

Creative Encounters

The Art/Science of Collaboration

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"An integration of art and science promises to be much more appealing and understandable to a larger public than either are alone."

"Research is the search for the future. Science and art are major forces in contemporary society. They must both contribute to the shaping of that future."

Stephen Wilson¹

In this article I look at three different approaches to creative and experimental projects that artists have developed addressing contemporary scientific knowledge. In the spirit of this *Reader*, this is an attempt to understand and articulate the (omni)presence of science and technology in culture and society. A number of contemporary artists are currently not just looking at digital technologies, but are also exploring and critiquing a range of scientific practices, including biotechnologies, in their work. These artists are attempting a sober but creative exploration of the ethical and cognitive dilemmas that we are confronted with by the presence of technologies in everyday life.

Jeremy Rivkin, writing about J. Craig Venter's recently announced plan to develop artificial life forms in laboratory environments, suggests that "other scientists worry that Venter's creation could wreak havoc on natural ecosystems or be used to create new kinds of biological weapons".² Such concerns are, however, not just the domain of scientists: whether they are opportunities or threats, discussion about such scientific 'discoveries' and research must be open for public debate.

The space that artists provide for an interrogation of a creative (public) imaginary provides real possibilities for informing technological innovation and scientific enquiry; indeed in this context, art has the potential to provide a forum in which to examine scientific and intellectual inquiry in very real social and cultural contexts; and to interrogate, intervene and sometimes co-opt the debate.

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Australia's **Back to Back Theatre Company** has, over recent years, been driven increasingly by an ambition to create a new theatrical space that merges screen and live performance. They make extraordinary multi-disciplinary theatrical events which merge architectural design, live performance, animation and sound. In their most recent and probably most ambitious project to date, the research and development of the work revolved around the current debate of genetic screening and the social implications of the human genome

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Image courtesy: Jeff Busby

project. At the Cytology Department at the Murdoch Children's Research Institute where prenatal screening for chromosomal disorders occurs, scientists were given the opportunity to engage in dialogue with the Back to Back ensemble – who physically and intellectually represent the disorders that the doctors seek to identify.

SOFT is a work that Back to Back describe as: "A soluble theatre product that won't affect your regularity. Taken once only, *SOFT* will give you greater understanding of what it means to be human. In a world where stem-cell research, cloning and pre-natal screening blur the line dividing humanity and technology, *SOFT* offers immediate insight and clarity".³

Bruce Gladwin, artistic director of Back to Back, said of the research, "The initial dialogue was a series of short field trips to the Murdoch Children's Research Institute in Melbourne. The aim was to bring the scientists who are involved in the development and application of the prenatal testing technology in contact with the actors who have the genetic condition which is detected in the test. As the scientist in charge of the department said – 'This is very confronting to the people who work here' I responded: 'Not half as confronting as it is for the actors'. The staff of the research institute explained what they do in the lab and the tools and methods they use do this. We spoke to the counsellors who consult couples who have entered the prenatal testing conveyor belt, also ethicists involved in the department. We also spoke to a scientist (Jsev Gesz) in Adelaide from the Womens' and

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Children's hospital who has discovered three genes which are linked to an inheritable form of intellectual disability in boys. The implication is a screening test which will soon be developed which will lead to further research and development of methods for increasing intelligence... Essentially *SOFT* focussed on current prenatal screening technology and the ethics surrounding it. It is often perceived that genetic technology is going to have implications for us in the future. However, for people with Down Syndrome, they are already being eliminated from our community. Ninety percent of pregnant couples terminate after a positive indication for Down Syndrome in an amniocentesis test. It seemed no one in the community was raising this as a concern and Back to Back seemed well placed to comment".⁴

Back to Back felt it was essential that the wider community hear this dialogue between scientist and artist. For them, three key questions from the research offered the narrative direction for the work:

>What is the 'function' of disability? What repercussions would we encounter by eliminating 'genetic disorder' and consequently narrowing the diversity of the human genome?

>What is the link between economics and human life?

>Is there a gene responsible for 'obsession for perfection'? The concept reinterprets 'perfection' as a genetic disorder in it's own right, allowing it to be treated as an illness, or even via termination. This utopian quest for 'perfection' has repercussions beyond the thematic here, and makes links with all human endeavour.

Inherent in the work is the symbiotic relationship between content and form. *SOFT* advocates for the value of diversity of human form and explores the subject through "diversity of theatrical form". To this end, they collaborated with a range of artists from diverse art form areas, including professor of architecture Mark Burry, animator Rhian Hinkley, sound artist Hugh Covill, designer Eferpi Soropos and emerging artists Dave Morrison and Chris Price. Whilst the work is not the direct result of collaboration between the artists and scientists, it was inspired by conversations between them. The pertinence of exploring relationships between human and technical is amplified for a company like Back to Back with an ensemble of people who have traditionally been seen as less than human. The work was premiered at the Melbourne Festival in 2002 to high praise and full houses.

Many contemporary artists see opportunities for working collaboratively across a range of disciplines as essential to the development of broader debates about the future of our planet. As we live through an age of increasing uncertainties, a deeper understanding of our environment – social, spiritual, emotional as well as physical – are key to developing a more intricate and integrated relationship with the world around us. Internationally, the rapid growth in the number of artists interested in this field is partly due to the artists responding to the key drives of social change: our current technological and scientific knowledge. These linkages are essential if we are to meet the complexities and challenges our future is already presenting.

Critical Art Ensemble is a group of artists whose work over some fifteen years has been based on the principles of collaborative practice.⁵ Over the past five years CAE's work has focussed on biotechnology and new forms of representation that emerge from this vast field. As tactical media artists, the group has completed major projects examining various aspects of the biotech revolution in theatrical forms that invite public participation and pro-



Cult of the New Eve logo

vide a context for lived experiences. For them, it is not so much about collaboration with specialists from divergent fields of expertise, but rather a gathering and sharing of knowledge and experience.

The recent body of 'biotech' work includes *Flesh Machine* (1997-98), which highlighted eugenics in the discourse and practice of current human reproduction technologies, and featured the actual genetic screening of audience members and the diary of a couple going through in-vitro fertilisation; and *Cult of the New Eve* (2000), developed in collaboration with Paul Vanouse and Faith Wilding, in which CAE used the apocalyptic language of an imaginary cult to explore the rhetoric surrounding recent genomic research. In *Cult of the New Eve*, CAE 'perform' dressed as a cross between the Heaven's Gate Suicide Cult and the Unabomber. *Cult of the New Eve* addressed the rhetoric that was being used (particularly by scientists) to calm public fears. They said, "It was listening to an entrepreneurial scientist called Lee Hood that got us thinking about this project". In one of his lectures he apparently announced, "I am going to make you all immortal". CAE became intrigued by recent biotechnological promises to create a New Eden: the fact that the Genome Project is described as the Holy Grail or (their favourite) the words echoed by President Bill Clinton, that the Genome Project is "God's Blueprint".

They see the key problem with such rhetoric in that it is believable when a scientist says it – dressed up wearing the authority of a white coat, it all sounds so possible. So CAE rethought the rhetoric deciding that best way to do that was to take the same messages from the most believable place and send it from the least believable place. In other words, take it from the mouth of the scientist and put it into the mouth of a cult figure. No one believes a word they say.

The term New Eve came from the first donor of DNA in the beginning of the Human Genome Project. This single DNA sample was taken from a woman in Buffalo, USA. CAE

decided to take her genome, splice it into some yeast, and use the yeast to make beer and cookies. "So there it was – eugenically pure. This was our communion – instead of wine and a cracker with us, when we say you're getting Eve, you're getting Eve! As you would expect not many people were enthusiastic about this particular proposition".⁶

Their most recent work, *Molecular Invasion*, developed in collaboration with Beatriz da Costa – a work they describe as a "Direct Action Project" – deals with "roundup ready canola", which has become a super weed. CAE worked on identifying the enzyme that is in 'roundup ready' plants so as to develop an inhibitor that stops aromatic amino acid creation: in effect reverse engineering the genetically modified canola. "We believe we have found a good compound – at least it works in the lab. So we are trying to make that into a 'defence kit' for the farmers. Next step is field-testing".⁷ For all their projects, CAE enlists the aid of scientific specialists in the field under scrutiny, while at the same time encouraging amateur knowledge across various fields of expertise. Their intention is to demystify scientific processes and contribute to an informed, critical, but most importantly public, discourse on biotechnology.

While certainly in great part pedagogical, their work is often hilarious, always rigorous (even when one doesn't agree with their position), as well as entertaining. As they suggest in their most recent publication, "Amateur discourse clearly has a place in the transgenic debates since some levels of study can be reviewed by non-experts. The stakes are too high for product safety testing to be left solely in the domain of corporate and scientific experts".⁸

CAE also suggest that "the goal for cultural resistance is to create temporary public space where education and inter-subcultural labour exchange can occur. Opening the knowledge bases and dissolving boundaries of specialisation is a primary goal... Under such conditions, dialogue can occur that is grounded in the present rather than in utopian or apocalyptic projections for the future".⁹

As technology further enables global multi-cultures and economies, the challenges of communication across disciplines becomes even more urgent. To borrow from the rhetoric of the Bridges Summit, Banff Centre, 2002: "Differences in work and communication styles, priorities, educational principles, institutional frameworks, temperaments, fundamental beliefs and values have the potential to become either obstacles or stimulants to effective collaboration. The BRIDGES consortium pinpoints collaboration itself as a skill... it identifies best practices, amplifies networks and provides a means of communication for those engaged in the reality of collaborative research across disciplines, borders and cultural contexts".¹⁰ It is important to acknowledge that collaboration is at the core of the development of new, innovative research. The arts must be at the heart of this endeavour.

Unlike the work of CAE and Back to Back, which begins with research undertaken with scientists, **Patricia Piccinini's** work is primarily studio based in its development. However, it is thoroughly researched, meticulously executed and luscious in its realisation. Piccinini has developed several bodies of work over the last few years which invoke near futurist scenarios, categorising them as atmosphere/autosphere/ biosphere.¹¹ The latter began when she launched her *Mutant Genome Project* in 1996 where she marketed the computer generated LUMP (Life form with Un-evolved Mutant Properties) where audience members could, via a computer terminal, customise features for their very own LUMP – gorgeous but mon-



Image courtesy: Patricia Piccinini. Science Story Part 1: Laboratory Procedures, 2001

strous artificial life forms. But this, like all of her subsequent work, deals with personal responsibility as well as the potential impact of genetic research.

Piccinini finds it thrilling, as an artist, to make something new or to bring something from her imagination to life. She says, "I imagine that is also what drives a lot of scientists to do what they do and I find a lot of things that happen in the science world exciting but also really frightening".¹² Piccinini believes that humans have always interfered with and altered nature and doesn't make value judgements about such research. In a recent work, *SO2*, she was inspired by the idea that we are about to produce the first synthetic organism. "I asked the question, why would you create a synthetic organism when we have so many organisms that are about to be extinct – why do we need a new one".¹³

The answer, of course, is because we can; and so she did. Piccinini made her own animal – *Siren Mole* – without consultation. It wasn't until later that all its defects were pointed out: it is naked so it gets sunburnt, it's got small legs so it can't run away and will never survive on its own. "Initially I was really upset about that because I felt I'd failed it – I'd made something that could not survive on its own. Then I thought, that's all right, it's very symbolic. This animal has to be looked after by people. It has to be nurtured and I think that was what inspired the next series of photographs with the scientists, the need to look after new life forms".¹⁴ For Piccinini it was critical that her animal, her new creation, was named. She consulted with a zoologist at the Taronga Zoo. "The siren that was washed up on the shores of Naples was a wondrous creature. No one knew where she came from but she was beautiful, but also dead. That was how I got the common name for my creation – the *Siren Mole*... at least my animal has a name, a context and a family, as the scientists are its parents and I guess that's one of the things that runs through my work, that there is a sense of care and nurturing for these life forms".¹⁵

"Piccinini's work does not suggest that human intervention in the essence of life is morally wrong; exuding as it does the sophistication of high-end technology, her work partakes in a discourse of first-world progress founded on the commercialisation of scientific and electronic innovation. Piccinini rather forces us to confront [the fact] that this intervention is well and truly with us, that the implications are not clear-cut but ambiguous, even contradictory, and that it is therefore vital that we see the consequences of technological innovation with clear eyes".¹⁶

In her work, Piccinini urges us to take collective responsibility for advances in genetic research and biotechnology. She urges us to understand the science, to name it and own it.

As Stephen Wilson has also suggested, "It is a critical error to conceive of contemporary research as merely a technical enterprise; it has profound practical and philosophical implications for culture. The shaping of research and development agendas could benefit from the involvement of a wider range of participants including artists".¹⁷

A handful of initiatives have emerged over the last decade which provide residency style programmes to foster this kind of cross disciplinary 'art/science' engagement. A forerunner to these kinds of projects was the Xerox PARC Artists in Residence (PAIR) program,¹⁸ which was a unique experiment bringing together artists and scientists for deep, long-term engagements. In a recent publication of the Australian Network for Art and Technology (ANAT), *scientific serendipity*, which documents the four residencies undertaken by artists working with scientists and scientific organisations ANAT has developed over the last four years, Rich Gold writes: "Designers and engineers often think of what they do as solving problems, but that's not how artists and scientists think of what they do. They create objects and ideas that bend the very fabric of our lives, pushing out the envelope in which innovation can occur. Combining the aesthetic with the physical, the artist with the scientist produces not just more art and science (which it does); or better artists and scientists (which it does); but it might also transform the matrix of innovation here to create a spectacular and productive six billion-seat spaceship that we want to live on".¹⁹

As Linda Cooper and I suggested in a recent essay: we can no longer talk in art or science about the future of humanity and its biosphere without engaging with the very real and often frightening possibilities raised by biotechnology and genetic engineering.²⁰ New techniques of molecular biology give us both the ability to read the code of life and the potential power to manipulate it. As social objects and consumers of new technologies, we must be alarmed by claims such as those of Michio Kaku: "The next century will witness an even more far-reaching scientific revolution, as we make the transition from unravelling the secrets of Nature to becoming masters of Nature".²¹

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The tendency for knowledge to be confined within disciplinary silos has led to serious problems in applying that knowledge to the complexity of the real world. In the past, many art/science collaborations were less partnerships than adjuncts: artists illustrating scientists' research outcomes through illustrative representation; the scientists facilitating art production through access to technologies and research. Increasingly there are a number of artists whose work is more involved in process – where perspectives are challenged and altered through cross-disciplinary contact. Art/science collaborations are now moving towards projects with conceptual contributions from a range of people and with corresponding opportunities for mutual benefit. The move towards such creative collaborations reflects a departure from specialisation, which in turn mirrors a growing trend in contemporary scientific research. Understanding the world as an infinitely complex system of interactions rather than a plethora of independent causes is a significant move away from reductionist approaches to understanding.

The role of science and the role of art are entwined: both disciplines are engaged with the principles of 'pure research'; of discovery and an exploration of paths to understanding. By allowing people from both realms to interact and cross-fertilise ideas and knowledge, very real opportunities for the development of new research and fresh critiques can be provided, which is essential for informed and public debate.

A range of programmes that have been recently established by arts and cultural funding agencies such as the Canada Council, the National Endowment for Science and Art and the Australia Council suggest that social innovations can be merged with technological development in the form of creative cultural expression, socially relevant actions, and economically promising products and services.²² As identified by Linda Cooper in her report to the Australia Council "creativity is a process, a way of thinking. We need to foster environments that are conducive to creative enquiry and innovation".²³ Such bureaucratic interventions come with their own sets of problems, but the institutional recognition of the importance of cross-disciplinary dialogue is noteworthy.

Identifying science and technology as an artistic medium in itself, as opposed to an integral part of human existence up for critical artistic reflection like all other aspects of our existence, is probably a circuitous dead end. At the same time, discussion of these issues must be opened up for informed public debate, as implementation of current research should not solely be left in the hands of scientists (and the corporations and governments that employ them). Artists, cultural workers and scientists must engage with the nexus between art and science at the very point where these collaborations fuse the complex social and political issues that face us in the 21st century.

This article is dedicated to the memory of Rich Gold (Richard Goldstein). Rich Gold was a digital artist, inventor, cartoonist, composer, lecturer and inter-disciplinary researcher. It was Rich Gold who founded the influential PARC Artist in Residence Programme in 1993 (mentioned in this article) which has been a model exemplar of successive programmes of this nature. Rich Gold died in his sleep on 9 January 2003, aged 52. He will be profoundly missed and fondly remembered as a visionary thinker and tenacious supporter of inter-disciplinary research and practice.

NOTES

1. Wilson, Stephen *Information arts: Intersections of art, science and technology* (MIT Press, 2002) p. 877.
2. Rivkin, Jeremy "Dazzled by the science: Biologists who dress up hi-tech eugenics as a new art form are dangerously deluded" (in *The Guardian* <http://www.guardian.co.uk/comment/story/0,3604,874312,00.html>, 14 January 2003).
3. <http://www.backtobacktheatre.org.au>
4. E-mail discussion with Bruce Gladwin (18 January 2003).
5. <http://www.critical-art.net>
6. Critical Art Ensemble presentation at conVerge symposium, bio-economics panel (Adelaide Festival 2002, <http://www.adelaidebiennial.com>, 3-4 March 2002).
7. *Ibid.*
8. Critical Art Ensemble *The Molecular Invasion* (Autonomedia, 2002) p. 5.
9. *Ibid.* p. 65.
10. Banff Centre, New Media and Visual Arts programme, Bridges II Summit (<http://www.banffcentre.ca>, 4-5 October 2002).
11. <http://www.patriciapiccinini.com>
12. Patricia Piccinini from an artists' talk at the symposium *conVerge: where art and science meet* (<http://www.adelaidebiennial.com>, 3-4 March 2002).
13. *Ibid.*
14. *Ibid.*
15. *Ibid.*
16. Millner, Jacqueline "Patricia Piccinini: Ethical Aesthetics" (in *Artlink* 2001).
17. Wilson, Steven "Art as Research" (<http://userwww.sfsu.edu/~swilson/artist.researcher.html>, 1996).
18. <http://www.pair.xerox.com>; this programme is examined in detail in the publication *Art and Innovation: the Xerox PARC Arist in Residence programme* (MIT Press, 2000).
19. Gold, Rich "I've been thinking about collaborations" (in *Scientific Serendipity* Australian Network for Art and Technology, 2002) p. 52.
20. Cooper, Linda and Amanda McDonald Crowley "Catalogue Introduction" (2002 Adelaide Biennial of Australian Art, *conVerge: where art and science meet* Art Gallery of South Australia, 2002).
21. Kaku, Michio *Visions, How Science will Revolutionise the Twenty-First Century* (Oxford University Press, 1998, Oxford) p. 10.
22. For details of these kinds of programmes, refer to the web sites of these funding agencies:
Canada Council (<http://www.canadacouncil.ca>);
National Endowment for Art Science and Technology (<http://www.nesta.org.uk/>);
Australia Council (<http://www.ozco.gov.au/newmediaarts/synapse.html>).
23. Cooper, Linda *Creative Encounters: art and science collaborations* (Australia Council, April 2001).