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Positioning: Art and the Life Sciences

INTRODUCTION

This inquiry begins with the description of a selection of research projects undertaken by multi-disciplinary print artists in which the life sciences have played an essential role: Earthmakers, the Broughton Archipelago Series, [a]drift, and Perceptions of Promise: Biotechnology, Society and Art.

I give special attention to the focus, breadth, and collaborative working relationships established within each project. I then examine some issues artists confront regarding the increasingly popular 'art and science' categorization used to group many works interfacing with the life sciences, and indeed science in general. Often located in an intermediary space between art and science, I address difficulties the artwork produced may confront in the positioning, or lack thereof, within contemporary critical discourses.

I begin by briefly clarifying how my concerns lead me to issues addressed in this paper. My study over several decades, of the ever-shifting relationship between ecosystems and human cultural structures, has drawn on a practice of fieldwork to collect images, specimen, and textural information from urban and non-urban sites. Of my work noted in this paper, I discuss two such sites: an old-growth forest site, and the site of remote fish farms, researched in the formation of Earthmakers and the Broughton Archipelago Series. Leading up to these projects, I spent the late 60s and 70s familiarizing myself with dominant cultural attitudes and policies regarding land usage. Then, seeking to understand subtle and complex interrelationships among social, political, and natural phenomena, in the 80s I probed the construction of Nature and Culture as distinct dichotomous spheres. In the early 90s, instead of just thinking about the forces shaping our relationship to environment in abstract terms, I decided to interact more directly with a specific aspect of the environment. I sought to adopt a more analytical approach to the physical environment, a new direction necessitating the seeking of knowledge and specimen from scientists.

Zeigler, B and J Smith, Earthmakers, installation views, (etchings on Kozo paper, cedar, sound component and index), Richmond Art Gallery, Richmond, BC, Canada, 1998. Reproduced courtesy of the artists

EARTHMAKERS

Earthmakers, begun in 1991, was a collaboration undertaken over approximately seven years with artist Joan Smith; together we worked with several soil scientists, master printer Peter Braune, and the public. We approached the understanding of land through on-site research, the collection of soil fauna samples, and documentation in the lab of those organisms. The Earthmakers' installations were comprised of more than two-hundred 24'x33' prints on translucent sheets of Japanese Kozo paper printed from 25 photo-etched matrices, on which over 5,000 soil organisms specific to a site on Northern Vancouver Island near Port McNeill, Canada, were depicted.

Also integral to the installations was a modular collage installed either on the floor or wall, comprised of twenty-five 31' x 31' units made of recycled forest products. It was modeled on the litter layer of the forest floor, from and beneath which the soil organisms depicted originated. An area of decomposing cedar in the centre of the floor referenced a square meter of old-growth forest soil, home to approximately 3,500,000 million organisms. An audio installation

matching the rhythm of raindrops with the pounding of footsteps recorded in Grand Central Station, New York, filled the exhibition space. An index was available to viewers detailing the scientific classification of each of the organisms – Order, Family, Genus and Species – and noting the source of the image matrices – whether drawn, photographed, printed, or computer generated.

Not knowing where this research would lead us when we began, over time it became important to us to attempt to 'activate a consciousness of the specific forest site referenced, and thereby serve to increase awareness of the essential part soil fauna play in the delicate life cycle of the forest and the Earth's ecosystem' (Zeigler & Smith, 1998). In the process of working on this project, ideological assumptions about Western science, as well as what is valued and what is not by the public and the government, were considered with increasing criticality. Similarly the concept of 'landscape' was reflected upon, in an effort to understand how ideas of nature, the land, and landscape are formed. In form, the work extended the use of the visual language in printmaking to that of large-scale installation, including print as well as sculptural and textural components, and stimulated the sensory systems of hearing and olfaction as well as vision. A project born of curiosity, in the end it served to profoundly shift my, Smith's, and many of the exhibition participants' perception of the life in which we are all immersed.

THE BROUGHTON ARCHIPELAGO SERIES

In 2002, I began work on the Broughton Archipelago Series, an ongoing project for which I have required assistance from marine biologists and fishermen to obtain specimens and broaden my understanding. The Broughton Archipelago lies in a remote area accessible only by boat off the mainland coast of British Columbia, Canada. At first glance it appears to be a true 'wilderness' landscape; fish farms nearly flush with the surface of the water appear hardly noticeable to tourists, and provincial/federal policy makers. A marine ecosystem that flows into the Pacific Ocean it is, in fact, severely threatened by all the associated problems of open-net cage Atlantic fish farming: high levels of sea lice, various viruses, parasites, and habitat destruction. Native salmon stocks, the prime food source for human and non-human

Zeigler B, The infants, eight images each 111.8 x 203.2 cm (44' x 80'), total dimension 1082 cm (35.5'), digital archival pigment prints, 2004 -7. Reproduced courtesy of the artist

inhabitants of this region such as whales, bears, sea lions, and birds, are severely threatened. I have taken many fieldtrips to this area to photograph and to further consider how we obscure our understanding of the 'other', human, or non-human, through cultural framing. Objectives of this work have been to problematise conventional representations of land and 'landscape,' to bring to mind the political consequences of romanticized misrepresentation of non-urban environments, and to better understand and shed light on the salmon aquaculture industry in British Columbia.

The Infants, a large-scale work in this series, is comprised of seven images of Broughton Archipelago pink salmon smolts, juvenile salmon ready to migrate seaward, and one image of a human infant. Each is enlarged to the approximate size of an adult human. The scale and presentation of these images serves to shift the 'specimen' out of the realm of scientific data, providing a different point of entry to the consideration of the consequences of current fish farming practices – one that is more affective or phenomenological. While the pairing of human and salmon infants in this work does speak to the outmoded, hierarchical, often romanticized, as well as objectified and commoditized view, of non-humans, it remains cognizant of sensationalist tactics often uncritically used in environmentalist discourse. Closer consideration of the installation might also highlight such strategies, and the cultural paradigms in which they function. Although many individuals are working tirelessly to protect the salmon, since beginning this project, west coast salmon species are increasingly threatened.

[A]DRIFT

[a]drift is an exhibition first shown in 2011 by Edith Krause, an artist with an MFA in Printmaking from the University of Alberta, and a scientist with an MSc in Zoology from the University of British Columbia. Taking a cue from diverse sources such as Johann Wolfgang von Goethe, the eighteenth-century poet, playwright and aspiring scientist, and Ernst Haeckel, the nineteenth-century biologist and illustrator, every month for one year, Krause collected microscopic marine plankton samples from Whaler Bay, British Columbia (Krause, 2011). She then analyzed, photographed, and used them as source material for [a]drift.

Transforming her fieldwork and laboratory analysis into a large-scale installation, she highlighted the difference in approach to biological specimens taken by scientists and artists, and where normal borders between art and science blur and overlap. Upon entering, her exhibition, [scientific method] familiarizes viewers with the collecting of samples for scientific study through the use of a microscope, an iPod, and a TV monitor (E. Krause 2013, pers.comm, 21 April). Then, [observation], a selection of holograph–like prints alludes to the subtle layering of visual and interpretive

material inherent to both visual and scientific observation (Jervis, 2011); woodblock prints on silk organza are layered over digital prints on rag paper to create a sense of three dimensionality and movement (Krause). This section of the exhibition is followed by [larval], greatly magnified, intricately cut woodblock prints of microscopic plankton, which through their scale relate to the viewer's body. This increases their presence as individual subjects and more appropriately conveys their ecological importance. Shaped to the outer contour of the larvae depicted, they appear to float on the wall, a visual manifestation of the word plankton derived from the Greek word 'planktos' that by extension means drifting. This then visually links to the next portion of the exhibition, a small room in which jellyfish, another planktonic species, that drift across every reachable surface, reflected by a mirrored ball centrally positioned on the floor.

Krause continued to take plankton samples in 2011-12, and though not conducting a formal analysis, found in general that there was less diversity in the samples than in the previous cycle (Krause). A 2010 Government of Canada report on the waterway linked to Krause's study area stated, 'Zooplankton abundance is decreasing in the Strait of Georgia…' (Johannessen & McCarter, 2010). Although the affective quality of the Krause's work instills a sense of wonder that may lead to greater understanding and appreciation, it is difficult to miss a sense of urgency in this work. Referencing the way plankton drifts as it is carried by water currents, **[a]drift** may also signal critical environmental issues, as humanity appears adrift without collective focus or sufficient respect for other essential life forms.

PERCEPTIONS OF PROMISE: BIOTECHNOLOGY, SOCIETY AND ART

The last project I will note, **Perceptions of Promise: Biotechnology, Society and Art**, first exhibited in 2011, brought together a sizable group of national and international artists and scientists, and eminent legal scholars, philosophers and sociologists, to work collaboratively on a large-scale interdisciplinary project related to biotechnology and stem cell research. Building upon momentum of the highly successful 2008 project titled **Imagining Science**, Professors Sean Caulfield and Liz Ingram of the University of Alberta Department of Art and Design, in collaboration with professor Tim Caulfield of University of Alberta Health Law Institute, initiated **Perception of Promise**. In addition to exhibitions of this work, a publication edited by Sean Caulfield, Curtis Gillespie and Tim Caulfield was produced. It features the work of the artists in the exhibition and texts by the scholars involved in this project, who explore 'popular culture representations of biotechnology in film, literature, print media, and the role art can have on public perceptions of biomedical research and, by extension, on policy debate and resulting regulatory frameworks' (Perceptions, 2011).

Edith Krause, **[a]drift**, installation view, FAB Gallery, Edmonton, Canada, 2011.
Reproduced courtesy of the artist

The project began with a three-day workshop that set a base of understanding for further collaboration throughout the project among the whole group, and allowed for discussion of the research concerns of all the participants. I am not able, within this brief text, to talk extensively about the concerns explored in the work of each of the nine artists participating in this collaborative project: Derek Besant, Sean Caulfield & Roy Mills, Liz Ingram & Bernd Hildebrandt, Shona MacDonald, Marilene Oliver, Daniela Schlüeter, and Clint Wilson. Many, though not all, of the artist in the exhibition have been involved with the medium of printmaking for many years and in this exhibition extended this work in new ways. Of special interest here, too, is the diversity of vantage points from which each artist explored concepts related to biotechnology, society, and art, and through which each opened up new ways of seeing and approaching aspects of these complex interrelated areas of inquiry. The vast array of materials the artists employed in their translation of related concepts may clearly signal for viewers that the processing of information and perceptions occurs in many non-verbal ways, making use of a range of different types of intelligence.

The statement on the Chelsea Art Museum Gallery website is of note in its approach to this work. It states:

> Without supporting one view of stem cell research over another, the artists propound viewers to ponder current forms of biotechnology. The art works move beyond usual debates, confronting viewers with deliberately multiple and uncertain images of blood, viscera and strange, organic forms. These creations implicate visitors, sometimes placing them literally within a shaped space, and sometimes asking them to slow down and draw on their own experiences to consider how historically specific conceptions of what constitutes 'life' are changing once again (Chelsea, 2011).

CONCERNS AND INITIATIVES

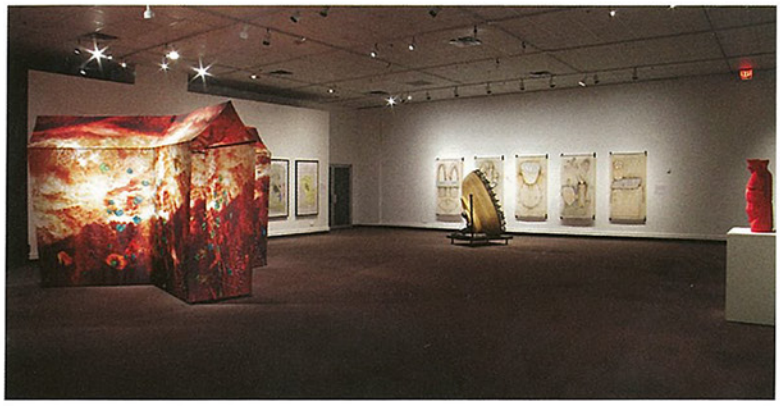
'Encompassing both art and science (Engine, 2012)' is a phrase now often used with enthusiasm. It is employed to indicate that people from the 'Two Cultures' (Snow, 1959) are talking to and learning from one another. The coining of the term 'Two Cultures' was first brought to prominence and public debate in **The Reed Lecture**, 1959, by C. P. Snow (Cambridge, 2013), when Snow identified 'the literary intellectuals and the natural scientists, between whom he claimed to find a profound mutual suspicion and incomprehension…' (Snow & Collini, 1998, vii-viii).

The projects I have discussed here now normally fall within the increasingly popular, though ill-defined, art/science category. I say 'ill-defined', because of the broadness and lack of specificity of this classification. The UK Science Council defines science as 'the pursuit and application of knowledge and understanding of the natural and social world following a systematic methodology based on evidence' (UK Science, 2013). The current art/science category would appear to relate, however, to artworks interfacing with the natural and applied sciences, since traditionally there has been a pronounced crossover between art and the social sciences, 'academic disciplines concerned with the study of the social life of human groups and individuals…' (Wiki).

Further, while attempting to imply that a new synthesis is occurring, the classification perpetuates a binary way of viewing knowledge. There are so many disciplines under the category of science that one has no idea if we may be talking about art related to caterpillars, computer systems inside of a jet engine, or possibly **Skin Graft**, a work by Zhu Yu, in which we see photographs of the 'artist sewing his own skin onto [a] pig carcass' (Wiki). Interestingly, even when a group of artists and scholars title a work within more specific perimeters, such as in **Perceptions of Promise: Biotechnology, Society and Art**, the heading on the website page for the exhibition at the Chelsea Museum of Art in New York read **Perceptions of Promise: Biotechnology, Science and Art** (Chelsea, 2011). Possibly an oversight, it may also demonstrate how entrenched in the collective psyche the 'art and science' classification has become.

It is also now commonly said that artists and scientists are collaborating. In that they are working 'jointly with others… especially in an intellectual endeavour' (Merriam, 2013), they are collaborating and on occasion an artwork may be co-authored between scientists and artists. Normally, however, artists seek information and knowledge from scientists that they could not obtain in any other way, and then they produce art. Scientists gain different types of insights through the exchanges, but normally, of course, these encounters do not precipitate scientific papers, although related articles may be written. As a result of the exchanges, both the artists and the scientists grow in some way, normally because something significant has occurred, and their institutions are pleased that people from different disciplines are talking to one another.

Where difficulties appear to arise, however, is when others look at many of the collaborations among artists and scientists within an 'art and science classification.' This tends to position the work produced in an intermediary zone between discourses in the arts and the sciences, when fundamentally art is being produced, with concepts developed under the purview of the artists. The idea of illustrating science or communicating scientific ideas to the public, although possibly useful and enlightening, fundamentally is not currently the task of an artist. Artists are referencing diverse types of knowledge as they always have, and through complex processes producing art within certain cultural contexts and evolving discourses.



Perceptions of Promise: Biotechnology, Society and Art, installation view, works of 5 of 9 artists shown, L. Ingram & B. Hildebrandt (left), S. Caulfield & R. Mills (centre), and Marilene Oliver (right), Glenbow Museum, Calgary, Canada, 2011. Reproduced courtesy of the artists

For artists interfacing with the natural sciences, of which the life sciences and biological sciences are also a part, an issue of reception-or lack thereof-of the artworks produced may surface because of their art/science positioning. It has been my experience that many such works are often dismissed and inadequately considered within contemporary critical discourse unless they are, for example, very clearly critiquing some aspect of science or scientific methodology, or such things as the system of display of scientific materials within a museum or gallery. It is somewhat understandable that positioning artworks, such as the ones I have discussed, within critical discourses may seem challenging. Much current art theory deals with the social construction of perceived reality in which norms, rules and laws are perceived as fluid and based on context, and binary oppositions and hierarchical structures are put under critique, whereas in science, the focus is on establishing 'scientific theories and laws…based on hypotheses…' (Zimmerman, 2012).

The question becomes, therefore, is the work of many artists interfacing with the life sciences also involved in cultural critique and if so how? May the very fact that certain artists have stepped outside the 'normal parameters' of contemporary art practice indicate that they may be attempting to obtain different perspectives on aspects of culture and its structures, similar to ones that other artists may be approaching through other means? Could it be that they are trying to break down structural institutional and societal barriers regarding how knowledge currently functions

within academia and society-at-large? Could a different understanding of life be gained through interfacing with knowledge derived from the life sciences, as opposed to the social sciences, enabling these artists to clearly see and better understand the effects current cultural structures and hierarchies are having not only on humans but on other plant and animal species on the planet.

I would contend that in many instances this indeed is the case. What appears misunderstood, is that through studying and imaging such things as bugs, plankton, and fish, and in contemplating stem cell research and its ramifications through visual means, artists also become cognizant of the many social, political, and economic structures impinging upon the life forms they are studying and employing in their artwork. At the core of many of these projects, there is a challenge to established ways of viewing life, to our relationship with the environment and other species, and to the hierarchical social structures within which we are currently operating.

It is possible, of course, with the developing interest in art/science initiatives that this type of understanding, as well as other discourses specific to various kinds of work bridging art and science, will evolve and be more broadly understood. This, however, will require an open mindedness regarding what may constitute valid critically informed art/science research, and an increased understanding of the ways such inquiries may benefit both society as well as the evolving distinct and mutual discourses within art and science.

It is also of interest to note that there are now several books focused on art and science that collectively discuss many pertinent issues of concern. Cognizant of related issues and discourses in both the art and the sciences, Siân Ede, in her 2005 book titled **Art and Science**, for example, takes a serious and informed look at this subject. Also, a selection of institutions normally focused on either art or on science have recently initiated art/science programmes with various mandates. In the fall of 2011, Central Saint Martins of the University of the Arts London began offering a MA Art and Science programme aimed at 'professional engagement in art and science authorship and creative practice' (Art & Science). Earlier this year (2013), the British Library hosted an exhibition titled **Encounters Between Art and Science**. It was comprised of artwork by Central Saint Martins' students from this new MA programme, who used the science collections in the Library as a main resource. This exhibition is also available to view on YouTube (Inspiring Science).

Edith Krause, **[a]drift**, one image from the [larval]series, approx. 121.9 x 132 cm (48' x 52'), shaped woodblock print, 2011. Reproduced courtesy of the artist

Other institutions with a primary focus on science have begun initiatives encompassing electronic art and other media. SARC (Scientists/Artists Research Collaborations), an independent research and education centre of the Santa Fe Institute, piloted an inter-disciplinary initiative during the summer of 2012. A statement concerning the SARC Working Group noted:

> It is time to move beyond the previous generation's too-narrow focus on art and technology, as mediated primarily by developments and applications of digital media. Too often, such collaborations have either been about artists critiquing or interacting with scientific or technological artifacts, methods, or processes, or have been about scientists acquiring compelling visualizations or other data transcodings from artists. While these types of 'science serves art' or 'art serves science' projects can be very fruitful, what have generally been missing are collaborations that truly advance both art and science, and society. This endeavor intends to be deeply interdisciplinary, in ways that may provide new means of investigating complex systems of all types…' [Dunne 2012].

Lastly, focused specifically on biological sciences, SymboticaA offers 'an artistic laboratory dedicated to the research, learning, critique and hands-on engagement with the life sciences' (SymbioticaA). Located since 2000 within the School of Anatomy, Physiology and Human Biology of the University of Western Australia, it is the first research laboratory of its kind enabling artists and sciences to engage in wet biology practices within a department of biological science. SymboticaA also hosts residencies, workshops, exhibitions and symposiums, and 'encourages better understanding and articulation of cultural ideas around scientific knowledge and informed critique of the ethical and cultural issues of life manipulation' (SymbioticaA).

In **Toward a Third Culture: Being in Between**, Victoria Vesna, media artist at UCLA, discusses the gap that still exists between the humanities and the sciences and how it historically originated. She reappraises the concepts of **Two Cultures** noted earlier in this paper, and highlights the concept of the Third Culture, originated by C.P. Snow in the early 60s, which would emerge overtime and close the gap between literary intellectuals and scientists (Vesna, 2008). She states, 'Practice informed by theory, utilising a methodology which makes it accessible to both worlds, is the key. Or, conversely, theory informed by practice…' (Vesna). While her area is communication technologies, this also has application to artists working with life scientists.

There are many varied and overlapping concerns among scientists, artists, and scholars of all disciplines that require open communication. Although institutional as well as individual barriers still exist, and I do remain leery of a broad overarching art/science classification, there is a critical urgency to many current multidisciplinary explorations. When one reads, for example, a 2011 State of the Oceans Report headline declaring, 'If the current actions contributing to a multifaceted degradation of the world's oceans aren't curbed, a mass extinction unlike anything human history has

ever seen is coming…' (Huffington, 2011), it is clear that conversations in a range of disciplines affect us all. All types of knowledge require respect, and people need to communicate more with one another to try to understand and confront the pressing issues we collectively face.

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