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Big Pigs, Small Wings: On Genohype and Artistic Autonomy

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Introduction

On Thursday the 23rd of November 2004 the headline on the front page of *The West Australian* stated: 'Gene tests to pick junior sports stars' (O'Leary, 2004: 1). The body of the text begins with the following prediction: 'Parents wanting to know if their child has what it takes to be a sports star will soon be able to buy a genetic test for about $100 from local sporting clubs and gyms'. Well, we thought, finally a tangible outcome for the Human Genome Project (HGP). Is this is the great promise that was delivered so ceremoniously four and a half years ago? Exactly four years prior to the publication of the above story in *The West Australian* we received a letter from the Wellcome Trust's Two10 Gallery inviting us to submit a proposal for a commissioned work to an exhibition titled 'Working Drafts: Envisioning the Human Genome'.

This paper will explore the notion of Genohype, a term coined by Neil Holtzman to describe the discourse of exaggerated claims and overstatements concerning DNA and the Human Genome Project (1999: 409-10). Genohype depicts the hype generated by scientists, the media, the public and the arts with regard to genetic research. In the context of this paper, Genohype is used in relation to the hyperbolic discourse that has been attained by genetic research and its applied outcomes, whether positive or negative. One of the effects of Genohype, as will be illustrated here, is that genetics has become synonymous with all life sciences. In this paper, Genohype will be examined in relation to the somewhat conflicting views with regard to the role of artists dealing with the application of newly acquired knowledge, using our very own Pig Wings Project as the case study.

Genohype

Nick Brown points out in his paper, 'Hope Against Hype - Accountability in Biopast, Present and Future':

> . . . it is often the case that, for a time at least, various areas of technological innovation become saturated with stratospherically high expectations of immanent and revolutionary change. Biotech is no exception and is today synonymous with the language and imagery of futuristic breakthroughs. The whole area is literally spilling over with heated aspirations, promises, expectations, hopes, desires and imaginings. (2003: 3)

This type of hype is required, according to Brown, to persuade investors, regulators, and the public for the need to invest and take risks to accomplish the revolutionary breakthrough promised by the developers of the technology. However, by creating these unrealistic expectations the promoters run a double risk. In the case of biotechnologies, the first risk is that the promises for incredible future scenarios will simultaneously raise great concerns that things will go horribly wrong. The second risk is that when it becomes obvious that the promise is not going to be fulfilled, the extent to which it was hyped becomes known. Disillusion and mistrust will then set in to the point where the level of funding subsequently drops and public confidence is lost.

How has biotechnology in general, and the Human Genome Project in particular, dealt with these issues? Critical Art Ensemble addressed aspects of this question in their Cult of the New Eve project.[1] They were interested in the type of rhetoric that is employed to sell biotechnology generally and the HGP especially. They argue that the biotech industries needed to remove themselves from the dark past of the biological-inspired ideologies of progress manifested in Nazism, by using rhetoric borrowed

from religious discourse. This, in turn, created a new type of scientific promise that the public was less able to see through, creating more hype, unrealistic expectations and fears greater than other technoscientific developments. It is interesting to note here that Craig Venter, who was the head of American company Celera, stated in a conference that accompanied the Paradise Now exhibition that he felt that the level of misunderstanding and misappropriation of biological knowledge at the beginning of the 21st century was similar to that in Europe during the 1930s (2000). The fact that he and his company were somewhat responsible for the situation was quickly brushed off and he went on to blame the media for creating the hype.

As early as 1994 (a year after the HGP began in the UK, known then as the British Human Genome Mapping Project), some scientists, such as Professor of Biology Steven Ross, expressed their concern that supporters of the project were '. . .guilty of extraordinary hype. They call it things like the book of life, or the code of the codes' (1994: 1123). This kind of rhetoric had reached an unprecedented level by the June 2000 joint announcement of the completion of both the public and the private working drafts of the HGP. Both Bill Clinton and Tony Blair appeared in a press conference to announce this event.2 A short survey of the press releases produced in that month by only one of the players in the public HGP, the Wellcome Trust, revealed the extent of this hype. The Director of the Wellcome Trust stated: 'A few months ago I compared the project to the invention of the wheel. On reflection, it is more than that... But this code is the essence of mankind, and as long as humans exist . . . is going to be important and will be used' (Dexter: 2000).

The Chief Executive of the Wellcome Trust Genome stated: 'I think there is something magical. . .. I think this is quite extraordinary and awe inspiring' (Morgan: 2000). But even the Wellcome Trust conceded in February 2001 in an online article titled 'History of the Human Genome Project: The First Draft, June 2000' that 'The joint announcement was probably more grandiose than the situation warranted but it ended concerns that one side or the other would be pre-empted, and it took the pressure off in terms of press coverage' (GF: 2001). The author of this article, identified only by the initials 'GF', tried to soften their tune by assuring us that:

> While the timing of the announcement may have been dictated more by political than by scientific criteria, there is no denying the importance of what has been achieved, and what will be achieved. The next few years will be devoted to filling gaps in the draft sequence and improving the overall accuracy. (GF: 2001)

The cover story in *The West Australian*, cited at the beginning of this paper, shows that Genohype endures. The idea that one test examining variants of one gene will determine the potential of a child to be an 'elite' athlete, demonstrates Genohype in action. Although that article quotes a scientist expressing concerns about this scenario, this only serves as a prelude for the main thrust of the story; the concern that these tests will 'add to the existing pressure on young people to succeed academically and in sports' (O'Leary: 2004: 1). The scientific report does not seriously question the feasibility or validity of gene-testing technology in determining specific attributes such as athletic traits or intelligence. The starting point of the 'debate' is instead genetically and technologically deterministic. In other words, the story gives the impression that one gene is all that it takes and that these kinds of tests are here to stay.

Contemplating the post-genomic future, we hear voices which advise against being seduced by Genohype, These include, for instance, Neil Holtzman, Director of Genetics and Public Policy at Johns Hopkins University, who coined the very term Genohype: 'Exaggerating the importance of genetic factors stops people thinking about the need to clean up the environment and tackle socioeconomic inequity (1999: 409). His argument is with those who exaggerate the clinical benefits that may occur as a result of the HGP. He describes claims, such as those made in the editorial in *Nature*'s 'Genome' issue that '. . .the application of knowledge from the project will, in time, materially benefit almost everyone in the world' as ludicrous (1999). These claims are based on the assumption that it will be possible to unravel the polygenic forms of common diseases even though the clinical outcome is determined by complex gene, environmental, and behavioral interaction. In his view, however:

> It will be difficult, if not impossible, to find the genes involved or develop useful and reliable predictive tests for them. It may keep the ethicists and philosophers in business but I think the term 'ethereal debates' describes them best, for they are built on a house of cards. The idea that we will be able to select genes we like and weed out those we don't to produce customized children is absurd. (Holzman, 1999: 410)

He is similarly concerned with commercial firms such as Genetic Technologies. After steady lobbying, Holzman and others have now persuaded the US's Food and Drug Administration to regulate the use of genetic tests. As observed also by Nik Brown, an interesting phenomenon occurs when knowledge is transferred from specialists' peer-reviewed scientific publishing to the public sphere, via the vehicle of press releases:

> . . . much of the careful qualification of scientific texts is abandoned for the more strident language of 'breakthrough', 'the first', 'the best', 'never before'. In other words, science communities suddenly metamorphose themselves into the highly competitive news conventions of the media code. When press releases arrive on the desks of science correspondents there is often precious little time to interrogate claims about new cures and revolutionary promises. (2003: 14)

Brown also observes that different voices compete in representing the future and progress. He suggests that: '. . .like any other contestable field, actors engage in such struggles with unequal access to resources with which futures are manufactured' (2003: 13). This type of struggle is clearly evident in the relationship between the public face of the HGP (represented by the Wellcome Trust) and the private interests involved in it (represented by, for example, Celera). One resource that the Wellcome Trust called upon that Celera could not directly do, was the Wellcome's access to the public's imagination through its prior standing and involvement with the arts.

Genohype as a dominant factor in the discourse of the new biology

One of the outcomes of Genohype, at the level of public discourse, is that everything biological becomes confused with genetics. We are constantly surprised by how many people tend to associate engagement with visceral messy cells, tissues and organs with the reductionist, controlled, clean promises of Genohype. This seems to happen often with reactions to art that deals with biology. We experience Genohype in relation to our own work. On numerous occasions we are referred to as 'genetic artists' and our work, which deals with tissue engineering, is described as 'transgenic'. An example can be found in Suzanne Anker and Dorothy Nelkin's book, *The Molecular Gaze: Art in the Genetic Age*, where we are said to produce transgenic artwork (2004: 95). In other cases, the words genetics or DNA are somehow inserted into discussion of our work for no apparent reason except as a result of the recurrence of genohype. For example, a review of our work was titled 'Giving (Real) Life to Art: Genetics and tissue culture find new forms - and a new audience' (Fitzgerald: 2004: 66). Suffice it to say that in the body of the text there is no mention of any issue concerning genetics.

It is important for us to emphasize through our artistic or curatorial work the diverse approaches encountered in biological art.3 These deal with all levels of life from the macro to the micro and include research about the social life of organisms, the whole body, tissues and tissue culture, as well as genetics and DNA. Ironically, often the same work that criticizes the reductionist view of life is used purposefully or by ill-informed people/journalists/curators to further the hype of the absurd idea that 'life is what is in the genes'. This phenomenon is not restricted to writing about art but has penetrated other media, such as the case of the 'Who plays God?' advertisement from 1999 featuring a photograph of Vacanti's mouse with a human ear attached to its back. The add was sponsored by The Turning Point Project, a coalition of technologically concerned and environmental groups including Greenpeace, the Sierra Club and the American Public Interest Research Group. The caption states 'This is an actual photo of a genetically engineered mouse with a human ear on its back.' The text rails against genetic engineering:

> The genetic structures of living beings are the last of Nature's creations to be invaded and altered for commerce... the infant biotechnology industry feels it's okay to ... reshape life on Earth to suit its balance sheets... . Who appointed the biotech industry as Gods of the 21st century... So far, there exist no half-human, half-animal 'chimeras' (like mermaids or centaurs) but we may soon have them. (1999)

However, the ear on the back of the mouse is a product of tissue engineering and the nude mouse itself is an outcome of a naturally occurring mutation which strips the mouse of fur and compromises its

immune system.4 There was no human intervention at the molecular/genetic level in making this chimera. Again, those who criticize gene technologies fall into the Genohype trap, and do not do their research thoroughly in order to check the accuracy of the scientific information they are using, and fail to mention other life science technologies that might be as destabilizing as genetic technologies. Genohype is such a strong concept, or strong meme, if we follow Richard Dawkins.5 Furthermore, Genohype is not a partisan concept and, ironically, can attract the same forces that oppose the 'gene revolution' in order to further promote it. After all, we are still granted a certain sense of control when dealing with a body that is neatly and logically codified according to its DNA pair bases, rather than when we are confronted by the messy and irrationally behaving visceral body.

The role of the artist

During the peak of the HGP hype, we were Research Fellows at the Tissue Engineering and Organ Fabrication Laboratory, Harvard Medical School. We were an integral part of the laboratory personnel, surrounded by scientists and researchers and participating equally in meetings and forums with our scientific colleagues. We became more and more aware of the transformation of knowledge as described by Brown.

The head of our laboratory was sometimes accused of hyping his field of research, tissue engineering, building unrealistic expectations with regard to the ability and timeframe of growing custom-built spare organs or neo-organs. We must admit that we were cautious in celebrating our opportunity to join Dr. Vacanti's laboratory and work alongside his team. Our appreciation of him, for letting us inside the inner workings of the laboratory to learn advanced tissue engineering techniques, was tainted by our understanding that there is a greater role in appointing artists to his laboratory. While the scientist or even the 'responsible' journalist should, at least in theory, report things as they are and support their claims with facts and evidence, the artist has the licence to imagine, to fantasise and to exhibit unrealistic expectations of science and technology (such as in the case of Australian artist Patricia Picinnini6). In the case of artists, who are also research fellows at the same laboratory in Harvard, these presumed separate realms of science/fact versus art/imagination can fuse into each other in the eyes of the wider community. There is a greater chance of this if an exhibition of the artistic results is framed in certain ways by curators and galleries and is marketed through carefully worded press releases. In simple terms, the artist becomes part of the biotech hype.

Can an artist deal with new technologies while maintaining autonomy and a critical approach?

'What is it that the artists have that these corporate interests are interested in? It is not the art, it is the access to the public imagination', Natalie Jeremijenko argues in her critique of the 'Paradise Now' exhibition (2000). We have noticed that in recent years there have been a significant amount of exhibitions dealing with genetics or 'Gene-Art'. Jackie Stevens explains this phenomenon in the following way:

> . . .art about biotechnology, especially with a critical edge, serves to reassure viewers that serious concerns are being addressed. Even more importantly, biotech-themed art implicitly conveys the sense that gene manipulation is a 'fact on the ground', something that serious artists are considering because it is here to stay. Grotesque and perverse visuals only help to acclimate the public to this new reality. (2000)

As illustrated in several types of writing, art or artists serve willingly or unwillingly as producers of a popular discourse on biotechnology; certain ideologies and their acceptance into society are being generated through the exhibition and the marketing of works of art. Kockelkoren asserts that artists cannot escape from the role played by technological mediation and following that, the acceptance and domestication of technology: '. . .artists are involved in technological mediation and the intrinsically related processes of disciplining' (2003: 106). Artists have always played an important role in technological mediation by appropriating new technologies in order to create a new visual language to deliver new meanings for these. Furthermore, Kockelkoren claims that all of human existence is mediated by technologies:

> People are 'naturally artificial'. . .Technology cannot alienate people from their naturalness, because they are already alienated by virtue of their very condition. Language, technology and art teach people how to articulate and even celebrate their

> ineradicable alienation. (2003: 27)

If we follow Kockelkoren's argument, artists must immerse themselves in the dialectics of new knowledge and technologies. They must adopt not just a representational approach but what we refer to as 'wet engagement'. Hence, artists researching and exploring the role of biotechnology in society can and should engage with the actual technologies and get their hands wet and dirty. The scope of this paper does not include a discussion of the ethics involved when artists manipulate life for artistic aims. For now it will suffice to quote George Gessert with regard to this issue:

> Do artists cross a line when they breed plants or animals, or use the tools of biotechnology? Scientists routinely cross the line. So do farmers, businesspeople, military men, and doctors. Only artists and certain religious people hesitate. Of course, one of the great human dilemmas is that we do not know the extent of our powers. We invent outrageously and as casually as we breathe, but we have no idea where our inventions will take us. Extinction? Slavery? 1000 years in Disneyland? Even if the Holocaust had never happened, we would have good reason to worry about where knowledge of genetics and DNA will take us. We will need all the awareness we can muster to engage evolution. To the extent that art favours awareness, the more artists who cross the line the better. (2003: 47)

Artists working with life manipulation, and, more precisely, with biotech, are participants in that culture. On the one hand, they can penetrate the laboratory space and scientific culture and in doing so reveal and democratise many aspects of the ways in which our common perceptions of life are transgressed by biotechnologies. However, the question that needs to be asked is: what strategies should artists employ in order to keep their integrity and autonomy working within this field, without being self-righteous or resorting to propaganda? In the case of the critical artist, how does she resolve the paradox of using the technologies she is critiquing or working with in the context of engaging with an economy she is also critiquing? The second issue is the role of the curator and art producer who then positions and contextualises the art work. This can sometimes sit at odds with or even contradict the original intention of the piece.

In the context of the arguments and debates of this paper, what kind of art can an artist do for a show dealing with the 'biotech revolution' that would not be serving the interests of Genohype? What kind of projects should one submit as a proposal for a commissioned exhibition marking the so-called completion of the working draft of the Human Genome Project?

The commission

In November 2000 we received an invitation for a commissioned work by the Two10 Gallery in London, which is fully funded and operated by the Wellcome Trust. This was accompanied by a brief summary of the exhibition theme. According to our reading, the brief implied that by following the gallery philosophy, which strives to 'challenge received ideas' and 'encourage critical dialogue about important cultural issues (e.g. the HGP)', we might critique the private side of the HGP. This could be done, we surmised, by challenging the issues surrounding gene patenting. So, we thought, this could be a role for artists that fitted with the commissioning brief: to fulfil what Brown referred to as unequal access to resources (in this case the artists' unequal access) in order to favour the Wellcome Trust version of the future over that of the private interests in the HGP.

We were somewhat surprised to receive this invitation, as our work had never directly dealt with genetics. It seems that the curators of the Two10 gallery fell victim to the Genohype for which their organization was partly responsible. One can speculate that because our work uses and deals with biological knowledge and application, it was assumed that our work concerned genetics. We therefore decided to address the type of Genohype that was generated by the HGP rather than directly refer to the issues concerning the patenting of life or deal with the direct effects of the HGP on medicine and pharmaceuticals.

In the Pig Wings project we grew three sets of wings made out of pigs mesenchymal cells (bone marrow stem cells) grown over/into biodegradable/bioabsorbable polymers (PGA, P4HB). The wings size is 4cm x 2cm x 0.5cm each and these were never intended to be implanted onto pigs. The original proposal we sent as a response to the commission was titled: 'Wings detached -- the good, the bad

and the extinct: Installation of three sets of bony wings, grown from pig stem cells'. In our preliminary statement regarding this project we wrote:

> Wings detached -- the good, the bad and the extinct can be seen as a representation of the set of values that are attached to gene technologies. The interpretation of genes is not a value free process. Wings carry many associations with them. Cultural representations of wings (mainly in Christian religious art) have been assigned arbitrary values in relation to both shape and origin. Bird-like wings are symbolically linked to the angels, representing their goodness and purity. Bat-like wings are generally attached to the bad fellows of mythology. But it might help us to remember that the implicit humane/angelic continuum also carries the curse of the mythic Icarus, who burnt his wings trying to fly too close to the sun. As the existence of the Pterosaurs (winged lizards) was not widely known until last century there is no culturally established value attached to their extinct shape. Extinction as we know it may even become 'extinct' as advances in biological technologies enable us to recreate extinct organisms from DNA samples. On the other hand, new kinds of extinction may arise, for example the extinction of the 'bad genes' by genetic-based eugenics. Our cultural perceptions of these three evolutionary solutions for vertebrate's flight can be seen as metaphorical analogs to our perceptions of gene technologies.
>
> The promises and hopes surrounding the Human Genome Project (both private and public) sounded like fantastic claims just a decade ago. Our attempt to make representations of wings made out of pig stems cells is an exercise in putting things in perspective. Humanity (mainly the English speaking part of it) has for generations made fun of the idea that pigs might fly. Now that we are getting close to fulfilling this dream, we can gauge how people will react to the fulfilment of other fantastic claims.
>
> Stem cells are the working drafts organisms and tissues they differentiate into. They are the raw material from which specialized cells develop. We know how to direct them to go down certain pathways and even how to edit their instructions/expressions. This control enables us to impose value system on genes and enact the processes which lead to the creation of 'the good, the bad and the extinct'. We can also leave the 'decision' to the cells and examine the results of a 'natural' situation with no social/cultural values attached. But would we be able to spot the difference? Will pigs be able to fly one day? (The Tissue Culture & Art Project: 2000)

We added that: '. . .we will also attempt to file a patent for "Pig Tissue Wings", and present our desire to "initiate and control" the pig wings "market". Anyone who will try to make pigs fly (by growing wings on them) will have to get our consent'. (The Tissue Culture & Art Project: 2000)

In retrospect it is not surprising that our work was rejected, as this ironic piece strikes at the heart of the hidden agenda that involves employing artists as agents in the service of Genohype. However, we never imagined that the rejection letter from the Two10 gallery and the events that followed would illustrate this point so well that it became for us an integral part of the whole Pig Wings piece. Due to copyright laws we are unable to directly quote the letter of rejection from the gallery but it is sufficient to say that it was a revealing document. Both the artistic and scientific merits of our proposal were questioned but one sentence in the letter presented a very interesting insight into what the gallery perceived as the role of the artist. This was a reference to the fact that the advisory group felt that our project presented an unrealistic reflection of the public's opinion of the Genome. This is a somewhat unconventional view regarding the role of artists in society. Artists are often described elsewhere as having a unique view of the world, and are hailed as presenting subjective, varied and unique observations about the world. Another point that was raised in the letter was that the gallery felt our work would not fit well with the other exhibits.

Although we respected the rejection decision we felt we needed to respond to these extraordinary claims by apologising to the Two10 gallery and the advisory group in a letter in the following way: 'We are sorry that our work did not reflect your perception of what the public opinion should be'. Their response to this apology was that their choice of words could have been different. But their main objection was that they did not approve of our vision of what the Genome represented. That was just too good for us to let go, so in setting up the website for the Pig Wings project we included the correspondence with the Two10 gallery as an integral part of the project. This was part of our treatment of the Pig Wings project as a process, art documentation or as 'living art' as argued by Boris

Groys: 'For those who devote themselves to the production of art documentation rather than of artworks, art is identical to life, because life is essentially a pure activity that does not lead to any end result' (2004:165). Among these art documentation activities, Groys lists the creation of unusual living circumstances, politically motivated art and so on.

In the meantime, the Working Draft exhibition had been staged and to our amazement we found the following statement in the curatorial essay that accompanied the exhibition:

> With an open brief, literal translations of the theme were not expected, nor did the artist have to reflect any specific 'look' or imagery associated with the Genome. Nevertheless the results were surprising. Major scientific discoveries inevitably attract a degree of controversy, and the Human Genome Project is no exception. So having expected an obvious degree of public debate to filter visually through the works, we found the results instead to be more subtle and hence potentially more interesting. And intriguingly, although the artists had no idea how others were responding to the brief, there is a distinct visual coherence to the overall display achieved through the artists' combining a harmonic palette (including an over-riding incidence of salmon-pink) with translucency. (Jones: 2001)

There is not much one can add to such a blunt misrepresentation of the selection process of the Two10 gallery. The absence of any mention of the curatorial decision with regard to the process of selection and rejection of works, and being 'surprised' by the results indicates that the curator used the participating artists to mask her own agenda. It is not surprising then that when the author of the above statement found out, three years later, that we posted our correspondence with her on our website she was not very happy. For obvious reasons we cannot disclose the full details of what followed but after approaches to our University's legal department and the possibility that funding to other research at our University from the body controlling the gallery might be affected, we removed the correspondence from our site. Indeed Brown was right again in observing the unequal use of resources in the struggle to dominate a vision of our manufactured futures.

For us this proved to be a form of resistance to being a passive agent in the play of 'Genohype forces' whether sustained by financial bodies, the media, curators and so on. By making the Pig Wings project a living piece both in the literal sense and in the metaphorical one as described by Groys we could unfold and reveal the ongoing politics played out in the 'Art and Science' hype we find currently around. As Groys states:

> The practices of art documentation and of installation in particular reveal another path for biopolitics: rather than fighting off modernity, they develop strategies of resisting and inscription based on situation and context, which make it possible to transform the artificial into something living and the repetitive into something unrepeatable. (2004: 177)

As suggested before, Kockelkoren argues that artists cannot escape their fate of being part of the process of creating public acceptance for the new technologies they are exploring, even when doing so from a critical perspective (2003: 106). Furthermore, as illustrated in this paper, critical artists, whose art work has been exhibited in thematic shows about biotech, are 'fig leaves'. Vested interests require an appearance of actual debate concerning these technologies' developments. The stage has been prepared for the next phase of the implementation of such technologies.

What form of radical art can you perform when the media and private companies suggest the most radical future scenario in ethics and credibility is one presented by something like the cover story in *The West Australian*? With the Pig Wings project we wanted to talk about Genohype and the rhetoric surrounding the HGP. We asked whether pigs would fly, and in the case where this eventuated (because no one knows what to believe anymore) we wanted to see what type of wings they might have.

We are not sure whether our own strategy -- the Pig Wings as living art (and art documentation) exploring Genohype in an ironic way by intentionally 'disappointing' the audience (realising that pigs cannot fly with the wings we made) -- is a useful one. We hope we are not falling into self-righteousness and that we continue to be wary about our role as artists manipulating living tissues in the age of Genohype.

Dimitry Bultov wrote an article mentioning the Pig Wings as a technological failure and in that fact becoming a more interesting piece. Bultov explains:

> . . . artists transfer the emphasis of their activities from art production to research of the conditions which give rise to works of art. As a result of such an approach, artwork must fail first, in order to be beautified later. . . I mean such kind of art activity which, while aiming at a conscious expectation of failure' and 'misfortune' of the project, has the purpose of representing some bans at functioning of an artwork. As an example of such a strategy, I can mention the project Pig Wings . . . Using tissue engineering technology which enables one to cultivate organs and tissues of different organisms in vitro, the artists have grown a pair of wings out of a pig's stem cells. And though technological problems with transplantation of the artificially-grown wings to a donor animal have been successfully solved, the artists decided to close the project at this stage, not to bring it to the stage of getting a real chimera. The conscious decision not to complete the project points to the fact that it is precisely the pre-programmed uselessness of the pig wings, that are wings only by form, but are not designed for flying in their essence and inner construction, which makes them a fact of art. . . . This kind of art engineering has a distinct preventive character because, reporting the failure of modern science and technology, it also gains a human dimension and contributes to our idea that the world has once been different and is still able to become totally different than it is. (2000)

Epilogue

The original title of Wings Detached has been changed to simply the Pig Wings Project. The project has been exhibited in different configurations internationally and featured in many media stories, including the New York Times, Arte TV and more.7 In many instances the galleries promoted their exhibition using statements such as 'come and see pigs flying in the gallery' but the visitor only encountered small objects displayed in cheap jewelry boxes. Pig Wings embody the promise and the disappointment, which underlies the rhetoric and hype of scientific discoveries and implications.

Endnotes

1 For more, see http://www.critical-art.net/biotech/cone/index.html As well as in Critical Art Ensemble (1998) *Flesh Machine; Cyborgs, Designer Babies, Eugenic Consciousness*. New York: Autonomedia.

2 'The Joint Statement' by President Clinton and Prime Minister Blair was released on March 14, 2000 and can be viewed on line http://clinton4.nara.gov/WH/EOP/OSTP/html/00314.html

3 For example, BioDifference, the show we curated as part of the Biennale of Electronic Arts Perth 2004. For more see http://lwgallery.uwa.edu.au/program/2004/BioDifference and http://www.beap.org

4 'The nude mouse, a hairless mutant discovered in 1962, is immunodeficient, and thus does not reject tumor transplantations from other species'. Osburn, B., Klingborg, D. , Hart. J., Wood, L., Berchhin, M. W., & Dassler, A. and Kim, Y. R. K. 'The Mouse in Science, Cancer Research', the UC Center for Animal Alternatives, School of Veterinary Medicine, University of California, Davis. http://www.vetmed.ucdavis.edu/Animal_Alternatives/cancer.htm

5 The term meme was coined in 1976 by Richard Dawkins in his book, *The Selfish Gene*, Oxford: Oxford University Press. In short, a meme is a self-propagating unit of cultural evolution analogous to the gene. Memes can represent parts of ideas, languages, tunes, designs, skills, moral and aesthetic values and anything else that is commonly learned and passed on to others as a unit. Like genes, memes can replicate and mutate.

6 Patricia Piccinini's web site: http://www.patriciapiccinini.net/

7 The Pig Wings project has been shown in the 2002 Adelaide Biennial of Australian Arts http://www.adelaidebiennial.com/, Boston Cyberarts Festival 2003, http://www.decordova.org /decordova/exhibit/pigwings.html, Biennale of Electronic Arts Perth 2002, http://www.absolutearts.com /artsnews/2002/07/31/30159.html and more.

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