Geophysical Survey of the Noah's Ark Inn, Marcham, Oxfordshire, July and August 2007.

William Wintle
September 2007



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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).

Since 2001 the University of Oxford has each July conducted a four-week research and training excavation in Trendles Field. This excavation was 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 geophysical survey was undertaken in the garden of the Noah's Ark Inn, to the south of the known temple site.

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 July and August 2007. The report is submitted in compliance with the requirements of the Section 42 Licence (Ref: AA/62285) 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 most probably dates from the 1930s and

appears to show some activity to the east of the Inn. It is therefore possible that this is the excavation of Bradford and Goodchild[1].



Figure 1 – The Noah's Ark Inn and Possible Excavations
NMR SU 4496/2 – Date Unknown
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Site A contained a Romano-Celtic 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

[1] The conjecture that the photograph was taken to record the excavation of Bradford and Goodchild is supported by analogy with the large number of photographs in the NMR collection for SU 4496 recording the excavations in Trendles Field since 2001.

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 has 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). The 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 65 metres, situated about 120 metres to the east of this temenos wall and in a slight depression leading south to the river Ock. Based on fieldwalking evidence Hingley differentiated between the north and east of the temple, where stone and tile were present, and the south and west, where there was an abundance of pottery and animal bone but little stone or tile (1985, 207). He suggested the former area contained buildings with stone walls and tiled roofs and having a religious function while the latter area contained domestic houses of timber and thatch.

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 (Allen 1988). The main area of trenching appears to have been to the north and west of the temple.

The Aerial Photographic Evidence

The aerial photograph in figure 2 shows a number of archaeological features associated with the Iron Age and Romano-British settlement at the Noah's Ark Inn. These features extend to the south and west of the excavated temple site. Bradford and Goodchild chose to excavate at the upper (northern) end of the field as they regarded the southern and south-western areas as unsuitable for occupation (1939, 3). However, the aerial photographic evidence suggests occupation did extend to the south and west.

The most complete interpretation of the aerial photographic evidence for the Noah's Ark Inn was provided by Hingley (1985) and his figure 4 is reproduced below as figure 3. This figure highlights three separate rectangular enclosures. The northernmost is defined by the temenos wall which surrounds the temple. An element of the southern section of this wall is visible as a parch mark in figure 2. To its south is a further sub-rectangular feature defined by a deep ditch, and which seems to have the same or similar eastern alignment as the northern enclosure. Within this southern enclosed area are a further series of ditches and circular enclosures. To the east of both these features is the eastern part of a third enclosure, defined by a deep ditch and on a different alignment. The relative dating of these three enclosures is not clear, but possibly the eastern is the earliest. It appears to be truncated by the two western enclosures, although there are no clear crop marks at the point where it would intersect with the south-western enclosure. The straight lines might hint at a Roman date for this enclosure.



Figure 2 – Noah's Ark Inn, Frilford
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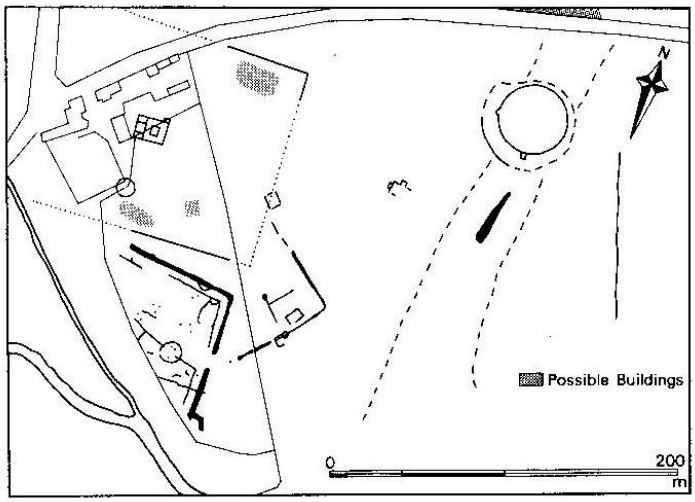


Figure 3 – Noah's Ark Inn, Frilford: Temple, Amphitheatre and Cropmarks
(Source: Hingley 1985, 206, Figure 4)

The Geophysical Survey

The geophysical survey had the following objectives:

- to allow a comparison with the aerial photographic evidence. Previous work has shown that geophysical survey can add more detail, particularly with regard to smaller features such as pits.

- to determine the location and extent of features such as enclosures and pits thereby indicating the density of settlement.

- to provide a comparison with previous results obtained in the geophysical survey of Trendles Field.

Permission to undertake the survey was given by the landowner, Mr John Duffield and by Mr Chris Welch of English Heritage.

The survey took place on Sunday 8th, Thursday 12th and Friday 13th July during the excavation season in Trendles Field. Crossing one survey grid was a temporary electricity cable supplying electricity to the excavation. This grid was re-surveyed on Tuesday 7th August after the completion of the excavation and the removal of the cable.

Using a Total Station the excavation surveyor set out a north-south base line within the Noah's Ark field to align with the excavation grid within Trendles Field. From this base line a grid of thirty-metre squares were laid out with tapes. Subsequently their position was checked and recorded using the Total Station. The survey grid was positioned to correspond in easting and northing alignment with the thirty metre squares previously used in the geophysical survey of Trendles Field to allow the processing of both surveys within the same dataset.

The north-south alignment produced only a few complete 30-metre grids: the majority of grids were partial and triangular in shape. On the east the grids were bounded by a thick hedge separating the Noah's Ark from Trendles Field and on the west by a line of nettles fronting bushes defining the edge of lower and boggy ground.

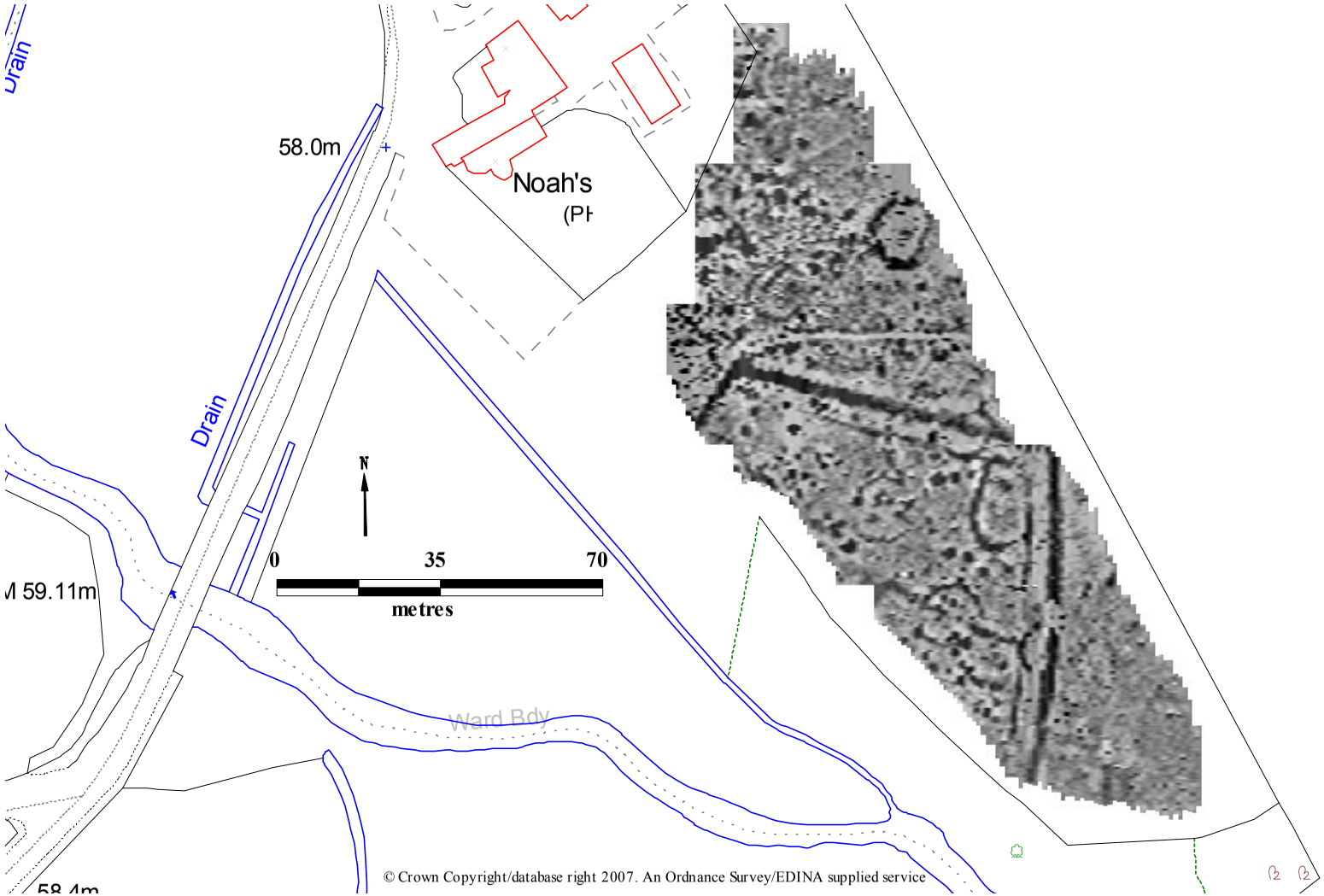
The magnetometer survey was undertaken using a Bartington Instrument's GRAD601 gradiometer with a single magnetometer tube. The traverses were one metre apart and readings were taken four times a metre along each traverse. The magnetometer was set to a scale of 100nT with a sensitivity of 0.1nT. The magnetometer was re-initialised each morning and afternoon at a marked position. The complete grids were walked in a clockwise "zigzag" pattern and the partial grids in a parallel pattern. The results have been processed by ArcheoSurveyor and are presented as block shaded images using a grey-scale.

Figure 4 shows the processed results of the 16 grids which were surveyed, while maps 1 and 2 show the survey location together with excavation trenches and features in Trendles Field. Map 3 provides a provisional interpretation of the geophysical survey.

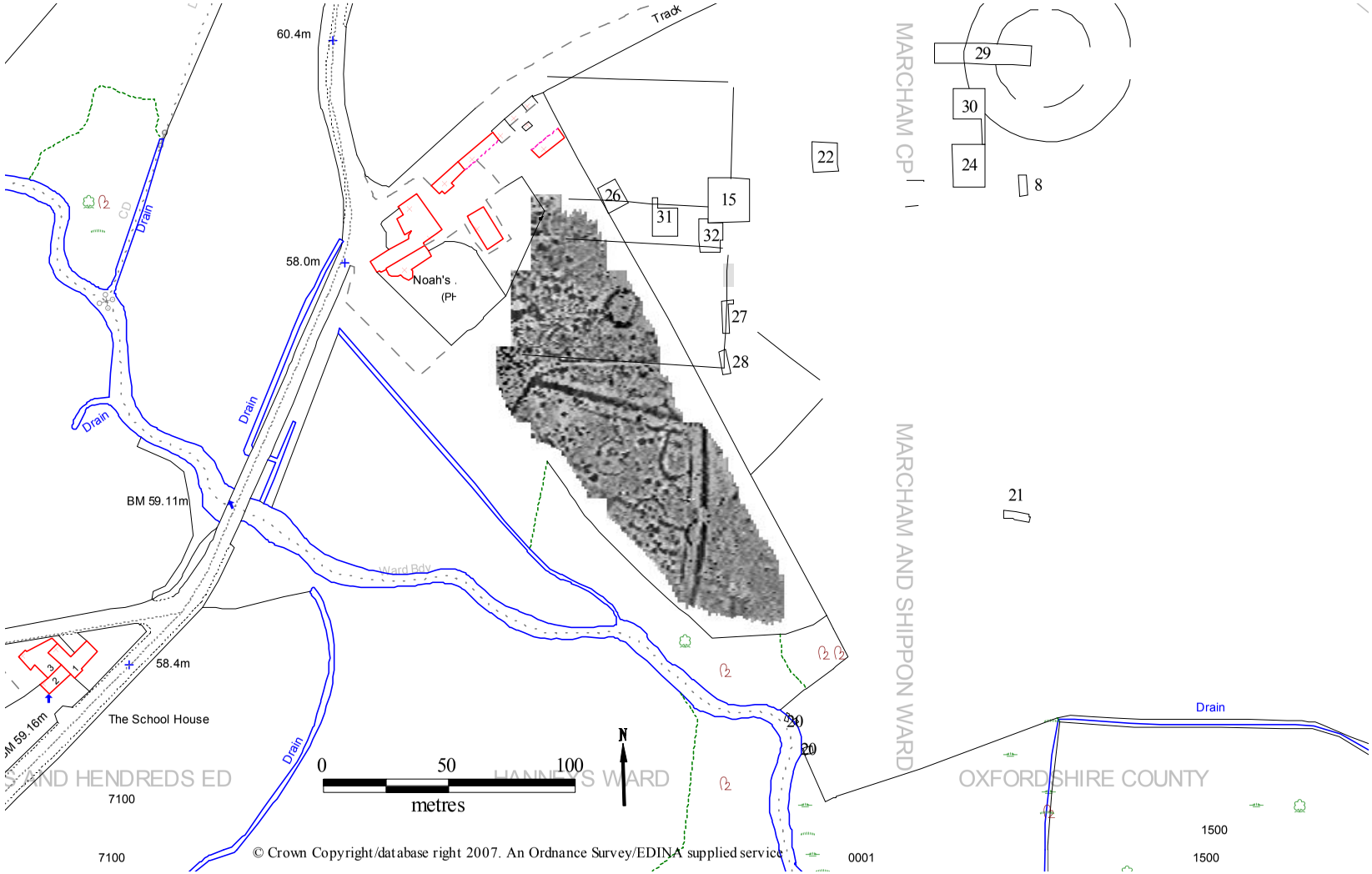


Figure 4 – Geophysical Survey of Noahs Ark Inn, Marcham 8th, 12th and 13th July 2007, 7th August 2007.

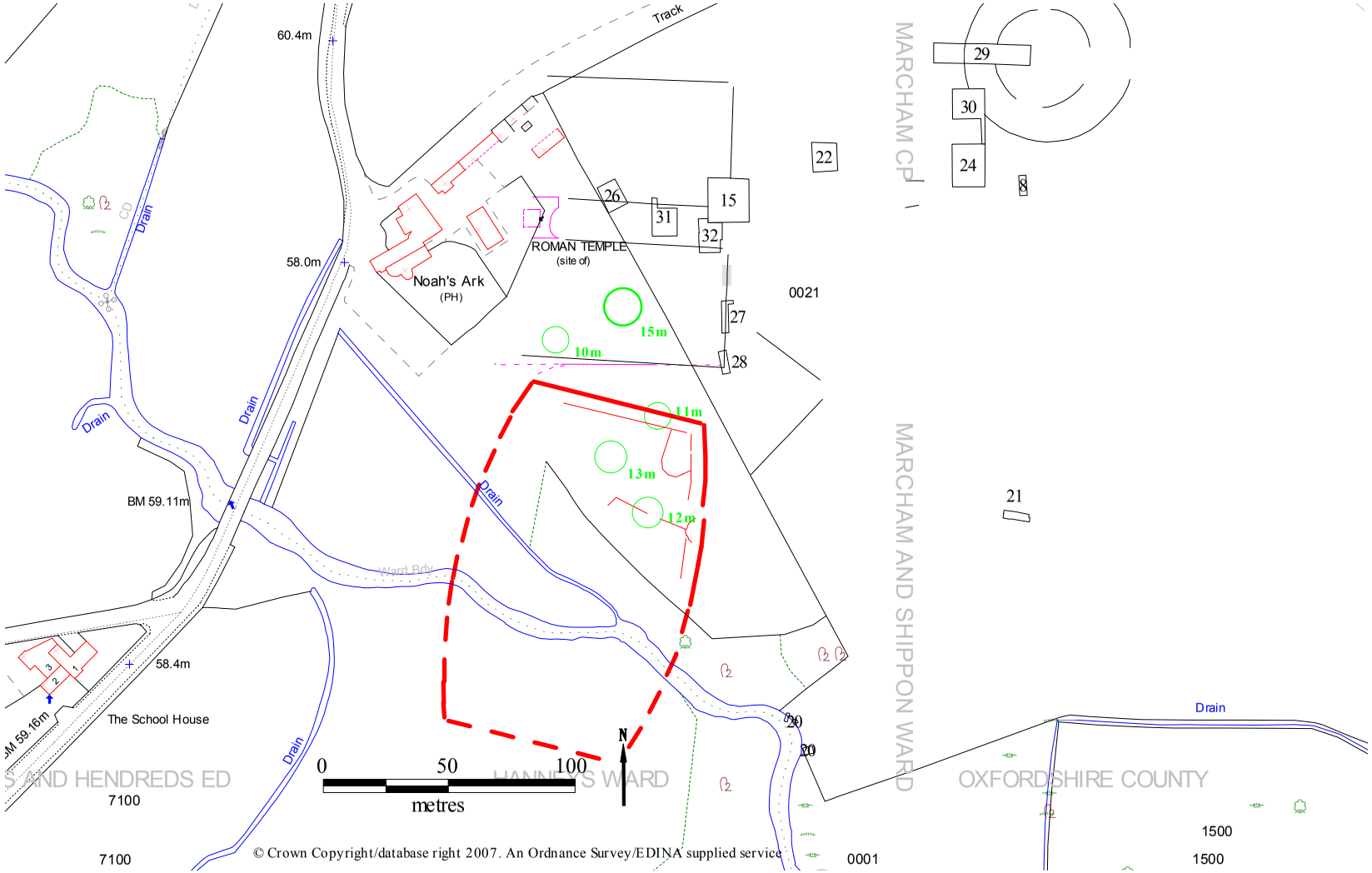
(Grids are 30 metre squares. North is at the top.)



Map 1 – Location of Geophysical Survey at the Noah's Ark Inn



Map 2 – The Geophysical Survey at the Noah's Ark Inn in relationship to Excavation Trenches (2006) and Projected Features



Map 3 – Provisional Interpretation of The Geophysical Survey at the Noah's Ark Inn
(See Discussion Section)

Discussion

The geophysical survey has confirmed the main elements of Hingley's interpretation of the aerial photographic evidence (see figure 3) and has provided a much clearer indication of the southern enclosure. In particular its western limit has now been defined. Although its northern ditch is straight, its eastern and western ditches are convex. Within the eastern and northern ditches is a smaller ditch, possibly a palisade trench. There is however no clear evidence for such an internal ditch on the west. As suggested by the aerial photographs the main enclosure also contains a range of smaller enclosures some of which are circular. A smaller enclosure of possibly similar shape to the main enclosure is located in the south-east. In addition there is evidence for rubbish or storage pits. An entrance to the main enclosure is located in the east but it is possible there may have been more than one entrance.

To the north of this enclosure is the southern section of the temenos wall. The line of the temenos wall is lost in the west and it is possible that it bends south towards the southern enclosure. North of the temenos wall and within the temple compound is an area of considerable magnetic disturbance on the east of which is a large, irregular circular feature while to the west is Bradford and Goodchild's Site C. It is unclear whether this magnetic disturbance is a reflection of underlying archaeology or more modern ground disturbance such as spoil heaps or backfill. The magnetic stack trace of this area suggests considerable numbers of small metallic objects. In the extreme west of this area, the geophysical image of Site C is distorted by a number of old fence posts, and the decaying remains of an external toilet block.

Visible in the northernmost grid is the outline of the eastern part of the temple portico and cella.

The following discussion considers in more detail a number of aspects of the geophysical survey.

The Eastern Enclosure

The aerial photographs indicate that only a small part of the ditch representing the eastern rectangular enclosure is present within the Noah's Ark field. The geophysical survey has detected only the extreme south-western end of this ditch and provides no evidence that it ran further south and west. This enclosure ditch was investigated in Trendles Field in trenches 3 and 12 (Lock, Gosden et al 2002, 76-82). In trench 3 an initial V-shaped ditch appeared to have been recut at a later date. The presence of an almost complete Middle Bronze Age bucket urn appears to date the early ditch to the Bronze Age, with a later recut in the Romano-British period. In trench 12 a ditch was located of similar size and shape to that in trench 3 and which had twice later been recut.

The Southern Enclosure

Importantly, the north-western limit of the enclosure has been detected. Assuming a symmetrical shape a possible maximum extent of this enclosure is suggested on map 3 where the definite features are marked in solid red, and projected features in dashed red.

In discussing the Noah's Ark site Bradford and Goodchild (1939, 3) suggested that the areas to the south and south-west were unsuitable for occupation as they are liable to

flooding. This is certainly the case now, but may not have been the case two thousand years ago. The location and orientation of this southern enclosure strongly suggest this area was used, and possibly occupied in the Roman period. Two possible lines of interpretation are outlined below:

a) The river Ock may have lain further to the south and west of its current course. In this case the land may have been higher and drier than it is now. Since the Roman period the river may have moved north and east, eroding much of the south and west of the enclosure. If this is so, these parts of the enclosure may contain preserved water-logged deposits. In addition, it may be possible to locate the enclosure ditches in the sides of the Ock[2]. Map 3 suggests two possible locations in the river Ock, and one in the field drain where the ditch might be sought. However, it is possible that the erosion may now be below the level of the original ditch, in which case this evidence may no longer exist.

b) The river Ock may have flowed in or close to its current course but the banks may have been higher and drier than now. In this case the enclosure may not have been symmetric and would certainly be smaller than suggested on Map 3

Some environmental evidence was discussed in the Interim Report for 2003 (Lock and Gosden 2004) for an open lake or swamp to the south of Trendles Field, together with finds of water-logged medieval artefacts.

It is possible to estimate the maximum size of this southern enclosure, assuming its shape as outlined in map 3. The distance between the north and south ditches is 140 metres, and the average distance between the eastern and western ditches is 85 metres. This yields an area of 1.2 hectares (ca 3 acres).

Circular Features

A number of circular features are visible on the geophysics image and are shown in green with their approximate diameters on map 3. These may represent drainage gullies surrounding roundhouses. The diameters of the roundhouses would be less than the gullies.

In a number of instances the gullies cut, or are cut by enclosure ditches. This suggests that the ditches and circular features are not contemporary, although the geophysical image does not provide any phasing evidence. Recently Allen (2000) has summarised the characteristics of Iron Age settlement in the upper Thames Valley. Firstly he has observed that ditched enclosures become more common in the middle Iron Age (400 BC to 0) and typically define an area between 0.5 and 0.8 hectares. Secondly, he notes that in the middle Iron Age houses were frequently built of stakes and enclosed by drainage gullies (2000, 9). This might suggest that the gullies are defining middle Iron Age roundhouses, and that the large, rectangular enclosure is a later feature.

It is also worth considering the circular features excavated in Sites A and C. The stake-built structure identified by Harding in Site A does not appear to have a surrounding gully, and its diameter led Harding to suggest it represented a stock enclosure rather than a

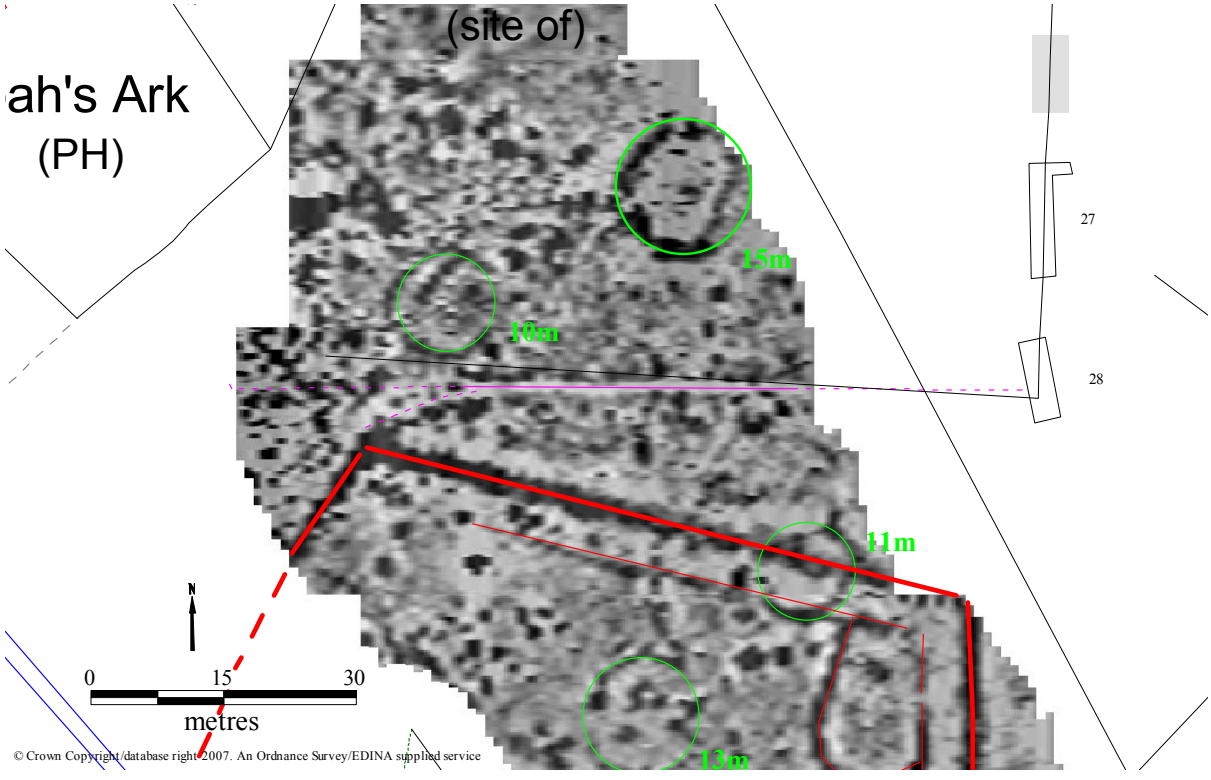
[2] I am grateful to John Walford and Chris Gosden for this suggestion. Perhaps a small coracle is needed for the 2008 season.

roundhouse. At Site C the Iron Age pennanular ditch had an external diameter of nearly 13 metres but enclosed a much smaller area only six metres in diameter (Harding 1987, 13). The large, irregular feature in the north-east of the geophysical survey is similar, but not identical to this description.

The Temenos Wall

The southern temenos wall is visible as a faint parch mark in aerial photographs and has appeared in the geophysical survey as a negative anomaly. These two pieces of evidence suggest the presence of a limited amount of masonry material still in-situ. The eastern edge of the temenos wall was followed south in trenches 27 and 28 and the corner located in trench 28 (Kamash et al 2007). Maps 2 and 3 show the southern element of this wall as detected in the geophysical survey as running directly towards trench 28.

Map 4 shows the same information as in maps 2 and 3 but in more detail. The certain features of the temenos wall are shown in solid purple, and the projected features in dashed purple. The projected line of the temenos wall does reach trench 28. However, the projection of the temenos wall based on the excavated features in trench 28, while being very close to the results of the geophysical survey, does not match precisely.

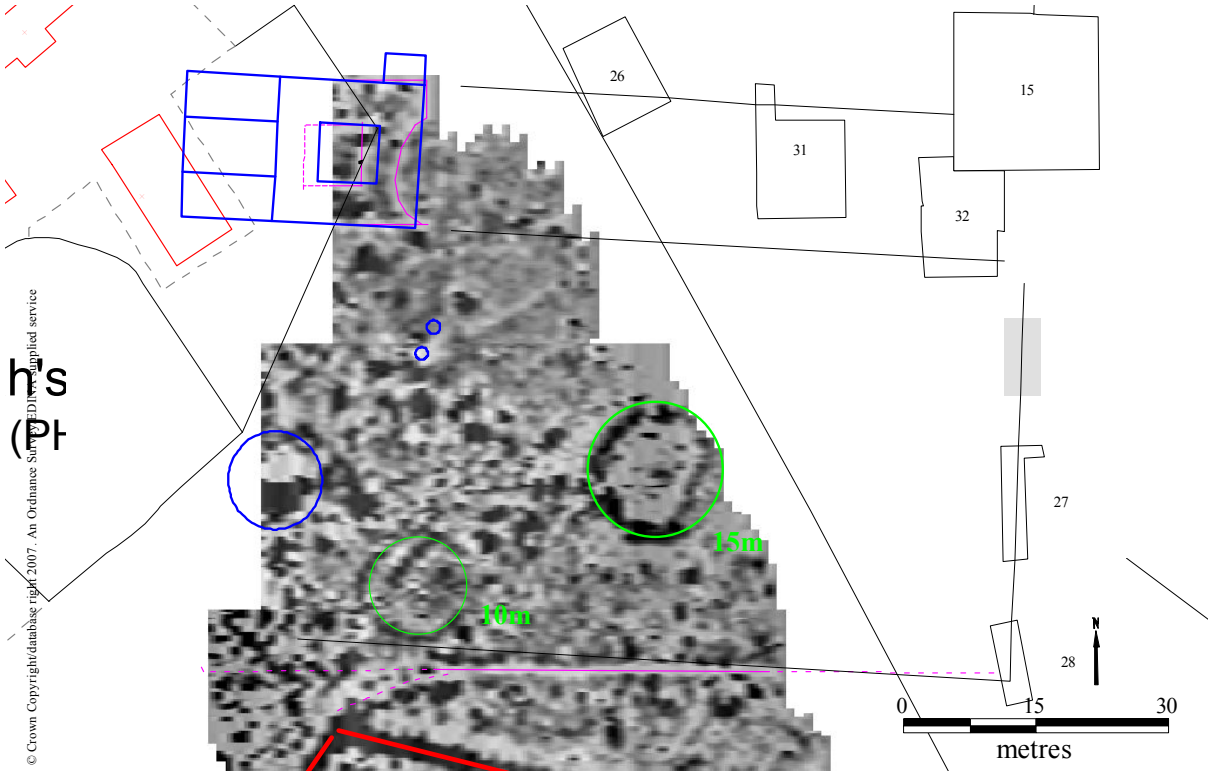


Map 4 – The Temenos Wall

The Temple

The location of Bradford and Goodchild's excavations (Site A and Site C) has been estimated by Michael Athanson, the excavation surveyor. The estimated locations are shown in blue on map 5, and can be compared with the geophysics results marked in purple. The

agreement, although not perfect, is very good. The location of the outer temple wall is almost exact, although there is an east-west misalignment of the cella by about 1.5 metres.



Map 5 – The Temple

There is however one obvious discrepancy between the geophysical survey and the excavations. The geophysical survey suggests the eastern wall of the portico has a distinct concave curve. It is unclear why this should be the case. It is possible that the excavation and subsequent backfill caused this disturbance. Additionally, as the survey traverse direction is north-south with a one metre traverse separation, features running north-south will be detected with less accuracy. However the apparent curve in the wall is greater than one metre.

Bradford and Goodchild (1939, 29) recorded the external sizes of the cella at 25 feet and the portico at 55 feet. This agrees well with the geophysics results which suggests a cella size of 8 metres (26 feet) and portico of 17.2 metres (55.9 feet). The geophysics gives a slightly larger measurement as the magnetic field associated with the masonry extends beyond the masonry itself. As with the temenos wall the negative magnetic anomalies suggests a limited amount of foundation masonry is still present.

To the east of the temple Bradford and Goodchild (1939, 31) located an entrance pathway 22 feet wide and extending eastwards 30 feet before fading out. There is no positive evidence of this feature in the geophysical survey.

Based on features excavated in trenches 15, 26 and 32 Michael Athanson has projected two lines running from these trenches towards the temple, of which only the southern line lies within the survey area. This southern line does appear to be associated with an area of magnetic anomalies, but this may be fortuitous. These anomalies do not extend to the temple.

Conclusions

The three objectives of the geophysical survey within the area of the Noah's Ark Inn have been met. The southern enclosure, the southern part of the temenos wall and the temple itself have been detected. The survey has added more detail to the information previously known from aerial photographs and excavation.

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. In addition, Mr Duffield arranged for the grass in the field to be cut prior to 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 Knight Boyer and Paula Levick. The following students participating on the excavation assisted with elements of the survey: Jenny, Naomi, Gitau, Sarah, Mike, Henrik, Christine, Adrian, Chris, Ann, Alice, Karen, John and Isobel. The geophysical survey work has been undertaken using a Bartington 601 magnetometer generously loaned to the Department of Continuing Education by Bartington Instruments. The results have been processed by the ArcheoSurveyor program developed by David Wilbourn of dwconsulting BV.

I am grateful to Michael Athanson and Nicola Savage for setting out the baseline from which the survey was measured, and for later checking and recording the grid co-ordinates. I am also grateful to Michael Athanson for the data specifying the 2006 trench locations, the projected features and the estimated location of Bradford and Goodchild's excavation. This data has been used in maps 2 to 5 and remains the property of the University of Oxford's Vale and Ridgeway Project.

I am grateful to Dr Richard Hingley and the editors of the Oxford Journal of Archaeology for permission to reproduce as figure 3 a diagram originally published as figure 4 in Hingley (1985, 206).

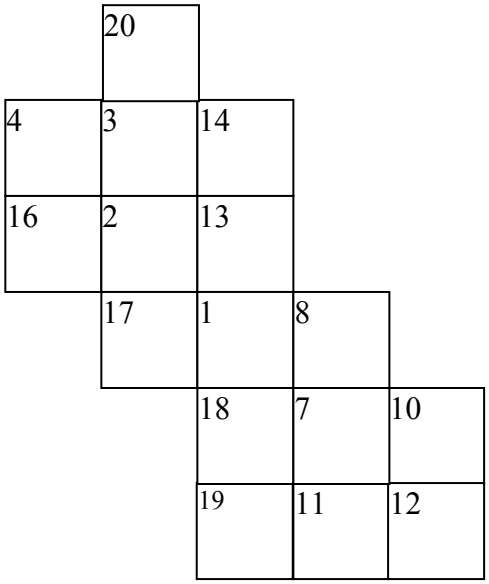
The maps in this report have been produced using MapInfo. Ordnance Survey data for these maps has been obtained from Edina Digimap and their copyright in this data is acknowledged.

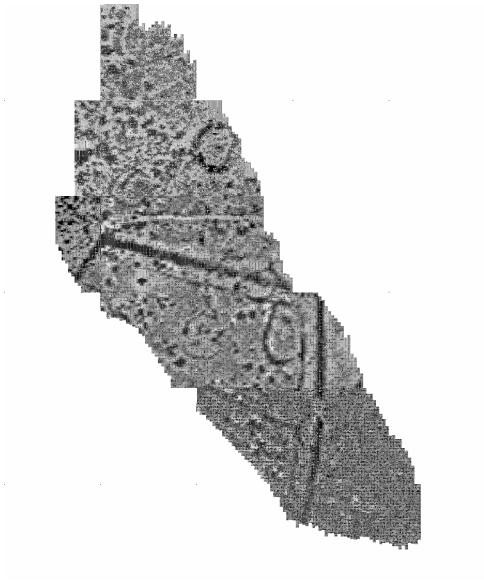
This work forms part of the Vale and Ridgeway Project's excavation at Marcham/Frilford in 2007 under the direction of Professors Gary Lock and Chris Gosden at the Institute of Archaeology, University of Oxford.

Appendix 1 – Data Processing

Grid Numbering

North is approximately at the top (see map 1). Grids were walked from south-to-north except where noted below.





Sunday 8th July 2007

Grids 1 to 8 (All Zig Zag)

Thursday 12th July 2007

Grids 10 to 15 (All Parallel)
Grids 11 and 12 walked from north to south.

Friday 13th July 2007

Grids 16 to 20 (All Parallel)
Grids 16 to 19 walked from north to south.

Tuesday 7th August 2007

Grid 20 re-walked (Zig-Zag)

Grids 5, 6, 9 and 15 do not exist. These grid numbers were used for training students and are not part of the survey.

Archeosurveyor Processing.

- Clipping -5 to 5
- Zero Mean Grid
- Zero Mean Traverse (except grid 8)
- De-stagger Inbound/Outbound -2 (for grids walked Zig-Zag)
- Interpolate Match X&Y

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