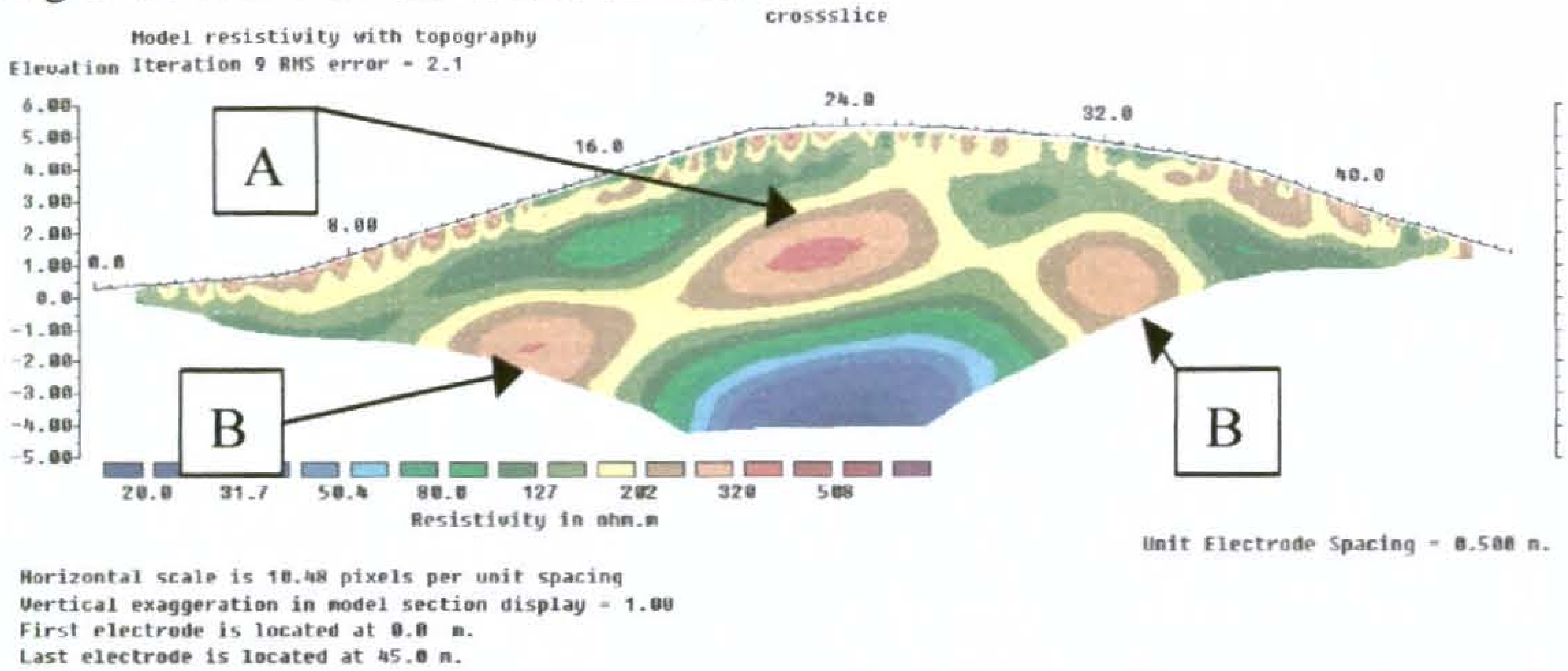
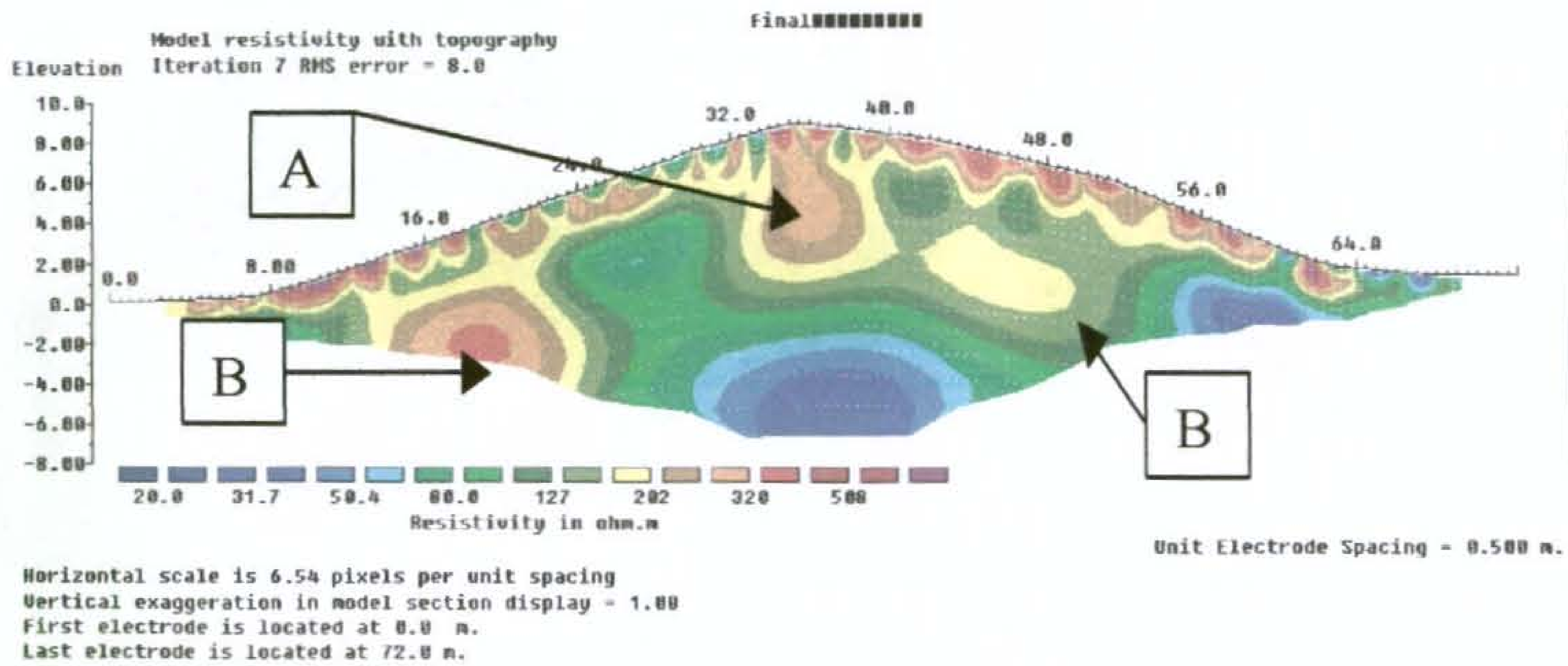


Figure 24 b. NW-SE transect of the mound nearer to the mound centre. Note that the scale is smaller than in Fig 24 a.



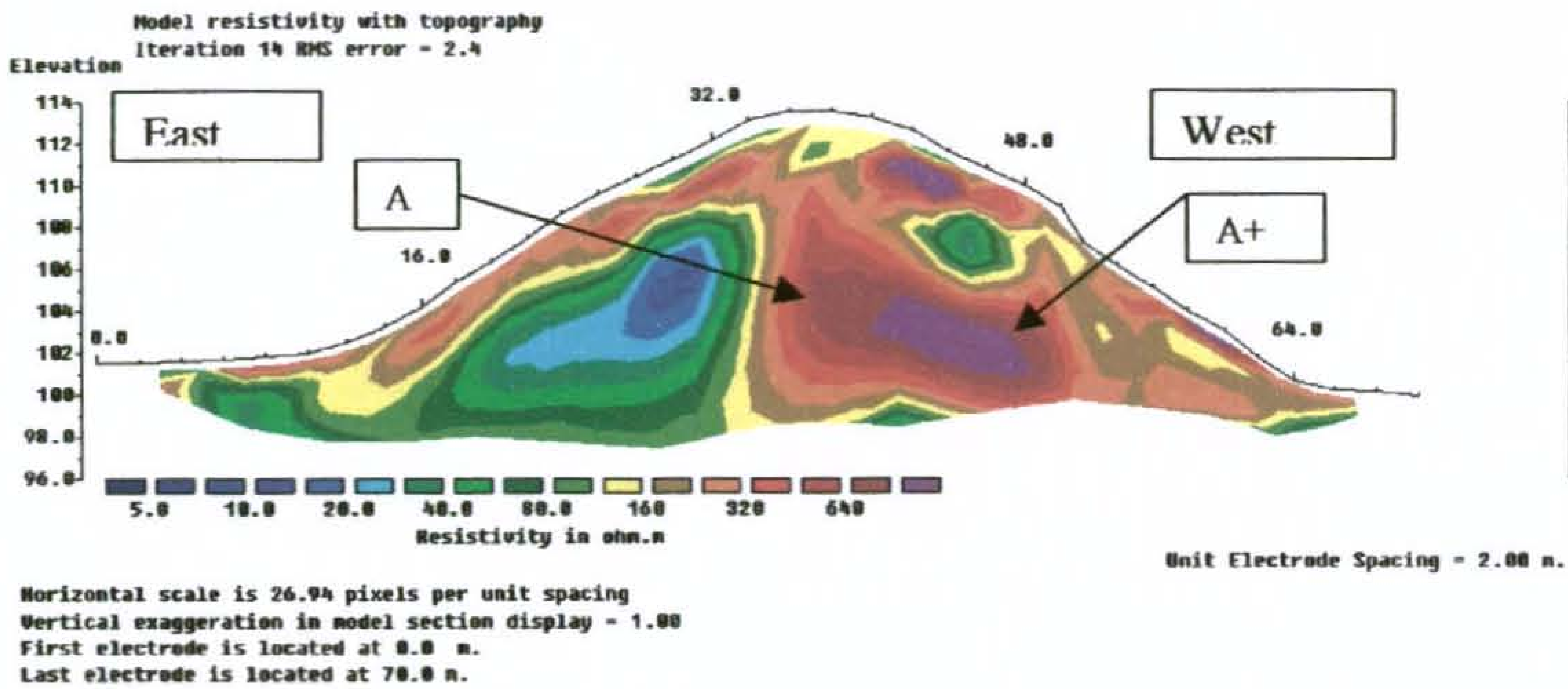
Initially, two ERT lines were taken across the side of this barrow to cross the line of the tunnel (Fig. 24 a, b). One was located about one third of the way up the barrow side, and the other taken about two-thirds of the way up the barrow side.

These ERT lines show significant internal variations, in particular both central, and marginal high resistivity anomalies. These are comparable to such features seen in the other barrows, but the lateral resistivity features are more pronounced.

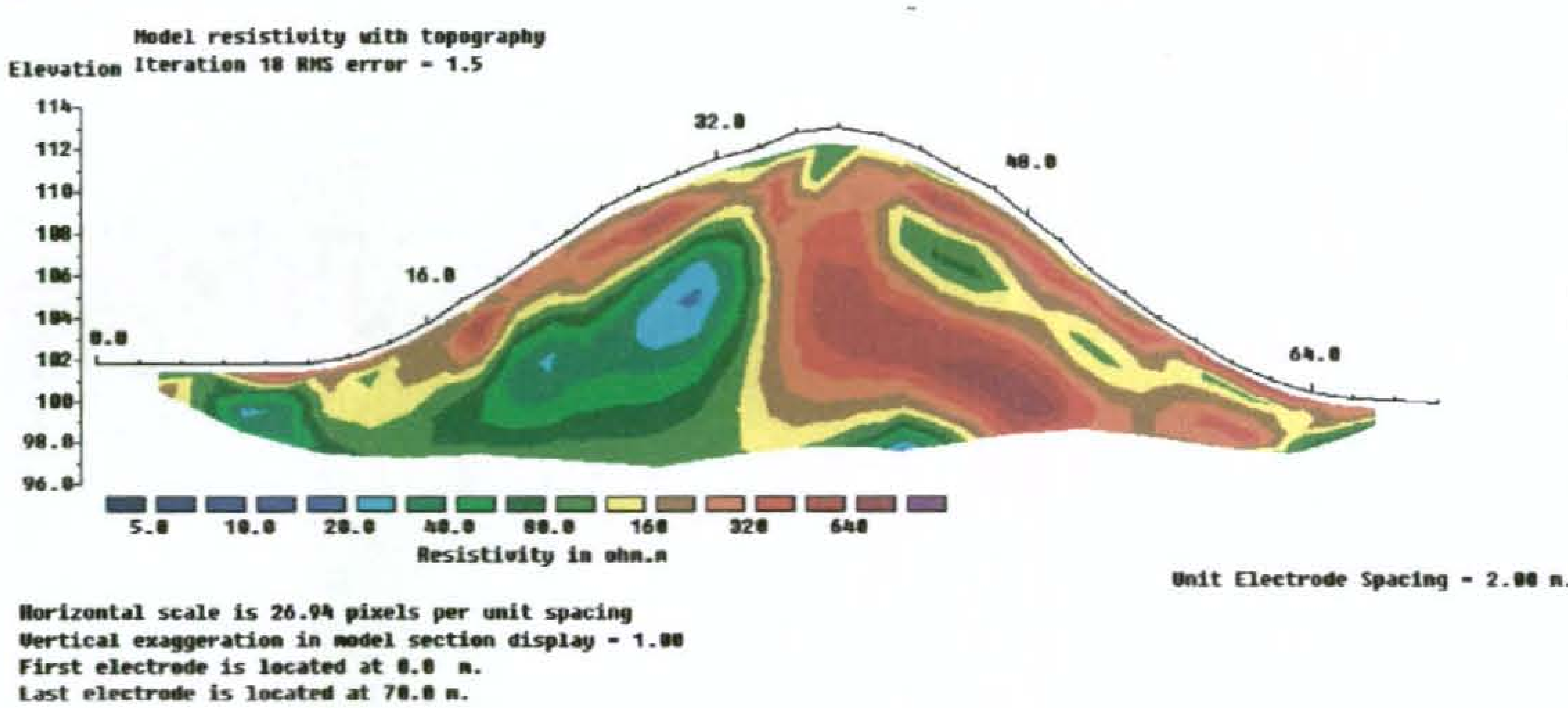
As a result, a set of twelve lines was taken perpendicular to the line of the tunnel, and located from the base of the barrow up to near the centre of the barrow (fig. 18 & 25). These lines form a more comprehensive test of whether the tunnel can be imaged, and can potentially be combined to form a 3-D image of this part of the barrow.

Fig. 25 A-L: Twelve cross-sections of Barrow IV. These lines are parallel to each other, and run from near the centre of the mound (A) to just beyond the edge of the mound (L), at 2m line spacing.

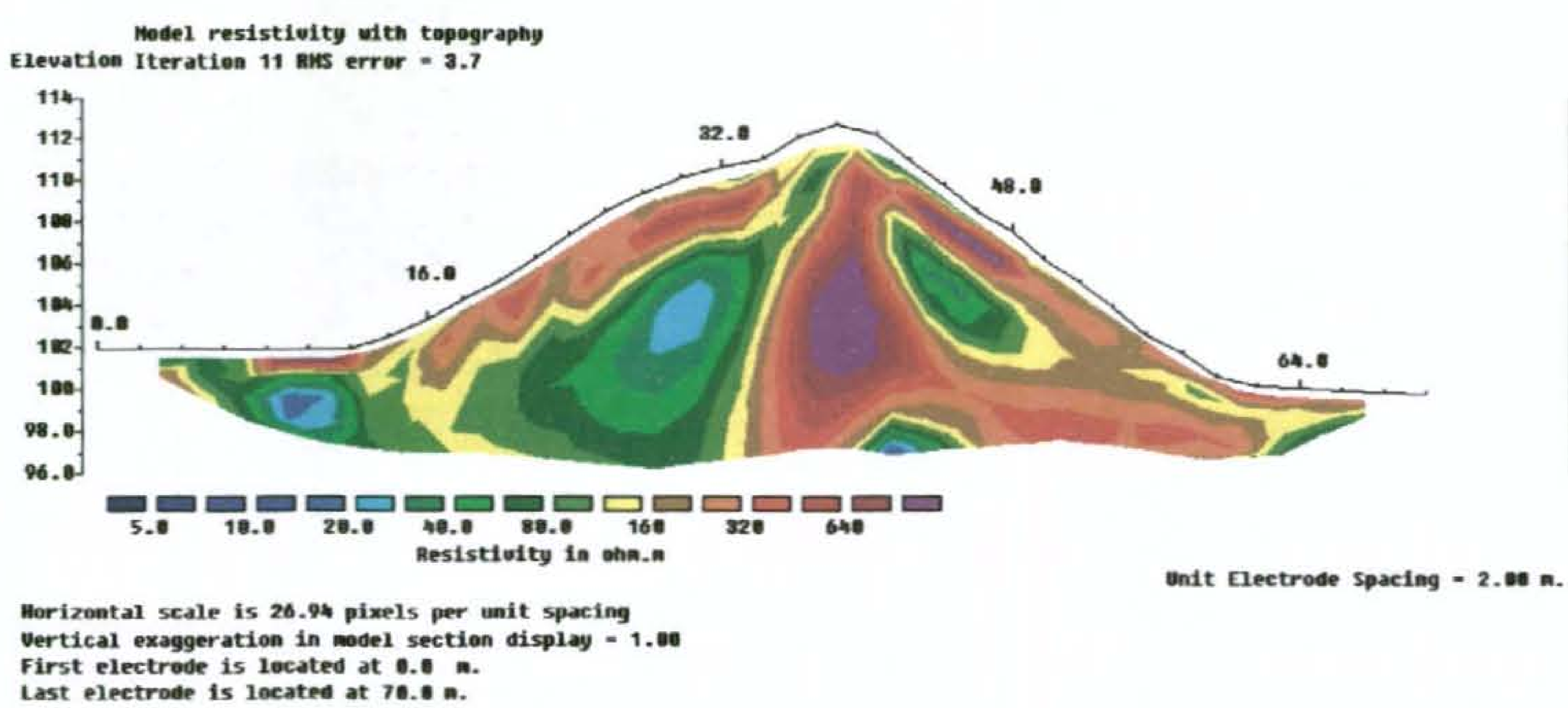
A



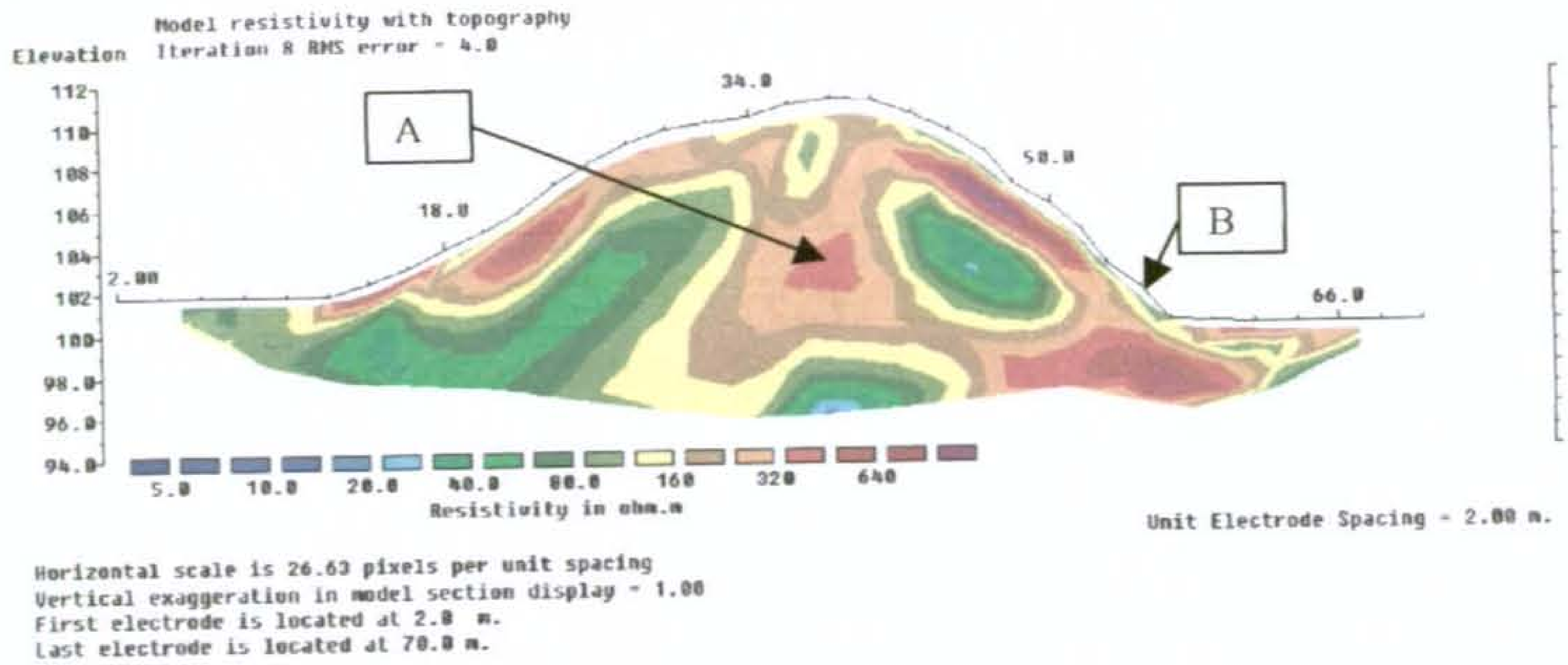
B



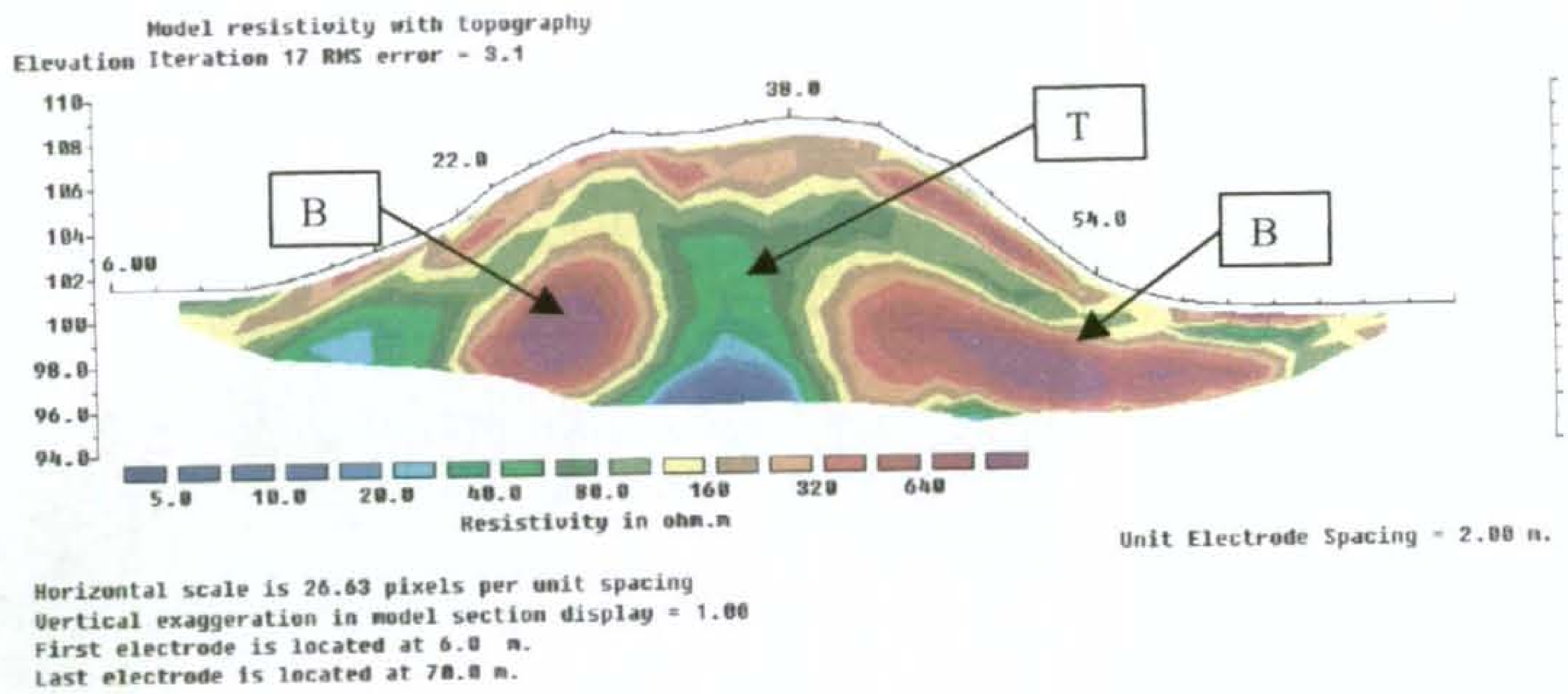
C



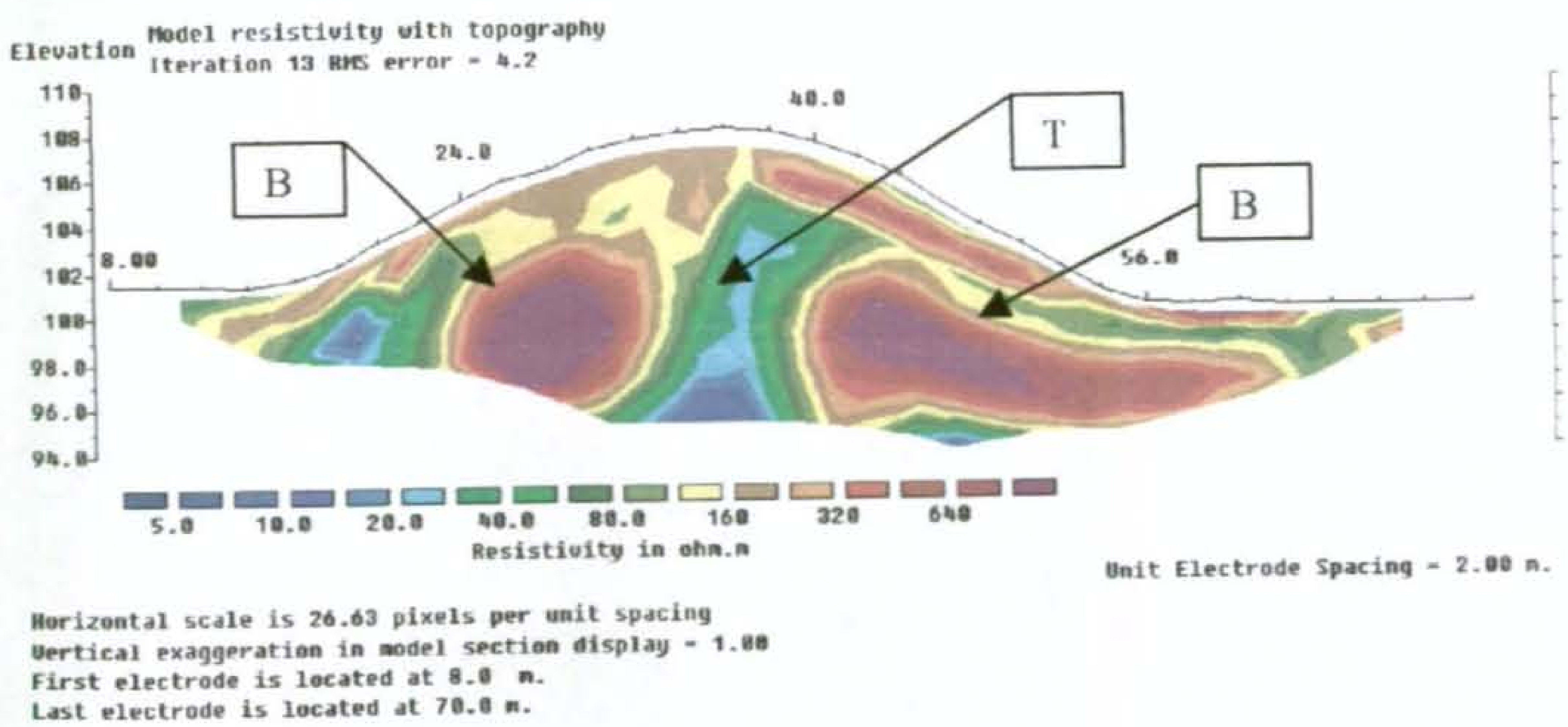
D


Model resistivity with topography
Elevation
Iteration 8 RMS error = 4.0
A
B
Resistivity in ohm.m
Unit Electrode Spacing = 2.00 m.
Horizontal scale is 26.63 pixels per unit spacing
Vertical exaggeration in model section display = 1.00
First electrode is located at 2.0 m.
Last electrode is located at 70.0 m.

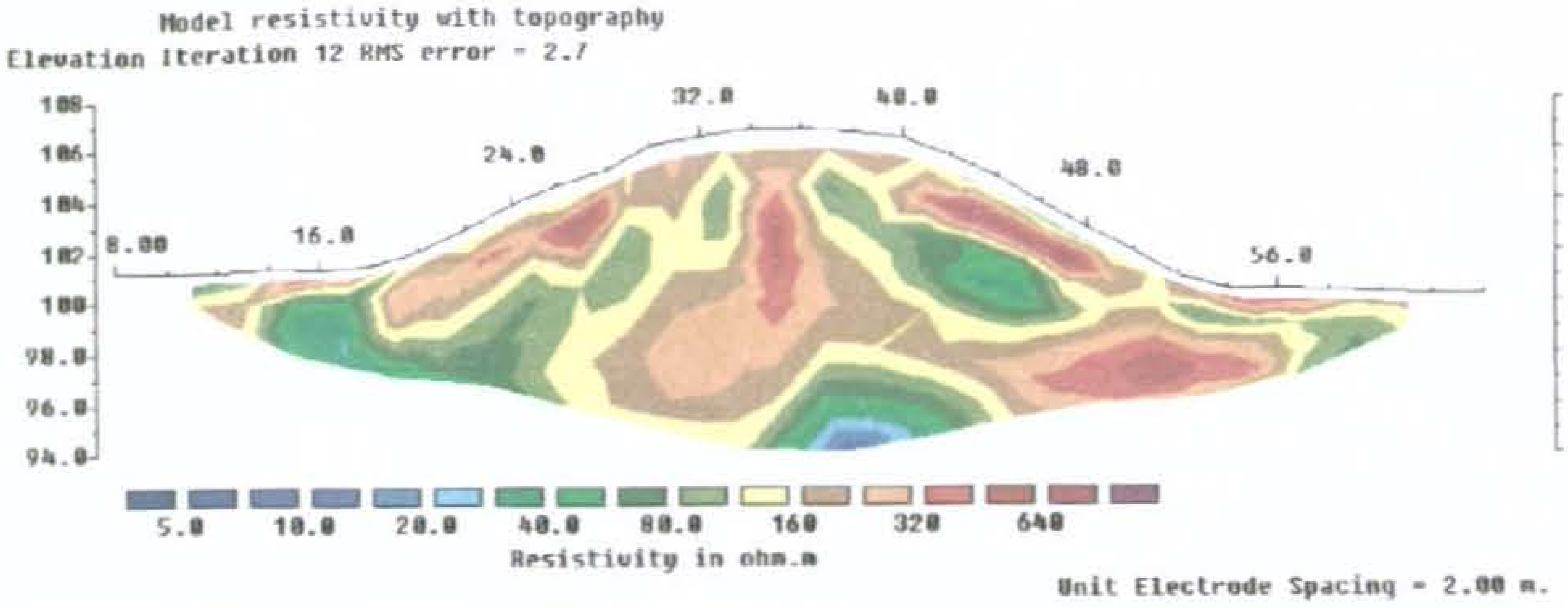
E


Model resistivity with topography
Elevation
Iteration 17 RMS error = 3.1
T
B
B
Resistivity in ohm.m
Unit Electrode Spacing = 2.00 m.
Horizontal scale is 26.63 pixels per unit spacing
Vertical exaggeration in model section display = 1.00
First electrode is located at 6.0 m.
Last electrode is located at 70.0 m.

F

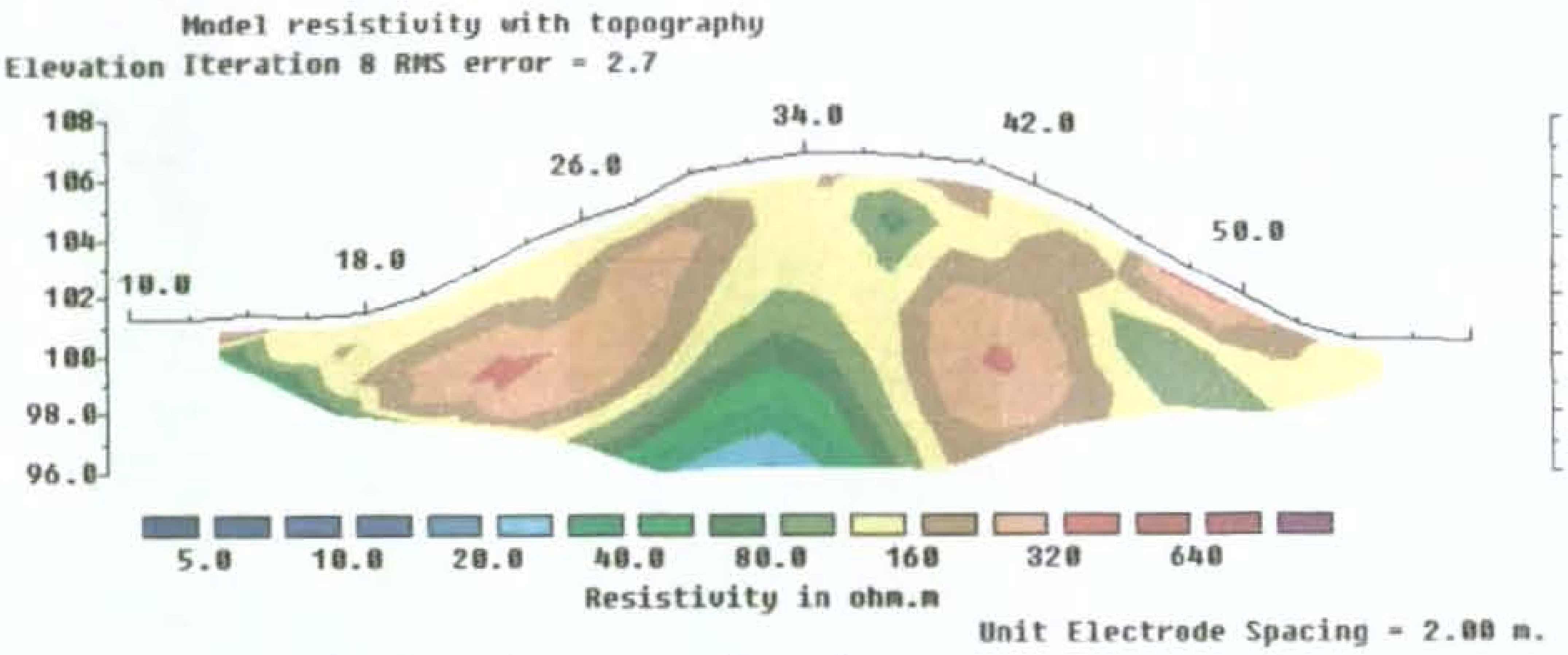

Model resistivity with topography
Elevation
Iteration 13 RMS error = 4.2
T
B
B
Resistivity in ohm.m
Unit Electrode Spacing = 2.00 m.
Horizontal scale is 26.63 pixels per unit spacing
Vertical exaggeration in model section display = 1.00
First electrode is located at 8.0 m.
Last electrode is located at 70.0 m.

G



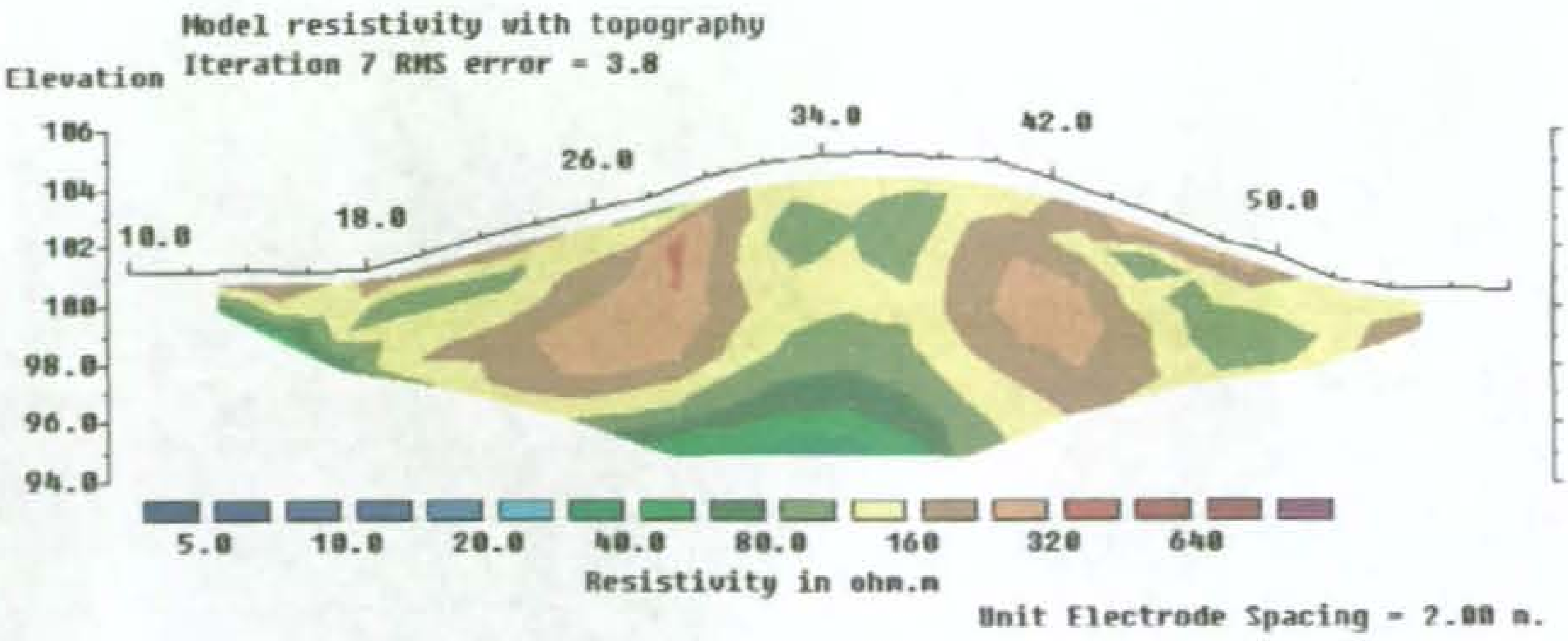
Horizontal scale is 26.63 pixels per unit spacing
Vertical exaggeration in model section display = 1.00
First electrode is located at 8.0 m.
Last electrode is located at 64.0 m.

H



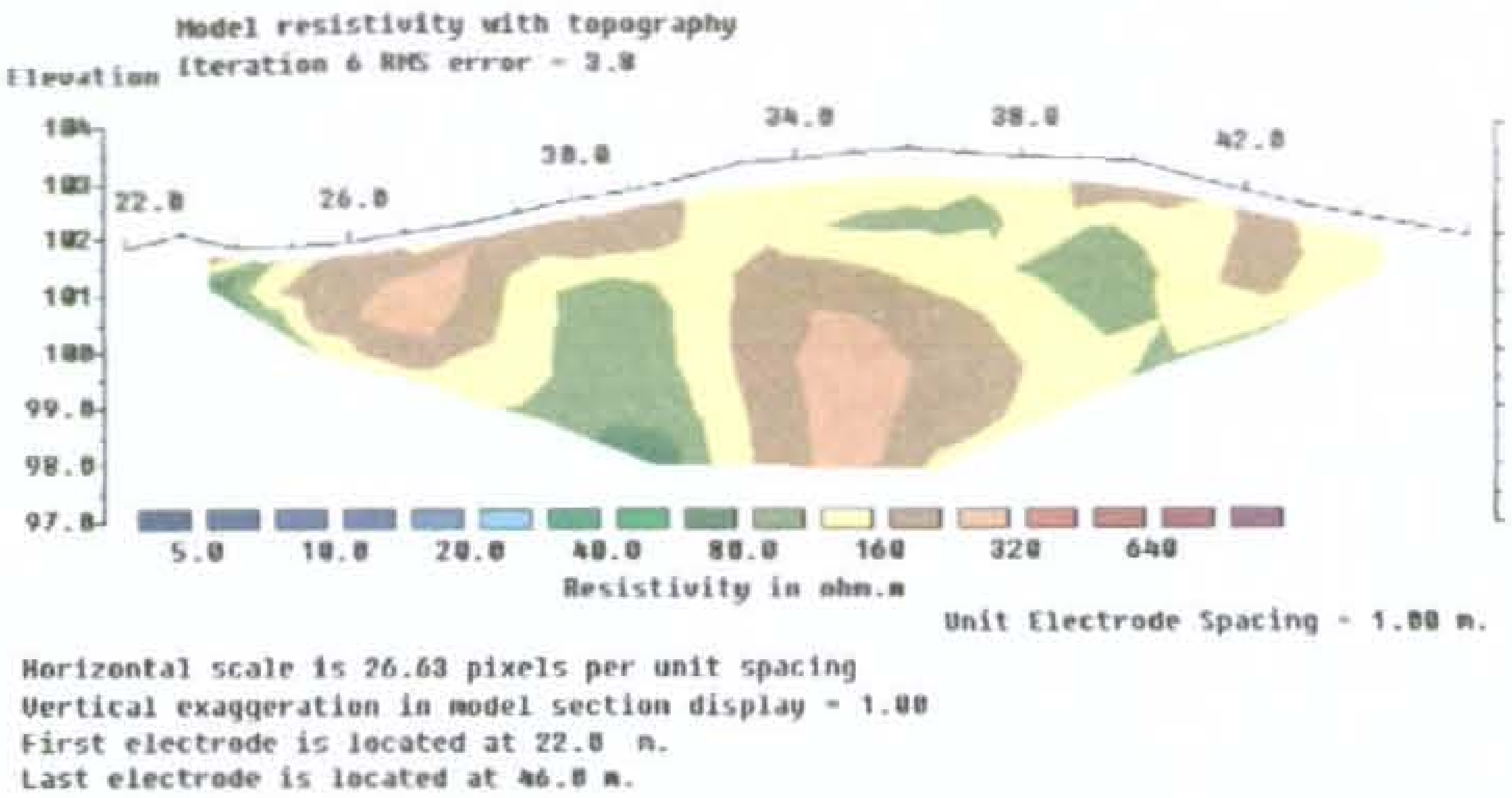
Horizontal scale is 26.63 pixels per unit spacing
Vertical exaggeration in model section display = 1.00
First electrode is located at 10.0 m.
Last electrode is located at 58.0 m.

I

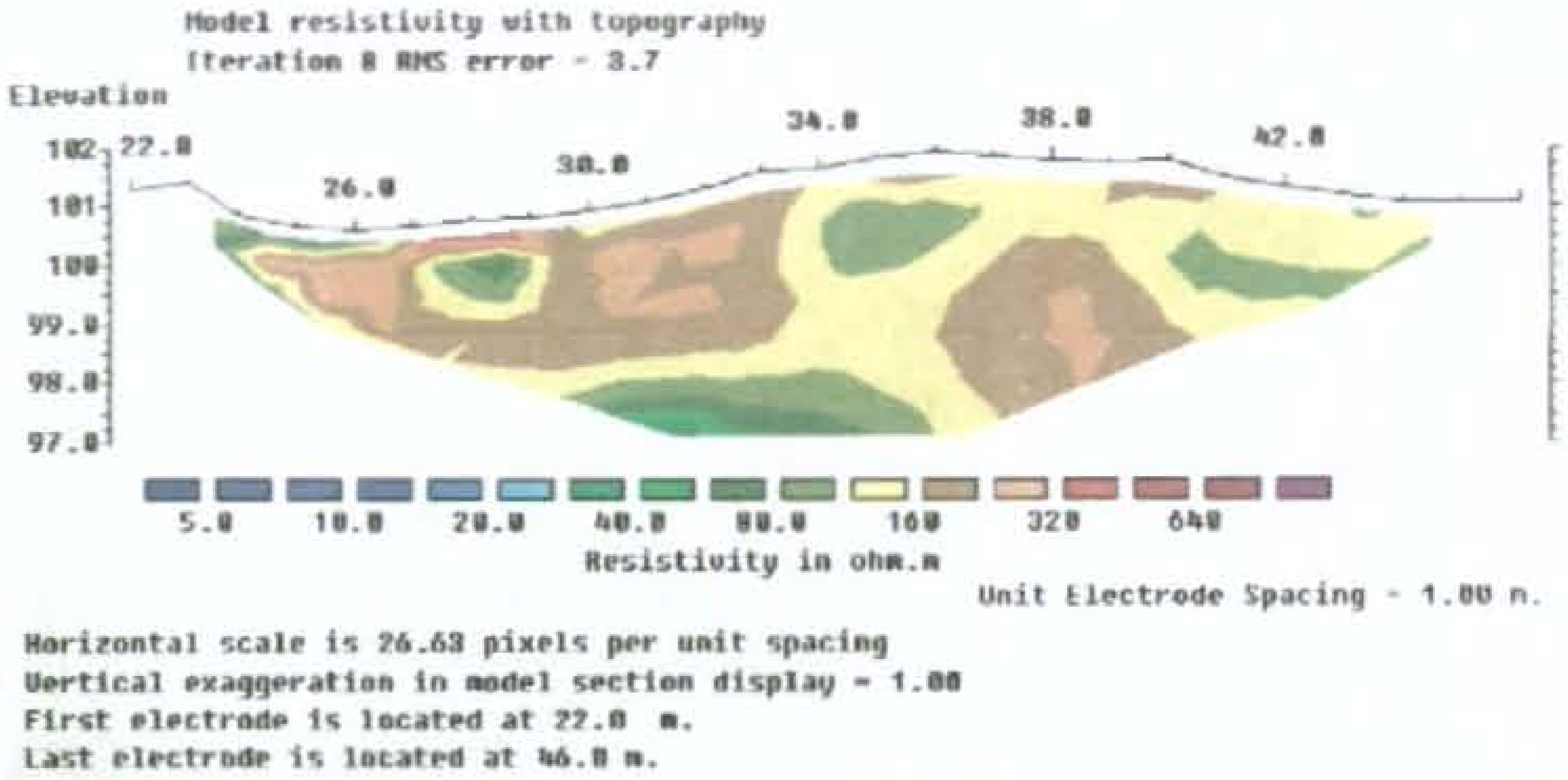


Horizontal scale is 26.63 pixels per unit spacing
Vertical exaggeration in model section display = 1.00
First electrode is located at 10.0 m.
Last electrode is located at 58.0 m.

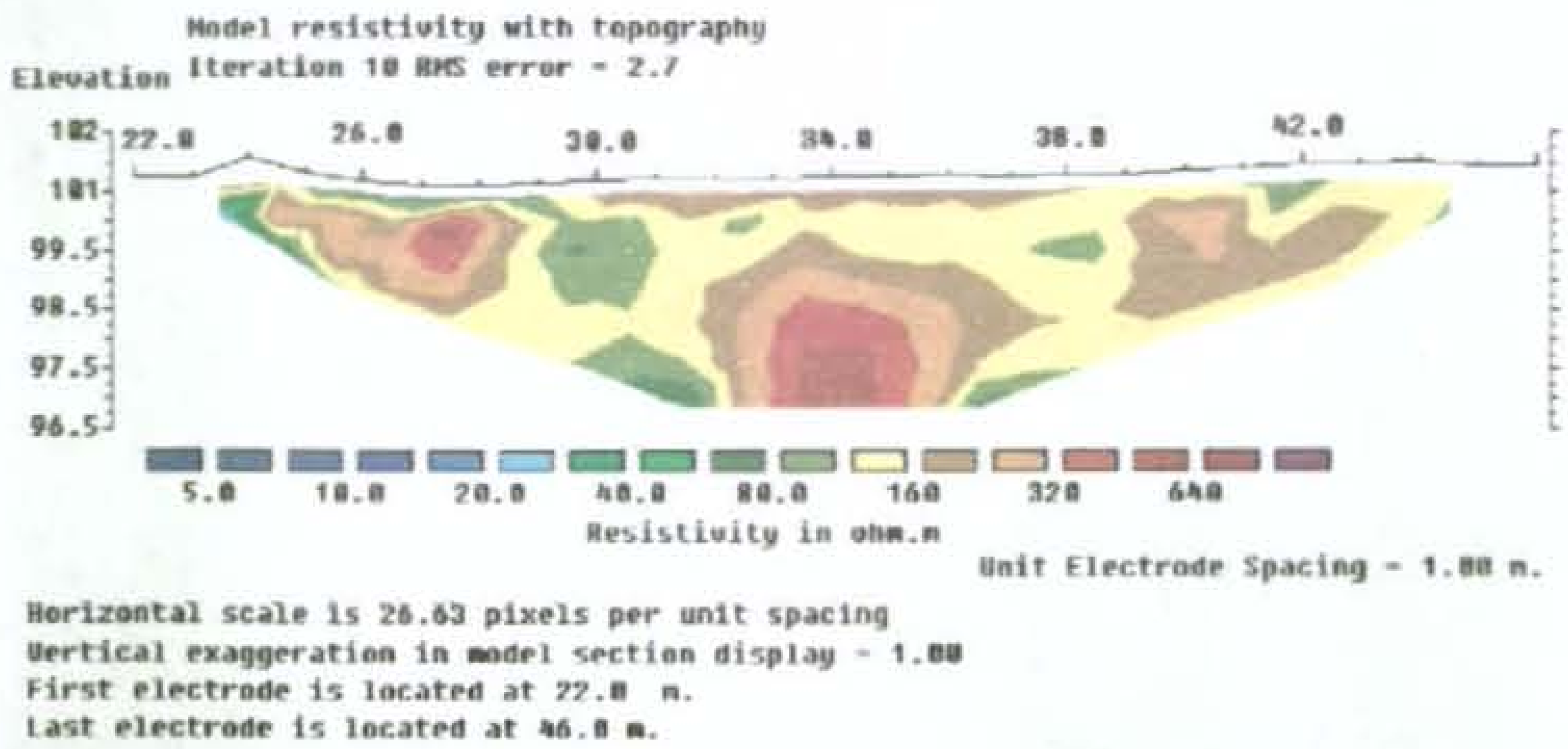
J



K



L



These ERT lines together show a complex resistance structure to the mound. There is an area of high resistivity (over 350 Ohm.m) forming a vertical structure in the centre of the barrow (e.g. fig. 25A, A). This is imaged in 2-D lines extending up to 10 m from the barrow centre. There is a large central depression at the top of this barrow above this feature. It is likely to be caused by a collapse which has worked its way up to the mound surface. It is unlikely to originate from a back-filled shaft, as the barrow was investigated by means of a tunnel, (unless a shaft pre-dates the 1836 investigation).

In the two near-central lines (fig. 25, A-B) of the central area of high resistance also extends significantly to the NW (A+). This may reflect the approximate location of an original horizontal access to the central chamber from the west. It is certainly striking that the north-western and south-eastern parts of the central profiles have very different resistivity, with the south-eastern values of less than 50 Ohm.m being what might be expected of partially saturated Chalk which is thought to make up the majority of the barrow.

Towards the margins of the barrow (e.g. figs. 25 E-F), there are higher resistance areas typically 4-5 m form the barrow margin and about 22m from the centre (B). As the 2-D ERT slices move towards the margins of the barrow these higher resistivity areas increase in size within the profiles. This is because the feature is forming an arc equidistant from the barrow centre, so more marginal lines are slicing through this feature over a greater horizontal distance. This feature is likely to relate to a revetment, or internal support, to the mound and is comparable to similar features seen in the other mounds.

Within the outer slices (e.g. figs 25 E-F), a low resistance feature, (with a core of less than 50 Ohm.m) is present cutting through the high resistance feature (possible revetment). This low resistance feature (T) is centred on the known location of the tunnel described by Gage (1836), though is significantly larger than the tunnel dimensions, perhaps because of limited resolution of the ERT inversion.

It seems that the tunnel, (or its possible back-fill?) has caused a lowered ground resistivity. This response is in marked contrast to the inferred increased resistivity of central areas of probable subsidence within the barrows. An open, air-filled tunnel, or a partially collapsed tunnel, might be expected to have higher resistivity than its surroundings also. So the lower resistivity is at first sight puzzling, and perhaps significant for the likely state of the tunnel. For instance it could imply that it is back-filled with fine-grained material that can readily retain water.

Summary of the ERT investigations

The ERT surveys have shown that there is significant variation in resistivity within the barrows. The barrows are thought to be constructed dominantly of Chalk rubble. Because of its properties, in particular the fine pore size and high porosity, this is likely to remain partially saturated, and so have resistivity in the range 50-200 Ohm.m. This is indeed the range of "background" values of the barrows in undisturbed, and off-centre areas.

The three southern barrows (IV, V and VII) have common features, which are a) a vertical high resistivity feature central to the barrows, and b) marginal raised resistivity features a few metres in from the edges of the mounds. These are most likely interpreted as a) collapse or subsidence structures originating from the central chambers, or possibly infilling of antiquarian shafts, and b) evidence of revetment structures to help build, and/or maintain the steep sides of the mounds.

The northern-most barrow (VI) is a little different. It has a central high resistivity structure, but with more complexity to this within the more central parts of the barrow. It lacks clear evidence pointing to a revetment set in from the margin, as in the other three barrows, but may, tentatively, have a more marginal kerb or revetment.

All four large barrows have significant "carapaces" of higher resistance relating to the development of soil profiles, and associated de-saturation of the outer parts of the barrows. Again, Barrow VI is different in kind, having a thicker, and more uniform "carapace" perhaps relating to modification, or restoration, of the barrow with a later sandy layer.

The ERT investigation raises significant issues with the design of such surveys for large barrows. There are issues to be explored of what is the achievable resolution within the barrow depending on the nature and scale of the array used, and the extent of coverage. These issues can be addressed partly by modelling studies. The experiment with a range of 2-D and pseudo 3-D modelling undertaken shows

1) that 2-D lines can give significant insight into the generalised, ideally symmetrical, structure of the barrows.
2) Off-centre traverses, as used to investigate the tunnel in Barrow IV, are a significant enhancement to lines across the centre of the barrows.
3) There is significant potential for 3-D modelling, using both radial and orthogonal grids, to image non-symmetrical structures. Such 3-D modelling is desirable i) because of the complex topography of barrows, and ii) to increase the resolution of the internal structures imaged.

The collection of adequate 3-D data is time-consuming compared to most other geophysical methods. Collection of real 3-D grids, rather than the integration of 2-D grids as used here, adds further demands on data collection.

Finally, the collection of ERT data is significantly enabled by management of the vegetation cover of the barrows, specifically the prevention, or removal, of shrubs and small trees. A return to the condition of the barrows of a decade or so ago would make a significant difference to being able to conduct more detailed ERT investigation of the mounds.

The villa and earthwork

Hella Eckardt

Part of a villa was excavated by Neville in 1852, in "Church Field" within "100 yards of the north-eastern base of the celebrated tumuli" (Neville 1853, 17; see also: Scott 1993, 32-33; Taylor 1998, 19). The remains comprised of a well and a small building constructed of flint and tile which included a furnace and hypocaust and may represent the bath building of a larger establishment. When the railway line was cut through between barrow VII and VI in 1865, the workmen reported 'ancient foundations', again located about 100 yards east of the hills (VCH Essex 1963, 43; Brocklebank 1913, 254). Brocklebank (1913, 254-255) also suggests that there are further remains " in an obviously untouched condition" in Bartlow Park. These three reports almost certainly refer to one large building (fig. 26).

Closely associated with this villa appears to have been a very substantial earthwork, located to the north of the barrows but perhaps originally enclosing them on all sides. The earliest reference to this earthwork is concerned with its western end (Gage 1834, 2-3 with plan) and describes an agger 317 ft long from east to west, with the eastern end cut by a ditch which separates it from the Bartlow rectory garden. At its western end the agger is cut by the road but it appears to end in a small rectangular enclosure measuring 120 x 63 ft. This enclosure had two entrances at its eastern end and enclosed a further mound of 26 ft diameter (fig. 26). Gage (1834, 22) investigated the agger and low barrow but made "no discoveries deserving notice".

Brocklebank (1913, 255) describes what must be the eastern end of the same earthwork as abutting the traces of buildings in Bartlow House Park: he describes the feature as an "ancient earthwork that follows the south bank of a small stream for some 350 yards: running east and west and being at its nearest only about 100 yards from the most northerly of the large barrows. In its best-preserved part the ditch still measures 12 ft across and the mound 4 ft in height". He also mentions that Roman pottery and coins are frequently found when gardening in this area.
The Victoria County History for Essex (1963, 39) describes the same feature as an "earthwork running e-w between the hills and the Granta to the N. It cannot be traced w of the gravel pit, on the e-side of the road running N from Bartlow station, but the mound and ditch can be seen intermittently, in a straight line from here to a point near the Granta, SE of Bartlow church, where it turns S and may be followed nearly to the railway. The mound was from 4 to 5ft high, and the ditch about as deep, the two measuring some 30ft wide overall. The present appearance is less impressive than these estimates imply. In the gravel pit the ditch was seen as V-shaped, cut some 5ft deep into the chalk".

The precise location of both the villa and the earthwork now appear to be lost. Beauchamp & Macauly (2004, fig. 1) and Masters (2004, fig. 2) do not indicate the location of the earthwork at all and place the villa almost directly to the north of the mounds.

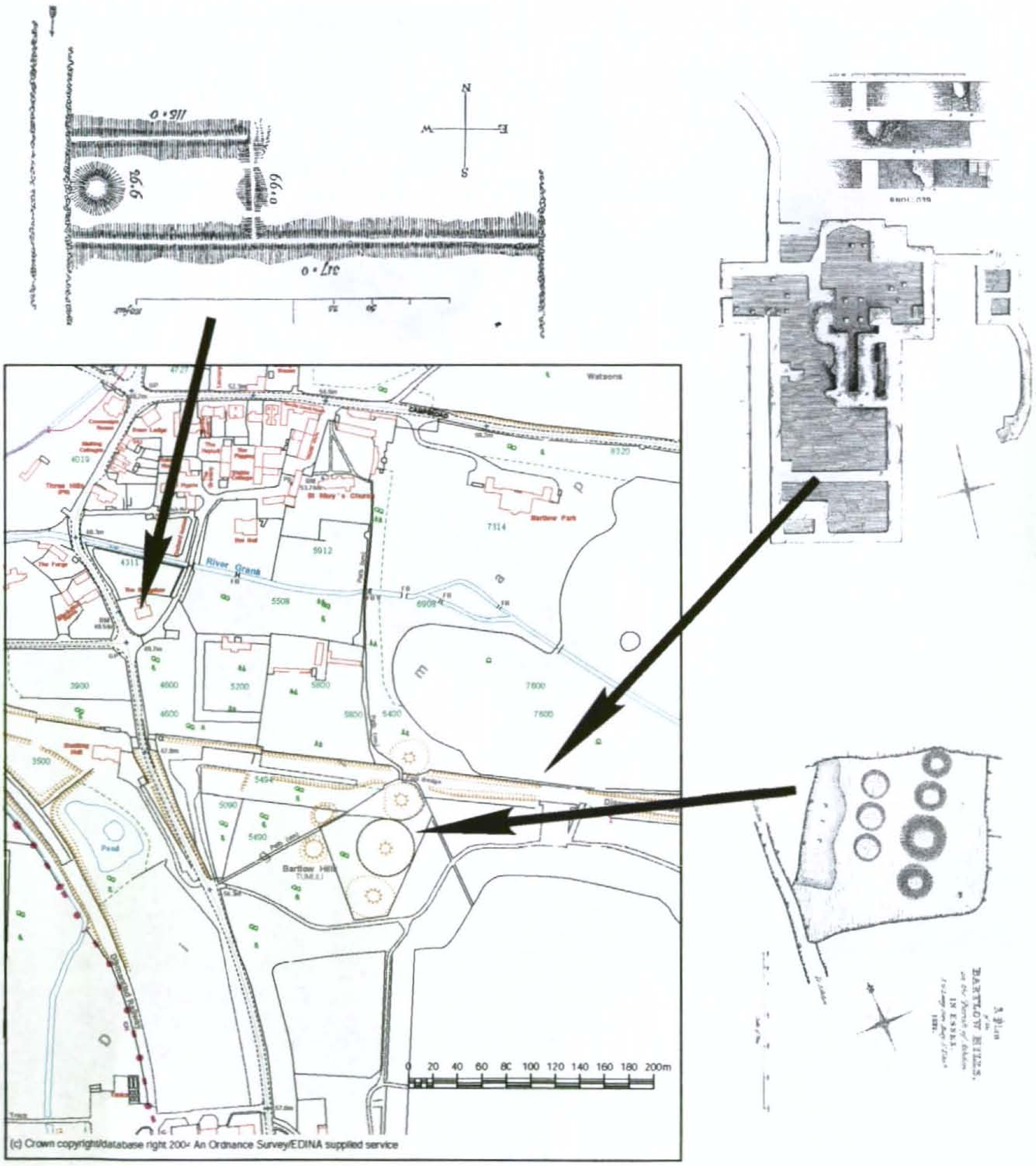


Fig. 26: OS map of Bartlow showing approximate location of the villa and earthwork.

More detailed archive research has now revealed more information on the later history and approximate location of these monuments. There are two sketch plans which appear to show the location of the earthwork in the later 19th/early 20th century (RCHM 1916, p. 4; Haverfield MSS in the Sackler Library: sketch plan with notes).

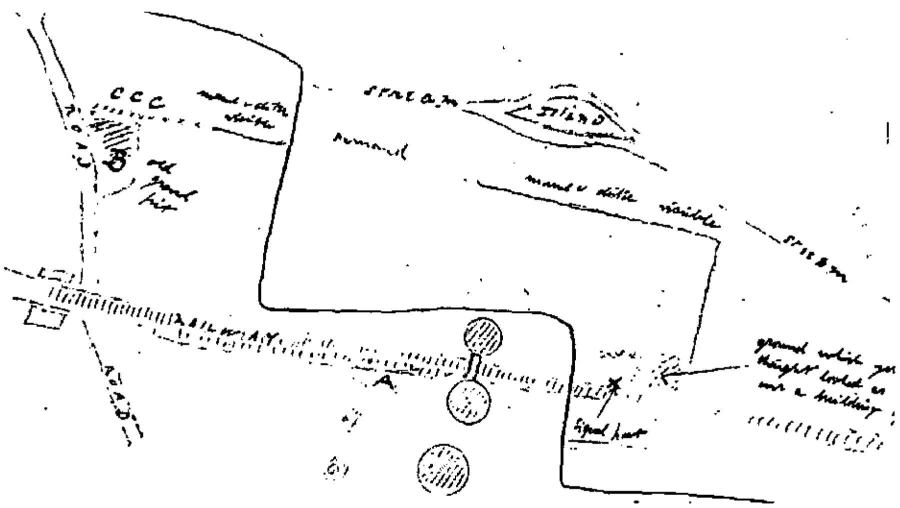


Fig. 27: Haverfield's sketch plan of the site. Note the signal hut in relation to the villa and earthwork. Sackler Library, Haverfield MSS.

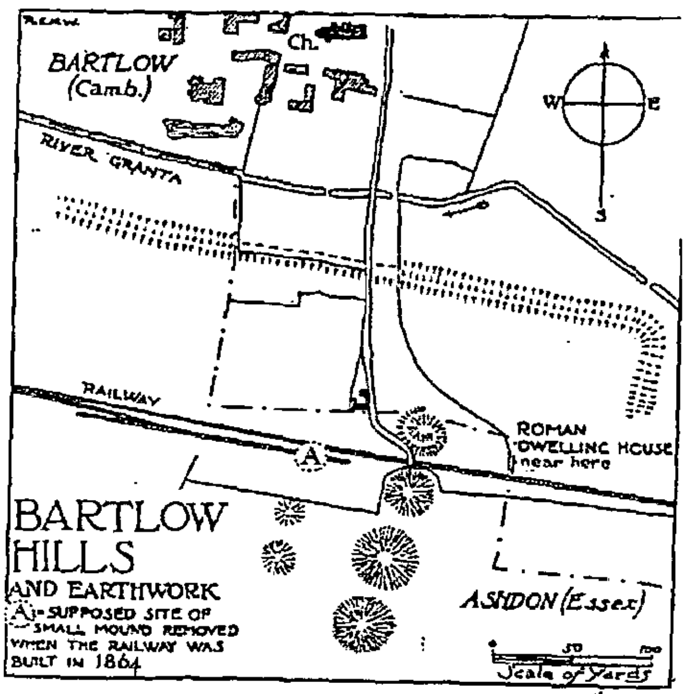
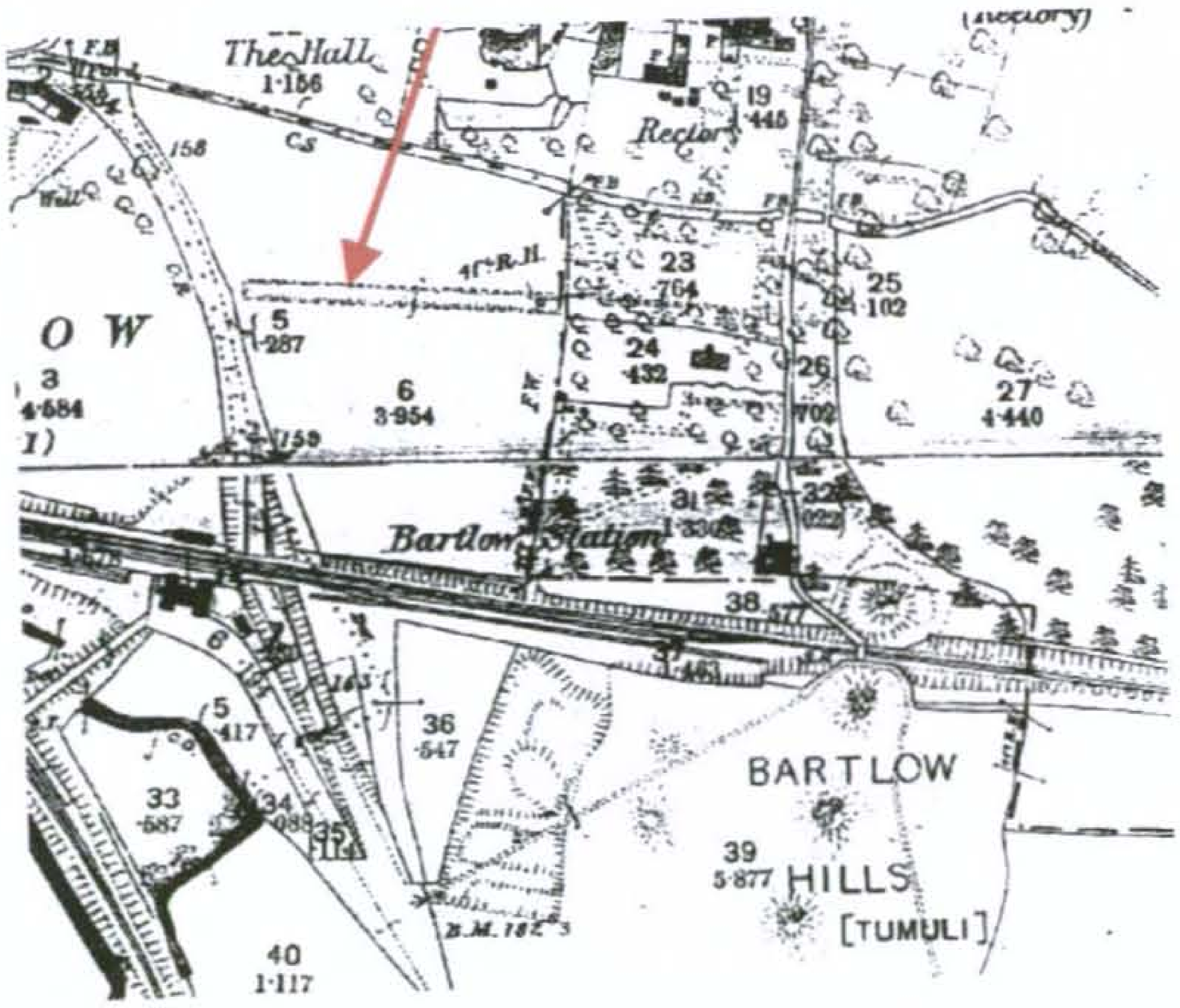


Fig. 28: Earthwork as observed in the early 20th century. (After: RCHM 1916, p. 4)

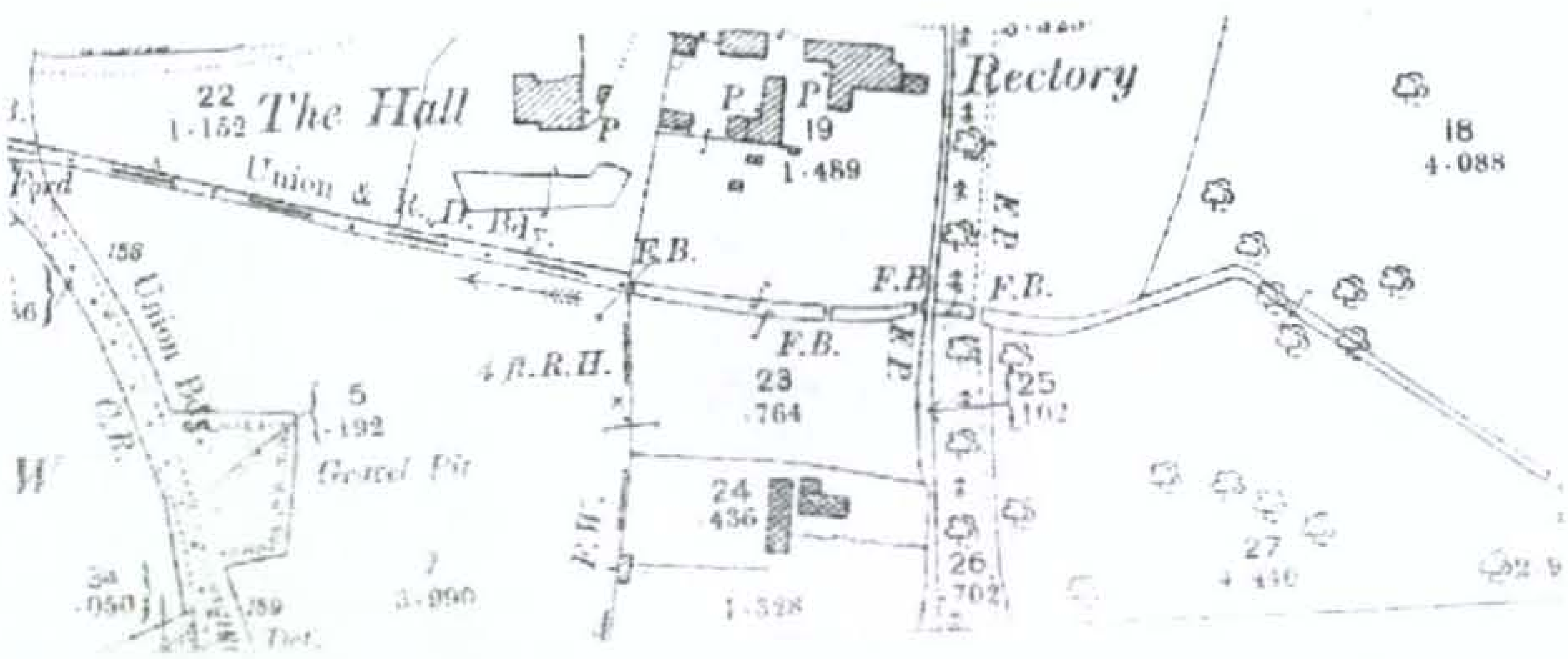
Haverfield's sketch (fig. 27) relates the north-south turn of the earthwork to the location of a railway signal hut. Today, there is still a small wooden hut located immediately next to the railway in roughly the right position, which was recorded in the 2005 topographical survey (fig. 7). If this is indeed Haverfield's signal hut, it provides an approximate location for the north-south extension of the earthwork. The villa ought to be located within (i.e. to the west) of this earthwork and much closer to the railway line than envisioned by Beauchamp & Macauly (2004). This corresponds with the information on field names given by the 1869 apportionment map (Cambridgeshire County Records Office, P9/27/3) which lists a number of fields bordering immediately onto the railway cutting as 'Church Field Meadow'.

The east-west stretch located within Bartlow Park and the remains of the villa itself are no longer visible as earthworks at all due to extensive landscaping in the park. In addition to landscaping carried out in the early 20th century, the recent creation of a lake and associated dumping of up to 3m of soil, chalk and flint to the south have obscured any visual evidence for what must have been a very substantial feature. The geophysical survey (Masters 2004, fig. 2) shows the beginning of a possible linear feature running north-south which is interpreted as a former boundary, possibly associated with a metalled surface and thought to be related to the north-south boundary indicated on late 19th century OS maps (Masters 2004, 4). This boundary may well have been located on top of the earthwork but this could only be established through further geophysical survey tracing the feature south away from the stream and through excavation. Curiously, the Masters 2004 geophysical survey, carried out prior to the recent dumping of soil, does not appear to have picked up the east-west stretch of the earthwork but this feature may be obscured by the presence of a fenceline or again be located slightly further to the south and away from the stream (i.e. outside the area surveyed).

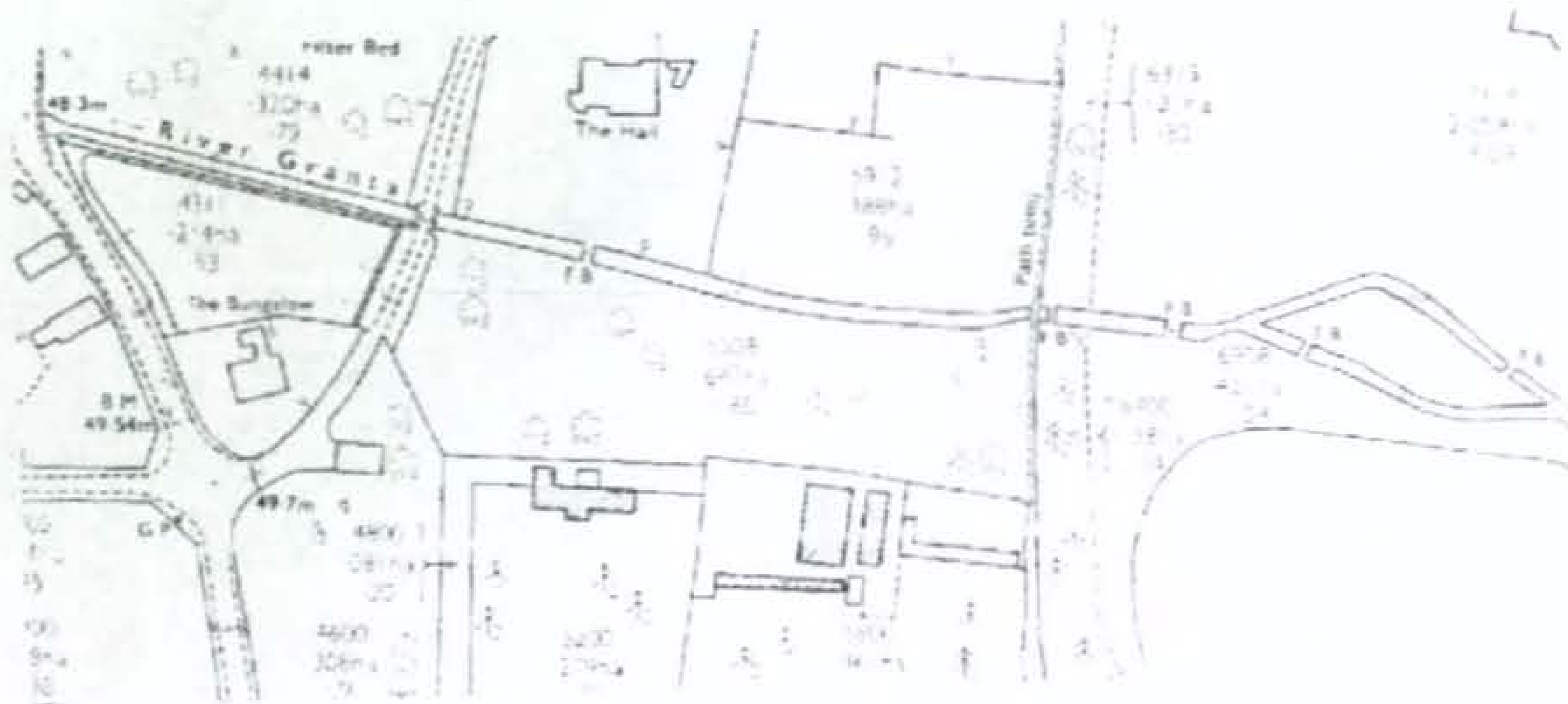
The history of the earthwork at its western end is even more complicated. Both Haverfield's and the RCHM plan indicate that the earthwork is no longer visible in the area of the original walled gardens of the rectory and Bartlow House. Further west, both the OS maps of 1877 (fig. 29a) and 1891 clearly show a significant linear feature, running up to the road. The low barrow and second earthwork forming the enclosure described by Gage are, however, not marked on these plans.



OS Map 1877



OS Map 1903



OS Map 1978

Fig. 29: The linear earthwork to the west of the Bartlow Hills: it is visible on the O.S. map of 1877 but by 1903 a gravel pit had been excavated over its western end; by 1978 a new road and bungalow were constructed.

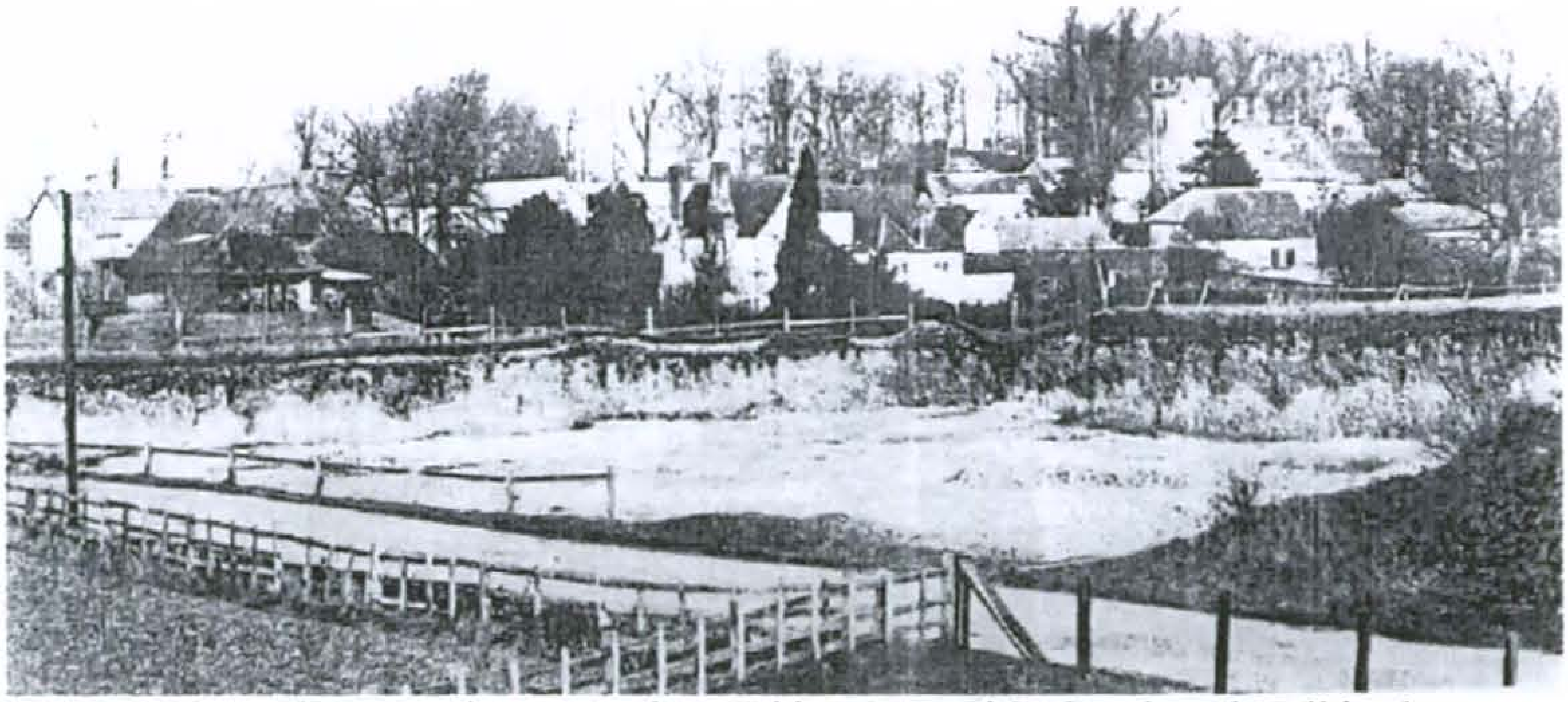


Fig. 30: View of quarry pit next to the road in 1904, with church and Hall in the background. Cambridgeshire Collection: YBartl. KO 6976).

By 1903, a large gravel pit has been cut immediately adjacent to the road. The northern end of this pit must have destroyed part of the earthwork, and it is here that the 5ft deep V-shaped ditch cut into the chalk was observed (VCH Essex 1963, 39, see above). Goddard (1899, 353) records that workers also found Roman pottery, bones and a millstone (now in Cambridge Museum) in the quarry pit.
The Cambridgeshire Local History Collection has two photographs from the early 20th century that are relevant: One (fig. 30; YBartl. KO 6976, from 1904) shows the excavated gravel pit. The other (YBartl. K17 18126, from 1917) shows essentially the same view but following the construction of a new road junction and a bungalow virtually on top of the pit.

Today, a small part of the earthwork is still visible in a lightly wooded area to the east of the Bungalow and just to the north of the walled gardens. It can be observed running for about 4 m on an east-west alignment. Where it meets the 'new' road running to the east of the Bungalow, there is a substantial mound but this is extremely unlikely to represent Gage's low barrow. Rather, it appears that that barrow and the most western part of the earthwork were completely destroyed by the quarry pit and the subsequent construction of the new road and the bungalow. The low mound at the side facing the new road may well be disturbance caused by the construction of a short access path, the boiler room once servicing the greenhouses in the walled gardens or its conversion into a garage (cf. fig. 29c).

The linear feature now for the first time identified in the wood is the last remaining original stretch of the earthwork and its recording must be a research priority.

Future Work

Hella Eckardt

Future work should focus on two main areas:

- Investigation of the linear earthwork and villa
- Excavation of features identified by the geophysical surveys in the immediate vicinity of the mounds

Investigation of the linear earthwork and villa

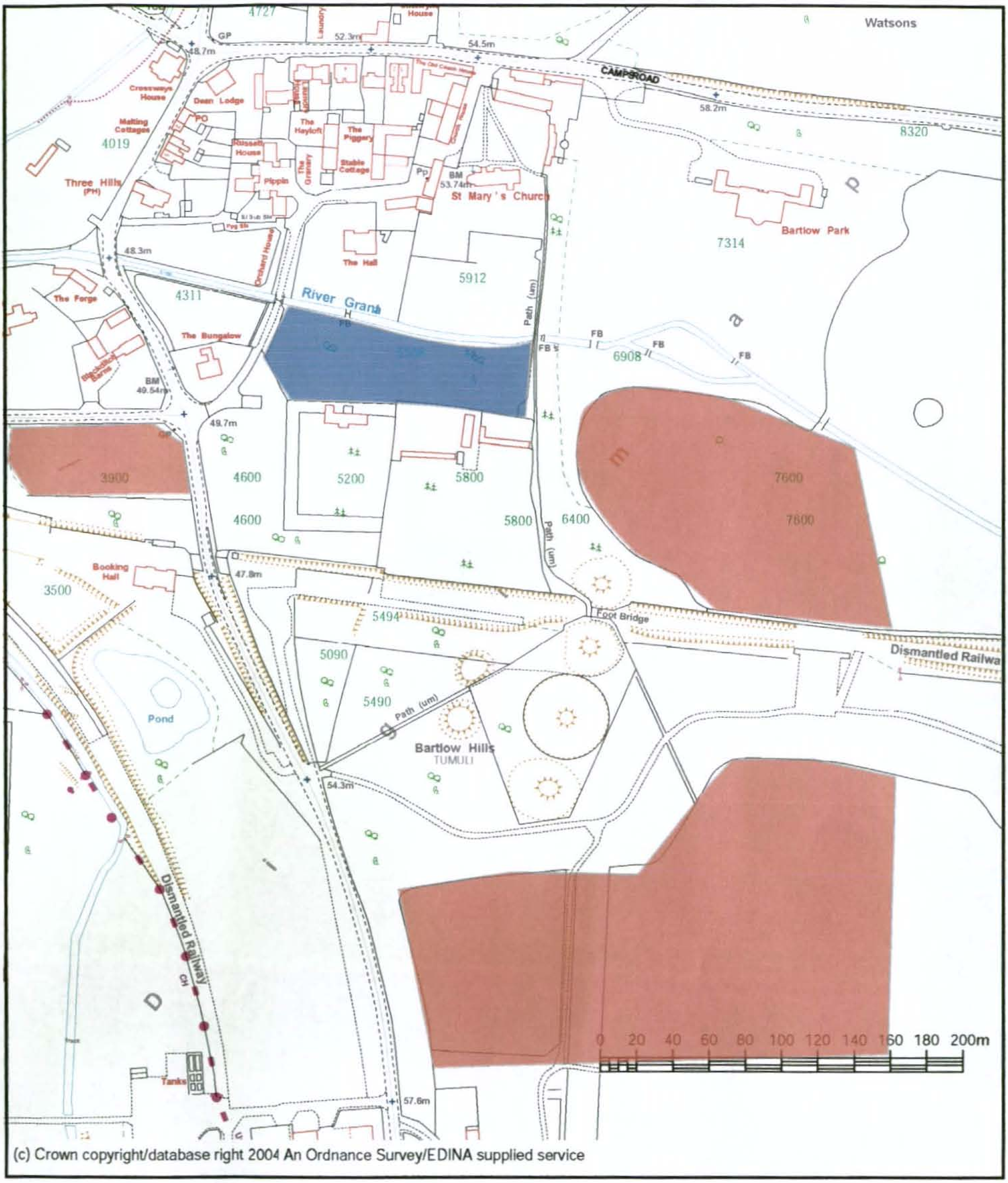
The investigation of the nature and date of the large earthwork surrounding the barrows and the villa must be a research priority (fig. 31).

The linear earthwork identified in the woods near the walled gardens is the last remaining and apparently undisturbed stretch of what appears to have been a very significant enclosure. We propose to conduct a topographical survey of this feature, to ascertain its remaining length and width and to plot in on the OS map. The NMR suggests that the enclosure may be Medieval but this seems unlikely given the sparse evidence for high status medieval activity in the area. To investigate the question of date and the exact shape of the monument, we also propose to excavate a small section of it. This is especially important given its unusual shape and obscure function. Goddard (1899, 353) describes it as having the ditch on the inside of the enclosure, suggesting that it is not of a defensive nature. Its location in relation to the land sloping away to the river is also curious and led Goddard to suggest that the feature was in fact a river embankment. Given its overall extent, it seems much more likely that the feature is a very large ritual enclosure but this can only be established by excavation.

It would be desirable to conduct a detailed geophysical survey of Bartlow Park, focusing on the approximate area of the villa and the N-S as well as E-W stretch of the earthwork. The considerable dumping of soil may be thought to obscure any such feature, but the Masters 2004 survey did identify some features. It is unlikely that the landowner will permit excavation in the recently landscaped Bartlow Park.

Finally, there is the question of whether the earthwork originally enclosed the mounds on all sides. Gage (1834, 2) mentions another earthwork ca 300 yards **south-west** of the mounds, at a place called Blackditch. No such place name is now recorded, but to the **north-west** of the mounds (exactly along the line of the earthwork were it to be extended across the road) is a group of buildings called 'Blackditch Barns'. These may mark the further extent of the east-west earthwork and its eventual turn south. Immediately to the south of these buildings is a playing field which could be surveyed to identify any potential earthwork running north-south. Continuing south, there have been major earth movements due to the construction of the railway line and Bartlow Station (now Booking Hall) and these would have obliterated any trace of the earthwork.

There are no historical record of an earthwork running east-west just to the south of the barrows and the area immediately to the south of the mounds is now covered in dense forest planted in the early 20th century. This is, however, only a narrow strip



Geophysics

Topography

Fig 31: Areas for future work at Bartlow.

and a geophysical survey could be carried out on the fields and meadow immediately to the south. Even casual field walking along the field located to the south-east of the mounds uncovered 2nd century pottery as well as tesserae and it seems likely that burials and perhaps further structures were located here.

Excavation of features identified by the geophysical surveys

The geophysical survey of the open flat areas immediately surrounding the mounds revealed a number of features. Many of these, especially the linear features are almost certainly modern fence lines but others may represent burials or ritual structures. The flint platform mentioned in the antiquarian reports has not been identified by the geophysical survey but this may be due to later disturbances, including camp fires. Given the remote location of the site and the interest it would arouse in metal-detector circles, it seems vital to explore the nature of the features identified by magnetometry and resistivity prior to publication of these initial results.

Conclusion

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In its first year, the project has achieved its main aims. A detailed topographical map has been produced, showing not just the four large mounds but also the two remaining lower mounds and the 'quarry pit'. It is clear that the profile of the large barrows has been affected by excavation, WW II use, tourism and erosion. The topographical survey excludes some of the most heavily wooded areas surrounding the barrows but is sufficient for the future management and research on the site.

The geophysical survey has identified a number of features in the flat open area immediately surrounding the mounds. Several of these may be modern features such as fences and campfires, but given the exceptional nature of the site and the threat posed by illicit metal-detecting in such a remote location, excavation of selected features must be a priority.

Perhaps the most striking results of the first year are the images created by the Electrical Resistance Tomography carried out by Dr Timothy Astin. This is an innovative method and its potential for archaeological research is demonstrated by the discovery not just of antiquarian features (such as the horizontal tunnel in Barrow IV and the vertical tunnel in Barrow VII) but by the possible identification of revetments in Barrow IV. In at least one barrow (Barrow VII), high resistance features of unknown function were identified on the edge of the top platform. It was, however, not possible to identify the layering of chalk and soil described by the antiquarian excavators with this method.

Finally, an initial field survey and archive research have brought together the evidence for Bartlow villa and an associated large earthwork.

In 2006/7, it is hoped to focus on the planning and partial excavation of the surviving part of the earthwork. Geophysical survey will be employed to identify whether the earthwork continued to the south of the mounds.

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