

AARGnews 8

CONTENTS

Editorial	....	....	....	....	....	3
Chairman's Piece <i>by Marilyn Brown</i>		....	....	....		6
New Journal : <i>Archaeological Prospection</i>	....		....	....		7
Aerial Photography – present techniques and future aspirations <i>by Chris Cox</i>						8
AARG1993 – Oblique Aerial Photography – Cameras <i>by Anthony Crawshaw</i>						13
AARG Annual Meeting 1994....		....	....	....		18
Tiptoe through the Cropmarks, Squelch through the Fens – but what next..?						
<i>by Rog Palmer</i>	....	....	....	....		19
3-D Still Video Images <i>by Anthony Crawshaw</i>			....	....		24
RCHME Closes Down!	....	....	....	....		25
Wazzat? Number 2 – not the answer! <i>by Anthony Crawshaw</i>				....		26
‘Aerial Archaeology’. What? <i>by Rog Palmer</i>			....	....		27
Books of interest?	....	....	....	....		30
Register of New Members (1993-1994)	....	....	....	....		32
List of Contributors	....	....	....	....		34
Notes for Contributors	....	....	....	....		35

EDITORIAL

Yes, we're getting thinner. At the AARG of the first issue I was given a life expectancy (for *AARGnews*, not me) of three years by a well known editor of aerial publications. We've managed to clear that but for how much longer is up to you as there is a limit to the amount of stuff that Anthony Crawshaw and I can churn out. And is it what you want anyway? Nobody tells me and not all that many members have left AARG so I can only conclude that no one out there is doing anything of interest! Or am I a member of the wrong research group?

Let me bore you (again?) by asking for your definitions of 'aerial archaeology'. I'll even buy a pint for the sender of one that I can understand – or which makes sense. I ramble on about it somewhere in this issue and can note from the benefit of the Editorial chair that Chris Cox (?sensibly) appears to restrict it to the physically airborne part of the game while a wider view must be encompassed by the phrase '...all aspects of aerial archaeology...' in Marilyn Brown's *Chairman's Piece* that follows. While I agree that from aerial beginnings may the rest of 'field archaeology' extend there must be a point, for purely functional reasons if for no others, beyond which 'aerial archaeology' is transformed into 'someotherkindof archaeology'. Come on then, please tell me where *you* think 'aerial archaeology' hands over to other specialists. Meanwhile, with my head stuck in the fens (or should it be sand?) and I remain unable to grasp, let alone define, what it is – therefore I refuse to accept that it can exist. [Wasn't much the same said of giraffes in Victorian England?]

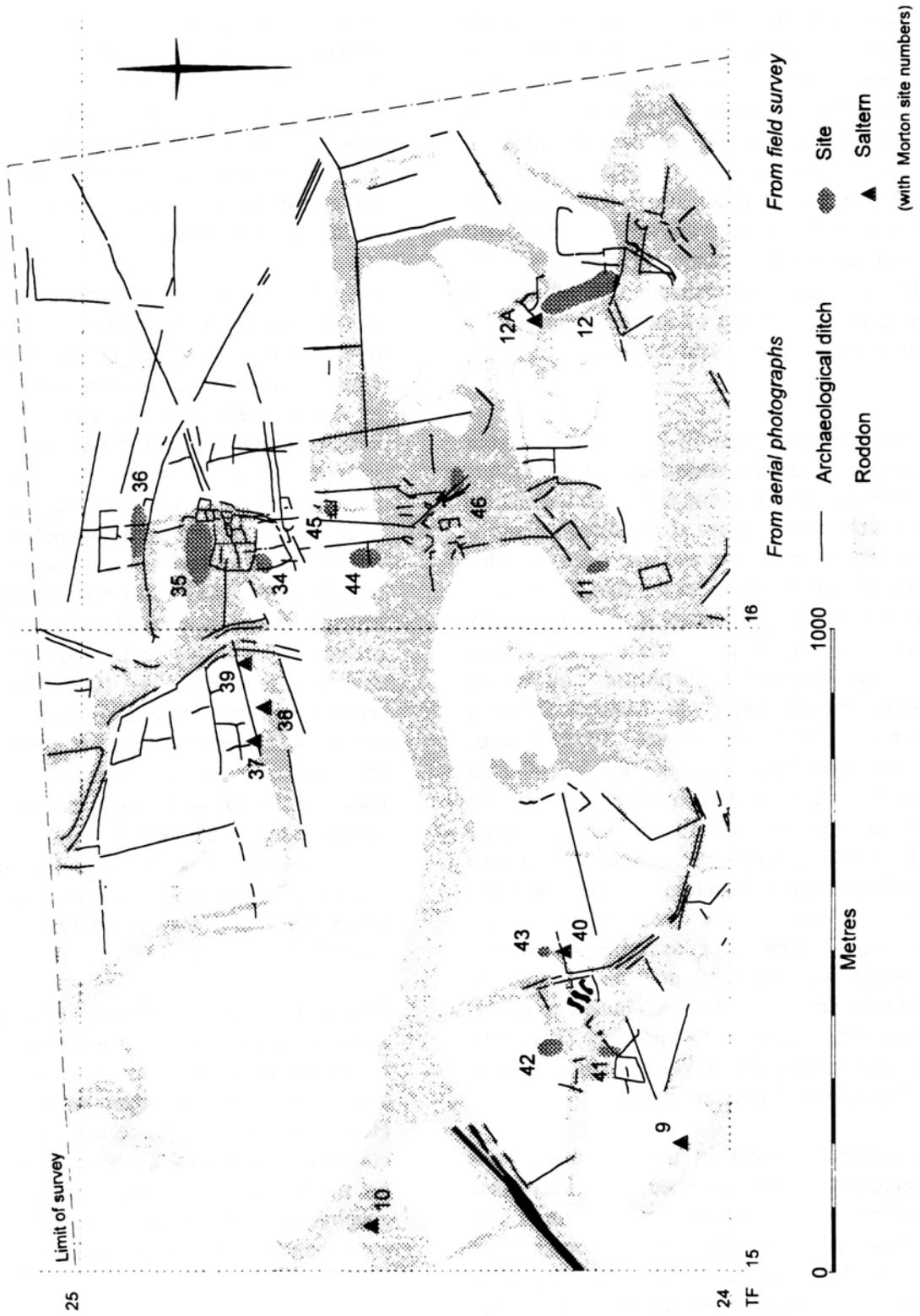
As a research student in the 70s there were contemporaries who relished the idea that archaeology was a science. An outcome of this was that, as 'scientists', they thought that everything they said had to be right – therefore they said very little! One of the good things about archaeology is that we are allowed to be wrong – indeed, don't we expect to be wrong? We try our best to be as right as is possible but we know there to be a

possibility that another hole in the ground (or even another aerial photograph) can alter the best of deductions. Surely part of 'the job' is to air ideas for colleagues to ponder or ridicule and, perhaps, the more of these the better the end result.... *AARGnews*, you may remember, was intended as a platform for discussion. We've had some, but not as much as there could be.

So, what can we do to attempt to sort out our own aerially derived problems? We might begin to extend our knowledge by admitting ignorance when we haven't a clue (something that was lost as AARG grew older and some of its members became 'important' and, maybe, can no longer be seen to be in doubt...). We could usefully precede field work (perhaps!) by engaging in a wider range of analytical procedures to tackle clearly stated problems – and then chuck out the ones that didn't work. Whether the old saying, 'a problem shared is a problem halved', is true in archaeology remains to be seen but there is a chance to find out at AARG in October. At a recent committee meeting to discuss AARG 94 our new Chairman got things going by saying that she wanted to find out what 'small enclosures' were ... "I've got lots and want other people to tell me about theirs and what they are" ... So we plan to ask three or four members to talk within a specific framework – and hopefully something useful may come of it. Details of AARG 94 will be found

This issue contains brief notice of a new journal, *Archaeological Prospection*, and it will be interesting to see how any aerial input compares with publication of other survey techniques. Here, possibly, is the place to make some comparative studies – although whether this will get much beyond 'air photography finds a site, geophysics shows a bit more, and excavation more than that' is another question..

I have had a couple of enquiries from AARG members about use of Professional Draw. My use of it is improving as I hope the figure opposite shows. That is a composite of about



20 AERIAL files, edited only to remove 'slightly off' duplication of features and straighten out the worst of the digitised shakes (old age rather than beer) with added natural background and sites (numbered) from the part of the Lincolnshire fenland survey. The figure does not include the central channels (ie the then-flowing water) but may help illustrate some of the features I discuss in *Tiptoe through the cropmarks..* (pages 19-23). Roddon side ditches can be seen east of site 39 (area TF159248) and there are several of the perpendicular ditches.

Many of the developer-funded assessments that APS undertake include such a digitally compiled figure. It seems to take no longer than making a conventional drawing and has the tremendous advantage that if, for example, a chosen tone (or colour for those of you with access to colour printers) doesn't look right it can be changed at the press of a few buttons. Use of layers also means that certain features to be omitted as necessary. Our 1:2500 output (hand drawn) usually shows and natural features that may affect understanding of the site on the ground. These will be part of a normal AERIAL file but would likely clutter a drawing at 1:10000. The conversion routine written by John Haigh sends each file from AERIAL to PRODRAW as a series of layers, one for each message, so any 'natural', 'soil', or 'frost crack' can be omitted (or copied to its own file) with little trouble.

There must be others of you out there who are using digital methods of storing or displaying mapped information. Can we have other examples, problems and advantages please (and help show [edited out!] what it ought to be doing!)?

On the photographic front we carry two contributions from the photographic session of AARG 1993. Chris Cox's piece which is all about how to be nice to interpreters and take photographs they can use please; and another Anthony Crawshaw offering concerning choice of cameras – for those of us with the spare money to have a choice! Anthony hints at future notes on choice of film and more about filters. These are all good subject matter for *AARGnews* and offer

the benefits of experience from current work. I ask other members for comments on any standard, or unusual, film types in use and for any response to these two items in this issue.

The *Books of Interest?* pages end with a note of two recent publications which we have glanced at but cannot do justice to in a few line comments. In the next issue Chris Cox will be 'reviewing' books on Lincolnshire and Shropshire from the air which offer two completely different approaches to (apparently) the same subject. My first impression of *Shropshire* was of superb quality black and white illustrations. Chris Musson should be well pleased with the efforts of his printer.

I don't think it's breaking any confidences to comment on one of our latest uses of aerial photographs. In the late 1960s there was a training dig of a Roman villa on the (then) northern edge of Cambridge. As expected, the principal activity seems to have been learning to dig and, indeed, contemporary aerial photographs show small square holes full of diggers (interesting for perceptive ability: I now *think* I can see a trowel on an AP but – still – no pottery. All the finds trays seem empty!). There is, apparently, a reasonable plan of the site, the pottery report is good, but the location is "fourteen feet from the ridge". Good one? That probably wouldn't matter but for the fact that the villa is somewhere in the grounds of a school that is falling down (the made them well in the 70s!) and the villa now needs to be 'found' so that a replacement school can be built with the minimum of archaeological interference. Whether this is possible remains to be seen and offers an interesting change and challenge. There are supposed to be some pre-excavation photographs at CUCAP while those showing the excavation in progress are extremely low and show only a few paths across what looks like common land plus one or two poles. Watch this space in *AARGnews* 9...?

This is the first issue which I have produced totally electronically. All contributions were sent on disc and all successfully read by my software. Keep them coming (please).

CHAIRMAN'S PIECE

Marilyn Brown

It is a pleasant duty, in my first column for *AARGnews*, to thank the retiring chairman, Bob Bewley, for all his work over the past two years. While retiring as chairman, Bob remains on the AARG committee in his capacity as ex-chairman, and has, in addition, taken up a new role as secretary of the Prehistoric Society. His period in office has seen the establishment (and I hope that is not too appropriate an expression) of the Aerial Archaeology Research Group as the society providing the major focus for those involved in all aspects of aerial archaeology in Britain and in Europe.

Following this, it seems timely to mention that AARG will be acting as a "European Partner" for the *Symposium zur Luftbildarchaology in Ostmitteleuropa* which it is proposed will be held at Kleinmachnow in Brandenburg (between Potsdam and Berlin), during the period 27-30 September 1994. This is planned as a working meeting, allowing the sharing of experience and methods with interested archaeologists from Eastern Europe and particularly the former East Germany. The proposal is that the Symposium should be made up of twenty members of AARG, twenty East European participants, either members of or already known to AARG and twenty from Germany, with a preponderance from the east. Otto Braasch's reconnaissance over East Germany has provided some indication of the information yet to be gathered and interpreted from this part of Europe.

Closer to home, the Royal Commission on the Ancient and Historical Monuments of Scotland was, last year, given responsibility for the curation of the collection of vertical aerial photographs of Scotland, formerly held by Scottish Office. These are now housed in the Commission's premises in Edinburgh, and can be consulted in parallel with the oblique collections and all other elements of the National Monuments Record for Scotland. The Commission, however, has not yet been granted any funds for the computerisation of the index to the vertical photographs, so that cover searches continue to be carried out manually. It is hoped that a suitable computerised index may form part of the Commission's GIS developments, allowing the full integration of this historic collection with the Record.

Following up Rog Palmer's note (*AARGnews* 4, March 1992) on Photo-CD, a number of AARG members, along with others concerned with recording and presenting landscapes, attended a seminar on Photo-CD, organised by Kodak in conjunction with the National Association of Air Photograph Libraries (NAPLIB), and arranged by Derek Edwards of the Norfolk Museums Service. Broadly speaking, the process was divided into three parts. First, digital cameras: these could not yet achieve the resolution obtainable by traditional silver halide film and were unlikely to have an impact on aerial reconnaissance in at least the medium term; second, digitisation of photographic images for storage and manipulation: the cost of a workstation required for digitising photographs and slides could be justified only for a large volume of material, but professional bureaux can carry out the process of transferring material to Photo-CD disks, but would be considerably more expensive than the £15 to £44 for a hundred frames mentioned in 1992, although High Street outlets offering a lower standard

would be considerably cheaper. The high resolution required for archaeological aerial photographs might allow a hundred 35mm images on a CD, falling to twenty-five for a 5x4 film format. There are archival and retrieval benefits, but it seems to me that the main archaeological benefit would lie in the potential for the on screen rectification and enhancement of the image; thirdly, output: this was via a thermal printer. The example, produced from a CD brought by Gillian Barratt of the University of Wolverhampton, was adequate, but by no means a match for the prints in her exhibition at the last AARG conference.

My conclusion would be that, while the system, apart from the CD camera, works reasonably, cost and the need for very large amounts of computer memory and CD disk space render the system as yet unsuitable for most archaeological aerial photography. John Haigh of the University of Bradford is working on image rectification for cropmark photography, and it may be that, as with his AERIAL programs, this less demanding approach may prove more suitable for archaeologists. Those attending the IFA conference in April at Bradford (where the aerial session organised by Chris Cox and Vikki Fenner promises to be very informative) will have an opportunity to find out.

NEW JOURNAL : ARCHAEOLOGICAL PROSPECTION

We received notice of this new journal (edited by Professor Mark Pollard and Dr Arnold Apsinal, Department of Archaeological Sciences, University of Bradford, West Yorkshire, BD7 1DP) which, it is hoped, will appear twice yearly. The editors ask for papers, reviews or short reports and can supply a copy of notes for contributors.

The journal might be the place where we can begin to show the archaeological world the scope and value of aerial reconnaissance, to get to some of the ground truths below the cropmarks, but whether this can be produced by us or them remains to be seen.

AERIAL PHOTOGRAPHY – PRESENT TECHNIQUES AND FUTURE ASPIRATIONS

Chris Cox

Last year, during one of our protracted discussions about the meaning of ‘aerial archaeology’ and the general pleasures of photo interpretation, I asked Rog Palmer what he considered to be a good set of photos from the interpreter’s viewpoint. Typically, he answered ‘*I don’t really need to know – I just work with what is there...*’

Very often, the survey data with which the air photo interpreter works proves to be very difficult to interpret and map accurately. ‘*What is there*’ is often not *what is needed*.

It requires great interpretative experience, skill, patience and often an inordinate amount of time to produce accurate maps and meaningful archaeological synthesis from some of the photographs which pass through our office. Some of the worst ones are often those which we have taken ourselves! I would agree with anyone who said that there is a certain challenge in the production of a cartographically accurate plan from a very low and very oblique photograph of a fascinatingly complex site using only one indistinct field boundary, a telegraph pole and a pigsty which was demolished in 1950 as modern map references. However, the challenge begins to pale and frustration sets in after a succession of such photos during a long and difficult job, where more time is spent manufacturing mapping control than is devoted to archaeological interpretation and analysis. In these circumstances patience levels, and thus good judgement, seem to decrease in relation to the increase in AERIAL error values.

In order to improve my own photographic work I made a list of the properties of a good archaeological aerial photograph. This was done purely from the interpreter’s viewpoint, in order to make my own photography easier to use. I now have set of criteria to apply to my photographic content as I look down the lens at the fields below, which I know will maximise my own efficiency during subsequent photo interpretation and mapping.

Having done this, I remembered the very first time I ever flew with Derrick Riley, who took me on a long flight to the Vale of York and the Yorkshire Wolds. I still have the photos from that flight, and the subsequent material which I produced under his supervision during the summer of 1984, plus the notes I made during and after our flights. His notes, and mine of ten years later, agreed to the letter on the properties of the ‘ideal’ aerial photograph, which he always insisted was not at all difficult to produce, and was a useful archaeological document in itself. It took me a while to fully realise the needs of the photo interpreter, and to consider these points whilst carrying out aerial photographic survey, and in no way do I wish to criticise other people’s photographs, rather to make a series of suggestions which may facilitate interpretation and help those people who are beginning, or wish to improve their archaeological aerial photography.

Other ‘specialisms’ within archaeology seem to regularly run formal practical training courses, covering excavation, earth moving, use of EDM equipment, geophysical survey, etc. I have never encountered a serious training programme covering oblique aerial photography beyond that which Derrick Riley provided, on a one-to-one basis, at Sheffield University. Obviously, the teacher to pupil ratio in this instance and the unpredictability of the British weather make such courses much less financially and practically viable than the field based teaching of ground survey techniques, which can be conducted by one ‘teacher’ and a relatively large group of students, usually in a howling gale on the side of some inhospitable mountain or in an exposed Fenland field.

In response to methodological questions about aerial photography and from a desire to open discussion of technical standards, a session at AARG 1993 covered aspects of aerial photographic composition and technique. This paper is a short synopsis of

my own contribution to that session, which was entitled *Aerial photography – Present techniques and Future Aspirations*, and I write it in memory of Derrick Riley, who was an excellent aerial archaeologist, a brilliant photographer, a very patient teacher and a valued friend.

FROM AIRCRAFT TO DESKTOP: AERIAL PHOTOGRAPHY FOR ARCHAEOLOGICAL INTERPRETATION

Archaeological uses of aerial photographs have expanded rapidly over the last decade, mirroring changes in the archaeological world as a whole. Oblique aerial photographs, with their inherent scale and perspective distortions are routinely used as a data source for landscape research projects and environmental impact assessments, often in conjunction with ground based survey techniques. Technical innovations in photographic, navigational and mapping procedures and in camera equipment are ongoing. The requirements of the air photo interpreter and field archaeologist must be met by the primary surveyor – the aerial photographer. Efficient survey procedure, maximum archaeological information retrieval, knowledge of the law, correct choice of equipment and intelligent and artistic photographic composition are all required of the aerial archaeologist, if we are to produce high quality, usable material which is both easy and pleasurable to interpret and facilitates swift and accurate mapping which can be used as a reliable guide for fieldwork or excavation trench positioning.

These guidelines are not at all definitive, nor are they in any way proscriptive. I hope they will provide a starting point for debate and discussion centred on the needs for training within aerial archaeology, and the needs for defined standards of survey work in order to improve the quality of data collection.

The photo interpreter needs:

Image clarity

Image clarity is essential to the interpreter, and relies on a combination of correct exposure, suitable film type, sharp focus and a high shutter speed to counteract any airframe vibration.

It is easy to avoid blurred or murky incorrectly exposed photographs by being familiar with the camera, films, filters and weather and lighting conditions, and knowing what equipment to use to cope with varying levels and qualities of light. We are, literally 'drawing with light' and need to understand its effects if clear record photos are to be consistently produced.

On a practical level, simple pre-flight camera checks can be carried out so that prior to flight, the photographer ensures that she is fully able to use the camera properly, swiftly, and under pressure which results from being in an unfamiliar aerial environment. Before taking any new equipment into the air, I have practised changing films (particularly roll films and those requiring manual dexterity and concentration) in a confined space (such as the back of a moving sports car) or with cold fingers (which often happens during winter photography). I have also tried to routinely use and test any new camera for a few weeks prior to its being taken flying. Try using it regularly to record family events and routine life (the presence of any noisy children will adequately test your ability to use the camera in less than ideal conditions) or to photographically record a working week, which will let you know its exposure timings, its idiosyncrasies and its limitations. It is also wise to know how to operate the camera manually, and how to cope if the exposure meter fails. Familiarise yourself with the effects of different filters and lens hoods, preferable in the air in a variety of lighting and weather conditions.

The lenses must always be clean, correctly filtered and the focus ring be taped to infinity. It is easy to get the wind in your eyes and thus not be able to focus correctly, or to forget to set the camera to the correct ISO number, if these things are not dealt with whilst still on the ground. If all these tasks are done in advance of even contemplating flight, then the camera bag can be taken from storage as you rush off to the airfield, and you

will be much more relaxed and focused on photography, having removed any doubts or last minute film searches which produce tension and reduce efficiency. It is advisable to carry spare batteries for the camera, and to take a second camera body in case of camera problems. Film is the most expendable, and most important, resource and large amounts should always be carried. The pre-preparation of flight plans and survey objectives is also highly desirable. In this way, the photographer can almost guarantee a good clear image, and to maximise the quality of the photograph from the outset of the flight, leaving the mind free to search for sites, compose the photo, ensure a high shutter speed, and deal with any minor problems easily.

The technical aspects of cameras, films, filters etc. are discussed in the major aerial archaeological publications, (such as Riley 1987) and everyone has their own preferred combination of film and camera. From an interpretative and archival viewpoint, black and white prints are preferred, with colour slide backup.

Suitable viewpoint

I have seen, and indeed taken, many photographs which do not show the site at its best angle. If you are beginning aerial photography, it is wise to fly a circuit around each site, considering the sun angle, direction of wind (which helps in circuit planning, and pilot instruction – see below) and nature of the features under survey. Earthworks, and indeed some cropmark features, definitely have a ‘best side’ in relation to the angle of illumination. These points are very well explained by David Wilson (1975; 1982).

Knowledge of the causes of atmospheric haze and the mitigation of its effects at all times of the year is very useful. Sometimes photography has to be carried out in less than perfect conditions, and it pays to be able to make the best of all types of weather by correct choice of film, filter and viewpoint. Photographs taken into or across the sunlight direction can be very badly affected by a hazy atmosphere, whereas a different viewpoint can at least ensure a ‘passable’ exposure, which will adequately record the site.

Complete site coverage

It is important that the interpreter should be shown the complete visible extent of any features which are recorded from the air. Most frustrating is the single photograph of, for example, a settlement site where the photographer’s eye has been drawn by a group of very obvious enclosures and other, less distinct, features such as attached fields and lanes can be seen but not traced fully as they disappear off the edge of the negative! These features may not have been perceived from the air if the photographer has not taken time to think carefully and look intelligently at the area prior to photography. The difference between an aerial photographer and an aerial archaeologist is that the aerial archaeologist uses knowledge, inquiry, observation and informed experience to decide what will be photographed, and how to accurately record the features being surveyed, whilst almost anyone can point a camera from an aeroplane window and produce a passable snapshot of a cropmark. More airtime can be spent looking carefully and appraising the landscape than actually taking photographs. Anyone can photograph a site – but what we aim for is to make an accurate and useful archaeological record, which is the basis for interpretation and archaeological thought. Therefore the complete site, and any other associated features, must be thoroughly recorded, in the same manner as the execution of a ground based earthwork survey.

Fixed points for mapping

It is essential that the site being surveyed is photographed so that modern fixed boundary detail is present in the photograph, preferably ‘framing’ the site. This allows accurate mapping. Corners of permanent buildings or field and road intersections are ideal, but not always available.

The flying height above ground is dependent upon the size of the features to be recorded and the size of the modern fields. During a typical archaeological flight, I like to fly at least 1500 feet above the local ground level, for a) safety – the execution of steep turns and orbits leaves little margin for pilot error if the aircraft flies low; b) large field of view and

ease of location and navigation; c) inclusion of field boundaries and other modern features in the field of view.

Flying a little higher or changing lenses increases the field of view, and once mapping control points are recognised and photographed, details can be filled in with more close-up shots.

In some instances boundary changes since mapping or the building of new roads and farms can render the most perfectly composed photo rather embarrassingly useless for routine mapping. This cannot be helped! Similarly, upland areas or areas devoid of mapping control can present problems and in these cases oblique photos may have to be mapped in conjunction with verticals or a 'best fit' approach adopted.

Detail of complex or small features

The interpreter also requires close detail of areas of the site which may be especially complex or important (such as areas where sites are seen in palimpsest, or areas where the physical or temporal relationship between two features may be elucidated). These photos help to supplement the complete site coverage, and fill in area which can be located from other photos with perhaps more mapping control.

Landscape context

It is helpful for the interpreter to have an idea of the context of the site being recorded. Is it on a slope? Is it near a stream or wood? Is it likely to be masked by a nearby industrial estate or pit-tip? Has part of it disappeared into a gravel pit? One good 'landscape' photo will often answer all these queries.

Stereo pairs

Two consecutive images of the same subject with an overlap of approximately 60% can be placed beside one another and viewed under a stereoscope to combine them and produce a single three dimensional view. This facilitates archaeological and topographical interpretation and is usually applied to vertical photographs, which are intended for stereo viewing. Obliques can also be taken as

stereo pairs, using a good quality motor drive. Instead of taking one photo, simply compose a suitable viewpoint and hold the motor driven camera steady, whilst keeping pressure on the shutter release for two, or even three, exposures. This gives excellent results, although the overlap needs to be at least 80% when taking obliques.

Verticality

It is possible to take an almost vertical photo from a light aircraft using a hand held camera. The scale between the foreground and background of an oblique photo are not the same. Therefore the photo is not an accurate representation of the size or shape of the feature being recorded. This often does not matter as these scale differences are lost during rectification if the photo is not almost horizontal. However, it is possible to produce an almost map-like vertical photo with a hand held camera by asking the pilot to carry out a steep turn directly over the site. Prepare yourself to 'feel' the turn, whilst looking directly down the lens at the site. When you have the site and its control points central and the view feels and looks vertical (you have to point yourself and the camera down a bit to do this) take the photos – or take two if you have a motor drive. This technique is worth explaining to your pilot, and practising together, because verbal communication is almost impossible if you have your head right out of the window and you are concentrating on the camera and the site rather than the flying. Derrick Riley used to be able to do this whilst flying himself (not recommended!), and he taught me to fly this with him as a safety pilot, so I would know exactly what the aircraft was capable of, and how to communicate the procedure to the pilot. To do this effectively, the wind direction and strength must be accounted for in the shape of the circuit around the site, or the aircraft will be drifted away from the target, which is required to be directly below.

The aircraft as a survey platform

Air photography will become much more enjoyable, professional, and controllable if you can learn about the capabilities of the aeroplane. What degree of turns can be achieved? How does this affect photographic

capabilities? Has the aircraft got a good field of vision – do any struts or wheels obscure the downward view? Does the window open fully? How much work does the pilot have to do in navigating and communicating with radio stations on the ground? How can the photographer communicate efficiently and get the photographic angle correct on the first run? Does the pilot know exactly what you are doing?

The survey team effectively consists of the pilot, the photographer, possibly a navigator, and the aircraft. What you do with the aircraft and how you communicate with the pilot determines the quality of your results and the efficiency of the survey. If it is not possible to spend a lot of time in the air, or to fly yourself, there are a lot of videos and books about flying which at least familiarise you with the aerial environment and allow you to look upon the aeroplane as a comprehensible survey platform rather than a piece of very complex machinery, the operation of which is best 'left to experts'. A company called 'Transair', (Fair Oaks Airport, Chobham, Surrey GU24 8HX, Tel: 0276 858533) produces a comprehensive aviation equipment catalogue which includes a lot of flying related books and videos at reasonable prices.

I have also found that archaeological survey is a very interesting and prized activity amongst flying club instructors or commercial pilots, who do a lot of routine work and appreciate the discovery and survey aspect of archaeological reconnaissance. The pilots with whom I have flown also seem to appreciate as much archaeological information as possible, and are another pair of very useful eyes, and will often report the beginning of the crop mark season in areas which they regularly fly for other purposes.

Conclusion

The interpreter ideally needs a 'set' of photos for each recorded site taken from a variety of angles as appropriate to the lighting and site type incorporating site detail, mapping control and landscape context. At least one stereo pair should be taken, if possible and appropriate to the subject. In this way the interpreter can use all the information, which is rarely combined in one photograph, and the photographer can be assured that a clear and comprehensive record is produced.

This paper has only covered the interpretative requirements of the aerial photograph, and has not touched upon composition for illustrative or artistic applications or photography of standing buildings, which were very well covered by Derek Edwards and Roger Featherstone at AARG. I wish to thank everyone who spoke at, or participated in, the afternoon at AARG, and hope that we can use the ideas put forward by the speakers to raise standards of archaeological recording within our discipline, and to begin to formulate strategies for the provision of practical training in landscape recording through aerial photography.

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AARG 1993 - OBLIQUE AERIAL PHOTOGRAPHY - CAMERAS.

Anthony Crawshaw

This contribution is a summary of part of my talk at Abergavenny last autumn, so if you were bored then, go no further. For the reader who is still with me the first point to note is that "if it ain't broke, don't fix it". In other words, if you are getting good quality photographs that the clients/users are happy with, stick to your proven methods. If you are less experienced, or just want to read about another person's approach to our common task, then I hope there will be something of interest. Although some of the points may strike you as nit-picking, they are still worth considering. Undoubtedly a good photograph is more than the sum of the details, but ignoring the details can spoil an otherwise good shot. If you don't agree with some of my comments, the editor is looking forward to being submerged by a barrage of correspondence.

My personal experience, which is bound to colour my remarks, is largely with 35mm. cameras, with some usage of medium format.

I am not going to discuss the cameras specifically designed for oblique aerial photography, such as the Agiflite made by AGI, excellent though they undoubtedly are. The reason for this is that they are very expensive if bought new and generally use 70mm. film. 70mm. film is not available in as many choices of emulsion as 35mm. or rollfilm and film processing is not widely available, which again puts the cost up. Another camera that I will not discuss further is the Linhof Aero Technika 45. Again, capable of superb results in, for example, set-piece photography of standing buildings, but with problems of film availability and expense.

I know of no aerial archaeologists who use either of these last two classes of camera.

The basic requirements for the camera should include the following:-

- (i). A shutter speed of 1/1000th. or 1/500th. of a second. Although good photographs are taken with slower shutter speeds, the number of failures due to blurring will increase at the slower shutter speeds. Superfast shutter speeds such as 1/4000th. are not needed for our style of photography. The added complexity of the camera needed to achieve 1/4000th. of a second will add to the cost and may decrease the robustness of the camera.
- (ii). In order to be able to use fine-grained films, for good resolution with fast shutter speeds, the camera lens must be of high quality. Specifically, the lens must be capable of being opened to a wide aperture (a 'fast' lens in camera jargon), and still have good resolution at that aperture. Often one hears that a particular lens is marvellous when stopped down a couple of stops. Unfortunately that is just what we can't do, whilst retaining fast shutter speeds and fine-grained films. Test data for lenses may be found in some camera magazines, such as *Amateur Photographer*.
- (iii). Through-the-lens metering for exposure means that you can dispense with a separate light-meter, with its nuisance value and potential for getting lost/damaged. A fully automatic metering system is a great boon - if you have to match a needle in the viewfinder there will be yet another thing to think about and you will have to use both hands on the camera. Shutter-priority mode is preferable to aperture-priority, because the latter will require occasional adjustments of the camera's aperture ring.

The less fiddling you have to do with the camera in the air, the better.

(iv). The balance/handling of the camera must be to your liking. Do all the necessary controls come readily to hand, without your having to reposition the camera? If the camera has a contoured handgrip this is a help if your hand is the same size and provided you are not left-handed... . Sheer weight of the camera need not be a problem, as the camera spends most of it's time on your lap. Indeed, the greater mass of a heavy camera can help to damp out minor vibrations. Ideally, the weight of the camera should be over your hand. If the weight is well off to the side, as when using a long and heavy telephoto lens or such cameras as the Pentax 645, you may have exaggerated movement problems if you use the camera one-handed. The reason is that turbulence when flying is often a vertical movement. If the camera's weight is directly over your hand, all that happens is that the camera moves up or down a little, and that movement is small compared with the forward movement of the aircraft. If, on the other hand, the camera's weight is off to the side, the vertical movement will be transformed into a twisting motion and this angular movement will result in blurring. If your camera's weight is off to the side, it is possible to attach a counter-weight to help control the twisting movement.

If you have to sit side-by-side in the cramped confines of a Cessna 150, can you turn to point the camera out of the window and still reach the camera controls, without taking up half of the pilot's space? Is it equally handy if you sit behind the pilot in a 172 and have to turn leftwards to point out of the window?

Don't forget that it is not a good idea to put the lens out into the slipstream, as this induces vibration.

If the camera has a viewfinder that one looks into at an angle from the line of sight of the lens itself, such as the Hasselblad with metering prism, then this can prove awkward.

There are two reasons for this:-

- (a). Because you will be looking downwards at an angle to the camera when using it, you will have to raise yourself higher in order to avoid photographs of the aircraft's windowsill.
- (b). It is not easy to use the other eye to watch the target as you fly round it. This practice helps when selecting the best angles for the shot.

If at all possible, try your chosen camera out in the air, before buying it. At the least, ask around, to see what other aerial archaeologists who use that type of camera think of it. Although you are not likely to get somebody who bought a lemon to admit it (particularly if it was somebody else's money that paid for it) you can read between the lines of their reply.

(v). Simplicity. Avoid unnecessary gadgets and complications. 'If it possibly can go wrong or get mis-set, then it will do so whilst in the air', is a good guiding maxim. Add to that the fact that it takes more time to correct even simple faults when flying, presumably due to one's other braincell being busy, and you will correctly deduce that simplicity and reliability are most important. As one is inevitably getting a camera designed for ground use, tape up all the controls that you don't need to use in the air. The most important of these is the focus ring, for it is mildly distressing to land and find that all those wonderful photos are focused on fifteen feet... . Is there something

convenient for you to tape the focus ring to? Would you have to undo the tape when changing lenses?

Whilst on the subject of taping up camera controls, use masking tape, not Sellotape or similar. Masking tape, although it loses its stickiness with time and has to be replaced, does not shrink like Sellotape. I once noticed that two corners of my photographs were regularly out of focus. This turned out to be due to the single piece of Sellotape that I was using at the time on the focus ring having shrunk. The resulting tipping of the lens was enough to produce the fuzzy corners when the aperture was wide open. So, use several pieces of masking tape, symmetrically placed around the focus ring to avoid tipping, should shrinkage occur.

Choice of Format, medium format vs. 35mm.. The choice is by no means obvious - some of the factors are set out below:-

35mm.

Easier Handling.
 Smaller Image, giving grainier results; any dirt is magnified on final result.
 Faster lenses available, better at wide-open apertures.
 Most cameras have shutter speeds up to 1/1000th.sec..
 36 exposures/film change.
 Generally cheaper cameras.
 Fixed backs (except Rollei).
 Lower running costs.
 Can be more versatile.

Medium Format

Heavier and steadier.
 Larger Image, giving possible difficulties with film flatness.
 Slower lenses, poorer at wide apertures, necessitating faster films.
 Most cameras do not exceed 1/500th.second.
 12 or 15 exposures/film change, unless using 220 or 70mm., when film choice and processing are reduced.
 Dearer cameras.
 Exchangeable backs, usually.
 Higher running costs.
 Often less versatile, but proven designs.

Although medium format has an image as the professional's choice, this is not necessarily so. You need look no further than the excellent aerial photographs obtained by Otto Braasch and Georg Gerster, both 35mm. users, to see otherwise.

Motor drives may or not be useful to you, besides their being the film makers best friend. If you are keen on taking stereo oblique pairs, a motor drive is helpful, but adds another layer of potential complications. However, one feature sometimes associated with motor drives that can be useful is the easy film loading system. With this you just lay the 35mm. film leader across the camera back, to a certain position, and then shut the back. Such cameras often come with automatic final rewinding of the film back into the cassette; both features save airborne fiddling.

Choice of lens. The focal length ranges generally used are 50-180mm. for 35mm. and 80-200mm. for medium format. Zoom lenses are used, but have a a number of possible problems:-

- (a). The optical quality may not be as good as a prime (single focal-length) lens, unless you choose very high quality and price.
- (b). The lens may not have as wide an aperture as a prime lens, at any given focal length.
- (c) It may not be possible to tape the lens focus on infinity and still zoom the lens.

If funds permit, it is preferable to have a separate camera for each lens, so as to avoid changing lenses in flight.

Apart from being another complication, were you to drop a lens,

it might roll around on the floor of the aircraft and get into the way of the aircraft's controls. Besides being bad for the lens, this could bring tears to your mother's eyes. Moral - it is not just the camera body that should be on a strap around your neck. Needless to say, extra cameras should be of the same make and model, so as to ensure familiarity of operation.

Filters. I would always recommend the use of one, for lens protection and to reduce the ultra-violet (UV) rays effect on the film. Try the following types for different films:-

Colour film	UV(0) or polarising filter
Black and White film	Yellow filter
False-colour infrared film	Deep Yellow filter

Filters will be dealt with in more detail in a future contribution to this august journal - you have been warned!

Gyro stabilizers are devices that bolt on to the tripod bush of the camera and reduce vibrations. This enables the use of slower shutter speeds/films. Sounds great, until you ask the price, which is several thousand pounds. I have never used one, nor do I know anybody else who has, so this is the limit of my comments. However, I have seen excellent results obtained with a gyro stabilizer.

Electronic Cameras come in two sorts, analogue and digital. The former is represented by the Canon Ion, whilst Kodak have a development model of the latter, based on a Canon 35mm. camera.

The Canon Ion was demonstrated at the York AARG and we tried it in the air that summer. The resolution didn't match film and there was a disconcerting difference in contrast between the two cameras we saw. The Kodak digital system was seen at the demonstration of their Compact Disc system and it's resolution was better than the Canon Ion, but still not as good as fine grain films. Prints from both systems were more expensive than, and inferior to, those from film. Despite this, I feel that there will be an increasing place for electronic imaging, particularly digital, with it's ability to supply images directly to computers.

Naturally, much of the above is a counsel of perfection and most people start with a camera that they already own.

If, however, you do buy a camera when you are starting out, buy a simple one. Experience with that will enable you to make an informed choice of the features that matter to you.

Consider buying a secondhand camera, but be careful if buying one used by a professional, as they might have used it so hard that it is worn out.

Lastly, keep the lens and camera clean. If you unload the film on the ground, take the opportunity to clean out the film chamber. This helps to prevent the build-up of dirt that will otherwise end up in the middle of your best photographs. Dust can be dislodged from a 35mm. camera body by taking the lens off and operating the shutter several times. Point the camera down when doing this - besides ensuring that dislodged pieces fall onto the floor and break, this means that the disturbed dust falls out of the camera body, not back into it.

AARG: ANNUAL MEETING: 1994

...bits and pieces

STUDENT BURSARIES 1994

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

Anyone wishing to apply please write before 4 July 1994 to Bob Bewley, The Old Manse, Ashton Keynes, Wiltshire, SN6 6NP, with information about your interests in archaeology and aerial archaeology, as well as your place of study.

CROP RECOGNITION FOR AARG

We hope to have a session on recognising crops from the air at AARG 1994. Please may I ask all interested to start collecting colour slides of aerial views of crops? Please stick either to crops that you have positively identified on the ground, or to unusual items that may be of interest generally. We would be particularly interested in crops that may be specific to your area.

Offers on this to: Anthony Crawshaw, 15 King's Staith, York, YO1 1SN

NOTES AND NEWS

As usual AARG 1994 will have space for your notes and news, probably at the end of the first afternoon.

Offers of short contributions should be made to Marilyn Brown, RCAHMS, John Sinclair House, 16 Bernard Terrace, Edinburgh, EH8 9NX

and so to ... AARG 1995

Any ideas ..?

Any problems ..?

Any thoughts on contents and contributions ..?

Please pass them on to Marilyn Brown, address as above.

**TIPTOE THROUGH THE CROPMARKS, SQUELCH ACROSS THE FENS –
BUT WHAT NEXT..?**

Rog Palmer

The first few paragraphs that follow were originally intended to start the Editorial but grew into something that seemed to require a space of its own (and, as usual, there was space to fill). Also as usual I'm complaining: I'm wondering what is, and how can we get at, the archaeological part of 'aerial archaeology', and I suggest the need to realign our thinking and questioning to tackle 'landscape' problems.

It gave me a small degree of pleasure to hear Carenza Lewis, paid-up AARG member and one of the RCHME's field investigators (if they are still called that), use the term 'black splodge' to describe part of a soil mark in a Channel 4 *Timeteam* programme (16 January 1994). The APU's preferred 'black macula' wouldn't convey quite the same meaning. I think 'splodge' was first used in the paper I wrote jointly with John Hampton (*Arch J* 134) and was chosen by me as a fair descriptor of certain recurrent features that I was finding during my Wessex interpretation which, when excavated (as, for example, at Little Woodbury), became the equally vague 'working hollows'. There was also an element of frivolity in the word that suited – still does – my choice, but by 1984 (*Danebury*, p8) my 'splodges' had become, quite rightly for that area, 'filled hollows' (which means, I suppose, that my 'ditches' ought to become 'filled ditches'..?).

Then with MORPH came seriousness and supposed objectivity, 'working hollows' were out and a 'splodge' became a 'macula'. At the unveiling of MORPH there was, I think, a certain amount of trepidation among the design team and I well remember Dave MacLeod turning to Bob Bewley at the end of MORPH's presentation and whispering, "They let us keep 'macula'!". Being a man of small words I had had to look up 'macula' when the MORPH blurb arrived. My old Penguin (it must be old, it has 12/6 on the cover) gave me: '**macula**, spot, stain, blemish', whereas '**splodge**' referred me to

'**splotch**, irregular stain or patch of colour'. I was using 'splodge' to describe irregular shapes shown by deeper soil and/or increased crop growth whereas 'macula' covers most features, cut or humpy, which have no linearity and thus has a series of sub-types (such as round, rectangular and amorphous).

Either word is a useless interpretative term as, like 'cropmark', they avoid any archaeological comment on the recorded features – such as should be an intention of, and result from, good photo interpretation. In common with a number of other aerially photographed phenomena these amorphous marks are responses to different features in different parts of the country. Field examination has shown that those on the Wessex chalk most probably result from soil fill in subsoil hollows whereas similar looking splodges in the East Anglian fens are more often the surface remains of an actual occupation layer. These are easily visible on the ground where they act as a signpost to a 'site' and usually are rich in pottery, burnt material (there are many red splodges in the Cambridgeshire fens, usually the locations of iron age or Roman salterns), and organically rich black gunge. The common factor in both cases is that 'splodge' (or whatever sub-type-macula it becomes) tends to equate with dense and reasonably long term settlement activity.

Our terminology is in turmoil and, as a first step, we perhaps need to decide whether we are describing aerial photographs, ground responses, or the archaeological features they show. [We can't even get our AARG application form right. After spending an hour or so producing the list of new members I note that we divide aerial interests into 'reconnaissance, post-reconnaissance, interpretation, transcription, application, etc'. Just what, I wondered, is 'post-reconnaissance' if not 'interpretation, transcription, application, etc'..?]

Many AARG members, especially those who were at the early Cambridge meetings, will be aware of my dislike of 'cropmarks'. Use of the term to describe archaeological sites is both misinformed and retarding. We should know better, yet even one as esteemed as Derrick Riley recently published the ridiculous phrase, '...the cropmarks were excavated...' (*Excavations at Mucking*, 1993). Yes, I know that we all know what it means but doesn't it give 'cropmarks' an archaeological reality which they do not and can not possess? The term is, of course, shorthand and may mean something like 'cropmarks of a ditch', 'cropmarks of a henge', or 'cropmarks of a field system', but it is the latter part of the phrase that is the important and archaeological part. In the CUCAP index 'cropmark' is used for any features so recorded that cannot be otherwise identified or described (look in the publications of St Joseph or David Wilson: they abound with 'field systems', 'iron age settlements', 'ring ditches', and 'causewayed enclosures' and where 'cropmarks' has to be used they are described (see especially Wilson 1982, *Air Photo Interpretation for Archaeologists*) But 'cropmarks' are so well ensconced in the minds of archaeologists that I have created confusion (usually questioning silences on the other end of the phone) by automatically interpreting them and telling people that a field is 'full of ditches' [if it is possible to 'fill' something full of holes...?]. This is especially disturbing to colleagues who have visited the field in question and know it to be flat! However, there is now an easy way to eradicate the word from our writings. APS recently acquired Word 6 which includes a new AutoCorrect function – the idea being that those daft and repetitive typing mistakes (like my oft written 'enclsoures') get automatically corrected. All we need to do then is program the thing so that every time we type 'cropmarks' it writes 'crop marked ditches of a levelled archaeological site' – or whatever the things are.

Can indiscriminate use of 'cropmark' be one of the factors (another major one being the much used equation, aerial photography = 'aerial archaeology') that creates a block between our aerial world and other archaeologists? Might we aim to wind up the

1990s by directing ourselves beyond the aerial specialities so that, by using our acquired and developed skills as photographers and/or interpreters, we collaborate with others to attack a number of (as yet unphrased) archaeological questions? We need to be a little more direct than the, "Well now, just look at that", syndrome – we need to demonstrate just what the aerial evidence can provide, to be very definite about its limitations and to propose further work that would help answer some of the immediate questions. The crucial point is that to pass beyond photography, interpretation, mapping and crude analysis we would seem to need the interest and involvement of other practising archaeologists. We need field data of an elementary kind – not the detail required by the period specialist who may be hoping to phase a site to the nearest five years but more akin to something that will fit the 'three age system'.

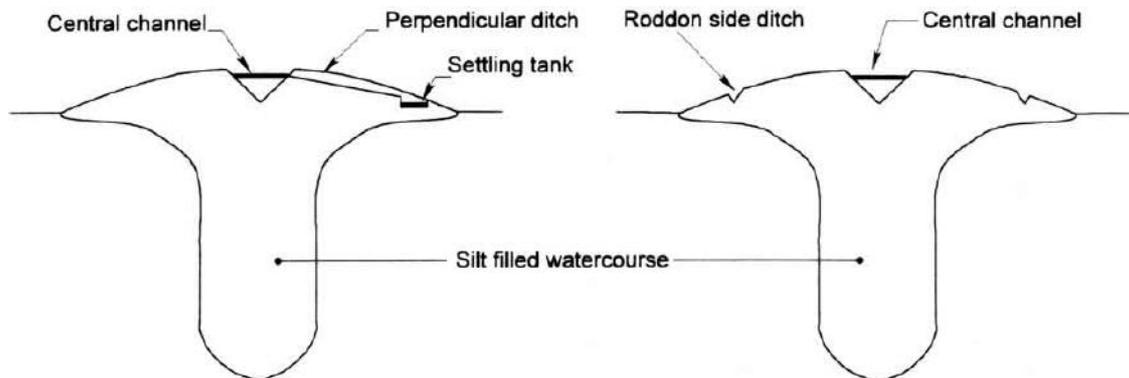
'Aerial archaeology' is now up and running. It may not be too unjust to say that it has got as far as it can go and is now sitting still and ticking over. It is willing and able to absorb relevant new technology but is generally reluctant to provide the archaeological output at the level which it, and no other survey method, is able. We have reasonable control of our flying programmes, we know when and where to look and are no longer fooled by the blank areas. We have a number of competent photographers who are not only 'discovering' sites but making efforts to ensure that their photographs are usable by the interpreters. On the post-reconnaissance side our archives are in sufficiently accessible states that we can rapidly find out what cover exists for sites and areas and easily locate the photographs. In the last ten years or so we have come quite a long way in that we can now efficiently rectify our photo interpretations and draw them to effective and clear conventional standards. We – or some of us – are keeping abreast of useful technology, such as RCAHMS use of CAD/GIS for digital archiving of interpreted data and we have various sets of terms by which we can describe the features recorded. But from that point things begin to falter. The few attempts at analysis of aerially derived data were interesting, designed (usually) to

answer specific questions, but they all require ground truth before we can begin to know if not only are our games the right ones to play, but whether their rules need rewriting.

One problem in this respect may be our inability to phrase the right questions to approach aerial problems (by which I tend to mean 'landscape' problems). Anyone with a smattering of archaeological knowledge will have had their thinking aligned through familiarity with excavation and the results so gained. With modern methods and with technology unleashed those results really can be quite astounding – to the extent that John Coles can write of a five-second activity that took place in c.1100bc (Coles and Coles 1986, 130). A comment like that may give other excavators something to aim for – they look for their own five seconds' worth in the site's micro record – but is this more for point scoring than for any valid archaeological reason? Any one of us can start with an aerial photograph and plan a site-specific excavation (this used to be a Cambridge Tripos question) but in a landscape context we require information on recurrent feature types. Excavation here may provide a date range (which may be extended to other features through association), may help explain a function for a feature or features and would give photo interpreters (and possibly photographers too) increased confidence in their findings.

An example. Settlement location and landuse in the Lincolnshire fens in the iron age and Roman periods was dictated by the extent of dry land. This was a changing factor during those times in which the 'constants' were the roddons – silted up beds of old (neolithic and bronze age) water courses – and a number of small islands. (Hall and Coles (1994) provide a very readable summary). We have there a landscape in which the dry and habitable parts were sinuous bands of slightly higher ground within which, often, there remained a small and active water channel. On air photographs roddons show as light-toned features while channels and archaeological ditches are dark lines. Both require interpretation and mapping if there is to be any hope of beginning to understand the archaeology of the area.

As my mapping progressed it became apparent that ditches and channels were often interlinked to create systems of water management such as had not hitherto been identified or explained. Two 'types' were noted: one in which a ditch had been cut more-or-less perpendicular to meet a channel, and the other where ditches paralleled a watercourse and which I named 'roddon side ditches' (see sketch sections).



Sections across two hypothetical roddons to show locations of the perpendicular ditches and roddon side ditches

The first type had also been noticed during Cambridgeshire fenland mapping and explanation was not too difficult. In some locations they were associated with salterns (found during field survey) and could have served to tap off water for settling (a medieval example was excavated recently at Parson Drove: French 1992), at others they linked with ditch systems that enclosed small fields and thus *may* have served a drainage-cum-irrigation function. Roddon side ditches were more puzzling. They followed the course of channels and therefore weaved about in a natural-looking manner – in fact until I found one which showed a series of sharply defined angular turns I was uncertain whether they were man made or natural. To add to my confusion it was obvious that a natural explanation was correct for some examples – where the dark lines were not cut ditches but showed accumulations of deeper soil against the slightly higher ridges of the roddons. In most cases such soil accumulation produced fuzzy-edged features of varying width which tended to bound the present-day edge of a roddon. Roddon side ditches were recorded higher on a roddon, were more sharply defined, and often were clearly linked to other definite ditches. In some cases I was certain in my interpretation of these ‘lines’ as archaeological – usually when they were either linked to other definite features or by virtue of their un-natural position on a roddon side – but in other cases things were more murky and it was very much a matter of, ‘well they look like those at *x* which were ok’, or, ‘they are on the same roddon as others’, or, ‘maybe, possibly, probably, oh hell, put them on’. In other words, deductive reasoning!

I was confident in my interpretation of the perpendicular ditches as features designed to tap watercourses but what were these roddon side ditches – what was the extent of the cut features, how might they have worked, and why? In plan some of them had angularity that can only have been made by cutting, so these were acceptable, but for what part of their length? The question may be irrelevant as, given the fenny intermixing of cut ditches and channels, it is suggested that man was taking over a length of channel through the process of linking it with deliberately cut

ditches. And what of the central channels? The presence of salterns along many of these roddons demonstrates that many of these were tidal and that suggests a raising and lowering of water levels. Such changes could perhaps usefully serve the perpendicular ditches, and allow ‘automatic’ tapping of water twice daily (French (1992, 64) suggests a once-yearly tapping at high spring tide) but would normally not effect the roddon side ditches.

So, what of abnormal conditions..? It does no harm to remind you that outflow from much of the Midlands of England drains into the fenland basin which is now maintained at its safe and agriculturally viable condition through continual management of dykes, main drains, rivers and sluices (Darby (1983) charts the history of fenland drainage). Without such management we may envisage either a much larger Wash than present or a land, to quote Jack Ravensdale, ‘liable to flood’ – in any case, a place of considerable sogginess. Parish and regional maps published in reports of the recent Fenland Survey show how the type and extent of wetness changed from mesolithic to medieval times (see also Hall and Coles (1994) for a more ‘global’ picture). Pottery scatters demonstrate the longevity of many of the settlements during the Roman period although their occupants must have remained in constant dread of waking up in a wet bed! Roddon side ditches, I suggest, were a way of avoiding such unpleasant awakenings and may have been cut to collect and regulate the waters from overflowing central channels at times of abnormally high levels. It makes sense (to me) in both plan and section but, to go back a page or so, I remain uncertain as to the nature and extent of many proposed systems. A small number of excavated sections (or possibly augered cores?) through chosen examples could seek the following information:

- 1 Were they cut features (and might we also seek evidence for maintenance of natural channels)?
- 2 Were they subjected to flooding, and hence silting, and how often?
- 3 Is there any dating information?

Results, particularly regarding the first question, would add confidence to my photo interpretation of such features and would help considerably towards understanding just what people were up to in the fens during the Roman period.

I suggest that this provides an example of a 'landscape' question resulting from current work. While any field input needs, by definition, to be site specific the case above is designed to seek answers which can be

applied to a large chunk of the fens. It's not a new idea: Collin Bowen saw an understanding of the Wessex linear ditch network as a key to much else in that area (eg Bowen 1978), and Derrick Riley studied brickwork fields before enclosures in *Early Landscape*. Did it work for them? Can any of our current mapping projects provide similar 'big' problems? Can we admit any need to inquire? If so, what next..?

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Volumes resulting from the recent Fenland Survey are published in the *East Anglian Archaeology* series.

3-D STILL VIDEO IMAGES

Anthony Crawshaw

In November I attended a demonstration of 3-D still video images at Tektronix UK, Marlow, organised by Leo Biek. The system used a standard PC with colour, or black and white, monitor. The only additional parts were a liquid crystal polarising screen which was placed in front of the monitor and a driver card for the polarising screen. This latter was fitted inside the PC.

The user has to wear a special pair of glasses, like polarising sunglasses, which enable a group of people to see the same image at the same time. Without the glasses the image appeared slightly blurred, but could still be understood. I did not find the glasses a nuisance, unlike the system that uses one red and one green lens. In use, the system was impressive, if a little dark, so that a room with subdued light was needed.

The uses for aerial archaeology will be limited by the availability of digitised stereo pairs, at the moment. Given such data, one application will be in education. Another could be to have a library of vertical stereo pairs available, to be called up for viewing when interpreting or plotting from other prints. Doubtless there will be other applications which come to your mind.

The system works by alternating left and right eye images on the monitor and changing the polarisation of the screen in time with the change in image. The cost is about £2000, for a kit to adapt an existing monitor, or about £15000 for a dedicated AppleMac (yes, I know it's not a PC) with an accelerator card and it's own monitor and software. This last is a concessionary educational price. For more information, contact;

Leo Biek,
Department of Civil Engineering,
The City University,
Northampton Square,
LONDON EC1V 0HB

Alan Day,
European Sales Manager,
CACHE Scientific,
Fourth Avenue,
Globe Park,
Marlow,
BUCKS., SL7 1YD

Telephone:- 071 794 4226

0628 486000

RCHME CLOSES DOWN !

Not quite as startling as the title suggests. More a note for users, or hopeful users, of the APU giving dates when the photographs will be boxed up and unseeable due to the move to the 'new' Swindon premises.

Despite requests, nothing official has come to me on this, so you'll have to make do with the Rogversion of things based on a provisional note dated January 1994.

For those of you who buy prints, the darkrooms are out of action until April 25.

Access to APs seems be in two categories:

Last day for loans is given as May 27 (so those of you who want to do some NMP work had better get organised).

Last day 'for accepting visitors at Acton and Swindon' is June 10.

But all is not lost...

'Specialist collection' is due to re-open on June 27 – followed by

Vertical collection re-opens on June 29.

and all sections fully operational on July 1....

I can remember when we tied string around the red boxes and chucked them in the back of a lorry.

WAZZAT? NUMBER 2 - NOT THE ANSWER!

Anthony Crawshaw

The photograph supplied by Vikki Fenner for AARGnews 6 did not suggest anything at all to me at first. However when I reread the text some time later the point that the two largest groups of sites were on south-west facing slopes stood out. Were these pairs of parallel lines connected with medieval cloth-finishing processes, such as bleaching in the sun? Another possibility might be the stretching process of tentering, where the forces involved would have been quite large. In other words, were the cropmarks the result of former beam-slots for some form of frame?

In order to check on this possibility I tried to find out some details about the frames used, from documentary sources. The fulling process for woollen cloth improved the texture but resulted in considerable shrinkage. To recoup some of this loss the wet cloth was stretched tightly between tenterhooks. These hooks were attached to the horizontal rails of a special fence high enough to take the full width of the cloth and of length enough for the whole bolt, perhaps 25-30 yards. The rails could be moved further apart to allow for different loom widths and in order to apply the necessary tension while the cloth dried. These fences were clearly of solid construction, since over-tentering 'by wrenche rope and ringe' was common enough to warrant prohibition by statute. The map of sixteenth century London (Museum of London - plate XVIII in Winchester studies, 7(ii), 'Object and Economy in Medieval Winchester', M. Biddle, Oxford 1990) shows groups of tents in the Moorfields area. These are arranged end-to-end or in parallel, but are shown with fence posts, not a solid base. An excavated example from Winchester (*ibid*) has substantial post holes which appear to be set some 4-6ft. apart. The illustration shows five or six posts per tenter, which puts them further apart than the

postulated example from Winchester. An engraving of a tenterfield appears as figure 143 in the RCHME volume 'Yorkshire Textile Mills, 1770-1930, published by HMSO in 1992. But in any case, the present remains would be a row of post holes situated close to a settlement, since one would not want to haul a heavy, wet, length of cloth further than necessary.

By contrast with the short time taken for tentering, bleaching of linen took weeks or months, depending on cloth thickness and weather. Because of the length of time involved, quite large areas of land were used, whole fields or, in one recorded case, a whole farm. Two accounts differ in the process. In one case the cloth is staked down on the grass, kept damp and turned weekly. There is a possible illustration of this in the centre of the same map of Moorfields - one of the hazards in the form of a playful dog is also shown. In the other account, from the thirteenth century, fields are rented from the Abbot of St. Gall, with permission to put up any necessary erections. The 'necessary erections' are thought to mean the wooden posts on which the linen was supported. A photograph of bleachfields in use may be found at Figure 187 in the RCHME volume. In all cases it is the sun that does the whitening, so a south-west aspect would be advantageous. Whether there were any other variants that would have involved frames with beam-slots for bases is a matter of speculation. Perhaps there might be a clue in the local field names - the bleachers were also known as whitesters.

Although I enjoyed this ramble, I doubt if we are any nearer the answer to the puzzle picture. My thanks to my informants about the medieval textile industry, Penelope Rogers and Ian Goodall.

‘AERIAL ARCHAEOLOGY’. WHAT?

Rog Palmer

Introductory monologue

I’ve always been puzzled by the term ‘aerial archaeology’ and, despite hours of discussion with self-confessed aerial archaeologist Chris Cox, remain unable to grasp, let alone define, what it is. I accept that a flying archaeologist is likely to be able to apply greater archaeological judgement than a flying dentist (yes, I’ve got one) but is that ‘aerial archaeology’? And if it is, where does ‘aerial archaeology’ stop? I can print black and white aerial photographs better than Jessops because my archaeological knowledge enables me to cheat as appropriate even when doing a bulk run – does that make me an ‘aerial archaeologist’? I can interpret those photographs to make maps of the archaeological information they record – does that make me an ‘aerial archaeologist’? I make notes and comment on the archaeological features so mapped and, sometimes, suggest their potential as sources of information to field workers – does that make me an ‘aerial archaeologist’? I’ve visited many of the sites and areas I have mapped, their locations have taught me of the skills that their makers had in use of the landscape – surely that can’t be ‘aerial archaeology’? Using my maps, the field knowledge, and anything useful that may be gleaned from publications I have tried quite hard to extend my knowledge of past societies and activities – would you like to call that ‘aerial archaeology’ too?

And on we go...

Is it kicking away at an old horse again (or whatever it is one is supposed to kick at to alleviate frustration – an old wife maybe?) to think about words and their meanings. And is it relevant to AARG anyway? I have no feelings for the old horse but I would argue that these thoughts have some bearing on, let’s be vague, aerial reconnaissance and post-reconnaissance. There is also the possibility that it may provoke response for a future issue of *AARGnews*.

The longer I spend working with aerial photographs, interpreting the things to make maps of what I hope to be archaeological features, the more, and different, questions arise. Definitely a case of ‘the more we have the less we know’. I have a different ponder on the subject elsewhere in this issue (well, no one but Anthony Crawshaw has sent me anything yet and the copy date was yesterday!) but here am thinking out loud in an attempt to locate the boundaries of ‘aerial archaeology’. In the past I have suggested that the term arose in an attempt to give an element of respectability to ‘aerial

photography’ and it has been interesting to see who in AARG uses it and who doesn’t. More importantly (to me) is to try and locate where the archaeology comes into the game and to try to establish the limits of the aerial input. Where, I suppose, must aerial reconnaissance and post-reconnaissance hand over to field-based techniques? Any such boundary is going to be elastic, to change with time (and maybe place) but it seems definitely to exist as the more games we play (call it analysis if you like) the greater is the need for field data to test our suppositions.

Let’s see where archaeological knowledge helps us with aerial aspects. Our archaeological background provides an important component in the basis for our perception, either as fliers or interpreters. It is what will affect our decisions (from whether to take a photograph to the classification of what has been recorded) which will vary with the depth and scope of our knowledge. However, any archaeology that we read about is *old* archaeology – an essential background but not necessarily relevant to current aerially derived problems. We need the factual base to confirm, or

otherwise, our observations but the results of past field work often fall short of satisfying the questions that can arise from aerial work. The facts that are coming in are not necessarily the ones we need to know nor are they coming in fast enough. It is probably correct to say that we are all breaking new ground – we may discover new sites or make new interpretations of old photographs – and it is results of such work that ought to help mould the questions we seek on the ground. The fact that, as Pickering has often told us, the ‘establishment’ does not do this is more our fault for failing to demonstrate the needs arising from aerially based research than for theirs for not knowing them! But this returns us to my theme – where does ‘aerial archaeology’ need to drop the ‘aerial’?

We can agree that aerial reconnaissance is a way of collecting data and that through photo interpretation we can make maps to show the archaeological (and other) features so recorded. Like any technique it has its own methods and techniques which need to be learned, developed and extended by its practitioners. But can (and should) ‘aerial archaeology’ go further? Are we being too grandiose about something that is, after all, little more than a method of survey? Forgetting the photography itself, let’s see how the results may be used.

There have been projects in the past which have linked aerial work with field survey and some with excavation. There have been, and are still, projects which begin with results of past aerial survey and add field-derived data. RCHME’s Dartmoor is one such – the mapping from air photographs has been completed and will be passed to the field team to form the basis of their survey. We should not necessarily expect any useful feedback to result from such a combination. Had field and aerial specialists been able to work together on the project understanding, on both sides, would have increased, and probably improved results. It’s not new to suggest that within RCHME there would be tremendous advantages to having APU interpreters seconded to regional offices to work as part of an investigative team.

My own work at Hambledon mixed air photo interpretation and field survey and was followed up by excavations which provided data relevant to my own part of the project but also showed me that such requirements were at a very different level to those of the ‘excavating archaeologist’. This difference arose again after my work around Danebury – work that was tacked on to the excavations rather than being anything integral to them. Having completed interpretation and mapping I was left in need of factual data to help the thinking. “What you need is a JCB for two weeks to bash holes in as many enclosures as you can”, proposed John Boyden a local (?ex) air photographer who had offered to fly targets for me. At higher levels the idea was very firmly squashed as it would not provide information at the same level as was coming from Danebury itself. Nor did it need to – but that didn’t matter.

Elsewhere it seems that the division of responsibilities between English Heritage and RCHME has successfully ensured that no centrally-funded project has combined a field and aerial input. Was it really John Hampton alone who, in 1976, called for an aerial aspect to what later became the Fenland Survey? At the time EH (or whatever they then were called) didn’t much like aerial photographs and, presumably, RCHME didn’t fund external work and had no internal capacity for long-term projects (that dates back to when RCHME employees totalled about 120 and the main work of the APU was archival). When things finally came together in the North West Wetlands Survey for which EH funded a part time aerial element (primarily photo interpretation) they chose an area – typically, but sadly for us – where there was virtually nothing to be found within the very tightly defined ‘wetland’ zones and where it was against the rules to peep over the fence and extend to where the stuff was likely to be found. The principal lesson to be learned from past survey projects has nothing to do with any archaeological results so gained but shows how essential is the need to fully integrate field and aerial aspects from the start.

This has strayed somewhat from any attempt to define 'aerial archaeology' but has indicated where aerial work can, and should, blend with field work. It has, perhaps, also hinted towards a boundary for, if you must, 'aerial archaeology'. It reflects a personal bias towards what I want to get from my own work and how I see uses of aerial photography fitting in with 'trying to understand the past'. Maybe the term really

should apply only to aerial photographers (and photography) as I note that RCHME seem to avoid the term regarding use of the photographs. In their assessment *Stonehenge Visitor Centre* (1991) the workers, Cathy Stoertz, Simon Crutchley and myself, were called 'air-photo surveyors' – although I don't know what was wrong with 'air-photo interpreters'.

Concluding dialogue

Imagine a social gathering, booze flowing, huddle in a corner, usual conversations, etc:

"I'm an aerial archaeologist."

"Oh, how interesting. Um.... What do you do?"

Well – what do you do?

'Among the rural sites those few surviving in earthwork form are remarkable, both in their visual appearance - the coming to life of dull cropmark plans - and in the potential they offer for the understanding of the farming economy.'

David Hall (in Hall and Coles, 1994, *Fenland Survey: an essay in landscape and persistence*. English Heritage: London).

...and I thought I'd begun to convert him...!

BOOKS (AND PAPERS) OF INTEREST?

Unterirdisches Baden-Württemberg: Archäologie und Luftbild. By Von Dieter Planck, Otto Braasch, Judith Oexle and Helmut Schlichtherle. Konrad Theiss Verlag, Stuttgart. 1993. DM 128,-.

We have seen only the publisher's blurb for this 'big picturebook' which uses a facing-page format to describe, using text, drawing and aerial photograph, 80 sites in Baden-Württemberg (the south-west corner of Germany: Otto's 'home patch' and local ground to the other authors). Diagrams appear to be a mixture of conventional plans and oblique drawings traced from the photographs and used as a guide to description. As expected from Otto, the photographs are excellent and reflect his commitment to flying and photography and his eye for composition. We in the UK received the publisher's blurb about a day too late to take advantage of the introductory offer – I can't decide whether that is due to unforeseen delays or good business.

'Segmented embanked pit-alignments in the North York Moors: a survey by RCHME'. By C A Lofthouse. *Proc Prehist Soc* 59 (1993), 383-393.

Analytical field survey, description and discussion about a group of earthworks. These are double pit alignments of various lengths and numbers but which are characterised by use of the spoil from the pits to make 'enclosing' banks. Association with burial mounds *may* suggest a bronze age date. The probably unanswerable aerial question is whether our now levelled and crop marked examples may have had similar banks. We have been warned frequently to remember that spoil from ditches had to go somewhere and that banks may have been of more importance in the past than the ditches that we normally record. Now we have another reminder relating to a type of site which, to my knowledge, has been previously described as either a line of holes or a row of trees.

An Atlas of Roman Britain. By B Jones and D Mattingly. Blackwell, Oxford. 1993. Paperback £14.99.

This is a paperback edition of a book that was first published in 1990. As a (by preference) prehistorian I found it a concise introduction to Roman Britain which kept clear of the clutter (pottery, inscriptions, personal names and other stuff that does not show on aerial photographs) which I find so tedious in many publications about the period. It may be of interest to AARG members for the use it makes of aerial photographs (including many taken by Barri Jones rather than the same old stuff from CUCAP) and, especially, of maps.

The authors have been extremely well served by Oxford Illustrators. The *Atlas* comprises a uniform set of maps which show, regardless of scale, the same natural features and which serve as a background for things archaeological. After a useful introductory chapter on how not to mis-interpret maps the *Atlas* makes use of old maps, place names and Itineraries to show known and 'unlocated' sites. This is probably old hat to Romanists, but new to me whose site names usually derive from the nearest available on the 1:10560 sheet. There follow three chronological chapters (pre-conquest, conquest and development) and another three dealing with economy, the countryside, and religion before concluding with a short chapter giving the various arguments for the end of Roman Britain. [I was reminded of one of Pickering's old sayings, that what we often call 'continuity' on the basis of site plans may well show continuity of occupation of a location but the changes we see can have only been made through destruction (or abandonment) and reconstruction and therefore show *discontinuity* of a way of life.] All chapters are easy to read and very understandable. This is not due to a simplistic approach – the text is a summary of the RB period but also presents new views and arguments – but to a clarity of style which is rare in archaeological writings. I surprised myself by becoming interested in what, until now, had always been (Fens excepted) 'bloody Romans'. The

authors know their subject, know what they want to say about it, can, and do.

I praised the maps in this *Atlas* and they run side-by-side with larger scale plans of, for example, buildings, industrial areas, and land allotment. All mapped information was culled from a large bibliography and combined as necessary to illustrate a theme although some of the larger scale drawings are reproduced more-or-less as originally published. Only one stands out as 'poor' and that may be partly due to its title. The relevant text reads that the middle Nene Valley '... has been chosen to illustrate the distribution pattern of villas in a broader context.' (P 246) while the figure itself is captioned, 'Lower Nene Valley villas in their landscape' (Map 7:13). All very well except that the 'landscape' is totally blank apart from the river and its tributaries – not quite the Roman scene that the rest of the book shows us. A day with the Cambridgeshire and Northamptonshire SMRs could have added a 'landscape' to the villas.

That single niggle aside, it's a good book, clearly illustrated and well written. It's much more than an atlas and, at £15, is the book I would recommend as an introduction to, and summary of, Romano-British history.

Natural Landscapes of Britain from the Air. N Stevens (ed). Cambridge: University Press, 1990. Remaindered price £10.99.

Britain's Changing Environment from the Air. T Bayliss-Smith and S Owens (ed). Cambridge: University Press, 1990. Remaindered price £10.99.

First noted in *AARGnews* 3 and now at remaindered price. I found mine in the CUP shop in Cambridge (February 1994) but assume they'll become more widespread. *Natural Landscapes* is written by geographers for geographers and comprises seven illustrated essays on different kinds of landform. The book explains a lot that the airborne archaeologist may see in passing and also provides information on landforms which is of use to the photo interpreter. Usefully, NGRs are given for each photograph and a six-page Glossary explains the terminology. *Changing Environment*

shows how we have messed up the natural landscapes – although in a book whose subject is *change* I would have expected to see more 'then and now' pictures.

Both volumes offer good reading and good browsing. They serve as a superb catalogue of the range (some of the range) of the CUCAP photographs and show the value of a forty-five year accumulation of pictures. In *Natural Landscapes* especially we have the skilfully chosen viewpoint and use of lighting which brings out the shape of the land. But there is also the odd 'grabbed shot' – how many of us have been in the right place at the right time to get a picture such as the soil blow in *Changing Environment* (figure 35)?

Britain from the Air: 1000 piece jigsaw puzzle. Gibsons Games. Price unknown.

The 'review copy' is of Bamburgh Castle, Northumberland. I've not had time to attempt it yet but looking at the picture and remembering past skills (the last one I did was plain red and circular) it looks a bit of a doddle with roads, buildings, textured sands and tramlines in the background fields. John Hampton used to ask potential photo interpreters whether they liked doing jigsaw puzzles and here is a series of eight that combines puzzle with aerial aspect. Maybe future RCHME interviews will add these to the tests for stereoscopic and colour vision. Might we await the day when an enterprising aerial photographer produces a set of favourite crop marks? Not wholly in jest – what a great way to be introduced to archaeology.

Lincolnshire from the Air. David Start, photographed principally by Chris Cruickshank. Heritage Lincolnshire, 1993. £14.95.

Shropshire from the Air: Man and the Landscape. Michael Watson and Chris Musson. Shropshire Books, 1993. £13.99.

Both volumes, which provide contrasting and individual aerial photographic coverage of the respective counties, will be fully reviewed in the next copy of *AARGnews*.

REGISTER OF NEW MEMBERS (1993-1994)

Members are listed alphabetically using the following format:
 NAME, address/General interests (period, technique, area, etc)/Aerial interests
 (reconnaissance, post-reconnaissance, application, etc).

ORDINARY MEMBERS

- ADAMS, /Application of thermal infra-red sensors and video technology to archaeological sites /Landscape archaeology, reconnaissance and imagery interpretation.
- ALCOCK, Olive, OPW, 51 St Stephens Green, Dublin 2, Ireland /unknown or /misaid!
- BOUTWOOD, Yvonne, 36 Springbank Crescent, Leeds, LS6 1AB /prehistoric, neolithic and bronze age tools /Interpretation and transcription.
- DONEUS, Michael, Institut fur Ur- und Fruhgeschichte, Franz-Kleing 1, A-1190 Wien, Austria /Neolithic Europe, methodology and statistical analysis /Bildherstellung (flying and photography), bildauswertung, archivisung.
- FASSBINDER, Jorg, Bayer Landesamt fur Denkmalpflege, Abt Bodendenkmalpflege, Archaologische Prospektion und Luftbildarchaologie, Postfach 100203, 80076 Munchen, Germany /Soil magnetism, magnetic prospection, geophysical prospection, climatology.
- FISHER, Simon, Boskenza, Rosudgeon, Kenneggy, Penzance, Cornwall /Thermal infra-red sensors and video technology.
- GERSTNER, Winifried, Klausenbergweg 22, W-84036 Landshut, Germany /Bildauswertung, planerstellung, inventarisierung.
- GIBSON, Alex, Clywd-Powys Archaeological Trust, 7a Church Street, Welshpool, Powys, SY21 7DL /unknown or /misaid!
- GOJDA, Martin, Institute of Archaeology, Letenska 4, 11801 Prague 1, Czech Republic / Landscape history, medieval settlement patterns, archaeology and history / Reconnaissance, post-reconnaissance, image data base, non-destructive methods.
- GRACE, Pamela, RCHME, Shelley House, Acomb Road, York, YO2 4HB /unknown or /misaid!
- GROSSMAN, Darja, University of Ljubljana, Dept of Archaeology, PP 580, 61001 Ljubljana, Slovenia /Reconnaissance, interpretation, transcription.
- HAMPTON, Katy, RCHME, Alexander House, 19 Fleming Way, Swindon, SN1 2NG / Landscape history (all periods and areas) /Interpretation and application.
- HASER, Jutta, Niebuhrstrasse 62, 1000 Berlin 12, Germany /unknown or /misaid!
- HODGSON, John, Field Archaeology Office, The Butts, Warwick, CV34 4SS /Neolithic in Britain and central Europe, cultural resource management (SMR archaeology and planning) /Reconnaissance, processing in relation to GIS.
- HOGAN, John, 68 Cromwell Road, Croydon, Surrey, CR0 2YN /unknown or /misaid!
- KELLEHER, Matt, Glanlea House, Ardkillmartin, Kilmallock, Co Limerick, Ireland / Classification of cropmarks and soilmarks in southern Ireland.
- KERSHAW, Antonia, RCHME, Shelley House, Acomb Road, York, YO2 4HB /Roman, prehistoric /Transcription, application.

- MAHNCKE, Geo-Beratungen, Einkenweg, D 53797 Lohmar Rhld, Germany /German history /Bildauswertung.
- MARKHAM, Philip, Northamptonshire Heritage, Northamptonshire C C, PO Box 287, 27 Guildhall Road, Northampton, NN1 7BD /Cropmarks, soilmarks /Interpretation, transcription.
- MARSDON, Steve, 11 Belgrave Road, Poulton-le-Fylde, Lancashire, FY6 7RP /Low level aerial photography from kites and balloons as an aid to excavation
- MATTHEWS, Fiona, 7 Burnham Road, Malmesbury, Wiltshire, SN16 0BQ /Uses of aerial photography.
- MILLER, Andrew, 13 Downham Mead, Chippenham, Wiltshire, SN15 3LN /all interests / Post-reconnaissance, interpretation, transcription, application.
- MOCCI, Florence, Centre Camille Jullian CNRS, Universite de Provence, 29 Avenue R Schuman, 13621 Aix en Provence, France /Protohistory, Gallo-Romain.
- MOLONEY, Rebecca, RCAHMS, John Sinclair House, 16 Bernard Terrace, Edinburgh, EH8 9NX /Roman archaeology and general landscape history, particularly Scotland /Post-reconnaissance, interpretation, cataloguing of APs, public enquiries.
- NEILL, Ken, DOE Northern Ireland, 5-33 Hill Street, Belfast, Northern Ireland /unknown or /misaid!
- PEACHEY, J P, Gatehampton Manor, Goring on Thames, nr Reading, Berkshire, RG8 9LU /Medieval period, landscape study /Interpretation, transcription, SMR.
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- RADCLIFFE, Francesca, Old Farm House, Elworth, Portesham, Weymouth, Dorset, DT3 4HF /Prehistory, medieval, archaeology and geography /Interpretation, transcription.
- ROBINSON, Ben, Cambridgeshire Archaeology, Fulbourn Community Centre, Haggis Gap, Fulbourn, Cambs, CB2 5HD /Prehistory, RB period /Use of microlights in aerial reconnaissance, aerial survey in the Fens.
- SMALL, Fiona, RCHME, Alexander House, 19 Fleming Way, Swindon, SN1 2NG /unknown or /misaid!
- STONE, Jane, RCHME, Shelley House, Acomb Road, York, YO2 4HB /All periods / Interpretation.
- STRACHAN, Dave, 21 North Dell, Springfield, Chelmsford, Essex /Post-reconnaissance, interpretation, transcription.
- TAYLOR-WILSON, Robin, 13 Cross View Terrace, Neville Cross, Durham, DH1 9JY / Survey techniques (geophysical, aerial, buildings and earthworks) /Transcription and application.
- URLINGER, Walter, Bayer Landesamt fur Denkmalpflege, Abt Bodendenkmalpflege, Archaelogische Prospektion und Luftbildarchaologie, Postfach 100203, 80076 Munchen, Germany /unknown or /misaid!
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- YOUNG, Andrew, Cave Cottage, Crean, St Buryan, Penzance, Cornwall, TR19 6HA /Post-reconnaissance, transcription.
- YOUNG, Bud, The Landscape Overview, 26 Cross Street, Morehampstead, Devon, TQ13 8NL /Air photographs in education.

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