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Editorial

CUCAP
On 31 January this year, I received an email from Alun Martin telling me that he had been dismissed from his post of librarian at CUCAP (I think we can return to calling it that after the disaster that was ULM). Unless things have changed since I was last there, this leaves the collection of photos, maps, index cards, books and associated stuff all crammed into the small room that was formerly the print store. Negatives are in another room. I passed on this information to the main users (RCAHMS/W and EH) and wrote to the Head of Geography under the hats of AARGnews editor and my Visiting Scholar status at the McDonald Institute for Archaeological Research asking for any information about reopening access to the collection. Their reply was a dismissive:

The CUCAP collection is currently closed to enquiries while we assess the state of the collection and implement a new management and operational structure to better enable future enquiries and access. It is not clear at this time how long this will take, but we estimate at least into Spring 2011. We have made significant good progress over Michaelmas Term 2010 and we will be better able to advise interested parties about further plans following further detailed assessment ongoing over the next few months.

At present their catalogue is still online (http://venus.uflm.cam.ac.uk/) and Alun told me that any enquiries from the outside world show that we expect CUCAP to be an actively-consulted library rather than something unloved and unused.

AARG 2010
The talking part of the meeting ran smoothly and to time, sustenance was ready when we had breaks, chairs were comfortable but not snoozily so (I think…), we had an interesting range of sessions, papers and posters, and the first contested election for a committee post in AARG’s history. We visited at least one tell too many in a field trip that takes the record for the longest yet, and showed that planning such things needs to include time to get out of city centres and time to get on and off buses. Despite being about two hours late for the official opening of the new Archaeo-park at Drăgăneşti-Olt we were greeted with enthusiastic (or relieved) clapping and, after the necessary speeches, treated to a display of traditional dance and singing. A conference review written by the four DART research students appears elsewhere in this issue and themes arising from the meeting are discussed in the Chairman’s Piece.

Our thanks go to Irina Oberlander Tarnoveanu for organising the venue and associated events. It will be interesting to see if the pre-conference workshop, to present uses of aerial images to (mainly) Romanian archaeologists has any positive effect in future work in that country.

Ljubljana
In January I had a week in Ljubljana to work with Darja Grosman to prepare for a training school (airborne and grounded) to be held in Serbia this June. Despite knowing one another since the 1994 Potsdam meeting we hadn’t worked together before and wanted the time to find out if we would be able to function as a pair as well as to plan a timetable and all the things that are needed to help a school run smoothly (sickbags, for example). One of the
deviations that happened along was that we spent a while examining Google Earth to see if we could locate some of the spectacular crop-marked sites in Sweden that were published in *AARGnews* 35 by Lars Forseth (Flying to the past in Nord-Trøndelag). Using just the place names and the published photos we managed to find most of them (I can’t now remember how many) using a mixture of modern landuse plus natural and archaeological features. It showed how much ‘chance’ information may exist in GE. Although whether we would believe all of it, if these often poor-definition images were the only source, is another matter.

Bibracte – lidar workshop
In the middle of March (14-16) this year, Rachel Opitz organised a workshop in *Training and research in the archaeological interpretation of LiDAR* at the well-appointed Research Centre at Bibracte, Glux-en-Glenne in France. Organisation was superb – from the several pages of registration form that allowed the sorting of ‘experts’ and ‘beginners’ to whatever juggling was necessary to ensure that students were allocated to their preferred workshop sessions (there were five run concurrently of which they could attend three).

Dave Cowley and I had been invited to run workshops on ‘Knowledge-driven interpretation’ in which we were helped by Murielle Leroy, who has been working with ALS in France. Our theme concerned the necessity to interpret rather than stop at pretty hill-shaded views and this seemed to be welcomed by students of all levels. I was grateful for the opportunity to present this need at a fairly early stage in the use of ALS in archaeology rather than have several years of unsuitable, but technical, manipulations such as were applied by many who jumped on satellite images as sources of data.

There was one recurring observation that I mentioned to our students. While many aerial photographers talk about ‘crop marks’ and geophysicists show us ‘anomalies’, the key word among the ALS people seemed to be ‘lines’. I suggested that none of those was a useful word when we begin to interpret our evidence and hope not to see any ALS-derived ‘lines’.

AARG digital archive
Following the Committee’s decision to create a digital archive of past meetings and other ‘relevant’ documents we put out a call for material to fill the gaps in my hoarded papers. Response was good and we thank Ivan Kuzma, Anthony Crawshaw, Fiona Small, Adrian Olivier and Kenny Brophy for copies their help with missing stuff. Thanks also to Grahame Soffe, Bob Evans, Moira Greig for sending comments about meetings and people. We hope Grahame may find the time to go through his unindexed photos from early meetings. By chance(?), Cinzia Bacilieri stayed with me for a few weeks between visits to Korea and she did the first batch of scanning and combined those files with those already in digital form. There may still be missing material – the heap from Kenny Brophy has not yet been fully checked – in which case we’ll be sending out specific requests. We’re not sure what to do with all this stuff, but we plan to get the most relevant on the AARG website at a future date.

This issue...,
…could have included many photos of Romanian folk dancers (part of the September field trip) if there had been space, as contributors sent me those instead of anything more archaeological. It’s good to see that others are attracted to what Dave Cowley calls my ‘other job’.
Clashes: a little retrospection

For some time now within AARG there have been some clashes, differences of opinion, views, thoughts. We have seen a phase when aerial archaeology clearly emerged beyond Great Britain and collided with a world in which aerial photographs hardly played any significant role whatsoever. But this clash, this confrontation of experiences, which probably surprised quite a few, was a calculated action and a result of AARG’s “mission”. The mission continues: there remain countries where aerial photographs, and remote-sensing methods in general, are marginalised. For those of us working in this field on a daily basis it may well be, and indeed probably is, a shock that there are others out there who “actually don't know about it yet?!”. But in actual fact it is this clash which is the driving force behind further initiatives undertaken by AARG – from the Kleinmachnow conference in 1994 and the workshop in Hungary in 1996 through to the *European Landscapes: Past, Present & Future* and *ArcheoLandscapes Europe* projects.

The clash of British practices and the “struggle” on the continent with using aerial photographs also had to lead to a confrontation of thoughts. The British tradition, though very rich thanks to O.G.S Crawford and others, was dominated quite strongly in the 1990s by projects such as the National Mapping Programme, which despite their high rank and value, were reduced to extended inventories of archaeological resources. The appearance at AARG of researchers who work at universities actually led this clash – research needs and approaches vs British conservation practices (including the National Mapping Programme and others like it). In effect, project assumptions (mainly referring to past landscapes) and their results are now discussed more frequently than problems arising from mapping or the results of aerial reconnaissance. I have no doubt that this enriches our reflections on what we do and why we do it.

Another significant clash in our practice is the “sudden” appearance of new remote sensing techniques – satellite imagery, LiDAR, multi- and hyperspectral sensors. Within aerial archaeology circles, satellite images have been around for fairly long (eg. Fowler 1995; 1996; 1997), but were invariably simply treated as “photos taken from a higher altitude”. The intrusion of other approaches, the application of increasingly newer technologies (including the analysis of particular bands, automatic extraction, edge detection, etc.) led to yet another clash between new practices and those in use so far. This was probably most evident during both conferences in Rome - *From Space to Place* in 2006 and EARSeL’s workshop in 2008. It is clear that AARG must deal with this problem that has arisen. The first step was the session at the Annual Meeting in Bucharest. The second is to be the AARG-EARSeL Joint Conference in Poznań, this coming September.

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Bucharest: from high-tech remote sensing to archaeology at a local society level

The Bucharest conference revealed a couple more such “clashes” in practice. The main theme of the conference was to promote the use of aerial photographs (and other airborne remote sensing techniques) in countries where this happens sporadically and is not an element within the academic or conservation systems (Romania, Bulgaria, Moldavia). The Pre-conference Workshop Remote-sensing programmes in archaeology: planning, organisation, results focused on this issue. Such meetings, and likewise the “retrospective” papers, show just how complex is the problem of the presence of aerial archaeology and other remote sensing methods in the archaeology of particular countries. This is not at all due to “the lack of usefulness” of the method in any given country but rather caused by common opinions which are being established, developing and becoming myths. They are the result of statements by “experts” who often do not possess any specialist knowledge but are “opinion-creators”.

Martin Heidegger, in 1927, described this as the distinction between the scope of “authentic existence” and “inauthentic existence”.

“Authentic existence” is based on an individual understanding of the world, where there is critical reflection on it and questions continue to be asked. “Inauthentic existence” is not based on solid knowledge, it does not encourage a thorough investigation of issues but existing opinions are accepted without deeper contemplation. One of the symptoms of “[…] immersing one's self in a reality which is not especially understood is that there is not so much talk amongst people (reden, in German) as idle talk. It is this idle talk (Gerede, in German) which defines the existence of an inauthentic being. The German word used by Heidegger indicates rather significant circumstances, that inauthentic, incomprehensible idle talk, only repeats that which someone else has said and wallows in the ruts of stereotype” (Markowski 2008: 1).

It is such an approach, connected with the structure of science (based on the role of experts) that leads to the creation and establishment of scientific myths, an interpretation of the world which cannot be verified (Topolski 1996). Therefore, the social context (including the social structure of science), and distinct characteristics of an individual (the desire, or lack of, to investigate the problems of reality, self-reflection) influence the creation of attitudes characterising “authentic existence” or “inauthentic existence” (also in aerial archaeology). It is no surprise then that in historical analysis we often come across figures and opinions, which seem today to be particularly relevant but which had, in the past, been rejected, ignored.

So the clash of “history” (Dinu Adameșteanu) with “reality” showed in Bucharest how many opportunities were wasted in the past. This does not concern only Romania. This is a statement that should be read out in the countries where the situation is similar – the opinions of experts should not be accepted without criticism. This leads to idle talk and this in turn to stagnation.

One of the most important sessions at the Bucharest conference was dedicated to “Interpretation” (chaired by Dave Cowley). First planned some time ago (Rączkowski 2009a: 7–8) it was inspired by the clash of aerial archaeologists with other remote sensing techniques (especially the workshop on Remote Sensing for Archaeology and Cultural Heritage Management co-organised by EARSeL in Rome 2008) or perhaps, to be more accurate, by: our understanding of the interpretation of aerial photographs and so how various remote sensing images are “interpreted” by specialists of other methods. We were unable to organise
this session in Certosa di Pontignano in 2009. The papers presented (especially by Véronique De Laet) showed that evaluations earlier commonly accepted regarding the role of “automatic extraction” resulted from a lack of understanding, from idle talk. To a certain extent, Véronique de-mythologised “automatic extraction”. The session generated much discussion on the role of “interpretation” in our practice. It is not surprising that opinions were varied, as this is what “interpretativity” is all about. In my view, both the session and the discussion revealed that each person, and under different conditions, undertakes diverse interpretation strategies. This is due to the connection of interpretation with perception (the second includes cultural experience – Michael Doneus), education (Rog Palmer: also Palmer 2009) and other snares connected to previous experience or interpretation (Darja Grosman). It is evident that each interpretation is “aim oriented”. The result is that this acceptance of theoretical assumptions governs how we interpret and as a result has a deciding influence on understanding. Do we need to cross, can we cross, to a “meta” level in our reflections on the essence of interpretation? I for one, certainly believe that this is necessary, however it demands reflection on a deeper philosophical, psychological level and so on. We cannot limit ourselves only to a discussion of individual interpretations, but we should view this phenomenon likewise from a wider perspective. This will mark a departure from idle talk towards “discourse” on interpretation. This problem does not only concern the interpretation of aerial photographs but also images achieved via other methods. This idea directed the impulse to organise a joint (AARG and EARseL) conference in Poznań. Will it inspire us all to discourse or will we continue with our idle talk?

The “Lidar in context” session (chaired by Rachel Opitz) revealed a similar problem. To a certain extent Lidar will revolutionise our view of past landscapes, but working with it generates similar problems as with aerial photographs. The image achieved depends on the tools applied, the technology, parameters, algorithms. It may be approached as an aerial photograph treated as an objective image of the world but it may also be treated as a complex image which exists due to a complex process of interpretation (Michael Doneus). Also, in the case of Lidar, it is easy to fall into idle talk and operate on an “inauthentic level”. This will not be changed by using modern technology, it will not guarantee the creation of a “better”, “deeper”, image of reality.

Another clash that occurred in Bucharest was related to the field trip. The planned visit to the mostly Neolithic settlements of the Gumelnita culture (visible as tells), finished at the Museum of the Plain Boianului in Drăganesti–Olt. I feel that all the field trip participants will remember the hospitality and the huge dedication of the local community in the creation and opening of the Archaeo-Park Gumelnita. During our visit for sure there was a clash between the vision of archaeology based on highly advanced technology where complex issues of the interpretation of the world are discussed, and archaeology which is becoming an important part of the consciousness of the local community. The second image is created thanks to the exceptional commitment of individuals (here, prof. Traian Zorzoliu has played a major role) with the idea to establish and spread knowledge amongst those living here and now thousands of years after those who created such a rich culture. I feel that in Heidegger’s categories such activity reflects “authentic existence” more often than that of many professional archaeologists. We should thank the Drăganesti–Olt community for “bringing us back down to earth”. I regret only that we arrived a few hours later than originally planned for the meeting which was so significant for the community.
Changes, changes, changes...

The clash of opinions, thoughts, experiences, as long as they are critically assessed, can lead to changes (of opinions, thoughts, experiences). We are able to acknowledge that we are then dealing with Heidegger’s “authentic existence”. AARG has, for some time now, been witness to the subject of the creation of ghettos by aerial archaeologists (Bewley, Rączkowski 2002; Rączkowski 2009b) and the need to go beyond. This gives us pause for thought on aerial archaeology, attempts to redefine it, uncover its new identity (eg. Hanson 2008). The clash with new technologies and the creation of new institutions concerned to some extent with a related theme (eg. ISAP, EARSeL, ISDE) once again questioned the identity of AARG. The lively debate that followed within the AARG Committee actually resulted in the formulation of a new description (this should not really be treated as a definition). The following statement was accepted:

AARG provides an international forum for the exchange of ideas and experience on archaeology and landscape studies using all forms of remote sensing, especially airborne and satellite based techniques.

AARG is actively involved in promoting the collection, interpretation and application of remote sensing data in fostering research, conservation and public understanding.

This may be found on the AARG web page. Any comments are welcome.

The changes concern not only thoughts on AARG. In our community much has recently happened (perhaps too much?). The process whereby the number of events grows has been going on for the last few years – more initiatives, new thoughts, ever more “clashes”. These changes can be observed within the process related to the development of technology (this is probably the most obvious), the social dimension of aerial archaeology, issues connected to education and so on. ArcLand for certain has a role to play in this acceleration and increase in “clashes”. How are we going to cope with this? From a personal perspective, I admit I am starting to feel a bit lost. Not so long ago it was somehow easier to classify, to describe, to bring things under control, and as a result, to understand. I get the feeling that many processes are happening “independently”, subcutaneously. I am unable to name, identify or tame them. More and more often I get the sense that I “inauthentically exist” in the world which surrounds me. I don’t have enough time, I lack the distance to stop, understand, and question whether it and what I do make any sense at all. Retirement seems to be the solution ☺.

References


Fowler M.J.F. 1997. It may not be done well ... but could be the best that is available, AARGnews 15, 33–35.


AARG/EARSeL 2011

AMBITIONS AND REALITIES
Remote Sensing for Archaeology, Research and Conservation

21 - 24 September 2011
Poznań, Poland

Organised by
Aerial Archaeology Research Group,
European Association of Remote Sensing Laboratories &
Institute of Prehistory Adam Mickiewicz University in Poznań

under the auspices of UNESCO

Proposals for sessions, papers and posters on following themes are invited:

• Ambitions and impediments: national and regional realities across Europe.
• Sharing understanding and experience: creating conditions for international or interdisciplinary exchange and cooperation.
• Modelling the past for the future: accessibility of lidar and similar data for uses in research and conservation.
• Remote sensing applications in responding to infrastructure and development projects.
• ‘Crossover studies’: learning from comparisons and combinations of remote sensing (and other) techniques.
• Exploration + interpretation = understanding?? But whose understanding?
  And of what relevance to conservation and public appreciation?

Closing date for session proposals/abstracts is 31st May 2011.

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AARG 2010 Conference, Bucharest, Romania

Rob Fry¹, Dave Stott², Laura Pring³, Dan Boddice³

As new AARG members, the 2010 conference in Bucharest was welcoming and friendly. The presentations and posters provided an excellent overview of archaeological remote sensing applications which, as relatively new members to the field, we greatly appreciated. The welcome reception at the Aviation Museum in Bucharest provided a fitting start to proceedings and demonstrated Romania’s strong aviation tradition under pioneers such as Aurel Vlaicu, Traian Vuia and George Valentin Bibescu.

The conference focused on traditional aerial prospection with a spotlight directed on Romanian applications. In addition, technologies such as LiDAR and hyper-spectral imaging were presented. A recurring element in the discussion was the development, under limited resources, of national-level cultural mapping programmes. From this followed debate regarding the detection of potential archaeology from the air and how this can feed into cultural resource management strategies at local and national levels. A number of general themes came out from the different sessions which are summarised below.

Google Earth was highlighted as a fantastic tool for initial study in the arena of archaeological prospection, especially if you don’t have a plane or satellite handy. Although undoubtedly one of the most useful and accessible tools of recent times, it is of limited spectral and temporal scope. In addition, one has no control over the imagery which is provided. Its value however, is as a tool for initial investigation, and the fact that it introduces concepts of GIS and aerial image interpretation to the public can only be seen as a good thing.

Multi-sensor approaches were also stressed. LiDAR was shown to greatly aid the expedient identification of sites, and provide a high level of topographic detail which can compliment conventional aerial investigation, especially for ‘problem areas’ such as sites below tree cover. With ongoing research, Multi- and Hyper-spectral imagery can provide further complimentary data by detecting features not visible with the human eye. This has many advantages and might be able to address the ‘honey-pot’ issue prevalent in traditional aerial photographic investigation and allow more reliable detection of sites in ‘difficult’ environments (clay, for example). The development of techniques and algorithms for analysing these data is a rapidly developing field, one that will surely continue in the future.

With these advancing technologies, issues rose as to how the vast amounts of increased data could be managed and made useful and available. This was met with mixed responses; one output in the future could be to employ a ‘citizen science’ attitude to the identification of features, similar to the way archaeologists and non-archaeologists discover new sites using Google Earth (as recently demonstrated by David Kennedy’s work in Saudi Arabia http://www.telegraph.co.uk/news/worldnews/middleeast/saudiarabia/8303974/Analysis-Saudi-Arabias-war-between-god-and-archaeology.html). Developing a successful, nation-

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wide aerial mapping programme with a minimum of resources is something we can potentially all help with by sharing knowledge and expertise. Open Street Map has achieved this for mapping, and it is possible to do something similar for archaeology.

Our hosts, CIMEC made every effort to immerse us in Romania’s fascinating heritage with a tour of the Dimitrie Gusti National Village Museum, and some of Romania’s many impressive Tell sites. We were also honoured guests at the opening of the new Archaeo-park at Drăgânești-Olt and viewed many displays of Romanian traditional dance. A brief visit to Bucharest one evening began with a trip to the historic beer hall of Caru’ cu bere, where Romanian tennis star Ilie Nastase was spotted. On a quick promenade around the city later, it was instantly clear why parts of the old town are called ‘Little Paris’.

The formal meal presented an opportunity for informal discussion, with traditional Romanian cuisine such as Mitite and Frigarui amongst the buffet choices. This was all accompanied with ample refreshments, which lubricated discussion and kept us up till the early hours.

Whether washed down with some Romanian Ţuică or a pint of Ursus, the flavours of Romania and the conference itself will stay with us, and we look forward to the next meeting in Poland.
**Archaeological remote sensing and geophysics: Munster 2010**

Conference review by Johanna Dreßler

The First Joint Conference, *Behind the scenes: New developments in archaeological remote sensing and geophysics* took place at the Westphalian Wilhelms-University of Münster on 19th and 20th November 2010. The conference was organised by German and the Dutch CAA, the Dutch Expertise Centre for Archaeological Remote Sensing (DECARS) as well as the Department of Prehistoric and Early Medieval Archaeology at the University of Münster. It was attended by some 90 archaeologists, other professionals and students from Austria, Belgium, Germany, Great Britain, the Netherlands and the USA. Kindly, the University of Münster (Department Prehistoric and Early Medieval Archaeology), Sensys GmbH and the Digitaal Erfgoed Nederland sponsored the conference, so no conference fee had to be paid.

A short summary is given below.

Altogether, there were five sessions in the two days. After the Welcome Address, the conference started at 1 p.m. with the first session chaired by Hans Kamermans. The first presentation was about using GPR for archaeological surveys. *How to conduct a state-of-art survey (and avoid the many pitfalls)*. Ferry van den Oever introduced four steps by which your work should proceed. (1: Good preparation, 2: Site assessment, checking equipment, 3: Processing data, 4: Interpretation and incorporation with other information). These were demonstrated using several examples.

Next was a presentation about *Three-dimensional underground. The application of ground-penetrating radar in archaeology*. Martin Posselt explained the working of ground-penetrating radar using three examples from his field of activity. He pointed out that GPR - in contrast to other geophysical methods - could be used inside buildings. Therefore, it is often applied in surveying Roman and medieval buildings.

The last presentation of the first session was by Kay Winkelmann, *Hardware aspects of the 16-channel MAGNETO®-MX Magnetic Prospection System*. MAGNETO®-MX is a vehicle-towed multichannel system for magnetic surveying of large areas which has been in use since 2008. It spans a width of two or four meters per track (depending on the sensor spacing) and, with speeds between 3 km/h and 15km/h, a large area (0,5 – 3,0 ha) can be covered in an hour (at the cost of a moderate, movement-induced, magnetic noise). The system had been used in a landscape surrounding a Bronze Age site in Slovakia where, during a period of ten working days, 100ha was surveyed. This produced a detailed map of the Bronze Age settlement with ring ditches, houses, pits and graves but also discovered of a Neolithic LBK enclosure and two Roman camps. He concluded by expressing three future requirements: 1. the need for increasing sensitivity, 2. the need to optimising carrier systems and 3. the need for specialized data processing and interpretation tools.

The Second Session, chaired by Axel Posluschny, started with *Beneath the Palace of Knossos: preliminary results*. Steven Soertens presented first results of a GPR survey done in May 2009 at the well-known palace of Knossos. Due to the one hundred year old colourful

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Evanland (in the style of an early Disneyland) concrete-reconstruction, the campaign concentrated on the open air sites. To complete the research, existing maps and plans, profiles of test pits, aerial photographs and a QuickBird image have been georeferenced to permit the spatial correlation between old data (plans and maps of early excavation), new data (current test pits and profiles) and the measured geophysical structures and anomalies.

This was followed by another study about a special site, Large-scale Geophysical Survey and LiDAR at the Oppidum of Manching (Bavaria) – Perspectives and Limitations of a Combined Approach by Holger Wendling. For more than six decades, Manching, one of the most important Iron Age oppida in Europe, has been the object of intense research (30ha of the 380 ha enclosed interior has been excavated). In order to connect the variety of known sites (structures, features and a huge number of finds) a large-scale geophysical survey was carried out followed by a LiDAR Survey in 2007. Aside from new perceptions of the oppidum and its hinterland, the whole survey has allowed a critical comparison of the methods used (excavation, geomagnetic data, LiDAR and aerial photography). This presentation ended with several examples of a comparative study to show the perspectives and limitations of a combined procedure.

Next, David Jordan gave his presentation, Sharpening our geophysical focus: Making better models of the geophysical properties of archaeological sites for prediction and interpretation. It was a cry from the heart, when he analysed the relationship between geophysical survey results and excavated remains. He suggested that we should accumulate the experiences of survey and excavation to establish the most effective approaches and that research into the geoarchaeological origins of geophysical behaviour of archaeological sites would be a valuable aid to prediction and interpretation.

The next paper, Photogrammetry for documenting Heritage and Archaeology by Rudi Goessens was a pleading about the advantage of digital photography and its impact on the improvement of photogrammetry. With the progress of digital photography, photogrammetry has become a remarkable instrument to document cultural heritage and archaeological findings. Digital photography is completely scale independent; the full range of scales you need for archaeology can be covered. Rudi Goessens presented several from small to large scale examples: satellite images, aerial photographs, excavation documentation, single buildings and at the end documentation of single archaeological objects.

The final presentation of the day was Ken Kvamme’s Keynote speech Augmenting Geophysics with GIS. He pleaded for us to improve uses of GIS in archaeological research. His concern is that GIS is nowadays used to display, overlay or integrate any survey data - but its advanced possibilities are rarely employed. He demonstrated these uses by chosing eight themes which he illustrated via several examples. The themes were: the correct handling of geo data, appropriate analysis methods, prospects of graphical display of data, advanced manipulation, 3D-modelling, approaches to integrate multi-dimensional datasets, pattern recognition and knowledge-based decision modelling.

The second day of the meeting started with the morning session (chair Karsten Lambers) with Guido Heinz and UAVs and remote sensing – early results of geodetic approach. During a student’s project, an octocopter (MikroKopter MK-Okto) was built for educational as well as research purposes. It is a remote-controlled, unmanned aerial vehicle, fitted with a GPS locator, which can carry 1.3 kg. Equipped with a low-cost digital camera it offers a cheap possibility to take aerial photographs of landscapes features as well as buildings and excavations. One focus of the research is to evaluate photogrammetric use of the aerial images.
The following paper, \textit{icopter as a new CIR Sensor Platform in Archaeology}, given by Matthes Rieke, was again about a self-built UAV and again the low-cost approach to conduct an aerial survey of an area. The main goal of the, in this case, quadrocopter is to collect data to generate orthophotos. For the orthophotos the copter is equipped with a customised camera with infrared-sensitive filters. These CIR images can be used for archaeological purposes. Another part of the project is to improve software for flight-planning to be able to extract specific flight instructions based on a given flight route.

Finally in this session, Michael Doneus gave a talk titled \textit{Archaeological Use of Airborne Laser Scanning for Woodland Survey – Prospects and Issues}. He pointed out the peril of obtaining cheap or free general purpose ALS data. It is the lack of meta data: you usually don’t get information about original point density, instruments used, procedure of filtering, type of flying platform, time of flight etc. He warned about using inadequate ALS data for archaeological application. With examples from his two-year-project, \textit{LiDAR-Supported Archaeological Prospection in the Woodland}, he explained the critical factors of laser scanning and pointed out the benefit of ALS survey for landscape archaeology especially in densely forested areas.

The second session of the day was chaired by Irmela Herzog and began with Ralf Hesse’s lecture, \textit{The potential of LiDAR-based Digital Elevation Models (DEM) and Local Relief Models (LRM) for the archaeological prospection of large areas: methods and examples from Baden-Württemberg}. In May 2008 the State Office of Cultural Heritage launched a project to verify and extend the existing archaeological archive by undertaking the complete archaeological mapping, using a high resolution LiDAR data, of the whole of Baden-Württemberg (35,571 km²). After one year, the processing of the entire data had been completed and 4000 km² had been examined, leading to more than 60,000 potential sites. Ralf Hesse explained the procedures to deal with the large amount of data and to extract local relief models, pointing out the use for archaeological prospection and spatial and topographic analysis. He also explained the method of creating Local Relief Models.

Afterwards, Geert Verhoeven gave a paper entitled \textit{Redefining Limits – The (Invisible) Future of Archaeological Aerial Reconnaissance}. The term Aerial Archaeology enfolded all kinds of images taken from a various altitudes to explore sites in the visible and invisible bands of the spectrum. The paper presented two approaches to aerial archaeological imagery. On one hand, the cost-effective acquisition of man-made oblique photographs from a light aircraft at low altitude and on the other, future possibilities of hyperspectral scanning. For the first he created the term GAFFA (generally affordable for archaeologists) and figured out, that with modified digital cameras you can also detect crop stress aroused by buried archaeological features in non-visible wavelengths. The second was a view into the future and the potential of hyperspectral scanning, a method that is currently too expensive and has a ground-sampling distance of 2.5m. The development of high-resolution non-visible imagery is of huge importance for the future.

After a long Lunch Break, Veronique de Laet chaired the last session of the day. Philip Verhagen opened with \textit{Discovering the Dutch Mountains: An Experiment With Automated Land-form Classification For Purposes Of Archaeological Predictive Mapping}. The manufacturing technique of geomorphological maps that are frequently used to understand the location of archaeological sites in the archaeological landscape is still the same since the 1960s/1970s despite the availability of LiDAR-based DEMs for the whole Netherlands. This procedure is subjective and time-consuming. DEMs simply “translated” into
Geomorphological maps exist in some parts of the country and only at the scale 1:50,000. Automated landform classification gives the possibility of creating highly-detailed large-scale landform maps in a short time. Most case studies have taken place in mountainous areas and the paper shows how this technique can be used in relatively flat landscapes with good effect.

Next, Bart Vanmontfort gave a lecture on The erosion of a Neolithic enclosure site at Ottenburg (Belgium). Since the early 20th century, archaeologists have studied the 90 ha enclosed site of Ottenburg which is located on a plateau in the Belgian Loess area about 50m above the valley bottom. The presented project aim was to model the the ancient and current erosion on this site. Two available LiDAR-based DTMs (a “standard” and a high resolution one) have been compared and augmented by data from an extensive augering survey.

The next presentation again used LiDAR-based digital models: Reconstructing barrow landscapes: The construction and modification of Digital Elevation Models. In this contribution Quentin Bourgeois pointed out, that DEMs have been used to reconstruct barrow landscapes. He introduced two aspects for consideration. First: Time. You have to keep in mind, that barrows were a burial tradition over a long time (early 3rd millennium BC up to 9th century AD). That means you have to understand the chronology of the barrows when you examine their landscape. Second: Vegetation. Bourgeois presented a PhD study from the same project that deals with recreating landscapes throughout the whole period of time barrows were built. Only with the “right” landscape you can analyse the reason for the choice of the location for barrows. Any further study will need to consider these two facets.

The final presentation of the conference was given by Karsten Lambers about Satellite-assisted Archaeological Survey in the Silvretta Alps: the first Steps. The joint project of the Universities of Zurich and Konstanz is conducting archaeological research in a region above the tree line. It is intended to show the potential of a satellite-assisted archaeological survey, using new emerging progress in sensor technologies, data analyses and integration of diverse data and methods. He showed the aims of the later stage of the project and presented the results of a first archaeological field survey.

All presentations were interesting and enthralling. They provided a thorough overview of developments during the last decade as well as on current state of affairs concerning remote sensing, geophysics and other methods. This was complemented by case studies, which showed how well these methods can be used for archaeological research. As the conference was so successful for participants and organizers, there will be further meetings on a biennial basis. The next meeting will take place in the Netherlands in 2012. You will find more information in good time on the webpage of the AG CAA http://www.ag-caa.de.
New legs for a long-term pursuit

Chris Musson¹, for the ArchaeoLandscapes Europe Project (ArcLAND)

A lively gathering in September 2010 in Bucharest sounded the starting gun for a new leg of the long-running pursuit of Europe-wide cooperation in aerial archaeology and other forms of remote sensing for heritage purposes.

In a meeting attended by nearly 50 representatives from 34 organisations in 24 countries across Europe the ArchaeoLandscapes Europe project (ArcLAND for short) was set in motion at the end of an all-day session run in tandem with the annual conference of AARG – the splendidly decorative legs in the introductory photograph belong to folk-dancers who entertained delegates during the field trip which linked the two meetings.

The ArchaeoLandscapes project (first introduced to members in March 2010 in AARGnews 40) will run for 5 years and involve an expenditure of 5 million euro, contributed equally by the project partners and the Culture 2007-2013 Programme of the European Union. After a short break to gather breath and complete the voluminous application form (167 pages of hard copy and a similar amount of digital data), the project follows on logically from Culture-supported cooperations in 2004-2007 (European Landscapes: past, present and future) and 2001-2002 (Conservation through Aerial Archaeology). These earlier initiatives, each involving an increasing number of organisations and countries across Europe, were strongly

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supported by AARG members. AARG also took the initiative in promoting the new project, as in the pioneering aerial archaeology training schools in the 1990s. Over the years the basic objective has not changed – greater cooperation in the heritage uses of aerial and remote sensing techniques across Europe – but the methods adopted have become both more broadly based and more tightly defined. Thus ‘remote sensing’ and ‘landscape’ have joined the original concept of ‘aerial archaeology’ while the programme for the next 5 years has been distilled into a single AIM and eight carefully-formulated ACTIONS, each overseen by a task-and-deliver Working Party of the member organisations under the general coordination of the project sponsor, the Roman-Germanic Commission of the German Archaeological Institute, based in Frankfurt.

The overall Aim is ‘to increase public appreciation, understanding and conservation of the landscape and archaeological heritage of Europe through the application and international sharing of skills and experience in airborne and other forms of remote sensing’.

The eight key Actions, in which each partner organisation will participate according to its needs and capacities at the time, are as follows:

1. The creation of an ultimately self-supporting ArchaeoLandscapes Europe Network, with a small central secretariat, to provide leadership, coordination and advice in the use for heritage purposes of aerial photography, remote sensing and landscape studies.

2. The use of traditional and innovative methods to publicize the value of aerial survey, remote sensing and landscape studies amongst the general public, students, teachers and all those who explore, enjoy or care for cultural landscapes and heritage sites across Europe.

3. Promotion of the pan-European exchange of people, skills and understanding through meetings, workshops, exchange visits, placements and opportunities for specialist training and employment.

4. Enhancing the teaching of remote sensing and landscape studies through courses for students and teachers, and in the longer term through the foundation of a European Masters degree in remote sensing and heritage management.

5. Securing the better exploitation of existing air-photo archives across Europe by researching, assessing and publicizing their potential for heritage interpretation and landscape conservation.

6. Supporting aerial survey, remote sensing and landscape exploration in countries relatively new to their use, especially in northern, eastern and southern Europe.

7. Exploring the uses of laser, satellite and other forms of remote sensing and web-based geographical system in archaeological and landscape research, conservation and public education.

8. Providing technical guidance and advice on best practice in aerial survey, remote sensing and landscape studies, with a particular emphasis on conservation and heritage management.
At the time of writing, in the early spring of 2011, the project activities are gathering pace, with several Working Party meetings already planned or undertaken, along with smaller workshops on remote sensing in general (Münster in November 2010, Mainz in February, a LiDAR workshop in France in early April, a two-part field-school in ground-based survey in the Netherlands in May and August, a Student Workshop in Slovenia/Serbia in June and an aerial archaeology training school in Denmark in July. The project’s fledgling website (www.archaeolandscapes.eu) will soon take wing with the addition of content and news from each of the project partners, and the promised international travelling exhibition, based for the moment on the presentation prepared by Martin Gojda and the National Museum in Prague at the end of 2004-2007 project, will be installed at Ljubljana, Slovenia, in May – the first of ten intended venues across Europe over the next 5 years. Before the end of the year the project will also be introduced to delegates in a poster at CAA in China and in sessions at UISPP in Brazil and EAA in Norway. The project’s second general meeting will take place on 20\textsuperscript{th} September, immediately before the AARG/EARSeL conference which will take up the following 4 days.

The current members of the ArchaeoLandscapes project are listed at the end of this note. Over the coming years the intention is to spread membership to every country in Europe by attracting further organisations to join as Associated Partners, contributing expertise and taking part in project activities, though sadly without benefit of the direct European funding available to the 24 initial Co-organisers in the scheme.

Further news of ArchaeoLandscape events, activities and public outreach will be reported in future issues of \textit{AARGnews}. Individuals and organisations wishing to learn more about the project, or to take part in its activities, are advised to consult the project website (launch of the final version hopefully in late Spring 2011) or to make contact with the project manager, Dr Axel Posluschny, at RGK in Frankfurt (posluschny@rgk.dainst.de).

Participants in the ArchaeoLandscapes Europe Project (ArcLAND)

\textbf{Co-ordinator/Project Leader:}
The Roman-Germanic Commission, German Archaeological Institute, Germany.

\textbf{Co-organisers:}
Belgium: The In Flanders Fields Museum.
Cyprus: The Cyprus Research and Education Foundation (STARC).
Denmark: The Holstebro Museum.
Germany: The Landesamt für Denkmalpflege, Baden-Württemberg.
Greece: The Institute for Mediterranean Studies (FORTH).
Hungary: The Baranya County Museum Authority.
Iceland: Fornleifastofnun Íslands – Institute of Archaeology.
Ireland: The Discovery Programme; and University College Dublin.
Italy: The Universities of Foggia, Salento (Lecce) and Siena.
Lithuania: The University of Klaipeda.
Netherlands: The University of Leiden.
Norway: The Norwegian Institute for Cultural Heritage Research (NIKU).
Poland: The Adam Mickiewicz University (Institute of Prehistory), Poznań.
Romania: The Institute for Cultural Memory (CIMEC).
Serbia: The Institute of Archaeology, Belgrade.
Slovakia: The Archaeological Institute of the Slovak Academy of Sciences.
Slovenia: The Slovenian Academy of Sciences and Arts; and the University of Ljubljana.
Spain: The Heritage Laboratory (LaPa), Instituto de Estudos Galeos Padre Sarmiento.
United Kingdom: English Heritage; the University of Exeter; the University of Glasgow; and the Royal Commission on the Ancient and Historical Monuments of Scotland.

**Associated Partners**
Austria: The Institute of Pre- and Proto-History, University of Vienna.
Belgium: Culture Lab
Czech Republic: The University of West Bohemia, Pilsen.
Estonia: The Estonian Heritage Society.
Finland: The Helsinki University of Technology.
France: Université de Franche-Comté, Besancon.
Germany: Johann Wolfgang Goethe-University of Frankfurt
Germany: i3mainz - University of Applied Sciences, Germany (DE)
Germany: University of Bamberg
International: The Aerial Archaeology Research Group (AARG).
Latvia: The Latvian Academy of Sciences.
Netherlands/Belgium: Dutch Expertise Centre for Archaeological Remote Sensing
Spain: The University of Granada.
Sweden: University of Uppsala

![Participants at the ArchaeoLandscapes meeting. Bucharest, September 2010](image-url)
Aerial archaeological substantiation of a Roman cadastre system’s predictive model

András Bödöcs¹

This article presents new research in Hungary: a survey of the Roman centuriatio in Pannonia. Previously one reconstruction of the estate cadastre map of the Roman city, Colonia Claudia Savariensis was published in 1965 by the two well-known researchers András Mócsy and Sándor Soproni.

Background

The area west of the Danube in Hungary was part of the province of the ancient Roman Empire called Pannonia (in the various periods of the Roman dominion, territorial divisions changed and it was known variously as Pannonia Superior, Pannonia Inferior, Valeria and Pannonia Secunda). The beginning of the conquest was believed to start in the first part of the 1st century AD, at the end of the Emperor Augustus’s reign or at the beginning of the Emperor Tiberius’s reign. In this process typical Roman settlements were established, as for example the colonies (coloniae). The conquest of Pannonia equally served economic and military interests. Among the reasons was the acquisition of new arable land for agriculture, where, for example, the legionary soldiers (veterani) who had a service time of 20-25 years were entitled to plots.

Fig.1 The territory of the quondam province Pannonia

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During the reign of Emperor Claudius in the first decades of the Roman conquest one of the oldest continuously inhabited settlements of Hungary was founded: the modern Szombathely, the ancient Savaria (Colonia Claudia Savariensis). Savaria was a Roman colonia with the same civil status as Rome. The exact year of its foundation is uncertain, probably it was between 46-50 AD. Among the first resettled colonists were legionary veterans of the XV. legio Appollinaris who had been stationed in the ancient Carnuntum (today Deutsch Altenburg, Austria) and were allocated land in this new territory. The former territory of Savaria is now shared between Austria and Hungary.

The development of Roman cadastral system
The location and boundaries of the newly allocated land often laid out using an official process called **deductio**. The conquered area was part of the Roman publicly-owned land, the **ager publicus**, from which all Roman citizens could benefit and rent. One early agrarian law, dated in 367 BC, the so-called Licinius-Sextius's land law, stipulated that a citizen can rent a maximum of 500 **iugera** of land for common ground. Resettled veternans were given free plots on this land.

The territory of the **colonia** was laid out by the ancient Roman surveyors in a pre-defined, logical structure that may also have been mapped. The surveyors’ skills and duties are well known: **mensor**, **mensor agrarius**, **agrimensor**, **gromaticus**. The survey was basically a gigantic rectangular coordinate system laid out in plots of units of **centuria** (2400x2400 roman feet – about 708x708 m, approx. 50 hectares) which were sub-divided into 200 **iugera**. The territory covered by this land allotment is shown in Figure 1. An early medieval textbook, the **Corpus Agrimensorum Romanorum**, is an illustrated treatise on land surveying that describes a lot of the processes involved.

The **centuriae** were surveyed from two main axes: the East-West (**decumanus maximus**) and the North-South (**kardo maximus**) roads. Next, the property-system was shown against its geographical environment on a large, engraved cadastral map, usually in bronze or metal (“**in aeris**”), as a kind of ancient cadastral GIS system. This was displayed in the city and a smaller copy was sent to Rome, to the central archives, called **Tabularium**. Using this map, anyone could identify to whom each **centuria** area was allotted and how much land any one person was using. Through the **centura**-identifiers the exact location of each property could be known. Unfortunately no bronze map survives, but from the French town of Orange (the ancient Arausium) various marble cadastral map fragments have been found. These give some idea of the precise knowledge that was available to the ancient people. Based on this ancient map, the parcel-system and its documentation of other roman colonies are easy to imagine. Although the alignment of the **centuriatio** was basically determined by the axis of the **decumanus maximus** (east-west) and the **cardo maximus** (north-south) (Figure 2), descriptions by the ancient surveyors show that there was not always a uniform design.

There were differing opinions on that as well. Which was the first main direction (usually considered to be the **decumanus** with an east-west alignment), and to what should it be aligned? The remains of surviving parcel-system in many area of the Roman Empire show a diverse picture. In Northern Italy for example, on the Po-plain the **centuriatio** systems installed on the territory of different cities were oriented to the Via Appia, a 150 km straight road which crossed the area. According to Hyginus Gromaticus, a 2nd century AD land surveyor, the north-south axis, the **cardo** is pointing to the centreline of the world ("a poli
Fig. 2. Limitatio/centuriatio of a colony’s territory. The two main axes: the so called cardo maximus (almost N-S) and the decumanus maximus (usually E-W) and around them developed rectangular network. The network is based on 1 centuria which is ca. 710m x 710 m.

axe”), while the alignment of the decumanus is following the arc of the Sun (“secundum solis decursum diliguntur”). Other surviving examples show variations of orientation or of the size of the centuriae. In some cases, as for example around Korinthos, the alignment of the centuriatio respected some natural features of the Gulf of Korinthos (Romano, 2006). On the territory of the aforementioned Orange (Arausium) three different parcel systems (A, B and C centuriatio) were established in which some differences in orientation, location and in chronology could be detected (Piganiol, 1962).

**Documentation of the ancient cadastre**

The analysis of remote sensing data has been proven very efficient in the detection of ancient Roman centuratio. In the 1950s and 1960s John Bradford, Raymond Chevallier, André Piganiol used black and white vertical photographs for their researches (Bradford 1957, Caillemer-Chevallier 1957, Piganiol 1962). By the 1970s, examination of aerial photographs was routinely used to survey these rectilinear road networks. An instrument called “Bane du filtrage”, developed in France, assisted the photo analysis (optique filtrage).
It is thanks to the analysis of aerial photographs that many *centuriatio* were identified in France (Orange), Italy (Lecce) and Croatia (Istria-Pola, Trogir, Split-Dalmatia). Unfortunately only small-scale photos and sketched maps of these have been published and made available for the public. For example, the 1:50.000 scale maps of the Tunisian Roman *centuriatio* published by Piganiol in 1954.

The survey of the *centuriatio* of Savaria has a much more recent origin. In the 1960s two renowned archaeologists András Mócsy and Sándor Soproni attempted the identification of this *centuriatio* on 1:50.000 scale maps through the analysis of aerial images (Mócsy, 1965). Their mapping could not be have been carried out at any higher lever because of restricted availability of aerial photographs and a large-scale topographic maps which were classified as 'confidential'. Their research results and maps illustrate the road system around Szombathely and the land division. Based on their work, in 1970s Endre Tóth attempted to identify the ancient landscape of Savaria in its entirely (Tóth, 1977). Archaeological excavations in the area started in the 1990s. Their results provided some missing pieces of the puzzle. Through the contributions of the Museum Savaria in Szombathely (eg. Csilla Farkas, Gábor Ilon, Dr. Péter Kiss, Ottó Sosztarics), small segments of a minor Roman road, different from the stony city roads in nature, were also identified. With one or two exceptions, all the segments identified by individual studies appeared as the continuation of a unique *centuriatio* landscape which was recently identified by the author (Bödöcs, 2008; Bödöcs, 2009).

**The first predictive model**

Our project was initially based on the results of an excavation by Gábor Ilon (Savaria museum) in 2001. This excavation revealed a right-turn intersection of a Roman road, north-east of Szombathely. Results were analysed on a GIS system on which other aspects immediately became apparent. The road, measuring 4.5m in width with two side ditches, was indistinct. However GIS analysis allowed to see the road in a broad archaeological context and show how it aligned with an already known public Roman road, identified in 1977 by dr. Endre Tóth. The latter is a 25 km public Roman road that connects Szombathely-East and the town of Sárvár. This can be seen almost in its entirely as cropmarks on Google Earth (2003.06.25.). The current resolution of Google Earth imagery for this area is much better than that of aerial photographs taken in the 1950s and 60s made available to the public only since the political changes. As for many other areas, Google Earth imagery represents a new and informative set of data that provides the opportunity to analyse the surveyed landscape in its entirely. This is particularly useful when the surveyed area covers several modern
countries, as in the case of the ancient province of Pannonia which is now spread across five countries.

The distance between the road intersection and the main Roman road was measured at roughly 2 centuriae, approximately 1420m. In search of more evidence of the centuratio, a grid was created in KML (Keyhole Markup Language) format with the origin at the road-crossing and orientation parallel to the road crossing and the main Roman road respectively (this showed there to be some alignment or construction errors in the main Roman road). The size of the each grid square was 2400 Roman foot (1 Roman foot is approximately 29.57 cm for the pes), a total of 709.63m. The grid was superimposed on to Google Earth imagery, showing that that the existing land division, artificial canals and road system shared a common alignment. To identify archaeological sites in this landscape, a combination of Google Earth imagery and aerial photographs was then used.

Figure 4. Rectangular roman road crossing near Szombathely. Drawing by Ferenc Derdák.
Raw search results

Kőszegpaty, Hungary (Fig 5): A linear ditch with a right turn is visible as soil marks 10 km north-east from the road-crossing. This is superimposed with the corner of one of the grid squares. Google Earth imagery (rectified by photogrammetry) does not always align with topographic survey maps in Hungary thus the data for this area were re-rectified onto Hungarian 1:10,000 scale topographic maps. In the E-W areas there was a minor difference whilst in the N-S areas the mismatches between GE imagery and Hungarian maps were up to 20m.

Bildein, Austria (Fig 6): The picture shows a feature visible alongside the Austrian-Hungarian border. Fortunately, good data coverage exists for this area. As it is shown, the perpendicular ditches form squares whose orientation and size corresponds to that of our grid.

Vép, Hungary (Fig 7): The following Roman road (A) visible on GE, has branching ditches. The northernmost road (C) appears to be superimposed on or by the supposedly *centuria* border, but it does not seem to continue to the south showing a potential turn. Another branch (D) is approximately 1 *actus* from (C)². The potential road crossing at (B) is 110m from (C), approximately 3x120 Roman feet=3 *actus*.

² The *actus* is ca.35m and was the smallest unit of Roman land division.
Refined centuriatio grid – the second model
The evidence on aerial photographs showing the relationship between the roads and the centuriatio should be confirmed by excavation. Further measurements need to determine the exact size of the centuriae. Deviations from the classic 709.63m value have been reported in other cases (Peterson, 1993). This variance could explain, for example, difference between the expected cell corners and the phenomena visible on aerial photographs.

First of all we recorded the coordinates of the sites with right angled intersections. From the coordinates we calculated the angle of the orientation of the rectangular grid using the formula $\theta = \arctan\left(\frac{Y2-Y1}{X2-X1}\right)$ (Peterson 1993). We have also created a relative coordinate system in which we can change the angle of orientation to provide the best fitting grid. Examination of various intersections found that the land allotment around Savaria was based most likely on a Roman foot of 29.48 cm – about 1 mm less than the official pes monetalis value of 29.57 cm. This results in a smaller centuria grid size with the value of 707.5 m, 2.4 m less than the pes monetalis based centuria value. If we multiply this difference over 30km, for example, we get about 100m deviation from the first and second predictive model. The orientation of the centuriatio in the Hungarian national map projection system (EOV) is 81.72° (East) and 351.72° (North). Converted to WGS84 projection these values become 80.02° and 350.02°.

Using these new values a second predictive model was created. This model has already been precisely aligned with the mapped sites, so we were looking for more control data. GIS processing of drawings of a Roman crossroad excavated in 2005 (we thank Ferenc Derdák for help) revealed that the road crossing deviated by only 2 metres from the correctly-orientated grid of the second predictive model. This could be recorded as positive verification.

Aerial research
After this, with the sponsorship of the National Scientific Research Fund (OTKA 68824) and Magyary Zoltán Public Foundation for Higher Education, we had the opportunity to
undertake several flights to make aerial reconnaissances. The flight-plan was based on the model and the corner coordinates of our black line-grid were used as hints, or target coordinates, for the exploration-flights. It was considered that the model grid points and the lines they made served as potential tracks of Roman roads or channels. So our first aerial research was to search for linear objects.

The 8 hour exploration above the target areas was performed by Dr. Zoltán Czajlik. Despite the fact, that in the year 2010 the weather conditions were not ideal for aerial research, the exploration was completed successfully.

From the air, a few sites had been photographed which are likely to be related to centuriatio system. In the Rum (Hungary) area, the photographs also recorded the double ditch of a probable Roman road which, according to the predictive model, is almost exactly in the right place.

![Figure 9. The predictive grid model (white) and the double parallel ditches of a Roman road on the rectified oblique photograph. Photo by Zoltán Czajlik.](image)

In figure 9, the parallel ditches are clear and they are positioned according to the predictive model. The photo was rectified on to a Google Earth satellite image. The satellite image, taken on 2 April 2002 does not show any traces of an ancient road in this place.

**Summary**

The survey of the Roman cadastre system of Savaria has led to many interesting observations and questions. One of these is that the known Roman public road (Tóth 1977) might also be the decumanus maximus, the main E-W axis of the centuria-system. In principle, this duality is not a paradox; they do not exclude each other as the decumanus maximus could serve as a main road as well. Nevertheless its clarification is an important task of the Pannonian Roman road network research. The orientation and the cell size of the centuria system could be tested on more archaeological data. Previous work by Mócsy-Soproni-Tóth does not deny the centuriatio model which is also supported by archaeological evidence from elsewhere.
Other investigations could examine the whole range of the centuriated area and how it relates to the greater territory of the colony. Although we could document a number of individual features (like roads, parcel-borders, canals), these may not always correlate directly with the former extent of the *centuriatio*. Examples of these "accidental" occurrences are known throughout the country, not only in the former province of Pannonia, but on the eastern part of the country, which is called “*Barbaricum*”.

**Bibliography**


An EPPIC Odyssey into Aerial Archaeology

Tara-Jane Sutcliffe

"Are you epic?" I was asked on arriving bright and early on my first day.
"Well ... Yes" I replied, grinning and looking forward to the adventure ahead:
"I am EPPIC!"

Introduction
My journey into Aerial Archaeology began in April 2009, when I won a nationally competitive English Heritage Professional Placement in Conservation (EPPIC) in Aerial Survey & Investigation. EPPIC is a capacity-building project funded by English Heritage and managed by the Institute for Archaeologists (IfA). Established in 2003, the scheme provides year-long specialist structured training placements in archaeological skills for which there is perceived to be a professional need. The scheme expressly aims to provide historic environment professionals capable of meeting future challenges; as a result the content and number of placements on offer varies each year. Now entering its fifth consecutive year, the EPPIC in Aerial Survey & Investigation is provided in-house with the English Heritage teams in York and Swindon.

I came to the placement from a background in multi-period landscape analysis, having formerly worked as a Project Officer responsible for completing Desk-Based Assessments. This drew upon a range of cartographic, documentary and archaeological sources and equipped me well to undertake an odyssey into the techniques and application of Aerial Archaeology.

Training
The majority of training was delivered 'on the job' on a mentoring basis and herein lies the boon of work-based learning: the opportunity to train within a professional organisation with highly experienced practitioners as teachers. Foremost, training focused on developing the ability to recognise, assess, interpret and record archaeological monuments and landscapes visible on aerial photographs and lidar imagery. This involved development of landscape interpretation skills in terms of topography, land-use, soils and vegetation: factors influential in determining the range of likely past activity as well as that potentially visible on aerial imagery. Likewise, familiarisation with common geological and agricultural patterns was prudently undertaken in order to prevent their misidentification as archaeological features.

Working on the English Heritage National Mapping Programme (NMP) exposes the interpreter to a wide range of features dating from the Neolithic through to the Cold War and so firm understanding of chronology and morphology are essential. Indeed, this is what makes air photographic interpretation so stimulating: to flagrantly misquote Marx, I found myself mapping a Neolithic cursus in the morning, a deserted medieval village after lunch and a
Second World War searchlight battery in the afternoon, just as I had opportunity to. In consequence, my knowledge of British Archaeology was expanded on almost a daily basis.

The production of metrically-accurate plans required training in the use of specialist software. For those technically minded, this is a particularly rewarding aspect of the placement, providing opportunity to develop GIS and AutoCAD skills as well as a working knowledge of John Haigh’s rectification program AERIAL. Mapping and recording in a digital environment has broadened my understanding and ability to use a range of data types. More importantly, I have been introduced to the standards required to ensure the quality of the disseminated product, including adherence to transcription and recording criteria, the use of controlled vocabularies for meta-data, and submission of work for formal quality assurance.

Figure 1. Erosion witnessed at Kilnsea on the East Yorkshire coast, where Godwin Battery built during the First World War has slipped onto the foreshore (Photograph by T-J. Sutcliffe, 18-AUG-2009)

How the air photographic record is formed, the types of images available and the biases in coverage and capture are also important factors for informed interpretation. To gain full appreciation opportunity was provided quite literally to take to the air: flying out of Sherburn-in-Elmet in North Yorkshire, in a Cessna 172, I was privileged to be able to take part in English Heritage routine aerial reconnaissance over Yorkshire and Lincolnshire (figure 1). What an adventure! Flying over the east coast of England was particularly exciting,

2 'it [is] possible for me to do one thing today and another tomorrow, to hunt in the morning, fish in the afternoon, rear cattle in the evening, criticise after dinner, just as I have a mind, without ever becoming hunter, fisherman, shepherd or critic’ (Marx, K. 1845 The German Ideology)
demonstrating at first hand the dramatic affect of coastal erosion on both the natural and historic environment.

Through formal training and experiential learning I also had opportunity to develop my professional practice in terms of time management, oral presentation skills, project management and knowledge of health and safety issues, as well as my understanding of the planning system as it applies to the historic environment. This was structured by pursuit of an NVQ in Archaeological Practice: a work-based National Vocational Qualification designed to measure competence in a professional role. In November 2010 I was very proud to be the first to achieve the level 4 of this award. The NVQ is assessed via a portfolio of professional work that can takes account of previous experience and in so doing it validates both one’s capabilities as well as potential. I found that the NVQ not only consolidated the training I had received in the EPPIC but also allowed me opportunity to stretch myself. At a time when employment, let alone career development opportunities are at a premium, the NVQ provides a competitive edge.

Support and encouragement was also provided by English Heritage for my introduction to the Aerial Archaeology Research Group (AARG). In September 2009 I attended the annual AARG conference in Siena, Italy. A much enjoyed event, which widened my appreciation of Aerial Archaeology in terms of the range of international research and on a personal basis provided opportunity to meet many members of the group. This September I attended the conference in Bucharest with the support of a Young Researcher's Bursary and was pleased to share the results of my recent research in two poster presentations. I look forward to next year’s conference and the opportunity for greater involvement with the group.

**Application**

My training was put to good effect through application on the Miner-Farmer Landscapes of the North Pennines project, a multi-team initiative involving members of the English Heritage Aerial Survey, Archaeological and Architectural Investigation teams. AARG members who attended the annual conference in Bucharest will recall Stewart Ainsworth’s engaging presentation on this project. Working to NMP standards and specification I focused on the upland landscape in the vicinity of Alston Moor, Cumbria, mapping lead and coal mining features, post medieval field systems and peat cutting. A steep learning curve, the project both demonstrated the impact of landform on past human activity and provided a most interesting introduction to industrial archaeology. In addition, lidar imagery was specially commissioned for the project and I was thus able to develop my understanding of the application and interpretation of this useful resource.

I was fortunate also to contribute to multi-disciplinary study of Thornton Abbey, an Augustinian monastery in North Lincolnshire now under English Heritage guardianship (figure 2). Mapping elements of the monastic precinct boundary, fish ponds and water management system, I was able to extend my knowledge of the monastic landscape as well as the post-medieval designed estate. I greatly enjoyed sharing the results of the project in a presentation to the Council for British Archaeology (CBA) East Midlands Group in March 2010 and also the opportunity to contribute to a co-authored English Heritage Research Report (Oswald et al 2011).
The most rewarding element of the placement and fruition of the training was the undertaking and successful completion of an independent project (figure 3). The former Roman town of *Isurium Brigantium*, located at Aldborough, North Yorkshire, was selected for an air photo analysis and mapping project (Sutcliffe 2010). Historic photographs were sourced from the National Monuments Record and the Cambridge University Collection of Aerial Photographs; given the recent closure of the latter, I am appreciative to have had the opportunity to draw upon this splendid resource. Further, having studied the history of the discipline it was also exciting – if not nostalgic – to use photographs both by St. Joseph and from the Crawford Collection. Cambridge University are undertaking an ongoing programme of geophysical survey at Aldborough and it is hoped that the air photographic survey will inform future survey strategies.

So jammed pack, the year quite literally (*sic*) flew by! I am pleased to report that on completion of the EPPIC in April 2010 I gained employment as an Air Photo Interpreter with Archaeological Research Services Ltd and am currently applying my new skill set on the North York Moors National Park NMP Project. The odyssey continues with this challenging and fascinating upland landscape and I was pleased for the opportunity to deliver a paper on the project at the annual NMP Conference in November 2010.
Figure 3. *Isurium Brigantium* as was; today the sleepy North Yorkshire village of Aldborough (NMR 20982/4 11-FEB-2010 © English Heritage. NMR)

**Conclusion**

Air photographic analysis and mapping is a relatively rapid, cost-effective and low-impact means of assessing the historic environment on a landscape scale for all periods from the Neolithic through to the Twenty-first Century. Projects that use aerial photographs, such as the NMP, deliver high-quality baseline information for use in the management of change in the historic environment. In the current economic climate when it is so essential to demonstrate relevance today in terms of conservation and management, it is all too easy to forget that archaeology is an adventure: a thoroughly exciting journey of discovery. I am fortunate that my journey in Aerial Archaeology over the past 18 months has almost daily reminded me of this. Having spent the past five years variously in the field, visiting archives and at my desk, I never dreamt that my archaeology would be from a bird’s eye view. I am very grateful for all the support I have received from English Heritage and the IfA and look forward to seeing where the path ahead leads!

**References**


Information, adverts, etc

Information for contributors

*AARGnews* is published at six-monthly intervals. Copy for *AARGnews* 43 needs to be with me by **August 14**. Editorial policy (for want of a better word) tends to be that if I am sent interesting contributions they go in up to an issue limit of about 50 pages. Vague instructions for contributors are on the AARG website.

Address for contributions:
Rog Palmer, 21 Gunhild Way, Cambridge, CB1 8QX, UK.  **rog.palmer@ntlworld.com**

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Conference of interest?

Archaeology Special Interest Group Session:

**Imaging our Heritage:**

*Cultural Heritage Applications of Remote Sensing and Photogrammetry*

RSPSoc Annual Conference 2011 - 13th-15th September, Bournemouth, UK

RSPSoc ArchSIG invites submission of papers to the special interest group session of the RSPSoc 2011 Annual Conference:

**Earth Observation in a Changing World**


Contributions are encouraged in the following broad areas:

- Novel remote sensing technological applications for the cultural heritage sector
- Ground based remote sensing techniques (e.g. laser scanning, geophysical survey)
- Airborne and satellite remote sensing
- Multisensor survey techniques
- UAVs for archaeological prospection

Please contact Rebecca Bennett **rbennett@bournemouth.ac.uk** for further information.
International Aerial Archaeology School, Velling, Denmark

2-8 July 2011 at Vestjyllands Højskole and Stauning Airport, Denmark

Organised by Holstebro Museum (Lis Helles Olesen) in cooperation with LAND, Aerial Archaeological Network Denmark and in collaboration with the ArchaeoLandscapes Europe project within the Culture 2007-2013 Program of the European Union.

The program, which will make use of practical exercises and group discussions as well as formal teaching, will aim to present aerial archeology as a process consisting of airborne reconnaissance, photography, interpretation, rectification of oblique air photographs, drawing and mapping of archaeological sites and features, and related topics. The language of the course will be English.

The work will be divided into two parts.
1) A "ground school" covering the basic principles of aerial survey and air photography along with the essential processes of interpretation and mapping of the collected imagery for use in archaeological recording, excavation, conservation and public education etc.
2) An "air school", based at a nearby airfield, aimed at providing first-hand experience in aerial reconnaissance and aerial photography.

The target group is archaeology students and practicing archaeologists from countries bordering the Baltic Sea: Norway, Sweden, Denmark, Finland, Iceland, the Faroe Islands and Greenland, Estonia, Latvia, Lithuania, Russia, Poland, Germany and the Netherlands.

Applications must be made before 16 May 2011

Details and registration form from Kira J. Klinkby, Holstebro Museum Museumsvej: kira.klinkby@holstebro-museum.dk, tel (+45) 96 10 40 17

DART project: Community workshop

27 April 2011 – University of Leeds

I’m not sure who this is aimed at: the blurb I have suggests it is for ‘…industry and practitioners to provide feedback on the DART objectives and methods.’

Details and registration at www.dartproject.info
Aerial Archaeology Training School, Kostolac, Serbia, 2011

Aerial Archaeology Training School is part of the international ARCHEOLANDSCAPES EUROPE (ArcLand) project of Culture 2007-2013 programme.

Date 03 - 14 June 2011

Programme Exploratory aerial survey with air photo interpretation and mapping. It includes introduction to the area of study (Southern Banat and a part of the Danube Limes area in Serbia), practical experience in reconnaissance and recording in the air, discussion and analysis of photographs, landscape and archaeology, archiving and mapping.

Participants The school is organised for a (maximum) of sixteen (16) participants from South-East Europe, addressing the problems in starting or developing aerial archaeology in areas new to this type of study and monitoring past and present natural or cultural landscape.

Instructors Team of seven (7) instructors from different European countries presenting and discussing different experience in this discipline.

Airport Kostolac LYKT, situated on the Danube, near the Roman Limes town of Viminacium http://www.viminacium.org.rs/?language=english

Accomodation KONAK, Draže Markovića 6, 12000 Požarevac, http://www.konakpozarevac.rs/

Organizer Department of Archaeology / Faculty of Arts, UNIVERSITY OF LJUBLJANA (Slovenia)

Applications must be made before 21 April 2011

Additional info & registration:

Darja Grosman
University of Ljubljana
FA / Dept. of Archaeology
SI-1000 Ljubljana; Askerceva 2 (Slovenia)
tel +38612411568
e-mail darja.grosman@ff.uni-lj.si
apdarja@gmail.com
Cropmarks

Interpreted by Rog Palmer

Google Earth (again)
While idly clicking my way through the history layers to see how the willow tree in my back garden was growing I was somewhat surprised when the row of coloured houses (built in the 1950s) changed into a grey field and the date on the history slider had changed from 1999 to 1945. Zooming out there are large chunks of greyscale photographs that have been added by the Geoinformation Group (otherwise known as Chris Going). In Britain, this material is a mixture of 5x5 km OS 1:10560 photo mosaics (complete with place names) and other source photographs. In Europe a lot of the photographs are of bombed cities or military targets and are dated to 1943 and 1945. Zooming out to show the whole of Europe, the history slider showed a 1935 date but I could find no photographs in that layer. It’s good to see that GE’s history layer really does contain some history despite the resolution being much poorer than the originals and we can hope that these early photographs may continue to expand so making GE an even more useful site for a first look at a new area.

Chris told me that he has sent Google a lot more than is currently displayed.

Old photos
Any of you fed up with the 1906 Stonehenge photos may like a change. Wikipedia includes an oblique taken from Eduard Spelterini’s balloon on 21 November 1904 of pyramids at Giza which may have archaeological merit. Altitude is given as about 600m. [http://en.wikipedia.org/wiki/File:Spelterini_Pyramids.jpg](http://en.wikipedia.org/wiki/File:Spelterini_Pyramids.jpg) This may feature in Martyn Barber’s *Glass Eye* if EH ever get around to publishing it.

Slightly more recent are examples of WW1 maps and photos held at McMaster University in Canada. [http://library.mcmaster.ca/maps/ww1/home.htm](http://library.mcmaster.ca/maps/ww1/home.htm)

Poidebard
I think this has been mentioned before but it may have been a non-functioning website at the time. Now it contains a few photos of Poidebard in action – aircraft, camera, Lewis gun (see right), other paraphernalia of the aerial photographer, and a selection of his aerial photographs.


Poidebard in an RE8 during a French-English expedition in Persia.

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1 rog.palmer@ntlworld.com
…and more French photos
or rather, aerial photos of Algeria by Edouard Stawski. The few I looked at seem good
quality although some had a curious appearance that may be due to very contrasty conditions.
Also, the 1960s film and cameras were not quite the same as we’re used to now. Some of the
captions include the word ‘horizontal’ – a word I’ve been using for extremely high obliques
but haven’t seen an aerial photographer admit taking them before. Thanks to Ioana Oltean for
sending me this link:
http://tabbourt.perso.sfr.fr/stawski/index.html

UAV’s for survey?
Paulo Fallavollita, one of the Bibracte students, gave me a pamphlet about Oben srl, a new
company that is using UAVs (airship, n-copter, planes) to carry a range of remote sensors that
include digital camera systems, thermal imaging and ALS with a maximum payload of 30kg
using the airship. They also offer post-processing of collected data.
www.oben.it

Other web links:
A small mixture of aerial and ground photos of ancient Greek theatres taken by classical
archaeologist Hand Rupprecht Goette. Pretty stuff with a links to Google Maps showing
locations and allowing you to zoom in to vertical images of various qualities.

http://blogs.getty.edu/iris/ancient-greek-theaters-seen-from-the-sky/

Under the heading of Wired Science is a series of artistic photos grouped by theme. For
example, agricultural landscapes, glaciers, sand dunes…plus some man-made scars. If you
don’t want to browse through GE, you can find pretty pics here. See also other pages for
educational purposes.

http://www.wired.com/wiredscience/tag/earth-from-space/

Wired Science again, but an article on using radar images to identify a former lake bed in the
Sahara.

http://www.wired.com/wiredscience/2010/12/egypt-lake/
Book Review

Irwin Scollard


In the middle Neolithic period (4850/4800–4600/4550 BC), monumental construction was already being carried out all over Central Europe long before Stonehenge or the building of the Pyramids. The structures consisted of up to four circular, deep ditches creating an interior space fenced off by palisade walls. In 2003–2004 the central distribution area in Lower Austria was examined after aerial discovery with large scale systematic geophysical methods, mainly magnetic. By combining all available information in a geographic information system, spatial statistical analysis was also carried out and more than 35 known constructions in the distribution area were compared. The database also offered the opportunity for virtual and physical reconstruction of the monuments and facilitated the examination of the astronomic aspects of the structures which were erected and used by the settlers of the Moravian-East Austrian Group of the Lengyel culture in Austria within a very short period.

The results published here show the various forms of the monuments and their common features and leads to new evidence on the interpretation of the function of these earliest known monumental structures in Central Europe. Geophysical results are presented systematically overlaid on geo-referenced orthophotos or rectified obliques of the soil and crop sites which in most cases led to their initial discovery.

At a time when increasing specialization has unfortunately led to ever greater separation of geophysical, GIS, aerial prospecting and virtual display practice, and where those engaged in one discipline are often ignorant of what can be accomplished in the other, this book should serve as a model of interdisciplinary presentation of a single fascinating theme.

The authors are with a newly established Ludwig Boltzmann Institute for archaeological prospecting in Austria:

[http://archpro.lbg.ac.at/institute](http://archpro.lbg.ac.at/institute)

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1 al001@uni-koeln.de
Archäologische Prospektion

Luftbildprospektion

Geophysikalische Prospektion

Kombinierte Interpretation

Virtuelles Modell

Archäologische Grabung
Books of interest?

Rog Palmer¹


(Publisher’s blurb) This book presents a synthetic overview of the archaeological mapping and investigation of the cropmark landscapes of the Magnesian Limestone belt and its margins in a defined study area, mainly covering the eastern parts of South and West Yorkshire. The extensive enclosure and field systems of the later Iron Age and Roman period are found to be developed from a largely elusive prehistoric landscape, only to be succeeded by an almost equally undetectable regime of undefined open fields in the post-Roman period. The visibility, form, function and distribution of the different cropmark complexes is considered in the light of extensive geophysical survey and excavation work over the last two decades.

*Editorial comment. That second sentence must have been written by a politician.*


This book, written in Slovak, is a 200 page text book of current methods that includes in-text colour illustrations. Ivan sent me a pdf copy of his chapter (80+ pages) on aerial archaeology. Other chapters deal with statistical methods, anthropology and archaeology, geological methods in archaeological research, archaeology and architecture and, if Google Translate got it right, legal aspects of archaeological research.

Ivan’s chapter seems to be a magnificent work. I was able to follow a lot of it using the pictures and names of people and it appears to provide a good introduction in the language. The inclusion of examples showing the same sites on different dates is particularly useful and may help eradicate the idea that one photo is sufficient. The chapter ends with web links (some, such as NAPLIP and Keele, out of date) and a glossary of English/Slovak terms as well as the usual references. Ivan’s chapter – maybe the whole book – seems to fill a useful hole in Slovakia and may attract more interest in aerial matters.


(Comments are based on a 20 page sample download). This book perhaps results from rapid cashing-in on the recently-acquired Aerofilms collection to present some ‘then and now’ views of six cites in Scotland (perhaps the grand total?). According to the Contents there are

¹ rog.palmer@ntlworld.com
also a dozen pages of anaglyphs of vertical photographs that can be viewed using the coloured glasses provided. It is pleasing to see that the sample image has been rotated so that the shadows fall correctly towards the viewer. Well done – so I’ll make no mention of their ignorant use of photography when they mean photographs.


Article not seen but info picked up on the web. Examination of Google Earth has identified about 2000 potential archaeological sites in Saudi Arabia on what appear (after a check on GE) to be a mixture of DigitalGlobe and Spot images. In the clear atmosphere, the DG images are good enough in places to show texture of trees and to hint at power lines between pylons. But the mind boggles at the patience needed to search this huge chunk of land.


*Papers from the meeting in Iceland, 2010. Publisher’s blurb:* Remote sensing is one of the main foundations of archaeological data, underpinning knowledge and understanding of the historic environment. The volume, arising from a symposium organised by the Europae Archaeologiae Consilium (EAC) and the Aerial Archaeology Research Group (AARG), provides up to date expert statements on the methodologies, achievements and potential of remote sensing with a particular focus on archaeological heritage management. Well-established approaches and techniques are set alongside new technologies and data-sources, with discussion covering relative merits and applicability, and the need for integrated approaches to understanding and managing the landscape. Discussions cover aerial photography, both modern and historic, LiDAR, satellite imagery, multi-and hyper-spectral data, sonar and geophysical survey, addressing both terrestrial and maritime contexts. Case studies drawn from the contrasting landscapes of Europe illustrate best practice and innovative projects.


*Publisher’s blurb:* Some 40 per cent of Europe is farmed and 47 per cent forested. The future of the majority of Europe's archaeological sites therefore depends on rural land uses that lie outside the spatial planning and development control systems of its various nation states. This volume, produced by the European Association of Archaeologists (EAA) and Europae Archaeologiae Consilium (EAC) Joint Working Group on Farming, Forestry and Rural Land Management, examines the challenges posed by agriculture, forestry and other rural land uses in terms of the long-term conservation of Europe's archaeological sites and the management of its historic landscapes. Profusely illustrated and with contributions from no fewer than 13 different
European countries, the volume will be essential reading for anyone concerned with contemporary heritage management, policy-making and legislation.


An assortment of papers – as such volumes tend to be – including a photo essay by Otto Braasch titled *Asterix und Infrarot – farbige Flugspuren*. Otto’s photos are as beautiful as ever and have not been let down by the printing, which is of excellent quality. Other papers presumably cover the interests of Jörg Biel and include illustrated comments on sites, burials and artefacts of the Celtic (La Tene) period – plus a few more aerial photographs.

[Thanks to Otto Braasch for sending me a copy of this book]

*The London Journal* (vol 35 part 3, published November 2010) is a special themed issue containing some papers given at a seminar called *Eyes Over London: Re-imagining the Metropolis in the Age of Aerial Vision*, held at the University of Westminster's School of Architecture in October 2008.

Chris Cox has this issue for review (one day, perhaps...?) which includes papers on early aerial views of London (Martyn Barber and Helen Wickstead) and interwar years on Aerofilms photographs (Davide Deriu) plus others. The list of contents may be seen at the following web address and copies can be bought by clicking around that site.

http://www.ingentaconnect.com/content/maney/ldn/2010/00000035/00000003

**EH NMP Reports**

English Heritage has been busily creating pdf versions of National Mapping Programme Project reports for free download on the English Heritage Website. Just type www.english-heritage.org.uk/nmp where you will find a page for every NMP project. Where there is a report available this is flagged by a link on the right hand side of the page. Some of the earlier project reports are still awaiting scanning, but there are more than 30 available already.

[Info from Pete Horne and Simon Crutchley]


This volume – in Czech with English contents, summaries and figure captions – presents ten papers by staff and students at the Department of Archaeology, University of West Bohemia at Pilsen on aspects of air- and space-borne remote sensing (we really do need to find a name for this). Student work is mainly from Master’s studies but it is noted that some continue
remote sensing topics into doctoral research. Martin is to be congratulated on encouraging so much student interest, as that has to be a good thing for the discipline.

After an editorial review of recent developments in central Europe, other papers deal with methods of transcription (1), variability due to geology, soils, weather, etc (1), aspects of internet photographic sources (4), a case study comparison of field walking and aerial surveyed sites (1), a case study of prehistoric settlement in the lower Ohře valley (1) in which the usefulness of old maps is noted as a help to identifying ‘recent’ features, and an evaluation of the potential of ALS for Czech archaeology (1).

The book is well produced with good illustrations in black and white and colour (24 pages). I expect a UK printer would have tried to save cost by squeezing the colour pics into fewer pages, but this book gives us (mostly) half a page per photograph and that aids their understanding by readers. The wrap-around cover photo (reproduced inside) is of a cropmarked field in low light. Martin gave me a copy of this book during the Lidar workshop at Bibracte and examination of the cover made us wonder whether upstanding crops such as those (maybe 30cm above the field ‘background’) would be detectable by ALS.


If you make a web search using the title of this article you should get to a pdf copy of a paper on the survey. The original was delivered at The Fourth National GIS Symposium in Saudi Arabia (4-6 May 2009). This work is based on ground survey and has no input from aerial images other than using a Lansdat background although analysis of high-resolution images, such as are available in GE, may provide useful complementary information.

Abstract:
GIS technologies along with the spatial analysis methodologies are important tools for advancement in archaeological research and to get better explanation of the ancient history. A wide range of information can be collected and analysed through the study of the spatial distribution of archaeological remains. During its Gas exploration operations and as a part of its commitment to protect the archaeological sites in Rub’ Al-Khali desert, South Rub Al-Khali (SRAK) company limited sponsored the archaeological survey project conducted by teams from the local museums in Dammam and Al-Hasa in 2006. This research has used the data obtained during this project and will try to utilize the capabilities of GIS technology along with some spatial analysis methodologies to study the distribution and characteristics of the archaeological sites in Wadi Al-Ghayran, Saudi Arabia. Most of the archaeological sites recorded in this region are related to the prehistoric periods. The research will mainly investigate the distribution and characteristics of archaeological sites and its proximity to old water resources. The study will also try to make inferences about the relationships of intervisibility between related archaeological sites within Al-Ghayran landscape using the Digital elevation Model (DEM). Finally, the visibility analysis would be used to help in planning future archaeological survey or prospecting programmes.
The Aerial Archaeology Research Group

AARG provides an international forum for the exchange of ideas and experience on archaeology and landscape studies using all forms of remote sensing, especially airborne and satellite based techniques.

AARG is actively involved in promoting the collection, interpretation and application of remote sensing data in fostering research, conservation and public understanding.

Since its foundation in the early 1980s AARG has vigorously encouraged discussion and cooperation through its annual conferences, workshops, specialist publications and biannual newsletter, AARGnews.

Membership is open to all who have an interest or practical involvement in aerial archaeology, remote sensing and landscape studies.

Johanna Dreßler M.A,
Landesamt für Archäologie, Sachsen, Zur Wetterwarte 7, 01109 Dresden, Germany
Johanna.Dressler@lfa.sachsen.de

AARG is a registered charity: number SC 023162.

AARG homepage. http://aarg.univie.ac.at/

Membership/subscription rates:

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* and applicants from Albania, Bulgaria, Croatia, Czech Republic, Hungary, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia, and countries of the former Soviet Union.

Subscription reminders may be sent out on January 1

Methods of payment:
- Standing Order mandate /Electronic funds transfer
- Sterling or Euro bank notes
- PayPal

Bank details are available on request for direct payment from overseas. Please contact the Secretary.

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Student bursaries. AARG has a limited number of student bursaries for attendance at its annual meeting. These are aimed at supporting bona fide students who are interested in aerial archaeology and who wish to attend.

Anyone wishing to apply should write to Dave Cowley, RCAHMS, 16 Bernard Terrace, Edinburgh, EH8 9NX, Scotland (Dave.Cowley@rcahms.gov.uk) with information about their interests in archaeology and aerial archaeology, as well as their place of study. Annual closing date for applications to the annual AARG conference is 31 May, other meetings for which bursaries may be available will be advertised on an ad hoc basis.