Bourne Park (Bishopsbourne) Geophysical Survey
2011 Results

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Frontispiece: View from north/northwest of the cricket pitch, east of Bourne Park House, southeast across survey area with pavilion and large iron roller visible.
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Abstract

As the pilot season of an ongoing research project, approximately 3 hectares of Bourne Park, Bishopsbourne (Canterbury, Kent) were surveyed with a Bartington Grad 601-2 fluxgate gradiometer in September 2011. A slightly smaller area was surveyed topographically with a Leica 1200 series GPS with smartnet. The survey was undertaken with the aim of determining the extent and nature of probable archaeological remains discovered through aerial photographic evidence as well as to test the effectiveness of geomagnetic survey in the area.

The area included the cricket pitch, where there is a modern pavilion, a large iron roller, groups of trees, and modern iron utility covers. These modern features are clearly visible in the results as either unsurveyed gaps or dipolar features. Large-scale archaeological features and limited geological features were revealed. Walls of possible Roman buildings show with some clarity as negative linear anomalies. In addition to the many dipolar anomalies resulting from modern surface material, one large anomaly appears to be associated with the buildings. Evidence for the remains of a ditch surrounding a barrow may be represented by an annular positive feature. The palaeostream channel or river terrace may be visible as a quiet area in the northeast of the survey area.
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Fig. 1. Ordnance Survey map of the area around Bourne Park showing the area surveyed in 2011.
Introduction

Background to this Investigation

On the suggestion of Kent HER Officer Dr. B. Croxford, Lacey M. Wallace and Paul S. Johnson arranged with the owner of Bourne Park (Bishopsbourne, Kent), Mrs. Vanessa McDonald, to undertake a geophysical and topographical survey from 26 to 29 September 2011. The focus was on the cricket pitch where cropmarks representing a possible Roman building had been observed by Mr. Chris Blair-Myers in aerial photos (TR 15 SE 326) and the nearby park area where metal detectorist Mr. Bill Gawler had found Roman coins and other finds (TR 15 SE 328–331) in the early 1990s. This area is hereafter referred to as ‘the site’ (Fig. 1).

The survey was carried out with equipment generously provided by Mr. Kristian Strutt (Archaeological Prospection Services of Southampton) and by Professor Martin Millett (Faculty of Classics, Cambridge). Mr. Kristian Strutt also provided expert geophysical advice and assistance on site. Dr. Ben Croxford (Kent Historic Environment Record) collated the background information, provided expert archaeological knowledge about the surrounding area, and also assisted on site. Dr. Christopher Miller (Tübingen) contributed geoaarchaeological advice and interpretations on site and also assisted in the survey. Mr. Chris Blair-Myers and Ms. Angela Brennan volunteered their knowledge of the local landscape, their time, and provided assistance on site. The survey was co-directed by Dr. Lacey Wallace and Dr. Paul Johnson.

Geology and Topography

Bourne Park is an area of open parkland between the villages of Bishopsbourne to the south and Bridge to the north c. 6 kilometres south of Canterbury. The Park lies in a chalk valley, called the Elham Valley, shaped by the Niablebourne Stream, which has its source at Lympne. The stream flows through Elham after which it is now only seasonal through Barham, Kingston, Bishopsbourne, Bridge, Patrixbourne, Bekesbourne, Littlebourne (from where the stream is called the ‘Little Stour’), Wickhambreaux, Ickham, and West Stourmouth. The Niablebourne, rejuvenated in Bishopsbourne by two springs in the Park (Fig. 2), runs from the southeast up to the northwest through Bourne Park, east of the site. A man-made pond (labelled ‘Bell’s pond’ on Fig. 1) fed by the stream was created in the Park in 1846. The valley slopes up away from the stream towards the A2 to the east. The Park is bounded by the grounds of Bourne Park House to the west, the drive of Bourne Park House to the north, by Bridge Hill Road to the east, and the village of Bishopsbourne to the south. The British Geological Survey records the local geology as White Chalk subgroup (British Geological Survey onshore geology 1:625000 scale data, DIGMapGB625).

The cricket pitch is an historic feature In its own right referred to as ‘Bishopsbourne Paddock’, it was home to firstclass matches of the Bourne Cricket Club, the county team patronised by Sir Horatius Mann in the 18th century, which drew huge crowds and made Bourne Park a significant sporting venue (Ashley-Cooper 1929). Bourne Park was once the grounds of Bourne Park House (English Heritage Building ID: 170984), a Grade I listed building to the west, but the house has been divided from the Park and is under separate ownership. The Park is now a pasture used for sheep grazing and a recreational area for walkers; the cricket pitch is no longer in use.

Aims and Objectives of Geophysical Investigation

The direct objective of these four days of survey in 2011 was to test the technique of gradiometry on the site and clarify the known remains (TR 15 SE 326, 328–331). The longer-term research objectives include investigating the relationship between this site and the Roman town at Canterbury, the significance of its proximity to the town as well as the Canterbury-Dover road, and the function of the buildings.

Scope of Report

This report presents the results and a basic initial interpretation of the 2011 gradiometer survey. The season consisted of only three days of data collection, which limited the scale of work that is necessary to understand the archaeological features within the surrounding landscape. The topographical survey was incomplete and did not provide enough information to create a surface model, and so is not presented here. Further work will be carried out in July/August 2012.
Fig. 2. View northwest of one of the springs and the Nallbourne Stream (with Chris Blair-Myers and Angela Brennan).
Archaeological Background

Several archaeological features, as well as artefacts, have been recorded in the area immediately surrounding the site and information regarding them is held by the Kent Historic Environment Record (HER) and the Portable Antiquities Scheme (PAS); the prehistoric, Roman, and Medieval remains are summarised here.

Prehistoric period

Archaeological work undertaken during the construction of the A2 revealed a Bronze Age barrow surrounded by a ditch, an Iron Age ditch cutting through the barrow, a second barrow containing ten cremation burials, and six cremations outside the boundary ditch approximately one kilometre east of the site, east of the A2 (TR 15 SE 83) (Macpherson-Grant 1980). On the eastern/northeastern side of Bridge Hill Road, linear earthworks (TR 15 SE 136) have been noted northwest of where two early Iron Age rubbish pits (TR 15 SE 17) were excavated during construction of a housing estate in 1961. Within the Park itself, two adjacent ring ditches (TR 15 SE 165 and TR 15 SE 166) have been identified from crop marks in aerial photos taken in 1976 (Cambridge University Collection of Aerial Photography—hereafter CUCAP—BXK 76-77) and other earthworks and linear features (TR 15 SE 151, 152, 153, 157, 158, 159, 161, 167) have been observed within the Park on the eastern/northeastern side of Bourne Park Road.

On the site, an Iron Age silver coin was found by Mr. B. Gawler in the early 1990s (TR 15 SE 331). In Bishopsbourne, three Iron Age copper-alloy coins (MKE57771, MKE57772, and MKE57582) and an Iron Age silver coin (MKE57776) are included in the Oxford University Celtic Coin Index and the PAS records a struck gold quarter staters of the Morini dating to c. 75–60 BC (MKE57442) and an imported Gaulish cast bronze potin dated to c. 100–50 BC (MKE57441) from Bishopsbourne.

Roman period

The site was first identified by crop marks showing a building, which are visible in a 1990 aerial photograph (Fig. 3) and 2003 Google Earth Image (Fig. 4) (TR 15 SE 326). Mr. B. Gawler collected Roman coins and other finds (TR 15 SE 328) in the area to the east of the Bourne Park cricket pitch where crop marks are visible. Romano-British cremation burials, inhumations, and associated artefacts, including a coin of Carausius (c. AD 286–293), were discovered during Bourne Park owner Matthew Bell's excavations for the artificial pond northeast of the cricket pitch in 1846 (TR 15 SE 1, 84) (Bell 1846:47–48; Haverfield et al. 1932:147), probably less than 100 metres from the site. Linear features (TR 15 SE 164) along with a possible trackway (TR 15 SE 156) visible in an aerial photograph from 1956 (CUCAP BXK 78-81) were located within the Park c. 500 metres northeast of the site. Another linear earthwork (TR 15 SE 167) visible in 1976 aerial photographs (CUCAP BSK 76-77) c. 900 metres northeast of the site could be a Roman trackway as it is aligned to the Roman road between Canterbury and Dover, which has itself been excavated in one area (TR 15 SE 169) c. 600 metres northeast of the site. Roman burials, vessels, and weapon fragments were found c. 700 m northeast of the site during alterations to the modern Canterbury-Dover road in c. 1833 and during GPO cable-laying work in 1956 (TR 15 SE 7) (Jenkins 1955:248; Haverfield et al. 1932:148; Rolfe 1845:279). Ploughed-out barrows of probable Roman date and an associated rectangular enclosure are located less than a kilometre east of the site near to and on the western side of the Canterbury-Dover road (TR 15 SE 5) (Jessup 1945:69). The PAS records Roman copper-alloy coins in Bridge dating to AD 260–296 (MKE57196), c. AD 300–400 (MKE57357), and c. AD 330–333 (MKE57381).

Medieval period

Mr. B. Gawler found an Anglo-Saxon brooch and buckle, dating to c. AD 410–1065 (TR 15 SE 329) and some Medieval coins (TR 15 SE 330) on the site. An early Medieval/Saxon barrow cemetery (TR 15 SE 2) comprising more than 100 tumuli was found on Hanging Hill within the Park near to the Roman road; the cemetery was first noted in 1771 and three mounds were excavated in the mid-19th century. Another probable Saxon barrow is located on the eastern side of the A2 (TR 15 SE 3) and nine Saxon barrows and ten chalk-cut graves were excavated in 1771 (TR 15 SE 6) on the western side of the Canterbury-Dover road.

Several Medieval artefacts have been recorded by the PAS in the general area: a copper-alloy brooch dated to AD 500–560 (MKE57032) at the eastern side of Bourne Park near Bridge Hill Road, a silver coin dated to AD 680–710 (MKE57371), a copper-alloy strap end with a zoomorphic terminal dated to c. AD 775–1100 (MKE57281), a copper-alloy dagger dated to c. AD 800–1000 (MKE57372), two copper-alloy stirrup mounts, one in the form of a human face (MKE56901) and another bearing a lion (MKE56902) dated to c. AD 1000–1100, a copper-alloy pin head (MKE57282) dated to c. AD 450–1066, a cast copper-alloy stirrup dated to c. AD 1300–1400 (MKE57284), a cast copper-alloy buckle dated to c. AD 1300–1400 (MKE57315), a copper-alloy mount dated to c. AD 1300–1400 (MKE57575), a copper-alloy...
The first mention of the village is as Burnan in 708 AD, when Egbert sold the manor to Ealdhur who, in turn, gave it to the Community of Christ. In 811 they in turn exchanged it with Archbishop Wulfred for the manor of Eastry.

The manor of Hautbourne continued with the same family from Domesday until it came into the own-
ership of the second daughter of William Haut. She married William Culpepper, who exchanged his lands in Bekesbourne for the paramount manor of Bishopsbourne. He then conveyed both manors to Sir Anthony Aucher, of Otterden. The manor remained with the Auchers and their descendants, the Beckinghams, until it was sold to Matthew Bell in 1844. It was again sold to Sir John Prestige in 1927 and in modern times to Somerset and Lady Juliet de Chair (later Lady Juliet Tadgell).

Many questions remain from this brief historical overview and the sources will be investigated in due course. It is intriguing that Bourne Park has, perhaps, been the location of a high-status residence since at least the 11th century.

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1 Sir Anthony Aucher (1614–1692) was made first baronet of Bishopsbourne in 1666. The manor house was rebuilt on the same site by the second baronet, Sir Anthony Aucher, in 1701. The current manor then became the seat of the Aucher Baronetcy of Bishopsbourne until the death of the third baronet Sir Hewitt Aucher in 1726.
Survey Methodology

As the nature of the superficial geological background was primarily fluvial/alluvial sedimentary deposition and the expected features were of varied nature (i.e. ditches, stone walls), the decision was taken to employ gradiometer survey for the initial evaluation of the site (Fig. 5). This method is efficient and suitable for detecting buried remains of a range of materials based on differences in their magnetic characteristics as compared to the geological background of the area (Gaffney et al. 1991:6), although the results are severely restricted in areas of modern disturbance and by the presence of ferrous material (Geoscan Research 1996, Scollar et al. 1990:362ff).

The area identified for survey was determined by the location of the crop marks in the aerial photos (i.e. in the northern corner of the cricket pitch, south of the pavilion), by the area of the Park, and by the modern features likely to have a negative affect on the results. Because of the presence of metal fencing along the boundary between the parkland and garden of Bourne Park House, it was not possible to survey a 3-metre buffer strip adjacent to this fencing. Although a number of alternative geophysical survey techniques could have been applied to the site (and may be in future), magnetometry represented the best compromise between speed and quality of data retrieval for a pilot season over a site where the nature of the archaeology is known to be significantly distinct from the natural geological background.

The magnetometer survey was undertaken using a Bartington Instruments Grad 601-2 Dual-Sensor Fluxgate Gradiometer. This equipment allowed the survey to be conducted rapidly as the area was relatively free of obstructions. In accordance with the aims of the project, readings were taken at 0.25-metre intervals along traverses of 0.5-metre spacing. This enabled a high density of data to be collected over the survey area while retaining a rapid coverage of the area overall. The geophysical survey grids of 30 x 30 metres were set out using the Leica 1200 series dGPS with SmartNet, and tied into the Ordnance Survey map of the area. Since the predominant alignments of the buildings were known from aerial photographs, the grids were orientated to transect these at an angle approximating 30°. In combination with the sample-density of the survey, this alignment provided sufficiently close spacing of readings to recover traces of the expected features.

Fig. 5. View facing north/northeast of gradiometry survey underway.
Geophysical Survey Results

The survey covered an area of approximately 3 hectares in Bourne Park, Bishopsbourne, to the east of Bourne Park House (see Fig. 1, above). This area was largely flat (see frontispiece) and, for the most part, free from obstructions. There were however three major limitations to the survey. Firstly, the cricket pitch pavilion (see frontispiece) was connected to electrical and water services producing strong responses from pipes and cables; on the surface of the pitch was a large iron roller (Fig. 6) for flattening the ground and several iron utility covers (Fig. 7). The pavilion itself was avoided with the magnetometer and shows in the results as a large area of dummy-data. Secondly, the area of the survey was bounded to the southwest by a metal fence (Fig. 8), dividing the parkland from the garden of Bourne Park House. This effectively reduced the area available for survey by c. 3 metres along this edge. Thirdly, the areas of trees and dense vegetation have produced several gaps in the data. Within the area where survey was possible the site exhibited a good response to the gradiometer and, where present, buried features showed clearly against the geological background (Fig. 9).

Description of anomalies (Fig. 10)

The majority of the area surveyed demonstrated small, scattered dipolar responses, likely resulting from the presence of ferrous materials on or near the ground-surface. The large, linear dipolar feature [1], located to the southwest of the area surveyed represents the line of a power-cable for outside lighting. A second large dipolar anomaly [2], adjacent to the edge of the cricket pitch, represents the effect of the large iron-roller which it was impossible to remove from the survey area. The irregular dipolar anomaly [3], located adjacent to the north of the pavilion, probably also results from the presence of ferrous material on the ground-surface.

A series of landscape-features are revealed through the presence of large-scale magnetic responses. The first of these is a low-response, positive anomaly [4], running for approximately 75 metres across the northern, central part of the site. To the east of the survey area, a 110-metre-long negative response [5] defines what appears to be the edge of a river-terrace and delimits the magnetically active area to the southwest from the significantly quieter zone to the northeast. Approximately 35 metres to the northeast of this feature (in the northeast corner of the area surveyed) a pair of positive responses [6] appear to suggest the far edge of the area of alluvial deposition. To the south of the area surveyed, an amorphous positive magnetic anomaly [7] and curvilinear feature [8] appear also to represent geological features.

The largest archaeologically significant features present are linear, positive magnetic responses [9, 9a, and 9b], extending for approximately 140 metres across the southern-central area of the survey. A positive macula [10] lying adjacent to this feature may also be of archaeological significance. The linear anomalies [9a and 9b] are paralleled to the southeast by another linear, positive response [11] running for c. 67 metres. Consistent with the alignment of the previous feature, located approximately 19 metres to the southwest is a rectilinear positive anomaly [12]. This feature encloses a 21-by-16-metre, annular positive anomaly [13]. The final large-scale feature is a 50-metre-long, linear, positive anomaly [14]. This feature runs perpendicular from an apparent intersection with [11] and is likely to continue beyond the southern edge of the area surveyed.

The centre of the area surveyed revealed a complex area of linear negative responses [15] covering an area of approximately 650 square metres, defining what appear to be buried structures beneath the cricket pitch. Within this area, a large dipolar anomaly [16] is interpreted as having archaeological significance on the basis of its relationship to the structures. A second group of negative linear responses [17] suggests that these features extend to the northeast. Negative linear responses [18 and 19] suggest additional structures beyond the edge of the cricket pitch, to the east of the previously discussed features and coincident with the eastern extent of the positive response [4].

Initial interpretations

The building identified in the aerial photos appears to cover a much larger area within the cricket pitch than was previously apparent, although the ‘apse’ suggested to be present along the ‘corridor’ across from the T-shaped wing of rooms visible in the aerial photographs of this building is not clearly shown in the gradiometry results. The large dipolar anomaly situated at the corner of the western complex could indicate the presence of a hearth. A second associated building, possibly connected, is aligned to the first building and situated to the east. There appear to be at least ten rooms in the western building and six in the eastern. Two linear positive anomalies south/southeast of these buildings could represent a boundary ditches; between them appears the remains of a ring ditch or barrow with its own rectilinear boundary ditch.
Fig. 6. Large iron roller (grid square C2).

Fig. 7. Iron utility covers (grid square B3).

Fig. 8. Metal fence separating gardens of Bourne Park House from Bourne Park (grid square A1).
Fig. 10. Digitised anomalies detected in the gradiometer survey showing also interpretation of the crop marks and Ordnance Survey topographical data.
Conclusion

The 2011 season proved the potential of geophysical survey methods for collecting archaeological data at Bourne Park. As a pilot for a larger project and means of assessing the potential of the area for the application of geophysical survey techniques to answer questions about the occupation and development of the landscape, the project was extremely successful.

On the basis of the results of the survey conducted, the following recommendations for further investigation can be made:

- Execution of a limited (multiplexed) resistivity survey to determine the nature and depth of the features discovered under and adjacent to the cricket pitch.

- Extension of the geomagnetic survey area to complete the area to the south of the modern streambed.

- Extension of the geomagnetic survey to include the rest of Bourne Park.

- Complete a detailed topographic survey of the area.

- Application of a high-density GPR survey to the areas of interest defined on the basis of features discovered through the geomagnetic survey.
Acknowledgements

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References


