Geophysical Survey of the Romano-British Temple at the Noah's Ark Inn, Marcham, Oxfordshire, June 2009.

William Wintle
August 2009



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Introduction

The University of Oxford has a long tradition of research and excavation in Frilford and Marcham. A late Romano-British and early Anglo-Saxon cemetery was discovered at Frilford in the mid-nineteenth century as a result of quarrying (Akerman 1865; Rolleston 1869;1880) and further excavations were undertaken just after the first World War (Dudley Buxton 1921). A small Roman villa a few kilometres to the west of the cemetery was excavated by Arthur Evans in 1884 (Evans 1897), and in the 1930s it was Evans who suggested to Bradford and Goodchild the potential of excavating in the vicinity of the Noah's Ark Inn (Bradford and Goodchild 1939). This excavation revealed an Iron Age settlement and a small Romano-British temple. A section of the area excavated in the 1930s was re-excavated and re-interpreted by Dennis Harding in the 1960s (Harding 1987).

Fresh impetus to research in Frilford was provided by the fieldwork of Richard Hingley of Southampton University which led to the discovery and initial excavation of an amphitheatre in Trendles Field, directly to the east of the Noah's Ark Inn (Hingley 1982;1985).

Each July since 2001 the University of Oxford has conducted a four-week research and training excavation in Trendles Field (Kamash et al 2007; 2008). These excavations were preceded by an extensive geophysical survey undertaken by Tony Johnson of Oxford Archeotechnics Ltd. The results obtained from geophysical survey and excavation in Trendles Field have provided considerable further detail on the nature and extent of Iron Age and Romano-British settlement and activity and suggest a strong spatial relationship between the Romano-British temple in the garden of the Noah's Ark Inn and structures discovered in Trendles Field. In order to investigate this relationship and also to identify possible further features in the vicinity of the temple, a magnetometer survey was undertaken in 2007 in the garden of the Noah's Ark Inn to the south of the known temple site (Wintle 2007). This was followed by the excavation of three trenches in 2008 (Kamash et al 2009).

The initial excavation plans for July 2009 included two further trenches to the north of the area surveyed in 2007. A resistivity survey was therefore performed in June 2009 over the area to be excavated. This area is unsuitable for a magnetic survey due to the proximity of metal structures including buildings, garden features, a swimming pool and a trampoline. It was also planned to extend this resistivity survey southwards during the July 2009 excavation to cover part of the area which had been surveyed in 2007. However, this latter survey did not take place.

This report describes the results obtained from the geophysical survey undertaken at the Noah's Ark Inn (SMR PRN 7119, Oxon SAM 211), Marcham, Oxfordshire, during June 2009. The report is submitted in compliance with the requirements of the Section 42 Licence (Ref: AA/62285/5) issued under the 1979 Ancient Monument and Archaeological Areas Act (as amended by the National Heritage Act 1983).

The Noah's Ark Inn

In 1938 three limited areas were excavated directly to the east of the Noah's Ark Inn and are referred to as Sites A, B and C (Bradford and Goodchild 1939). Figure 1 shows an aerial photograph of the Noah's Ark Inn which is situated just to the north of the bridge over the River Ock. Although the photograph is undated, it dates from the 1930s and appears to show the excavation of Bradford and Goodchild.



Figure 1 – The Noah's Ark Inn and Possible Excavations
NMR SU 4496/2 – Date Unknown
© Allen Collection / Ashmolean Museum

Site A contained a Romano-British temple overlying an Iron Age hut which the excavators believed had burnt down immediately prior to the construction of the temple. Site B just to the south contained a range of Iron Age pits, together with an Anglo-Saxon burial which had disturbed a late Roman coin hoard. Bradford and Goodchild interpreted Site B as the main area of the Iron Age settlement as it contained about half of the more than forty drainage and storage pits excavated. A circular, Roman structure 36 feet in diameter was found at Site C, which lay eighty feet south of the temple. Bradford and Goodchild termed this the 'Rotunda' and on the basis of votive finds argued that it had a ritual function. The rotunda overlay an Iron Age penannular ditch, which the excavators believed was its precursor and which also had a ritual function. Thus at both the temple and rotunda Bradford and Goodchild argued for continuity of activity from the Iron Age to the Romano-British period.

In 1964 Harding re-excavated a part of Site A over the western section of the temple (Harding 1987). Whereas Bradford and Goodchild had argued for continuity between the Iron Age hut and the following Romano-British temple, Harding sees no chronological

relationship between the two. Instead, he interprets the hut as a large stake circle, which with a diameter of 9.6 metres would be too large for a roundhouse, and is therefore more likely to have been a small compound for stock. Moreover, he argues (1987, 13) that the temple cannot have been built before the middle or second half of the second century. Although Site C was not re-excavated, he believes that the ditch is better interpreted as being domestic, relatively early and unrelated to the later rotunda. By breaking the structural continuity at both Sites A and C, Harding has undermined Bradford and Goodchild's arguments for religious continuity.

An extensive survey of the Frilford area between 1978 and 1984 by Hingley led him to conclude that the temple and rotunda at Noah's Ark Inn, rather than representing a wayside shrine, form part of an extensive Roman religious complex containing the temple, other 'monumental' buildings, an amphitheatre and a cemetery (Hingley 1985, 202). This survey was based on a study of aerial photographs and an analysis of artefacts collected from fieldwalking. The aerial photographs produced two important discoveries. Firstly, confirmation of the ritual significance of the temple came from the identification of a surrounding temenos wall as a parch-mark. Secondly, the identification of an amphitheatre, 65 metres in diameter, situated about 120 metres to the east of this temenos wall and in a slight depression leading south to the river Ock.

Parts of the temple and rotunda were re-excavated in 1987 during an evaluation conducted by the Oxford Archaeological Unit for a proposed extension to the Inn (Miles and Wait 1987; Wait and Miles 1988). The main area of trenching was to the north and west of the temple.

The Geophysical Survey

The geophysical survey had the following objectives:

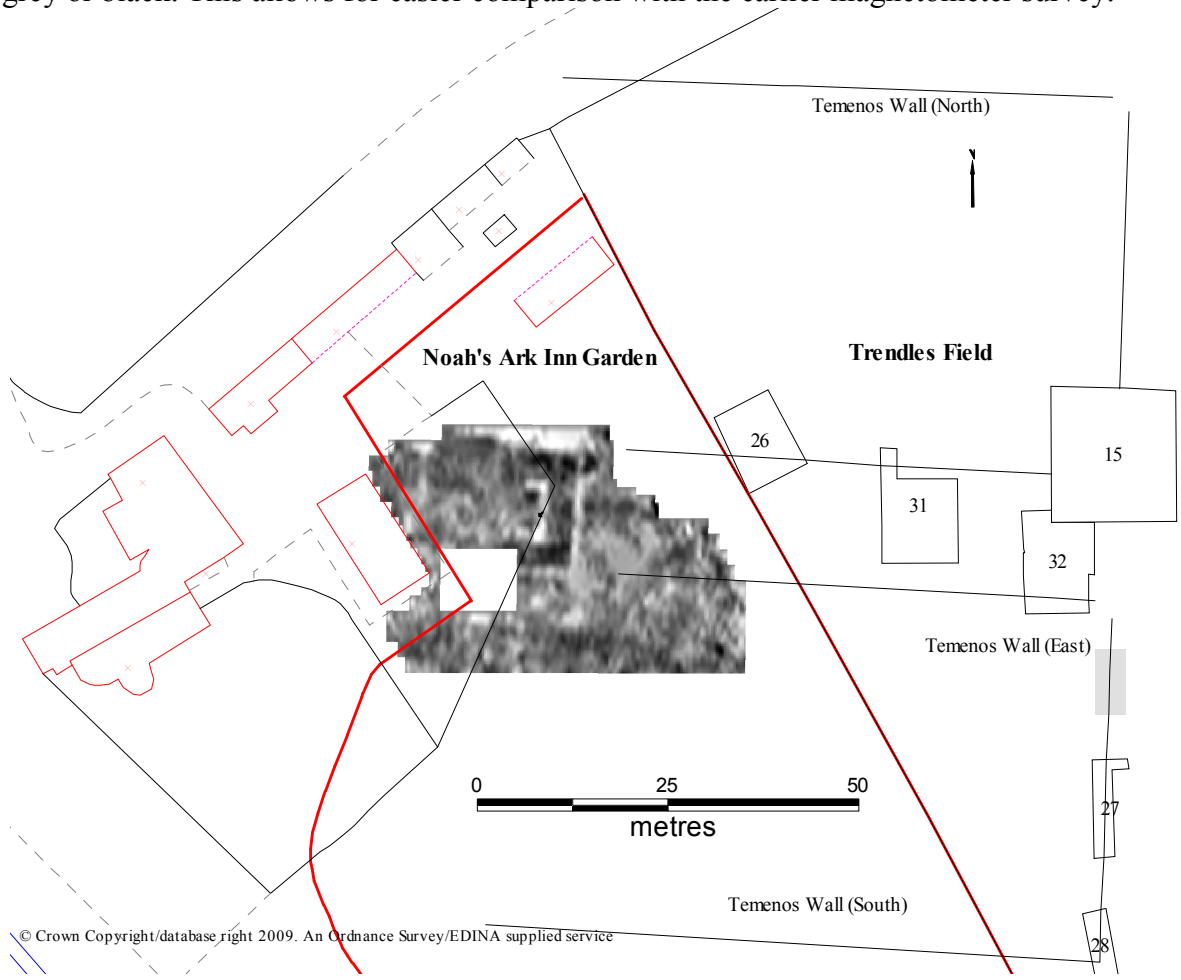
- to determine the location, extent and survival of features within and in the vicinity of the temple
- to allow a comparison with the previous magnetometer survey. This had identified the southern and eastern walls of the temple.

Permission to undertake the survey was given by the landowner, Mr John Duffield, by the occupants of the Noah's Ark Inn, Mr and Mrs Mumby, and by Mr Chris Welch of English Heritage.

The survey took place on the 5th, 7th and 12th June 2009. On the 5th June a total station was used to set out a north-south base line within the Noah's Ark garden to align with the excavation grid within Trendles Field. From this base line a grid of six twenty-metre squares were laid out with tapes. Subsequently their position was checked and recorded using the total station. Map 1 below shows the survey location together with a number of excavation trenches in Trendles Field and projected features such as the temenos walls and entrance ways leading into the Noah's Ark Inn garden. The red line denotes the extent of the scheduled area.

The resistivity survey was undertaken using a Geoscan Research RM15-D resistivity meter. The traverses were one metre apart and readings were taken every 50 centimetres along each traverse. Two separate twin probe surveys were performed: the first with a mobile

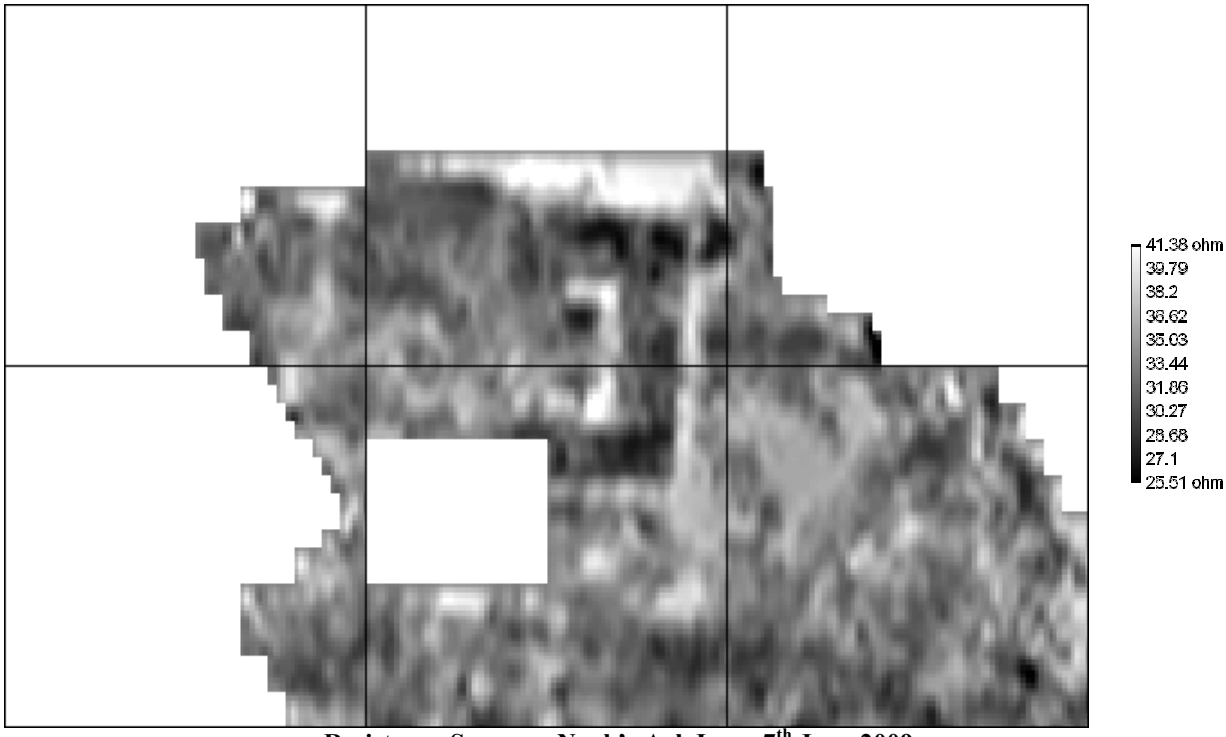
probe separation of 0.5 metres (7th June) and the second with a mobile probe separation at 1 metre (12th June). For both surveys it was possible to survey all the grids over the temple site without moving the remote probes. The grids were walked in a clockwise "zigzag" pattern and the results have been processed and are presented as block shaded images using a grey-scale. Areas of high resistance are shown as light grey or white and of low resistance as dark grey or black. This allows for easier comparison with the earlier magnetometer survey.



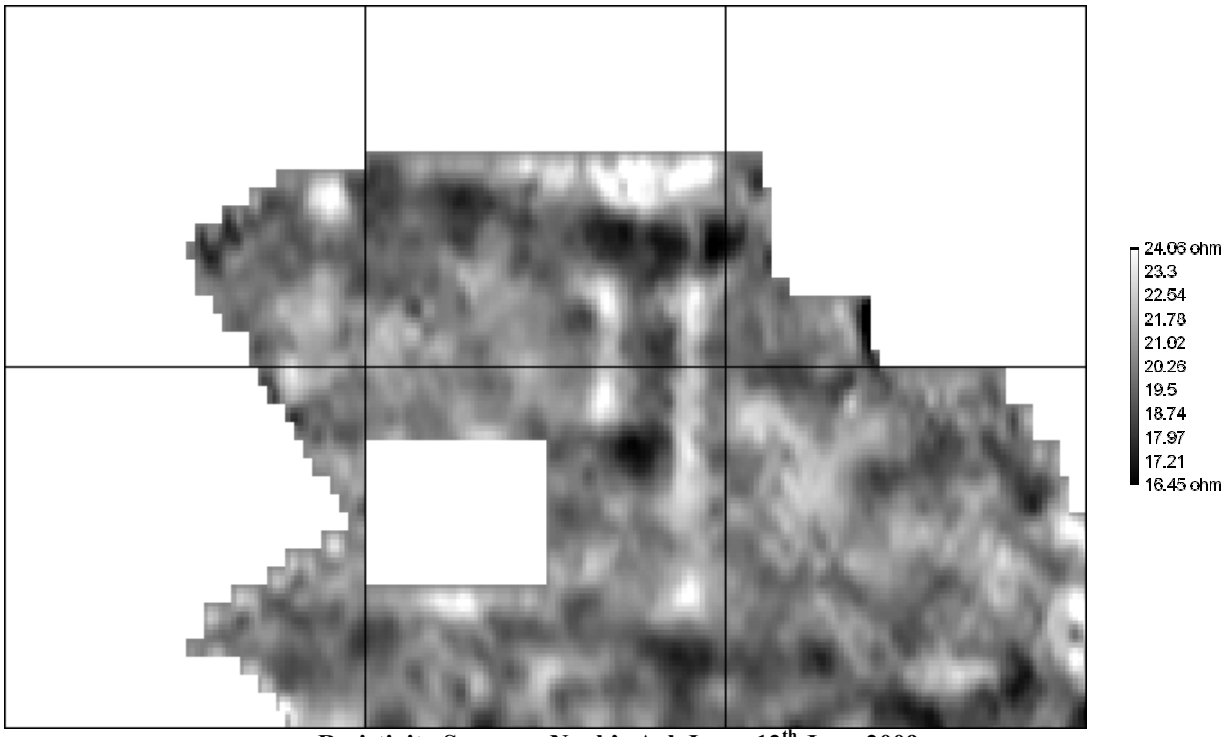
Map 1 – Resistance Survey of the Noah's Ark Inn Temple Site
Relationship to Excavation Trenches (2006) and Projected Features

Figure 2 shows the processed results of the six grids which were surveyed. The raw resistance measurements (ohms) have not been converted to resistivity (ohm-m). As the results have been processed by a high-pass filter which removes the mean value, the mean has been added back in afterwards. The depth penetration of a resistance survey is linked to the mobile probe separation: the greater the separation the greater depth but poorer spatial resolution. It can be seen that the 0.5 m survey has produced a clearer image than the 1.0 m and this suggests that most of the archaeological features are relatively shallow, possibly about 0.5 m with no deep features underlying the temple. Further details of the survey and the data processing are given in Appendix 1.

Maps 2 and 3 show both the resistivity survey from 2009 and the magnetometer survey from 2007 in relationship to the features discovered by Bradford and Goodchild. The location of Bradford and Goodchild's excavations (Site A and Site C) has been estimated by Michael Athanson and are shown in blue on maps 2 and 3 and can be compared with the geophysics results. The agreement, although not perfect, is very good.

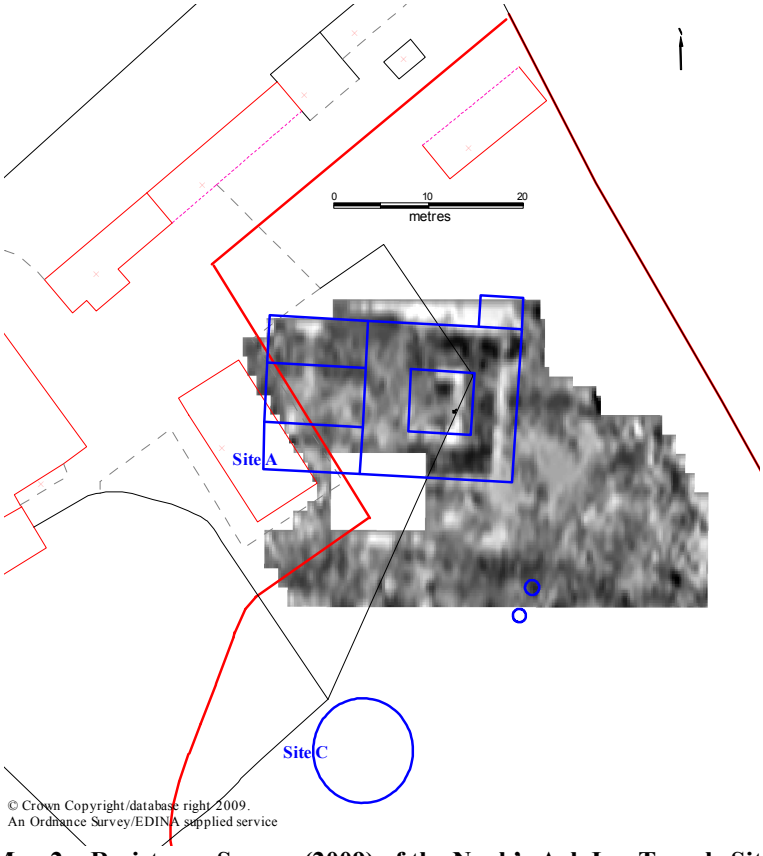


Resistance Survey – Noah's Ark Inn – 7th June 2009
(Grids are 20 metre squares – North is at top)
Probe Separation = 0.5m



Resistivity Survey – Noah's Ark Inn – 12th June 2009
(Grids are 20 metre squares – North is at top)
Probe Separation = 1.0m

Figure 2 – Resistance Survey of the Noah's Ark Inn Temple Site



Map 2 – Resistance Survey (2009) of the Noah's Ark Inn Temple Site Relationship to Bradford and Goodchild's Excavation



Map 3 – Magnetometer Survey (2007) of the Noah's Ark Inn Temple Site Relationship to Bradford and Goodchild's Excavation

Discussion

The geophysical survey has confirmed the main elements of Bradford and Goodchild's plan of the Romano-British temple: an outer portico and inner cella. For the portico, the foundation trench of part of the southern wall, all of the eastern wall and much of the northern wall are clearly visible. In addition, the foundation trench of the inner cella wall is also visible in all its eastern and some of its southern and northern parts. Bradford and Goodchild (1939, 29) give the external dimensions of the portico at 55 feet (16.75 metres) and of the cella at 25 feet. This agrees very well with the resistive survey which suggests 16.4 metres and 8 metres respectively. The area of high resistance beyond the north wall is probably explained by the northern annexe (at the north-east) and by the exterior pathway, 11 feet wide, which survived only on the northern side.

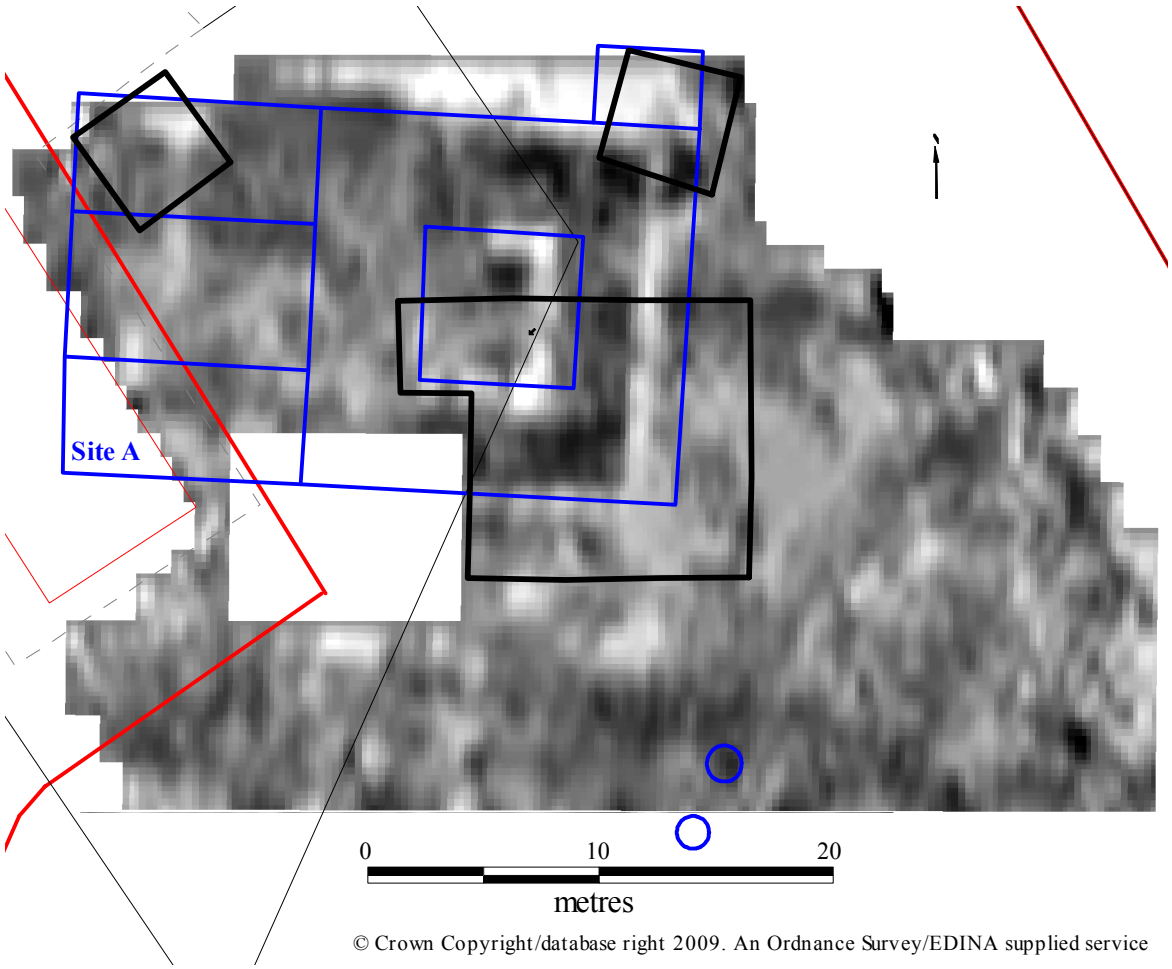
Bradford and Goodchild argue that the main entrance to the temple lay to the east (see also map 1 above) and discovered a substantial entrance pathway, 22 feet wide and extending 30 feet eastwards (1939, 31 - 32). This is not apparent in the geophysical survey and it is possible that the excavators have removed most of it. There is a line of lower resistance heading east from the portico and this may correspond to the excavation trench into this pathway (1939, 28 - figure 9).

To the south of the temple are a number of isolated areas of high resistance. Bradford and Goodchild suggest that the exterior pathway found to the north of the temple also existed on the east and south but has been disturbed and largely removed by later stone robbing (1939, 29). It is therefore probable these are destruction and disturbance deposits rather than structural remains.

The geophysical survey does not provide any evidence for the western portico wall or for the three rooms of the western annexe. It is in this area that Bradford and Goodchild located the stake holes of an Iron Age hut (1939, 8 – 10) and this area was extensively excavated by Harding in 1964. It is therefore possible that the material in the foundation trenches has been removed and/or that the disturbed nature of the backfill masks any archaeological response. There is a suggestion of a western wall some 21 metres to the west of the eastern wall but this does not agree with Bradford and Goodchild's plan. This high resistance feature may corresponds to a baulk Harding left between his main trench and two smaller trenches to the west (1987, 4 – 5, figures 2 and 3).

Maps 2 and 3 highlight one clear difference between the 2007 magnetometer survey and the 2009 resistive survey. The magnetometer survey suggests the eastern wall of the portico has a distinct concave curve whereas the resistive survey shows it as a straight line. Although the magnetometer survey used a traverse direction of north-south with a one metre traverse separation, which means that features running north-south will be detected with less accuracy, it is not clear why the magnetometer produced such a poor result.

The results of this resistivity survey were used to assist in determining the locations of the trenches to be opened in July 2009. Map 4 below illustrates the location of these trenches with respect to the temple and the geophysical survey.



Map 4 – Resistance Survey of the Noah's Ark Inn Temple Site
Excavation Trenches 2009

Conclusions

The two objectives of the geophysical survey within the temple area of the Noah's Ark Inn garden have been met. It has been possible to detect the location and extent of the temple and its inner cella. In addition, areas of high resistance near the temple indicate areas of building material (probably rubble and tile). As the site has already been much disturbed, this may be backfill rather than in-situ material. In addition, the resistivity survey has added more detail to the information previously obtained from the magnetometer survey.

Acknowledgements

I am very grateful to Mr John Duffield for permission to conduct this geophysical survey on his land and to Mr and Mrs Mumby, the occupiers of the Noah's Ark Inn, for access and their assistance and interest in the survey. I am also very grateful to Mr Chris Welch of English Heritage who gave permission for this survey to take place on a Scheduled Ancient Monument.

In undertaking the geophysical survey I am grateful for the assistance of John Hawes and Paula Levick. The geophysical survey work has been undertaken using a Geoscan Research RM15-D resistivity metre owned by the Oxford University Department of Continuing Education. The results have been processed by the ArcheoSurveyor program developed by David Wilbourn of dwconsulting BV.

I am also grateful to Michael Athanson for the data specifying the 2006 and 2009 trench locations, the projected features and the estimated location of Bradford and Goodchild's excavation. This data has been used in maps 1 to 4 and remains the property of the University of Oxford's Vale and Ridgeway Project.

The maps in this report have been produced using MapInfo. Ordnance Survey data for these maps has been obtained from Edina Digimap and their copyright in this data is acknowledged.

This work forms part of the Vale and Ridgeway Project's excavation at Marcham/Frilford in 2009 under the direction of Professors Gary Lock and Chris Gosden at the Institute of Archaeology, University of Oxford.

Appendix 1 – Survey Details and Data Processing

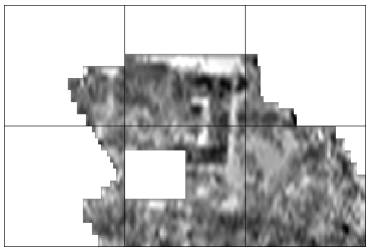
Resistivity Survey

Grid Size: 20 m x 20 m
Traverse Separation: 1 m
Sample Interval: 0.5 m
Mobile Probe Separation: 0.5 m and 1 m
Voltage: 40V
Current: 10mA
Gain: 1
Frequency: 137

Grid Numbering

North is at the top. Grids 1, 3, 4, 5 were walked with the first traverse from east to west and grids 2 and 6 were walked with the first traverse running west to east.

4	3	6
5	1	2



ArcheoSurveyor Processing.

Twin Probe 0.50m

- Clipping 2 SD
- Despike Threshold 3 Window Size 3
- High Pass Gaussian Filter Window Size 21
- Add 32.9 (mean)
- Interpolate Match X&Y
- Interpolate X and Y

Twin Probe 1.0m

- Clipping 2 SD
- Despike Threshold 2 Window Sise 3
- High Pass Gaussian Filter Window Size 21
- Add 20.5 (mean)
- Interpolate Match X&Y
- Interpolate X and Y

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