Drawn to Investigate

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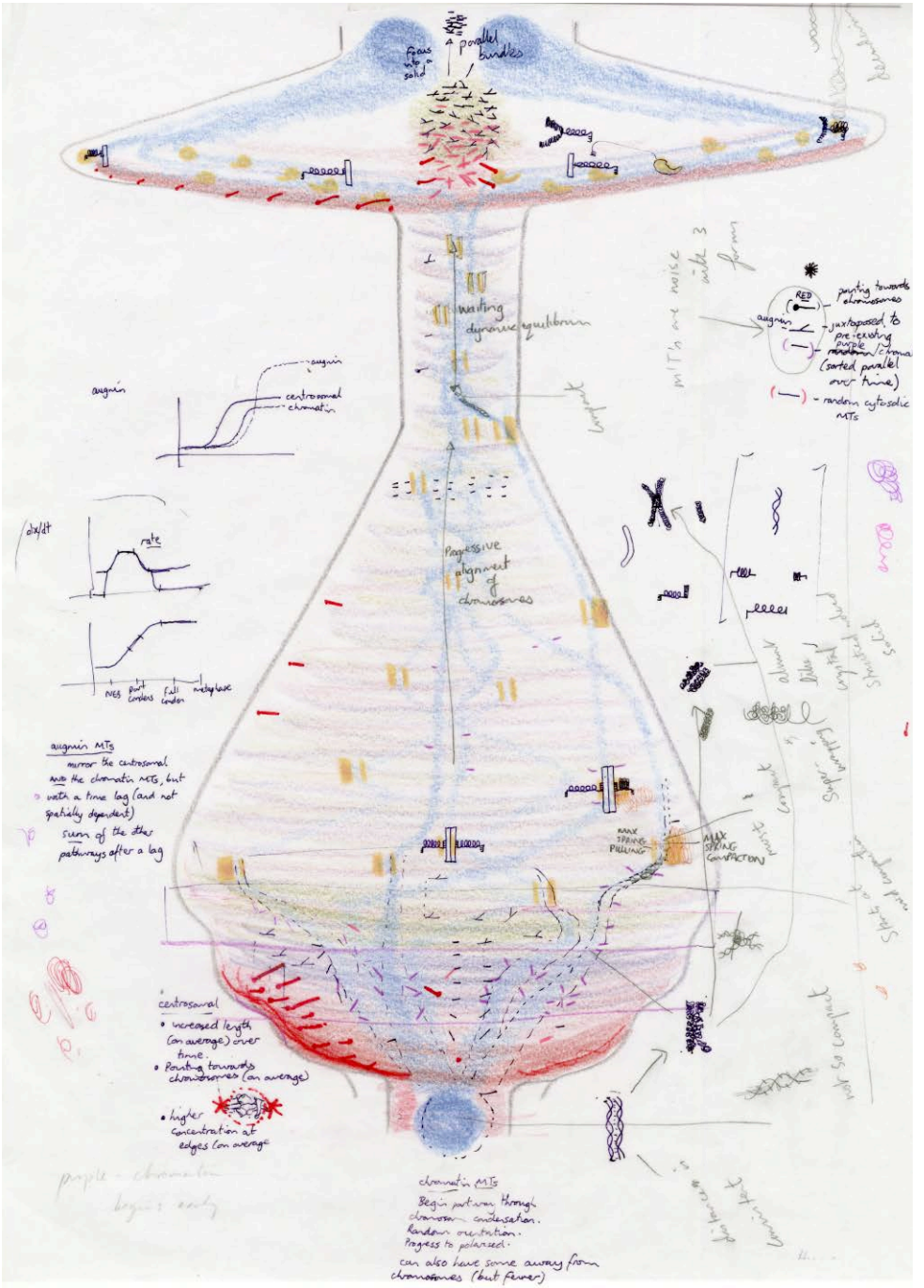
The Ruskin - Museum of the Near Future
Lancaster University

10-17 1 2020



Gemma Anderson,
Relational Process Drawing
2017-19, 29.7 x 42.0cm

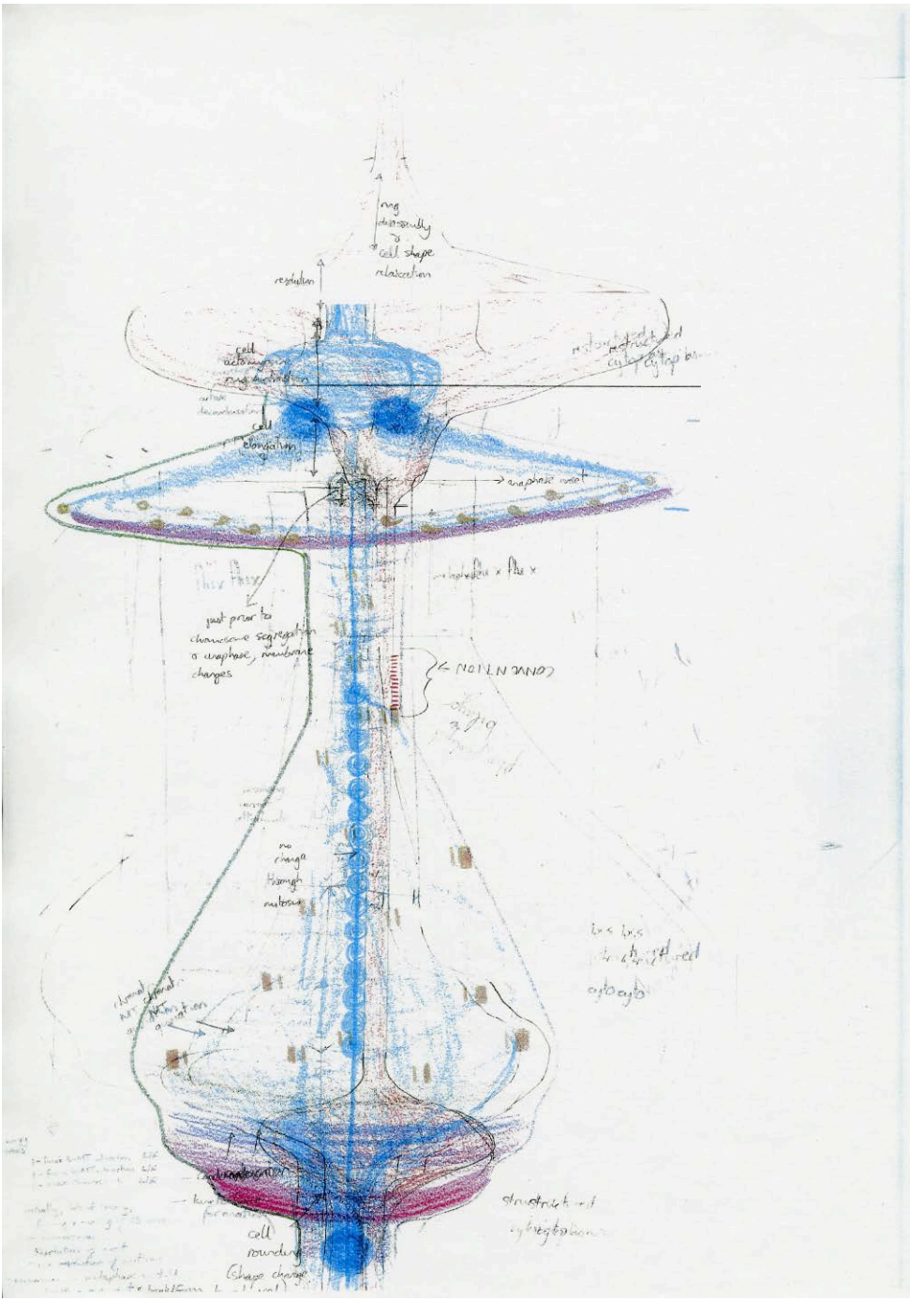
Introduction

In recent decades, collaboration between artists and scientists has flourished, supported by the development of new exhibition spaces, online platforms, publications, residencies and funding streams. Here we look at the contribution of drawing in this rapidly expanding area of interdisciplinary research. Drawing, historically, is associated with knowledge generation and critical investigation in the sciences yet remains today a vital tool in some areas of scientific practice. This exhibition, *Drawn to Investigate*, highlights how drawing continues to work across the porous boundary between observation and expression, empiricism and invention in a range of investigative practices.

The exhibition looks at the potential of drawing as an investigative tool to make meaningful contributions to knowledge outside the arts. It brings together a range of examples of contemporary drawing with a relationship to 'scientific' research. 'Science' is used in the most inclusive sense, embracing all forms of thorough investigation, spanning anthropology to anatomy, oceanography, mathematics and more. This approach builds on the ethos of nineteenth century critic and polymath John Ruskin (1819-1900), and his advocacy for drawing as a way of seeing and understanding the world. It was through a daily practice of drawing that he developed a prescient understanding of the impact of industrialisation on the natural environment, work we would now consider as climate science.

Therefore, it is particularly fitting that this exhibition should take place at The Ruskin Museum of the Near Future, at Lancaster University. We would like to thank The Ruskin Director, Sandra Kemp, and the rest of her team for facilitating this opportunity and thank Lancaster Institute of Contemporary Arts and the Faculty of Social Sciences at Lancaster University for their financial and institutional support. We also thank the artists themselves for their contributions. The exhibition accompanies the conference *Drawing Talking to the Sciences*, the third in the series of *Drawing Conversations* conferences initiated by Helen Gørrill and Jill Journeaux.

Sarah Casey, Gerry Davies, Helen Gørrill
January 2020

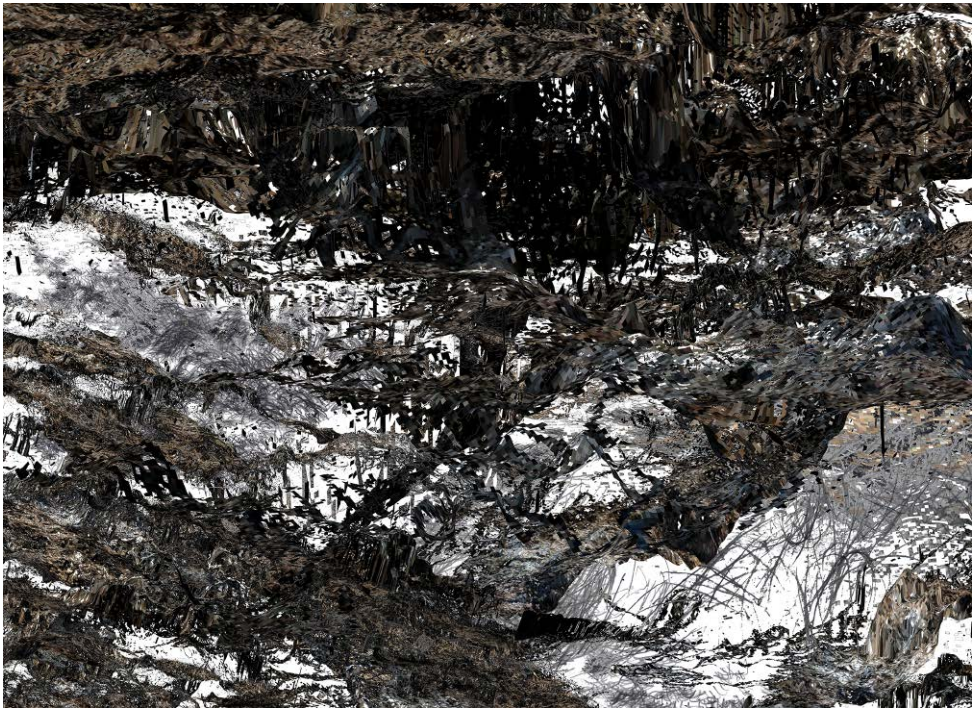

ring
cell shape
relaxation
cell
elongation
anaphase onset
just prior to
chromosome segregation
& anaphase, membrane
changes
no
change
through
mitosis
cell
rounding

Relational process drawing is a new approach to drawing 'natural history'. Rather than focusing on the morphology of the object, these drawings focus on the dynamic patterns of the processes of life and draw together relationships between energy, time, movement and environment at the molecular, cellular and organismal scale. These processes can be understood as 'nested processes'; part of a spatio-temporal continuum of life, where protein folding is essential to cell division (mitosis), which itself is essential to embryogenesis. Each process is intrinsically inter-related to many others, and there is also reciprocity. For example, different domains of the embryo undergo different amounts of cell division, dependent on the folding state of proteins within them; while external developmental cues can affect the cell cycle which, in turn regulates protein folding. These drawings are the result of a collaboration with a philosopher of biology, John Dupré and cell biologist, James Wakefield, who has spent 20 years seeking to understand the process of cell division. Here we show co-created drawings of that process. The images here begin to reveal how a new epistemology, based on the process of collaborative drawing with scientists can begin to 'make visible' a processual and relational view of life.

Relational Process Drawing
2017-19
29.7 x 42.0cm

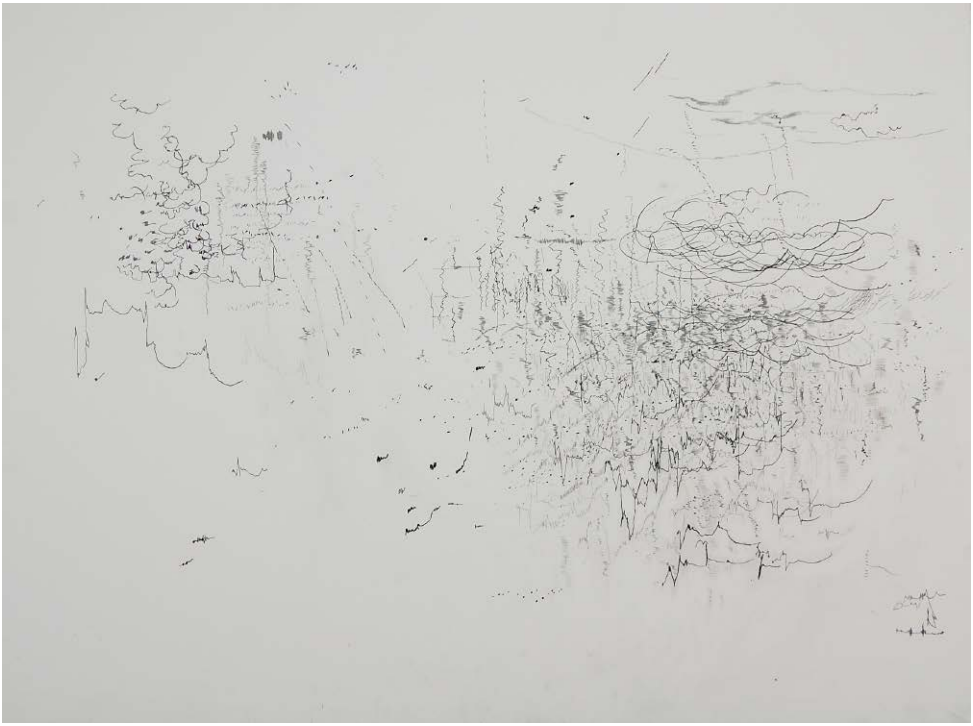
Saturn Incognito is an ongoing series of drawing responses tothe raw images from NASA's Cassini mission to Saturn. The Cassini raw images are digital images taken remotely by a spacecraft orbiting Saturn. Produced in a scientific context, as 'raw' data, they predate a scientifically fixed meaning. While composed of mutable and discreet pixels, they share with analogue photography the instant of capture, which forever ties them to the object imaged. This work treats the original raw images with the various 'traits' of analogue photographs, and which digital images are accused of lacking. Selected images are digitally inverted, drawn in pencil on aged paper and subsequently scanned, inverted again and enlarged to produce prints. Drawings and prints are presented together. While inverting the images evokes the analogue 'negative',the presence of an indexical original is undermined by their manual rendering in drawing and later re-digitisation. The antique paper provides an exaggerated materiality and sense of time-lived, another aspect of our experience of images endangered by the screen-favouring digital. The work explores the relationship between surface and process, objectivity and subjective expression, especially in our encounters with scientific raw data.

Saturn Incognito
2019
30 x 21cm



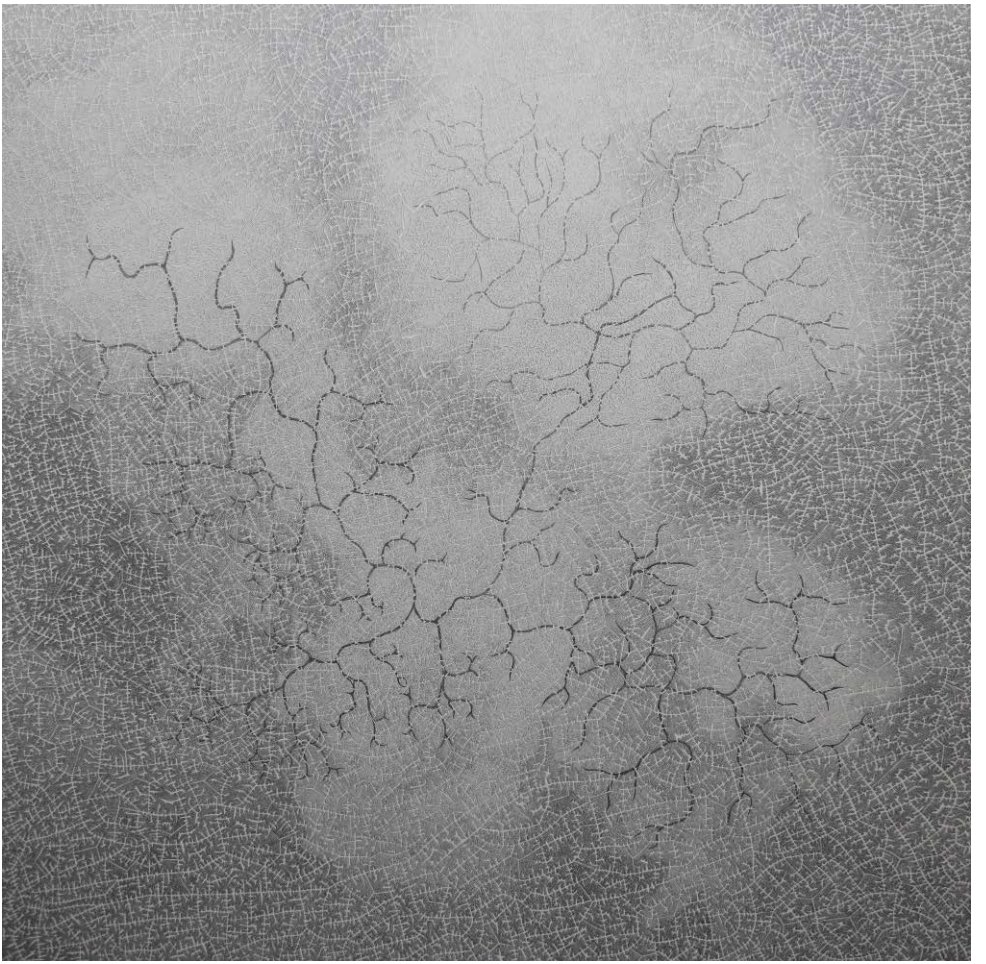
Phygital Drawing (2018) results from an interdisciplinary exchange between fields of contemporary drawing practice, archaeology and, significantly, an interplay and fusion with digital archaeological spatial technologies. Imagery born from this process is discernible as land matter through profile, suspended in an ethereal and ambiguous environment. There is a corporeal hint as forms are composed through line and cyclical marks, while conversely the pixels extend a sense of post-human, post-medium, fragile and formative in construct. The abstract and immersive visual still exposes the cognitive, cyclical and excavation surface encounters of field archaeologists at work in a trench. The work began as a visual record of the field archaeologists' trowelling actions, revealing past landscapes at an iron age archaeological excavation site in Bodfari, north Wales. The term 'phygital' (physical and digital) is appropriated to describe the work and nexus of processes. Non cartesian modes of mapping are employed, allowing for visual reinterpretations of sensory modes of enquiry that seek to extend drawing; authorship; body; surface; material and thinking through spatial mapping apparatus. The work results from a sustained five year residency with the School of Archaeology, University of Oxford (2014-18).

Phygital Drawing
2019
72 x 100cm



This drawing is from an extended series concerned with the difficulties of recording birdsong, with the premise that the immeasurable can be captured through the transcription of direct drawing. The drawing process is tuned to events happening in real time, listening allows the development of sensitivity and direct appreciation of the hidden complexity of living systems reflected in visible form. Using a system of visual notation, each drawing in the series is a representation of an ever-changing soundscape with sequences of data extracted from a living environment. They differ from more familiar forms of observational drawing in that the information gathered is auditory rather than visual whilst authenticity produces a drawing type which is intrinsically independent of aesthetic values. The soundscape occurs in the spring woodland of North East England. Despite a determined consistency of technical approach, location and duration the experience recorded reveals great variations within this soundscape day to day. These variations also combine with the perceptual influences and limitations of the observer. The term biosemiotic relates in part to the developing science of communication between different species –in this context the observer and the observed are revealed through the recording of both subjective and objective outcomes.

Biosemiotic Drawing–Birdsong, Jesmond Dene
2017
56 x 76cm

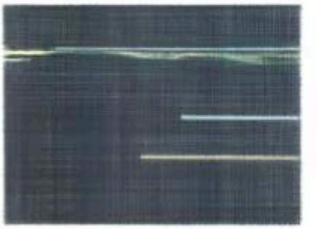
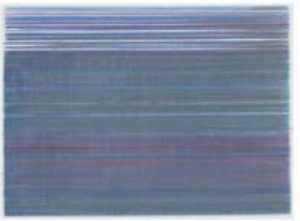
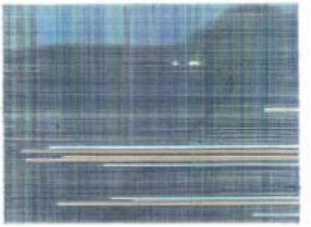
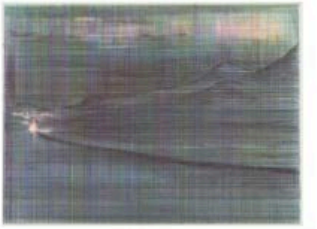
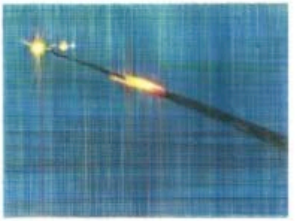
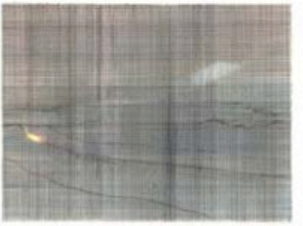
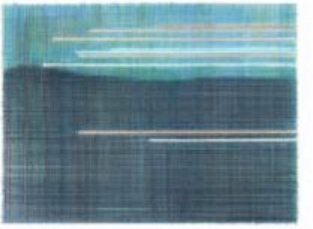


Michael Geddis

This drawing comprises two forms of marks - a cellular pattern and a darker sinuous structure. A third white-space element is outlined by the cellular pattern. The sinuous structure resembles a much-magnified view of retinal blood vessels. Its top-right section is lighter-toned which is suggestive of pathology. The white-space pattern resembles the dendritic patterns of cracks that appear in plundered peat bogs. Fields of cellular pattern initially look like areas of solid shading but closer examination reveals underlying intricacy. In places, marks are placed at resolutions of over 100 dots-per-inch. The drawing includes distinctively microscopic features - areas of soft focus and sharp focus/crisp silhouettes with a sense of diffuse lighting that appears to be coming from underneath the pictorial plane. Visually, the white-space element predominantly overlays the other elements. However, darker tone in parts of the sinuous structure confuse the eye, which tries to bring it forwards in pictorial space. This generates a slightly uneasy visual tension of something not being quite right (or pathology). Micro-surgeon's loupes, a portable operating theatre light and very fine pencil leads (0.2 mm) were used to produce this drawing. This equipment was funded by the Arts Council of Northern Ireland Lottery Fund.

Post-digital Retinopathy I
2017
84 x 84cm



Computer screen technologies are such a pervasive and intimate cultural presence in our lives that no longer is the digital so clearly separate to the material world but each influence the other. In some cases, the psychological and sensory dialogue set up between the computer-mediated world and the physical, experiential one can be an exciting territory, ripe for investigation.

These drawings explore a viewpoint disconnected from the natural world they depict, developed from webcam images retrieved from a road traffic website that monitors and records roads and weather conditions countrywide in Iceland. Occasionally these cameras malfunction – producing the still images containing glitches used to develop some of these drawings – and present a vulnerable, disintegrating image of landscape.

The drawings are time consuming to make, built up gradually through multiple layers of repetition. The experience of being imaginatively elsewhere, suggested by the screen landscape, is replaced by the being here in the studio, returned back to the here and now by the physical act of making.

Northern Lights and Glitches
2017-19
each 54 x 60.5cm

Emma Hunter

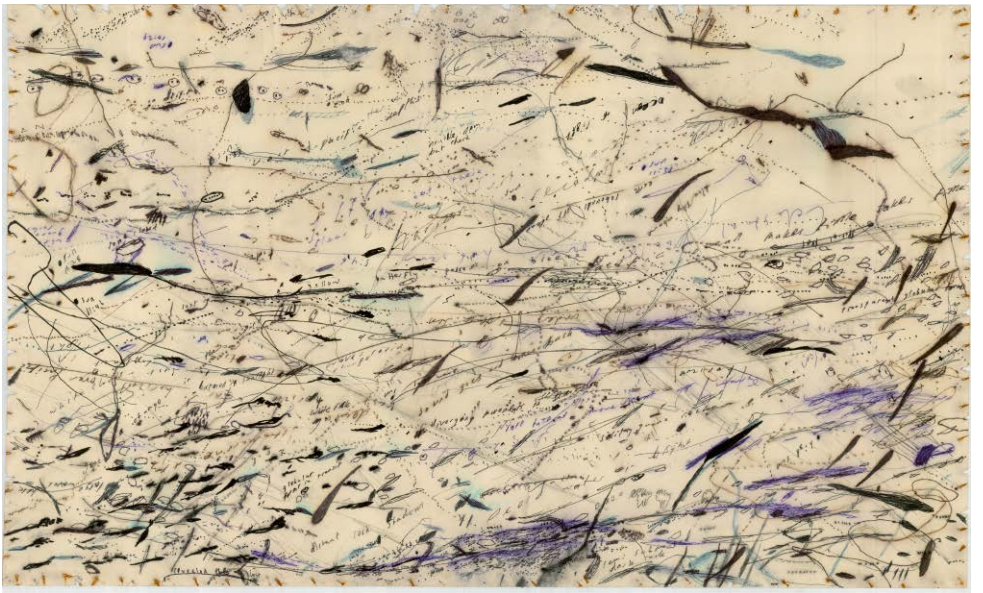
Solve et Coagula is a series of cyanotype prints made for *Stream*, a research project in collaboration with The Royal Brompton Hospital, London, funded by The Wellcome Trust. The project examined early development of the embryonic heart. Before the four chambers of the heart are formed two distinct currents of blood flow and loop by each other and in the "still water zone" -the boundary between the two currents, the septum dividing the chambers forms. Essentially, there is dynamic movement, which predicts the solid structure of the heart, and this symbiotic relationship between solid structure and fluid blood flow patterns continues throughout the life of the heart. Observations, medical drawings, engravings and suminagashi (Japanese paper marbling) were synthesised and drawn onto transparent paper which was then used as the negative. The drawings re-imagine the emerging muscle structure as a form that flickers between solidity and fluidity. The term, *Solve et Coagula*, is borrowed from alchemy meaning to dissolve and coagulate. This process is a method of 'painting with light' to create a painting/drawing/photogram hybrid with echoes of biomedical technologies which reveal the body's interior. However, unlike technologies which seek to make the body transparent, these emergent watery forms endeavour to emphasise the mystery of the body's interior.

Solve et Coagula
2014
28 x 20cm

Johanna Love

This piece of work has been made as part of my current research project examining the material power of dust. I am gathering dust from my grandmother's home in Hamburg, Germany, a city heavily bombed during World War II. Here dust becomes a metaphor for memory; a physical archive of time and place – as evidence of, and witness to, history. I am working in collaboration with scientists at the Natural History Museum, London, using state of the art imaging technology to look at the dust in new ways, then bringing images and materials together to generate complex readings of space, surface and scale. The scientific information is transformed and recommunicated through the gradual, physical and imaginative process of drawing. This translates the imagery into a far more human and accessible narrative. In this work, I use laser-etching and drawing to create an optically shifting image and surface, where the image remains continually incomplete, revealing and hiding, almost falling apart, then coming together again. Here the paper physically suffers through the long process of making, yet also celebrates its own materiality. The cut and drawn paper sheet suggest open pages of an unreadable book, inviting imagination, suggesting a dark history.

Der Engel Schwieg (The silent Angel)
2019
each 118 x 90cm



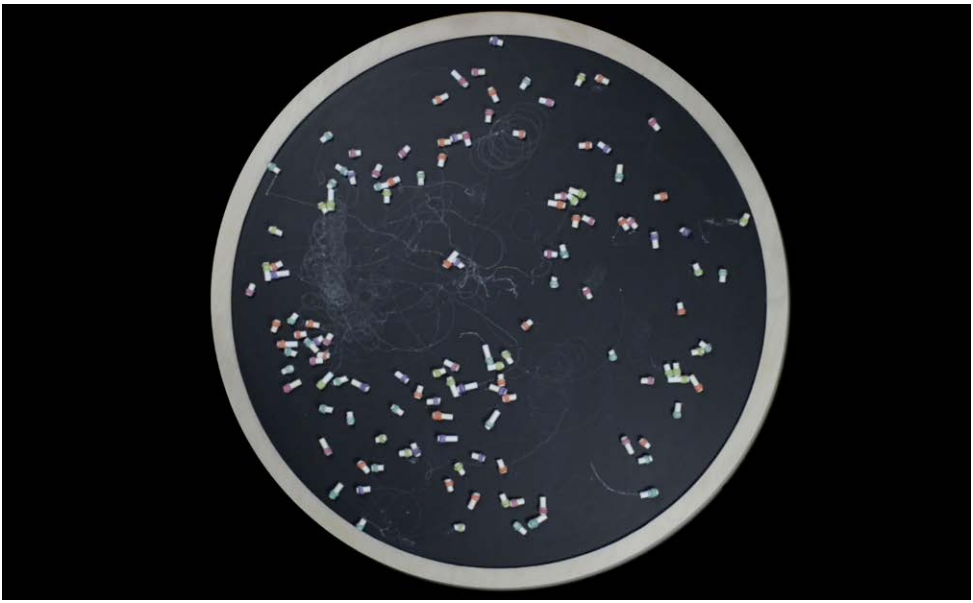
This is one of a series of drawings produced in January 2018 when the artist spent five weeks in northern Chile. The drawing was created over a twelve hour period of being semi-amphibious and immersed in the Pacific Ocean. The drawing comes directly from an intense physical and mental venture through time and space, with lines and occasional notations attempting to reveal and record parts and experiences of that embodied journey through the landscape, a live stream of consciousness and a solitary experience of the sublime.

12 Hours In and With the Pacific Ocean (Chile)
2018
56 x 94cm


4.30 p.m.
14.3.13
MOST
listen in
please.

These examples from *War Art & Surgery* (2011 - 2014), a WW1 Centenary project, acknowledged Henry Tonks' remarkable 1917 pastel portraits of wounded soldiers. Their shattered faces were repaired by Harold Gillies' pioneering reconstructive facial surgery and recorded by Tonks' drawings. War Art & Surgery was to record the training of modern day military medical personnel before deployment to Afghanistan, alongside the reconstruction and rehabilitation of wounded servicemen and women following their surgery. Drawings were produced at Tactical Medical Wing, RAF Brize Norton; AMC Strensall Camp, Yorkshire; DMRC Headley Court, Surrey; and The Royal College of Surgeons of England. Moved both by extraordinary surgical skills and the quiet heroism of service personnel the artist presents a graphic portfolio recording 21st Century military surgery. Artworks had to describe the weighty subject matter of conflict, to tell a visually intense, sometimes visceral story with compassion and a light touch aesthetic. They illustrate not the impact of battle but its lasting aftermath. The project was a collaboration between Julia Midgley; Liverpool School of Art & Design, LJMU; The Royal College of Surgeons of England; and the MOD.

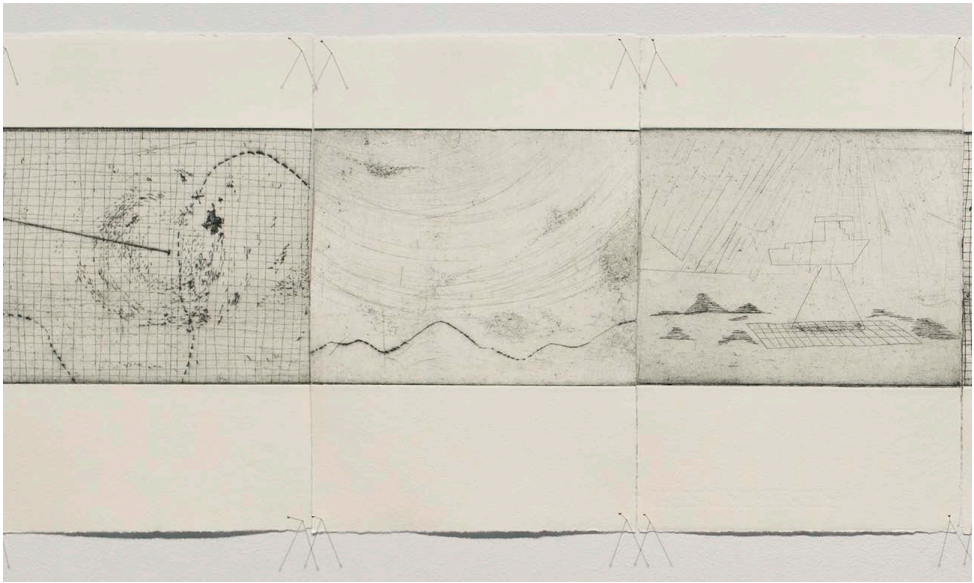
W.A.S.099 "Listen in Please"
2013
50 x 60 cm



Daksha Patel

The video is the outcome of my residency in the Applied Mathematics department, University of Bristol exploring the phenomenon of 'Active Matter', which is the higher order collective motion generated by complex systems. Typical examples include the movement patterns of bacterial growth, the murmuration of starlings or the swarming of bees. Active Matter is both a theoretical and an experimental area of scientific research, and the production of models to test theories is ongoing. The video comprises of an interactive work activated by vibrations from speakers under a circular blackboard emitting the sound of bees swarming. The vibrations propel chalks across the blackboard to create a drawing. In the mathematics department, blackboards are commonly used as a space for collaborative thinking and as a method of revealing thinking processes in real time, especially whilst teaching. In this work, the chalks leave a trace of their activity creating a drawing that is an artwork as well as raw data for scientific research. The installation extends scientific fieldwork practices and becomes a tool for recording and synthesizing data.

Active [Drawing] Matter
2019
Video



Annalise Rees
Jan Hogan
Vanessa Lucieer

An autonomous underwater vehicle (AUV) is launched into the waters off southern Tasmania, Australia. Sending out electronic pings an acoustic 'image' reveals the unseen sea floor deep below. At the same time a visual artist carries a long roll of ink stained paper down to the shoreline and submerges it beneath the waves. The underwater world seeps into its fibres. Another artist stands on the deck of a boat. Her pencil tracks over a journal page, the graphite marking the pitch, roll and yaw of the heave and ho' of the boat. This series of etchings documents a dialogue between two visual artists and a marine spatial analyst over the course of a six-month collaboration where drawing became a key process to describe and better understand respective fields of expertise, disciplinary language and technical approaches. Copper plates were used as the primary site for recording the exchange. They divulge a form of visual note taking, explanation and instruction. The resultant etchings explore the construction of image and knowledge through drawing-based processes and technologies used to communicate the marine environment.

The Line Dialogues(detail)
2017
each 29 x 19cm

Dara Rigal explores physical phenomena in her practice. Her work gives underlying concepts of current science tangible and experiential form. Drawing is central in this process. The series 'Back Propagation' was produced during Dara's residency with the Optical Networks Group in the Department of Electrical and Electronic Engineering at University College London. The group researches the fundamental properties of light and their use to generate, carry, route and process data for different applications. Dara worked within the UNLOC programme which focused on 'unlocking the capacity of light'. In the journey along optical fibres information is distorted, blurred and extraneous noise is produced. One of the group's endeavours was the programming of 'Back Propagation' in which the data's journey is digitally reproduced and then reversed to undo the distortion. Experiments with ink and coffee on paper were made to understand and process this concept of the manipulation of information carried on light. These drawings became and active means to approach the scientific methodology and transform the understanding of optical communications. These studies were presented alongside other investigations and installations made with light at the Royal Society symposium *Beyond the Sate of the Art Optical Communications*, 2017.

Back Propagation (with noise)
2015
39 x 49 cm


Scaley

Doris Rohr

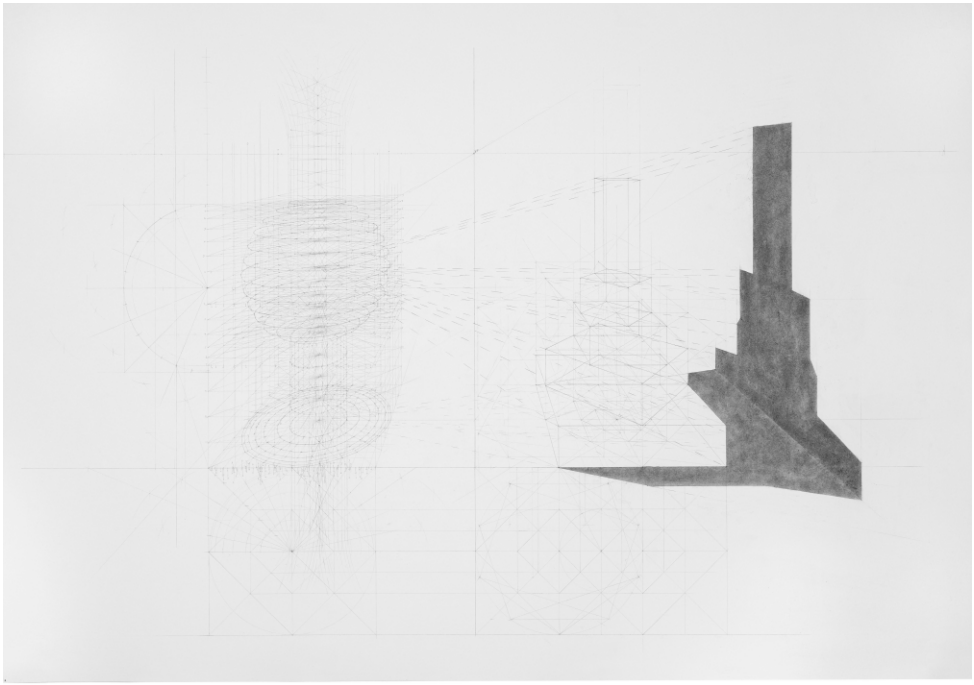
Doris Rohr's practice and research are concerned with sense of place, ecology, memory and imagination. Her processes involve drawing, writing and the spaces in between. The drawings in the notebook depict a response to the natural history collection of the Victoria Gallery and Museum, Liverpool. The observational recording of species under threat of extinction, such as the Pangolin, is a response to the animal's representation in natural history. Drawing brings out a different understanding of the animal, taken its identity beyond the status of 'exhibit', thereby reconnecting with the mythical dimension of a shared lifeworld. Recording these severed species, split off and alienated from their natural environment, becomes an act of atonement. The relationship of 'objective' photo with 'subjective' interpretation is driving Rohr's interest in scientific photographs from an undated (approx. 1950s) *Observer's Book of Wild Animals of the British Isles*, for example the Greater Horseshow Bat sleeping in cave. The photo evokes archaic prehistoric or trans-historic qualities not normally associated with scientific illustration. Translating the photos to free hand drawing allows for synthesis and imaginative connection between an otherwise fragmented relationship of the sciences to the arts.

Notebook: Pangolin (Victoria Museum and Gallery)
2018
25 x 57 cm (double page spread opened)

Emma Stibbon's work looks for a geological understanding of place. To do this, she will often talk to earth scientists who help her understanding of the underlying forces that drive change in the landscape. This enables her to identify features in the field. She believes it is this reading of place and her efforts to understand how it has evolved that provokes her to draw.

Stibbon often gathers earth materials from the sites she has been drawing in and back in the studio incorporates them into her drawing media. Using natural materials from particular locations allows her to explore the physical and metaphorical relationship between process and place. She aims to create a relationship between the drawn image and the subject through choice of media, mark, and paper. During a recent visit to the Alps, Stibbon drew the melting ice that flowed from under the snout of the glaciers. In these media experiments and small sketchbook she included glacial flour; this is made up of fine-grained particles of rock, generated by the mechanical scouring of bedrock by glacial erosion.

Media experiment
2016
30 x 33cm



Richard Talbot

This work was created as part of a research exhibition entitled *A Scientific Encounter: On Interobjectivity* and was made in response to the wide-ranging collections belonging to the University of Montpellier in France. Intentionally un-themed and unguided -the only constraint to the response was scale. Given that the collections were research collections across numerous disciplines and largely not mediated for public consumption, it created a situation where one could make free and anachronistic associations across the collections. I chose three seemingly unconnected objects –models of geological crystal structures, a piece of glassware involved in generating X-Rays, and Niceron's 17C treatise on Linear Perspective. The resulting work takes the form of a still-life 'representing' the chosen objects, and is akin to the elaborate tableaux found in perspective treatises such as Niceron's treatise –one of the selected objects. The drawing explicitly shows the mechanisms and expressions of Linear Perspective –projections, light rays, reflections and shadows, and the complex matrix ('a bundle') of lines used to construct (and connect) the visual phenomena and objects that are depicted. Thus the content and form of the drawing became, inadvertently and serendipitously, an embodiment of the act of choosing, of connecting, and the processes of depicting.

Point, Line, Plane, Solid
2017
each 60 x 88cm

Contributors

Gemma Anderson is an artist and researcher, currently co-investigator on the art/science/philosophy AHRC funded project 'Representing Biology as Process' (2017-2020) at the University of Exeter and associate Lecturer in Drawing at Falmouth University. She has collaborated on a number of innovative art/science projects. Her book Drawing as a Way of Knowing in Art and Science (Intellect Press)launched in 2017.

Sarah Casey is Senior Lecturer in Drawing and Installation at Lancaster University, UK. She studied History of Art with History and Philosophy of Science before retraining as an artist. She makes drawings that test the limits of visibility and material existence through dialogue with researchers in fields ranging from archaeology, astrophysics and anthropology. She is co-author of Drawing Investigations: graphic relationships with science, culture and environment (Bloomsbury 2020).

Gerry Davies is Senior Lecturer in Drawing at Lancaster University, UK. His work addresses issues of emigration and habitation in the face of climate change and rising sea levels. A graduate of the Royal College of Art, his drawings are in numerous collections and have been exhibited in solo and survey shows nationally and internationally. He is co author of Drawing Investigations: graphic relationships with science, culture and environment (Bloomsbury 2020).

Hondartza Fraga is a visual artist living in Leeds, currently studying a Practice-led PhD at the School of Design at the University of Leeds funded by the AHRC through an award from the White Rose College of the Arts & Humanities (WRoCAH). Her research explores the relationship between art and scientific visualisations of remote places. The catalyst for the project is the Cassini mission to Saturn, in particular, the relationship between the raw data/images and their processed versions.

Stefan Gant is an internationally recognised artist and currently Senior Lecturer in Drawing and Digital Practice at the University of Northampton. Practice and research publications explore 'phygital' (physical and digital) dialogues in contemporary drawing. He is currently artist in residence, Blenheim Field School, School of Archaeology, University of Oxford (2019-2023).

Jennie Speirs Grant is an artist based in North East England. A lifelong interest in drawing and related issues - material, perceptual, expressive, cultural and observational - informs a wider practice based in sculpture and environmental concerns. Her Phd research explored intersections between contemporary drawing and studio glass practice.

Michael Geddis uses microscopy to make observations, micro-surgeons loupes to produce finely detailed drawings and vacuum filtration to extract natural soil pigments for inks. His work is included in art collections of the NICS, Arts Council of Northern Ireland, Lisburn and Castlereagh City Council, Ballinglen Museum of Contemporary Art and Ulster University. Geddis has exhibited widely across Ireland and participated in group exhibitions in London, Stockholm, Lapua & Rovaniemi (Finland) and Washington DC.

Helen Gørrill is co-founder and director of the *Drawing Conversations* conference series. She is an artist and writer whose PhD thesis was co –supervised by the Royal College of Art, London. Her work is in collections worldwide including the Elizabeth Sackler Center for Feminist Art at Brooklyn Museum. She publishes widely in academic and popular press. Her book, *Women Can't Paint*, forthcoming from Bloomsbury 2020, has already been shortlisted for numerous awards.

Lesley Hicks is Senior Lecturer in MIMA School of Art, Teesside University. She studied Fine Art at Newcastle University and Painting at the Royal Academy Schools. Her practice based PhD research explores how the nature of the experience of place, might influence or inform the drawn mark. Exhibitions include: Driven to Draw: Twentieth-Century Drawings and Sketchbooks from the Royal Academy's Collection, Royal Academy 2012, godsbridgeX, Bowes Museum 2014, Contemporary Drawing from Britain, Xi'an Academy of Fine Arts, Xi'an, China 2015; shortlisted for the Jerwood Drawing Prize in 2017.

Jan Hogan is Head of Printmaking at the School of Creative Arts and Media at the University of Tasmania. Her research explores the traces left in the land of past events intertwining deep geological time with historical events and the present moment. Her focus is on cross-cultural and cross-disciplinary dialogues about Place and Space through visual language. Her practice is based on testing the materials and methods of printmaking and drawing, challenging these traditions through innovative translations of techniques. Jan exhibits regularly and has work in national and state collections.

Emma Hunter is an artist who explores parallels between the materials and processes of drawing and phenomena occurring in the natural world. In 2012 she was the recipient of an award from The Wellcome Trust to work with scientists at The Royal Brompton Hospital London to study the fluid dynamics that form the human heart. Her work is in numerous collections.

Johanna Love is an artist and academic living in London. She is currently Pathway Leader for MA Fine Art Printmaking at Camberwell College of Arts and Senior Lecturer in Fine Art Printmaking at the University of Brighton. She completed a practice based PhD at Chelsea College of Art, examining the subject of dust and the photographic image. She exhibits widely nationally and internationally. Recent exhibitions: Under a Darkening Sky, Standpoint, London (2019); Lunar Gardening, Kingsgate, London (2019); Solo exhibition, Kloster Bentlage, Germany (2018); A New Vision of Printmaking, Kuandu Museum of Fine Art, Taipei (2018).

Vanessa Lucieer is a marine spatial analyst at the Institute for Marine and Antarctic Studies at the University of Tasmania. She uses marine surveying and remote sensing to study and map the ocean, providing information for marine biodiversity assessment and resource management. In the past 15 years Vanessa has explored the shapes and textures of seafloor habitats from Norway to Antarctica.

Peter Matthews received his MA and BA in Fine Art from the Nottingham Trent University. His works have been shown internationally: The Drawing Center, New York; Drawing Room, London and the Saatchi Gallery, London. In 2019 Matthews had a large-scale installation at The National Maritime Museum London supported by Arts Council of England. He was also a Winston Churchill Fellow to the USA, and had a solo show in Hiroshima, Japan, supported by the Daiwa Anglo-Japanese Foundation.

Juila Midgley is a professional Reportage or Documentary artist with awards for drawing, painting, and printmaking. Her works are regularly exhibited in the R.A. Summer Exhibition. She is a Fellow of the R.E. and RWS; member of Reportager; affiliate Medical Artists Association; member Artists in Archaeology; Manchester Academy of Fine Arts (past VP); and until her retirement in 2013, a Reader in Documentary Drawing at Liverpool School of Art & Design, Liverpool John Moores University. She presents her work worldwide. Five publications about her documentary residencies have been published.

Daksha Patel explores scientific processes of measuring, mapping and visualising the human body and its environment. Residencies and research within scientific institutions regularly inform her work: King's College, London anatomy laboratories (2019/20); Life Science at University of Dundee (2018/19); Applied Mathematics at University of Bristol (2019), and Neuroscience and Imaging Science at the University of Manchester (2018 & 2016). She is intrigued by what remains immeasurable, illusive and unseen, despite our increasing capacities to visualise and gather data about the world around us.

Annalise Rees completed a PhD at the University of Tasmania in 2017. Annalise's work is informed by historical practices of exploration, navigation and cartography. She has worked with the International Cartographic Association and exhibited and participated in residencies in Australia, India, Japan and Canada. Since arriving in Tasmania she has spent many months at sea on fishing boats and scientific research vessels investigating our relationship to the sea using drawing as her primary means of encounter.

Dara Rigal explores physical phenomena through a range of materials. In her practice, she gives underlying concepts of current technology tangible form. She has recently displayed her work for the Optical Networks Group 25 Year conference at Royal Society 2019, London Light (Photonics Collaboration), Kings College 2019 and London Light (6 Vessels of Light), Kings College 2018. This collaborative approach is a continuum and distillation of her work as an Architect. She has a BES and MArch (Columbia 1994). Her engagement with Art and Science has grown naturally from this background.

Doris Rohr is Senior Lecturer at Liverpool Hope University where she teaches theory and practice for Fine Art and Design students based at Hope University's Creative Campus. She is editorial board member and co-founder of Drawing Research Theory and Practice. Her PhD Drawing on Nature: the legacy of Ruskin's Moral Cosmos (2016) investigates the continued relevance of John Ruskin's thoughts on drawing and the environment.

Emma Stibbon produces large-scale drawing and prints depicting environments that are undergoing dynamic change. Often working in the field, she has undertaken placements in Antarctica and the High Arctic, and the volcanic landscapes of Iceland, Italy and Big Island, Hawai'i. Stibbon's work is held in private and public collections including the Victoria & Albert Museum, London, Bristol City Museum and Art Gallery, and the Fitzwilliam Museum, Cambridge. She was elected Royal Academician in 2013.

Richard Talbot studied at Goldsmiths' College and at Chelsea School of Art, and was awarded the Rome Scholarship in Sculpture in 1980. In 2004, he was awarded a major AHRC Fellowship in The Creative and Performing Arts at Newcastle University, and has since become a permanent member of staff there. His work includes large-scale drawings, sculpture, and more recently, video/installation. His research and studio practice is centred on contemporary drawing, but he brings to this a particular interest in the theory, history and practice of perspective.

This publication accompanies the exhibition *Drawn to Investigate*, curated by Sarah Casey, Gerry Davies and Helen Gørrill, at The Ruskin Museum of the Near Future 10-17th January, 2020.

The exhibition is part of the international conference *Drawing Conversations 3: Drawing Taking to the Sciences* held at Lancaster University 17th January 2020. This is the third iteration of the Drawing Conversations conference series initiated by Helen Gørrill and Jill Journeaux.

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