

The Holography Show

A travelling exhibition of holograms
produced at Goldsmiths' Holography Workshop, 1980-82

Introduction

Holography requires a level of technical competence and skill that makes intuitive exploration difficult for beginners. Despite its marvellous 3D appearance, and the natural appeal of a new medium using 'high technology' means, holography is a labour-intensive craft that few will have time to master.

For this reason, Goldsmiths' Holography Workshop is a unique project. It is the first and only workshop in Europe dedicated to offering artists the opportunity to execute their ideas in holography with the collaboration of skilled staff.

The Holography Show contains eighteen pieces by ten artists, produced at Goldsmiths' Holography Workshop between 1980 and 1982. The show demonstrates the variety of holographic technique employed, from the technically-complex coloured *Hand and Yoyo* by Bill Moltenti, to the simple Denisyuk-style holograms used by Jeremy Diggle in *Helsinki Box*. These two also demonstrate the range of intention and use already possible: Moltenti's four- by five-inch image is almost a traditional 'postcard picture' of a Yoyo; Diggle presents us with a box of found objects and 'frozen' holographic relics.

Holography is a technical curiosity, even as a contemporary art form. Some people greet it enthusiastically; others are more cynical about its value. Artists using holography contribute to this debate and new work is anticipated with excitement.

Bill Culbert, Peter Donebauer, Liliane Lijn and Andrew Logan each received an Arts Council bursary to make a hologram with us. The work was completed in six months and was an experiment for each artist, none of whom had any previous experience of holography. The results are exhibited in *The Holography Show* for the first time. The exhibition opened at the Orchard Gallery, Londonderry in October 1982, and it travels to seven other venues in Britain during 1983.

Susan Gamble
Goldsmiths' Holography Workshop
September 1982

Holography

In daylight a typical hologram looks like a simple sheet of glass. To make it work, you have to hold it at a certain angle in a strong beam of light. Then you see the subject of the hologram behind the sheet of glass or, in some cases, floating in front of the glass. The subject looks three dimensional.

The glass sheet is coated with an emulsion which bears a microscopic pattern of zebra-like lines. The pattern breaks up light striking the hologram, transforming it into a recreation of the light reflected from the original subject. The 'replica' is so good that you believe you are seeing the original subject. You see the subject when you look *through* the hologram, almost as if the hologram was a window in a box containing the subject.

The hologram starts life as an unexposed black-and-white photographic plate. The microscopic pattern in the emulsion results when the plate is exposed to laser light reflected from the subject. An arrangement of lenses, mirrors and diffusers gives the correct lighting of the subject during recording. The hologram fails if any part of the equipment moves, so the process is carried out on a heavy table isolated from ground movements or vibrations. There are two such tables at Goldsmiths' Holography Workshop: the largest one is a concrete slab 3.5 metres long, 2 m wide and 300 millimetres thick, resting on partly-inflated car-tyre innertubes.

The first holograms were made in the late 1940s by the Hungarian-born scientist Denis Gabor. Holograms became simpler to make when the laser was invented and commercially-introduced during the 1960s. Better photographic emulsions became available during the 1970s, and artists in the United States and elsewhere slowly began to learn the craft.

Holography already encompasses several different forms and uses. A new Disneyland city called Epcot in Florida has holograms 1.2 m high and 2.4 m wide (four by eight feet) that took three years and cost hundreds of thousands of pounds to make. At the other extreme, a company in California called Light Impressions mass produces holograms 75 × 75 mm (three by three inches) for less than a pound each; the holograms sell in novelty shops and bookstores.

Records have been pressed with holograms on their surface. At the Hermitage Museum in Leningrad, holography is practically routine for documenting valuable artworks in three dimensions. Britain's electricity generating board is looking at similar holographic techniques to check nuclear reactors. Holograms have appeared at trade shows, in shop windows and as advertising give-aways. Videogame manufacturers are considering the possibilities.

The holograms in *The Holography Show* have been made on glass photographic plates at Goldsmiths' Holography Workshop. Each is an original hologram, exposed to the laser and processed individually, and represents hours, days or even weeks of work. The simplest holographic 'camera' takes an hour to set up; processing and drying the first test plate typically takes another hour.

The subject matter for holograms is often specially made. Certain materials remain stable for long periods and special paint finishes often respond better under laser illumination. Metals, glass, ceramics and plaster are particularly good and two-

dimensional graphic artwork can also be included in the image.

Many of the holograms in the show are made from the three-dimensional image projected from a first hologram. The second hologram can be recorded where it straddles the image produced by the first, and in this way the new hologram can show the subject lying across the surface (half in front, half behind) or even floating in front.

This image-transfer process is almost always used to produce holograms visible under ordinary spotlights. But there are other fascinating properties of the technique that can be used in interesting ways. After the transfer, for example, the image in the new hologram is only visible when you look through a rectangular frame standing out in front of the hologram at the location of the first hologram. It is possible to combine first-generation holograms in such a way that the image seen in the second hologram depends on the precise position of the viewer. For example, in John Wood's animated holograms of scissors, your eyes move up and down through 80 original holograms of the scissors at successive stages of opening and you see each 'frame' of the action in sequence.



A holographic 'camera' can be very complex; Susan Gamble aligns optical components for the 'Body in Question' series of holograms. The laser is housed in the box in the top left hand corner of the table. The white screen in the bottom left hand corner is a diffuser.

Michael Wenyon and Susan Gamble, instructors at Goldsmiths' Holography Workshop, next to the workshop's large concrete isolation table.



Interior of Goldsmiths' Holography Workshop

Goldsmiths' Holography Workshop

Goldsmiths' Holography Workshop aims to develop creative holography by providing instruction for artists and a fully-equipped rental facility. The workshop is an old gymnasium in Camberwell, South London.

The premises are owned by Goldsmiths' College, University of London, and the workshop is housed by the College's Fine Art Department. Although the College maintains the premises, the workshop is self-financed and has an independent teaching programme open to the public. The workshop was established with grants from the Calouste Gulbenkian Foundation of Lisbon, Portugal, the Rockefeller Foundation of New York and by the Arts Council of Great Britain. Grants, tuition fees and rental charges are the only sources of income. Policy for the workshop is decided by a management committee chaired by the head of Goldsmiths' College Fine Art Department, Peter Cresswell.

Building work to convert the premises from changing rooms to holography workshop began in October 1979. Michael Wenyon joined the project at this time to design the facility and prepare the teaching programme, for which he has been responsible ever since.

The first courses were in May 1980. At that time an exhibition of holograms by visiting American artist Rick Silberman was held in the workshop's gallery. Silberman stayed at the workshop for six weeks, advising on early preparations and helping with the teaching of the first classes.

Susan Gamble joined the workshop as full-time administrator in October 1980, and regular courses and hire of the facility began.

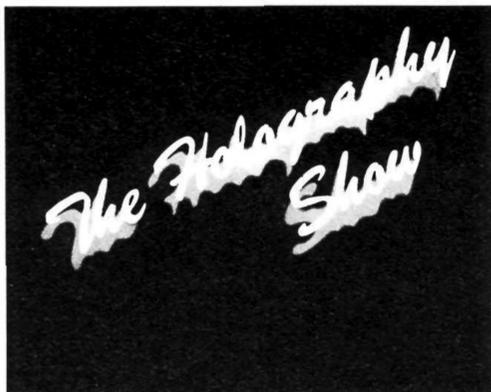
Bill Molteni, a New York holographer was resident Guild of St George Fellow in Holography at the workshop for nine months in 1981; he brought new techniques and experience.

Spotlights and Glass Plates was the title of the workshop's first show, held in the workshop gallery in October 1981. The exhibition contained nine holograms, six of which had been made by staff of the workshop.

Four British artists received training bursaries from the Arts Council of Great Britain to make holograms at the workshop during 1982. The selection panel consisted of workshop staff Susan Gamble and Michael Wenyon, Peter Cresswell of Goldsmiths' College, Peter Bird of the Arts Council and the art critic Edward Lucie-Smith. The panel chose Bill Culbert, Peter Donebauer, Liliane Lijn and Andrew Logan.

The workshop showed seven holograms on a stand at the Bath Festival Contemporary Art Fair in May of 1982.

In the summer of 1982 Michael Wenyon travelled across the United States for seven weeks on a fellowship from the Winston Churchill Memorial Trust to study creative holography.



Work is listed by artist. Notes to certain pieces have been added by Susan Gamble and Michael Wenyon. Measurements are given in the order: height, width, depth. At some venues the content of the show may differ from this listing.

- 1 **'Darts' 1981**
300 × 400 mm reflection hologram
wall-mounted

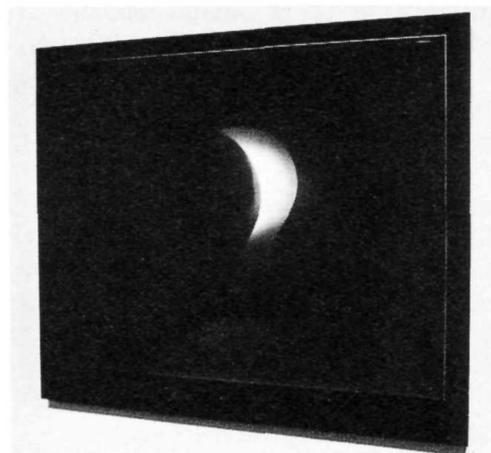
One of the workshop's first 'shadowgrams'. The paper darts (actually cellophane) fly in formation towards the hologram. An early version, Dart, showing a single airplane, was made in 1980 during the visit to the workshop of Rick Silberman. Silberman uses shadowgrams – in which the subject is seen in silhouette against a diffuse bright surface – almost exclusively. He taught us the tricks of the technique and showed us its versatility. M.W.

Peter Cresswell

Born Chelmsford, Essex, England, 1937. Presently Head of Fine Art, Goldsmiths' College, University of London and Chairman of Goldsmiths' Holography Workshop Management Committee. Major one-man show of paintings at Ogle Fine Art, Eastbourne, Sussex, 1977, plus numerous group shows including Air Gallery, 1976. Showed hologram in *Light Years Ahead* at Photographers' Gallery, 1980.

Bill Culbert

Born Port Chalmers, New Zealand, 1935. Presently runs Experimental Workshop in Department of Fine Art, Reading University, England with Ron Haselden. Education at Canterbury School of Art, New Zealand and Royal College of Art, London. Numerous group and one-man shows since 1961. One man shows include *Beyond Light*, Serpentine Gallery, London, Dec/Jan 1976/77, Acme Gallery, London, 1979 and Sunderland Arts Centre, 1980.



Eclipse, Bill Culbert, 1982

- 2 **'Eclipse' 1982**
203 × 254 mm reflection hologram
wall-mounted
- 3 **'Window 84490' 1982**
203 × 254 mm reflection hologram
wall-mounted

The lit lightbulb of Eclipse is not recorded by its own emission of light because that could not be registered by the holographic process. Instead, its frosted surface was lit from behind by a narrow laser beam. M.W.



Helsinki Box, Jeremy Diggle, 1980

- 4 **'Helsinki Box' 1980**
356 (H) × 304 (W) × 178 (D) mm box,
objects and two 203 × 254 mm
reflection holograms in door
wall-mounted
- 5 **'Memory Wreck Picnic Set' 1981**
plastic case
508 (H) × 431 (W) × 41 (D) mm,
objects and 102 × 127 mm
reflection holograms

Jeremy's pieces are personal relics: The Helsinki Box recalls a visit to Finland; Memory Wreck Picnic Set contains images from his youth in Welwyn Garden City. The holograms are a simple type invented by the Russian scientist Yuri Denisyuk; they are used in Russia to record artefacts and historical objects. S.G.

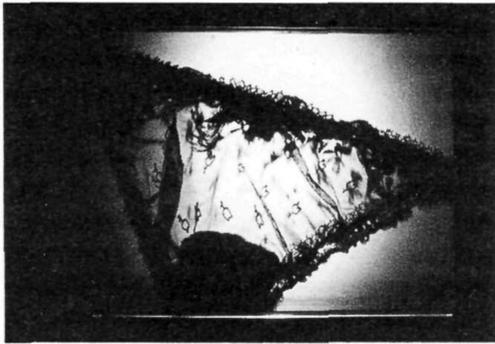
- 6 **'Spectral Viewing' 1982**
400 × 300 mm transmission hologram
illuminated by TV screen
special display

Jeremy Diggle

Born Welwyn Garden City, England, 1955. Presently Globe Conservator, National Maritime Museum, Old Royal Observatory, Greenwich. Received Masters in Fine Art from Royal College of Art, London 1981. Group shows include *New Contemporaries*, Acme Gallery, London 1976/77; *Three Painters One Sculptor*, Aspex Gallery, Portsmouth, England, 1981 and *Alternative Ideal Home Exhibition* Institute of Contemporary Arts, London, 1977. One man shows: *A Concord Budget Justified*, 5 Dryden Street gallery, London, 1978 and *Memory Wrecks*, Goldsmiths' Holography Workshop gallery, 1982. Author of *Norway Time 3 Additions* limited edition book published by artist, 1977.

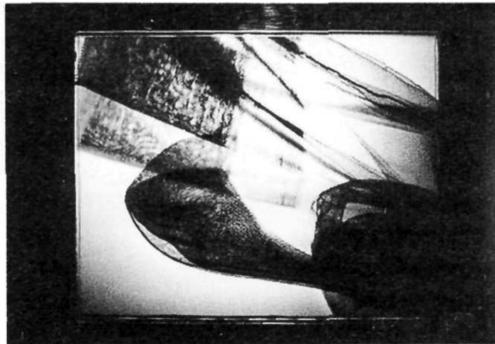
Peter Donebauer

Born St Leonards, Sussex, England, 1947. Presently working in own video studio in Brixton, London and managing director of Diverse Productions Ltd, producing alternative news programme for Channel 4 TV. Produced *The Water Cycle*, the first commissioned videodisc for Thorn EMI Video Program, 1981/82. Produced first ever video art piece commissioned for national broadcasting in Britain, 1974. Has had video artworks commissioned by the Arts Council of Great Britain, British Film Institute and the Calouste Gulbenkian Foundation. Designed and built, in collaboration with Richard Monkhouse, an image-processing colour video synthesizer, 1976-78; this forms the basis of his present studio and has been used in live performances, teaching and the making of all other video works since that date.



- 7 **'Waitress's Mirrors' 1982**
comprising 'Cake on a Plate' and 'Tart on the Floor', two circular mirror-backed transmission holograms, 229 mm diameter, in wooden frames with linen bows suspended

These look like ordinary mirrors – until you look to see your own reflection . . . The names refer to British colloquialisms for loose women. M.W.



Knickers and Stockings, Susan Gamble, 1982

- 8 **'Knickers', from the 'Body in Question' series 1982**
203 x 254 mm transmission hologram suspended

- 9 **'Stockings', from the 'Body in Question' series 1982**
203 x 254 mm transmission hologram suspended

Susan dresses up the hologram plate with lingerie and exposes it to diffuse light. Moiré patterns appear between the different layers, and the laser emprints a sharp shadow on the emulsion surface. Spectral colours mix to create beautiful pastel shades. M.W.

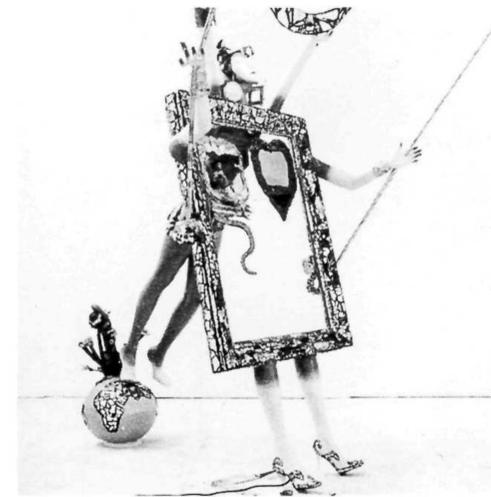
Susan Gamble

Born 1957, Edmonton, Middlesex, England. Presently administrator and instructor at Goldsmiths' Holography Workshop. Received BA Hons Fine Art from Goldsmiths' College, 1979. Showed holograms in *Spotlights and Glass Plates*, Goldsmiths' Holography Workshop Gallery, 1981 and in *International Holography Exhibition* at St. Mary's College, South Bend, Indiana, 1983

Liliane Lijn

Born New York City, 1939; moved to Europe 1955. Presently working from own studio in London on 1982 Norwich Sculpture Commission for Norwich Central Library and *Crossing Map*, an experimental novel to be published Spring 1983 by Thames and Hudson, courtesy Hans Jorg Mayer Editions. Major individual exhibitions at Serpentine Gallery, London, 1976, at Wolverhampton Art Gallery, 1979, and at Roundhouse Gallery, London, 1981. Work shown in Hayward Annual 1978.

- 10 **'The Illusory Web' 1982**
sculpture with holograms
size not known at time of printing



Goddess of the Void, Andrew Logan, 1982

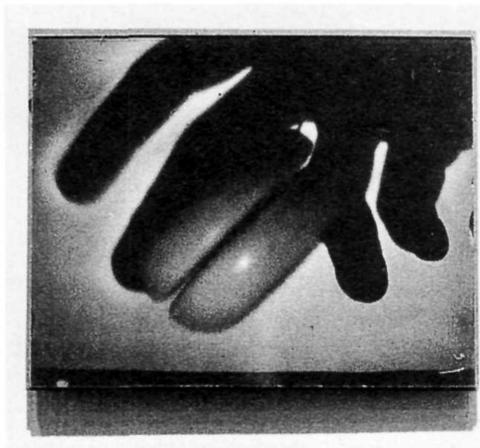
- 11 **'Goddess of the Void' 1982**
mirrored sculpture, 3.05 m high, 1.2 x 1.2 m base (approx) with two 203 x 254 mm reflection holograms
free-standing

- 12 **'Galactic Mobile' 1982**
mirrored mobile with motor, 2.5 m diameter
with six reflection holograms
suspended

(Note: only one of either of the pieces 11 or 12 will be included in the show at each venue)

Andrew Logan

Born Witney, Oxfordshire, 1945. Presently working in own studio in London on Indian Collection for exhibition 1983. Received diploma in architecture from Oxford University in 1970. First one-man show at New Arts Centre, London, 1973. Participated in *Goldfield '76*, Whitechapel Art Gallery, London, 1976. Exhibition *Reflections* at Patrick Feale Gallery, 1977. *Egypt Revisited* sound and light spectacular in Super tent on Clapham Common, London, 1978. Organiser of *Alternative Miss World* competition.



Hand and Yoyo, Bill Molteni, 1981

13 **'Broken Glass' 1981**
102 × 127 mm mirror-backed
'rainbow' hologram
wall mounted

14 **'Hand and Yoyo' 1981**
102 × 127 mm two-colour
reflection hologram
wall mounted

These two small pieces demonstrate quite separate approaches to the production and use of colour in holograms. In Broken Glass, Molteni superimposed three identical fields of broken glass at different heights; because the 'rainbow' hologram disperses colours at different vertical viewing angles, you see each pattern of glass in a separate colour.

The green background and yellow yoyo of Hand and Yoyo hold their colours as you move around because the 'volume reflection hologram' selects discrete colours from the white light illuminating source. The hologram you see was exposed twice to two separate 'master' holograms: one depicting the front-illuminated yoyo and a second of the diffuse background illumination, where the hand and the string appear in silhouette. The hologram was dipped into a solution of the chemical triethanolamine in between exposures, a process which swelled the emulsion and altered the colour of the second image. Notice how you can look through the gap in the yoyo along the string and how the fingers of the hand (which is mine) seem pressed against the glass plate of the hologram (in fact they were pressed against an auxiliary piece of glass deep in the scene of the 'master' hologram). M.W.

Bill Molteni

Born 1949, Baltimore, Maryland, USA. Presently consultant to holography group, Polaroid Corp. research laboratories, Cambridge, Massachusetts. Was Guild of St George Fellow in Holography at Goldsmiths' Holography Workshop, Jan – Oct 1981. Director of research for the Holographic Film Co., New York City, 1976-81. Received BA in psychology from Monmouth College, West Long Branch, New Jersey, 1972. Work in group shows of holograms at International Center of Photography, New York, 1975, at Museum of Holography, New York, 1975, '76, '77, '78, '79, '80 and '81, at Walker Art Gallery, Liverpool, 1979, at Seibu Museum of Art, Tokyo, 1977.



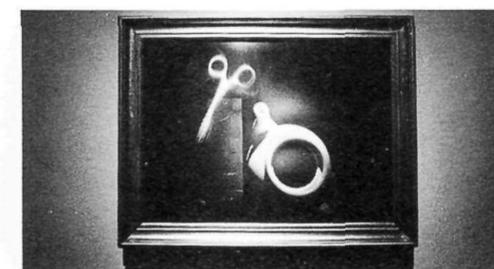
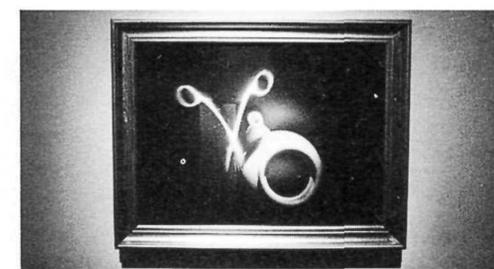
Venetian Blind, 1981 (left), and Holographic Spectacles, 1980 (right), Michael Wenyon

15 **'Holographic Spectacles' 1980**
400 × 300 mm reflection hologram
wall-mounted

16 **'Venetian Blind' 1981**
300 × 400 mm reflection hologram
wall-mounted

17 **'Here You Could be Inside or Outside the Situation' 1982**
400 × 300 mm reflection hologram
wall-mounted

These pieces are about looking at a hologram, or looking through the hologram, as in the Venetian Blind. The glass plate of the hologram literally becomes a window – but are you on the inside looking out, or outside looking in? S.G.



Scissors and Teapot, John Wood, 1982, two stages of animation

18 **'Scissors and Teapot' 1982**
300 × 400 mm animated reflection
hologram with sculpture
wall-mounted

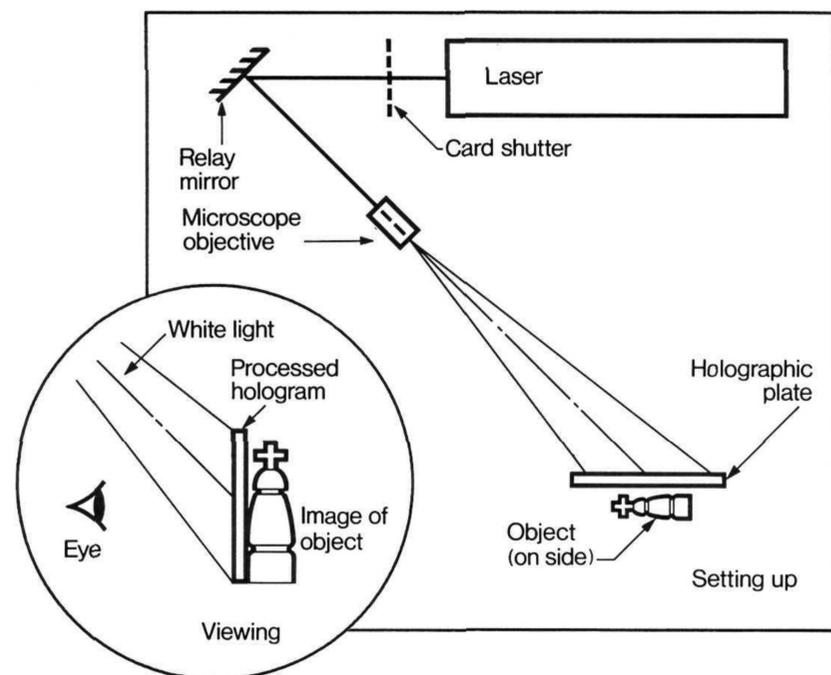
It took John more than a year to perfect the mechanism which holds the scissors and opens them in 80 discrete steps. As you watch the animation by moving up and down, you can just make out the metal wheels turning and opening the scissors. The 80 master holograms were recorded side by side as strips on one glass plate. A simple computer timer controlled the process automatically, opening the scissors one stage at a time, advancing a strip-mask across the hologram, letting the apparatus settle and then making the exposure with a remote control shutter. The 80 exposures took a total of 16 hours – John started the equipment in the evening and returned the next morning to process the hologram. M.W.

Michael Wenyon

Born 1955, Dayton, Ohio, USA; moved to England 1966. Designer, instructor and administrator at Goldsmiths' Holography Workshop since 1979. European editor of *Laser Focus* magazine 1978-81. Author *Understanding Holography* published by David and Charles Ltd, Newton Abbot and Arco Publishing Inc. New York, 1978. Received Master of Science in Applied Optics from Imperial College, London, 1978. Work in group show *Spotlights and Glass Plates* at Goldsmiths' Holography Workshop Gallery, 1981, and at *International Holography Exhibition*, St Mary's College, South Bend, Indiana, 1983.

John Wood

Born Bath, England, 1945. Presently Assistant Head, Fine Art Department, Goldsmiths' College, University of London. Received Dip AD (Hons) in Fine Art, Manchester Polytechnic, 1968. Founder member of Deaf School rock and performance group, 1974. Showed Tune Doodler toy in international group travelling show *Toys by Ten Artists*, 1972-73. Has studied and written about alternative energy schemes. One-man show *On The Side of Things*, Scratch Gallery, London, 1982.



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