



THE CURRENT DISTURBED

'Art researcher' or 'exotic pet'? **Jeanine Breaker*** reflects on her art-science research experience, including a Leverhulme Trust research fellowship at BGS

Leonardo da Vinci said: "We know more about the movement of celestial bodies than about the soil underfoot." His statement is still relevant almost 600 years later, and in many ways, has led to pressing global concerns over energy, food and water supply, pollution and climate change. Dr Nicholas Riley, BGS Head of Grantsmanship and Science Policy (Europe) states: "Industrialisation and urbanisation have increasingly led to a disconnection between society and the constraints that the Earth places upon it. Public respect for landscape and responsibility to live in harmony with it relies upon our collective visual literacy – our ability to recognize how the landscape came into being, its evolution and how our actions may increase or diminish our vulnerability to its natural behaviour."

The UK's research culture is one of the most progressive in the world, and UK funding organisations are creating opportunities for artists to work with leading science research organisations like BGS to address such pressing concerns. My year with BGS was one of the most productive and pleasurable of my professional career, however art-science research collaboration poses conceptual challenges – to

Above: The 15 x 5 foot triptych, *The Current Disturbed*, resulted from fieldwork conducted in the English Midlands near Swarkstone. Two soil-profile peelings flank my soft pastel drawing, which fastidiously replicates the soil-profile between the peels. The drawing is entirely comprised of visual and textual geological annotation derived from interviews with BGS sedimentologists after careful study of the peels. A truncated shadow is depicted against the soil-profile enveloped in light, literally and metaphorically overexposing the soil surrounding the embodied profile

both sides. Finding an effective balance, which avoids confusing novices on one hand and patronising the informed on the other, can prove elusive when two disciplines' methods and approaches are as foreign to one another as are geology and contemporary art. One scientist, for example, asked if I would be drawing portraits of old men in beards, while a college art professor asked me if geology was even considered 'real science'. Caught between these two extremes, an art-science research fellow – though the scientists refer to me as their 'artist-in-residence' – can sometimes feel like an exotic pet.

FIELDWORK

While conducting fieldwork in Holland, I captured spectacular shadows cast by a geologist against striated soil that appeared almost primitive. These silhouettes against the soil-profile formed the conceptual basis of my film, *Embodied Profiles*, created as output for my fellowship. The geologist's initial response, springing from his habitual criteria for judging scientific pictures was, "Beautiful – too bad about the shadows." From my standpoint, the transparent primitive silhouette provided the creative resolve – a physical manifestation of evolution through which to access and engage with the science.

As experts in both art and science become more specialised, value and respect between estranged cultures diminish and require continual reinvestment in art-science collaboration. University of Oxford Art History Professor Martin Kemp, a leading authority on the art and science of Leonardo da Vinci, has cautioned: "Many intelligent, motivated people were interested in art and science but found that a lot of art didn't relate to their lives, and that a lot of science was mightily obscure.[...] In an art-science collaboration, it is important that the artist does not impose a view on the science. Nature has more imagination than we do, so it is best to let it speak for itself.[...] Equally, if either party tries to impose too much – either by riding roughshod over the scientific content or by demanding needless technical accuracy – things can go wrong.[...] A successful art-science work should be more than simply communicating scientific ideas in a mathematics-free version. It should impact on people in a direct way, with a sensory component that moves them."

Gongbing Shan, a reviewer for *Leonardo Journal of Art Science and Technology* writes: "Multidisciplinary has become a catch-word of some currency. However, those who engage in multidisciplinary research typically find that it is considerably more



difficult to do than they initially anticipated. This is especially the case for the multidisciplinary research between art and science. If artists and scientists aim toward a common goal, then as fundamental research methodologies of constituent disciplines diverge, new demands are placed on both parties and their efforts must become complementary rather than merely integrative. Perhaps the next stage in the evolution of multidisciplinary research between art and science will be one where artists and scientists can supersede both disciplinary boundaries and the mere coordination perspectives, resulting in modes of thinking that ►

Right: *Earth Spine*
(see image notes on page 19 for further information)

Below: *Fractal Fields*
(see image notes on page 19 for further information)





Left and above left: Stills from the film *Embodied Profiles*, an installation featuring 18 x 24 inch soil-profile peelings from Holland – two that are adjacent and a perpendicular cross section – and a third wall which features a film created from my footage in Holland. The film uses the distortion of slow motion to reveal mysterious sounds and the timeless elegance of Earth science fieldwork. Dr Westerhoff's profile is embodied against the soil-profile, in a distillation of time and evolution that speaks to the vulnerability of Earth at our hands

► become transdisciplinary. I consider [such fellowship work to be] moving toward this direction.”

The goal of my fellowship was to investigate the creativity of the scientific method and the methodology of scientific creation. Ann Pizzorusso, a geologist who researches Leonardo da Vinci's work, offers a relevant perspective here: ‘Leonardo's paintings and drawings, viewed from a geological perspective, reveal a remarkable fidelity to nature.[...] He memorialised his observations in his notebook, now known as the *Codex Hammer*, which details his thoughts and observations on geology, hydrology and the effects of water and air on the Earth. He revealed his observations in his paintings and drawings by precisely depicting geologic formations which, at the time had not been named, but which are readily identifiable to a modern geologist.[...] All we know about Leonardo suggests that he had too much respect for the nuances of natural beauty to ignore them.’ Lack of resonance with the real world inevitably leads to reductive aridity. Without sensitivity to environment, an artist has little upon which to draw, and the work offers the viewer little to which to respond.

Advanced technologies have provided Earth science with a plethora of new ways to study the earth, and as a result of their prevalent use, the public risks losing touch with the physical environment. A decade ago a group of hikers were much less likely to risk a mountain trek without a map. Today emergency services are routinely called out to rescue hikers relying on satnavs and other devices that are unable to show features at the appropriate scale for fell walking, or that have lost signal, power, or both. Stanford University Professor Robert Harrison writes that these computer devices “draw [students] into their blinkered personal realms[...]. This retreat from the natural world is most evident in the young, but it is not a generational phenomenon.[...] The computer is changing the very essence of the human animal”.

My time at BGS revealed the limited knowledge and understanding of the natural world

that prevails among those of us untrained in geoscience.

To paraphrase Hydrogeologist Dr Vanessa Banks, to the Earth scientist the landscape represents a 'time shot' of the continuing evolution of the Earth's crust, and understanding of the landscape is based on a range of scientifically tested conceptual models. These models provide a route to an artificial visual literacy, as drawn from training and acquired experience.

MULTI-MEDIA

Engaging with the working methods and processes of geoscience through the first-hand experiences of a layman with very little physical science background, I focused on creating multi-media 'arte/facts' that integrate soft pastel drawing and geological annotation with geological techniques using soil itself as medium. One such technique is 'soil-profile peeling' in which lacquer is used to bind a thin layer of soil onto a backing-board with muslin to extract large-scale vertical slices of the soil-profile intact.

My drawings were created with the loosely bound materiality of

Below: The 7 x 4 foot triptych *Angle of Repose* features a 2 x 4 foot soft pastel and graphite drawing flanked by two soil-profile peelings of the same size created during our fieldwork in Holland. My drawing replicates a vertical section from each of the peels, and imbeds textual and graphic 'borehole log' annotation into the fabric of the drawing. 'Oscillating between the micro and macroscopic', *Angle of Repose* re/presents multiple layers and textures of the soil and its geology, which in this case dates back 70 million years

soft pastel because it is such an intimate medium, much like drawing with soil. (In fact, my hues were matched to the geologically precise 'Munsel' colour chart.) I created four large-scale multi-media arte/facts, collectively called 'Authentic Landscapes'. These were derived from rigorous study of the nuanced structure of the soil in collaboration with geoscientists at BGS and BGS affiliate, Dr Wim Westerhoff (Netherlands Organisation of Scientific Research-TNO). See captions for further explanation.

Although we all, to some extent, find ourselves immersed in an increasingly virtual world, a renewed investment in the material nature of drawing continues to emerge and engage on all levels and in all fields, because human beings continue to be drawn to an intimate, material experience of their environment – ever curious about how, as Paul Klee put it, 'to make unseen things visible'.



***Jeanine Breaker** was funded by a Leverhulme Trust Research Fellowship, in the first ever art-based fellowship to be held at NERC British Geological Survey (BGS) jebre@bgs.ac.uk

FURTHER IMAGE NOTES

Fractal Fields, (P17) also resulted from the fieldwork in Holland. Fractals are the 'self-similar' patterns common in nature in which corresponding patterns recur at progressively smaller scales. The first panel is a highly textured 18 x 24 inch soil-profile peeling. My soft pastel drawing in the centre replicates the precise location from which the peel was taken. The third image uses microscopy to magnify a few sand grains taken from the peel. An antique brass film loop magnifying the sand grains hovers over the drawing. Written between the lines of the soil are riddles about landscape preservation comprised of antiquated phrases dating as far back as the 16th century.

Jeanine produced five short films. *Embodied Profiles* (see P18) *Authentic Landscapes* begins with a brief narrative describing insights about my investigation with BGS, and is followed by crisply edited documentation of the soil-profile peeling process. *The Dichotomy of Being Underfoot* is a frenzied three-minute filmic 'trip' compressed from two hours of footage taken down a 90-meter borehole with a 360-degree CCTV 'spinning camera' on a private estate in the Peak District. The audio track mixes the rhythmic sounds of borehole drilling with that of a human heartbeat.

