Bourne Park (Bishopsbourne) Geophysical Survey

2013 Results

NGR: TR18315308

Lacey M. Wallace, PhD
Alex Mullen, PhD
Paul S. Johnson, PhD

October 2014
Frontispiece: View west across Field 1 from Bourne Park Road.
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Abstract

In the third season of an ongoing research project, approximately 20.3 hectares of Bourne Park, Bishopsbourne (Canterbury, Kent) were surveyed with two Bartington Grad 601-2 fluxgate gradiometers in August 2013. Part of this area was also surveyed topographically with a Leica 1200 series GPS with smartnet. The survey was undertaken with the aim of revealing a greater extent of the features discovered through aerial photographic evidence as well as to extend the geomagnetic survey. A pilot test of ground-penetrating radar and electrical resistance survey was also undertaken, but will be reported on in the next (2014) report once the first GPR survey area has been completed.

The area included the remaining eastern half of the field (Field 1) previously surveyed in 2011 and 2012 as well as the large field (Field 2) across Bourne Park Road and a portion of the field (Field 3) south of Field 1. Large-scale archaeological features and limited geological features were revealed. Several ditch enclosures were found, in addition to lines of aligned pits, one circular feature, and several dipolar anomalies possibly representing burials.

This report duplicates most of the information provided in previous reports, although now in updated form, so that it may be read independently.
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Fig. 1. Ordnance Survey map of the area around Bourne Park showing the area surveyed in 2011–2013 and finds/sites of note (NB: not all features recorded by the HER and visible in aerial photographs are shown).
Background to this Investigation

Following successful survey seasons in 2011 and 2012 (see Johnson and Wallace 2012; Wallace, Johnson, and Strutt 2013; and Wallace, Johnson, Strutt, and Mullen 2014), Lacey M. Wallace (University of Cambridge), Paul S. Johnson (University of Nottingham), and Alex Mullen (University of Oxford) arranged with the owner of Bourne Park (Bishopsbourne, Kent), Mrs. Vanessa McDonald, to undertake a geophysical and topographical survey from 10 August to 31 August 2013 with funding provided by the Faculty of Classics, University of Cambridge, All Souls College, Oxford, The Association for Roman Archaeology, The Roman Research Trust, The Canterbury Historical and Archaeological Society, and the Kent Archaeological Society.

Previous survey had focussed on the part of Bourne Park containing 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 detectorists Mr. Bill Gawler and Mr. Terry Sewell had found Roman coins and other finds (TR 15 SE 328–331) between 1986 and 2002. This area is hereafter referred to as ‘Field 1 west’ (Fig. 1). Following the observation of a rectilinear enclosure (TR 15 SE 155) in aerial photographs from 1976 (CUCAP BXK 78–81) across the valley near to Bridge Hill Road, a further 8 grids were also investigated with magnetometry on the final day of fieldwork in 2012 (referred to as ‘Field 2’). The 2013 Survey focussed on Field 1 East, completing the survey of Field 2, and beginning ‘Field 3’ (the field south of Field 1).

The magnetic and topographical surveys were carried out with equipment provided by the University of Cambridge and Kent County Council. The ground-penetrating radar survey was carried out with equipment from the University of Ghent by Lieven Verdonck. Undergraduate students in Classics from the University of Cambridge, Ashley Chhibber, Camilla Clark, Gabriella Jeakins, Michael Loy, Annika Matthews, Alex Mirošević-Sorgo, Pia Salter, Rob Stroud, and as well as local volunteers Sean O’Connor, Mags Erwin, and John Corfield carried out the fieldwork with Site Director Dr. Lacey Wallace and site co-directors Dr. Paul Johnson and Dr. Alex Mullen.

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 Nailbourne Stream, which has its source at Lyminge. 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 Nailbourne, rejuvenated in Bishopsbourne by two springs in the Park (Figs. 2 and 3), runs from the southeast to the northwest through Bourne Park, east of Field 1 west. An artificial lake fed by the stream was created in the Park in 1846. The valley slopes up away from the stream towards the A2 to the northeast. The Park is bounded by the grounds of Bourne Park House to the west, the drive of Bourne Park House and Bridge Village 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 first-class matches of the Bourne Cricket Club, the county team patronised by Sir Horatio 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 the survey was to investigate the landscape surrounding the Roman structures, to collect data that will make it possible to analyse the relationship between this site and the Roman town at Canterbury and the significance of its proximity to the town as well as the Canterbury–Dover road. By expanding the area we hoped to begin to interpret the landscape context of the known features, the character and function of the buildings and enclosures previously identified. This stretch of the Canterbury–Dover Roman road appears to have had around it a complex burial landscape from at least the Iron Age through to the Anglo-Saxon period and the siting of a large Roman rural complex here is likely to be related to the burial significance of the area.
Fig. 2. View north of one of the springs and the Nailbourne Stream (with Chris Blair-Myers and Angela Brennan).

Fig. 3. View north/northwest towards the spring called 'The Roman's Cold Bath' by Vine in 1886.
Scope of Report

This report presents the results and a basic initial interpretation of the 2013 geomagnetic survey in Field 1 and Field 2, in addition to an updated version of the 2011 and 2012 gradiometer and topographical survey. The magnetic survey of Field 3, the electrical-resistance survey and the ground-penetrating radar survey within Field 1 West will be included in the next report. The full integration of antiquarian investigations, aerial photographs, documentary evidence, and other archaeological work in the area (including metal detecting and excavations) will be collated in a journal article.

The description of magnetic anomalies from the 2013 survey seasons which follows here is organised by area surveyed. The survey conducted in August 2013 continued from the point reached at the end of the 2012 season, completing Field 1 by surveying the area to the north of the Nailbourne (Field 1 East) and then undertaking a complete survey of Field 2 to the north of Bourne Park Road which had been the subject of a very small pilot survey at the end of the 2012 season.

As a result of this overlap, and the publication of the survey at the end of the 2012 season the geomagnetic anomaly numbering system has been revised to be more consistent and logical, and to correlate better with the published results. Because of this, the numbers used in the interim reports of results from 2011 and 2012 (Wallace and Johnson 2012; Wallace, Johnson, and Strutt 2013) are now obsolete. In particular, the numbering from the pilot study of Field 2 has been superseded in this report as a result of the completion of survey activities in Field 1 East. This new, revised numbering of anomalies has been incorporated into this report and as such presents a complete and coherent description of the anomalies recovered to date.

In addition to the formal geophysical surveys undertaken and reported here, project staff worked alongside a local metal-detectorist (Jim Goldswain), who has permission from the landowner, to investigate briefly the western of the two springs that rise within Bourne Park. No material of archaeological significance was found during this activity (Fig. 4).

Field 2 showed evidence of clandestine activity by metal-detectorists. In particular areas along the northwestern limit of the field were observed to have small holes (Fig. 5) dug into the top/sub-soil in an apparently random pattern.

Left: Fig. 4. Jim Goldswain metal detecting in the spring.
Above: Fig. 5. Evidence of illicit metal detecting hole in Field 2.
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), the Portable Antiquities Scheme (PAS), and the Museum of Canterbury; the prehistoric, Roman, and Medieval remains are summarised here. Additionally, objects from Bourne Park held by the Canterbury Heritage Museum found during metal-detecting surveys in the 1980s and 90s have been identified and photographed (with the held of volunteer Sean O’Connor), but not yet catalogued, and are not included here. Discussions were also held with Mr Bill Gawler, the metal detectorist who found the objects, which resulted in the discovery that he has no knowledge of the remainder of the finds’ current location(s).

Prehistoric period

Burials and related features
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 a boundary ditch approximately one kilometre east of the site, east of the A2 (TR 15 SE 83) (Macpherson-Grant 1980). The 1st-century-BC cremation burial (location undisclosed) in an Iron helmet found near Canterbury may support the possibility of late pre-Roman Iron Age burials.

Earthworks, cropmarks, features
On the eastern/northeastern side of Bridge Hill Road, linear earthworks (TR 15 SE 135 and 136) have been noted north of where two early Iron Age rubbish pits (TR 15 SE 17) were excavated during construction of a housing estate in 1961. A concentric ring ditch (TR 15 SE 134) further north on Patrixbourne Hill could be prehistoric as well. Within the Park itself, two adjacent ring ditches (TR 15 SE 165 and TR 15 SE 166) thought to be prehistoric are represented by crop marks in aerial photos taken in 1976 (Cambridge University Collection of Aerial Photography—hereafter CU-CAP—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. Vine (1886:170–173) noted that a depression in the land known as ‘Old England’s Hole’ (now thought to be a chalk quarry) was likely to be the location of an Iron Age oppidum—Vine thought it was that mentioned by Caesar (Commentaries, V.21). Vine also noted that a horse burial with evidence of ferrous material was found by local boys within ‘Old England’s Hole’.

Artefacts
On the site, an Iron Age silver coin was found by Mr. Gawler in the early 1990s (TR 15 SE 331). In Bishopsbourne, six Iron Age copper-alloy coins (CCI-950139, 95014, 950933, 950154, 950155, 962323), a struck gold quarter stater of the Morini dating to c. 75–60 BC (KENT-134AD2), and an imported Gaulish cast bronze potin dated to c. 100–50 BC (KENT-01D293) from Bishopsbourne and an Iron Age silver coin of Cunobelin (CCI-950166) from Bridge, are included in the Oxford University Celtic Coin Index and/or the PAS.

Roman period

Burials
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 1848:47–48; Haverfield et al. 1932:147). 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, later, during GPO cable-laying work in 1956 (TR 15 SE 7) (Jenkins 1956:248; Haverfield et al. 1932:148; Rolfe 1845:279). Lord A. Conyngham also excavated a tumulus near ‘Old England’s Hole’ containing an inhumation burial and ‘breastplate of silver, pierced as by a spear, a curved sword six inches out of line, two bronze shoulder-pieces, four spear-heads, and a wooden vessel banded with bronze bands’ (Vine 1886:173). Ploughed-out barrows of probable Roman date and an associated rectangular enclosure are located on the western side of the Canterbury-Dover road (TR 15 SE 5) (Jessup 1943:69). Four cremations and 13 inhumations (TR 15 SE 26), dating to c. 3rd–5th centuries, were excavated in 1973–4 at the southeastern edge of the field south of Bourne Park and east of Bishopsbourne village.
Earthworks and cropmarks
The western wing of the buildings within the main enclosure in Field 1 west was first identified by crop marks, which are visible in a 1990 aerial photograph (Fig. 6) and 2003 Google Earth image (Fig. 7) (TR 15 SE 326), by Chris Blair-Myers and Ben Croxford. Vine (1886) identified several features visible in the landscape and interpreted them as related to the 54 BC invasion of Julius Caesar. Vine also noted two hexagonal features (one of which is TR15 SE 154 excavated by Paul Wilkinson between 2003 and 2006, see Wilkinson 2008) and rectilinear earthworks, visible in the northeastern area of the park, which he believed to be the remains of Caesar’s camp. Although Vine’s interpretations need to be treated with caution and investigated further, his observations demonstrate that the features pre-date WWII (which was one hypothesis, previously on the Kent HER, for the hexagonal feature). This enclosure on Vine’s map lies in the same area as other linear features which are now known (TR 15 SE 164) along with a possible trackway (TR 15 SE 156) visible in an aerial photograph from 1956 (CUCAP SU 1) associated with what appears to be the same rectilinear enclosure (TR 15 SE 155, in Field 2, partially surveyed in 2012 and completed in 2013, and included in this report) visible in aerial photographs from 1976 (CUCAP BXX 78–81). These linear and rectilinear features are located in Field 2, c. 500 metres northeast of the main enclosure in Field 1 west. 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 (Vine 1886:173) and at the Barnham Downs site during the A2 construction in 1971, east of Barnham (MacPherson-Grant 1980:136).
Artefacts
Mr. Bill Gawler and Mr. Terry Sewell 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. Many of these objects are no longer available for study and are not properly catalogued, but 73 are held by the Museum of Canterbury. The PAS records Roman copper-alloy coins in Bridge dating to AD 260–296 (KENT-E5EBC6), c. AD 300–400 (KENT-A87541), c. AD 310 (KENT4080), and c. AD 330–333 (KENT-E632F3)

Medieval period

Burials
An early Medieval/Saxon barrow cemetery (TR 15 SE 2) comprising more than 100 tumuli visible in 1771 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. Approximately 100 Saxon burials were excavated by Paul Wilkinson between 2003 and 2006 (Wilkinson 2014). Another probable Saxon barrow is located on the eastern side of the A2 (TR 15 SE 3) and nine Saxon barrows containing ten chalk-cut graves were excavated in 1771 (TR 15 SE 6) on the western side of the Canterbury–Dover road. Another Anglo-Saxon cemetery excavated c. 1973–4 (TR 15 SE 32) lies to the south, east of Bishopsbourne village.
Artefacts
Mr. B. Gawler found an Anglo-Saxon brooch and buckle (TR 15 SE 329) and some Medieval coins (TR 15 SE 330) on the site. 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 zoomorphic spout from a vessel dated to c. AD 1300–1500 (MKE57574), and silver coins dated to c. AD 1249–1286 (MKE57382), c. AD 1272–1307 (MKE57316), c. AD 1279–1327 (MKE57302), and c. AD 1279–1377 (MKE57306).

Documentary and historical evidence
In the Domesday Book, Bishopsbourne is listed as ‘Burnes;’ a manor held directly (in demense) by the Archbishop of Canterbury Christ Church. It had 64 villeins and 53 bordars with 30.5 ploughs as well as a church and two mills. The manor rendered £20 in geld (tax) in 1066 and £30 in 1086. The royal estate at Faversham was of comparable size and Eastry (for which Bourne was exchanged in 811) was actually smaller in 1086. Only Dartford, Aylesford, and Milton Regis (held directly by William the Conqueror) were significantly larger in 1086. Bourneborough was, therefore, one of the most important non-royal rural estates of the early Medieval period in Kent. The 13th-century church of St. Mary the Virgin lies c. 500 m southeast of the ‘villa’ buildings and an earlier building (i.e. one standing in 1086) is that mentioned in the Domesday Book. The village has been dominated by the manor of Bourne Park since at least the 17th century. The current manor house was built in 1701 and replaced an earlier structure.

According to the historical research presented in "A Guide to the Church of St. Mary the Virgin, Bishopsbourne, Kent: The Cradle of Anglicanism" (St. Mary the Virgin Church Parochial Church Council, 2008),

‘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 ownership 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 Auckers 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).’

This summary is not correct in the later particulars. In 1800 Bourne Park was inhabited by William Harrison and before that by Sir Horatio Mann (Hasted 1800). Matthew Bell was the owner in the mid-19th century and Sir John Prestige the owner up until 1962 when he sold the estate to Mr. Richard Neame. Mr. Neame then sold Bourne Park House to Benedictine Monks who used it as a monastery for a few years before selling the property on to a developer, who planned to convert it into flats, but eventually sold it to Mr. Somerset de Chair and Lady Juliet de Chair (now Lady Juliet Tadgell) in the early 1980s. Bourne Park has been in separate ownership from Bourne Park House since Mr. Neame sold the house. The Park was inherited by Mr. Neame’s daughter, Mrs. Vanessa McDonald, who is the current owner and uses the land to graze sheep, as her father did.

Bourne Park has perhaps been the location of a high-status residence since the 11th century and a detailed investigation of Bourne Park and its associated structures/features remains a desideratum; numerous resources could be assembled to achieve this end, including the manuscript (the ‘Book of Bourne’) written by Martin Bell (19th-century owner) held by Robert Prestige, tithe maps, estate maps, and manorial rolls.
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 2011 evaluation of the site, which proved effective. 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 in 2012 was determined by the density of features identified in 2011, and the decision was taken to survey completely the western half of Field 1 with both magnetometry and topographical survey in 2012. In March 2013, a small area of electrical resistance survey was undertaken in the 2011 survey area. In August 2012, the location of magnetometry survey in Field 2 was chosen based on the presence of the rectilinear enclosure and trackway in aerial photographs. In August 2013, the eastern half of Field 1 was surveyed, as was the remainder of Field 2 and part of Field 3. The presence of metal fencing along the field boundaries meant that it was not possible to survey a 3-metre buffer strip adjacent to this fencing.

The magnetometer survey was undertaken using a Bartington Instruments Grad 601-2 Dual-Sensor Fluxgate Gradiometer (Fig. 8). 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 GPS with SmartNet (Fig. 9) along the same grid and orientation as the 2011/2012 seasons. In combination with the sample-density of the survey, this alignment provided sufficiently close spacing of readings to recover traces of the expected features.
Geophysical Survey Results (Figs. 14–19)

The three seasons of survey have covered an area of approximately 14.42 hectares in Field 1 to the east of Bourne Park House and c. 10.81 ha across Bourne Park Road (see Fig. 1, above) in Field 2. Field 1 is largely flat (see frontispiece) but slopes up towards Bourne Park Road on its eastern side, and is, for the most part, free from obstructions; Field 2 lies on the valley slope. There were however some limitations to the survey. The area of the survey was bounded by metal fences (Fig. 10). This effectively reduced the area available for survey by c. 3 metres along these edges. Electrical and water services produced strong responses from pipes and cables; several iron utility covers (Fig. 11), fenced-off saplings, an old iron roller (Fig. 12), and a heavy steel sheep-pen base also had to be avoided, as did trees and other vegetation (e.g. dense nettles, etc.); the brick foundations of a 19th-century lake-house (Fig. 13) also disrupted the survey; dense flint nodules and metal debris cast up from recent dredging of the artificial pond also appear to have had a strong effect in the northeastern part of Field 1 West. Within the area where survey was possible, the site exhibited a good response to the gradiometer and buried features showed clearly against the geological background (Fig. 14).

Description of anomalies from Field 1, 2011–2013 (Figs. 14–18)

Field 1 is divided into two halves by the Nailbourne stream and the artificial lake. It contains the cricket pitch and cricket pavillion and borders Bourne Park House, Bourne Park Road, the drive leading to Bourne Park House, and Field 3. It is relatively flat but slopes down towards the stream. We have identified at least five ditched enclosures in this field, represented by linear positive anomalies, as well as other ditches and dipolar area features. Two large buildings, represented by negative anomalies and first identified in aerial photographs (see above), lie within Enclosure 2.

In the northern part of Field 1 West, there were dense dipolar anomalies which we believe represent post-medieval landscaping. On the surface there was a dense spread of flint nodules [1], and although there could be rectilinear features within this area, there was such a large amount of iron both on the surface and buried that they are too obscure to interpret. A quiet area separates [1] and [2], which could indicate a possible terrace associated with the building of Bourne Park House and the creation of the landscaping which included the artificial pond c. 1846. Other linear dipolar anomalies [3] and [4] are likewise separated by quiet areas and appear to be aligned both to [2] and to Bourne Park House, further supporting the likelihood that they are remnants of landscaping, such as terraces or ha-ha walls. This area appears to be bounded to the south by a perpendicular, linear, dipolar anomaly [5]. Within this ‘enclosure’ (‘Enclosure 1’) are four sub-rectangular dipolar anomalies [6], [7], [8], and [9]. Parch marks in satellite images from 2003 (Google Earth) show a complex of linear and rectilinear features in this area. Outside this ‘Enclosure 1’ to the south/southeast are two dipolar anomalies [10] and [12] seemingly associated with linear feature [5] which possibly represent ornamental buttresses of a brick wall.

South of this area of post-medieval landscaping in Field 1 West lie ‘Enclosures 2–5’; the two buildings, other ditches (including three southwest–northeast ditches which appear to continue into Field 1 East) and a penannular ditch.

‘Enclosure 2’ is formed of two (?) parallel positive linear anomalies (probable ditches) [14] on the northern side (one of which appears to continue across the stream as [37]), a single positive linear [15] (probable ditch) on the western side, and two (?) parallel positive linear anomalies [16] (probable ditches) on the southern side (one of which continues beyond ‘Enclosure 2’ to the southwest). The negative linear anomaly on the eastern side [17] (boundary wall?) continues to the southeast to form the eastern side of ‘Enclosure 4’ and terminates at a large dipolar anomaly [17a]. This possible boundary wall [17] is also aligned with the eastern side of ‘Enclosure 5’, which may suggest that Enclosures 2–5 were contemporaneous. Within the enclosure is a low-response, positive anomaly [18], running for approximately 75 metres northwest–southeast, apparently of a different phase than the enclosure itself. The centre of the enclosure revealed a complex area of linear negative responses [20] covering an area of approximately 650 square metres, defining the building first recognised in aerial photographs. On the building's northwestern corner, a large dipolar anomaly [22] is interpreted as having archaeological significance (e.g. as a hearth/furnace) on the basis of its relationship to the structures. A second group of negative linear responses [21] represents the building to the northeast.

Electrical resistance survey (Fig. 17) was also undertaken over ‘Enclosure 2’ in March 2013. Only 8 grids were completed, but the results show the southern end of the western building in far more detail than the magnetometry. In August 2013, ground-penetrating radar was begun over the same area with excellent results (Fig. 18). The GPR will continue on a larger scale in 2014 and all GPR results will be included in the next archive report.
Fig. 9. View facing west of topographical survey underway.

Fig. 10. Metal fence separating gardens of Bourne Park House from Bourne Park.

Fig. 11. Iron utility covers.
Fig. 12. Large iron roller.

Fig. 13. Brick foundations of the lake house.
Fig. 14. Processed results of the 2011–2013 gradiometer surveys with Ordnance Survey topographical data.
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Fig. 18. Raster results of the ground-penetrating radar survey in Field 1 west.
Fig. 19. Digitised anomalies detected in the gradiometer survey of Field 2 and Ordnance Survey topographical data.
A possible ditch-lined path is formed by [16], [27], and [26] and continues northeast as [25] and across the stream as [39]. Although these features were not visible as anomalies further upslope (i.e. further northeast), it is possible that they formed the sides of a path leading up to ‘Enclosure 7’ (Field 2).

‘Enclosure 3’ is formed of positive linear anomalies [27], [28], and [31] and may have been subdivided or drained by the possible ditch [32]. ‘Enclosure 3’ is separated from ‘Enclosure 2’ by the ditch-lined ‘path’, but may have originally abutted ‘Enclosure 2’ before the creation of ditch [27/26].

‘Enclosure 4’ is formed by ditches [31], [26], [28], and [17]. ‘Enclosures 3 and 4’ are therefore separated from ‘Enclosure 2’ by the double-ditched ‘path’.

‘Enclosure 5’ is formed by positive rectilinear anomaly [33] and contains a possible structure or smaller enclosure [34] represented by positive linear anomalies and two dipolar anomalies at two of the inside corners. Northeast of the fifth enclosure is a faint semi-annular positive anomaly [35].

Field 1 East demonstrates only sparse presence of geomagnetic anomalies, the largest of these is an approximately 260m long dipolar anomaly [36], which runs broadly northwest–southeast across the field and probably should be interpreted as a former river terrace along with positive anomalies [40] and [45].

In this northwestern area is a c. 27m linear, positive anomaly [37], running northeast–southwest. This feature appears to pick up the alignment of the northern ditch [14] of ‘Enclosure 1’ to the southwest of the Nailbourne. A long broken-linear anomaly [38], running north–south for approximately 68m, which does not share the alignment of any other features, lies to the southeast of [37]. To the south and east of [38] are a group of parallel linear, positive anomalies [39], which appear to continue the alignments of ditches [25] located to the southwest of the Nailbourne, for approximately 47m to the northeast.

Linear, negative anomaly [41] runs slightly west of north–south for approximately 60m but does not appear to respect any of the major alignments seen elsewhere in the survey results. To the southeast of this negative anomaly is a group of three linear/rectilinear parallel, positive anomalies [42], measuring approximately 41m by 34m, which appear to define a 90° corner and may represent another enclosure. Approximately 3m to the northeast of these features is a 31m linear, positive anomaly [43] which appears to pick up the alignment of the northern ditch [31] of ‘Enclosure 5’ to the southwest of the Nailbourne. Approximately 37.5m to the northeast of [43] the alignment is continued for a further 51m by a linear, positive anomaly [44], which appears to run beyond the edge of the survey area to the northeast. The southwestern end of this feature is intersected by a c. 80m-long curvilinear, positive anomaly [45], which, as stated above, is likely to represent a palaeostream edge or terrace.

The majority of Field 1 contained small, scattered dipolar responses (see Fig. 14), likely resulting from the presence of ferrous materials on or near the ground-surface. The large, linear dipolar feature [23], located to the southwest of the area surveyed represents the line of a power-cable for outside lighting. A second large dipolar anomaly [24], adjacent to the edge of the cricket pitch, represents the effect of the large iron-roller which was not possible to remove from the survey area. The irregular dipolar anomaly [19], located adjacent to the north of the pavilion, probably also results from the presence of ferrous material on the ground-surface. Other dipolar anomalies are noted in the northwest of Field 1 East, adjacent to the pond, these should also be seen as having no archaeological significance (indeed, the large circular dipole there is a modern inspection hatch that we failed to avoid because it was buried underneath sediment; the remaining five hatches in Field 1 East appear as ‘blank’ circle-shaped areas in the data).

Description of anomalies from Field 2, 2012–2013 (Fig. 19)

Field 2 is located on the northern slope of the Nailbourne valley, northeast of Field 1 and borders Bourne Park Road, Bridge Hill Road, Field 4, and Field 5. This area is on the steeply-sloping side of the valley (i.e. the northeastern side of the field is considerably higher than the southwestern). In Field 2, we have identified at least two enclosures, an area of concentrated dipolar responses possibly representing (in part) burials, and double rows of pit alignments.

‘Enclosure 6’ is represented by positive linear anomalies [65] and [66], within which are a scattering of small positive and dipolar anomalies as well as a wide positive linear anomaly [64] parallel to and within the eastern side of the enclosure. Positive linear anomaly [63] may represent a terrace and runs parallel to and south of [65]. The enclosure
appears to have been longer north–south in one phase as a second southeastern corner is visible [62], which contains a large positive anomaly, perhaps a large pit. This enclosure does not share the alignment of the others.

Overlying ‘Enclosure 6’ are two double rows of pit alignments, represented as fairly-regularly-spaced positive anomalies [67] and [68], which appear to run from the Roman road in the northeast all the way to Bourne Park Road in the southwest. There are also indications of some of the pits being renewed and/or replaced with others, not in exactly the same alignment. Although we did not pick up a continuation of these pits in Field 1, there has been significant post-medieval and modern landscaping in the area that would become the artificial lake. These have been studied in relation to old mapping for the area, estate-plans and aerial photographs and no obvious correlation with recorded features can be demonstrated (e.g. as an avenue of trees), despite the apparent orientation of these features toward Bourne Park House.

‘Enclosure 7’ appears to have had at least three phases, and three sizes. In its largest form, it is of a different phase than the extended version of ‘Enclosure 6’ because the northernmost ditch [59] of ‘Enclosure 7’ crosses the southern part of [62] from ‘Enclosure 6’. The three phases of western ditches of ‘Enclosure 7’ are represented by [56], [57], and [58]; the phases of the northern ditches are represented by [61] and [59], and possibly [60]. No eastern or southern boundaries of this enclosure have yet been found. The eastern side is likely to lie underneath the modern disturbance of [47] and [48] and the southern is likely to be found in Field 5. Within the smallest version of the enclosure, bounded by [58] and [61] a modern clump of trees can be seen on OS maps, although only a few of these trees remained in 2012–2013. The magnetic responses in this area [50] were highly dipolar, which may be related to debris collecting in the modern trees, or may be archaeological. The largest dipolar anomaly [69] is in an area of an old chalk quarry surrounded by trees. The approximately-circular arrangement of small dipolar anomalies [70] could represent a Bronze Age barrow with its ditch reused for later burials; the remaining scattered dipolar anomalies in this enclosure may also be burials, based on analogy with the known burials along this ridge and the Roman road. To the northeast of the large concentration of dipolar anomalies [50] is another 11.5m diameter, penannular anomaly [55], which opens to the west.

The western part of Field 2 demonstrates a relative scarcity of archaeologically significant geomagnetic anomalies. The central part of this area shows a 71.25m-long linear, positive anomaly [52], which appears to respect the predominant orientation of anomalies in Field 1. Adjacent to the southern end of this feature is a penannular positive anomaly [53], with a diameter of c. 16m and open to the east. The far southern corner of Field 2 contains a c. 22.5m-long linear, positive anomaly [54], aligned northwest–southeast and also broadly consistent with the predominant orientation of anomalies in Field 1.

Dipolar anomalies [72], [73], [74], and [75] are regularly spaced and the westernmost [75] is also present as a large concave area in the ground surface. Because of their regular spacing, they may represent a ‘stick’ of bombs from WWII. Towards the northwestern edge of the survey area [51] is an area of disturbed ground where iron/steel rods/cables were observed at, or slightly below, the ground-surface. This area also contains a chalk platform, visible as a topographically raised area, and may have been a WWII gun emplacement.

It should be noted that the field is crossed by a series of parallel, linear anomalies which probably can be related to modern agricultural practices and are, therefore, not discussed in detail here. The eastern edge of this field was characterised by large dipolar responses [46] and [47], in part these may have resulted from the extensive metal fencing along the edge of the field. Additionally, a pair of long, linear dipolar anomalies are shown to cross the southeastern corner of the field. The first of these [48], is approximately 135m in length and has an affect 10.5m wide. The second of these linear dipolar anomalies [49] is approximately 161m in length but only effects a band c. 3.75m wide.

**Initial interpretations**

The sides of ‘Enclosure 1’, an area of post-medieval terracing, are formed by the drive of Bourne Park House, the artificial lake, and a possible brick wall represented by [5]. Within this enclosure are remains of walls and structures probably associated with 19th-century ornamental landscaping. Enclosure 2 is formed by ditches (or double ditches) on three sides and a possible stone wall on the eastern side. Within this enclosure lie two wings of a building complex (the western wing covers an area measuring c. 52 m. NW–SE and 19.5 m. SW–NE; the southern wing covers an area measuring c. 33.5m SW–NE and 21.5m. NW–SE), almost certainly of Roman date, and a possible third wing on the northern side which is unclear in the magnetometry and electrical resistance results (the GPR has not yet covered that area). The size of the villa is comparable to West Park Roman Villa in Rockbourne, Hampshire (RCHM 1983). The dipolar anomalies associated with the wings could represent hypocausts or furnaces. Sub-rectangular positive anomalies
within this enclosure could represent large pits. Ring-ditch [30] appears to respect the continuations of the boundaries of Enclosure 2; and may possibly, therefore, be later: perhaps a ditch surrounding an Anglo-Saxon burial. Enclosure 3 could be divided by a ditch down its centre, and may contain a structure (unnumbered positive anomaly), but it is too obscured by the strength of the dipolar anomaly [23]. Enclosure 4 contains several large sub-rectangular positive anomalies, which could, again, represent internal structures/pits/etc. Enclosure 5 is separate from the other attached enclosures and appears to contain a structure within it, perhaps associated somehow with the stream to its southeast.

Enclosures 1–5 all lie approximately parallel to the Roman road. Enclosure 6 (and the possible terrace to its south), however, lie at an angle to the road, although much closer to it. Such a difference in alignment could indicate that Enclosure 6 is from a different period. The enclosure seems to have two phases, having been shortened or moved northward in a second phase. Because the northern ditch [13] of Enclosure 2 lines up with [37] in Field 1 East and [59] in Field 2, indicating a boundary or possibly the ditch alongside a track between Enclosure 2 and the Roman road. The shortening of Enclosure 6, therefore, may perhaps be related to the construction of Enclosure 2 and ditches [37] and [59]. Enclosure 6 Phase 1, may, therefore, pre-date Enclosure 2 and Enclosure 6 Phase 2 may be of the same or later date. Enclosure 7, formed on its northern side by one of these aligned ditches [59], defines an area filled with dipolar anomalies that may be burials. There appear to be at least three phases (and sizes) of this enclosure. The northeastern side of Enclosure 7 is aligned to the road and to the enclosures surrounding the probably Roman structure, and is therefore likely to be of Roman date and perhaps replaced Enclosure 6 as a funerary enclosure. The double rows of aligned pits could represent the formal edges of a trackway or approach and appear to be later than Enclosure 6 because they too are aligned to the Roman road and other enclosures. Although they look very much like a post-medieval tree-lined avenue, there is no evidence in photographs or detailed maps for such a feature (despite the detailed depiction of a tree-lined avenue behind Bourne Park House in 18th-, 19th-, and 20th-century maps and 1946 aerial photographs) and the current hypothesis is that they are of Roman date. Burials found in the construction of the artificial lake may have been their original focus, to lead from the Roman road to a burial area there, perhaps as a monumentalised path lined with posts, or as double ditches (ditches in the East Riding of Yorkshire, on the Wolds—which has the same geology as this part of East Kent—are often represented by pit alignments when the ditches are eroded significantly, see Stoertz 1997).

Plans for future work

In 2014, the ground-penetrating radar survey of Enclosure 2 will be completed, as will the magnetic survey of Field 3. Field 4, north of Field 3, where the hexagonal feature and Anglo-Saxon burials were excavated by Wilkinson, will also be surveyed with magnetometry. The topographical survey will continue across the Park.

Acknowledgements

The authors are extremely grateful to Mrs. Vanessa McDonald, the owner of Bourne Park, for granting permission for the survey of this exciting site. This site was discovered in the 1990 aerial photograph by Mr. Chris Blair-Myers, and we are thankful that he has shared his discovery and encouraged our efforts. The survey would not have occurred without the aid and instigation of Dr. Ben Croxford of the Kent Historic Environment Record, and we are extremely grateful for his help and advice. Many people from Bishopsbourne have been kind enough to share their knowledge, maps, photographs, and other documents and we particularly thank Mr. Roly Corbett and Mr. Robert Prestige.
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