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Editorial

The Art and Genetics collaboration between scientists, mainly working at the University of Otago, and artists associated in one way or another with the Dunedin School of Art—as students, staff and alumni, was planned to conclude with an exhibition during the Genetics Society of Australasia annual conference, hosted by the University of Otago, together with the New Zealand Society for Biochemistry and Molecular Biology. From the very first, in late 2016, artists and scientists met together at monthly scheduled meetings, but also in research laboratories, in the field, or in more relaxed get-togethers, over a period of eight months. The idea, as always over the history of these Science Series projects, was to share experience of different disciplines, for artists to get to know research fields outside their normal comfort zones, for scientists to wrestle with the fact that others find their work often incomprehensible in the media and language of investigation, as well as, more broadly, from a conceptual perspective. The process of overcoming such mutual disexperience, a seeming linguistic and methodological incommensurability, is the subject of these projects, the middle, if you like, of a chain, with scientific practice at one end and artworks curated for exhibition at the other.

It is, perhaps, a sign of our multidisciplinary times, that taking part in this project were artist-scientists and scientist-artists. Science has to do with observation, the recording of evidence, with the documented trial of hypotheses, with measurement, building upon the work of scientific endeavours of the past. Artists too are observers: they make marks to record a representation, they trial ideas through drawing and more finished sketches. They are interested in the mathematics of measurement—particularly of perspectival forms of representation in Western art from the Renaissance onwards, when art was closer to the science of the day than in our own era. They are constantly looking over their shoulders at the press of art's histories.

Genetics, genomics and bioinformatics may seem, at first sight, at a remote distance from the painter and print-maker, the sculptor and video artist, yet it was astonishing how much interest each group showed in the work of the other from the first meeting. Genomics in particular is about how each discovery in molecular genetics adds to the complex picture of what it is to be human, how a foetus is heir to a complex history of genetic biochemistry, with instructions to grow this way or that, with faults that replicate tendencies to biofailure and virtues that enhance chances of normal growth and maturation. Often the scientists in the project were working on a microsection of genetic structure

or genomic development, and generally on an aspect of "how human genetic variation impacts on disease and its treatment" (Julie Whitefield), including psychiatric disorders.

But the genetic sciences have a wider compass. Human beings live in the world, and the world exists within a solar system. Our world and solar system impact on the way we develop as individuals and groups. Genomic studies and epigenetics look at this wider set of impacting experiences on the human body—with the mind as a key component. Whereas the genetic code can be quantified, and changes in the code can be observed over time, the triggers for change, for the development of the genetically endowed organism, are dizzyingly complex and variable that call for all the ingenuity that is increasingly becoming available through the advance of the computer sciences, as Julie Whitefield and Martin Kennedy make clear. Indeed, Julie's unique experience as a scientist-artist bears witness to the accelerated expansion of our knowledge of the genetic sciences over a lifetime.

As a social historian of art I am particularly interested in how our mind-bodies, in different societies and at different times, come to make art and why. What may our genetic predispositions and experiential triggers—"a stunning inventory of previously hidden switches, signals and signposts embedded like runes through the entire length of human DNA," as Heramaahina Eketone points out, with reference to current publications of the ENCODE Project— lead us towards in our art making and art use? What part might our geographies and histories, as well as our individual life-experiences and biologies play in the sort of images we appreciate, create, despise, destroy? After all, the players in history, including art history, are human beings, creatures of the Earth, with an evolving set of biological features based upon the specific genetic attributes of individuals and groups within geographic and social constraints. These constraints change over time, leading to time and space specific behaviours, some of which have to do with the way those individuals and groups express image-ideas based upon social beliefs, aspirations and fears, customs and the uncanny, the seemingly-known and unknown. Behaviour is both social and biological. Above all it is mutable.

Human beings made art, at least from the Stone Age, but had no "history" of art until, arguably Pliny the Elder's *Natural History* (c. AD 77-79), with passages describing Greek sculpture and painting. For this reason Western art history has always had a bias towards the art of ancient Greece as the foundation of the notion of "art" and art's history. The history of the art of other cultures has always been seen through Western consciousnesses, with painting and sculpture as the Fine Arts, and other forms of art described as craft, folk, decoration, or with some other phrase to denote "otherness" and secondariness, lower in the rank of art's hierarchies. Thus art's history was "canalised," as Hal Waddington might have described it,[1] on the epigenetic landscape of Western consciousness, into the valley of art's history as determined largely by Italian scholarship in the Renaissance, exemplified by the work of Giorgio Vasari, and later elaborated by German scholarship, beginning with the development of art criticism by Johann Winckelmann and aesthetics by Immanuel Kant. This view of art's histories thus became assimilated into Western consciousness, normalised as the single academic tradition of the history of art.

Yet traditions have histories of formation, justification and rejection. They are disputed and revised. They are tested according to notions of truth and falsehood. The processes of change, of contestation, are generated by what Gregor Mendel called "hidden determinants." We now know that some of these determinants, possibly all to a degree, are genetic.

Modern science, also, increasingly understands these biological processes, each complex in themselves, as variables with sets of equally complex social constraints. Nature is indeed influenced by nurture. As Steven Rose points out:

> The material world consists in a multitude of entities and processes of various levels of complexity. Each level is governed by a set of organising principles dependent on, but irreducible to, those that govern lower levels…At each level of complexity, from molecule to cell to organism to ecosystem and society, new properties and organising relationships emerge, and to each belongs its own proper science.[2]

Yet art and its history is observer-relative knowledge, not intrinsic to the world. The history of science is also relative and not intrinsic.

This relativity is well underscored in this project by Heramaahina Eketone's remarks that accompany her artwork, putting forward different sets of parameters for considering culturally reductive aspects of genetic studies. Are there particular genomic sequences for the way minds think of our place in the world, our traditions and inheritances, customs of thought, of group activity, of beliefs, of sexual behaviours? What are the ethical and value questions raised by conservation genetics? Do we really know the consequences of what we are doing in genetic engineering? These scary questions are side-stepped by most of us. They are potentially too revolutionary, the answers as yet unknown. We'd rather count something or make a picture. But I think the wider questions raised by a historically nuanced epigenetics are worth asking. They are often implicit in the experience of the Otago-based artists and scientists who took part in this exciting Science Series Art and Genetics Project in 2017. Their areas of research and visual images, their collaborations and interactions are well-documented in this issue of *Junctures*. They offer images and ideas for thought—and thinking, ultimately, is what art and science are all about. The way we think about both art and science is crucial to our sense of "being in the world," as Pravu Mazumdar eloquently contends in his significant contribution to this issue, with his emphasis, through a reworking of the ideas of Michel Foucault and others, on the many "histories" of science, as well as the Arts.

1. See C H Waddington, "Epigenetics and Evolution," *Sympozia of the Society of Experimental Biology*, 7:1956, 186–99: "Experiments in Canalizing Selection," *Genetics Research*, (Camb.) 1:1960, 140-50: "Genetic Assimilation," *Advances in Genetics*, 10:1961, 257–93: "Towards a Theoretical Biology," *Nature*, 218:1968, 525–27.
2. Steven Rose, "How to Get Another Thorax," *London Review of Books*, 8 September 2016, 15.