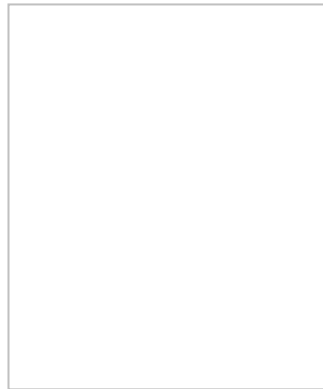


The Royal Photographic Society

HOLOGRAPHY GROUP

Newsletter October 2002



Hologram produced from dot matrix master by
Spatial Imaging Ltd

Editorial

I apologise for the delay in producing this newsletter. I had somehow become responsible for producing some eighty articles for the forthcoming Oxford Companion to the Photograph, with a very firm deadline, and, as always seems to happen under such circumstances, my computer crashed; then, when that had been sorted out, my printer gave up. These disturbances were supplemented by the advent of workmen to dig up my front garden to replace the main drain, and more workmen to replace a window frame some character had tried to force (fortunately, without success). But at last I was able to get down to it. Most of this newsletter is devoted to our conference at the Royal College of Art. We were able to use this prestigious site because of the generosity of the Shearwater Foundation, a charity that exists to promote holography as an art form. Thus the theme of the conference was 'Holography, Art and Design'. It proved phenomenally successful. A special vote of thanks goes to our Chairman Kevin Brown, who put in an immense amount of preparatory work behind the scenes. A bouquet, too, for the RCA itself, who – never mind their large fee – provided a superb buffet, endless supplies of coffee, and a highly competent technician who sorted out all the usual visual aids problems in short order. The final number of delegates was not far off a hundred, some of them from mainland Europe and even some from across the Pond. All the more formal papers are reproduced on our website in the form they were given to us (give or take a little subediting). In this précis I have added a little from my own notes here and there, and have filled in, as far as I can, what may have been said at the time but didn't appear in the papers later submitted. Some papers didn't materialise, so I have tried to fill in some of the missing detail from my notes. We hope to make such conferences a bi-annual event, though we may not be able to aspire to the RCA's facilities every time.

A further vote of thanks is due to our Treasurer Jonathan Ross, who staged an impressive exhibition in his own gallery, to go with the conference. Jonathan has acted as host to our Committee meetings for the last three years, and we are grateful for his generosity.

Graham Saxby

Holography, Art and Design Report on a conference held at the Royal College of Art, 23 March 2002.

Although our Group had produced a printed Proceedings document for the previous conference, it had proved an expensive undertaking; so instead, with our Website now up and running, we decided this time to put the whole Proceedings on it, so that everyone with access to the website could read it and download any document they found interesting. The address of the website is www.holography.co.uk. As to the conference itself, there was much of a reunion spirit about it, as many of the delegates there hadn't seen much of each other for some time. In anticipation of this, a fair amount of time was allocated for breaks. Considering the early start and the uncertainties of the railway system at weekends, it was a pleasant surprise to find more than eighty participants present at starting time.

The conference began with our Chairman Kevin Brown's welcome to the delegates, and introduction of the morning's chairman Margaret Benyon. MBE (Hon. Fellow).

The first speaker was Sam Moree from New York, with a tribute to his co-founder and fellow artist Dan Schweitzer, who died recently. For many years the two ran the New York Holographic Laboratory, in a dungeon under an old cinema in the centre of Manhattan, and gave many holographers their first lesson in the craft. With typical modesty Sam ascribed the originality of most of their creations to Dan, who built the models using balsa wood, cardboard and modelling clay. During their time together they created many striking images, often with a stage-set atmosphere (both had been involved in the acting profession) and visual puns. Sam showed a number of slides of work inspired by Dan, whom he summarised as 'a well-rounded artist'. [Unlike many fine-art holographers, they were completely open about their methods, and gave away many useful tips to learners. Enthusiasts were always welcome in their studio, especially when accompanied by a bottle of wine.]

The second speaker was Professor Georges Dyens of Quebec University's Holography Department. He described his department's work in putting together a CD-ROM containing an interactive encyclopedia of holographic art called Holography Art: Real Virtual 3D Images, with contributions from nearly a hundred holographic artists world-wide. Its main purpose is as a teaching tool for schools, colleges and universities. It

has a very full section of bibliography and references. Further information is available at gdyers@hotmail.com.

The next speaker was Professor Hans Bjelkhagen (Fellow) of De Montfort University, on possible methods of obtaining images visually indistinguishable from the original objects. He described two methods he has been researching for some years, namely full-colour reflection holograms and Lippmann colour photographs. His full paper contains a wealth of practical detail, which you can download (all 18 pages of it) from our website. After examining the availability (or otherwise) of obtaining suitably balanced panchromatic recording materials, Hans discussed the choice of wavelengths for good colour reproduction in a hologram, showing that three were not really adequate, and at least four were needed for full colour fidelity. He described the set-up for colour Denisyuk holograms and the required processing technique for avoiding changes in emulsion thickness. He then explained Lippmann's interference technique for natural-colour photography, and his own modifications to them, taking in the problems of emulsions, processing methods and display. He produced some striking examples of his own work in both areas.

Hans was followed by Dr Andrew Pepper, whose subject was holography in architecture. Andy is the UK representative of the Shearwater Foundation, which sponsored this conference, and thus himself deserves a big vote of thanks for his efforts. After discussing early ideas for display galleries by designers such as Anton Fürst, Andy described the work of a number of international holographic artists whose holograms have been displayed in public places. He discussed the merits of holograms of models of architectural projects, and the use of embossed holograms in tiles and wall decorations. He showed slides of holograms incorporated in public spaces, and looked at the principles underlying images that changed colour or shape under varying lighting or viewing conditions. His complete paper, with illustrations in colour, is available on our website and Andy's own www.apepper.com.

Dr Martin Richardson then presented images from his forthcoming book *Spacebomb*, with suitable commentary. These include some of his best-known earlier work, along with many more recent images made in his pulse laser studio in the Oxo Tower on the South Bank, London. Martin is now also working in the field of lenticular photographic stereograms.

David Burder (Fellow), in an address he entitled *The Eternal Triangle: The Agent, the Client and the Hapless Burder*, gave an amusing account

of the problems and misunderstandings that arise between a client's aspirations, an agent's assumptions and the operator's technical tools, and showed how popular misunderstanding of the possibilities of three-dimensional imaging produces his biggest headaches. David is the director of 3D Images Ltd, and is Britain's foremost operator in the field of non-holographic 3-D images. He explained that in his business one has to wear four hats: the businessman, to organise contracts and licensing; the magician, to conjure workable ideas out of impractical requirements; the scientist, to calculate the way to put them into practice; and 'Bob the Builder' to carry them out. He related some anecdotes about the misapprehensions and improbable requirements of clients, and showed how technology could sometimes realise the most far-out ideas. He displayed some of his own commercial projects such as lenticular multi-image and 3-D advertisements, and stereoscopic modifications to cameras such as the 'Twinolta' camera constructed from two 35 mm cameras.

Mike Anderson was next off the mark. Although he has retired from teaching photography he is still active in holography, and has recently completed a new and much improved version of his miniature holographic workstation. Now known as the PTI Holocamera, it is being marketed by the Precision Tool and Instrument Company for educational purposes. It uses a red diode laser with a stabilised output, and can be used to make single-beam reflection holograms, or transmission masters using the bypass principle to avoid the need for a beamsplitter. As the laser produces a clean diverging beam there is no need for a spatial filter; and for single-beam reflection holograms the elliptical beam can be made circular by the insertion of a cylindrical lens. There is a magnetic film holder taking films up to 4 × 5 in. Processing is with a developer based on the CWC-2 formula (for Slavich material) and a standard EDTA bleach, carried out in a leakproof plastics container. Further technical information is available from Mike at michael.anderson@triaster.co.uk or telephone 020 8427 9685. Marketing enquiries should go to The Precision Tool and Instrument Company, Brett Drive, Bexhill, E Sussex TN40 2JP, e-mail michael@solgroup.demon.co, or telephone 01424 732674.

The afternoon session was chaired by Andy Pepper. The first speaker was Dr David Pizzanelli of Light Impressions International Ltd. His subject was 'Direct-Write Digital Holography', but his paper had a much wider scope. In a detailed introduction he covered the history of commercial holography. The main problem in early commercial holograms was that the image was the same size as the object, and this often entailed the need for a scale model of the original, perfect in every detail. [I still have a model of a sand-cast elbow-joint pipe made for a hologram to go on a catalogue cover. It is less than 20 mm long, and cost as much to make as ten of the monster fittings it represented.] David showed the importance of the evolution of the holographic stereogram, made at first from a large number of photographs of a rotating subject, and later from a camera (or a battery of cameras) on a rail. The advent of embossed holographic printing spawned '2D-3D' artwork in two planes, which became a standard for security holograms. The next stage was to download the images on to an LCD screen from a computer, to form the individual images. This led inevitably to the building up of images using only two focused laser beams, generating dot holograms in a fashion analogous to halftone printing. The replay colour of a dot was controlled by varying the angle between the two interfering beams. Dot matrix holography quickly replaced 2D-3D in popularity, as no models were needed and any desired image was possible. The presentation concluded with descriptions of the techniques employed by various commercial enterprises. Total computer generation of the images was now the rule, and full-colour animated direct-write 3-D was already becoming a reality. David's paper, with all illustrations, is available on our website or direct from David's at www.pizzanelli.co.uk.

The next presenter was Sam Moree, returning to show us slides of his own work. Unfortunately, we don't have the facilities for reproducing them here, though many of you will have seen the holograms themselves at international exhibitions.

Walter Spierings of The Dutch Holographic Laboratory, Eindhoven, was first noticed as a craftsman of rare quality when his beautiful illustrations of the eight types of display hologram graced the entrance to the Light Dimensions exhibition at the Octagon in 1983. Since then he has founded his own company and developed the Holoprinter from an original copying device somewhat similar to that originally developed by Applied Holographics Ltd, to a much more sophisticated machine capable of originating 3-D images by digital methods and pointing towards the creation of digital holographic video. Unfortunately, only his video illustrations are available on our Website, though these are pretty

comprehensive. You can obtain more information from Walter's own website, www.holoprint.com. The progress of development has also been recorded in the proceedings of the last four Lake Forest symposia.

Amanda Ranalli provided a little light relief in the introduction to her presentation on 'Henry VIII, Holograms, and all that...' Amanda is the UK distributor of Slavich holographic materials and Geola products, and has a long history of holographic supplying, having worked with Duncan Croucher in the early days of Agfa materials, and assisted with the organisation of the legendary RPS 'Light Dimensions' exhibition. Her explanation of the title of her talk was that Anne Boleyn's father, in a request to the French court for his daughter to be returned to England, described his letter as 'a hologram', i.e. a document written personally and not by a secretary. [It is ironic that this term became transformed into 'holograph', a word Gabor consequently felt unable to coin (by analogy with 'photograph'), owing to its pre-emption by the literary world.] She discussed briefly the rise in importance of the hologram in commercial presentations, and pointed out that Slavich emulsions are now the only holographic materials readily available worldwide. The gist of the presentation was a plea for better marketing of the concept of holography and the elimination of misunderstandings over the nature of a hologram, confusion with photographic stereograms and the identification of holography with security stickers and souvenir shop trash. She felt that perhaps the art hologram deserved a new name. [Any suggestions?] She urged holographers to press for exhibition space in public places such as shopping precincts. A précis of Amanda's presentation is available on our website.

Stephanie Hunt and Oliver Cossairt came from the USA to talk about the MIT Museum, which took over the collection of New York's Museum of Holography when it became insolvent and had to be wound up. Their full paper is available on our website. [You are warned that it is couched in American education-speak, which is characterised by very long sentences and numerous polysyllabic neologisms.] The gist of their paper is that with an enormous number of holograms of both historical and scientific interest under their roof there is no way of displaying them all; they describe various methods of simulating parallax using animated projection, videotapes and quasi-3-D computer images. They emphasised the importance of education in holography, but seemed to be reticent about the success of MIT's Spatial Imaging Group in this respect. [I seem to remember that the old Museum in NY did a pretty good job along these lines.] For further information you can contact Stephanie and Oliver by e-mail at museum-programs@mit.edu.

Dr Paula Dawson, though unable to attend the conference, sent two papers from the University of New South Wales. The first, by a team led by Dr Bruce Harvey of the Surveying and Spatial Information Systems Department, and including Paula, describes a project to study the use of shadows in traditional and holographic images, using a live model assuming the attitudes of figures in three well-known paintings and scanning each figure to acquire three-dimensional data. The second paper, by Paula herself, describes her research in relating the use of darkness in paintings to its use in holographic imagery. Both papers are reproduced on our website.

The final presentation was by Jo Fairfax, who describes himself as ‘a public artist’. He spoke more or less impromptu, and the record on our Website is a literal (and sometimes hilarious) transcription of what he actually said. [Did he have a tame shorthand writer hidden away?] An adequate précis would still be too long to fit in here, but you can read all of its 29 pages and numerous illustrations on our website. Jo’s main topic was the relationship between public sculpture and holography; it thus largely complemented Andy Pepper’s thesis. He showed a large number of slides of holographic displays integrated into public buildings, and finished by showing some thirty other projects of his own which, though not specifically holographic, contained ideas generated by holographic images.

On conclusion of the conference most of us went to the exhibition of holography that Jonathan Ross had mounted especially for the conference in his private gallery in Earls Court Road, just walking distance (for the fit) away. The work on display there certainly showed that art holography is still very much alive and kicking. I must mention in particular the beautiful images by Iñuki Beguiristain, an artist whose work I have not seen before, and whose work was later displayed at a personal exhibition at Waterstone’s in Piccadilly.

Department of Partly-Baked Ideas

In the Summer 1986 issue of holosphere I was again complaining about the use of unnecessary jargon in applied physics papers (and lectures too), in particular the stretching of the meanings of otherwise commonplace words well beyond their elastic limit. As I have mentioned before, I was unhappy about the tendency of some holographers to refer to their table set-ups as ‘cameras’ when they are plainly nothing of the kind. A conventional camera can in fact readily be modified to make focused-

image holograms. It only needs the introduction of a reference beam into the camera body using a single-mode optical fibre. Such a camera was at one time in regular use at Rolls Royce's aero-engine research department, for vibration studies.

Having examined this camera, as well as two others designed by Loughborough University's Engineering Faculty for interferometric studies, the DPBI was moved to speculate on the possibility of beach holographers, using portable lasers. At the time the possibility seemed unlikely, as the ancillary equipment for a 10J pulse laser weighs about a ton, and the DPBI suggested instead a powerful argon laser with a hefty tripod and a very short exposure. Today there are pulse lasers you can easily carry around, and with a synchronised shutter and a notch filter to keep out ambient daylight, outdoor holography is indeed a practical possibility. There appear to be two snags, though. The first is that you need an enormous lens aperture to get any useful parallax; and the second is that in an optical image the longitudinal magnification is the square of the lateral magnification (so that, for example a 10× reduction in image size means that the image is 100 times flatter). Neil Davies's 'Holoscopic camera' (see May 2000 Newsletter) gets over the aperture problem by using a multilens array somewhat resembling a fly's eye, and which can be as wide as you like. The second problem is overcome if you reconstruct a real image of the object by replaying the hologram back through the original lens system to bring it back to size, and make a hologram of this image. This will regain the lost depth.

Most of the DPBI's ideas, though perhaps wacky on the surface, are based on fairly sound theoretical grounds, and more than one of them has subsequently been realised in some form. But as far as I know nobody has tried making holograms out of doors – though it wouldn't surprise me if Paula Dawson were to have a go. Steve Smith of Lasersmith Inc, Chicago, has tackled it in a different way. He uses a line of twelve Nikon cameras on a gantry to produce the originals for holographic stereograms. These can be fired simultaneously, or (for animation) successively. A group stereogram of the delegates at the Fourth Lake Forest Symposium in 1991, made this way, forms the frontispiece of the Proceedings.

Graham Saxby

Complete amateur holographic lab for sale

We are sad to have to report that Charles Vallance, a long-standing supporter of the Group, died recently. His widow would like his working equipment to go to someone who would be able to put it to good use. The main items are as follows:

Spectra-Physics 15 mW HeNe laser, fully up to specification
Spatial filter with $\times 40$ objective and clean pinhole, nominal $5\ \mu\text{m}$ (actually nearer 8)
Four 150 mm diameter \times 15 mm thick front-surface $\lambda/10$ mirrors
Small steering mirror and mount
Sand table, 63×120 cm, 32 cm deep, with inner tubes and scaffolding support
Three further f/s mirrors, various sizes
Eight 50 mm sq glass ND filters, 0.1—3.0 density
Beam combiner, 20 cm sq; wooden film holder and glasses
Perspex fume cupboard, $42 \times 60 \times 92$ cm, with extractor fan and trunking
Processing dishes, measuring cylinder, beakers, wall hygrometer/thermometer, digital balance, spotlight, safety goggles and protective clothing
Various chemicals e.g. EDTA, ferric nitrate, as used in bleach baths

The best offer around £1500 would be acceptable. There are also 6 unopened boxes of fairly fresh (perfectly OK) Agfa 8E75 HD 4×5 in. film, 100 sheets, which are offered separately for bids over £60 each, highest bidder takes.

Please get in touch with Graham Saxby initially, tel. 01902-341291, or e-mail graham.saxby@ukonline.co.uk.

Holography Group Committee

Chairman

Kevin Brown
12 Chesson Road
London. W14 9QX
0207 610 1078

Secretary

Bob Gibson
12 Park Road
Chandlers Ford
Eastleigh
Hants. SO53 2EU
023 8025 2171

Treasurer

Jonathan Ross
286 Earl's Court Road
London
SW5 9AS
0207 370 2239

Newsletter Editor

Graham Saxby
3 Honor Avenue, Goldthorn Park
Wolverhampton. WV4 5HF
0190 234 1291

Committee Member

George Jozsa
81 South Knighton Road
Leicester. LE2 3LS
0116 270 9277

Committee Member

Molly Gibson
12 Park Road
Chandlers Ford
Eastleigh
Hants. SO53 2EU
023 8025 2171

Webmaster

Joyce Peck
7 Magpie Close
Flackwell Heath
Bucks. HP10 9DZ
0162 852 3076

Committee Member

Philip Gunton
80 The Shrublands
Horsford
Norfolk
NR10 3EL
01603 890841

Committee Member

Jeff Blyth
7 Bath Street
Brighton
Sussex
BN1 3TB