Contents

Editorial 2
Photo Offerings 4
Chairman’s Piece by Włodek Rączkowski 5
AARG 2010, Bucharest – info and call for papers 9
ArchaeoLandscapes Europe: a new European project for aerial archaeology, remote sensing and landscape conservation by Chris Musson (Development Officer, AARG) 10
The DART project: Developing the roadmap for archaeological remote sensing in the 21st century by Anthony Beck 15
‘Gone with the Wind’ Aerial Photography of Bâtiment Pi, Malia, Crete (Bronze Age) by Christophe Gaston, Thibaut Gomrée, Maia Pomadère 17
Ultima Thule – recent aerial survey of Orkney, Scotland by Dave Cowley 25
Information, adverts, etc 36
Cropmarks 37
Books of interest? 38
Birger Stichelbaut. World War One aerial photography: an archaeological perspective.
Martin Fowler. Corona mission declassified.
AARG: general information, membership, addresses, student bursaries 39
Opportunities
At a time when the world seems to have run out of money we are fortunate that two major projects have secured awards that will enable them to tackle different themes that are relevant to AARG and the development of our interests. Both are subjects of contributions in this issue and it is sufficient here to offer congratulations to Chris Musson and Anthony Beck, plus their respective project partners, for their successes with funding ALE and DART. I’ll leave you to make the pub jokes.

AARG 2009
After a bit of official concern that lunch in Italy could not be completed in 45 minutes, the meeting at Certosa di Pontignano, near Siena, was relaxed and enjoyable even though there was no beer. Of the presentations, Cathy Stoertz’s dissection of one photograph showed just how much information could be gleaned from, and attached to, a single picture. For me this was a brilliant demonstration of the power of interpretation (where the meaning of interpretation includes use of other sources) and I was pleased to learn that it will be published in the forthcoming AARG-badged book about uses of archival photographs, Landscapes through the lens: aerial photographs and the historic environment, edited by Dave C Cowley, Robin A Standring and Matthew J Abicht. Another talk, by Kenny Brophy, was a hilarious piece about the death of crop marks. There may have been a serious point to it, but it had me crying with laughter in places.

The field trip took us to an extensive Etruscan/Roman town where we did the usual chatting with friends, took random photos, and paid occasional attention to the site through which we were informatively and knowledgeably guided. This was followed by a 3-4 hour lunch break and I’ve no idea what happened after that! Several of us took the pleasure of having an additional day in Siena after AARG. I had been there before at workshops and, in the summer, it is a very nice place to hang around and do nothing. My memory of that day is of wide-ranging, sometimes irrelevant, conversations that took place in several bars. Well, as tourists we had to tour. I was flying back to England from Rome and, because of rail works, the first part of the journey – from Siena to somewhere on the main line – was by bus. That was an enjoyable journey because, unlike trains which tend to follow level(ish) ground, the roads went into the hills and gave a chance to see the Tuscan countryside.

Cover pictures
Someone recently asked me why, with my great love for aerial photos, I’d been putting them on the cover. Two reasons: firstly no one sends me any alternatives so it’s usually a last-minute search thro my own pics to see what may be suitable for fading and not confuse any words over it. Secondly I don’t mind writing over photos – even my own – whereas writing over maps is definitely a major sin. And if anyone is interested, the present cover is part of a photo taken over the sea somewhere near Rome on my flight home from AARG. The light that evening was magical and visibility (checking the photos against Google Earth) exceeded 100km. A selection of those photos is at: http://rogpalmer.cantabphotos.com/091010193314/

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1 rog.palmer@ntlworld.com
Climate change…
…has, to date, remained unmentioned in our annual meetings and the pages of AARGnews. But at the end of 2009, while politicians were faffing around in Copenhagen, it was difficult to see, hear or read any news in which it did not feature at, or near, the top of the list. Commentators have been a bit gentle implying that everything will be fine if we change our light bulbs, drive fewer miles each day and stop cows farting – but I think this is tickling a few small aspects and avoiding looking at the greater, and longer term, picture. These schemes are a bit King Knut-ish and seem to be politically undamaging and perhaps devised to make ‘us’ responsible for slowing the change. As far as I know, very few people have categorically stated that a major change will happen and, if it does, to propose ways that mankind may survive it. And I’ve been little aware of changes in the slogan from ‘save the world’ (which has survived far worse) to ‘save mankind’ – which is altogether a more-delicate species than a planet – although it was raised in Iain Stewart’s series of BBC programmes How Earth Made Us.

During the past couple of years I’ve upset a few friends by saying that it amuses me that mankind seems likely to be on the verge of wiping itself out. We have become very efficient at destroying things, so wrecking the environment that we need to support our species (and many others) is simply the ultimate extension of that thoroughness. Mankind has had a reasonable lifespan – a few million years or several thousand, depending on where you place our origins – and, in simple terms, has cocked it up. Maybe it’s time to retire gracefully (as if humans would…) and let another species become dominant in a few million years.

Climate change could feed dozens of disaster or sci-fi movies, and already there have been a few. But imagine the simple scenario where sea level has risen 30m (a figure I read somewhere). Has anyone yet taken a map, or the modern equivalent, and redesigned that new world? Has anyone yet agreed to abandon places such as London and New York and make plans to relocate cities above the 50m contour? Will people be prepared to accept that we will need to write off millions of the population in order that the dominant, or better-located, may try to survive? Can anyone imagine the wars that will be fought to gain and keep preferred territory? Are religious extremists likely to become dominant powers? Will anyone remember Kenny Brophy’s ‘last crop mark’?

And will there be any crop marks? What changes may any change in climate bring to the aerial world? For a start, if temperatures rise we may need to design aircraft and engines that can operate in thinner air. I realise that aircraft are not quite the same as paramotors, but one August in Armenia we were unable to fly because the 40° temperature had made the air too thin for the wing to take one person much higher than 10m above ground level. Admittedly our ground level was 1500m – but this may be a sign of things to come. And crop marks? They may migrate north leaving the UK and temperate Europe with a season of a few days. Or maybe we’ll begin to find a whole new range of past features. If, that is, there is any money for anything as frivolous as archaeology in a dying world..?

But enough of this musing of doom and destruction. Maybe we will save mankind by changing a few light bulbs… I really don’t care.
This issue
Apologies for the lateness of its delivery which was due to a number of factors of which the most relevant was that I had received only one contribution by the middle of February. Help was offered by Dave Cowley (to whom many thanks) who, in between work and editing Landscapes through the lens, found time to prepare a picture essay about his flights over Orkney in 2009. At the AARG committee meeting we wondered if this reluctance to contribute may be because we have carried several fairly heavyweight papers in recent issues and this had perhaps changed the newsletter intent of each issue? AARGnews is a newsletter, so please send anything of interest – unless you’re happy to receive thin issues.

Photo offerings

There was a Remote Sensing meeting in India just before AARG last year to which I couldn’t go because I’d just bought a new printer. Dave Cowley kindly submitted two photos from that meeting, one of which shows our Eminent Chairman and can accompany the Chairman’s Piece and the other includes Dominic Powlesland (the hairier of the pair), our most recent Honorary Member.
Chairman’s Piece: Human vs non-human?

Włodek Rączkowski

Aerial photographs, landscapes, humans?

Few people today question the fact that aerial photographs are an essential tool in the study of past landscapes. Ever since the time of O. G. S. Crawford they have served as the basis for reflection on the landscape (Fox 1932). Landscape has been an important subject of archaeological research particularly since the 1970s (Aston and Rowley 1974). This was connected with the development of archaeology (processual archaeology) and also discourse with other disciplines (geography, sociology, anthropology, history).

Robin Glasscock formulated the opinion: “[…] it has been observed that aerial photographs tend to dehumanise the landscape; big buildings rather than small people show up from a great height. Thus, an aerial photograph of the ruins of an abbey […] may be of considerable interest for what it shows of the ground plan, surviving buildings and earthworks but it tells us very little about Christianity, the monastic life, or the date of the foundation” (1972: 9). It is not surprising as one of the criticisms of processual archaeology (as well as culture-historical archaeology earlier) which was voiced in the 1980s was the focus on the “elimination” of human beings as a subject to be researched (Shanks and Tilley 1987). The processes, the mechanisms explaining cultural changes were more important and humans as individuals were relegated to the role of a small cog of little significance in universal cultural systems. The lack of the presence of humans concerned both the approach to landscape archaeology and aerial photographs. So therefore the issue of humans and aerial photographs arises. Do aerial photographs really “dehumanise the landscape”? As a result, do the attempts to introduce humans into the past landscapes proposed by postprocessual archaeology mean that aerial photographs (aerial archaeology) are useless as a totalising landscape (Tilley 1994)? Perhaps we should pause and consider the role of aerial photographs, or rather more broadly, aerial archaeology, today in the context of contemporary discourse in archaeology?

Cathy Stoertz, in her paper US7GR LOC 349 3041: one Saturday afternoon on the Home Front presented at the AARG Annual Meeting in Certosa di Pontignano, answers this question to some extent. An aerial photograph became the foundation for the creation of an image of one day (or even one afternoon) in an English village. The result was an excellent example of microhistory told through aerial photographs. The paradox is that this history unequivocally concerns people – inhabitants and soldiers – even though they are not present in the photograph. Cathy presented an astute interpretation of an aerial photograph, at the base of which there was a question about people. In this way she showed us that aerial archaeology can, in its interpretations, go beyond the standard interpretation expected today of “archaeological features” or “past landscapes” understood as the sum of mapped natural physical or cultural elements. Of course, this interpretation demanded other sources of information be used but this does not change the essence – aerial photographs can add to the humanisation of historical (archaeological) description, but we must want to perceive humans. I think that in this paper Cathy came close to the concept of landscape as formulated by Tim Ingold (1993).

1 wlodekra@amu.edu.pl
For me, this paper was “breathtaking”, it opened a whole new way of thinking, of writing about the past based on aerial photographs. Right at the start though questions arose – why was such a paper written now? Could it have come out 10 or 15 years ago? Of course I may be wrong (fortunately no one will check) but I believe that the changes which took place in aerial archaeology over the last few years created the conditions for such a story to appear. We must look at this from a historical perspective.

Historical perspectives – can we humanise aerial archaeology?
Changes in theoretical thought in archaeology gradually led to certain changes in aerial archaeology. The basic model of aerial archaeology still used today, first shaped by O. G. S. Crawford, was created in the 1960s and ‘70s. It was then that aerial photographs were of particular interest to institutions concerned with the protection and management of archaeological heritage. The inspirations of processual archaeology were not particularly reflected in this model (Rączkowski 2001). So at the forefront of new theoretical discussion in archaeology from the 1980s and ‘90s aerial archaeology was dominated by an objectified, cultural-historical and partly processual approach to the world. Glasscock’s opinion that aerial photographs “dehumanise the landscape” is of no surprise. Do we still think this of aerial photographs and aerial archaeology today?

After years of debate in archaeology brought on by the criticism of processual archaeology, the symptoms (of this discussion) also appeared in aerial archaeology. They gradually encompassed different aspects of aerial archaeology. Many of these were not earlier subjects of reflection. Have humans, as a result, appeared in aerial archaeology?

I also suggest looking at this problem on three main planes: understanding the nature of the aerial photograph, working practices with aerial photographs and the past (including past landscapes) as discovered through them. When discussing aerial photograph working practices I include aerial survey, as well as air photo interpretation. Of course, this is not an exhaustive list of the aspects regarding work with photographs.

So what then is the photograph? It is widely understood as a representation of the world. A photograph shows, in a real way, that which existed in front of the lens. There is no doubt that when we look at a photograph of a friend standing in front of the Eiffel Tower that they were really there. Such treatment of the photograph is the result of the historical context of photography as a cultural phenomenon. This was in the mid 19th century, when the world of science was dominated by empiricism, and photography documented the world as it was (unlike in painting). Such thought is well reflected in the statements of many famous photographers of the 20th century:

“Photography is the only ‘language’ understood in all parts of the world, and bridging all nations and cultures, it links the family of man. Independent of political influence – where people are free – it reflects truthfully life and events, allows us to share in the hopes and despair of others, and illuminates political and social conditions. We become the eye-witnesses of the humanity and inhumanity of mankind” (Helmut Gernsheim 1913–1995) (Busselle 1980: 199).

“The camera has offered us amazing possibilities, which we are only just beginning to exploit. The visual image has been expanded and even the modern lens is no longer tied to the narrow limits of our eye; no manual means of representation (pencil, brush, etc.,) is capable of arresting fragments of the world seen like this” (László Moholy-Nagy 1895–1946) (Moholy-Nagy 1925).
This realism in photography implied its neutrality, the cultural context of photography did not influence the image recorded on the plate. A similar situation occurred in language. Language was thought of as neutral, allowing the world to be recorded as it really was. Only the revolution in linguistics (F. de Saussure) and philosophy (J. F. Lyotard) led to changes in the way contemporary cultural phenomena, including photography, were viewed. Roland Barthes was the philosopher who focused very closely on the cultural context of photography. In his concept, photography is entangled in a cultural game, and this means that both the subject of the photograph and the way in which it is read depends on the photographer and the viewer of the photograph. The neutrality of photography and the language used to describe it were questioned. “Suddenly” the creator and the users of photography were in a “different world”. A “human being” had finally appeared in the process of taking photographs and their interpretation as Operator and Spectator (Barthes 1996).

Aerial archaeologists only really started to discuss this issue at the start of the 21st century. It was particularly highlighted in the publication From the Air: Understanding Aerial Archaeology (Brophy and Cowley 2005). The result was a change not only in the cognitive status of aerial photographs (Rączkowski 2001), but also the appearance of humans as photographers (eg. influence on the decisions involved in aerial survey – Cowley 2002; Wilson 2005) and interpreters both during aerial survey (Rączkowski 2002), and photo-reading (Palmer 2005).

As result of this direction in the development of thought, we are starting to consider more the various subjective conditions which have an important influence on the way photographs are taken and then used. Most certainly humans have appeared in aerial archaeology discourse. However, closer analysis of our discussion shows that actually we are only concerned with ourselves, the past has been pushed to one side in this discussion. Perhaps this is not the most precise formulation. The past, especially landscape, is always the subject of our interest and we are aware of the influence of our research context on the result, on the image of the past (Brophy 2007). But in this research of the past we are still analysing archaeological features, structures, their spatial relations, chronology, typology, draw maps, etc. Human beings, yet again, somehow disappear. We are still unable to uncover humans in the landscape – or we never ask the right questions, or we do not have a suitable method.

Will Cathy’s paper breakthrough the current barrier in this matter? Will it be the impulse to undertake projects in which humans are the focal point? Will there be more such proposals at the AARG Annual Meeting in Bucharest?

**Technology and humans?**

There is one more field in which it is difficult to see human beings. For sure, technology was created by humans. But to what extent do we consider its involvement in cultural contexts? We view technology as something very useful, certain, objective. The usefulness of technology means that we treat it as “supplier of data” which is not open for discussion (I do not mean the interpretation of the data). This data is objective and presents the world as it is (objectively).

Aerial archaeology found technology fascinating from the very start. Airplanes, balloons, kites, just as cameras, are technological products. Nothing strange therefore, in the fact that they had, and indeed have, a place in aerial archaeology discussions. Nowadays we probably
speak less of aeroplanes and balloons. In their place we have multi- and hyper-spectral sensors, LiDAR, software etc. I sometimes have the feeling that these discussions are totally dehumanised. Is it really so that technology exists beyond the human world? Perhaps the extent to which the cultural context influences the development of technology, its place in the contemporary world is worth considering. How can it be that technology conceals the world from us, imposes certain patterns on the way we act, think?

Thus there comes about a challenge – “uncover the human hidden by LiDAR!” Of course this is a certain metaphor, but for me, the human aspect is missing from this “technological” discourse. Perhaps someone will undertake this challenge in Bucharest? The invitation is open!

A dream
My dream is that human beings will be centre of discussion in aerial archaeology. We will no longer be occupied with typology, chronology, technology, geomorphologic forms, nor even cropmarks, but we will speak of people in the past and about ourselves. We will stop pretending that scientism will provide a full understanding of the world, past landscapes will be filled with people (not only their products), and behind the technology we will see a human face. For is not “gossiping” about people more interesting than reading the instructions on how to use the GPS?

References
AARG 2010 Bucharest
16 - 18 September 2010

Organised by the
Institute for Cultural Memory (CIMEC)
and the Aerial Archaeology Research Group

** Proposals for sessions, papers and posters are invited**

16 – 17 September: Conference Papers

18 September: Field Trip
Neolithic sites south of Bucharest, towards the Danube

Closing date for proposals of papers, posters and sessions is 31 May 2010

Conference Organising Committee
Professor Dr hab. Włodek Rączkowski (AARG, University of Poznań)
Irina Oberländer-Tarnoveanu (CIMEC), Dave Cowley (AARG, RCAHMS)
Carmen Bem (CIMEC), Lidka Žuk (AARG, University of Poznań)

Address for conference correspondence:
Dave Cowley, RCAHMS, 16 Bernard Terrace, Edinburgh, EH8 9NX, Scotland
Email dave.cowley@rcahms.gov.uk

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STUDENT/YOUNG RESEARCHERS BURSARIES FOR AARG 2010
These are to support bona fide students and young researchers who are interested in aerial archaeology and wish to attend the conference. Applications to Dave Cowley at the above address, by letter or email. There is no formal application form but please provide the following information:
Your interests in archaeology and aerial archaeology; place of study; the name and contact details of a supervisor or employer who can provide a reference; an estimate of travel costs to attend.
Closing date for applications is 31 May 2010


Aerial Archaeology Research Group website:  http://aarg.univie.ac.at/

Pre-conference workshop: 15 September
Remote-sensing mapping programmes in archaeology: planning, organisation, results
ArchaeoLandscapes Europe

A new European project for aerial archaeology, remote sensing and landscape conservation

Chris Musson, Development Officer, AARG

Readers of AARGnews will be pleased to learn that a new round of European funding has been secured for the promotion of aerial archaeology on a European scale. The project will be led by the Roman-Germanic Commission of the German Archaeological Institute, in Frankfurt, and will involve 33 other organizations (universities, museums, official bodies and research institutes) from almost every part of Europe. The project will last for five years from autumn 2010 and will involve a total expenditure of 5 million euros, half of it contributed by the partners themselves and the other half by the Culture 2007-2013 Programme of the European Union.

This opens up a further phase of European cooperation and builds on initiatives set in train by Otto Braasch, Bob Bewley and AARG in the 1990s, and later on the success of two Culture 2000 project in the present decade (http://muzarp.poznan.pl/EuLandscapes/). There is the funding and commitments here to build a genuinely pan-European network of expertise and cooperation which will be self-sustaining in the longer term, encouraging and facilitating the application of aerial survey and remote sensing in archaeology, landscape studies and heritage conservation. Educational initiatives, and communication with the general public, the younger generation and potentially influential politicians and public officials will form key elements of the project.

The ArchaeoLandscapes project was one of only ten approved, across the whole sphere of European cultural cooperation, in the 2009 round of applications within Strand 1.1 of the Culture 2007-2013 Programme. The following pages are a slightly edited version of the application submitted in October 2009 after frantic final preparations by the project partners, the Roman-Germanic Commission and the project consultants Culture Lab in Brussels.

Now the real work can begin!

The aim of the project

The Aim of the project 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 Project will seek to achieve this through eight key Objectives or Actions:

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

2. By using 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. By promoting the pan-European exchange of people, skills and understanding through meetings, workshops, exchange visits, placements and opportunities for specialist training and employment.
4. By 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. By 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. By providing support for aerial survey, remote sensing and landscape exploration in countries relatively new to their use, especially in northern, eastern and southern Europe.

7. By further 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. By providing technical guidance and advice on best practice in aerial survey, remote sensing and landscape studies, with a particular emphasis conservation and heritage management.

**Background**

In many parts of Europe aerial survey and air photography have helped to reveal more ‘new’ heritage sites than any other method of exploration. This long-established technique has now been joined by satellite imagery, airborne laser scanning and a variety of airborne and ground-based methods known jointly as ‘remote sensing’ (since they explore what is beneath the earth or ocean without disturbing its surface or damaging what lies below). These techniques can dramatically illustrate the character and importance of heritage sites and of the evolving landscapes within which they lie. Better public understanding and appreciation can in turn lead to greater enjoyment and caring, and ultimately to better conservation of heritage sites and landscapes for the enjoyment of future generations.

There are many parts of Europe, however, where remote-sensing techniques have yet to realize their full potential, and in some countries they have hardly been used at all. The aim of the ArchaeoLandscapes project is to address this imbalance and to promote the wider use of these strikingly successful techniques across Europe as a whole.

The genesis of the project lies in the mid-1990s, with two aerial archaeology training schools in Hungary and Poland, aimed principally at the recently ‘de-militarised’ countries of central and eastern Europe. Later, similar schools, along with workshops and other meetings, were held in Italy, Finland, Germany, Romania, Lithuania, Estonia and Poland through two Culture 2000 projects. These broadened the growing network of contacts and cooperation across Europe. The new project aims to bring this process to long-term sustainability.

It will do this by creating a self-supporting pan-European network to promote the exchange of personnel and skills, to raise public awareness, to facilitate activities, to improve specialist education, to draw on under-used archival sources and to publish advice on standards and techniques. A fundamental element will be public communication, conveying key messages to young and old, specialist and non-specialist alike. This ‘outreach’ work will be supported by targeted research and educational initiatives which over time will enhance mobility and the sharing of skills and job opportunities across Europe.

**Actions within the project**

**Action 1: Creation of the ArchaeoLandscapes Network.**

The key means of attaining long-term sustainability will be the formation of a pan-European network to be known as the *ArchaeoLandscapes Network (Europe)*. This cooperative partnership will secure funding from its member organizations and grant-giving bodies so as to support a small professional secretariat – a ‘nerve-centre’ that will provide expertise, advice and support for initiatives in the fields of landscape studies, heritage conservation and public education. The strength of the network will lie in its heterogeneous nature and its total coverage of Europe, linking a large number of well-established
bodies in education, research, conservation and public service. It will not rely on any individual institution for its existence and the secretariat may migrate around Europe over time.

**Action 2: Communicating with the public and with cultural resource managers.**

In many parts of Europe the last decade has seen a surge of interest in the past, not only in historical and archaeological sites but also in the cultural landscapes within which they achieve their full meaning and visual impact. The project will use both traditional and new techniques to foster this interest and to show how cultural landscapes and heritage sites can contribute to European, national, regional and local identity and ‘sense of place’. In addition to hard-copy publications and exhibitions there will be a particular emphasis on web-based output so as to involve a wider and younger audience and to engage with politicians, planners and cultural resource managers.

**Action 3: Promoting the exchange of skills, experience and job opportunities**

In a field with a relatively small number of professionals across Europe it is essential to share understanding, skills, experience and research results. The project’s approach will build on the success of the earlier Culture 2000 projects so as to construct an effective and economical programme of meetings, workshops and conferences on general or specific topics, sometimes carried through to traditional or web-based publication. There will also be meetings of specialist groups focusing on such topics as satellite imagery, airborne laser scanning, public communication or the use of geographical information systems such as GoogleEarth. Exchange visits and placements will also figure in the educational work-programme, along with an increased emphasis on on-the-job learning and specialist instruction in data-interpretation, methodology, instrumentation and communication techniques.

**Action 4: Enhancing the teaching of remote sensing and landscape studies**

There is an urgent need to improve the teaching of landscape studies and remote sensing and to increase opportunities for students, professionals and cultural resource managers to acquire specialist skills. The project will address this need by creating contacts, facilitating exchanges and prompting discussion between teachers and professionals working in these fields or wishing to apply these techniques in their research or conservation work. The improvement and broadening of course-content will be a priority, with the shared and compared experience of existing teachers and professionals being key contributing factors. There will be a particular concentration on establishing intensive courses across Europe and in creating web-based material for distance learning. A long-term objective will be the creation of a year-long European Masters degree involving work and study in at least three countries of Europe, thereby opening up possibilities of future employment outside the participants’ own native countries.

**Action 5: Securing the better exploitation of existing air-photo archives**

Europe has an immensely rich inheritance of aerial photographs containing as yet unrealised information about the dramatic landscape transformations of recent decades, along with previously undocumented (and therefore unprotected) archaeological sites and landscape features from the more distant past. The very existence of these archives is often hardly known in the broader heritage sphere and their potential for landscape and heritage work remains largely un-assessed. The project will create at least a preliminary guide to the existence and potential of these archives. A particularly rich international resource, from WWII onwards, lies in the millions of photographs recently transferred to the care of one of the project partners (the Royal Commission in Scotland). A key objective, therefore, will be to make this archive more accessible so that it can play an enhanced role in heritage research, documentation and conservation across Europe.

**Action 6: Supporting aerial survey, remote sensing and landscape exploration.** Support, both financial and technical, is needed for aerial and ground-based exploration in parts of Europe where the use of remote sensing does not yet constitute an everyday tool in the hands of archaeologists and landscape specialists, whether for research, conservation or public communication. The project will
provide this kind of support for colleagues in Iceland, Scandinavia, Holland and various countries of south-eastern and Mediterranean Europe.

**Action 7: Exploring the uses of laser, satellite and other forms of remote sensing**

The effective use of satellite imagery has long been a goal within archaeology and landscape studies and other forms of airborne imaging, including laser scanning (or ‘lidar’) have raised new possibilities in recent years. Lidar in particular has enabled precise digital models of the earth’s surface to be made at reasonable financial cost. Strikingly, this technique can also ‘see through the trees’ to reveal previously hidden cultural landscapes beneath. National and regional authorities across Europe have been adopting lidar as a key technique in their mapping and landscape modeling work and a rich fund of new data is now potentially available for landscape and archaeological studies. The project will promote experimentation and the sharing of skills between project partners who are using – or wish to use – these techniques for cultural purposes. Greater use of internet-based systems such as GoogleEarth will also be sought so that the general public can ‘fly through’ heritage landscapes previously inaccessible to them.

**Action 8: Providing technical guidance and advice on best practice.**

An effective way of maintaining and improving standards and performance is through the circulation of technical notes on best practice and on successful initiatives, wherever they might occur. Such notes help to build on experience gained in one institution, situation or country by making it available to those engaged with similar work or problems elsewhere. The project will compile and issue guidance and technical notes, mainly through the Internet, on such things as specialist teaching, aerial survey and the acquisition, post-processing, interpretation and ground-truthing of lidar, satellite and other forms of remote-sensing data for cultural and heritage purposes.

**Management, outcomes and sustainability**

In terms of applications for European cultural funding the project is unusual in involving a group of small, medium and large co-organisers and associated partners from virtually every country in Europe. The project’s eight key Objectives or Actions aim to provide a heterogeneous group of participants with the opportunity to undertake whatever aspects of the work seem relevant to their own particular needs, skills and financial resources.

To ensure efficient policy-making, management and monitoring of the project will be supervised by a committee of nine representatives drawn from different sizes of participating organizations. There will also be ‘special-interest’ groups dealing with each of the eight Actions, along with ‘task-and-deliver’ working parties for events such as major conferences or specialist training schools. There will be at least three plenary sessions of the whole partnership during the project’s five-year life.

The most tangible outcome will be the creation of a genuinely pan-European partnership, with clear objectives and long-term sustainability through its wide membership across Europe. Equally important will be the enhancement of cooperation between specialists across Europe, with improvements in training, skill-sharing, public communication, student mobility and potential employment. Important but previously under-exploited air-photo archives will be assessed and made more widely available. New technologies will be explored and publicised. The project will lead to improved public and professional awareness of the value of heritage landscapes and archaeological sites, and of their better conservation through the use of aerial and remote-sensing data in protective measures and planning processes.

As well as producing or preparing material for at least three books and a number of ‘popular’ booklets the project will create its own website to offer all sections of society a range of relevant information, news and educational material. The web-based output will be tailored to a variety of target groups, from the generally interested public to the younger ‘computerate’ generation, as well as to specialists.
seeking technical advice and students wanting to make their way into landscape and conservation studies through distance learning.

The central aim of the project will be to secure closer and more varied cooperation across Europe in the fields of landscape conservation, aerial survey and remote sensing. It will do this through the formation and development of a genuinely pan-European network, self-sustaining in the longer term through subventions from its members and through grants from a variety of other sources. The success of cooperative efforts by many of the project members over the past decade has shown that there is a thirst for this kind of collective approach to problems and solutions across Europe. The enthusiasm and teamwork shown in these earlier initiatives demonstrate beyond doubt that more can be achieved through cooperation and collective effort than through uncoordinated work in individual countries or institutions.

Organisations and countries taking part in the Project

The Project will bring together the following 34 organisations from 24 different European countries, plus the internationally-based Aerial Archaeology Research Group (AARG). It is hoped that other organisations will join as Associated Partners during the lifetime of the project, particularly for instance from France, Portugal, Spain and other countries of south-eatern Europe.

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

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: The 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 Archaeology), 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 Universities of Exeter and 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.
Czech Republic: The University of West Bohemia, Pilsen.
Estonia: The Estonian Heritage Society.
Finland: The Helsinki University of Technology.
International: The Aerial Archaeology Research Group (AARG).
Latvia: The Latvian Academy of Sciences.
Spain: The University of Granada.
The DART project: Developing the roadmap for archaeological remote sensing in the 21st century

Anthony Beck¹

Aerial and geophysical survey has substantially increased our understanding of the nature and distribution of archaeology. However, there is variable understanding of the physical, chemical, biological and environmental factors which produce the archaeological contrasts that are detected by the sensor technologies. These factors vary geographically, seasonally and throughout the day, meaning that the ability to detect features changes over time and space.

Detection of Archaeological Residues using remote sensing Techniques (DART) is a three year, £815,000 Science and Heritage funded initiative led by the School of Computing at the University of Leeds. The Science and Heritage programme is funded jointly by the Arts and Humanities Research Council (AHRC: www.ahrc.ac.uk) and the Engineering and Physical Sciences Research Council (EPSRC: www.epsrc.ac.uk). To examine the complex problem of heritage detection DART has attracted a consortium consisting of 25 key heritage and industry organisations and academic consultants and researchers from the areas of computer vision, geophysics, remote sensing, knowledge engineering and soil science.

Enhanced knowledge of archaeological residues is important for the long-term curation and understanding of a diminishing heritage. There are certain geologies and soils which can complicate the collection and interpretation of heritage remote sensing data. In some of these 'difficult' areas traditional detection techniques have been unresponsive. DART will develop a deeper understanding of the contrast factors and detection dynamics within ‘difficult’ areas. This will allow the identification of appropriate sensors and conditions for feature detection. The successful detection of features in ‘difficult’ areas will provide a more complete understanding of the heritage resource which will impact on research, management and development control.

Detection techniques rely on the ability of a sensor to measure the contrast between an archaeological residue and its immediate surroundings or matrix. Detection is influenced by many factors - changes in precipitation, temperature, crop stress/type, soil type and structure and land management techniques. DART will increase the foundational knowledge about the remote sensing of sub-surface archaeological remains. This research will increase the understanding of how archaeological residues can be detected and the impact that physical, chemical, biological and environmental processes have on the detection process.

The programme of research has been designed specifically to identify physical, chemical and biological contrast factors that may allow the detection of archaeological residues (both directly and by proxy) using sensing devices. To determine contrast factors samples and measurements will be taken on and around different sub-surface archaeological features at different times of the day and year to ensure that a representative range of conditions is

¹ A.R.Beck@leeds.ac.uk (School of Computing, University of Leeds, LS2 9JT, UK)
covered. Field measurements will include geophysical and hyperspectral surveys, thermal profiling, soil moisture and spectral reflectance. Laboratory analysis of samples will include geochemistry and particle size. Models will be developed that translate these physical values into spectral, magnetic and electrical measures in order to determine detection parameters. This will allow DART to address the following research issues:

- What are the factors that produce archaeological contrasts?
- How do these contrast processes vary over space and time?
- What processes cause these variations?
- How can we best detect these contrasts (sensors and conditions)?

The key will be to understand the dynamic interaction between soils, vegetation and archaeological residues and how these affect detection with sensing devices. This requires understanding how the archaeology differs from, and dynamically interacts with, the localised soils and vegetation and how these differences can be detected.

DART is committed to open science principles and aims to act as an exemplar for how data, tools, and analysis can be made available to the wider academic, heritage and general community. Data, software, and services developed throughout the project will be made available for re-use with appropriate open licences. Freely accessible methods will be preferred. To ensure preservation in the longer term all items will also be archived on secondary public repositories and in host institutional repositories where available.

Sensors and sensing technologies will continue to develop. DART will provide tools with which to evaluate the heritage potential of new sensors, and to model the conditions under which they should be deployed. This will allow heritage managers to understand the potential impact of new sensors and to deploy them appropriately. Unmanned Aerial Vehicles will provide platforms to efficiently and effectively deploy sensors with bespoke flight patterns. This has the potential to generate a phenomenal amount of data: far too much to be evaluated by manual analysis. DART aims to develop models which can be used to rate the archaeological potential of a dataset collected by a third party, thereby increasing the efficiency of analysis and transcription. DART will provide foundational models, tools and systems intended to take archaeological remote sensing science into the 21st century.

As described in the approaches to open science, DART will attempt to provide open access versions of all its material. This article is available on-line at http://www.scribd.com/doc/27759433.

The project web-site is currently under construction: we received notification of the award on the 1st March and this article was submitted to Rog on the 3rd! For further information on other articles and project developments please follow DART_Project on twitter: www.twitter.com/DART_Project.
‘Gone with the Wind’
Aerial Photography of Bâtiment Pi, Malia, Crete (Bronze Age)*

Christophe Gaston¹, Thibaut Gomrée², Maia Pomadère³

The archaeological site of Malia is located on the north shore of Crete, about 30 km east of the island’s modern capital, Heraklion (fig.1). During the Bronze Age, also known as the Minoan era (about 3000-1400 B.C.), the area progressively developed to become one of the principal palatial centers of the island. The site has been excavated since 1915, revealing a Minoan palace and a surrounding city.

In 2005, a new research program⁵ started in a densely inhabited area of the urban center. The excavation revealed a new building, named bâtiment Pi (fig. 2). Since the beginning of the excavation, archaeologists have had the opportunity to work with aerial photographer Christophe Gaston. This article presents both the methodology and the technical equipment used by the photographer on this particular excavation, and the application of this material by archaeologists.

IN THE AIR
It is very important that the photographer undertaking the aerial campaign, in any archaeological site, has a good knowledge of the subject to be photographed. Christophe Gaston has been involved in the Malia excavation since 2003, so he has become familiar with

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* We would like to thank Dave Cowley for his interest in this project, Lina and Eleni Manousogiannaki for their help with the English translation, and Jean-Noël Anslijn for the conception of the map presented in fig. 1.

¹ Aerial photographer, http://www.truellevolante.fr/, christong@free.fr.
² PhD Student, University of Lyon 2 / IRAA, thibaut.gomree@mom.fr.
³ Maître de conférences, University of Picardie Jules Vernes, maia.pomadere@u-picardie.fr.
⁵ Directed by I. Bradfer-Burdet and M. Pomadère (French School at Athens - EfA) in 2005 and, since 2006, directed by M. Pomadère. The excavation reports are annually published in the Bulletin de Correspondance Hellénique (BCH).
the site and its demands and he has already met the expectations of the archaeologists and the architect with whom he has been working.

Fig. 2: aerial photograph of bâtiment Pi at Malia (© C. Gaston)

**Light**

In aerial photography, several parameters should be taken under consideration in order to obtain good quality photos. Firstly, one should know what the images are going to be used for, in order to determine the most appropriate technique and timing for the shooting. Depending on the lighting, the photos will show different things. An early day light or the light at the end of the day will illustrate the architectural remains emphasizing the shadows of the features. Furthermore, images taken at these particular times of the day are warmer and consequently aesthetically more appealing. The light during the middle of the day is vertical and it eliminates shadows. Thus the images obtained can be used as a background for the architectural drawing. On the other hand the vertical light yields a rather flat image without any relief. Depending on the type of photo needed, camera adjustments and the choice of day and hour are particularly important. Obviously, meteorological conditions will largely influence the camera adjustments to be made.

**Material**

It was necessary that the equipment used for photographing in Crete should be, above all, light and easy to put together. Kites should be able to lift the rig in which the camera sits, therefore lightness is very important. The pole and its accessories should also be as light as possible, in order to prevent the handler from getting tired. In Crete the meteorological conditions, such as light and wind, could change rapidly. Thus it would be wise to plan the
photograph shoot in advance and prepare the field for it. Taking into consideration the reasons above, the digital compact cameras Fujifilm E900 and Canon G9 were chosen.

**Rig**
The rig is made of aluminium, because it is easy to obtain, work and, more importantly, to repair. The size of the rig was adjusted to the dimensions of the cameras. Most of the parts are standard stock components, so they are easy to find and replace. It is very important to keep a sufficient stock of material, so as to be able to independently repair and maintain the apparatus.

The rig allows the camera to turn 360° on a vertical and 60° on a horizontal axis, obtaining the most suitable depiction of the subject. A radio control connected to a video receiver and a motorized remote control allow us to see, in real time, the image that will be captured by the camera. We are also able to know the available space in the memory card, to check the condition of the batteries and ultimately to control the various adjustments on the image.

**Kites**
The kites used are single line kites, capable of lifting quite heavy objects while maintaining stability. Three kites are used, depending on different conditions of flying: a Maxidopero in case the wind is low or very low and a Rokkaku or a Calomil for strong wind. These types of kites allow the photographer to work in a wind rating from 1 to 6 on the Beaufort scale.

**Pole**
The technique of taking pictures by pole involves the adjustment of the rig to the far end of a pole, measuring 7-8 meters. This method renders photos vertical or oblique. Setting up takes only a few minutes and photos can easily be taken at different times of the day, even if the site is not empty. In contrast to the kite process, weather conditions obviously play a minor role in this kind of photo-shooting.

**Work in progress**
The whole procedure of the photo shoot is conducted by 2 people. One holds the pole and the kite while the other controls the rig and takes the photos. A third person is often required in the kite process, in order to secure the perimeter of the site and help the kite holder. Generally the archaeologist oversees the use of the radio controller and the video receiver, because he/she is the most suitable person to choose the views of interest.

**After the photo-shoot**
Computer treatment of the photos is possible and most of the times is needed, depending on the further use of the images. The photos taken by pole and even by kite in Malia are adjusted in order to be used in drawings and architectural plans. Some preparation of the site is needed, in order to be able to treat the photos taken. For example, the placing of grids, big enough to be visible in the photos, is essential. These grids are placed in different points and their positions are accurately surveyed. The site at Malia is relatively flat and these grids are placed close to an altitude point, the Z axis. The elements photographed are adjusted in two dimensions the X and the Y axis with as little deformation as possible and with great precision, the slightest error being of some millimeters. As we have already pointed out, when the picture is to be used for a drawing, it should present very few shadows in order to reflect the exact limits of the designed object. The post treatment is the same for all photos (fig. 3).
The first step is to correct the lens deformation (fig. 4) and for that, there are several lens correction programs. The one used in Malia is *Lens-Rectifier*. After that the adjustments are made using *Photoplan* (fig. 5). Finally, any other aesthetical adjustment is possible using any photo treatment program one wishes to.

Fig. 3: aerial photograph before treatment (© C. Gaston)

Fig. 4: aerial photograph after correction of lens deformation (© C. Gaston)
ON THE GROUND
Aerial photos taken from 2005 to 2008 have resulted in good documentation of the area, which archaeologists have used in several ways.

Documentary Archives
It is by far the most obvious use. The photos taken on a regular basis by kite and by pole are part of the photographic corpus of the excavation. They allow the recording of the evolution of the site, in all or of a specific sector, offering a global view of the excavated area (fig. 6). They become, in that way, a documentary source which actually complements the photographic documentation made on the ground.

Building Analysis
These aerial photos, after being rectified, enable observations about the orientation and the accordance of walls, possibly overlooked in an on-ground examination or a traditional photo. Having an expanded and vertical vision of the excavated area, archaeologists can have a global view and hypothesize about a possible connection of different and distant walls. The photographic documents are also used for closer observation and identification of the area and also to determine new places for further investigation and new trenches.

Aerial photography has also allowed the identification of emerged structures in the nearby beach, surrounding the site. Those ruins had been identified on the ground, but their length and orientation would have been very difficult to establish without the help of aerial photography. The prompt recording of these ruins by aerial photography was all the more important because they were visible only for a few days. After that they became covered by sand.
Fig. 6: example of a photograph taken from our pole (© C. Gaston)

Fig. 7: superimposition of architectural plan on the rectified aerial photo (© C. Gaston / G. Hilbert).
Aerial photographs and architectural plan
The use of rectified aerial photographs gives the architect the opportunity to superimpose his general or partial plans or just simply to verify the alignment of the plan, checking its accuracy (fig. 7). For this reason the chosen topography points, taken by the theodolite, are marked in color thus making them visible in the aerial photos. Once printed, the photos can serve as a background plan under the layer used for the architectural plan. In that way, the architect has a chance to correct any mistakes made on the site. Thus, aerial photographs provide a useful tool for obtaining an exact graphic document.

Day to day aerial photography on the working site
The architect is not the only one who can profit by aerial documentation.

Archaeologists can also profit by this type of documentation in two ways:
- Photos taken by kite allow archaeologists to obtain a general layout of an excavated building which is much more precise and detailed than a simple visual drawing. Archaeologists can immediately use rectified photos as scaled plans. These assist in following the day to day work on the site, firstly in the daily updating of the excavation diary, secondly by documenting the numbering given to excavated spaces that are discovered and thirdly by recording the progress of stratigraphical units under excavation.
- The photographs taken by pole are probably the most useful tool during the excavation. The immediate results provide us with a vertical view of a specific sector at any given moment. In this way we can avoid placing the sector in inactivity, while the graphical plans are drawn. Thus a significant amount of time is gained and the archaeologists can continue to concentrate on the excavation itself, instead of leaving it in order to make drawings. And this to sum up, is the greatest advantage to using aerial photography: the graphical work on the photos can actually take place without any presence on the site. For example, the photos taken by pole allow the immediate recording of a feature before its dismantling (fig. 8). The procedures are rapid, the
necessary time of the photographic intervention on the field was reduced to 15 minutes, as opposed to a much greater amount of time that would be required to draw traditional plans. However, it would be cautious to reserve such procedures to simple features, for which we can be sure that all the data will be visible on the computer and we will not be obliged to make any verification on the site.

**Didactical use of aerial photographs**

A last point that we wish to make concerns the use of aerial photographs as a didactical tool, in the sense that it can enrich the material presented in complementary activities of the excavation such as conferences, public presentations, publications etc.

It is always interesting and useful to actually present the excavated buildings in their natural environment rather than on a simple graphical plan. In this way we can present a global view of the site to the public, complementary to the architectural plan. The photographic representation helps the spectator understand the course of the whole excavating procedure by showing the sequence of work and the actual size and height of architectural features, something that is not always evident on a traditional architectural drawing (fig. 2, 6).

**CONCLUSION**

The presence of an aerial photographer on an archaeological site represents an opportunity for the archaeologist to obtain, in a quick way, purposely-placed aerial views that can be used in various ways to provide an indispensable documentation resource and a complement to traditional architectural drawings. In the case of Malia, the particularity of the site, the climate and the light require a well informed choice of material, including the most appropriate photographing technique. The every day collaboration between archaeologists and the aerial photographer can prove fruitful in the acquisition of complementary data during the archaeological exploration.
Ultima Thule – recent aerial survey of Orkney, Scotland

Dave Cowley

The Orkney Islands lie off the northern tip of mainland Scotland (Google Earth location), and while in no way should this beautiful archipelago (Figure 1) be regarded as beyond the boundaries of the known world, it has not been subject to sustained archaeological aerial survey for a number of reasons. Firstly, there has been a perception that Orkney is too far north and too damp for plough-levelled sites to be revealed through cropmarking. Secondly, has been the sustained emphasis on ‘more productive’ areas in southern and eastern Scotland. Thirdly, until relatively recently much archaeological work has concentrated on the remarkable suites of Neolithic and Iron Age monuments, with a focus on excavation and little prospective fieldwork of any kind. Finally, there is a clear Edinburgh-based bias in RCAHMS’ flying, which we have deliberately been addressing over the last five years, working in the north and west to redress this historical imbalance and so to create a more even aerial perspective on the country. The issues of gaps in knowledge and applications of prospection were addressed in The Heart of Neolithic Europe World Heritage Site Research Agenda (Downes et al. 2005), where the need for sustained aerial survey is clearly stated (Brophy 2005, 104-5).

Figure 1: Contrasting landscapes, from fertile lowland set to arable and pasture, and heather-clad uplands on Hoy in the distance. The sea is never far away in a landscape that has witnessed dramatic sea-level rise and consequent inundation, including the two bodies of water in the foreground. (DP 687474 - © Crown Copyright: RCAHMS)

1 Dave.Cowley@rcahms.gov.uk
In presenting preliminary results from aerial reconnaissance during 2009, this paper illustrates some significant contributions to the archaeology of Orkney, turning some preconceptions on their head and opening up entirely new avenues for research. All the more so, as there are immediate linkages with ongoing research programmes. The Orkney College of the University of the Highlands and Islands has an active fieldwork programme that has immediately begun to follow up some results, while *The Rising Tide* project, examining the submerged landscapes of Orkney, has also followed up targets identified from the air in shallow water. Aerial survey in 2009 was undertaken in two periods, initially in May and then at the beginning of August.

**Recording unknown landscapes: plough levelled sites**

Weather patterns in Scotland are always variable, but the last few years have produced some unusual conditions. For example, in 2008 while the cropmark honey pots of the east coast were largely wiped out by a wet summer, large parts of the west coast were remarkably dry producing significant amounts of previously unrecorded material in the south-west (Cowley 2008, 7-9). These types of events have occurred in the past (e.g. 1992, Cowley and Brophy 2001), but the lure of guaranteed high returns in traditional cropmark areas has almost certainly limited the extent to which these windows of opportunity have been exploited. A recognition of the need to extend the boundaries of aerial survey has prompted RCAHMS to attach a higher priority to exploiting such opportunities, at the expense of investing survey time into well-explored areas that have benefited from well over 30 years of repeated survey (Cowley and Dickson 2007, 50-4).

And 2009 presented another opportunity to explore an unknown area, as Orkney enjoyed a warm and dry summer, while much of the rest of the country had a poor season. Soil moisture deficit figures for Orkney climbed steadily during July and on the 5th and 6th of August we (DC, Kevin Macleod and pilot Ronnie Cowan) made the three hour flight from Edinburgh to Kirkwall. Almost immediately cropmarking was visible in many of the arable fields and prospection over the next 24 hours produced a respectable haul of previously unknown sites. None are spectacular for their registration or detail, and in many cropmark rich areas would be regarded as an indifferent rag-bag of sites. However, it is the implications of these results that are important. For many years the only plough-levelled site to have been revealed by cropmarking is a large enclosure at Overbigging discovered by J K St Joseph of Cambridge University in 1965. Routinely, buried sites turn up as a tractor dislodges stonework, but to date there has been no success exploring this buried resource extensively and systematically from the air. The string of discoveries in 2009, ranging from ditched barrows to large enclosures, amply illustrate the future potential. Some types of sites recorded in his way are recognisable by comparison to upstanding remains (Figure 2), but more importantly they include large oval enclosures for which analogies are difficult to find (Figure 3). Even in well known areas previously unknown sites have turned up. The Ring of Bookan (‘A’, Figure 4), for example, is well known and lies within *The Heart of Neolithic Europe World Heritage Site*. Its classification is debated, but it may be a henge with internal features. The mound above it, just across the public road was not known and since it was recorded from the air has been targeted by the Orkney College Geophysics Unit, using both gradiometry and resistance survey. These surveys (Figure 4 – bottom) enhance the information about the mound, suggesting that it is probably another major component of the Neolithic landscape, and also record extensive remains of ridge and furrow cultivation, only visible in small areas on the aerial photograph. In this case and in many others, survey over two summer days has opened
Figure 2: New discoveries during August 2009 include site types that are familiar in the known repertoire of monuments. The scatter of ring ditches at Car Ness on Mainland Orkney are probably the ditches around Bronze Age barrows for which analogies can be found in excavated cemeteries. (DP 068095 - © Crown Copyright: RCAHMS)

Figure 3: This large oval enclosure at Marwick on the northwest Mainland Orkney does not have equivalents in the known monuments and may represent a new type of site. (DP 066519 - © Crown Copyright: RCAHMS)
Figure 4: The Ring of Bookan (A) comprises a broad-flat bottomed ditch and may be the remains of a henge with internal stone settings. The mound above it (circled) is a new discovery during 2009 and has been further investigated through geophysical survey, generating additional and complimentary information. (Top: DP 068803 - © Crown Copyright: RCAHMS; Bottom: Resistance survey, grid at 20m intervals - © Orkney College Geophysics Unit/ORCA)
up a whole new perspective on Orkney’s landscape, turning the orthodoxy that these islands were not a happy hunting ground for aerial reconnaissance on its head and setting up a new challenge for survey and recording in the future.

**Seeing beneath the waves**

This theme of opening up new avenues for recording is also highlighted by another aspect of the survey. Encouraged by the results from Aberdeen University’s *The Rising Tide* project (Dawson and Wickham-Jones 2009a, b, 2010), some time was spent looking for features under the aquamarine seas, both during August and during an earlier trip in May 2009. The seas around Orkney are dynamic and there are areas of intensive tidal scour, but also relatively still water and potentially stable sea bed. Studies of sea levels indicate that the land mass of the islands has halved in the last 6000 years, suggesting that there may be a high potential for submerged cultural landscapes to survive. And so, armed with a number of likely locations some targeted reconnaissance and photography was undertaken. The complex geology, patterns formed by underwater vegetation and recent activity along the coast (e.g. World War II and oil industry) have conspired to make the identification of submerged archaeological features complex. However, perseverance has been rewarded by some worthwhile returns, which require further exploration on the ground/in the water, but illustrate the potential for seeing through the crystal clear waters onto early prehistoric landscapes. For example, anomalies identified from the air in Mill Bay on Hoy, have been visited by *The Rising Tide* team who discovered that there was a layer of peat beneath the sands in the bay (Wickham-Jones pers. comm.). There is therefore undoubtedly a submerged landscape in this bay (Figure 5), and the anomalies recorded on the aerial photographs may include prehistoric monuments among the debris of vessels salvaged after World War I.

![Figure 5: A prehistoric landscape inundated by rising seas? – the features recorded below the water in Mill Bay on Hoy may include monuments from the Orkney’s distant past, submerged by rising sea levels. (DP 066524 - © Crown Copyright: RCAHMS)](image_url)
Exploring unimproved ground: reconnaissance across ‘upland’ Orkney

The complexity and monumentality of Orkney’s Neolithic and Iron Age sites (below) has understandably been a magnet to archaeologists for many years and there has been a sustained emphasis on exploring such monuments. Unspoken and implicit has been an assumption that the archaeology of Orkney was relatively well-known. However, the aerial reconnaissance described above and geophysical survey and excavation by Orkney College (e.g. Card 2010) has shown that this is not the case. In addition, prospective ground fieldwork by archaeologist James Moore and others in the Archaeology Department at Orkney College has lead to the discovery of relict prehistoric and later landscapes surviving in the unimproved, upland areas of Orkney. This potential was further highlighted during aerial reconnaissance of such areas in the late evening of May with the assistance of James in the aircraft (Figure 6). The low oblique lighting threw even subtle earthworks into high relief and photographic records of extensive head-dykes and other boundaries, cultivation remains and buildings have been created for future study. This collaboration with Orkney College has been very valuable, as the RCAHMS aerial survey also benefited from the onboard experience of other local archaeologists, Amanda Brend, Nick Card and Martin Carruthers, bringing much needed local knowledge to the survey process. Not only has the aerial photographic recording added considerably to what was already being explored on the ground, but it has also yielded a haul

Figure 6: A rare survival of the footings of a prehistoric round house (A) and field banks discovered through field survey by Orkney College on the unimproved ground of the west Mainland of Orkney. Hollow trackways and other boundaries of possibly medieval and post medieval date cut across the ridge. (DP 059810 - © Crown Copyright: RCAHMS)
of previously unrecorded earthwork sites. A particularly exciting find is a group of small possible square barrows of potentially early medieval date on the northeast of Hoy. When first spotted and photographed from the air these were assumed to be shieling huts related to summer pasturing. It was only on close inspection of the photographs (Figure 7) later that two of the structures were recognised as comprising a clearly square mound, bounded by shallow ditches broken by possible causeways at the corners – a type of square barrow mostly known in south-eastern Scotland and dating to the mid 1st millennium AD. These require ground investigation to clarify their nature, but by coincidence what may be a related type of monument was excavated during summer 2009 at South Roeberry, also on Hoy, by the Orkney Research Centre for Archaeology (ORCA – Nick Card pers. comm.). Their excavation has revealed a prehistoric round cairn that has been later modified to create a rectangular cairn of a type that are known from northern Scotland and date to the mid 1st millennium AD. Together the aerial survey and the excavation have the potential to open up an entirely new perspective on the burial practices of early medieval Orkney.

Figure 7: The cluster of small structures on the unimproved heather moorland in northern Hoy may be a so-far unique example of an early medieval barrow cemetery, including two square mounds bounded by interrupted ditches. (extract of DP 060149 - © Crown Copyright: RCAHMS)

Recording the known
The ancient monuments of Orkney are justifiably world famous and the importance of its Neolithic landscape is recognised through World Heritage site status. The Ring of Brodgar henge and stone circle, seen from above, or visited on the ground (Figures 8 and 9), are a powerful statement of this status, both locally and in a north-west European context. But Orkney is not a one-trick pony, and its Iron Age remains are another major strength, as the broch tower and cluster of buildings at the Broch of Gurness show (Figure 10). In both these
Figure 8: The Ring of Brodgar – henge, stone circle and tourists. The aerial perspective provides new ways of seeing familiar monuments as well as recording monument condition and land use change. (DP 060159 - © Crown Copyright: RCAHMS)

Figure 9: Monuments such as the Ring of Brodgar are a huge attraction for tourists to Orkney, fascinating human and canine visitors alike. (Photo: D Cowley)
cases, the aerial perspective provides an illustrative and interpretative tool, throwing fresh light onto monuments that are already well known.

To this can be added the importance of general views from the air in recording the varied landscapes of this island cluster, setting monuments in context and illustrating Orkney’s complex patterns of landuse and topography (e.g. Figure 1). And, since RCAHMS’ remit extends to all aspects of the built heritage, the aerial perspective is also brought to bear in recording urban areas (Figure 11) and other buildings.

Conclusions
Recent aerial survey in Orkney illustrates the successes of a flexible and interactive approach, combining expertise in a highly effective recording tool, with the potential to challenge established views, to stimulate further research and to break new ground. The systematic application of aerial survey to Orkney was well overdue, and the results from 2009 underline its utility as a technique. The view that Orkney is unsuitable for aerial survey cannot be sustained, and while northern Scotland presents many challenges to aerial work in a small single engine aircraft, not least highly variable weather patterns, there is no doubt that it has a significant role to play in revealing the unknown and providing new perspectives on the known.
Figure 11: Kirkwall’s fine cathedral was largely built during the 12th and 13th centuries and still dominates the town, whose medieval street plan survives intact. (DP 59174 - © Crown Copyright: RCAHMS)
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http://www.abdn.ac.uk/staffpages/uploads/arc007/RT Interim winter09_1.pdf
Information, adverts, etc

AARG Archives

As part of the commemoration of AARG’s forthcoming 30th birthday, the committee is creating a digital archive of past events and people. At the time of writing we have not seen what Vikki Fenner (an early secretary) has but know that we are missing programmes and lists of participants from the following annual meetings:

1987 ??
1988 ?? one of these was at Bristol
1992 Dublin
1993 Abergavenny
1996 Chester

If you have information about these could you please contact the Editor in the first instance, (rog.palmer@ntlworld.com) or send original papers (which will be copied and returned) or copies (paper or scans).

If any of you have photographs from any past meetings we would be grateful to have copies of those for archiving and restricted access. Or any memories of those early meetings that you’d care to share with others as we are planning a ‘birthday issue’ of AARGnews once we decide in which year AARG was born.

Wanted: old working GPS units

Poland (in the forms of our Chairman and Secretary) is seeking unwanted but working GPS units for recording field walking surveys and to familiarise students with their use. A first donation has been the Editor’s old GPS III and others of any kind will be welcome.

Please contact Lidka Żuk (lidkazuk@amu.edu.pl) who may then persuade you to bring it to AARG in Bucharest.

Information for contributors

AARGnews is published at six-monthly intervals. Copy for AARGnews 41 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
Cropmarks

Interpreted by Rog Palmer

Radio-Past, a laboratory for non-invasive techniques – www2.radiopast.eu/

From the project website:
Being an acronym of Radiography of the Past, Radio-Past concerns a project where 4 academic and 2 industrial partners join their resources to develop integrated non-destructive approaches to understand and valorise complex archaeological sites.

The project, which was launched April 1st 2009, will last 48 months and aims at developing so-called “open laboratories for research and experimentation” at the archaeological site of Ammaia in Portugal. Here, the Coordinator Institution (University of Evora) pilots an archaeo-topographical project named “Cidade de Ammaia”, centred on a deserted Roman town. This research is linked to several reference projects, mainly on Roman urban sites in Italy, where several of the partners are active since many years.

Radio-past is holding a training course for 20 post-graduate students in July 2010. Details should be found on their web site.

El Dorado?

There have been many reports of a series of earthwork enclosures (etc) identified near the Brazil/Bolivia border. Among these are:
http://antiquity.ac.uk/ant/083/ant0831084.htm

With numerous others reports elsewhere and including a short video with flying footage at:
http://www.scientificamerican.com/video.cfm?id=65644772001

APAAAME’s photostream

David Kennedy has taken advantage of modern technology to put more than 7000 photos from his flights over Jordan on the web. The collection is searchable by place-name or site types and is stored in a series of date or campaign sets. The images are fairly small and are watermarked but serve to show the range of sites photographed and will, no doubt, by much used by picture researchers and others.
http://www.flickr.com/photos/36925516@N05/

More free high-resolution orthophotographs

A press release in October noted that DigitalGlobe has signed an agreement with Microsoft to launch the Clear30 programme that will distribute high-resolution (30 cm) aerial imagery on its Bing Maps web site. Initial cover will be of contiguous landscapes in the U.S. and Western Europe. The same data will also be available through DigitalGlobe’s usual channels. These photographs were taken using the large-format UltraCamG made by Vexel Imaging GmbH, a company recently bought by Microsoft.
Such competition between Microsoft and Google can only benefit archaeological users.
**Books of interest?**

Notes by Rog Palmer rather than reviews:


This is an unpublished PhD dissertation but is available as a pdf copy to anyone interested enough to contact the author: birger.stichelbaut@ugent.be. It includes detailed notes on archive sources and a thorough discussion of types of WW1 features. Illustrations include some anaglyphs.


Another of Martin’s detailed analyses of an single CORONA mission that was unusually inclined so as to overfly Soviet ICBM complexes and SAM sites and also to check the disposition of Egyptian SAM sites to check their compliance with ceasefire provisions in the Suez standstill zone following the Six Day War against Israel.


This volume includes some chapters of interest regarding the aerial and geophysical survey of the 15x10 km environs area. I’ve not seen the whole volume but know that three chapters cover aspects of the survey and offer comparison and combination of aerial and geophysical results (although it is the raw data – photographs and geomagnetic plots rather than interpretations of these that are compared).

Illustrations include close-cropped rectifications of aerial photos so that we can see things to scale. This is a good idea which I don’t think I’ve seen before other than the occasional single (and whole) photograph. It makes comparison with geophysical results immediate and is something to encourage in other publications where aerial photographs provide data instead of illustrations.


This book is unseen but for the publisher’s website which shows this to be a technical book in which there may be something of relevance to archaeological survey among their chapters on plant science. As such, the book may be of interest to three of our members….
The Aerial Archaeology Research Group

The Aerial Archaeology Research Group (AARG) provides a forum for the exchange of ideas and information for all those actively involved in aerial photography, photo interpretation, field archaeology and landscape history. This also includes the use of aerial photographs in defining preservation policies for archaeological sites and landscapes.

Since its foundation in 1980, AARG has actively encouraged such exchange through its annual conference, specialist meetings and, more recently, through the biannual publication of its newsletter, AARGnews.

Membership of AARG is open to those interested in aerial archaeology as well as its active participants. All applications for membership, subscriptions and changes of address should be sent to the Secretary:

Lidka Żuk, Institute of Prehistory, Adam Mickiewicz University, ul. Sw. Marcin 78, PL61-809 Poznań, Poland. lidkazuk@amu.edu.pl

AARG is a registered charity: number SC 023162.

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

Membership/subscription rates:  
Individual  £15.00  20.00 Euro  
Students *  £10.00  10.00 Euro  
Institutional  £25.00  40.00 Euro  

* 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  
Cheque in Sterling or Euro payable to AARG  
Sterling or Euro bank notes  
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.