



## Chichester and District Archaeology Society

### Geophysical Survey

#### Petworth North Garden – November 2017



Figure 1. CDAS volunteer using the magnetometer

## 1. Summary

At the request of The National Trust, the Chichester and District Archaeology Society carried out magnetometry and resistivity surveys in the North Lawn. The surveys identified the fire protection system ring main, the extension to the cow tunnel, and some features from the pre Capability Brown formal gardens. Other paths may be from later layouts of the gardens.

## 2. Background

During 2017, the National Trust at Petworth carried out a redesign and replanting of the North Lawn flower beds, returning them to the shape they had in the 1890s. While this work was in progress, there was a once in a generation opportunity to carry out a geophysical survey to discover what was underneath the beds.

Maps show the layout of the formal gardens as they existed before Capability Brown remodelled the park and areas closer to the house (figure 1). The object of the survey was to find out what could still be identified, and its exact location.

Figure 2. Pre Capability Brown formal gardens



## 3. Site Access/ Health and Safety

The Health and Safety Risk Assessment (Appendix 1) was prepared prior to undertaking the survey.

## 4. Method

These surveys utilised the following equipment:

1. Geoscan RM15 D Resistivity meter that CDAS was able to purchase for the Medmerry project as a result of generous donations for this purpose from the Chichester District Council Coastal Pathfinder Project and the Chichester City Council.

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2. Geoscan FM256 magnetometer. Previously purchased by CDAS as the result of a generous grant from the Chichester Harbour Conservancy.
3. Electronic Theodolite. Previously purchased by CDAS as the result of a generous grant from the Chichester Harbour Conservancy.

The grid was established so that it ran through the centre of the Tijou gate and parallel to the west face of Petworth House, 12.72 metres from the west facing elevation, measured at right angles. The face used was that of the majority of the stone work ignoring the various pediments.

The grid squares were measured from the point in the middle of the Tijou gate. The electronic theodolite was set up 60 metres north of the Tijou gate. From this point the grid was established using tapes to measure the distances and the theodolite to measure the angles.

### 5. Volunteer Participation

CDAS members worked on the survey during 30th and 31st October 2017. 15 CDAS members participated in the survey and provided a total of 24 man days of effort.

### 6. Survey results

Figure 3.

## Petworth North garden Magnetometry survey - October 2017

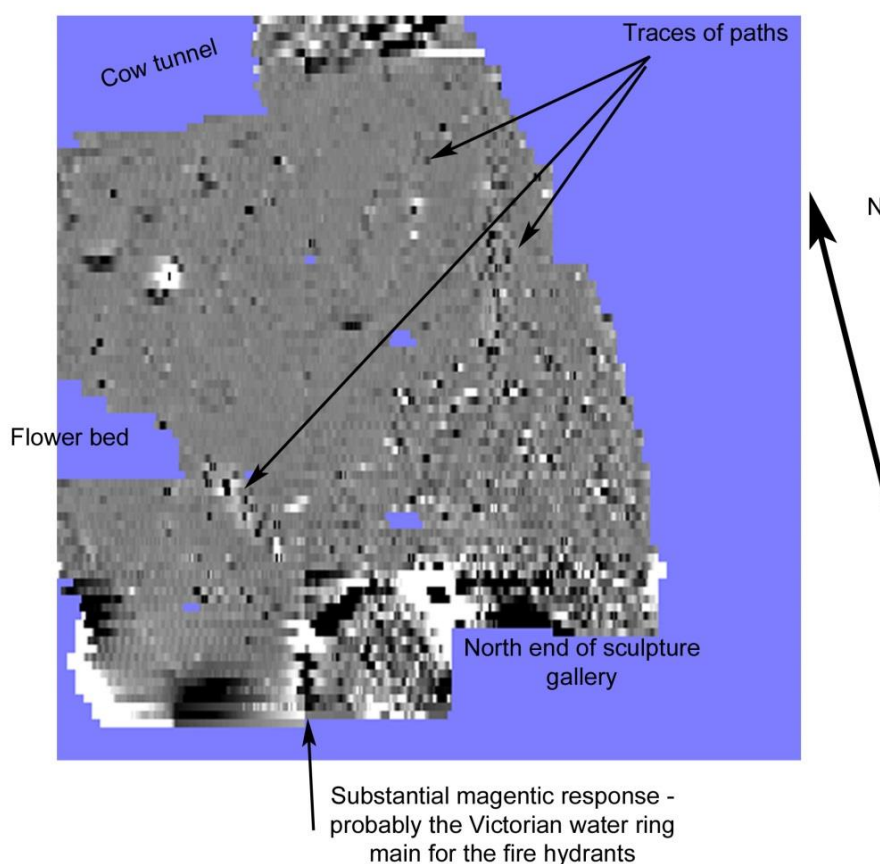


Figure 3 shows the results from the magnetometry survey. The key features are:

- The cow tunnel. There is a blue area which is the entrance and further to the east there is the response from the extension to the cow tunnel completed in the 1970s. This feature is also clear in the resistivity plot.
- Linear scatters of responses indicate potential paths, one of which can also be seen in the resistivity survey.
- On the east side of the plot, there is a scatter of points. These may indicate the re-planting of the garden at various times.
- Around the house in the south of the plot, there is a substantial magnetic response. There is a good possibility that this is the Victorian water ring main designed to supply the house fire hydrants.
- In the south west corner of the plot the strong responses are the result of the iron fence around the edge of the park and the Ha-ha.

Figure 4.

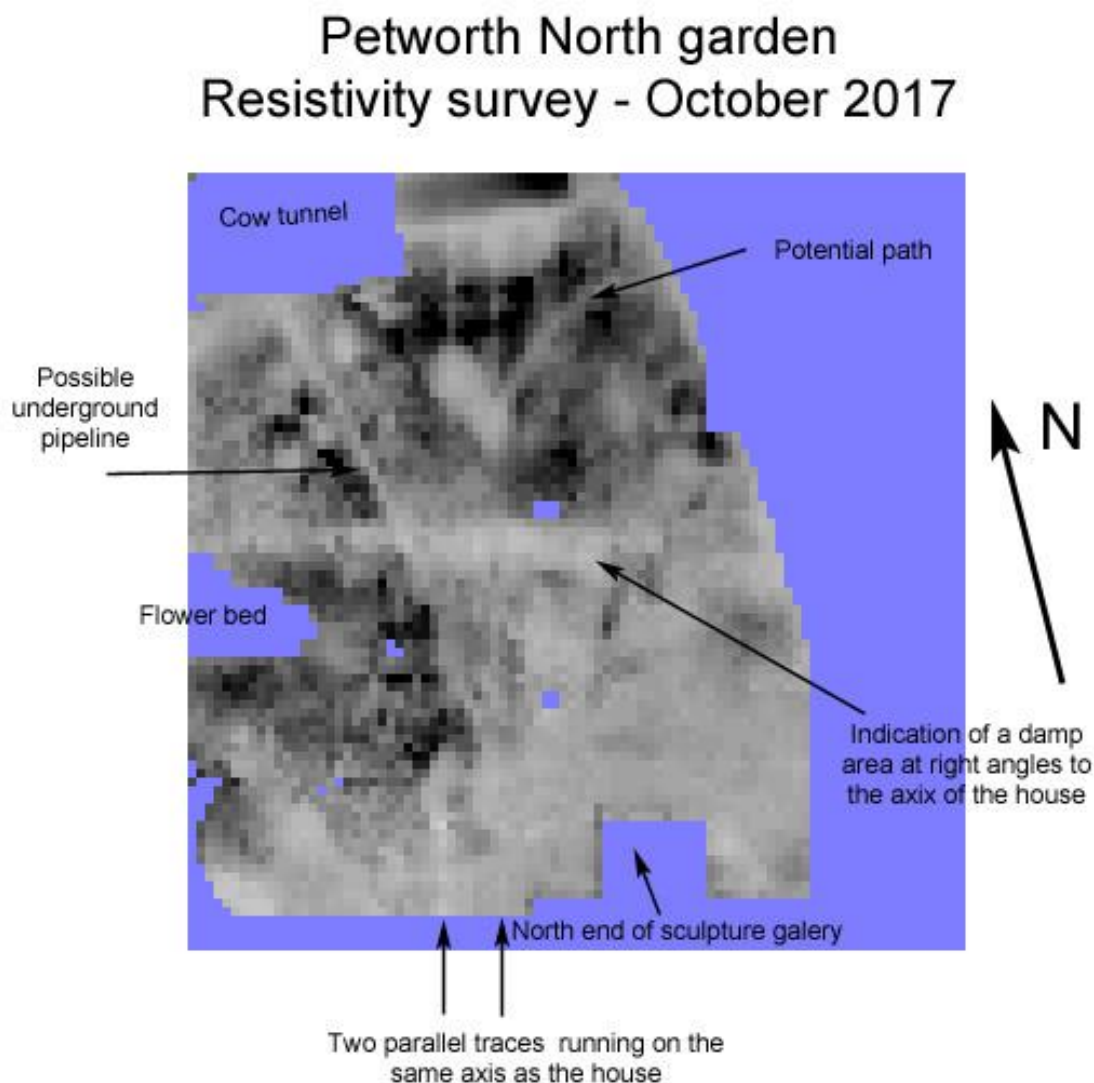


Figure 4 shows the results from the resistivity survey. The key features are:

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- The cow tunnel. There is a blue area which is the entrance and further to the east there is the response from the extension to the cow tunnel completed in the 1970s. This feature is also clear in the magnetometry plot.
- On the east side of the plot there is a possible curving path. This path can also be seen in the magnetometry survey. This curving path would not easily relate to the orthogonal formality of the pre Capability Brown formal gardens, so it is probably of a later date.
- Running east west is a pale (damp) response which. This feature has not yet been interpreted. However, in this location, it is at right angles to the axis of the house, so it is reasonable to suppose that this is part of the early pre Capability Brown formal garden layout.
- The responses round the north end of the sculpture gallery are uninformative. This area had been cultivated recently and the soil was dry and “fluffy” with a lot of entrapped air. It is believed that the soil conditions have made the resistivity readings valueless.
- Running vertically through the centre of the plot there are two parallel lines of white (damp) responses that line up with the axis of Petworth House. These can also be seen very faintly in the magnetometry survey. Comparing this response with the plan of the gardens in figure 2, this response could be the boundary between the parterre and the orange garden. Damp responses are usually ditches and these responses could be trenches dug for the roots of hedges.
- On the west side of the plot, there is a damp response which could be a pipeline although its emergence halfway along the retaining wall at the eastern end of the cow tunnel. Figure 5 suggests that this response may have been a path.

Figure 5. 1843 Tithe map



## 7. Discussion of results

The ground of the North Garden has clearly been turned over multiple times over the years. As a result it is very difficult to pick out the traces of previous garden layouts reliably, unless there is other corroborating evidence. As a result of the present survey:

- The evidence of the division between the two gardens (parterre and orange) on the north side of the house is quite compelling. Figure 5 shows that the 1843 Tithe map had a path in the same location although the parterre and orange gardens have disappeared.

- The interpretation of the strong magnetometry response around the north end of the house and the Victorian fire hydrant ring main is also quite compelling. Later metal detecting discovered four manholes in this location.
- Figure 5 suggests some corroboration for the suggestion of curved paths on the western side of the survey area, but there is no suggestion of a curved path on the eastern side of the plot. If they are indeed paths, these must be part of a layout in the north garden. Given their clarity, it is most likely that they are post Capability Brown.

#### **5. Next Steps**

The survey has identified a number of potentially interesting features. However, remote geophysical surveying cannot fully identify or date features. What has been discovered merits a programme of further investigation when the opportunity arises, and when it fits in with the activities of the other users of the park.

Trevor Davies

CDAS Survey Team Leader

November 2017

## APPENDIX 1

## CHICHESTER AND DISTRICT ARCHAEOLOGY SOCIETY RISK ASSESSMENT FORM

<b>SITE NAME: Petworth</b>		<b>SITE CODE: Petworth</b>		<b>ASSESSMENT BY: Trevor Davies</b>		<b>PAGE 1 OF 2</b>	
<b>ACTIVITY: Surveying (Week commencing 30th October 2017)</b>		<b>No. of people present: (Min 2 / Max 6 at any one time)</b>					
<b>HAZARD IDENTIFICATION</b>							
<b>HAZARDS IDENTIFIED</b>	<b>People at risk (tick)</b>		<b>Likelihood of injury (tick)</b>			<b>NOTES</b>	<b>ASSESSED BY</b>
	<b>Volunteers*</b>	<b>Public</b>	<b>Probable</b>	<b>Possible</b>	<b>Remote</b>		
1. Beware ticks	✓			✓		From deer – can cause Lyme disease	
2. Avoid leptospirosis	✓			✓		An infectious disease that affects humans & animals	
3. Exposure to sun, wind and rain	✓			✓		No shelter available on site	
4. Rough and wet ground	✓			✓		Potholes dug by animals and nighthawks	
5. Insect bites	✓			✓			

\* Includes CDAS members and non-members.

<b>ACTION PLAN</b>			
<b>Hazard No.</b>	<b>MEASURES REQUIRED TO REDUCE RISK TO ACCEPTABLE LEVEL</b>	<b>NOTES</b>	<b>All measures in place. Signed/dated by Site Supervisor</b>
1	Check for skin for ticks		
2.	Wash hands before eating		
3.	Volunteers advised to bring and use suntan cream and drink plenty of fluid. Use of hats and windproof jackets advised		
4.	Boots or wellingtons to be worn where possible	Not possible when using magnetometer	
5.	First Aid kit available		

### CHICHESTER AND DISTRICT ARCHAEOLOGY SOCIETY RISK ASSESSMENT FORM

<b>SITE NAME: Petworth</b>	<b>SITE CODE: Petworth</b>	<b>ASSESSMENT BY: Trevor Davies</b> <b>DATE: 25/10/2017</b>	<b>PAGE 2 OF 2</b>				
<b>ACTIVITY: Surveying (Week commencing 30th October 2017)</b>		<b>No. of people present: (Min 2 / Max 6 at any one time)</b>					
<b>HAZARD IDENTIFICATION</b>							
<b>HAZARDS IDENTIFIED</b>	<b>People at risk (tick)</b>		<b>Likelihood of injury (tick)</b>			<b>NOTES</b>	<b>ASSESSED BY</b>
	<b>Volunteers*</b>	<b>Public</b>	<b>Probable</b>	<b>Possible</b>	<b>Remote</b>		
1. Spikes on resistivity machines	✓			✓		Care in use	
2 Sharp flints in the ground	✓			✓			
3. Manual handling	✓			✓			
4. Beware Brown tailed moths	✓			✓		Can cause rash/asthma/eye irritation	

<b>ACTION PLAN</b>			
<b>Hazard No.</b>	<b>MEASURES REQUIRED TO REDUCE RISK TO ACCEPTABLE LEVEL</b>	<b>NOTES</b>	<b>All measures in place. Signed/dated by Site Supervisor</b>
1.	Volunteers advised. First Aid kit, available		
2.	Volunteers advised. First Aid kit available		
3.	Volunteers reminded of correct lifting procedure. Warning against becoming tired.	Ensure those carrying the equipment are rotated regularly.	
4.	Don't touch the moths		

\* Includes CDAS members and non-members.



