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Pipelines and archaeology

This is the title, subtitled ‘one approach’, of a short report summarising recent work on a drought-related pipeline in the Vale of York (Nick Pearson and Dave Brinklow, The Archaeologist 30, 18-19). I am aware that the Vale is one of those reputed ‘poor’ areas for aerial reconnaissance but am also aware that Pete Horne and Co at RCHME’s York office have been bashing away at it for the past few years. However the ‘one approach’ didn’t even hint at aerial photos – the ‘preliminary archaeological work’ was field walking and geophysical assessment [how did they know where to use geophysics?] – but then it didn’t mention use of SMRs either. Maybe consultation of existing documents is such a standard procedure as to not merit mention..?

Soil removal for the pipeline was a 30m strip, although the report doesn’t mention whether field walking was also confined to that band (as sometimes happens), so possibly all understanding of context was limited to that tiny strip of countryside.

I read the report with some interest as my Christmas was spent interpreting APs for a similar pipeline on the Maxey gravels – ‘one approach’ maybe, but somewhat different to that taken in Yorkshire. As most of you know, A Matter of Time (RCHME 1960) showed the Maxey area to be somewhat busy, and the succeeding 35 years have added to our knowledge both from the air and on the ground. I had been contracted by Cambridge Archaeological Unit to prepare mapping at 1:2500 for the course of a short (<4km) pipeline. I like working for CAU because they maximise the potential of developer-funded projects to further their archaeological research interests and this may have helped us decide that my mapping needed to extend at least one modern field-width each side of the central pipe. In effect this width varied from 150m to 600m but it was necessary to give context (as well as to locate a certain percentage of the excavation trenches) to the narrow swathe of destruction for the pipeline. My eventual mapping, when reduced to 1:10000, showed a prehistoric and RB track-linked landscape complete with cross roads, T-junctions, and assorted settlements with hints of fields in between. This background information can now be related to any field-walked or excavated evidence and, I think, results in more informative archaeological results than the ‘circular and curvilinear iron age features bisected by ... modern land drains’ that was one of the products of the Yorkshire pipeline.

From my point of view, one of the best things about developer-funded archaeology is that it forces us look where we would not necessarily chose to look. So instead of research-guided pickings like, ‘let’s dig Gussage All Saints because it’s similar to Little Woodbury’ we are getting a much broader spectrum of sites and features that just happen to be where development falls. I expect that one result of this – if anyone is ever able to synthesise the huge heap of results – would be to give us a considerably different prehistory (for example) than we currently have as a result, pretty much, of pure research interests. To aid any future synthesis (or perhaps to make it a viable starter?) it would seem essential to ‘tie up’ our current evaluations as neatly as possible. It follows that in cases where AP evidence is likely to aid this process it must be used to the full, and I would hope that any AARG members involved with development control would promote this theme.

Technology strikes again: 1

It was interesting to read in the small print on RCHME’s England from the Air: 1998 Calendar that, ‘...detailed mapping (both digital and manual) can be combined with the most precise site analysis and interpretation.’ With that information and the rumour (if correct) that the next chunk of NMP from the York office will extend down from Cathy’s wolds and be mapped using AERIAL we can perhaps look forward to .dxf-friendly output, no more inked-up hand-traced pencil-drawn paper maps, and the ability to combine NMP output easily with other data. Great stuff...?
What next – GIS and computer assisted classification?

Talking with people in Air Survey during a recent Swindon trip reminded me of some of the problems – practical and philosophical – that Chris Cox and I had during the first year that APS was converting to primarily digital mapping. As with pen and ink, we used AERIAL transformations as the basis for making a final drawing – and as with pen and ink, it took quite a while to learn to handle the new medium competently. Practical considerations range from the need to modify digitising technique, to using the right program for the job. Chris and I used graphics software (Professional Draw: which I think is better than CorelDraw but was less successfully marketed and is now defunct) before acquiring Autocad. Both ProDraw and CorelDraw can be used to produce good ‘finished’ maps and plans. Autocad can be persuaded to produce ‘not bad’ output, but it is essentially an engineering drawing package and cartography is not especially well catered for and has to remain pretty basic. APS uses Autocad because many of our commercial clients can accept its output (and virtually all APS reports now include digital copy) and use it, for example, for on-screen planning of excavation strategy. This does not mean it is the ideal program to use as the basis for compiling an extensive record – that, surely, is what GIS are for? And meeting Phil Markham (working on Northants NMP) in CUCAP recently tended to prove just that. Instead of the rolls of maps that most of us turn up with, Phil had a laptop which held a simplified 1:2500 plan of the county plus all his AP transcriptions as finished drawings (ie they had been edited to include different line thicknesses, etc) input from the 1:2500 scale that Northants uses as is basic mapping scale. Some of you may have seen Phil’s demos at AARGs, but he has also been kind enough to write a note on the Northants system for this issue of AARGnews (pp17-20).

Technology strikes again: 2

From maps we go to photos (ok, so I think backwards...) From the Prague catalogue was published (see Books of Interest? pp42-43) Otto Braasch contacted me and asked if there was a foolproof way of faithfully reproducing colour, especially from slides. From what he told me the answer, in the Prague case, would have been to slow down a bit – but a more useful answer was offered (sic) by Kevin Jones after I pursued a throw-away remark in one of his emails. Kevin’s piece in this issue (pp23-25) is an editing of a number of replies from colleagues in New Zealand and I thank him for acting on this request so rapidly. The printing problem is one that concerns many of us (and can be as relevant to maps as to photographs) and so if any of you have any useful information or guides on how to do it successfully, could you please share it with the rest of us?

Aerial photographs: 1

The phrase, the finest aerial survey, cropped up on a recent calendar and set me thinking in two directions. The second of these was to wonder just who should be the judge of the suitability of aerial photographs for aerial survey – where by ‘aerial survey’ I mean completing the act of survey through interpreting photographs to produce maps or plans – as a field surveyor would do for an earthwork. In this case, I suggest it is the user who is the best judge of ‘the finest’, and that the most suitable photographs will be those taken to suit the needs of the interpreter. I know you’ve heard it all before – ‘please take stereo pairs’, ‘please give us prints’ (and I still prefer black and white for most work), ‘please give us control information’ – but it hasn’t made much difference to the way some photographers operate, and our libraries continue to accumulate ‘record shots’ and illustrations. Ah, now, illustrations.... Here the photographer can be the judge of its own work and can strive to take those pretty pictures that we all like to have on the wall. But this style of photography results in pictures that are of minimal use, and are certainly not ‘the finest’, for full archaeological survey.

Aerial photographs: 2

Pleasingly, the AARG photographic competition brought in far more entries than I was expecting and my first thoughts on
seeing them laid out at RCHME concerned presentation. Elsewhere in this issue is the opening contribution on what I hope may turn into a discussion on how to obtain the best published photographs, but an obvious and essential first step is to begin with the best originals. It seemed that only two entrants (maybe three?) had gone to the trouble to make prints specifically for the competition, and those attracted the eye immediately. Other entries included prints that I wouldn’t have let out of my darkroom, or that needed spotting, or were too small to effectively show the subject (and that’s just an old age comment!). Any photographic magazine will say much the same thing – but it does make me wonder just how much the photographs are to blame for any abuse we may heap on printers and publishers. The 1970s computer operators’ motto, garbage in = garbage out, is as appropriate to reproduction of photographs as it is to getting sense out of machines. Some appear as fillers in this issue and all will be on display at AARG 98 so you can judge for yourselves.

Zeguma

Avid readers will remember Anthony Comfort’s report in AARGnews 14 covering work on the Euphrates. He has sent me a copy of his 1997 report, with superb image reproduction, and invites readers to contact him if they would like to have a copy. This will be of interest to anyone following the use of satellite imagery. (46 Montée Willy Goergen, L-7322 Steinsel, Luxembourg anthonycomfort@compuserve.com)

Radar imagery

Some aspects of remote sensing seem to be developing so fast at present that anything in print is out of date. This note, therefore, adds to that written by Anthony Crawshaw a week or so ago (pp33-35). Anthony has been rummaging around the www and, as well as his contribution, keeps sending me address of gems that he has found or pursued (and to those of you with that kind of mind – I’m talking about radar ... sad really!). Also a recent posting on Britarch noted use of radar imagery to ‘illuminate’ details of waterworks and temple remains at Angkor Wat, Cambodia (ref: Science News 153, (21 February 1998), p117). Three-dimensional radar portraits of moisture, vegetation, and elevation patterns were taken from a NASA aircraft in 1996 following preliminary, but less precise, data from a 1994 space shuttle flight. [Someone, somewhere, knows how to tap the right pocket. So how about the 1998 crop mark season please NASA...? Verticals too – yummy!]

From this issue

I’m pleased to have the piece by David Wilson on using the F24 camera. It really does seem a huge brute and makes mockery of those complaints about using modern medium format cameras from a Cessna 150/152.

For many years I’ve been interested in observations concerning plough damage to levelled sites and am pleased to have persuaded Keri Brown (better known for her research in ancient DNA) to write a piece for AARGnews about the devastation in Italy. Her work there began with an M.Phil at Manchester (as she wrote: ‘The subject of my thesis was the aerial photography of the Tavoliere. I was offered a choice of material to study - either the hillforts of the Welsh Marches or the ditched enclosures of southern Italy - Italy won ’) and is continuing via the prospect of using radar images to locate deeply buried (and undamaged) sites.

Our pilots tend to be among the great forgotten: one or two perhaps being acknowledged in a Somewhere from the Air book, most remaining unknown except to the photographer. Yet any of us who try to take aerial photographs soon realise the difference that sympathetic aircraft handling can make to our results. Even the few hours that I have flown have been ample to provide a short-list of preferred local pilots and those best avoided. Paul Everson’s obituary of his pilot, Tom Hayes (clearly one of the good ones), helps remind us that successful photography is often a result of good teamwork.
Chairman’s Piece

Cathy Stoertz

A random selective review of developments over the past six months begins with a few impressions of AARG97 in Edinburgh. The “official” speakers continued to uphold the tradition of quality and interest which we now take for granted, and the views expressed during formal and informal discussions demonstrated a healthy mixture of consensus and divergence. A recurring theme in AARG debates is the question of perception - how does the aerial archaeological community see itself, and how do others see it? Is aerial archaeology a specialism (like geophysics etc) or a separate discipline, and does the answer to this question govern the uses and expectations of aerial survey and its results? Many presentations came from archaeologists who are able to combine the practice of several specialisms including aerial archaeology, and it seems clear that this approach allows the greatest depth and breadth of understanding, whether the specialisms are brought together in one individual or a team.

The proposals for short-duration, focused working groups which arose during the meeting should enable interested AARG members to address a range of specific issues, starting with an up-dated comparison of different methods of photographic survey in the light of the past decades’ accumulated experience of both photography and interpretation. If funds and weather permit, it is hoped that Pete Horne, David Wilson and others will be able to run controlled trials during the coming season. Pete and Rog will then assess and report on the results in a future AARGnews.

Not for the first time, any tendency to indulge in excessive introspection of the “why are we here and where are we going?” variety was thrown into sharp perspective by colleagues from other parts of Europe. Under circumstances which make current British funding and logistical problems seem trivial, Juris Urtans is exploring the possibilities for national survey in Latvia, and Wlodek Raczkowski and others in Poland are trying to enable fledgling projects to survive and flourish. The significant achievements which continue to be made throughout eastern Europe are due in no small part to the energy and persistence of AARG members and those with whom they work.

Further progress can be reported from Europe: Zsolt Visy writes that the 8,000+ photographs resulting from the 1996 training course in Hungary are now catalogued and available for use by Hungarian scholars at Janus Pannonius University in Pécs. Also in Pécs, a workshop in January formed the concluding phase of an aerial archaeology project funded by the European Union’s Raphael Project. The earlier phases of this project included an exhibition of aerial photographs from the Czech Republic, Slovakia, Hungary, Germany and Britain which opened at the National Museum in Prague in October (travelling on to other venues, finishing in Dresden), and a conference in Prague at the same time.

The exhibition opening was attended by many dignitaries, academics and Eurocrats who expressed a great deal of goodwill and interest; the exhibition itself is very well presented and should produce a good public response wherever it is shown. The conference provided many examples of the integration of survey techniques and disciplines at the earliest stages of project design, reconnaissance and “discovery”. The majority of the projects described, from all over Europe, are already incorporating the next steps of analysis, and speakers were able to
offer results which reached far beyond inventories of sites. I was pleased to be able to represent both AARG and RCHME at this gathering, not least because at last my talk on the Yorkshire Wolds project could be accompanied by advance copies of the book, delivered by courier to the check-in desk at Heathrow 30 minutes before my flight. (Full publication now achieved: see review elsewhere in this issue. (End of commercial).

Another exhibition, dealing with British aerial archaeology (photographs supplied by the three Royal Commissions and CUCAP), has been organised by Wlodek Raczkowski with the sponsorship of three archaeological institutions in Poznan and AARG. David Wilson attended the opening on 19 January and reports that “the general effect was excellent, with intelligent groupings of photographs, not only by country but also by topic and technique”. And more hot news from Poznan: last semester Wlodek taught Poland’s first ever course in aerial archaeology, at the Institute of Prehistory, Adam Mickiewicz University.

After all these successes, it is disappointing to have to report that the second bid for money from the Raphael Project, to support a training course in Poland in 1998 (sponsored by RCHME as EU partner), has failed for reasons as yet unknown. All is not necessarily lost: Bob Bewley and others are currently exploring alternative sources of funding, and a “Plan B” may still take shape for the summer of 1998, although perhaps in a scaled-down form. Failing that, the Raphael Project itself still has a couple of years to run, and it may be possible to reapply for training funds, or to frame another application for a different project.

Looking farther ahead and afield, I understand that Wlodek and Martin Gojda have volunteered Bob Bewley to organise an aerial archaeology session for the 1999 World Archaeology Congress in Cape Town. Special emphasis will be placed on the unique contribution of this specialism to the understanding of landscapes and the management and protection of sites.

In an archaeological world where funding crises and commercial pressures are universal, the potential to generate public awareness and understanding remains aerial archaeology’s greatest strength. Exhibitions, publications, conferences, courses and outreach activities of all kinds (including, I hope, AARG98) all serve to excite public interest. And, as Lorna Sharpe pointed out in Edinburgh, public interest is one of the best preservation tools available to the archaeologist today.
AARG 1998

Annual conference: 10th – 12th September 1998

College of Ripon and York St John, York

This year’s meeting takes place in York, host city to the Arts Council UK Year of Photography and the Electronic Image. In addition to the standard AARG meeting and field trip, this year’s conference will incorporate a public day school on Saturday 12th September. This day is designed to offer an aerial and archaeological viewpoint alongside other celebrations of the UK Year of Photography and the Electronic Image. As a day of talks, demonstrations and images, the day school will look at aerial survey in Yorkshire, as well as examples of landscape projects, computer applications, future developments, and a celebration of aerial images for their own sake.

Your Committee intend to structure the day school as an extension of the Annual Conference and to keep papers at a suitable level to be of interest to AARG members as well as the public.

Full booking details are expected to be dispatched to members in May but a flier should be included with this AARGnews giving the latest information on speakers and their subjects.

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‘Obliques or Verticals?’ AARG Working Party

Following debate on the issue of whether archaeological aerial reconnaissance would be better served by flying blocks of vertical photography rather than oblique survey, a small working party (Anthony Crawshaw, Pete Horne and Rog Palmer) was set up at the Edinburgh meeting of AARG. The working party has not yet met but has been communicating electronically. CUCAP have offered support in providing vertical photography for a trial in the coming summer, an offer which led to David Wilson joining the working party. Members of the working party are aiming to meet in March to discuss the aims and methodology for the trial.

[this is a remarkably brief summary of the amount of communication that’s gone on]
AARG Aerial Photograph Competition: Results

Fiona Small

As you would have seen when you read *AARGnews* 15 from cover to cover, we decided to run a photographic competition to join in with the celebrations of the Year of the Photograph and Electronic Image 1998.

We asked for prints - black and white, colour FCIR, hand-coloured or digitally manipulated - and in total we received 17 individual entries to the following six categories: Archaeological Site, Archaeological Landscape, Architectural Site, Architectural Landscape, Landscape and Abstract.

Many thanks for all your contributions and here are the long awaited results:

1. **Archaeological: Site**
   - **Entrant:** R Moloney
   - **Photographer:** Angus Lamb, RCAHMS
   - **Subject:** Black and white print of earthwork enclosures, Whitcastle Hill, Roxburghshire. Copyright RCAHMS 1989.

2. **Archaeological: Landscape**
   - **Entrant and Photographer:** Karen McBride
   - **Subject:** Colour photograph of Mousa, Shetland taken 12 November 1996.

   Congratulations to a promising beginning and welcome to AARG.

3. **Architectural: Site**
   - **Entrant and Photographer:** Anthony Crawshaw
   - **Subject:** Colour photograph of York Minster and Cathedral close under a light covering of snow taken 22 February 1993.

4. **Architectural: Landscape**
   - **Entrant:** R Moloney
   - **Photographer:** Angus Lamb, RCAHMS
   - **Subject:** Black and white print of Dumbarton¹ viewed down the River Leven with Dumbarton Rock and the Clyde Estuary in the background. Copyright RCAHMS 1989.

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¹ It has to be said that a certain Mr R Palmer of the committee thought this was in eastern Europe somewhere!!!
5. **Landscape**
   Entrant and Photographer: Martin Gojda
   Subject: Colour print “A typical image of landscape in East Poland near Lublin in the afternoon sunlight”.

6. **Abstract**
   Entrant: R Moloney
   Photographer: Robert Adam
   Subject: Black and white print of Clairinch, Loch Lomond.
   Copyright RCAHMS 1994.

   I have to confess this is my personal favourite.

Finally, I have to include an entry in a category all of its own. Well, I am not quite certain which category it was originally intended to be entered in ... possibly an Archaeological Landscape judging from the fragment of Northamptonshire Medieval open field system peeping out from under the wing. Unfortunately, there is an awful lot of wing ... Cessna 172 if I am not mistaken. Well, I couldn’t really tell from the photograph, rather from the fact that I know that the entrant usually flies in one. They do say that honesty is the best policy, so Phil Markham of Northamptonshire Heritage, thank you. Don’t call us, we’ll call you ...

Landscape: East Poland, near Lublin. Photo: Martin Gojda (from a colour print original)
Derrick Riley Bursary for Aerial Archaeology

This annual award is offered to assist the bursary holder in the making, analysis or interpretation of aerial photographs. The bursary provides financial assistance up to the sum of £500 to help meet travel, flying expenses, film processing or similar costs necessarily incurred during the work. The panel will accept applications for smaller amounts and reserve the right to make two, smaller, awards if this is adjudged to be the most beneficial decision in any given year. In recognition of Derrick’s encouragement of young scholars preference may be given to younger applicants.

Application forms can be obtained from:
Professor Keith Branigan
Dept of Archaeology and Prehistory
University of Sheffield
Sheffield S10 2TN
UK
to whom completed forms should be returned by April 30. Successful applicants will be informed before the end of May.

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World Archaeology Congress, South Africa, January 1999

Call for papers

Bob Bewley has been asked (or persuaded) to organise a session (10 papers) on aerial archaeology at WAC 4 and offers AARG members the opportunity to participate.

He writes: “I have thought that the session should be on Approaches to understanding sites and landscapes from the air and taking in New Zealand, South Africa, Jordan, North Africa as well as Europe. I don't want a, Here, look at the new sites we can see from the air session I want a debate on approaches and uses, leading eventually to a greater understanding and eventually heritage management.”

Deadline for paper proposals: 10 April 1998.

Any offers or questions to Bob at swindon@rchme.gov.uk (with Subject=Bob Bewley... to help mail sorting in Swindon. Note forthcoming change of email address in AARG list of members).
Cerne Abbas Giant, Dorset, England

Photograph and caption: Francesca Radcliffe

On the morning of July 10th 1997 the well-known chalk figure of the Cerne giant, cut on the hill north of Cerne Abbas in Dorset, suddenly acquired a companion. It was but the briefest of encounters as the new figure, seen on the left, disappeared the following day. She was laid out in white tape as an exercise in surveying and plotting carried out by Bournemouth University students. Having been alerted of the event I managed to persuade Giles Romanes, my friendly pilot, to fly over it.

Photograph © Francesca Radcliffe: 233/10: 10 July 1997

[Rog-comment. This reminds me of another short-term change to the Cerne giant that must have occurred about 1970. At the time I was commuting to wherever the RCHME APU was then based, and had become adept at reading inverted newspapers on buses and trains. One headline, , forced me to spend a few pennies on what I think was the Daily Sketch where I discovered that the sex change had been made with the help of a can of green paint and that the villagers were most offended (I’ve since lost the cutting but think it may have included a ground photo). I had hopes that John Boyden, local farmer and air photographer, was flying that day so that the Commission’s red box holding ST6601 could be browsed as man, man, man, man, man, woman, man, man, man, man,... but I’m not going to tell you if he was.]
The Williamson F24 aerial camera

David Wilson

Geoff Hall's piece on Harold Wingham in AARGnews 15 brought back memories. My only contact with Harold was when he gave me advice in 1974 on aerial photography from airships: see Wilson (1975), note on p.13. Contact with the F24 camera, on the other hand, was frequent between 1965 and 1974 and made a lasting impression! There can be few of us still flying who have had much experience of this equipment, so it may be of interest to set down my recollection of it.

The F24 was already obsolescent at the time of the 1939-45 War, but this did not stop a great many of them being used during wartime reconnaissance, both in fixed mounts for vertical survey and hand-held for obliques. After the war, purchase of a Government Surplus F24 was the standard way for a novice to begin in aerial photography. Supplies both of complete cameras and of spare parts (e.g. shutter-blinds) were abundant and inexpensive until the end of the 1960s.

Unlike the cameras most of us are using today, the F24 was designed as an aerial camera and had a fixed-focus lens. This is an immense advantage, as a simple and relatively inexpensive lens can be fitted that nevertheless gives as good or even better results than something much more expensive that has to be able to focus down to one metre. I doubt if such a lens was geometrically corrected for all parts of the visible spectrum plus the near-infrared, but when used with a minus-blue filter and panchromatic film it furnished photographs of excellent contrast. As any aerial archaeologist should know, good contrast is the key to definition in the rendering of cropmarks and other indicators of archaeological remains. It is also valuable for achieving panoramic views (high obliques) of landscape that manage to retain legible detail in the middle distance.

Exposure was made by means of a focal-plane shutter incorporating a shutter-blind. This is a spring loaded piece of opaque material with a narrow transverse open slot; when the blind is released, the slot crosses the film, exposing narrow bands of emulsion continuously across the format from one side to the other. A second or capping blind, without such a slot, protects the film from further exposure as the shutter-blind is subsequently wound back.

Such a mechanism can have a number of special effects on the resulting photograph. When a photograph is taken from an aircraft, there is appreciable forward travel during the exposure, different parts of the frame actually being exposed at very slightly different times. In vertical survey the camera is mounted in such a way that the travel of the blind across the negative is in sympathy with (rather than opposed to or, worse still, at right angles to) the travel of the aircraft.
above the ground. This helps to minimize both unsharpness caused by image movement and geometrical distortion caused by sequential exposure. In oblique photographs the latter distortion is unavoidable; the blind travels from the bottom to the top of the picture, so the image will be pulled a little to one side as you go up the frame. This is not something that is noticeable in ordinary use, but it is a (possibly unsuspected) complication in rectifying photographs taken with this camera.

A more noticeable effect derives from the fact that it is difficult to ensure that a shutter blind travels at constant speed from one side of the film to the other. When it does so, it is said to be 'efficient'. The F24 shutter mechanism was not wholly efficient in this sense and there was appreciable acceleration. This means that vertical photographs were systematically darker on one side than the other, regardless of the position of the sun. With oblique photographs, on the other hand, this effect is seldom seen, as the upper part of the photograph, which received a slightly shorter exposure, was also the part that normally received the greatest amount of light.

Exposure was determined by a combination of two factors: the width of the slot in the shutter blind and the size of the aperture in the iris diaphragm. During any given flight the shutter-blind would not be changed unless it was known to be damaged, and it was not normal practice in any case to make use of different widths of slot; so exposure was controlled solely by altering the aperture. This was done by moving a substantial lever between a
number of notches in the lens casing, each identified by an easily read f-stop number engraved beside it. I imagine that it was intended that the camera could be operated by someone wearing gloves.

The film was 5½ in wide and pre-loaded into individual magazines in the darkroom. A 47-ft length of film yielded about 100 usable photographs. When the magazine was fitted to the camera, the film was pressed against a glass plate (the register-glass) on which were engraved the fiducial marks familiar from the first thirty years of post-war oblique photography. All photographs were taken through this register-glass, from which specks of dust needed to be cleaned more often than they actually were. Even if this cleaning were done whenever the magazine was changed, whole films could still show an identical pattern of intrusive specks from frame to frame before the next cleaning cleared them away.

The other routine procedure when changing magazines was to release the shutter, with no magazine fitted and the camera held up to the light, so as to check that light was actually getting though. It was not unknown for a shutter-blind to get stuck in one position, or to hesitate, resulting in a series of blank frames, or frames of which only one half was ever exposed. Inevitably, this only happened on days of exceptional visibility in areas seldom visited, such as Shetland!

The way that the magazine was attached to the camera was surprisingly primitive and not entirely secure. On one side a short rod protruded which engaged with the perforation in a metal bracket. On the other side a kind of clamp was screwed down to hold the magazine in place, but this was not very positively located. The motorized drive of the camera engaged with a dog on the side of the magazine, and the forces imparted in winding over between exposures were quite capable of shifting an insecure magazine on one side to let in light.

The design of the fittings was such that this possibility could not be wholly excluded, so some home-made devices were contrived to minimize the possible effects. The cataloguing assistants (female, naturally) were set to sewing covers of blackout material that fitted round the whole of the body of the camera. These had an elastically hem to keep them on, and the integrity of their protective cover was only breached by a small slot, bordered in buttonhole stitch, to expose the telltale that confirmed whether the film was still being wound on or had now run out. Over the cover, for added security, was clipped a length of elastic (referred to as ‘parachute-elastic’, so presumably of a kind used in parachutes).

The camera as a whole, apart from the weakness just described, was very robust. It was also quite large and heavy, around 24 lb or 11 kg, as Geoff said. If you had the camera resting on your knees and your pilot went into a tight turn to give you the angle you wanted on a photographic target, you soon learnt not to try to pick it up until the aircraft had come out of the turn, as the extra G-forces in the turn made the camera simply too heavy to lift without straining yourself.
During oblique photography the camera body rested against your upper chest and, if you clamped your elbows to your sides, you had a very steady position. The thing to watch then was not to rest your arm against the side of the window or any other part of the airframe, as this would pass on the highfrequency engine vibrations that were otherwise damped out in your own body.

When we eventually converted to a Hasselblad 70 mm camera, I wondered how I would ever learn to hold it steady. It felt such a lightweight that I seemed to have no control of it all.

Why give up the F24 in the end? The 5-in format was becoming less and less used, and the film manufacturers were requiring larger and larger minimum orders before they were prepared to supply film that had to be cut specially to this size. And, whatever the reason might be, we were finding that a larger proportion of the films received had significant variations of sensitivity producing a wavy line down one side of the exposed photographs. (We did not consider that this had anything to do with us, and the manufacturers would not concede that it had anything to do with them, but it was a problem that was getting worse, and it ceased when we changed cameras.) The supply of spares was drying up too, and even if you did find a replacement shutter-blind, what guarantee could there be that an unused blind thirty years old would not split the first time that it was used? We actually had some new shutter-blinds specially made, but the writing was on the wall.

Finding a satisfactory replacement in the 70-mm format was no easy matter. Improvements in lens design over the previous thirty years should have made it simple enough to reduce the format by $\frac{Z}{4}$ linear and still to achieve results as good as we were accustomed to from the F24. The problems lay in the fact that potential replacement cameras were not designed for aerial work. More than one manufacturer had taken a successful press camera, given it handles and a motor drive and called it the 'Aero-Press' or something similar. But the fastest shutter-speed was a nominal $1/500$ s; this might be only $1/350$ s in practice, dropping to $1/250$ s after intensive use, which would undoubtedly yield some unsharp pictures. A special heavyduty shutter might have done the trick, but the real problem was the capacity of the film magazine. What was usually provided was a standard 120 back, which needed to be changed every twelve exposures. This was a convenient size for a journalistic assignment but it made no sense for serious photographic reconnaissance. It was only when Hasselblad developed their 70exposure magazine, that our troubles were over. And even a Hasselblad is not designed for aerial work?

Reference

AIR PHOTOGRAPHY AND GIS; THE NORTHANTS APPROACH

Phil Markham, Northamptonshire Heritage, England

On the return from the Edinburgh conference it was made clear to me that not everyone has been bored by our approach despite yearly renditions (excepting this year). Certain hardy perennials admitted never actually getting around to look at it. They advised that it be put into print, so here goes.

Northamptonshire Heritage (a section of the County Council) has been conducting an annual aerial survey for archaeological sites for around twenty years and the Sites and Monuments Record now has a collection of around 30,000 oblique air photographs. The archaeological detail was interpreted and plotted from the early 1980s using John Haigh's AERIAL computer program. This involves tracing the features onto acetate sheets using a 0.13 mm rotring pen and the detail is then digitised. The program converts the information into rectified digital data and can be stored in different file formats such as DIG or CAD. The tracing, 1:2500 and 1:10000 plots were archived for general use. More importantly the AERIAL files (DIG files) were also archived as it was envisaged that with computer development these could produce a digit map. They were also retained unaltered so that each stage was clearly documented and irregularities noted.

After successfully competing for an internal GIS pilot scheme it was a simple matter of importing the DIG files into GIS (MAPINFO). Each DIG file was originally tagged with the SMRs photo number it was taken from and this can be easily retrieved in MAPINFO. John's program enables different colours to be used and information can be tagged to it. This data is in vector format.

This level of data is represented below

This information is then further interpreted using similar conventions to RCHMEs National Mappir Program. This is done in MAPINFO and involves the production of VECTOR line and polygo information. The data is combined into the individual geographic objects which are described in the RCHMEs MORPH2 data base. These individual objects (eg. a ring ditch) have an attached table which records its associated MORPH number and SMR number. More complex objects or where one ditch used as part of two or more individual objects the production of this data becomes more complicated. With the objects successfully produced it is possible to select and highlight each monument together with its associated numbers. A single ditch can therefore be part of numerous objects and have a series of associated numbers.
This level of data is represented below.

This information is normally divided into the following data layers:
- CROPMARK
- SOILMARK
- EARTHWORK
- RIDGE & FURROW

The use of different data layers enables the data to be used in numerous ways for research questions.

This level of data is represented below.

The background map used is the OS 1st edition 6” to 1 mile. © Crown copyright.
NEAR FUTURE DEVELOPMENTS

1. MAPINFO provides a mapping front end to the SMR. The table information will help to provide a seamless interface between the air photographic interpretation layers and associated data base. This basically means that when a monument is highlighted its data base records will be automatically called up.

2. These data layers can be incorporated with map information and used in the field on laptop computers. This season we are going to develop this by linking a Garmin 90 GPS to the laptop and have real time moving map information while airborne. This will enable us to see if a site (p or complex) is new and a photo economically viable or not (argue at will please). Due to poor conditions last summer this ability was not proved. With luck and an unexpected offer of help from Anthony Crawshaw this may have been proved to work by the end of the coming season.

3. It is hoped at the time of writing that with John Haigh's help we will be able to accurately import scanned oblique air photos (raster images) into MAPINFO using AERIAL 5. This will enable accurate on screen interpretation of aerial images thus saving time and 0.13 rotring pen nibs on acetate sheets. With digital images from the scanning of negatives there will be a massive cost saving by not producing prints until specifically required. Digital Data storage is an issue but the price of disc storage is rapidly reducing. With the increasing quality of printers actual prints will be needed less frequently. There is the added benefit that colour images will have the same life expectancy as black and white images once scanned and these are far preferable for publication. Data transfer is also quicker and easier digitally. AERIAL 5 has been reviewed previously AARG NEWS number 12 March 1996

The scanning and registering of photographs has been possible for a number of years using RASTOOLS and we have piloted the procedure but it is not viable because of its complexity and the time required.

An example of this together with other data layers is represented below.
The data layers used in this work include the following:

1. The photograph itself
2. A digital copy of the photograph (raster image)
3. A rectified copy of the photograph (raster image)
4. The vector archive layer for the county
5. The vector interpretation layers for the county
6. Background map layers

4. With digital images and data comes the question of data enhancement and standards which can be addressed later or elsewhere, but should be addressed soon.

SUMMARY

This work and other areas of Northamptonshire Heritages work can be viewed at the following web address:

http://web.ukonline.co.uk/glenn.foard/webdoc9.htm

Comments or enquiries can be E.Mailed to me at:

heritage@northamptonshire.gov.uk

TERMINOLOGY

VECTOR - A coordinate-based data structure commonly used to represent map features. Each object represented as a list of sequential x,y coordinates. Attributes may be associated with the objects. A computer image can be represented in vector format or in raster format. (I)

RASTER - A type of computerised picture consisting of row after row of tiny dots (pixels). Raster images are sometimes known as bitmaps. Aerial photographs and satellite imagery are common types of raster data found in GIS. A computer image can be represented in raster format or in vector format(n)

BIBLIOGRAPHY

(ii) as above page 325
Do good crop marks mean good archaeology? Crop marks that appear year after year as reliably as clockwork might be thought to indicate that below ground, all is well with the site and its archaeological contents. This may well be so with many sites, but for those located on arable lands subjected to the intensive methods of modern agriculture the appearance of crop marks may be misleading as to the ‘health’ of the site. The Neolithic ditched enclosures of the Tavoliere, S.E. Italy, are a case in point. These spectacular sites were first brought to archaeological attention by the work of J.S.P. Bradford in a series of articles in Antiquity (1946, 1949 and 1950). He identified these enclosures from black and white verticals taken by the RAF during 1943-45. By great good fortune, the time that this aerial reconnaissance was carried out, in May, June and July, were the best months for crop mark formation in this region, and the wealth and clarity of detail seen on these APs is superb. The crop marks were formed in response to the cutting of ditches and pits into the limestone subsoil – the enclosure ditches are from 1-2 m wide and 2-3 m deep. The surface of the subsoil (or crosta in Italian) lies only approximately 50 cm below the topsoil, and it is at the junction of topsoil with subsoil that the living surface of these settlements would have been located, and where the evidence for structures and activities would have been found. Excavation within the enclosures has so far proved disappointing, with only scant traces of hut structures being found (one exception being Ripa Tetta, but even here the interpretation of the evidence is problematic). The ditches have in any case tended to be the focus of archaeological endeavour, as they have produced a wealth of material, including pottery, flint, obsidian, human remains (including formal burials), animal bones and plant remains.

The reason for the lack of knowledge concerning the activities and structures within the enclosures is easy to identify. Since the Second World War, modern agricultural practices have been introduced into the region (and lots of European money to use them!). These included deep ploughing, which was used (and still is used) on the heavier alluvial soils of the valleys (which could not be ploughed very well by horse-drawn ploughs prior to WW II) and also on the crosta-developed soils to break up the harder crosta subsoil in order to improve drainage, even though most of these soils are located on slight hills and sloping ground. The deep ploughing turns over a metre of soil, and thus destroys or severely disrupts the archaeological deposits located c.50 cm below the surface. Where deep ploughing has taken place, one sees large white lumps of crosta littering the surface, as well as freshly broken sherds of pottery.

This practice of deep ploughing is also responsible for the destruction of other archaeological information, for the Tavoliere contains not just the Neolithic landscape of ditched enclosures, but also a Roman centuriated landscape and a Mediaeval landscape of earthworks and field systems. Deep ploughing has affected them all. More recent aerial photography carried out by the Italians in 1955 and by the late Derrick Riley and Otto Braasch in 1987 and 1989 can be used to trace the damage. For the Neolithic sites, one can see a ‘blurring’ of the edges of the outer enclosure ditches and there has been a loss of internal detail. One of the characteristic features of these sites is the presence of C-shaped ditches within the main enclosure ditches - these are thought to represent the living areas of the social groups within the settlements (Bradford called these ‘hut-compounds’). The C-ditches are on average 1m wide and up to 2 m deep - at the site of La Panetteria I they are only 1 m deep. Fourteen C-ditches could be counted at La Panetteria I in the RAF vertical – in the later APs they have almost vanished. Mediaeval
earthworks such as Motta della Regina and Santa Cecilia have almost been ploughed to ground level. The 1943-45 RAF verticals are an irreplaceable resource for landscape study for the Tavoliere, as they show the sites before the effects of deep ploughing.

The most recent aerial photography taken in 1987 and 1989 shows many Neolithic ditched enclosures and Roman centuriation, and without knowledge of the RAF archive one might think that the information that these photos contain shows a ‘healthy’ landscape, archaeologically speaking. The presence of the heavily damaged mediaeval earthworks however sounds the alarm that all is not well (and indeed some of the earthworks have completely disappeared!). Ditches and other subsoil-cut features several metres in depth lie beyond the reach of deep ploughing. Crops can still respond to the more moisture-retentive fill of these features and produce crop marks. From the air, archaeological sites can be located and all seems well. On the ground, field survey and excavation reveals the truth about the condition of the site and its archaeological ‘health’.

I believe that all is not lost in the Tavoliere. Other techniques could be used to locate undamaged sites. One possibility is SIR or Shuttle Imaging Radar. This is a remote sensing method which is able to penetrate the ground as much as 5 m in suitably arid conditions. The Tavoliere is a region famed for its long, hot dry summers – 5 or 6 months without rain. I hope that it will be possible to use this method to locate sites that may be buried beneath deeper deposits of post-Neolithic soils, and which would therefore be protected from the ravages of deep ploughing. The excavation of just one preserved site would revolutionise our knowledge of the origins of agriculture in Southern Italy, and of the social organisation of the Neolithic in this region.

References
Bradford, J.S.P., 1950. The Apulia Expedition, an interim report. Antiquity 24, 84-95

My work on the Tavoliere includes:
Commercial printing and imaging from 35 mm slides

Kevin Jones

People are sometimes disappointed by the quality of offset printing from slides. Is there a foolproof way of going from a digital file (of, say, a frame that has been cropped as required and tarted up look even more perfect) to a printed page? At Rog’s request I asked two of our people with long experience in this area for 10 or less commandments on the subject of getting best results from a commercial printer when dealing with slides.

Offset printing for books, brochures, etc., is a process involving scanning, colour separations, film work (and proof), printing plates, ink and offset printing presses. There are ample opportunities for degradation of images to occur in each of the stages.

People sometimes expect too much. Slides are excellent for conferences because one generally projects a primary image from very good emulsions through very good optics in the projector. Any other reproduction process involves intermediate media. The range of colours (colour gamut) that can be recorded on photographic film, that can be displayed on a computer monitor, and that can be printed on a printing press all differ from each other and are only a fraction of the colour gamut that the human eye can perceive. Nevertheless, there are many other things to consider when going from original photograph to the printed page.

Loss of quality from scanning slide film is possible but should not occur. Until about 10 years ago, most publications demanded slide film - the scanner operator could look to the slide to compare colour and the image was sharper than scanning off a print. Improvements in both photographic prints and digital scanners now mean that the difference between scanning from slide or print is negligible.

The advent of cheap flatbed desktop scanners enables people to do their own scanning, but the quality can not match the quality of drum scanners. If the work is going to a printing press, scanning should be done by a professional on a drum scanner or a high end (cost) flatbed scanner. The cheap flatbed scanners (less than US $2,000) can not match the others for sharpness or colour fidelity.

In the printer’s contract, try designating the lines per inch that you want the photo scanned and/or printed at, but remember the printer can override that to whatever the defaults on his/her output device is, and usually will. Also, ensure that the resolution of the scan is adequate to produce the required quality.

Generally, for offset printing, scans are made to 300-350 dots (pixels) per inch (dpi) at final printed size. The relationship between printed image resolution and half tone screens is: scan resolution (dpi) = 2 x half tone screen resolution (lines per inch (lpi). The half tone screen is determined by the type of paper and quality of press the publication is to be printed on.
High quality art paper publications (e.g., the sort of material that Chris Musson uses or most of the recent high quality books such as Shepherd and Greig’s *Grampian’s Past*) are printed at 175 or 200 lpi so the scan resolution will have been 350 dpi. Scan resolution could be as low as 1.5 x lpi - but image quality will degrade if you go lower than that.

The basic principle is: **the rougher the finished printing then the coarser the lines per inch that the printing method can deal with** (80 dpi for a photocopier, 150-200 for offset on art paper). However, all this will be in vain if the person driving the press is not aware of the required quality. So, yes the printer can cock anything up - by poor inking and so on. The only reliable solution at press time is to sign off a pass sheet for the first proof run when the job is started. (Even then inking can vary through the run.) This is potentially expensive for the printer and they may prefer to make a chromalin or other form of proof which shows how the colours will combine.

Printing on recycled (blotting?) paper, that some corporates of an environmental persuasion prefer, requires a coarser half tone screen of 120 or 133 lpi (i.e., scans 240-266 dpi; any finer and the ink just blocks up on the page). For standard colour printing on matt or glass art paper, one should use 150 lpi screens (and therefore scan at 300 dpi).

This makes a file of approx 30 megabytes for an A4 image, and would cost about US $60 at a professional scanning bureau in Wellington New Zealand. The cost pushes some people to use cheaper scanners, and the file size causes them to compromise resolution to save disk space, resulting in poorer quality results.

Another issue to be aware of is that colour transparency film has higher contrast than negative film (the contrast assists with the visual impact on screen - see remarks on projection above), and can cause shadows to block up and highlights to bleach out. Any scanner operator who knows the job will compensate for this.

**Photo CDs**

The Kodak Photo CD format was not designed for printing, but for viewing on various devices - TV, HDTV, computer monitor. For each photo on the CD, four separate files are made. Three are at the optimum resolution for each of the viewing devices, and one is at "high" resolution for printing. The "high" resolution is adequate to print up to about A5 size, which is not particularly large for modern publications. The colour on Photo CD images has not been corrected or balanced in any way for printing. Any Photo CD image to be printed, should first be opened in imaging software such as Adobe Photoshop and colour corrected. This is a task which takes quite a bit of experience and requires an understanding of the differences between a Photo CD image and a "normal" scan.

A common application of scanning is for PC-based mapping from images which are layered under a grid or manipulated to correct to a survey grid or to create an orthophoto - over which is digitised the line drawn map. This type of scanning can be done at up 120 lines/mm (up to
5,000 dpi) and images will take up to 80 MB of disk space (hence you won't get these on to a
diskette and you won’t want these hanging around on your hard disk either).

We had a scan of an earthwork fortification (about 900 m square) recently from a
conventional 23 cm square diapositive to TIFF format at a scale of 1:10,000 with a claimed
ground resolution of 0.12 m - more than enough to resolve storage pits but not quite enough,
one suspects, to observe possible controls such as the tops of fat fence-posts. Incidentally we
were quoted about US $1000 for the scan which we have to accept because it comes with the
calibration data for the camera and the suppliers record of the control points.

A lot of interest relates to the inkjet printing such as we do for conference-type one- or two-
off posters. Most of the principles are the same but it is probably more difficult to generalise
for inkjet printing - each inkjet printer has its own vagaries. For example, the colour balance
of an image must be prepared for a specific inkjet printer, whereas for offset printing, what
gets imaged to film (and proof) should be what you get off (almost) any press.

On inkjets, colour results will be more variable. The same file printed on different machines
and the results have been markedly different. This reinforces the point that files prepared for
inkjet printing should be prepared for a specific printer. This may mean doing test prints and
adjusting colours etc before committing to the final job. However, because the print results
are so variable from machine to machine, the colour quality of the original scan is less critical
- it will probably have to be adjusted for the printer anyway. Thus, desktop scanners can come
into their own as very effective tools for inkjet print jobs.

Fortunately, because inkjets are much coarser, it is possible to scan at much lower resolution
- 100 dpi or possibly even less in some cases.

I think we seem to have come up with - not 10 commandments - but two rules of thumb and
two adages:

- The rougher the finished printing then the coarser the lines per inch that the
  printing method can deal with.
- Scan resolution (dpi) = 2 x half tone screen resolution (lines per inch: lpi).
- Always find someone who knows what they are doing and use them.
- An offset printer can always mess things up but generally you will get what you pay
  for.

Acknowledgements
Much of this has been shamelessly cribbed from Chris Edkins and Jeremy Rolfe (Department
of Conservation, Wellington, New Zealand) - cartographers, draftsmen, scientific illustrators
and designers extraordinaire.
Remote Sensing Society: Archaeology Special Interest Group

_AARGnews_ 12 carried a page noting the formation of this group and the contents and span of its first meeting. Since then a second meeting has been held and the group’s first newsletter published. This includes a summary of the aims of the Archaeology SIG which I reproduce in full below\(^1\). While there is bound to be a certain amount of overlap with AARG the SIG offers a much broader view of all kinds of remote sensing currently used, or of potential value, to archaeological investigations. If they can keep the geophysical contingent from taking over I feel there is much for AARG to learn from the SIG. For example, it is among their members and not ours that digital image interpretation is being developed; it is their members who have produced the first paper in _Internet Archaeology_ of a landscape project that has made considerable use of aerial photographs and published them in a way that we have not even thought of (Powlesland, _et al_ 1997). Reading their _Aims_ it seems there may also be considerable advantages in belonging to a group with the oomph of the RSS behind it and I think it important that AARG forms an official link with the SIG and hope that many of our members will think it worthwhile to join. Thus I make no apologies (do I ever?) for including a copy of their membership form on an otherwise blank half page somewhere in this issue!

Reference:
http://intarch.ac.uk/journal/issue2/powlesland/index.html


Editorial
_Welcome from the group convenor_

The launch of the RSS Archaeology SIG on 26 February 1996 has at last opened the opportunity for multidisciplinary collaboration between remote sensing scientists and field archaeologists. It is long overdue as it appears that most of us who work in archaeological, electromagnetic remote sensing have been striving in isolation for years (often the case with rapidly developing new technologies as happened with archaeological geophysics during the formative years in the 1950’s).

It had been extremely encouraging to see interest in the new SIG from such a wide range of specialists - from space satellite systems, through “conventional” aerial applications, to traditional geophysics and alongside these the integration of data sets through GIS. New scientific technologies have always been slow to evolve in archaeology, mainly due to the lack of capital funding for research and development, and it is all the more important therefore that this SIG takes a major initiative in providing a forum for the interchange of new ideas and debate in current research.

\(^{1}\)I am grateful to Alison Cauldwell for permission to reproduce this piece, and for her promptness in whizzing it down the phone line in an already formatted and edited form.
The past year has seen two meetings of the SIG, at the British Geological Survey and RSS 96 in Durham. The quality of the papers given has been excellent and has revealed a very diverse range of interests, although all seeking a common goal in the detection of new archaeological sites and features and the improvement of interpretation within existing, known anomalies. One of the most significant topics raised at both meetings was the availability of data to the archaeological community - and that means data of the right quality and with a sufficiently high resolution. No doubt much future discussion will centre on the improvement of spatial resolution which is so crucial for archaeological interpretation.

A small steering committee has been established to organise future meetings and it is intended to hold at least one national meeting annually. It is likely that the SIG will seek to collaborate with other groups and societies in holding technical meetings. All ideas for future events and meetings are welcome, and I look forward to meeting you all at future SIG events. We hope that you will enjoy reading this first edition of the Newsletter. To receive further copies (Spring and Autumn 1998) please complete the enclosed form and return it to Anthony Denniss with your subscription.

Dr Christopher J Brooke

Aims of the SIG

At the first meeting of the Archaeology SIG there was a general discussion of the aims and role of the group amongst the 50 or so delegates from a range of archaeological backgrounds. The salient points are summarised below.

1. Purpose of the special interest group;

The group has been established as a response to a perceived need to bring people working in the field of remote sensing and archaeology together, to learn from one another and to encourage a coherent rather than disparate appproach to research work in this area.

What role can this group play?

David Greenbaum commented on the value for the community gained through the establishment of the Geological Remote Sensing Group, particularly in encouraging the use of new techniques.

- Do the interests of those attending focus on techniques or targets? A straw poll suggested that interest was divided 50/50 amongst those present therefore perhaps the SIG should reflect this. Other groups exist which have a more specific remit.

2. What does “remote sensing” include?

What areas should the SIG cover - have any been missed out of the programme for this first SIG meeting?

- The definition of “remote sensing” as put forward by Sabins would not include geophysical techniques yet these are well established tools and raise similar issues to those of concern to the remote sensors as defined by Sabins - eg data processing, GPS, GIS.
- Advances in geophysical techniques could form a topic for a future meeting.
- Aerial photography is included in remote sensing. Archaeological techniques which are well established need to be used in conjunction with newer techniques as no one technique will give the full story..

3. What should the activities of the group include? The following were suggested;

- convening meetings for the SIG alone - at least one per year.
- encouraging members of the SIG to attend other RSS meetings eg annual conference.
- convening joint meetings between RSS and other interested groups
- An electronic discussion list could be set up (Martijn van Leuson) but this would exclude those with no access to the Internet.
- A newsletter could be produced.
4. Can the SIG act as a pressure group?

To what extent could the group have a voice to argue for the needs of the community? Eg data acquisition for image and map data.

° Initiatives are being set up, reducing the cost of data for educational and research purposes, including Ordnance Survey data.
° The RSS has strong links with industry and all the data providers are members.
° RSS has negotiated the CHEST scheme. Participating academic institutions can obtain software and images for much reduced prices.
° Images are and could be made available via the Internet. Not likely to be suitable for research purposes but could be a teaching resource - possibly the SIG could provide sample imagery to illustrate the use of remote sensing for archaeological applications on a homepage as a teaching resource.

5. Research Agenda;

What research topics have came out of this meeting? What other topics should be considered?

° Thermal imagery - what factors influence the visibility of crop and soil marks? How can we make best use of the available data?
° Stereoscopic images - Could stereo images be used to create DEM’s for sites where topography is subtle and OS DEM’s are inadequate?
° Links between different types of data; eg parameters controlling geophysical data will also be of interest in relation to thermal data.

6. Points made in relation to the use of digital data

° Images on disc or on a CD are more accessible for interpretative work compared to boxes of hard copy images.
° Interpretation from digital images can be fed straight into GIS - immediate links with map and other data bases.
° PC based image processing packages are now widely available (see Internet).

Image processing is seen as a specialised field. Not many researchers will have access to or be able to afford specialist workers to do this. Poor processing could create false crop marks. Many functions are available in the packages on the market but which algorithms should be applied to what data? A simple guide suggesting techniques that can be applied in archaeological image work would be useful.

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Aerial Archaeology in Central Europe: a short conference review

October 9-11, 1997, National Museum, Prague, Czech Republic

Michael Doneus

The conference was organized within the frame of the project Treasures of our common past – history written in earth, supported by the European RAPHAEL-programme. It took place in the National Museum in Prague. The conference was accompanied by the exhibition From the air – pictures of our common past in Europe, which was organized by the same project and opened during the first evening.

All together, 30 people from eight European countries came to listen to the one and a half days of lectures, which were given in German, English and French. The programme was well balanced and covered a wide spectrum of themes, such as funding of projects by the European Union, historical aspects, regional trends and perspectives of aerial archaeology (from Czechia, Moravia, Hungary, Slovak Republic, Poland and Sachsen), archiving, mapping, GIS-applications and landscape analysis.

The lectures on the recent programmes of our eastern European colleagues clearly showed that, despite the financial problems most of them experience, a lot of good work has been done there. However, it could also be seen that, in central Europe, aerial reconnaissance still does not play the role it deserves. It is still seen by most archaeologists as an independent discipline, which has nothing to do with their everyday work. Therefore, one future aim will be to stress the impact of aerial reconnaissance on the understanding of ancient landscapes, as was demonstrated at the conference by the example from the Yorkshire Wolds.

Personally, I was very happy to hear about archiving experiences since, unfortunately, this theme is very often neglected. How to define standards, how to link archives together and how to make the data available to our colleagues and the public via Internet should be discussed more widely in the near future.

The conference was rounded up with an excursion to Central Bohemia. However, many delegates did not join, but used a fine and sunny day to walk around and see the sights in the city of Prague.

Literature:
Crop Circles: exhibition of photographs

Anthony Crawshaw

Just when you thought it was safe to go back into the air...

...they're back! Yes, it's the Crop Circles!

This time, it's in the form of an exhibition at Camerawork, a photographic gallery at 121 Roman Road, London E2. The exhibition is the work of Rod Dickinson and mostly comprises a series of display boards, upon which are mounted photographs of many of the more interesting recent designs, together with press cuttings about them. The press cuttings originate both from the conventional press, and also from the magazines of the "cerealists". These latter are not aficionados of All Bran, as one might suppose, but those who devote their time to study of the formations. At the top corner of each board is a statement that all these circles are the work of Dickinson and his colleagues. The examples shown cover the period 1994 - 1997. Many of the formations shown are things of beauty, almost, dare one say it, works of art.

There are several things which give me pause for thought about the exhibition and its explanation of the formations. Firstly, I would have been more convinced if some detailed explanations had been supplied of just how some of the very intricate fractal and snowflake patterns had been laid out and constructed. Secondly, Dickinson's parallel interest in UFOs leaves me with a niggling doubt. Thirdly, although Dickinson is apparently a professional photographer, few, if any, of the excellent aerial photographs were apparently taken by him, but by Steve Alexander. In short, there is a question at the back of my mind, as to whether Rod Dickinson and colleagues have moved on from hoaxing Cerealists to hoaxing the fringes of the Art establishment. Go, and make up your own mind.

The catalogue has to be read to be believed; did you realise that crop circles were folk art, whose forms are "made with the desires, fantasies and occult knowledges of the 'true-believers' in mind"? Or that "Dickinson's crop circles enact one of the most widespread psychological conditions in contemporary late capitalist culture, iatrogenesis, or co-dependence"? No? Go, See and Believe..., or alternatively find the text on the web site next below.

Rod Dickinson and his colleagues have a web site, which includes details of how to 'roll your own', if you will pardon the expression, plus more.

http://www.head-space.com/circlemakers/index.html

is where to find them. It is a nicely designed site, a pleasure to look at.

The cerealists have their own web site, The Crop Circular, at

http://www.nh.ultranet.com/~lovely/homepg.html

This site is also a visual delight, with globes, upon which you may click, for further information. The instruction reads "Click balls to access pages". (I kid you not – you read it first in AARGnews – Newsquiz eat your heart out!)
Try also another crop circles site at  
http://theparaweb.com/aliens/crop.html
with some links in it.

The gallery itself has a web site at  
http://www.camerawork.net
This is not particularly well organised, with no obvious information on the exhibition. The 
viewer is asked to download extra software to view the site fully, which I could not be 
bothered to do.

Another site which might be worth a look is called 'The crank menagerie', which was turned 
up by a search on "The Crop Circular", said to be at  
http://www.lns.cornell.edu/~niehle/crank/html
My attempt to visit it met with a message to the effect that it might not still exist, so we 
crankers may be out of luck.

The exhibition runs until the 8th. April, Tuesday - Saturday, 1-6 p.m., Sundays 1-5 p.m., 
admission free. The nearest tube station is Bethnal Green, on the Central line, which has an 
entrance on to Roman Road; the gallery is about ten minutes walk away. The gallery's 
telephone number is 0181-980-6256. I enjoyed my visit.
Radar images on world wide web

Anthony Crawshaw

The following two pages list sites of Radar Images and was given out by Dr. Blom of NASA’s Jet Propulsion Laboratory, at the St. Cloud conference on Remote Sensing in Archaeology. This conference was reported on in the last AARGnews.

I have tried most of the www links given and the only one found not to work was the JPL Educational Outreach Center. The link: http://edcwww.cr.usgs.gov/landdaac/sir-c/ is the site that enables you to identify the coverage of particular areas.

I am told, by Dr. Blom, that a good entry level introduction to the interpretation of radar images may be found in the new edition of the book Remote Sensing, Principles and Interpretation, by Floyd Sabins. A description of the technical aspects may be reached from the NASA-JPL home page:-


Another web site of interest is a list of links relating to GIS and Remote Sensing:-

http://www.calmit.unl.edu/calmit/gisrs.html

Weather freaks might be interested in a list of weather-related links at:-

http://www.met.reading.ac.uk/~brugge/index.html

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And from the same author (and to fill in the space) comes the following communication:

Remote Sensing Applications in Archaeology

I have just tried to visit the Remote Sensing Applications in Archaeology site, St. Cloud State University, and find that they have reorganised themselves into the Archaeological Remote Sensing Consortium.

Their new address is

http://eleftheria.stcloud.msus.edu/arsc

Clearly my eyesight is deteriorating (too much cranking!) as I read the final character as an 'E', instead of a 'C'.

There is a promise of publishing the proceedings of the 1997 conference on CD, but no details, as yet. Much of the material is straight from the old RSAA home page, not even the name changed.
HOW TO OBTAIN EARTH IMAGING RADAR MATERIALS

This information sheet explains how to obtain NASA photographs, slides, mission status information, and CD-ROMs produced by the Earth imaging radar missions at the Jet Propulsion Laboratory (JPL). Also listed are home pages where you can obtain information and see radar images.

Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, California 91109
http://www.jpl.nasa.gov

* INTERNET COMPUTER ACCESS

NASA/JPL IMAGING RADAR HOME PAGE
The radar group at JPL has set up a World Wide Web server site. The URL for the site is:

http://southport.jpl.nasa.gov/

The site contains up-to-date information on the Earth imaging radar programs at JPL, educational materials, radar images, and results from previous missions. Also available is information about future missions, sample data and videos, information on how to get radar images and software for displaying radar images, plus links to other Internet sites including:

JPL Educational Outreach Center:
http://www.jpl.nasa.gov/education.html

JPL PUBLIC INFORMATION OFFICE
PUBLIC ACCESS COMPUTER SITE

The JPL Public Information Office (PIO) provides general information about JPL missions. PIO will direct specific inquiries to the appropriate sources. The office's primary responsibility is to provide materials to the working press.

JPL PIO maintains a public access Internet computer site for imaging radar data:

http://www.jpl.nasa.gov/radar

For questions related to the PIO site, please contact:

Public Information Office
Mail Stop 186-120
(818)354-5011, Fax: (818)354-4537

* RADAR IMAGE DATA

GENERAL INFORMATION

NASA/JPL has acquired radar image data from its ongoing Airborne Synthetic Aperture Radar (AIRSAR) program (1988 to present), and from four Spaceborne programs (SEASAT [1978], Shuttle Imaging Radar-A [SIR-A] [1981], Shuttle Imaging Radar-B [SIR-B] [1984], Spaceborne Imaging Radar-C/X-Band Synthetic Aperture Radar [SIR-C/X-SAR] [1994]. Coverage has been obtained over parts of all continents, and most oceans, in support of scientific investigations in ecology, geology, hydrology, oceanography, and radar sensor technology.

Information on future imaging radar missions can be viewed at the following URLs:

Geographic Synthetic Aperture Radar (GeoSAR):
http://www.consrv.ca.gov/geosar/

Light Synthetic Aperture Radar (LightSAR):
http://lightsar.jpl.nasa.gov/lightsar

Some data from AIRSAR, SEASAT, and SIR-B are available from the JPL Radar Data Center. Contact them for specific product and media availability.

Radar Data Center
Mail Stop 300-233
(818)354-2386; Fax: (818)393-2640

SIR-A optically acquired and processed data are available as 5 inch photographic products from the National Space Science Data Center (NSSDC) in Greenbelt, Maryland. Contact the NSSDC for specific ordering information.

National Space Science Data Center
Request Coordination, Code 633
NASA/Goddard Space Flight Center
SIR-C low-resolution, and precision digital data are available from the U.S. Geological Survey's EROS Data Center (EDC). For specific coverage information and product availability, check the SIR-C page of EDCs website at URL:

http://edcwww.cr.usgs.gov/landdaac/sir-c/

* PHOTOGRAPHIC PRODUCTS
Photographic products of released images are available through the JPL contractors listed below. They maintain and sell a catalog of available images which is updated periodically. Released images have a specific "P-#" which can be found at URL:

http://www.jpl.nasa.gov/radar

All images have captions describing the area covered and features of particular scientific interest. For products contact:

Newell Colour
221 North Westmoreland Avenue
Los Angeles, California 90064-4892
(213) 380-2980, Ext 269
Fax: (213) 739-6984

* SLIDE SETS
Slide sets of some of our most popular images can be previewed on line at:


Slides may be purchased from:

Finley-Holiday Film Corp.
Box 619, Whittier, CA 90601
(800) 345-6707; Fax: (310) 693-4756

* VIDEOS
JPL has an on-line video resource catalog at:

http://www.jpl.nasa.gov/video/

A wide variety of space-related videos for home or educational use can be purchased from:

Finley-Holiday Film Corp.
Box 619, Whittier, CA 90601
(800) 345-6707; Fax: (310) 693-4756

Most copies can be produced in NTSC or PAL formats.

* SIR-C EDUCATIONAL PRODUCTS
The SIR-C Education Program (SIR-CED) is an education initiative based around NASA's imaging radar program. Its primary component is a CD-ROM designed for middle and high school students. The CD-ROM is available from NASA CORE at a minimal cost. The CD can be used on a PC, MAC, or UNIX computer.

The CD-ROM can be previewed at no charge on the following site on the World Wide Web:


Other education packages are also available from NASA CORE.

NASA Central Operation of Resources for Educators (CORE)
Lorain County JVS, 15181 Route 58 South
Oberlin, Ohio 44074
Tel: (216) 774-1051 (ext. 293/294)
Fax: (216) 774-2144
http://spacelink.nasa.gov/CORE

* EDUCATOR RESOURCE CENTERS
NASA's Education Division supports Educator Resource Centers (ERCs) at each NASA Center, as well as a large number of Regional ERCs in cooperation with educational organizations around the country. It also supports a national center for distribution of audio-visual materials, known as NASA CORE (address above).

The ERC at NASA's JPL has a variety of planetary material available for teachers. The JPL ERC has a video collection, which is updated periodically. For information on titles/contents, and other services, contact:

JPL Educator Resource Center
Mail Stop CS-530; (818) 354-6916

Gábor Bertók

The concluding event of the 1997 Treasures of Our Common Past in Europe - History Written in the Earth - Aerial Archaeology in Central Europe project (supported by the RAPHAEL Project of the European Union) was the opening of an aerial archaeological exhibition in Pécs, Hungary (displayed last October in Prague). At the same time a meeting (Workshop Pécs) of researchers interested in aerial archaeology from various European countries took place at the Department of Ancient History and Archaeology, Janus Pannonius University, Pécs. This was attended by 22 delegates representing Lithuania (2), Poland (4), Scotland (1), Germany (3), Romania (2), Slovakia (2) and 8 from the host country.

The following topics were discussed:

- how archaeological air reconnaissance is organised and integrated into the archaeological topographical research in the participants’ countries,
- on integrating aerial photography into archaeological fieldwork,
- possibilities of cooperation in aerial archaeological research and possible plans of a common application for further RAPHAEL support in 1998/99.

Lectures held during the Workshop (in chronological order):

- W. S. Hanson (Scotland): on the integrated survey methods (field-walking, aerial photography, geophysical surveys and selected excavations) and latest results of the Upper Clyde Valley project, with special emphasis on exploiting the maximum possibilities presented by aerial photographs;
- O. Braasch (Germany): many examples showing the possibilities of winter aerial photography and surveying underwater sites from the air;
- I. O. M. Bogdan-Cătănicu (Rumania): on using old aerial photos taken for mapping purposes to survey the archaeology of the Dobrogea region in Rumania;
- Zs. Visy (Hungary): on the latest developments of the Babac project (Baranya County, Hungary) to survey and research a Roman villa and its environments using field-walking, geophysical methods (caesium-magnetometer-survey), geochemical sampling, aerial photography and excavation;
- Ivan Kuzma (Slovakia) presented a poster that described the integrated archaeological methods used by the Archaeological Institute of the Slovakian Academy of Sciences to explore the possible neolithic circular enclosures in Slovakia.
AirPhoto - A WinNT/Win95 Program for Geometric Processing of Archaeological Air Photos

Irwin Scollar

Irwin Scollar has condensed his years of image processing experience into his program AirPhoto. This is currently in the beta-test phase and is expected to be commercially available in the near future. I (Rog) have spent a short time with a beta-test version and found it a delight to use, and produced a series of rectified images using a range of control points within a couple of hours of downloading. Control points are placed by mouse and can be dragged to a better place when things go wrong. Development of the program is taking account of different file types (tiff, jpeg, png, pcx) and will soon have the option of using coordinates from any one of 18 national grid systems. I was amused by a comment in a recent email: ‘The next version (1.14) which I’m still working on has a transformation which permits dealing with very hilly terrain if there are seven or more control points. That seems to have worked quite well on a few test images from Switzerland.’. The text below is extracted from Scollar’s more detailed Readme file but is sufficient to give AARG members a taster of his program.

Aims:
To provide a useful tool for archaeologists (and perhaps others) without large amounts of money to spend on hardware or software which will enable them to deal with a reasonable number of the many aerial images which have accumulated over the years using modest PC's and peripherals.

Another aim for AirPhoto is to avoid as much human interaction with the data in the images as possible. The idea is to use extreme oblique images and overlay them with a base map or maps as output. It is primarily intended for images made with uncalibrated hand-held normal cameras. It also includes a simple transformation for dealing with some kinds of satellite or scanner imagery. Since such images rarely have archaeological information, no great effort will go into dealing with them.

What AirPhoto does:
AirPhoto makes pseudo-orthophotos from scanned extreme obliques and superimposes scanned maps on them. It is not a photogrammetric plotting program, nor is it a true orthophoto program working from a digital terrain model. It is designed to give a very fast result with a minimum of handwork apart from the entry of corresponding control points in a picture and a map. Colour or black and white images may be used, and up to four maps may be combined to obtain a result for pictures which show data contained within more than one map. Mosaics may be made from multiple colour or black and white images. The map may be overlaid in black or white with the image(s) or combined with them to give best visibility.

What AirPhoto is not:
AirPhoto is not intended to compete with high accuracy photogrammetry packages. Most archaeological air photos have been made with uncalibrated cameras under uncontrolled conditions with inadequate numbers of control points, so only a fairly useful qualitative result is feasible. An estimated 5,000,000 images made since the 1920’s in the European archives represent an enormous amount of data which can never be recaptured under controlled conditions. It is the goal of AirPhoto to deal with this kind of image within the limits of the data and the financial limits of most archaeological institutions and private investigators.

It is also not intended for making site plans which are essentially based on subjectively extracted data from photos put into maps. AirPhoto has no option for subjective choice of information apart from the choice of control points, it’s WYSIWIG (what you see is what you get).
Why use AirPhoto?
The advantage is that it's much faster than a photogrammetric plotting program and is without any subjectivity in the interpretation of data by the user. The disadvantage is that it is not easy to incorporate data from many photographs taken over many years under widely varying conditions at least in the present version.

Another disadvantage is that it does not currently deliver a black and white site plan such as archaeologists are used to using. It only delivers another photo in colour or in black and white, geometrically corrected to fit the map data as a guide to where things are. It does not deliver the abstraction from reality which a plan constitutes. The user then has to make his own decision about the information thus presented and perhaps use the output in a CAD or GIS, or drawing package to superimpose his interpretation on the geometrically corrected data.

Hardware requirements:
A Windows NT or Windows 95 computer with at least 16 MB of physical memory. A Pentium, Pentium Pro or Pentium II processor will greatly speed up operation but the program has also been tested successfully on a 486 66mHz machine.

32MB or more of physical memory will be an advantage. The virtual memory setting of the machine must be set to at least 64 MB, preferably more.

You also need a scanner to enter new data. A flatbed or slide scanner with at least 300 dpi and 24 bit colour resolution is recommended if you wish to process colour air photos.

It is advisable to have a display with 1024x768 or higher resolution, but the program will work with displays having lower resolution.

Software:
Although the program will work under Win95, it runs 20% faster and better under WinNT 4.0. If you haven't installed WinNT, consider doing so. Although the screen looks like Win95, it is a completely different and far better operating system, unless you like to play DOS games which WinNT won't support. It is also useful to have as much physical memory as your machine and finances can support. However, be warned that if you have a machine with an Intel TX chipset, the optimum amount is 64MB, beyond which performance may actually degrade due to cache misses.

An image treatment program for pre-processing colour correction, sharpening and other image editing tasks like Adobe Photoshop or the much cheaper shareware programs Lview or Paintshop Pro will be advantageous, since the current version of AirPhoto does no pre-processing.

Trial program:
AirPhoto can be downloaded for a 30-day trial from the following servers:

Europe:
FTP ftp.uni-koeln.de /pc/basp
http://www.uni-koeln.de/~AL001/basp.html

UK:
FTP super3.arcl.ed.ac.uk (dir) ftp/pub/baspmirror
HTTP

If you use these servers to pick up Winbasp and other files, please use only one of them for a given set. Otherwise, if you mix files from different servers, and there are delays in synchronisation, the installation or running of programs may fail.

Enquiries:
Irwin Scollar: AL001@RS1.RRZ.UNI KOELN.DE

PS: Fruitful research?
While spell checking, my computer wanted to change airphoto to apricot. I’m sure Irwin Scollar is capable of writing a program for the geometric processing of archaeological apricots – but would we have a use for it?
News from Europe

Hungarian aerial photographs
Following comments in the last issue of AARGnews we have received a letter from Zsolt Visy noting that all photographs taken by Otto Braasch between 1992 and 1997 plus those resulting from the training week are now indexed and available for consultation by Hungarian scholars. His letter to AARG included a copy of the distribution map and letter that has been circulated to potential users. Completion of the indexing of the 8000+ slides from the training week is quite some achievement and we can look forward to hearing how this growing collection becomes used in understanding aspects of the country’s past.

Archaeology mailing list
A new mailing list "ARCH-DE" for archaeology in German (we speak English too) has been set up recently. Hopefully it will become a useful source for tapping and exchanging information on archaeology in Austria, Switzerland and Germany. The address is:
arch-de@charon.ufg.uni-freiburg.de
There are two web pages holding information on how to register etc and on what the list is all about:
http://www.uni-tuebingen.de/ufg/archde.html
http://www.ufg.uni-freiburg.de/d/forum/disput/arch-de.html

European Council
The complete text is in Web at: http://www.coe.fr/summit/edeclplan.htm
Further information at:
www.coe.fr/summit/epresentation.htm = Introduction
www.coe.fr/summit/edeclplan.htm#ActionPlan = Final Document
www.coe.fr/summit/eheritage.htm = Special Documents, Enhancement of the European Heritage

Summit proposals:
A new European Heritage Campaign to mark the 50th anniversary of the Council of Europe in 1999, to include projects and activities across Europe. Areas to be considered will include conserving cultural landscapes and ‘moveable heritage’ (eg. art objects, sculptures and furniture) in their original environment and tackling the abuse of cultural heritage in times of conflict.

A major exchange and training programme to preserve and revitalise professional and traditional crafts and skills.

There may be opportunities for archaeological efforts in 1999 within this new Heritage Campaign. This would add to the ongoing RAPHAEL program of the EU, although archaeology does not seem to have fared too well in 1998. The AARG-related application for a second training week – this time in Poland – did not get RAPHAEL funding, and the application for the RAPHAEL project ‘History of Landscapes’ could not be completed in time by the University of Glasgow – the given deadline was just too short to get the paperwork done.
Obituary: Tom Hayes

Paul Everson

Tom Hayes, who piloted me for aerial reconnaissance in northern Lincolnshire in the late 1970s and early 1980s, died in April 1997. Tom was amongst the nicest men I have been fortunate to know. He was as capable and reliable in his own areas of expertise, which included building and flying light aircraft, as he was unassuming in deploying those skills. He used to talk about the amount of cycling he did in his youth, which gave him a lively knowledge of the diversities of the landscape and interest in how it was and had formerly been used and occupied. In my experience he took an open-hearted pleasure in the aspect of discovery that characterises first-hand archaeological work, whether through finding Roman pottery or flint on the ploughed fields of Branston, where he lived, or in observing the cropmark affects of buried sites from the air.

Certainly through this latter activity he made a more major contribution to the archaeology of Lincolnshire than is generally known or will ever appear from the formal records. For he observed the formation of cropmarks in parts of northern Lincs. and Kesteven for many years when flying his own plane from Sturgate, and had well-informed knowledge of where they most commonly occurred. He tried photographing them, but with results that were unsurprisingly disappointing given that he was flying solo and in a low-winged aircraft. Instead, he always welcomed opportunities to combine his enthusiasm with helping others who were interested. In the 1960s he piloted the RCHME’s chief photographer, Bill Light, to secure aerial images for the York inventories. In Lincolnshire, he flew a few sorties on behalf of Lincoln City and County Museum with Denis Petch (I think) and Peter Wilson taking the photographs on different occasions, but without the benefits of a sustained programme of reconnaissance. When I approached him in the late summer of 1976 on behalf of the fledgeling North Lincolnshire Archaeological Unit, our timing missed the remarkable drought conditions of that summer and its predecessor.

Nevertheless the subsequent years brought steady and economically achieved results. This was due in no small measure to Tom on at least two accounts: first he was flying regularly anyway, keeping an eye on crop conditions and prompting our reconnaissances accordingly; secondly, he was far more than the pilot, being as adept at spotting archaeological features on his side of the aircraft as I might be on mine. I often recall the brilliant early Saturday and Sunday mornings in summer when we flew, and going to Sturgate to unlock the hanger and pull out the club plane to set off long before anyone else was about. Or a couple of winter flights we made in a borrowed Auster, with open cockpit and wearing leather flying cap and gloves in freezing conditions. Post-flight debriefing was ritually accompanied by tea and Wagon Wheels - a combination as evocative of these adventures for me as the thrill of the experience itself. In a more formal way, it was a pleasure as well as a due acknowledgement of his role to associate him with the contribution on air photography that we made to Mrs Rudkin’s Festschrift. He in turn was pleased to have a part in honouring someone he had known and respected for many more years than most of us.

Tom’s contribution to Lincolnshire’s archaeology was considerable, and to a large part invisible in the conventional published literature. See nevertheless:


[This obituary appeared in Lincolnshire Past and Present and is used with kind permission of the editor, Hilary Healey.]
Books of interest?


Many archaeologists new to Yorkshire will have experienced the excitement of opening J. R. Mortimer’s *Forty Years’ Researches in British and Saxon Burial Mounds of East Yorkshire* and discovering the pullout coloured map of the linear earthworks and barrow cemeteries of the Yorkshire Wolds - followed by the disappointment of visiting the area, and discovering it to be almost devoid of upstanding prehistoric earthworks. *Forty Years’ Researches* was a product of the Edwardian era, when primitive aircraft were just getting off the ground (literally in some cases). The first air photograph of Stonehenge (from a balloon) was taken in the year when Mortimer’s great volume was published. Two years later came the Earthworks Committee and the beginnings of the foundation of the Royal Commissions. Now, nearly a century later, the Royal Commission has produced this superbly-crafted volume. The skilled transcription of some 35,000 air photographs has countered the destructive activities of the centuries (as this book demonstrates, the demolition of east Yorkshire’s antiquities has been going on since late prehistoric times). The Royal Commission has presented us with a richer stock of earthworks than Mortimer can ever have anticipated. These mostly take the form of lines on maps - four maps at the scale of 1:25,000, supported by various other ‘period’ and area maps.

Catherine Stoertz’s text is lucid and straightforward, a model of the balance, caution and ‘objectivity’ which one expects from the Royal Commissions. It is understandably economical. Clearly, hard decisions have had to be made about avenues not to be explored; for instance, there are only four air photographs in the book, and discussion of comparable material elsewhere is virtually non-existent. The earthworks can be roughly dated and put into sequence by morphology, typology, their relationships with one another, and the evidence gleaned from excavations. Six major horizons are defined, from the Neolithic to the early post-Roman, although chronological definition is still poor; the duration of these horizons and the extent to which they overlapped, are not yet well understood. Many readers will become absorbed in trying to interpret the pattern made by the (mostly later Bronze Age?) linear earthworks, some of which are several kilometres long. Stoertz suggests that ‘organic’, piecemeal developments took place within an early framework (probably later Bronze Age) which subdivided land on a grand scale. The late Iron Age and Romano-British periods feature the remarkable ‘linear’ settlements, their roughly square domestic enclosures set along broad droveways leading out to what seem to be large pastures set within the older dyke framework. The field antiquities of this period are odd in both Yorkshire and British contexts - a superabundance of burials, yet no real ‘hillforts’; a wealth of land boundaries, but without Grassington-style ‘Celtic fields’, or coaxial systems in the style of those further west, on the Magnesian Limestone and in the Pennines. It is good that, despite the East Yorkshire chalklands’ early start, they have not established in prehistorians’ minds the hegemony which the Wessex chalklands have achieved in the south of England. There may be lessons for us in contemplating an area which may in some sense have ‘by-passed’ mainstream Iron Age and Roman developments, although we will have to tiptoe carefully among the issues raised by the practice of reading social and economic organisation from patterns in the landscape.

This book is offered as ‘a basis for further research’. It is to be hoped that the Swindon archive is well indexed, because there are quite a number of research questions which are, understandably, not answered in the book, and take us beyond the recognition of pattern in networks of lines: how to interpret the fading out of linear features in individual cases; how to understand and work with the complex interplay between ‘boundaries’ and ‘trackways’; how to tease out a sequence in places where there is chronological depth, especially at the ‘points of landscape control’ (one wonders whether there really are no
provisional understandings this side of full excavation). I would like to know more about the extent to which medieval land use has affected the completeness of the pattern. One might regard this book as a beginning, a necessary demarcation of the terrain in advance of detailed, problem-oriented engagement with the material. But it is also one of the achievements of this tremendously worthwhile enterprise that, despite problems of time-depth and chronological uncertainties, for several periods of prehistory we probably now know as much about the distribution of settlement and land-use patterns as we do about these phenomena in the late medieval period. There is much to build upon here; Catherine Stoertz and the Royal Commission deserve our warmest thanks and congratulations.

Andrew Fleming
Dept of Archaeology, University of Wales, Lampeter


This book was produced as part of the Luftbildarchäologie in Zentraleuropa event held in Prague last October and briefly reviewed by Michael Doneus in this issue. Although part of its role in life is to serve as a catalogue to the travelling exhibition of aerial photographs it is considerably more than just a catalogue, comprising ten illustrated introductory essays as well as 113 A5 sized, and mostly colour, plates. Essays are written in English (2), German (6) and French (1) and range from basic principles and history to specific examples where field investigation has taken place. While the historical concern is mostly with the airborne side of the work and the discovery factor, it is shown that the real archaeological investigations begin once the aircraft has been put back in its box. The book updates papers given at AARG meetings, such as Ivan Kuzma’s investigations of Slovakian ‘rondell’ sites, and shows some of Zsolt Visy’s work on Roman remains in Hungary. Interestingly, Visy’s source photographs include many of military origin suggesting that there is a way into the archive of central Europe taken during the cold war.

For many, especially we mono-language Brits, it is the pictures that will form the most useful part of the book despite, in some cases, these having some curious colours [our European correspondent told me that it was produced in a hurry – although I’ve seen worse from supposedly ‘normal’ printing]. This is also where the title of the book, pictures of our common past, shows its meaning. To those of us familiar with pictures of our own country, whichever one, there will be photos that, if seen without the caption, could well belong there while others are definitely ‘foreign’. This is perhaps to be expected from features constructed using a common technique (digging holes) and presents a past version of what can be seen today in the buildings in each country: the only difference is that the APs show similarities and differences in cropmarks. No, see how stupid that word is ... the APs show us that there are similarities and differences in the plans of ditched features.

But remember that this book accompanies an exhibition and is likely to be bought by the non-archaeological public. As such it is an excellent way of getting archaeological aerial photographs into the homes of ‘ordinary’ people, but will these make sense to them even after reading Martin Gojda’s essay on the principles? I think that most of the plates can be understood – to the extent of seeing the features photographed – without too much head-scratching, and the captions offer brief and multi-lingual descriptions of, usually, what is showing and how it is showing (although there is a tendency to use the word ‘cropmarks’ to describe earthworks too, but that may have arisen through attempting to write all captions in a uniform style). Our descriptions of sites may cause a few headaches to the public. What mental pictures of the past will be conjured up by, ‘A possibly multiple-phased double-ditched, although intermittently single ditched prehistoric settlement site...’ (p149), or
‘Double-ditch system?’ (p97), or ‘Circular ditch of 30m diameter visible as cropmarks, results [what results???] confirmed by geophysical research.’ (p115)? Who lived in, ‘Cropmarks of an earthwork.’ (p157), and what archaeological sense is there in, ‘One of the only photos to show parch marks inside the neolithic henge of Avebury.’ (p190)?

Regardless of the fact that the book may have been produced in a hurry, more thought should have been given to the captions as these are the only way for the public to begin to read and understand the photos. With no helping archaeological finger to point out what to us may be obvious, just how far might the public get towards visualising some of our common past? My answer has to be ‘not far’ and I give two reasons. Firstly, is that a glaring omission among the introductory essays is one describing what went on in the past. It is assumed that the public know that people lived in cropmarks and buried their dead in cropmarks, etc, etc without telling them what we know about their daily life – that, for example, in places there were villages surrounded by fields and linked together by tracks; that some people lived in round huts set within property defined by embanked enclosures, and so on. Archaeological research has provided such pictures of the fabric of past societies and it is unfortunate that this, ‘how they lived’, was not communicated to the readers of this book. My second point concerns the captions and their relationship to the photos. In many cases they barely relate, hinting at the archaeological features but neglecting the topography, the natural features, and some of the more relevant modern features. In a catalogue like this I would expect the captions to describe the picture, not summarise (poorly) the archaeological bits.

However, all this aside, for AARG members this will be a useful book. It provides a compendium of almost Europe-wide sites that I’m sure will be useful to those of us who lecture and it shows the achievements and the advances that have been made in the last few years. And it does begin to show the commonality of the past as well as those differences which, using excavated artefacts, enabled scholars such as Childe to chart European prehistory. Might it be possible to generate a new version one day by studying what may be called the civil engineering of the past rather than the products of its light industry? This is where aerial photographs start to get interesting – in the potential they hold for understanding our past – and this surely is where the R in AARG should be probing.

For enquiries and for orders of the catalogue: Frau Susanne Mai Dipl.-Bibliothekarin (FH) Landesamt für Archaeologie mit Landesmuseum für Vorgeschichte Japanisches Palais D-01097 Dresden Germany


A first glance at this book reveals that it might be of some interest to aerial archaeologists and archaeologists alike. The initial impression one gains from the title and lavish appearance is of a ‘coffee table’ book, but on reading it quickly becomes clear that this is an authoritative look at the archaeology, history and landscape of Ireland. Gillian Barrett has contributed sections on the ‘hidden landscape’ and the destruction of antiquities, illustrated with archaeological air photographs and distribution maps. Some of these show the dramatic effects of land clearance and agricultural ‘improvement’ on the preserved ancient landscapes of the Dingle Peninsula, County Kerry. Perhaps of greatest interest is the wealth of aerial photography used throughout the volume to illustrate a range of subjects from geology and settlement patterns to habitats and historic buildings. A full review may follow in the September edition of AARGnews.

Toby Driver
A contribution in this issue outlines the aims of this group. While I’m not trying to lead anyone away from AARG, I think this will be of interest to some members. Maybe the Group will serve as the technical research and development arm of AARG..?

Archaeological Remote Sensing Group - Membership Form

Title ___________ Initials _______ Surname ________________________________

Affiliation

Address (for correspondence)

__________________________________________________________

__________________________________________________________

Telephone ___________ Fax ___________ E-Mail _______________________

Membership fees (renewal October 1998)

<table>
<thead>
<tr>
<th>Individual:</th>
<th>Student £3</th>
<th>Other £5</th>
<th>Institute £10</th>
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<tr>
<td></td>
<td>Student US$10</td>
<td>Other US$15</td>
<td>Institute US$25</td>
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</table>

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Return completed forms along with payment made payable to the Archaeological Remote Sensing Group (A.R.S.G) to:

Anthony Denniss, ARSG Treasurer, Phone:+44 (0)115 9363290
British Geological Survey, Keyworth, Fax: +44 (0)115 9363474
Nottinghamshire, NG12 5GG, UK Email: a.denniss@bgs.ac.uk


Kevin Jones sent notice of the following, and a few printable comments, including:

‘The authors don’t appear to have done either the aerial photos or the photogrammetry. The only innovative point is that they have calculated room volumes from the rubble volumes.’


On page 130 under the heading ‘Cremation’ there are two paragraphs of crucial importance to those of you who misuse the term crop mark (or the word cropmark). Within those paragraphs you, the reader, can substitute ‘crop mark’ and ‘crop-marked’ for ‘cremation’ and imagine you’ve heard it all from me, even to her phrase: ‘In practice, no archaeologist has ever excavated ‘a cremation’, ...’. Lovely stuff!

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1Addresses are Britain unless otherwise located [I’m not being nationalistic, they wouldn’t fit the page otherwise!]