Light, Art and Science Meet in the Gallery

Art has always made use of colour to create an image, whether to represent something in the world or a fantasy created in the mind. In the past that colour was, more often than not, matte, with little light reflected in the specular direction. It would have been noticed, even by those drawing or etching in caves or carving on rocks, that surface roughness affects the reflection of light: the eye would have been caught by the light and the fact that the light changed the visual appearance of colour. Painters and sculptors used this quality of specular reflection to enhance the effects they could achieve. Russian icon painters used gold paint to depict the radiance of heavenly light, caught by the candelabra in dark cathedrals, to dramatise the image, to make it seem unearthly, heavenly. Sculptors used light to illuminate standing stones to give them a magic quality at sunrise on significant days of the year. Brightness is a subjective experience: we each see things differently according to the place we stand in the changing geography of our lives, in our progress though the luminescent landscapes of our days, unconsciously responding to the refractive index of materials, the shifting angles of incident light and the constantly changing topography of the world, from one fluid moment to another.

Luminescence plays an important part in our aesthetic vocabulary. Porcelain and jade can have a transluscent quality that cannot be achieved with earthenware, and, for that reason, are often more valued in the Chinese and Japanese artworlds. It was the development of oils for painting in the early 15th century that gave the surface of an image a fugitive luminescence that could be enhanced with impasto, with ground glass and other materials to create rich effects of brightness on the human eye. These effects became aesthetic values.

Brightness, luminescence, radiance are properties of light used by artists since ancient times for other reasons: light is associated with life and darkness with death, light with enlightenment and darkness with ignorance, evil hides in darkness and goodness shines with an inner light. Thus light has had moral qualities bestowed upon it.

The Enlightenment in Europe was associated with the rapid advance of the investigative sciences. Everyone wanted to know everything—time, space, energy, light, the world about us. The Sublime of Edmund Burke used the contrasts of light and dark to display the drama of our world, such as William Hodges' *A view of Cape Stephens in Cook's Straits with waterspout* (1776), where the human figures are dwarfed by the storm with the flash of lightning in the sky and the brilliant white of the

dramatic waterspout itself against a background of billowing, dark and threatening clouds; qualities of light were used to portray the subliminity of violence and to illuminate contrasts.

But what if the artist turns to the subject of light itself?

In 2015 a group of sixteen artists and eleven scientists came together in the Art and Light Project, organised by Peter Stupples, from the Dunedin School of Art at the Otago Polytechnic, and Ruth Napper, from the Anatomy Department at the University of Otago. The artists were all associated in one way or another with the Dunedin School of Art—as alumni, staff, students or friends of the School. They were painters, printmakers, sculptors, photographers, creators of electronic installations, ceramicists, fashion and textile designers. The research scientists came from a variety of disciplines—botany, physics, anatomy, physiology and computer science—at the University of Otago. At the first meeting of the group, in October 2014, the organisers pointed out that, in the same way as in the previous collaborations of scientists and artists in what has become known as the Science Series (Art and Neuroscience 2012-13, Art and Anatomy 2013-14), the aim of the eight–month project was not for the artists to illustrate the work of the scientists, but through their association to generate creative energy to make artworks inspired, triggered by the spirit of the scientists' research as understood by the artists. The joint group met monthly through the duration of the project, and at each meeting three artists/scientists would report on the progress of their co-operation. The project culminated in a public exhibition, 15-30 August 2015, in the HD Skinner Annex of the Otago Museum and the publication of a descriptive and illustrated catalogue.

For most artists the project set them racing up the near vertical arcs of learning curves. The way scientists understood and worked with light was not the way artists thought about it. The concepts were all new and, at first, almost incomprehensible, enlightenment coming slowly, even if, finally, still through a glass darkly. Artists learned to respect the work of scientists and were amazed by their "arts." They learned a lot about science. In turn scientists found that the way artists thought generated a new specular reflection on their work: they began to see what they were doing in a different way. It gave them visual food for thought. The difficulties the artists faced in coming to terms with the science also helped the scientists to understand the difficulties everyone outside their immediate field might have in comprehending what they were familiar with every day, and so gave them pause to think how words or images could help to bridge the chasm of incomprehension.

The nature of light, two oscillating fields—one electric, the other magnetic, propagating through space as a wave, was the foundation concept tackled by Rebecca Cameron in her delicate porcelain installation. The use of laser light to create a lattice, like a net, to hold wavelike atoms, waves holding waves in microseconds of measurement, makes Rebecca's conceptual frame, by comparison, seem simple. Lynn Taylor took this more complex idea out of its intangible lattice and reframed it in a grid of imagination and placed it in the photoshopped reality of light-sensitive printing plates to hold onto the idea long enough to make optick-images for her pendants. Those moments of quantum measurement were also the somewhat sceptical subject of Holly Aitchison's painting: can we really grasp this concept, her images seem to say.

The fugitive nature of light, often existing in forms we cannot see with the human eye, such as the rays reflected or refracted from a curved surface, rainbow caustics, caught by the camera, sent Pam McKinlay on a journey into previously unknown territory in which she remains in thrall. The fugitive

images from receptors placed around the world to capture data from space were caught by Sarah McKay, like those of Pam McKinlay, accidently by the camera, unseen by the artist until the film was developed and the image further manipulated to expose a moment in the magic stream of life *Within the Outside*. The loss of life in the cell, the black holes that appear in the nervous system, that can be partially restored by deep brain stimulation with blue light, was the catalyst for James Bellaney's seemingly abstract canvas of a painterly brain, the surface activiated or deadened by wavelengths of colour in close association, a momentarily static map of waves of life and death. The blue light is, as it were, a fluorescent marker, like the electroluminescent wire that gave life to Desi Liversedge's crochetted yarn.

Multiple images of objects from all angles are used by Steven Mills to create models or maps of particular sites. These ideas were used by Liz Rowe to create flat ceramic maps and by Sue Novell to make a digitally constructed, multi-layered landscape, developing to another stage the techniques with which she has been working for some years.

Campbell Island's megaherbs show their secrets of pollination only through thermal imaging and infrared film, giving a spectral light to the human eye, that Sue Pearce used for her traces of acrylic and chalk pastel on black gessoed-paper. Sue Taylor used her sewing machine to draw the pollinating insects. The same research was also the foundation for the book of images from Janice Lord's diary on Enderby Island, *Glistens with Nectar*, by Marion Wassenaar and Kiri Mitchell, that used her text as the basis for Dada poetry, also reproduced in Braille, so that those without light could see at their finger ends the magic of the Subantarctic archipelago.

Firefly squid emit arrays of blue light from protein crystals in their body and inspired a natural development of Lynnette Taylor's already mature series of grid paintings.

The Graphics and Vision group in the Department of Computer Science at the Univeristy of Otago served to inspire, in part, the works by David Green, *Embodied Earth*. These complex works, using the power of lightning to give the viewer a greater sense, through an extension of the sensile experience of their bodies, of the atmospheric life of the Earth we inhabit, are described in some detail by members of the team of artist/scientists/computer manipulators who helped to construct these experiences for visitors to the HD Skinner Annex. One of these experiences was the donning of a haptic jacket that enabled the wearer to experience the lightning strikes that flash around the world in real time. As Elsie Percival wrote in a review of the exhibition:

> I stood cloaked in a heavy jacket at Otago Museum's Annexe gallery and watched the thunder erupt somewhere in Africa. I felt a sudden electric vibration in my right side. Another bolt exploded in north-eastern Australia. I lifted my arm and felt a gentle buzz on my elbow. Dancing thunderstorms crackled in front of me—I hugged the jacket close to my body to bring my tiny existence closer to these celestial forces. I felt the pulse of the Earth.[1]

Near these exciting events stood another coat, not yet for wearing, but a prototype of a "smart" jacket, the work of Natallia Trayan and Alexander Doronin. As Natallia explains: "My aim was to create a new smart clothing material that would manipulate light, causing it to become polarised, and so provide a rich palate of colours only visible when the viewer is wearing polarized glasses."

What had started out as an exploration of potential relationships between artists and scientists, to tease out new ways of working together, had developed, by the time of the exhibition, into a series

of works, all of which could be called prototypes for the future, not only of art forms but also of conceptual thinking that crossed and recrossed the seemingly unbridgable chasm between art and science, pointing the way to further potential collaborations.

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This edition of *Junctures* contains papers further developed by some of the artists and scientists as a result of their cooperation and experience. It embellishes the brief introduction to their work already published in the catalogue and serves as a further tribute to the creative energy expended over that eight-month period. The paper by Col Fay, whilst not part of the Project, nevertheless covers similar ground and seems to fit quite seamlessly into the context of the Project.

1. Elsie Percival, "International News: Artists shed light on Scientists' work in 'the Art and Light' exhibition at the Otago Museum," *SciArt in America*, blog, http://www.sciartinamerica.com/blog/international-news-artists-shed-light-on-scientists-work-in-the-art-and-light-exhibition-at-the-otago-museum (accessed 12.11.15)