ISAP NEWS

The newsletter of the International Society for Archaeological Prospection

Issue 7, April 2006

Contents

Editor's Note

louise.martin@english-heritage.org.uk

I would like to thank all the contributors to this issue of ISAP News. There is once again a wide range of thought provoking subject matter. I hope you find something to suit your own interest and the inspiration to submit your own article next time round. The next deadline for contributions, be they news or notices, articles or adverts, is nominally 7th July 2006. Get your thinking caps on now!

May your days be sunny, batteries full and local hostelries well stocked.

Reflections

Armin Schmidt, ISAP chairman A.Schmidt@Bradford.ac.uk

While planning for further fieldwork in Iran, I became increasingly frustrated by the recent political developments and their possible implications for joint archaeological projects. This reminded me of the speech, which Professor Angelo Guarino held during the opening ceremony of our *6th International Conference on Archaeological Prospection* last September in Rome. In his opinion, our profession does contribute to World Peace since we help to preserve Cultural Heritage, which is essential for the national identity of all people. Of course it is a small contribution but I felt that this view indeed opens the perspective for some wider purpose of what we do. It may seem obvious to us members of ISAP that archaeological prospection leads to increased 'cultural identity' but not everyone will have thought of this. I recently attended a workshop entitled *Preserving our Past* and I was amazed how little awareness there was amongst the 80 participants from across the UK about prospection methods. So I thought you might like to read Professor Guarino's address again and think about the contribution of your own work to the grand challenges.

Another problem that has raised its head with vigour recently is the threat of severe restrictions for GPR antenna output power in Europe. There have already been serious implications for GPR systems in America and a similar debate is currently ongoing in Europe. There is a danger that a new European low-power GPR regulation will seriously impinge on the ability to use this wonderful tool for archaeology (I assume you all have seen the book by Larry Conyers, *Ground-penetrating radar for archaeology*, Altamira Press, 2004). Our Treasurer, Chris Leech, is Chairman of EuroGPR and informs us in this newsletter about the latest developments. You will already have seen some comments on the email list 'isap-all'. On behalf of ISAP I have sent a letter in support of GPR to the chair of the CEPT Committee, which is responsible for the licensing. A copy of the letter is available on our web site in the 'members' section. Please do to contact your own national committee to make sure people understand the importance of reasonable GPR power output.

Of course there is also good news! Many meetings and conferences are taking place and this issue of the newsletter is full with interesting events and opportunities for courses. Recognising that we need to ensure a well trained new generation of archaeological geophysicists and remote sensing scientists, ISAP will continue to support student attendance at conferences with bursaries. At the moment it is planned to offer studentships for the next Archaeological Prospection conference in Nitra in 2007 and the GPR2008 conference that may be held in Birmingham, UK. If you have any additional suggestions, please feel free to either circulate them on the email list or send them to me directly.

I wish you all a very successful spring and summer and hope to see many of you at the conference in London in December, which will be preceded by our Annual General Meeting on 18 December 2006.

Cultural Heritage: A Value for the World

Prof. Angelo Guarino, President of the CNR Special Project "Cultural Heritage".

Edited version of a speech held during the opening ceremony of the *6th International Conference on Archaeological Prospection*, Rome, CNR, 14 September 2005.

Young people represent our future, here in Rome as well as in other countries all over the world. What kind of message are we giving to this young generation? What kind of life are we preparing for them? More specifically what kind of contribution are we scientists making with our studies to their future life?

At the beginning of this millennium, after a terrible century, which saw two world wars with many million victims, mankind is now bombarded by

commonplaces, a flood of inconsistent words, which flow from all communication media, TV channels, newspapers and the Internet.

One of the best-advertised commonplaces is "globalisation". Mankind should be happy, trustful and confident because we are moving towards a "global village" where any conflict will disappear and peace and welfare will dominate in all corners of the Earth. Unfortunately, this is only a commonplace, a "virtual reality" exercise carried out by mass media. In real life we observe how all over the world there are wars and religious and ethnic conflicts, which create innocent victims and condemn million women and men to a miserable life of poverty and lack of liberty.

Today we observe all over the world a confused trend towards a loss of national Cultural Identity. The preservation of national Cultural Identities of the various world populations is absolutely crucial if we really want to increase peace and welfare. But, what is the link between Cultural Identity and Cultural Heritage?

Cultural Heritage represents any material evidence of the Cultural Identity of a population. It represents the cultural roots of the identity of a population. This is similar to a tree, where the branches, flowers and fruits draw their lymph from the roots. Cultural Heritage defines the diversity existing between countries. The civilisation of our planet developed as a consequence of this diversity and globalisation must not lead to a loss of this diversity! A uniform "global village" is a dangerous stupidity. Any small village the world over has the right to preserve monuments and documents, which do mean something to the heart of its citizens even if these monuments do not attract any tourists.

The often quoted link between tourism and Cultural Heritage is another example of how dangerous commonplaces can become. It implies that the monuments to be preserved should be chosen according to their ability to attract tourists, since tourists mean money and jobs. There is no doubt that tourism, particularly cultural tourism, is a precious resource all over the world, but it has some unpleasant side effects. If we examine data, which refer to the countries of the Mediterranean Basin, we may easily conclude that the European countries obtain from tourism a much larger percentage of their Gross Domestic Product (GDP) and a much larger percentage of jobs than the North African countries do. In other words, tourism gives generous fruits only to richer countries, exactly as it happens in other industrial areas! It is worth observing that the impact of mass tourism on the world patrimony of Cultural Heritage is also often detrimental. Sometimes this situation leads to bizarre ideas. For instance, in Spain, to avoid that the track of millions of tourists destroys the Alhambra in Granada, it was proposed to build a copy of it close to the original monument, and let tourists only visit the copy. In other words, a kind of cultural Disneyland!

Another branch of mass tourism refers to museums and again with negative consequences. Too many people are visiting Mona Lisa at the Louvre museum. This is partly as a consequence of a best-selling novel; the Author is getting richer and the Louvre administrators are getting in trouble in Paris as the try to preserve the masterpiece.

But, what is the role of us scientists in preserving the world's Cultural Heritage? We really need very skilful scientists; the cost of developing new products and equipments for the preservation and conservation of Cultural Heritage is enormous and any future involvement of enterprises, particularly SME's, depends on answers coming from us scientists. And science must be understood in the widest sense as only the collaboration of archaeological and geophysical researchers can lead to meaningful results.

However, scientists should not work to just satisfy their curiosity; they must transfer their results to the world's scientific community and be equally committed to transfer their insight to the rest of the world's society, starting from companies, which will exploit their work.

I should say here that in the top list of commonplaces we may also include "Enterprises need innovation". There is no speech of a political official without this sentence: "Our enterprises need innovation"! Innovation is a part of life: it is relevant for individuals as well as for enterprises. Once electric power was available, most candle manufacturers simply went bankrupt or changed their business. However, how can a small

enterprise innovate without the help of scientists and a significant financial support by our governments or common European Authorities? I guess that this question will remain forever without an answer.

And just a final question: Why should we spend on this heritage patrimony so many significant human and financial resources? Why should we preserve our precious archaeological monuments employing resources, which could be better employed to face other major problems, like poverty and unemployment? More clearly: what kind of link exists between Cultural Heritage and our quality of life? Unfortunately, our quality of life nowadays is often put in danger. Economic crises, epidemics, frequent and ferocious conflicts in Africa, Asia, and also in the heart of Europe, genetic manipulations, terrorism and extreme environmental phenomena, probably caused by men, make the beginning of this millennium rather distressing and engender in us the same fears that people mast have had at the beginning of the first millennium. And yet, if we simply consider the living conditions only one hundred years ago, the progress in the quality of life of citizens is astonishing. About one hundred years ago, in London of 1899, the centre of a powerful empire during the triumphant Victorian age, there were 1.3 million citizens who lived below the threshold of poverty. Unfortunately, even today many women and men do live below this margin of poverty.

What kind of life are we preparing for the young boys and girls who are beginning their school courses today? A common and concerted effort carried out by scientists, enterprises and public administrations will certainly increase the chances for peace and welfare all over the world. The preservation of our Cultural Heritage will contribute to this.

Edited by Armin Schmidt, April 2006

GPR Licensing Issues

Chris Leech, Chairman, EuroGPR trade association. chairman@eurogpr.org

Many of you may not be aware of current moves to provide a legal framework across Europe within which GPR systems can be purchased and used. Currently there are no licences for GPR systems but as they are intentional EM emitters, then strictly speaking GPR systems are being used unlawfully. As the volume of GPR systems across Europe is very small, none of the national regulators have bothered about this especially as there were no standards by which they could compare a GPR to and say it did not adhere to.

This is about to change!

CEPT, the EU body which deals with such issues is in the final stages of formulating a standard to which all new GPR systems should be manufactured and used. EuroGPR trade association and several prominent manufacturers and users have been working with ETSI (European Telecommunications Standards Institute, who technically have formulated the standard) and CEPT for several years now to ensure that the new standards do not seriously degrade the performance of GPR systems. Once this standard has been ratified by the European Commission, then it is the national radio licensing authorities who will be tasked with the job of issuing licences to GPR users and policing their correct use by operators.

We do not know at this point how the national authorities will implement licensing, we do however have a possible licensing regime which Ofcom in the UK are considering and it is very possible that other national authorities will follow the lead of Ofcom, as it is more advanced in this process than other nations.

We hope, as this is the least painful route financially, that this will follow the following route: The importer or manufacturer of the GPR will hold a master licence, and will keep an accurate log of all owners coordinates, types of systems with serial numbers of instruments sold.

The GPR system owner will have to be a member of EuroGPR trade association, and thereby committing to adhere to their code of ethics and code of conduct in operation of the GPR system.

The owner will have to prove their competence in operation and knowledge of GPR to EuroGPR to become a member.

The owner will provide a log to Ofcom of all usage of the GPR systems showing dates, times, location and frequency(s) used.

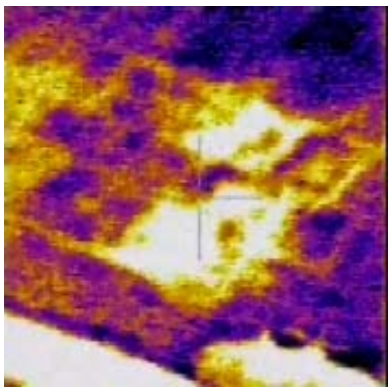
At the time of writing we do not know how CEPT or the national bodies will regard GPR systems already in the market place, as these almost certainly will not conform to the new standards, especially systems with un-shielded antenna. It is hoped that such systems will be regarded as too small in number to demand their withdrawal from use, and that is recognised that as time goes by they will gradually fail and thereby be removed from service by natural wastage. At the very least the owner will have to 'licence' the system and use as above.

We hope to be able to provide you with more definitive information on this issue which concerns many of us, by the time of the next newsletter.

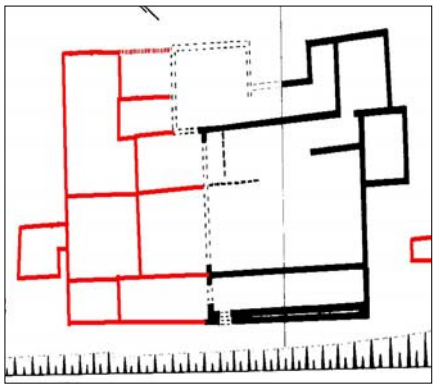
Thermal Prospecting on Vegetation

Ulrich Kiesow, archaeoflug. ukiesow@gmx.de

In the *summer of 2005, archaeoflug carried out a series of flights with the aim* of *testing a new method of archaeological prospecting for its ranges of application*. With a thermal image camera a*erial videos of potential negative crop marks were taken and evaluated. The series of flights confirmed the assumption of the author that the development of a negative crop mark is accompanied by an increase of temperature of the vegetation concerned. Archaeoflug has succeeded in proving the existence of "warm crop marks" which can be seen before and during the emergence of negative crop marks. The article explains the method of thermal prospecting as an additional method of aerial archaeological photography.*



The thermal image provides



additional information (red)

to classic aerial prospecting

Contents of the article:

1. Until now thermal prospecting has been carried out predominantly on bare soils. Irwin Scollar points out further possibilities of thermal prospecting in his researches. Archaeoflug assumes that potential negative crop marks lead to warm crop marks.

2. Plants regulate their temperature by water transpiration. Water shortage leads to restricted water evaporation. If at the same time warmth is supplied to the plant from the outside (sun radiation, increasing air temperature), then the plant can no longer prevent its temperature from rising. A warm crop mark is produced. Three stages of development of warm crop marks are possible. At the beginning of water shortage the temperature of the plant rises. A warm crop mark 1st level appears. No classic crop mark is recognizable yet. As long as the vegetation is still green and the water shortage continues, the buried structure becomes visible to the eye as a pale brown crop mark. A volatile classic negative crop mark and warm crop mark of 2nd level appears. In the more mature, browner condition this brightening is no longer perceptible with the eye, however it is still thermally visible. If the water shortage persists, the volatile classic negative crop mark will wither and become fixed. A warm crop mark of 3rd level appears. At full maturity no more

evaporation takes place. Temperature differences can only arise from shading. The stages of development 1 and 2 are reversible when water shortage disappears.

3. Warm crop marks appear before and together with classic negative crop marks. Through this the time-period in which a buried structure is detectable increases. Hidden structures in the ground can thus be prospected within a longer period of time. A hidden structure which for meteorological reasons (a too short dry period) cannot be discerned as a classic negative crop mark can be documented by thermal prospecting as a warm crop mark of 1st level. The method therefore permits the detection of unknown archaeological structures.

4. The camera provided by FLIR-SYSTEMS, an AGEMA Thermovision 400, weighs approx. 6 kg, has the size of a TV camera and produces a picture with a resolution of 140x140 pixels. A telephoto lens with a 7° angle is used. The picture produced by the thermal image camera is recorded by means of a digital video recorder in a video file. Post processing can produce single pictures from the recorded video file. When prospecting thermally, the concerned surface is observed on the camera screen or through the eyepiece. The current picture produced by the camera is observed. This observation type is suitable for aiming at specific targets such as known archaeological sites and suspected settlement locations. At present, thermal prospecting of an extensive area, with the aim of detecting new sites or structures like in classic aerial photography, is not possible. This can only be achieved by systematically prospecting a predefined limited grid and then evaluating the produced data on the ground.

5. Aims of the examination of warm crop marks were: the proof of their existence, the comparison with the classic crop mark, the analysis of the meteorological influences. A roman villa was chosen as the object of examination. Parts of the villa had been excavated and documented in the sixties and after that turned back into arable land. Between June 23rd and July 23rd 2005 archaeoflug carried out ten thermal prospections of the object. The meteorological conditions were provided by Agrowetter.de and contain: Calculated soil temperatures in different depths down to 1 metre, sunshine duration, air temperature, air humidity. All prospecting results are documented in a comparison of thermal picture and aerial photo with the necessary meteorological data in a chronological order in the complete article. In addition the analysis of the meteorological conditions, accompanied by a comparative image analysis is carried out.

6. During the summer-2005 project the existence of warm crop marks could be definitively proved over a period of one month. 10 Thermo videos of different quality were taken. The first thermal prospections, on the 23rd and 24th July 2005 show warm crop marks of first, second and third level. When prospecting thermally, the consideration of meteorological and flying conditions are of greater importance compared to the classic aerial photography. Comparing the best results of both methods shows that thermal prospecting provides a greater amount of information than classic aerial photography. The volatile classic negative crop mark is only visible on green canopy up to a certain degree of maturity, whereas the warm crop mark reappears up to full maturity. Compared to the visibility of volatile classic crop marks, which appear together with warm crop marks of 2nd level, the latter can be seen significantly clearer. The thermal image can show warm crop marks of 1st level, which can not at all be seen, in the aerial photo. Solar radiation: A preferably strong and long solar radiation will support the evaporation and the warming of the crop mark. To avoid disturbing reflections the object should not be exposed to direct sunlight at the time of flight. Air temperature: A preferably high air temperature supports the evaporation and the warming of the crop mark. Humidity: The lower the humidity, the higher the evaporation and the warming of the crop mark. Air movement: Wind will lead to a weakening of the warm crop mark as the arising temperature differences are strongly diminished by the removal of warmth. Phase of growth: The most informative images can be expected on the ripening, green vegetation, as the plants are “full of juice” and react strongly when evaporation decreases. Time of day: The experiences made in the campaign suggest, that prospecting in the late afternoon and evening promises the best results. However further tests are necessary to confirm the following considerations: In the morning-time the humidity is

high, solar radiation and the beginning of temperature rise are not jet sufficient to bring about a significant warming of the canopy. At noon the desirable full solar radiation is present, but leads to confusing reflections. A temporary clouding however makes successful prospecting possible also at noon. In the afternoon the oblique sunrays only disturb in one line of sight and in the evening there are no disturbing reflections at all. The humidity is low, the air temperature is still high and the air movement dies down.

7. The summer-2005 project has rendered essential insights into thermal prospecting on vegetation. A continuation under consideration of the results achieved and with the aim of deepening and improving the application of the method is worth striving for. The actual level of knowledge suggests the following questions and tasks for the next project: Thermal prospecting as an independent method. Is it possible to detect buried structures, which at an early stage can exclusively be documented as warm crop marks of 1st level? How long do they already exist before the first volatile classic crop mark appears. To find an answer to these questions, regular flights starting one month earlier than in the summer-2005 project should to be carried out. Time of flight: The assumptions to the best time of day for prospecting should be checked. For this purpose at good visibility a diurnal flight over the object should be carried out in intervals of one hour. Camera: How high is the maximum precision of detail in the thermal image? The rather modest resolution of the camera (140x140 pixels) used up till now does not allow a statement concerning the actual existing thermal information on the canopy. A more modern camera with a higher resolution should be used in the next campaign. Warm positive crop marks: I. Scollar classified classic positive crop marks in the early ripening phase as cold crop marks in the thermal image. These should also show up as “cooler” crop marks when water shortage is present in the riper phase of growth, because compared with the surrounding canopy they do not react to the water shortage. To show this, specific prospecting flights should be carried out over known ditches and embankments.

The complete article can be downloaded at
http://aarg.univie.ac.at (English)
or http://www.archaeoflug.de (German)
Requests for the video material should be sent to the author: ukiesow@gmx.de

A Comparison of Archaeomagnetic Results from a Towed Magnetometer Array and Traditional Methods

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Christopher Leech, Geomatrix Earth Science Ltd., Leighton Buzzard, UK chris@geomatrix.co.uk

The Geophysical Equipment Exploration Platform (GEEP) system allows large (>1 Hectare) sites to be surveyed quickly and efficiently, and provides consistent, high quality data. It consists of two components: a geophysically undetectable mobile platform and a logging station (see figure 1).
The mobile platform is towed over a site at an average speed of 6km/h. Location is provided by the onboard Differential GPS and compass systems. The platform may carry a variety of sensors, running simultaneously. Data from all sensors on the platform is telemetered to a remote logging station, where the geophysicist may view the data in real-time, in enough detail to make basic interpretations. In this way data quality is assured.

Survey Site:
The Vale of Pickering, in the North-East of England, is a site of extensive archaeological interest and is currently being extensively surveyed using fluxgate gradiometry followed up by excavation of areas of interest (see Powlesland, D., 2003). The position of the survey grid for each gradiometer survey is provided by an RTK GPS system.

The GEEP carried 4 Cs vapour magnetometers attached at 1m intervals transversally, across the survey line, on a 3m frame at the back of the platform (see figure 1). This produced a 3m swath of data, allowing the platform to be towed along survey lines 4m apart.

Figure 1: The two components of the Geophysical Equipment Exploration Platform: a) the mobile instrument platform carrying 4 Cs vapour sensors; b) the logging station, showing a GPS map and various sensor data displays

Results and Analysis

Data Processing Method:

- The fluxgate survey method produces multiple files for processing. The GEEP system produces a single file for the entire survey consisting of 31000 data points.
- The consistent mechanical mount for each sensor on the platform ensures consistent data of a consistent quality is recorded throughout a survey.
- Sensors mounted on the GEEP operate at 10Hz, which gives a data point every 170mm along each survey line.
- Corrections to be applied to the GEEP total-field data include heading errors, diurnal variation (corrected using a remote magnetic base station), the removal of geological signals (by using a high-pass filter) and finally cornering errors (in sharp corners the tow vehicle gets closer to the sensors, introducing an error in their readings). Cornering errors are removed by removing data collected in corners from the data-set.

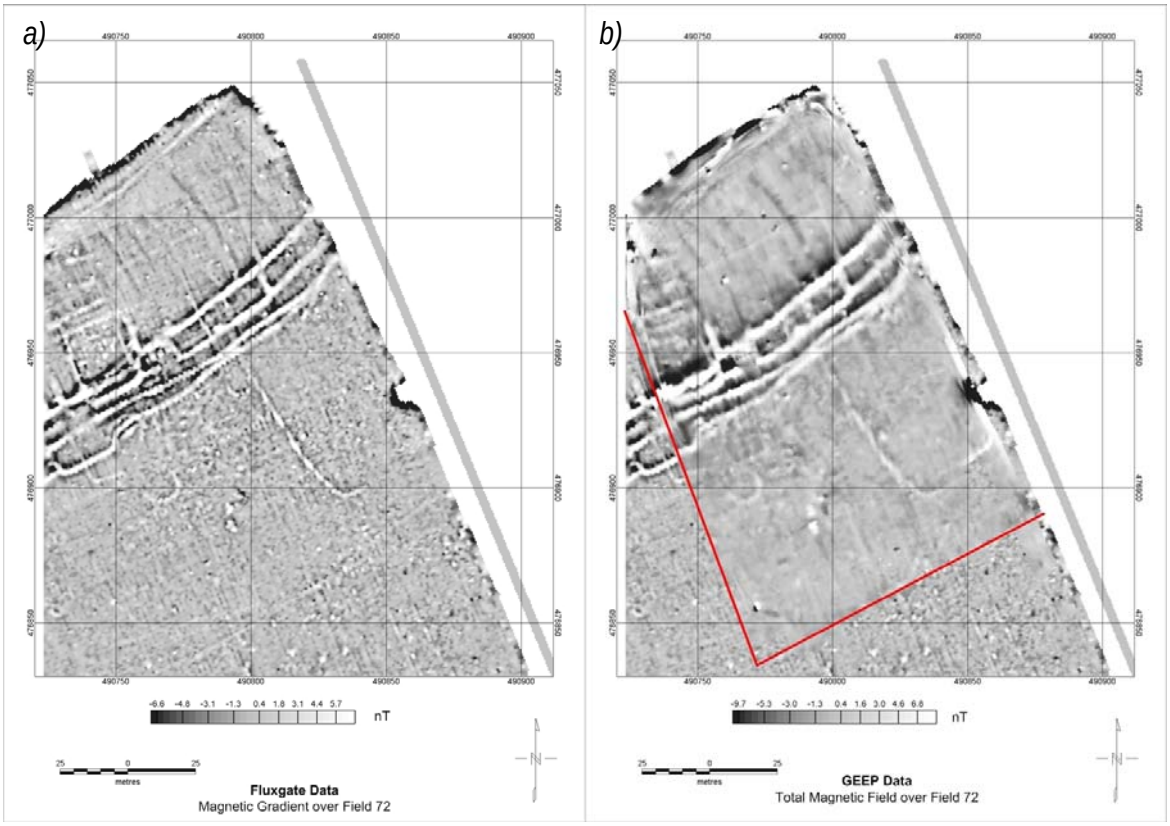

Figure 2: a) The gradiometer data; b) The GEEP data, shown within a red border, overlaying the gradiometer data. Both images are gridded at 0.5m spacing

A Comparison of the Data Produced:

Both images in figure 2 have been gridded using 0.5m spacing. The gradiometer data is shown using a linear grayscale, whilst the total field data uses a normal distribution due to its greater range of signal amplitudes. Despite its smooth appearance the total field data has not been filtered in any way, excluding the interpolation to the 0.5m grid shown.

The total field data produces a larger range of amplitudes than the gradiometer data, implying a higher sensitivity. Both images show the same principal anomalies, including a medieval settlement (SW-NE), a circular feature and a long line (running SE). Smaller circular features, NE of the bold circular anomaly are also visible.

the gradiometer data. Its greater lateral sensitivity has widened some of the more prominent features such as the 'ladder settlement', and has increased the wavelength of the profile recorded (see figures 2 and 3).

Having a single data file saves a large amount of time when processing, and makes on-site processing much simpler.

The GEEP's use of DGPS and the removal of the need for a survey grid have not had a noticeable effect on the positions of any anomalies, and small anomalies can be located on both datasets. A great deal of time can be saved in the field by the removal of a pre-planned survey grid.

The principal benefit of the use of the GEEP over

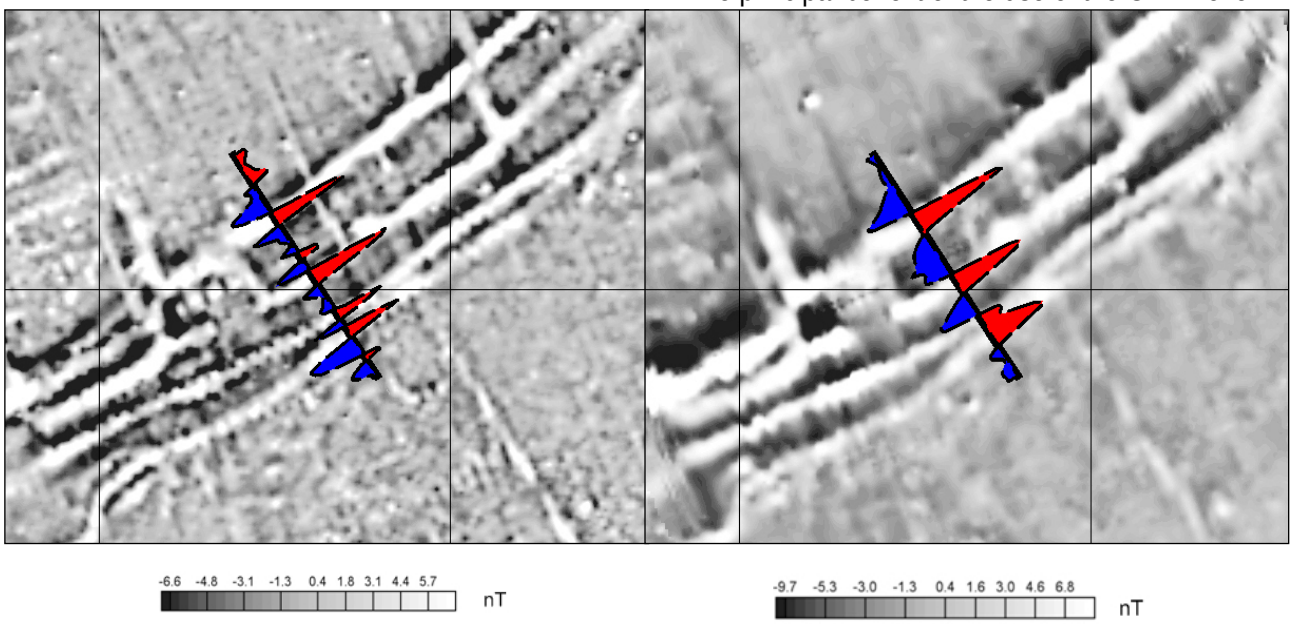

Figure 3: The magnetic profiles of each dataset over the medieval ladder settlement on a 50m grid: a) the profile of the gradiometer data; b) the profile of the total field

The total field image is less sharp than the gradiometer data, which is due to the inherent properties of the vertical magnetic gradient. This is also seen in figure 3, which shows a typical profile over the medieval ladder settlement for each data-type. Here the gradiometer shows a shorter dominant wavelength than that of the total field.

Conclusions

Both methods have produced comparable images, each showing archaeologically significant anomalies within this field. The total field measured by the GEEP is over a wider amplitude range than

the gradiometer is the time the survey takes to complete. The area total area surveyed was 2 Hectares (5 Acres), which the GEEP covered in 1 hour and twenty minutes. This rate of surveying allows sites to be surveyed extensively, efficiently and quickly, but without sacrificing data quality.

Acknowledgements

Thanks are due to Dominic Powlesland and James Lyall for providing the FM256 data for the comparison in this paper and for logistical assistance during our survey.

Conference, Seminar and Course Announcements

EIGG Geophysical Equipment Exhibition, Leicester, UK: 25 May 2006

10.00—1600 Live demonstrations of geophysical equipment on the EIGG test site, with opportunity for hands-on trials.

The Demonstration programme will run from 10am to 4pm on the two EIGG Shallow Geophysics test sites at Leicester, with various instruments being demonstrated on a schedule. This will maximise viewing time, but minimise interference between different instruments, and the potential geophysical signatures of the observers. The weather may also have some effect. For this reason the programme may be adjusted. Latest news will be available on the website, which also carries details of the construction of the test-site.

This event has free entry, free car parking, refreshments. Packed lunch will be available for collection on-site by those pre-ordering.

The site is 5 miles from junction 21 along the Leicester Ring Road at Grid Reference: SK 629016
Full details and news updates of the program of the exhibition and demonstrations are available on the website: *http://www.le.ac.uk/geology/iah/research/EIGG/EIGG_EX2006hp.html*

XVth International School in Archaeology, Tuscany, Italy: 10-18 July 2006

As part of the Europe 2000 programme, the University of Siena, Italy is organising its XVth International School in Archaeology with the special topic: “Geophysics for Landscape Archaeology”. The summer school will comprise lectures and practical field training to equip interested participants with a sound foundation in archaeological geophysics. The summer school is endorsed by ISAP and several ISAP members will be amongst the teaching staff.

The summer school will be held from 10-18 July 2006 in Grosseto, Tuscany. The course fee will be 500 Euros plus 250 Euros for food and accommodation.

Further details can be found at: http://192.167.118.99/CCGBA/laboratori/lapetlab/pagine/XVsummer.html

The conference organisers are:
Stefano Campana
(scampana@alice.it)
University of Siena, Landscape Archaeology
Riccardo Francovich
University of Siena, Medieval Archaeology
Salvatore Piro
National Research Council ITABC and
University of Rome La Sapienza - Geophysics for Archaeology

EIGG and Forensic Geology Group Day Meetings, London, UK: 19 and 20 December 2006

ENVIRONMENTAL AND INDUSTRIAL GEOPHYSICS GROUP

FORENSIC GEOLOGY GROUP

Two day meetings at Burlington House, Piccadilly, London: 19th–20th December 2006

19th December: ***Recent Work in Archaeological Geophysics***

Shallow geophysical techniques are playing an increasing role in the evaluation of archaeological sites, in their discovery, interpretation and management. This will be the seventh in a succession of biennial meetings in which contributors from the UK and further afield present and debate the results of recent research and case studies. Suppliers of equipment and software also attend and the meeting therefore represents an invaluable opportunity for both archaeological and geophysical practitioners to take advantage of recent research and developments.

Convenor: Dr Andrew David, English Heritage, Fort Cumberland, Eastney, Portsmouth, PO4 9LD, UK; Tel.: +44 (0)23 9285 6764; email: Andrew.David@english-heritage.org.uk

20th December: ***Geoscientists at Crime Scenes***

This follow-on meeting, which aims to capture shared interests between the archaeological, geological, humanitarian and law enforcement communities, will follow a macro- to micro-scale organisation. The initial sessions will include geophysics, aerial, satellite and landscape interpretation. These will be followed by presentations on anthropology, buried materials, trace evidence and innovations in materials analysis.

Convenor: Dr Alastair Ruffell, School of Geography, Archaeology & Palaeoecology, Queen's University, Belfast, N. Ireland, BT7 1NN; Tel.: +44 (0)28 9097 340 email: a.ruffell@qub.ac.uk

It is anticipated that each meeting will attract 60 or more participants. As well as oral presentations, there will be space for commercial and poster displays.

Those interested in contributing to either meeting are warmly encouraged to contact the respective convenors, and to submit abstracts of up to 1000 words in length, accompanied by suitable illustrative material, no later than the 31st August 2006. These will be collated and made available to all those attending.

Attendance will be free to members of the Geological Society. Non-members will be asked to pay £20 to attend a single day or £30 for both days. Registered students can attend for £10 or £20, respectively. A further charge will be made for commercial exhibitors.

Pre-registration and payment is preferred and will be possible between 1st July – 1st December 2006. Please contact: Louise Martin, English Heritage, Fort Cumberland, Eastney, Portsmouth, PO4 9LD, UK; email: Louise.Martin@english-heritage.org.uk

3 funded MSc Studentships: University of Bradford

MSc in Archaeological Prospection: Shallow Geophysics

UNIVERSITY OF BRADFORD

MAKING KNOWLEDGE WORK

The Department of Archaeological Sciences at the University of Bradford, U.K., is pleased to announce that three prestigious NERC studentships will be available annually from September 2006 for its *MSc in Archaeological Prospection: Shallow Geophysics.* For UK students these include university fees, a maintenance grant of £7,880 and research expenses; for other EU students only university fees are covered.

In addition, the Department offers a range of other MSc courses as well as MPhil/PhD research degrees in archaeological sciences and archaeology.

For further details please consult http://www.bradford.ac.uk/archsci/depart/pgrad/arcpros/ and email the course manager, Dr Armin Schmidt (A.Schmidt@Bradford.ac.uk), or telephone ++44 - (0)1274 - 23 3531.

Commercial Advertisements

Journal Notifications

Archaeological Prospection

Chris Gaffney. Vice-Chair, ISAP

Volume 13(1) is now out and includes the following papers:

- M. Dogan, S. Papamarinopoulos Exploration of the Hellenistic fortification complex at Asea using a multigeophysical prospection approach
- Tomasz Herbich, Christoph Peeters Results of the magnetic survey at Deir al-Barsha, Egypt
- Roman Křivánek Magnetometric prospection of various types of large ditched enclosures in Bohemia
- Paul J. Gibson, Dorothy M. George Geophysical investigation of the site of the former monastic settlement, Clonard, County Meath, Ireland
- Kenneth L. Kvamme Integrating multidimensional geophysical data

The next Issue will include a GPR supplement edited by Larry Conyers.

I have been sent the following regarding the ISAP membership rate for the journal Archaeological Prospection. Please note that the contact at Wiley has changed.

"The ISAP member rate is £80.00. The subscription must be paid in advance before the service will begin. The contact in Journals Fulfilment handling the ISAP membership subscriptions is Cathy Cogger. Her telephone number is +44 1243 843183 and her email is ccogger@wiley.co.uk."

Please contact Cathy to work out the best way to pay.

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