

EXPERIMENTS

ART & SCIENCE

12 March – 29 May 2010

Anne Brodie & Simon Park

Andrew Carnie & Paul Broks

Annie Cattrell with Stan Cornford, Peter Cockrell &
Prof Morten L Kringelbach

Chris Drury with Dr Lynn Fenstermaker & Hugh Corr

Katharine Dowson & Dr Gabriele Jordan

EXPERIMENTS

ART & SCIENCE

Experiments is the first in a series of unique, exhibitions curated by Artakt with GV Art. It brings together the work of five artists whose practice develops with close and productive collaborations with scientists. In a rare opportunity for professionals of each discipline to develop a relationship with each other, the artists and scientists explore the others productive processes, investigating the mythology of 'neat laboratory worker' versa 'chaotic, creative artist.'

CREATIVE CHANCES

MARINA WALLACE

On 7 May 1959, the research scientist C P Snow gave a lecture in Cambridge called 'The two cultures and the scientific revolution.' The 'two cultures', as he defined them, were that of the 'literary intellectuals' and of the natural scientists — a pairing that we now refer to, in a different way, but with comparable implications, as 'artists & scientists.' Snow maintained that the profound mutual suspicion and incomprehension that existed between the literary intellectuals and the natural scientists should be overcome. 'The degree of incomprehension on both sides is the kind of joke that has gone sour', he stated. 'This polarization is sheer loss to us all.' In his view, there seemed to be no place where the two cultures met: 'The clashing point of two subjects, two disciplines, two cultures — of two galaxies, so far as that goes — ought to produce creative chances. In the history of mental activity that has been where some of the breakthroughs came. The chances are there now. But they are there, as it were, in a vacuum, because those in the two cultures can't talk to each other. It is bizarre how very little of 20th-century science has been assimilated in 20th-century art.'¹ At the time when Snow was delivering his lecture in Cambridge, modern art was developing in a new direction. After the end of the 19th century, George Seurat and the Impressionists were drawn towards handling the qualities of light and colour in a methodical and scientific way. After the period of historical confluence of the streams of science and art which took place at the Bauhaus in Dessau

in the 1930s, the notion emerged in the 1950s that art should, above all, examine its own nature. This was according to the vision of the influential art critic Clement Greenberg, whose vision helped promote the emergence of an exclusively language-based art in the 1960s. Conceptual art ensued as a result, and references to other than art itself became increasingly less poignant. C P Snow's paper on the two cultures was delivered at the end of the 1950s, when a separation of art and science (not the first one) was inherent not only in the English education system, but also in the emerging art world at large. On the other side, the United States were launching Explorer 6 from the Atlantic Range in Cape Canaveral, Florida, and the Russians were receiving back the first photos of the far side of Earth's moon through the probe Luna 2. The Earth was focusing on the Moon.

Many years after C P Snow, coinciding with an exhibition co-curated by Artakt and the Wellcome Trust with some of the artists in *Experiments*, another influential English scientific figure expressed himself on the subject of art and science.² On 10 March 2002, the developmental biologist, Lewis Wolpert, took a different view to C P Snow, arguing against any similarity between the creative processes of artists and scientists, and showing himself to be unsupportive of the current art & science 'trend:' 'Art does not explain, but it broadens our experience in ways that are not clearly understood. I value it in its own terms but it has nothing to do with understanding how the world works. To pretend that it does is to trivialize science and do nothing for art.' Wolpert concluded uncompromisingly: 'We should stop pretending that the two disciplines are similar, and instead rejoice in the very different ways that they enrich our culture.' Implicitly, Wolpert returned in his statement to

wishing for the two cultures to remain separate. According to Wolpert, 'Of all the arts, painting is the one least related to science, as it does not deal with complex ideas or explanations, is the easiest to appreciate, and the response is often an emotional one.'³ Leonardo da Vinci would not have agreed with Wolpert: the Renaissance man's willingness to investigate phenomena over and above the limits of the painter's powers went well beyond the demands of the kind of painting imagined by Wolpert. John Constable, the 19th century English painter of landscapes, clouds and skies, would not have agreed with Wolpert either: 'Painting is a science, and should be pursued as an inquiry into the laws of nature. Why, then, may not landscape painting be considered as a branch of natural philosophy, of which pictures are but the experiments?'⁴ It is to the concept of 'experiments' that Constable turned his attention. Looking hard, investigating, searching for laws in nature, verifying one's point of view, whether it be in relation to perspective, colour, form, or expression, the constant confrontation with nature's laws is as present for artists as it is for scientists. Trivializing is not something any one would want to do if serious about drawing parallels. Rather, the clue about the separation of the disciplines seems to me to be in the environment within which artists and scientists operate professionally. Is it not true that the split happens more at the level of education, of professional opportunities, rather than of personal interest? Surely, no-one could legislate on whether individuals should or should not be interested in a discipline other than the one they practice by training. But many would have the right to determine whether a student can be admitted to the study of science or of art, according to their academic profile and curriculum. As C P Snow pointed out, this is where the first split happens, as in the field of education. He analyzed the

problem, and suggested a solution: 'There is only one way out of all this: it is, of course, by rethinking our education ... Nearly everyone will agree that our school education is too specialized. But nearly everyone feels that it is outside the will of man to alter it. Other countries are as dissatisfied with their education as we are, but not so resigned.'⁵ He went further by saying, 'Science, in order to be good to art has got to be assimilated along with, and as part and parcel of, the whole of our mental experience, and used as naturally as the rest.'⁶

In this sense — both on a less conscious level, and on a more rational one — rather than focusing on the similarities or differences between art and science, we should look at how people who are in the two fields are set to interact or not, and how they manage to interact. The organizations that sponsor the process of interactions like to use the term 'collaborations.' For the purpose of this argument, I would add that what we are interested in, and what the artists and scientists in *Experiments* are themselves interested in, is also the idea of forming a relationship.

Relationships are about getting our own needs met, often on an unconscious basis. In other words, we try to find someone who is complementary to us and can help us learn, heal, and grow. Collaborations, on the other hand, are about a process where two or more people, a group or organizations work together along an intersection of common goals—for example, an intellectual endeavor that is creative in nature—by sharing knowledge, learning and building consensus. *Experiments* was conceived with both ideas in mind, the relationship and the collaborations established by the artists and

the scientists in question. Annie Cattrell with Stan Cornford, Peter Cockrell and Prof Morten L Kringelbach, Andrew Carnie and Paul Broks, Chris Drury with Dr Lynn Fenstermaker and Hugh Corr, Katharine Dowson and Dr Gabriel Jordan, Anne Brodie and Simon Park, have related to each other and collaborated with one another in ways that have been variously fruitful. The usefulness of their collaborations to the wider science or art community is not something we need to focus on. Perhaps it is worth reminding ourselves, in Immanuel Kant's words, that 'Notion without intuition is empty, intuition without notion is blind.'⁷ Even certainties that seem to emerge from profound and verified knowledge and from scientific laws, are shuttered at the sight of the unexplainable structures of nature. Santiago Ramón y Cajal, the Spanish histologist and pathologist who, at the beginning of the 20th century pioneered the investigation of microscopic structures of the brain, was stopped in his tracks when he observed from life the eyes of animals: 'In the study of this membrane [the retina] I for the first time felt my faith in Darwinism weakened, being amazed and confounded by the supreme constructive ingenuity revealed not only in the retina and in the dioptric apparatus of the vertebrates but even in the meanest insect eye ... I felt more profoundly than in any other subject of study the shuddering sensation of the unfathomable mystery of life.'⁸

The questions to be raised around *Experiments* should therefore be clear, simple, but important. What is it that separates the disciplines and its practitioners? What is the purpose of such separateness? How on earth, in fact, did we develop the sense that art and science are such separate disciplines that there should be different courses, different universities, different profes-

sional outlets, and completely separate training grounds for the two different cultures?

What did the artists in *Experiments* gain from their interactions with the scientists? And vice-versa, of course? In particular, what triggered the initial interest in the collaboration? When is a collaboration between an artist and a scientist a 'good collaboration'? Does the art that emerges from the interactions reveal something on the science? Is the science 'good' to the art (paraphrasing from C P Snow) and is it assimilated along with, and as part and parcel of, the whole mental experience, and used as naturally as the rest? Finally, is the relationship between the artist and scientists in *Experiments* useful to both and, eventually, to the viewer?

Marina Wallace

12 February 2010

COLLABORATIONS

ARTISTS & SCIENTISTS

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- 1 C P Snow, *The two cultures*, CANTO, 1998, p. 16–18
 - 2 *Head On Art with the Brain in Mind*, Science Museum, 2002
 - 3 *The Observer*, Sunday, 10th March 2002
 - 4 'The History of Landscape Painting', quoted in Charles Tomlinson, *Collected Poems*, (1985), p.33.
 - 5 *Ibid.* p.16
 - 6 *Ibid.* p.18
 - 7 Immanuel Kant, *Critique of Pure Reason* (1781), trans. Norman Kemp Smith (1929), p.93.
 - 8 Santiago Ramón y Cajal, *Recollections of My Life* (1898), p.576. Quoted in Sidney Perkowitz, *Empire of Light* (1999), p.16.

ANNE BRODIE & SIMON PARK

This work constitutes part of the outcome of a Wellcome-funded project *Exploring the Invisible*, a collaboration between artist Anne Brodie, microbiologist Dr Simon Park and writer/curator Dr Caterina Albano.

Its purpose is to research alternative artistic and social applications of the light-emitting and communication properties of the bioluminescent bacteria, *Photobacterium phosphoreum*, a marine bacterium more usually associated with biomedical applications within a laboratory context.

'Working together outside of the usual confines of both science and art, we have developed a body of photographic, film and interactive work, based on less traditionally scientific quantifiable attributes – subjectivity, emotion, playfulness and instinctive human enquiry.'

The collaboration allowed the artist to enter into the laboratory, and the scientist to step outside of it. The boundary of the laboratory was broken down, the artist's basement studio became part-laboratory, part-studio. Bacterial and algal cultures were grown in teacups and cut-glass crystal vases inside the warm laboratory culture cupboard.



Anne Brodie, *Algae 1* and *Algae 3* from *Basement series*, collaboration with Simon Park

Anne Brodie After gaining a First degree in Biology, Anne completed an MA at the Royal College of Art in 2003. Working experimentally with hot glass, film and photography, she was joint winner of the international Bombay Sapphire prize for design and innovation for her short film, *Roker Breakfast*, in 2005. A pivotal shift in her working practice occurred after 2006, when Anne was awarded the British Antarctic Survey/Arts Council Artists and Writers Fellowship to Antarctica, where she lived and worked at a scientific base for nearly three months.

Working on the boundaries between science and art, her current work explores questions of ownership and the decision-making processes involved in what constitutes 'valid data' – usually the preserve of scientists. In 2009, Anne was awarded a Wellcome Trust arts award for a collaborative project exploring bioluminescence.

Dr Simon Park is a senior lecturer at the University of Surrey, where he teaches Bacteriology and Molecular Biology. As an internationally recognized molecular bacteriologist, he has published over 60 papers in international refereed journals, books and other periodicals. His wider activities and practice are driven by the common misconception that microbiological life is primitive and always detrimental and that, through collaborations with artists, the real nature of the microbiological world can be revealed. In this context, he has been widely involved in many collaborative projects with artists; Wellcome Trust-funded collaborations include *Sixty Days of Goodbye Poems of Ophelia* with Jo Wonder and *Exploring the Invisible* with Anne Brodie.

ANDREW CARNIE & PAUL BROKS

Temporal Lobe Epilepsy (TLE) has affected many creative individuals and is thought to be the source of much artistic inspiration – both Vincent Van Gogh and Fyodor Dostoevsky had the condition. The electrical storms associated with TLE may cause a kind of cross-pollination of ideas between different functional areas of the brain, giving the artists extraordinarily insightful visions.

From my involvement in TLE, I made a time-based work, *Seized Out of this World*, using three pairs of projectors. Each pair projects images onto three semi-transparent voile screens set between the projectors. Images rise from one projector and then dissolve into images from the second projector. Each set of projectors works through its slide sequence independently from the other pairs, showing primarily the same sequence of images with some variations.

The work *Seized* was made with support and direction from Paul Broks, a neuropsychologist, Senior Lecturer in Clinical Psychology and Dr Adam Zeman, Professor of Cognitive and Behavioural Neurology at Plymouth University. Both shared their knowledge and understanding of TLE and arranged meetings with patients, who kindly gave me their time to talk about their condition and the effects it had upon them.

The sequences within the time-based work *Seized*, deal with particular elements of TLE, as described in the Geschwind Syndrome or Waxman-Geschwind syndrome, named after the doctors who identified it. The syndrome describes a range of behaviours and personality features — such as hypergraphia, hyper-religiosity and out of body experiences — associated with the condition, which is a neurological condition. All these characteristics have fed into the various sections of the time-based work *Seized*.



Andrew Carnie, *Seized*, installation, collaboration with Paul Broks

Andrew Carnie is an artist and lecturer whose current work explores scientific themes and involves 'picturing' the body through science; working with a mixture of new and old media. The topics of his work include memory, the brain, developmental neuroscience, genetic disorders, temporal lobe epilepsy and the human body after death. Recent creative work has produced complex slide installations and video projection works, using multi layered screens in pieces that reflect an interest in the brain as an ever-changing vital organ and the 'self' as in part a construct informed by contemporary scientific imaging. His work encompasses an interest in sequential photography and its link to scientific research. Carnie's work has been shown in the Science Museum London, the Natural History Museum Rotterdam, Design Museum Zurich, Exit Art in New York and the Williams College Museum of Art, Massachusetts.

Recent projects include *Things Happen* (2005) a time-based piece on genetic diseases made for the Mendel Museum, Abbey of St Thomas, Brno, Czech Republic and *We Are Where We Are* an eight-projector piece based on the architecture of the body for the Art and Mind Festival, 2006.

Paul Broks is a clinical neuropsychologist, author and dramatist, based at the University of Plymouth. After training in clinical psychology at Oxford University, he pursued a research career before turning to clinical practice in neuropsychology, working in neurology and neurosurgery centres in Leeds and Sheffield. Paul gained recognition as a writer with his first book, *Into the Silent Land* (Atlantic Books, 2003) which combined neurological case stories, fiction and memoir in an extended meditation on selfhood and the brain. Shortlisted for the Guardian First Book Award, it has been translated into 15 languages. A second book, *The Laws of Magic*, exploring memory and imagination, is forthcoming. His theatre work includes two plays, *On Ego and On Emotion* (co-written with the writer/director Mick Gordon) for Soho Theatre. Their work has had successful productions in Europe, Australia and the Americas. Paul's latest theatre project is a play for the Royal Shakespeare Company, *Seized*, which examines the neuropsychology of passion and belief through the life of a young woman with temporal lobe epilepsy.

Paul wrote and narrated *Martino Unstrung*, a feature-length documentary film about the jazz guitar virtuoso, Pat Martino, and he is currently working with Hugh Hudson on a documentary film about strokes.

ANNIE CATTRELL, STAN CORNFORD & PETER COCKRELL

Conditions is made of 12 sub-surface, etched optical glass, rectangular solid cubes. The 3D etching shows typical cloud formations on each month of the calendar year around London. Meteorologist Stan Cornford, author of *D-Day: How Weather Played A Critical part in the Normandy Landings*, acted as consultant for this large scale sculpture commissioned by the V&A for their *Out of the Ordinary* touring exhibition in 2007. The 12 sculptures show the altitudes of common clouds in high, mid and low levels within the earth's atmosphere. Cloud formations are formed by water in different states from droplets to ice crystals. In consultation with Cornford, Cattrell made clouds in her studio and scanned them using laser technologies at the RCA. This data provided the material from which the virtual modelling of the cloud shapes, behaviour patterns and altitude position were effected. The etched clouds were deliberately positioned asymmetrically within the solid glass to emphasise their transience and ephemerality within a given space or time.

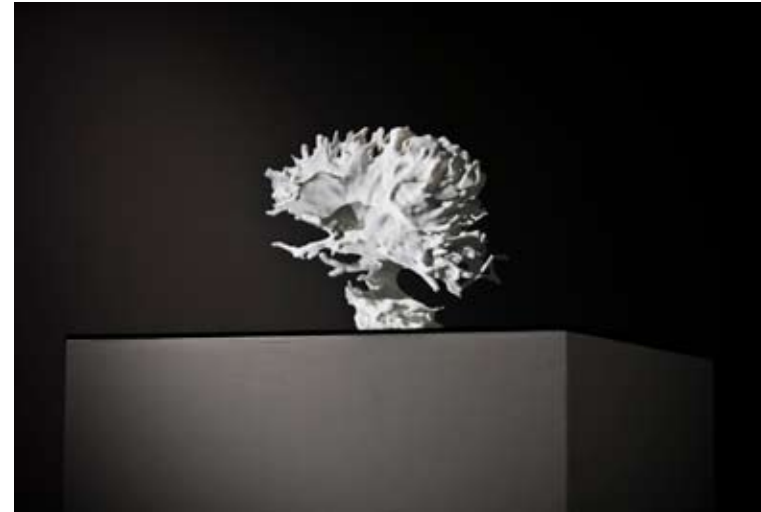


Annie Cattrell, *Conditions*, sub-surfaced etched optical glass, collaboration with Stan Cornford and Peter Cockrell. Credit: Shipley Museum & Art Gallery.

ANNIE CATTRELL & PROF MORTEN L KRINGELBACH

Pleasure/Pain makes visible in 3D the extent of active pathways within the human brain while experiencing pain and pleasure. The territories of these conflicting, mapped emotions physiologically overlap within the brain. State-of-the-art surgical interventions can now allow the levels of pleasure and pain to be controlled and diminished, if necessary.

The sculpture was made using a combination of MEG (magnetoencephalography) and deep brain stimulation (DBS) clinical data, in order to virtually model the sculpture. It was then rapid prototyped in London, using SLS (Selective Laser Sintering). To realise this project, Cattrell worked with cognitive neuroscientist Prof Morten L Kringelbach from Oxford University, whose research has culminated in the books *Pleasures of the Brain* (Snell Communications, 2009) and *The Pleasure Center* (OUP 2009).



Annie Cattrell, *Pleasure/Pain*, rapid prototyped SLS, collaboration with Prof Morten L Kringelbach. Credit: MIC Auckland.

Annie Cattrell was born in Glasgow and studied Fine Art at Glasgow School of Art, University of Ulster and at the Royal College of Art. She is Senior Research Fellow in Sculpture at De Montfort University and is about to begin a residency based in Orkney at the Pier Centre, working in part with scientists from Herriot Watt University who are involved with research into renewable energy technologies.

Cattrell's solo exhibitions include the Anne Faggionato Gallery (London), The Faraday Museum at the Royal Institution (London) and Berwick Gymnasium Gallery (Berwick upon Tweed). She has exhibited widely nationally and internationally including: *Out of the Ordinary* at the V&A in London. *Hybrid*, MIC Auckland; *Medicine and art: Imagining a future for life and love*, Mori Museum, Tokyo; *Invisible Worlds*, Mechelen (curated by MUKA, Antwerp); *Invisible Worlds*, Freiburg Kunstverein, Germany; *The Body, Art and Science*, National Museum in Stockholm; *Einfach Complex* at Museum Gestaltung in Zurich; *Paper Cuts*, Frederic Taylor Gallery, New York. Her work is owned by The Wellcome Trust, MacManus Gallery and Museum, Glasgow Art Galleries, Aberdeen Art Gallery, Edinburgh City Art Centre and is in many private collections. In 2008, she jointly won the annual Bombay Sapphire prize.

Cattrell has recently undertaken a number of commissions including at the Forest of Dean Sculpture Trail; The Bio-chemistry Department at Oxford University and at Glaxo Smith Klein Beecham scan centre at Hammersmith Hospital in London. She has completed residencies at Camden Arts Centre; The Royal Institution of Great Britain; The Royal Edinburgh Hospital; ACE Helen Chadwick Fellowship at Oxford University and at the British School at Rome. Cattrell is a tutor at the Royal College of Art and has lectured in many art colleges in the UK including: Edinburgh School of Art, Central St Martins, University of Gloucester etc. She is currently external examiner at the University of Newcastle.

Stan Cornford For much of his career, Stan served in the Met Office as observer, forecaster, instructor, researcher and manager. His last two posts were as Principal of the Office's College and then Director for International Affairs. In 1990, he joined the World Meteorological Organization (WMO) in Geneva, and represented WMO at the General Assembly of the UN, New York. As Director (Special Duties) of WMO, he served in the UN team which achieved the Framework Convention on Climate Change signed in Rio de Janeiro, June 1992.

As a consultant, Stan's commissions include opening discussions on climate change within six governments in southern Africa, to research the history of weath-

er and warfare for a two-year exhibition in the Cabinet War Rooms, Whitehall. He has also worked with the Australian Bureau of Meteorology and compiled a biography of meteorologist Charles Meldrum. Stan served as honorary General Secretary of the Royal Meteorological Society for five years and helped form the European Meteorological Society, also serving which as its Treasurer and Vice-President.

Professor Morten L Kringelbach is a prize-winning neuroscientist who is the Director of Hedonia: Trygfonden Research Group, a unique trans-national research collaboration between Oxford and Aarhus universities.

The main focus of his research is to understand the functional neuro-anatomy of pleasure and reward processing — a scientific area which he has helped pioneer. While pleasure is at the heart of what makes us human, it is also one of the most important factors keeping us from staying healthy — for example, the devastating effects of the lack of pleasure found in depression. He is also using deep brain stimulation to treat and understand the underlying mechanisms of illnesses such as Parkinson's disease.

Kringelbach is a fellow of the Association Psychological Science and, in 2009, he was elected to the advisory board of Scientific American, as one of 40 of the most influential scientists in the world. He has written five books for the general public, including his major Danish bestseller *Hjernerum*; his latest book, *The Pleasure Center* (OUP, 2009), provides a novel synthesis of how pleasure is central to our lives and how this can give us a better understanding of the brain.

Kringelbach's ongoing collaboration with the Scottish artist Annie Cattrell explores the unseen inner spaces of the living human body and brain.

CHRIS DRURY & DR LYNN FENSTERMAKER

This collaboration with Dr Lynn Fenstermaker at The Desert Research Institute in Las Vegas formed a part of the research for my exhibition *Mushrooms/Clouds* at the Nevada Museum of Art in 2008. The show was ultimately about the cycles of life and death and the use and abuse of land within the context of Nevada, the Nevada Test Site (NTS) and Native American land rights.

As a part of my research, I expressed an interest in visiting the NTS and speaking to some of the soil ecologists working there. The museum organised meetings in Reno and Las Vegas between myself and the Desert Research Institute. The Curator from NMA emailed a list of questions ahead of my visit, one of which was the question 'What is growing in the soils of the NTS where 100 atmospheric tests were carried out?' The email was picked up by Dr Fenstermaker, who was curious to know what kind of an artist I could be. She looked up my website and was interested to note my fascination with microcosm and macrocosm. It jogged a memory of a recent magnified image of a soil cyanobacteria called *Microcoleus vaginatus*, found in the soils of Frenchman Flat. We decided to use this image as a work in the exhibition and a further two works arose from it: *Life in the Presence of Death II*, a 14m long stencilled partial gene sequence (559) from the *Microcoleus*, using NTS soil on a 14m

long wall of the museum, and 559 Shelter Stones, a crude stone fallout shelter with the floor plan of a splattered explosion, made from 559 stones gathered from the desert.

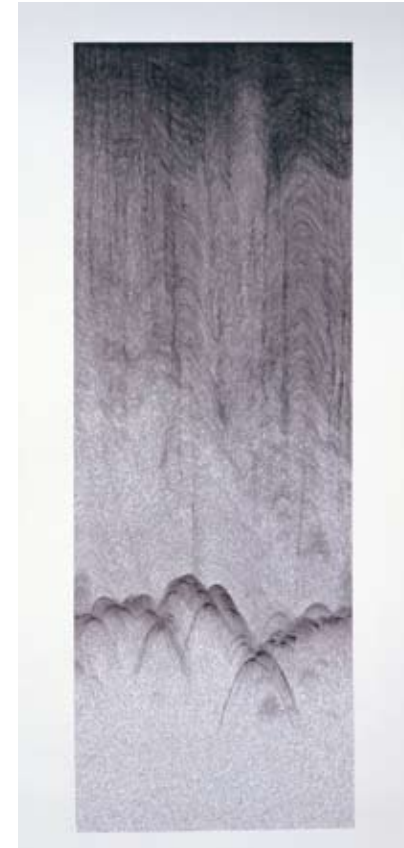


Chris Drury, *Life in the field of death*, collaboration with Dr Lynn Fenstermaker

CHRIS DRURY & HUGH CORR

Chris Drury joined glaciologist Hugh Corr in the field as an artist-in-residence, observing and helping to run one of the remote depots that the airborne campaign operated from. The airborne geophysical instruments used ice-sounding radar to reveal what lies beneath and within the ice; magnetometers to elucidate the underlying rock type and a gravimeter to measure the thickness of the Earth's crust. The pattern of internal layering, which caught Chris's eye, are predominantly sedimentary layers caused by the precipitation of volcanic aerosols. These isochrones are invaluable in understanding how the ice flows now, and when subject to an entirely different climatic regime.

During a conversation about work Chris Drury had been doing on the heart, Hugh Corr said that these echograms were like 'the heartbeat of the Earth.' This one statement made Chris realise that it would be possible to make works about what they were standing on, but couldn't actually see — the history of the Earth over the time from Cro-Magnon man to now, encoded in a river of ice. So, when they eventually returned to Britain, Chris made regular visits to Cambridge to talk to Hugh and to choose sections of the echograms which seemed to him to speak volumes. Hugh provided all these and put them into a format which he could use and work on.



Chris Drury, *Under the ice, over the unknown* – from *flight G23*, collaboration with Hugh Corr

Chris Drury In his work, Drury seeks to make connections between different phenomena in the world — specifically between nature and culture; inner and outer and microcosm and macrocosm. He collaborates with scientists and technicians from a broad spectrum of disciplines and technology, and uses whatever visual means and materials that best suit the situation. He has exhibited and worked with small communities worldwide over 30 years; recent projects include a two-month residency in Antarctica, and *Mushrooms/Clouds*, an exhibition about place, ecology and politics at The Nevada Museum of Art.

During the last decade, he has been working with doctors and clinicians to make links between systems in the body and systems on the planet, with particular reference to the heart. Works have used drawings, prints, digitally-sourced imaging, as well as a biodiversity reed-bed scheme of several acres in extent, based on flow patterns in the heart. His work is included in numerous Land Art survey books and he has his own monograph, *Silent Spaces*.

Dr Lynn Fenstermaker is an Associate Research Professor at the Desert Research Institute, Las Vegas. Her work, like Chris Drury's art, crosses many scales, from and focuses on the natural landscape. Her research has utilised remotely sensed data to assess, map and monitor the effect of environmental stressors, particularly climate change, on vegetation at small and large scales.

Her work has demonstrated that, even in sparsely vegetated, arid regions, environmental stressors have a significant impact on vegetation. Dr Fenstermaker is involved in two research efforts to examine the effects of elevated CO₂ and other global change variables on the Mojave Desert ecosystem. Recently, Dr Fenstermaker was co-author of a paper discussing ecosystem uptake of carbon dioxide in the Mojave Desert. Results of the two-year data reported in this paper reveal that arid systems may be storing more carbon dioxide than had previously been anticipated. Dr Fenstermaker initiated a new study to examine carbon flux and spectral properties of soil biological crusts in response to changing moisture conditions. The cyanobacteria *Microcoleus vaginatus*, central to Chris Drury's *Life in the Field of Death*, is one of the soil biological crust components involved in this new study.

Hugh Corr is a glacial geophysicist employed by the British Antarctic Survey (BAS) — a component of the Natural Environment Research Council (NERC) — Hugh has specialist knowledge of all aspects of radio glaciology, from equipment

development and deployment, through to processing and interpretation. The Antarctic continent, which is larger than the combined areas of the USA and India, has over 98% of its area covered by a great ice sheet. Hugh has worked for BAS for more than 20 years and has been on a total of 13 Antarctic field seasons, most recently as a member of large international collaborative projects, part of the International Polar Year (IPY). An engineering graduate from the University of Essex, he became besotted by the white continent after his first field season. His great desire is to understand Antarctica's role in the Earth's environment and contribute to our understanding by published contributions in high-impact journals.

KATHARINE DOWSON & DR GABRIELE JORDAN

Our collaboration has consisted of a series of discussions over the years, reflecting on the nature of vision and the psychology of IQ tests, and a Wellcome Sci-Art proposal on colour psychology — a much discussed, yet not greatly understood, field on how different colours might affect people's moods and behaviours. The unifying force in all these interactions is the lens, through Dr Jordan's research and my use of spectacle and magnifying lenses in the work *Myriad*, that refracts the human form and questions the nature of vision.

The discovery of the lens changed how we see the world: it enabled scientists to explore space and see into micro-worlds, and artists to play with light and vision, resulting in photography and film. Dr Jordan's research combines the man-made lenses of varying focal lengths with the natural lens and variations of colour vision in the human eye.

Micro Macro 4 uses light reacting lenses and is a three dimensional discussion on the nature of scientific research and the natural world.



Katharine Dowson, *Micro Macro 4*, Acrylic, light reacting glass lenses, 23cm cubed.
Collaboration with Dr Gabriele Jordan

Katharine Dowson studied sculpture at the Royal College of Art and exhibited in London, USA, Brazil, Europe and Asia. Collections include The Wellcome Trust, The Arts Council Collection, Cultura Inglesa, Brazil, The Ulster Museum, Aberdeen Art Gallery, The Institute of Neuroscience Newcastle University. Private collections include *Shark Infested Water*, *Saatchi Collection of British Art in the 90s*.

Dowson employs various media, including transparent materials, to define her work. Glass represents the fragility and durability of membrane tissue and allows her to reinterpret contemporary medical imaging. Juxtaposing the domains of science, art and medicine, Dowson was commissioned to create work for the ground breaking shows, *Spectacular Bodies: The art and science of the human body from Leonardo to now* at The Hayward Gallery and *Head On: Art with the Brain in Mind* at the Science Museum, commissioned by the Wellcome Trust.

With the latter, she collaborated with scientists researching into dyslexia — specifically into the part of the brain that process words — and the anomalies there may be with the dyslexic brain function in that area. She had an fMRI scan as part of this research and produced a body of work around the psychology of IQ testing and the images of her brain.

She was artist-in-residence at Sunderland University in 2004–5 and is currently artist-in-residence at Middlesex University London.

Dr Gabriele Jordan: After gaining a first degree in Psychology at the Ruhr-University Bochum in Germany, Gabriele specialised in visual psychophysics at the University of Cambridge where she received her PhD in 1992. She is now a senior lecturer at Newcastle University's Institute of Neuroscience where she teaches courses on cognition, the genetics of colour vision, and art, mind and brain. One of her long-term interests concerns the inter-individual variability seen in X-linked (red/green) colour vision. Recent discoveries include the existence of tetrachromatic women and the finding that some colour-deficient observers are capable of discriminating hues that are invisible to colour-normal observers.

In her work, lenses form an integral part of specialised optical setups to probe the participants' visual systems. The trick is to image light of known wavelengths and intensity directly onto the viewer's own lens which, in turn, projects it onto his/her retina for further processing. This so-called Maxwellian viewing (as opposed to free viewing) affords many advantages for research into colour vision.

Artakt curates and manages pioneering exhibitions and research led projects at a national and international level in the field of art, science and culture. At the centre of Artakt is the conviction that art, science and culture individually and, above all, collectively, can and should be communicated as creatively, accurately and widely as possible in a daring and innovative way at the highest visual level. Artakt's research and collaborations result in outstanding and ground-breaking exhibitions, together with related outputs such as academic articles and publications, talks, seminars and conferences as well as performances and satellite events.

Artakt, Central Saint Martins College of Art & Design, University of the Arts, London
www.artakt.co.uk

GV Art represents a broad community of established and emerging artists. Working in a variety of disciplines, this diverse group shares a common artistic and emotional vocabulary which is in sympathy with, and helps mould, the gallery's sensibility. Defined by neither ideology nor fashion, it demands only tolerance for the individual voice, interconnectivity between man and environment and fresh approaches to our understanding of the human condition
www.gvart.co.uk

VISITOR INFORMATION:

GV Art, 49 Chiltern Street
London W1U 6LY nearest tube Baker Street
Tel: 020 8408 9800
Email: info@gvart.co.uk

GALLERY OPENING HOURS:

Tuesday to Friday 11am – 6pm
Saturdays 11am – 4pm or by appointment
Admission Free



artakt

