

ISAP NEWS

The newsletter of the International Society for Archaeological Prospection

Issue 56

June 2019



Editorial

Dear Members,

Issue 56 starts with Roger Ainslie's personal experience when trying to update the national heritage records with his own, new, results. And the subsequent discovery of a link to the ADS geophysics database that could be useful for others as well.

The geophysical results from two low mounds in the USA, built in the form of large birds (you have to see the data to appreciate how spectacular this is) provide important additional information about the makeup of the mounds. And it illustrates that despite the great images we now see from processed LiDAR data, geophysics is needed to bring out the inside information.

The final piece shows that you do not have to write a full article to make a great entry for *ISAPNews*. Some text and interesting data plots are sometimes enough. Of course we all now want to know the details of these data from De Middelburgh (including data ranges, scale bars etc.), but these will come at a later stage. Do feel encouraged to follow suit. Or discuss it on the *isap-all* email list.

We have reformatted the newsletter to use mostly a single-column layout that should make it easier to read it on-screen. Do let us know how this suits you.

With best wishes for a good summer season followed by some holidays ...

Armin Schmidt

editor@archprospection.org

The Cover Photograph shows the GPR survey of castle De Middelburgh (see p. 14).

A Forgotten Byway of the Internet? 3

Roger Ainslie

Conference Announcement 6

18th International Conference on Ground Penetrating Radar

Geophysical Survey of Two Bird-Effigy Mounds at the Capoli Mound Group 8

Colin Betts

Castle De Middelburg: very different from what we thought! 12

Ferry van den Oever & Nancy de Jong-Lambregts

Journal Notification 18

Membership renewal

£7 or €10 for the whole calendar year. Please visit:

www.archprospection.org/renew

Archaeological Prospection journal

Take advantage of the deal offered to ISAP members by Wiley-Blackwell for this journal:

www.archprospection.org/wiley

The views expressed in all articles are of the author, and by publishing the article in ISAP News, the ISAP management committee does not endorse them either positively or negatively. Members are encouraged to contact authors directly or to use the discussion list to air their views, should they have any comments about any particular article.

A Forgotten Byway of the Internet?

Roger Ainslie¹

¹Abingdon Archaeological Geophysics (UK)

archgeophys@hotmail.co.uk

This all started in 1974 when the government decided not to accept the Redcliffe Maud report which would have abolished County Councils and replaced them with regional government. At that time we in England lost the ability to have regional archaeological organisations and became subject to national government not wanting to get involved with individual sites and County and District Councils who had other priorities.

I carried out a survey near Banbury which indicated that a Roman settlement was larger than the Historic England PastScape internet record said it was. So I did my bit and responded to the part at the end of their entry for the site which said "Please help us keep our information accurate and let us know if you see any errors on this page". No change appeared in the PastScape system to reflect my additional information.

So the next site I investigated was a Scheduled Ancient Monument, Chipping Norton castle. I complied with the section 42 Licence requirements, submitting an OASIS form and report to the ADS grey literature library, sending copies of the report to Historic England and the County HER etc. The PastScape entry for the site remained unchanged. I thought it would be my public duty to let them know, only this time I asked for a reply to confirm what they were going to do with the information I provided.

The reply in October 2018 is worth repeating in full :-

"Thank you for your email regarding the PastScape webpages.

Historic England are now only updating PastScape records for marine records. This is in preparation for the implementation of the Heritage Information Access Strategy (HIAS) which will see terrestrial records transferred to the appropriate local Historic Environment Record (HER). Under the HIAS principles, which have been agreed by the sector as a whole and recognised in the Culture White Paper, local HERs will be the primary source for information on the historic environment within their area and Historic England will be responsible for the national marine record. You may find more information on this work in the following link:

<https://historicengland.org.uk/research/support-and-collaboration/heritage-information-access-strategy>

This will not affect the National Heritage List for England (NHLE) in any respect. If you feel that the results of the Geophysics survey should be addressed in the Scheduled Monument record you may either apply to have the data added to the record as an enrichment, details here: <https://historicengland.org.uk/listing/enrich-the-list/>

Or you may apply for a formal assessment of the Scheduled Monument here: <https://historicengland.org.uk/listing/apply-for-listing/> "

As the work had been done as part of a Section 42 licence I didn't ask for the Scheduling record to be amended as I would have assumed that as Historic England already had both printed and electronic copies of the report, they would have done this themselves, without reminder.

The interesting bit was in the link to their access strategy where it says "Charging policy will remain in the purview of the local authorities" - so we could remain stuck with charges of over £100 per hour plus VAT to get information out of a system into which we have put data into freely.

This was news to me, but apparently there had been no press release by Historic England. Similarly the archaeological press may be unwilling to criticise the system for fear of alienating the providers of its copy.

The prospect of having a better system did however offer some hope:

- They could devise a way of stopping County HER's from refusing to validate non-planning application related reports, which is a necessary step to get them onto the ADS grey literature library. Their excuses seem to range from lack of resources to along the lines of "we don't validate stuff if we haven't approved the written scheme of investigation and we only do that for planning related matters".
- The access to metadata could become less restrictive, so anyone could, for example, search by "magnetometer survey" and "geology".

So I contacted the ADS and suggested this. Their reply held out some hope.

- HE and ALGAO: HER have agreed to a system to expedite transfer of reports uploaded to OASIS into the ADS Library. HERs can choose their level of review, and there are now time limits on the review period. More information can be found at <https://archaeologydataservice.ac.uk/blog/oasis/?p=636>
- They said that in the case of geophysics, data is also transferred from the OASIS records to the Geophysical Survey Database, which is based on (and includes) the original English Heritage database (EHGSDb), that was started in 1995:

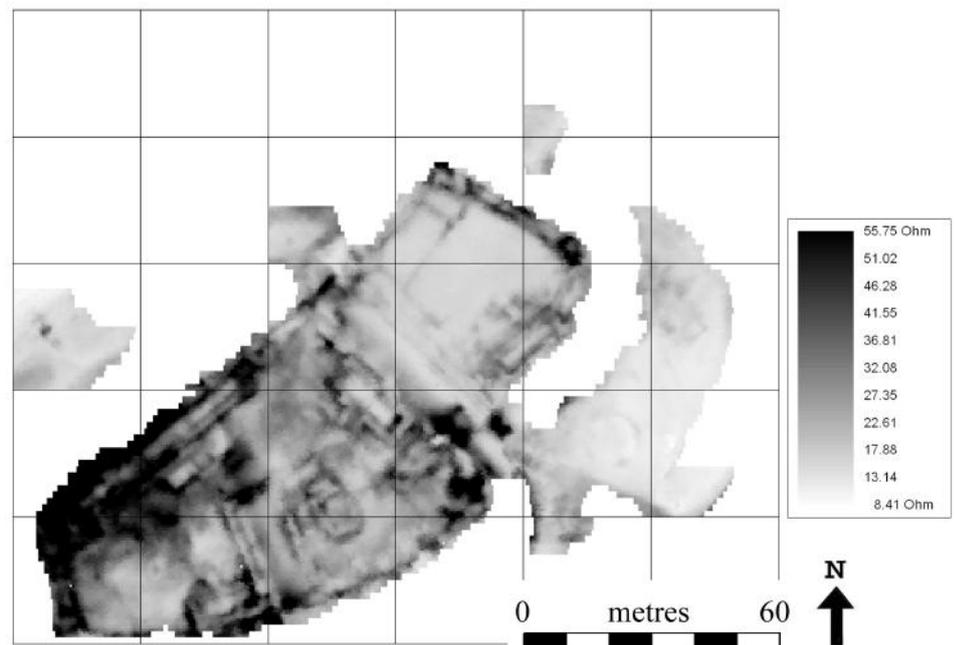


Figure 1: Chipping Norton castle, earth resistance survey. "Not that I know what the anomalies are, but I know where they are."

https://archaeologydataservice.ac.uk/archives/view/ehgsdb_eh_2011/.

It is within this database that you will be able to see the full technical metadata. These records are also linked to the grey literature stored in the ADS Library. The ADS database and the OASIS database are openly available sources of data but there is obviously a subtle difference between them.

On the possible replacement for PastScape, it remains to be seen what will happen. It would have been nice if Historic England had kept that system until they had something better that worked. They appear to rely on HER's and Heritage Gateway, which is being redeveloped but only has data from about 60% of HER's. We don't know how freely accessible, comprehensive and searchable any new version will be.

The ADS are redeveloping OASIS with support from HE and HES and are having a new programme made.

It would be good if future OASIS metadata entries were to correspond with items required in the [ADS Guide to Good Practice: Geophysical Data in Archaeology](#), the [EAC Guidelines for the use of Geophysics in Archaeology](#) or the English Heritage Guidance on Archaeological Geophysics (or whatever standards are considered appropriate). By ensuring that reports adhered to the metadata format in order to be admitted, it could avoid the deficiencies which Alice Cattermole found in her Review of the Standard of Reporting on Archaeological Artefacts in England, Historic England Project No. 7090, July 2017.

The good news is that we appear to have come across a web-link to a probably forgotten database on the internet. Armin Schmidt apparently sent an isap-all email about it some years ago. It gets about 40 visits a month, so may not be widely known.

The current ADS Library search fields (once you ignore the large search buttons and go to the search lists in the menu bar further up the screen), are:

All fields; Author surname; Title

By putting the location of the site (e.g. Chipping Norton) against an "all fields" search gives Chipping Norton Castle at about the 30th entry after a lot of references to published journal articles. Browsing can be by personnel name, organisation or report series. It therefore enables reports to be located and downloaded, but not much more.

The link to the EHGSDb part of the ADS (see above) is far more useful. There you can query data. Fields include the information we put on the OASIS records when we send them in. OASIS ID,

The image shows a screenshot of the ADS geophysics database search interface. It displays four search fields, each with a dropdown menu:

- Period:** The dropdown menu is open, showing options: "Bronze Age", "Bronze Age", and "Early Bronze Age".
- Geophysical Technique:** The dropdown menu is open, showing options: "Electromagnetic", "Ground penetrating radar", "Magnetic susceptibility", "Magnetometry", and "Marine - magnetometry".
- Instrument Type:** The dropdown menu is open, showing options: "-", "Alkali Vapour", "CAESIUM GRADIOMETER", "CAESIUM MAGNETOMETER", and "CONDUCTIVITY METER".
- Resistivity Electrode Configuration:** The dropdown menu is open, showing options: "DOUBLE DIPOLE", "Dipole-dipole", "POTENTIAL GRADIENT", "SQUARE ARRAY", and "Square".

Figure 2: ADS geophysics database with some of the query fields.

Monument number, project title, County, grid reference, dates, surveyor, monument type, period, geophysical technique, land use, geology etc. A search for "Oxfordshire" and "castle" then produced results for 5 surveys, one of which was the Chipping Norton castle survey.

Whilst we await developments on any updated Heritage Gateway, we have at least this system for geophysics which works, (although I wish the geology people would stop changing their names for strata). If the rest of the OASIS metadata information was similarly searchable by the public it could make large scale studies, such as John Blair's "Building Anglo Saxon England" far easier and entail less travel. This can only be a good thing - unless you are an oil company, derive tax from fuel use, sell motor cars, provide overnight accommodation etc. An inefficient system is likely to have more stakeholders than an efficient one.

Conference Announcement

18th International Conference on Ground Penetrating Radar

The 18th International Conference on Ground Penetrating Radar (GPR 2020), will be held in Golden, Colorado, USA from June 14 to June 19, 2020. This event has been held biennially since 1986 and is the premier event for GPR research and applications world-wide. At this conference there will be a *special half-day session focusing on archaeological applications and research using GPR*. The call for abstracts and additional information will be coming out this summer. The session chair for the archaeological applications is Larry Conyers, and preliminary abstracts or ideas about contributions can be sent to him at lconyers@du.edu. When this is done additional materials will be forwarded to those interested when they become available in the next few months.



ACQUIRE ASSEMBLE PROCESS VISUALISE PUBLISH GEOPHYSICAL DATA

WWW.DWCONSULTING.NL
INFO@DWCONSULTING.NL

TERRASURVEYOR

FULL FEATURED 2D DATA PROCESSING PACKAGE

TERRASURVEYOR 3D

TAILORED SOLUTION FOR GEOPHYSICAL VOLUME DATA

TERRASURVEYOR LITE

INSTRUMENT SPECIFIC, INTRODUCTORY VERSION

TERRALOGGER MS

FIELD DATALOGGER FOR THE MS-2 & MS-3



Designers and Manufacturers of User-Friendly Geophysical Instrumentation

www.geoscan-research.co.uk
info@geoscan-research.co.uk

@GeoscanResearch
+44 (0) 1274 880568

RM85 – 1 Instrument 3 Modes + Geoplot 4 data processing software:

1 Resistance – Probe Mode

Twin (multiple, parallel), Wenner, Double-Dipole, etc. Optional GPS



2 Resistance – Wheel Mode

Square array, Optional gradiometer logging with FGM650, Optional GPS



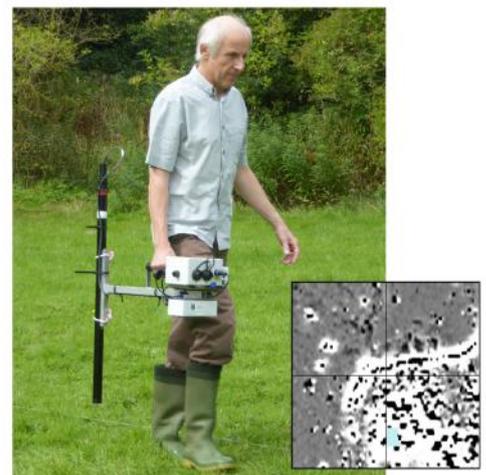
Geoplot 4

Upgrades From Geoplot 3 Discounts



3 Gradiometer Mode

RM85 + Sensys FGM650 + adapter box
Optional GPS **(shipping now.....)**



Geophysical Survey of Two Bird-Effigy Mounds at the Capoli Mound Group

Colin Betts¹

bettscol@luther.edu

¹Sociology, Anthropology and Social Work Department, Luther College, Decorah, Iowa (USA)

This report presents the initial findings of a magnetic and earth resistance survey of two bird effigy mounds that are part of the Capoli mound group located along the Mississippi River in northeastern Iowa (Figure 1). The mounds at the Capoli site were built by people associated with the Effigy Mounds culture that is defined in large part by the construction of zoomorphic earthen mounds in the Midwestern United States from A.D. 750-1000 (Benn 2009; Mallam 1976). The results presented here are the first step in a multi-instrument geophysical and topographic survey of the four bird mounds, four bear mounds, and single linear mound at this site.

Ultimately each of the mounds will be surveyed using earth resistance, magnetics, and ground penetrating radar, and a high resolution topographic map will be produced of the site areas. Little is known about the mounds' internal structure and methods of construction; the current research project seeks to address this shortcoming by supplementing the limited existing geophysical data on this cultural phenomenon (e.g. Betts and Stay 2017; Kvamme 1999). The resulting data should provide valuable insights concerning the practice of effigy mound ceremonialism. This project is supported by funding from the R. J. McElroy Trust, Kinney-Lindstrom Foundation, and a Historic Resource Development Program grant from the State Historical Society of Iowa.

The two bird mounds that comprise the southeastern group of mounds at the site were surveyed in July of 2018 by the author and Luther College research assistants Anna Luber and Linh Luong. The mounds, located on an alluvial terrace remnant, measure 67 meters and 47 meters from wing-tip to wing-tip and have a maximum vertical relief of around 50 cm (Figure 2). The 0.4 hectare area is a restored prairie; the area surrounding the mounds was mowed prior to the survey and the remaining

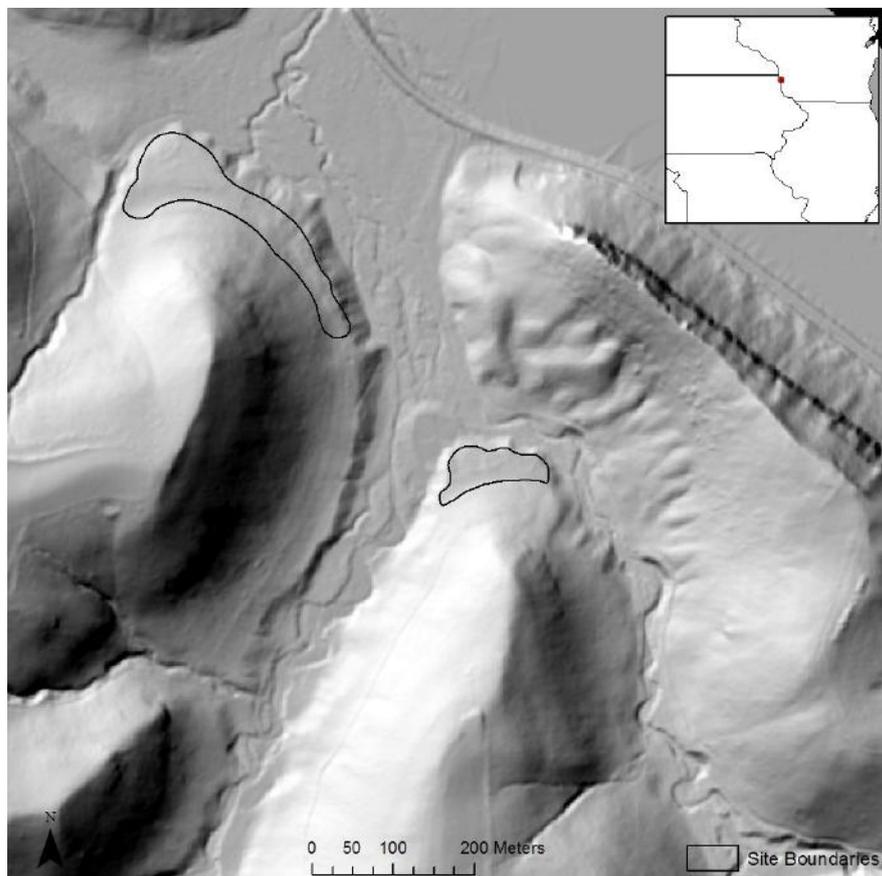


Figure 1: Lidar hill shade map of the site area showing the Capoli site boundaries.

standing vegetation on the mound surfaces was manually flattened to permit passage of the instruments. The mounds were surveyed using a Geoscan RM85 earth resistance meter and a Bartington Grad 601-2 fluxgate gradiometer. The earth resistance survey employed multiplexed dual twin 0.5 m, and 1.0 m twin arrays utilizing 0.5 m traverse intervals and 0.5 m sample intervals; the magnetic survey utilized 0.5 m traverse intervals and 0.125 m sample intervals.

The results are, in a word, complex and defy complete



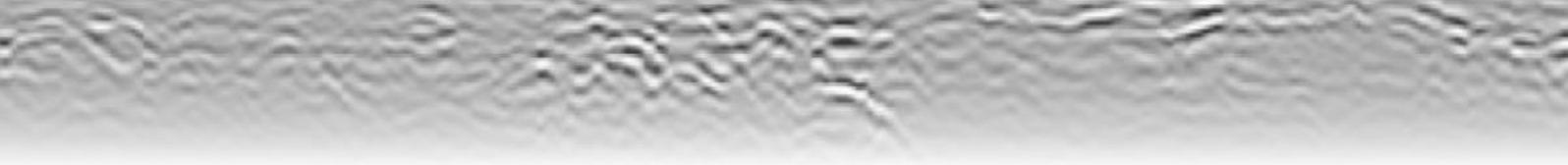
Figure 2: *Linh Luong collecting earth resistance data.*

Figure 3: *Images of processed gradiometer and 0.5m double-twin earth resistance data.*

discussion in this context (Figure 3). However, based on the preliminary results, the following initial observations are offered. The most general conclusion is simply the recognition of the effectiveness of both of the techniques for examining these features as well as the extent to which they complement each other. Historic period impacts are evident as cattle trails intersecting one wing of the large bird and the effects of looting are visible as low resistance/low magnetic anomalies and a magnetic bipole in the torso and neck of the larger mound, respectively. Both mounds are defined by areas of higher earth resistance and higher magnetic signal, and exhibit internal variation in the level of both that likely represent internal structures such as rock inclusions, fired areas, and the basket loading area associated with construction (Benn 2009; Kvamme 1999). Perhaps the most interesting result is the presence of magnetically different soil in the upper and lower portions of the wings, especially those of the larger mound. The specific source of this contrast is unknown, but it is likely the result of the use of either topsoil or a magnetically enriched anthrosoil to construct the upper portion of the wings and the use of subsoil to construct the wing's lower portions. One intriguing possibility is that at the time of construction this magnetic contrast would have been manifest as a visual contrast between the darker, more magnetic topsoil and the lighter hues of the oxidized subsoil. Finally, both data sets revealed the presence of anomalies outside of the mounds that may be associated with the ritual processes that were involved in their construction. The addition of GPR and topographic data for these two mounds, data from additional mounds at this site and others in the region will aid in evaluating and expanding on these initial results.

References

- Benn, David W. 2009. Continuity in the Woodland Mound Building Tradition of Northeastern Iowa. *Journal of the Iowa Archeological Society* 56: 1–32.
- Betts, Colin and Marshall Stay. 2017. Geophysical Investigations at the Ward Long Mound Site, Allamakee County, Iowa. *Journal of the Iowa Archeological Society* 64:45-51.
- Kvamme, Kenneth L. 1999 *Archeo-Geophysical Surveys at Effigy Mounds National Monument*. Department of Anthropology and Center for Advanced Spatial Technologies, University of Arkansas, Fayetteville, Arkansas. Submitted to the Midwest Archeological Center, U.S. National Park Service, Lincoln, Nebraska.
- Mallam, R. Clark. 1976 *The Iowa Effigy Mound Manifestation: An Interpretive Model*. Report No. 9. Office of the State Archaeologist, University of Iowa, Iowa City.



Castle De Middelburg: very different from what we thought!

Ferry van den Oever¹ & Nancy de Jong-Lambregts²

¹Saricon (NL) ²Municipality of Alkmaar (NL)

fvandenoever@saricon.nl

Surprising new insights thanks to geophysical research and additional historical-archaeological research.

In November 2018 Saricon, commissioned by the municipality of Alkmaar, The Netherlands, carried out a geophysical survey on the site where once the Middelburg castle in the Oudorpolder was situated. The aim of this survey was to establish to what extent there were still remnants of this castle and what the exact position of these remnants are. In 1942 there was an archaeological excavation by professor J.G.N. Renaud and in 1974 there was another small archaeological study conducted by E.H.P. Cordfunke. But the only results of these excavations were a black-and-white short film of the excavation in 1942

(<https://www.youtube.com/watch?v=nJTk4OMoWjM>), very few finds and an excavation drawing without coordinates from 1942, thus leaving us with lots of questions. This article highlights the particularly spectacular results that the geophysical research, combined with new historical investigations has produced and which has changed the view of the castle De Middelburg forever.

Well, let us rephrase this: in fact this is not even an article. Because we're still busy gathering additional data, processing data and haven't even started with a half-decent interpretation yet, so this is just a series of colorful pictures. Nothing more, nothing less.

While at it, we surveyed an additional castle (De Nieuwburg) some 600 m further to the North. Elaborate historical research is still ongoing and in July 2019 the last of the geophysical fieldwork will be done. At the end of 2019 we hope to shed some coherent, but stunning, new light on these castles of Alkmaar!

Floris V and his fortresses

Count Floris V was born in Leiden in 1254 and was the son of Count Willem II. He built several fortresses to try and quench the rebellion of the West-Frisians. In 1282 he won an important battle against the West-Frisians. Immediately after his victory, Floris started to create five castles to prevent the West Frisians from taking their land again. Two of these fortresses were in Alkmaar on both sides of the important Munnikenweg (monk's road); the Nieuwburg and the Middelburg. These castles were about 600 m apart from each other; the distance of two arrowshots. In other words, the enemy could be struck with artillery anywhere between the two castles.

Figure 1: *Left: Aerial photograph from the period 1920-1940 showing very clearly the contours of castle De Middelburg, taken from the northwest. One can see that the castle had several ramparts and moats (Source: Collectie Nederlands Instituut voor Militaire Historie). Right: current location of castles De Middelburg (southwest) and De Nieuwburg (northeast) (Source: Google Earth). Based on an excavation in 1971, the outlines of remaining foundations of De Nieuwburg were visualized in the landscape with bricks.*

Both castle sites were subjected to geophysical surveys. The surveys were a combination of GPR, magnetometer and EMI. The following equipment was used:

- GPR: ZOND12e, 300 MHz antenna
- magnetometer: 4 VALLON sensors and non-magnetic cart
- EMI: CMD-miniexplorer (GF Instruments).

The positioning was done with a RTK-GPS (Trimble SPS855).

The processing and interpretation is still on-going and at the end of the bird-breeding season both sites will be surveyed with GPR again, then using an even denser grid with a 500 MHz antenna. This additional GPR work will be done based on the preliminary results so far.

Without going into too much detail, and not having finished the surveys, we will present here some preliminary results. Well, that is to say, colorful pictures. The final report will of course have the visualization of the data in greyscale as well and proper scale- and range-bars.

Just to reveal one aspect that definitely needs further examination: castle De Middelburg seems to have been a lot bigger than assumed. A new, still to be studied source of so called 'countal accounts' (15th century, see also Figure 10) reveals that there were numerous structures belonging to the castle. Apart from a 'voorburcht' (a small entrance castle), even a small harbor was present. The results are spectacular and will change the ideas about these castles, their importance and their construction. In this study the preliminary results are combined with ongoing historical research.

Fieldwork

Below are some pictures from the fieldwork carried out in December 2019 and January 2019.

Figure 2: Magnetometer survey
(Source: Photo ARCH)

Figure 3: EMI (Source: Photo ARCH)

Figure 4: GPR (Source: Photo ARCH)

Research results

A visualization of the magnetometer survey data is shown in Figure 5, superimposed on an aerial photo of 1942. Certain concentrations and structures are clearly visible. Individual metallic objects are also apparent.

Figure 5: Visualization of magnetometer data.

Also the GPR-data clearly show some interesting reflections. The structures belonging to foundations are visible on the time slices. The shapes correspond to the excavation drawings of Renaud (in 1942) in Cordfunke (in 1974).

Figure 6: Visualization of GPR data.

Even the 3D-model of the GPR-data can help interpreting the results. In the red circle, for example, a significantly deeper structure (well?) is visible.

Figure 7: Visualization of GPR data in 3D.

The images of the EMI-survey also show very clearly, yet differently, striking contrasts. The moat is clearly visible in the data from depth 1 (Figure 8) and the fact that the moat on the eastern side seems broken/open may indicate a structure there (bridge?). Also in the middle of the moat remains of the castle are recognizable. Different structures are also visible to the south of the moat (the location of a former harbor, bordering on an ancient lake).

Figure 8: Visualization of EMI conductivity data (software TerraSurveyor, depth 1).

But most surprising are the localised high anomalies spread along the centreline of the moat in the data from depth 2 (Figure 9).

These are clearly part of the defensive structure around the main castle. But are these so-called pad foundations? The

Figure 9: Visualization of EMI conductivity data (software EM4SOIL, depth 2).

strong extended anomaly in the centre represents the foundations of the castle itself. But what is the dark blotch to the east? This calls for further investigations!

The ongoing historical research is producing a huge amount of information about the castle, its building history, its maintenance, its functions etc..... Figure 10 is just a screen shot, a fraction of the enormous and elaborate source of information (ducal accounts).

So far, we are amazed by the results of the combined geophysical survey and the historical research. But there is still more to come. Additional fieldwork (GPR in more detail), additional desk studies and the daunting task of interpretation.

to be continued ...

Figure 10: *Countal account NL-HaNa, grafelijkheidsrekenkamer/Rekeningen, 3.01.27.02, inv.nr 1608, 15th century*

Journal Notification

[Archaeological Prospection 2018: 25\(4\)](#)

Ground-penetrating radar and electrical resistivity tomography studies in the biblical Pisidian Antioch city, southwest Anatolia

COSMO SkyMed X-Band SAR application – combined with thermal and RGB images – in the archaeological landscape of Roman Mellaria (Fuente Obejuna-Córdoba, Spain)

Discovery of the Romanesque church of the Abbey of our lady of Bec (Le Bec-Hellouin, Normandy, France) by means of geophysical methods

LiDAR from drones employed for mapping archaeology – Potential, benefits and challenges ([Free Access](#))

Revealing early villages – Pseudo-3D ERT geophysical survey at the pre-pottery Neolithic site of Kharaysin, Jordan

ERT imaging of the interior of the huge tumulus of Kastas in Amphipolis (northern Greece)

Hyperspectral satellite imagery detection of ancient raw material sources: Soft-stone vessel production at Aqir al-Shamoos (Oman)

[Archaeological Prospection 2019: 26\(1\)](#)

Integration of GPR and magnetics to study the interior features and history of earth mounds, Mapoon, Queensland, Australia ([Free Access](#))

Sem: A Viking Age metalworking site in the southeast of Norway? ([Free Access](#))

Mapping the subsurface structures of a lost medieval village in South-Western Romania by combining conventional geophysical methods ([Free Access](#))

Deploying multispectral remote sensing for multi-temporal analysis of archaeological crop stress at Ravenshall, Fife, Scotland ([Free Access](#))

The archaeology of world war I tanks in the Ypres Salient (Belgium): A non-invasive approach ([Free Access](#))

Soil geochemical methods in archaeo-geophysics: Exploring a combined approach at sites in Scotland ([Free Access](#))

Discovery of buried historical structures in the Kaveri–Kollidam interfluvium, southern India ([Free Access](#))

[Archaeological Prospection 2019: 26\(2\)](#)

- Tales from the outer limits: Archaeological geophysical prospection in lowland peat environments in the British Isles
- Geophysical prospection and archaeological excavation of ancient iron smelting sites in the Barun-Khal valley on the western shore of Lake Baikal (Olkhon region, Siberia)
- Three-dimensional modelling of large archaeological sites using images obtained from masts. Application to Qubbet el-Hawa site (Aswan, Egypt)
- Magnetic field modelling and analysis of uncertainty in archaeological geophysics
- Object-based image analysis: a review of developments and future directions of automated feature detection in landscape archaeology
- Using deep neural networks on airborne laser scanning data: Results from a case study of semi-automatic mapping of archaeological topography on Arran, Scotland ([Free Access](#))
- Creating a community of prospection practitioners: Contributions of the US National Park Service workshop

Your Newsletter Needs You!

**Please send
survey reports (ca. 700 words and some images),
interesting images/data (with a short caption),
cover photographs or
notifications
to the editor:**

editor@archprospection.org