

***Transformations of the Flesh; Rupturing
Embodiment through Biological Technology***

by

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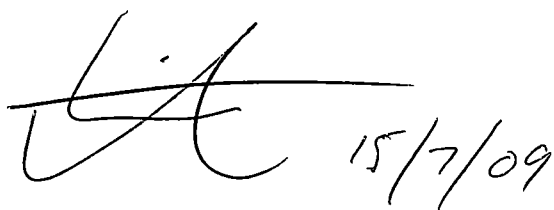


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Abstract

This doctoral project encompasses an investigation of embodiment¹ in relation to ideas about human transfiguration and self perception through art practice.

The research addressed ways in which objects can participate in and add debate to the relationship between biomedical interventions, human embodiment and self perception. These have been addressed through examination of transfiguration and hybridization of human and animal form, extension and commodification of bodily materials, and ethical issues that arise. An artistic investigation of embodiment, in relation to ideas concerning human transfiguration and self perception has resulted.

The project draws upon an international movement by artists to deal with new perceptions of life and subjectivity through new and diverse applications of biological technologies. Focus is upon the aspects of these technologies which are generally not addressed by the scientific field; issues of psychological, conceptual and cultural significance.

¹ Embodiment as a sense of self as experienced through the senses.

Examples of attitudes towards the human body and biological technologies in recent history, for example J. Huxley's *The Tissue Culture King*, provide a background to contemporary issues in the field. Ideas about the formulation of subjectivity in relation to physical form are grounded in the writings of Lacan and Caillois. The significance of human tissues and their ability to represent complex ideas about human identity, and the ethical issues raised by bodily commodification are expressed by Waldby, Andrews, and Nelkin. The research and its outcomes are located alongside contemporary artists in the field such as Motohiko Odani, Ken Rinaldo, TC&A, and O'Reilly who address the conceptual field through approaches ranging from science fantasy to visceral biotech and performance works.

Findings are presented in a body of cross media works involving three streams spanning traditional modes of making from non-biological object based forms; biological artworks involving tissue culturing bodily materials; and performance works made through direct experience with biotechnology.

The project has concluded that first hand engagement with biotech processes and bodily materials achieved critical engagement with the research ideas. First hand explorations in biotech practices have the ability to open alternative experiences and representations of the body, outside of those which are dictated by dominant culture.

The presentation of bodily materials outside of their usual location within the fixed body, as in artworks created in the second and third streams of investigation, have the ability to open new experiences and readings of embodiment, and its relationship to evolving biological technologies.

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CHAPTER ONE

Central Argument

This doctoral project encompasses an investigation, through art practice, of embodiment¹ in relation to ideas about human transfiguration and self perception. The initial focus, the significance of the hybridization of human form with other organisms through biotechnology, developed into a more concise concern with the human body itself. From this the research pursued aspects of morphosis² within a broader relationship between body, bodily tissue, objects and space.

The research addressed ways in which objects can participate in and add debate to the relationship between biomedical interventions, human embodiment and self-perception. These have been addressed through examination of transfiguration and hybridization of human and animal form, extension and commodification of bodily materials, and associated ethical issues. An artistic investigation of embodiment, in relation to ideas concerning human transfiguration and self perception, has resulted.

The traditional notion of human physicality is based upon a view of the body as a fixed, bounded and exclusively human entity, physically and psychologically contained and separated from other individuals, and species. Biological technologies which extend, manipulate, transform and hybridize the human form stand as a significant threat to this conception of the body, challenging human perceptions of, and relationships with, the human self, other organisms and the wider environment. Tissue engineering techniques allow the body to be grown outside of, and in addition to, its original complete form. These developments break down traditional notions of the fixed body into a more physically and conceptually fluid realm, and as such are a strong focus of this project, as manifested through engagement with tissue culture itself.³

¹ Embodiment as a sense of self as experienced through the senses.

² Morphosis as undergoing change in form or structure.

³ From herein these bodily materials living outside of the body, including tissue, blood, cells, organs in bodies separate from those they originated in, will be referred to as the extended body- blood cells organs which continue living (with technological intervention) once removed from the body.

Wet biology practices directly explore the human body outside of, and in addition to, the physical living or deceased body, as seen, for example with tissue culture practices and organ transplantation where bodily material continues to live in foreign bodies, whether as a laboratorial artificial body (the incubator) or a living host body. A more complex example is Xenotransplantation, “the transplantation of an organ, tissue or cells between two different species”⁴ because the process can significantly threaten the conception of the body, through physically amalgamating human and animal materials. This exegesis proposes a view of processes such as xenotransplantation, which extend the life of tissue outside of its original body, as a potentially psychologically transformative experience, with the ability to challenge human perceptions of, and relationships with, other animals and, subsequently, the wider environment.

While the transplantation of an organ from one body to another presents a succinct platform from which to engage these ideas, techniques involving the removal and sustaining of living tissue outside of the body, such as tissue culture techniques, also illustrate the potential for a wide transgression of the physical human form through an immediate and accessible proximity to the body. This project explores the relationship between the physical body and conception of self through the manifestation of the extended body as tissue culture, the living body outside of its usual form.

As William Ewing states, “the body is being re-thought and reconsidered by artists and writers because it is being restructured and reconstituted by scientists and engineers.”⁵ Similarly, this project draws upon an international movement by artists to deal with new perceptions of life and subjectivity through new and diverse applications of biological technologies. The project focuses upon the aspects of these technologies that the scientific field generally does not: issues of psychological, conceptual and cultural significance. The project is not interested in introducing new forms of ‘life’ but rather, new interpretations of existing form. It aims to question the relationship between the physical body and conception of

⁴ Merriam-Webster online medical dictionary, viewed 5th December 2005, <http://medical.merriam-webster.com/medical/xenotransplantation>

⁵ Ewing, W 1992, *The Body; Photoworks of the Human Form*, Thames and Hudson, London, p9.

self through the manifestation of the living (and subsequently preserved) body outside of its usual form

Background

Places empty of people are often thought of as desolate or non-living spaces, as if the existence of life is only validated through the lived experience of the human. As Karen Frank explains, “humans structure the world in a fundamental way by making a boundary between us as human beings, and the other, that is, the places we inhabit and the world as given. The fundamental typological distinction between us and not-us not only structures the material world, but frames the way we think about and re-present this world. The boundary secures us, places us in our habitats; it infuses the world and us with meaning”.⁶

‘Space’ however is both internal and external to the body, a place in which life may exist, disguised, or in forms outside of usual or comfortable definitions of ‘life’. As new developments in biological technologies occur, abilities to interact within these and other spaces and to generate growth and life in the most unlikely of circumstances, are greatly enhanced. The possibility of life to manifest in unexpected ways has significant potential to challenge our perceptions, experiences, and relationships with the natural world and the spaces we inhabit.

Biological materials carry loaded ethical and social complexities, often unexplored by those in the scientific community. Inherent to working with bodily materials and forms, and within a framework of critical and ethical engagement, are issues of transfiguration, mortality, the sacred nature of flesh, human/animal hybridity and relationship to different forms of life.

Bodily tissue, once taken from its original host is often no longer viewed as part of the living body, but as a material of some kind, located in between object and waste. Through biotechnological intervention the extended body, today, has potential for extended growth and transformation; more potential, in fact, than whole complete bodies. While appearing to lose all agency and meaning upon separation from the body, extended flesh takes on new associations and

⁶ Frank, K.A 1995, p238.

implications, both culturally and politically. The extended body plays a significant role within global politics and development through its market value in the tissue economy and biomedical developments, particularly reproductive technologies.

The human body consists of autonomous substances, indifferent to our political and economical climate. When laws are made to govern the use of, and right to the body, they are also governing a form of 'life'.

The majority of people catalogued in tissue culture databases, such as the *American Type Culture Collection*⁷, are long dead, yet parts of their bodies (their tissue) have been given the possibility for eternal life through being made into immortal cell lines. In addition to this, tissue can be purchased over the internet, combined with the tissue of other people's bodies and made into pharmaceutical treatments for countless individuals who sometimes, unknowingly, ingest these into their own bodies. As Andrews and Nelkin argue, considering that "Existing laws do not even require that people be told that the treatments they are receiving are made from body tissue",⁸ let alone which body or bodies the tissue in question has come from, the biomedical industry is effectively creating not only a cannibalistic culture but also a cannibalistic species.

Stories of organ transplant recipients channelling new memories, characteristics and tastes after receiving their new organ, also conjure the notion of speaking through the body beyond death – of the continued presence of the deceased donor as channelled through their living flesh within the new host body.

The use of human material in biomedicine is described by Scheper-Huges as a 'form of late modern cannibalism' in which the individual's need for tissue consumption to live is broadened to a society's need for the flesh and blood of its people to pursue its quest for disease free survival and ultimate immortality. This cannibalistic attitude towards the body, which one could say is expressed through an active tissue economy in which the body is an amalgamation of objects for the

⁷ American type culture collection; the global bioresource centre, viewed 10th November 2007, <http://www.atcc.org/>

⁸ Andrews, L., and Nelkin, D 2001, *Body Bazaar; the market for human tissue in the biotechnology age*, Crown Publishers, New York, p36.

taking, has a long history in medical science through anatomy, as well as in anthropology and, through acts such as grave robbing and the body trade of people from ethnic minorities. Today though, body trade no longer focuses solely on the procurement of the bodies of the dead, but also the materials of the living.

Although cannibalistic practices, performed in primitive cultures to obtain the spirit power of the deceased, are generally thought to have been widespread, Marvin Harris in his book *Cannibals and Kings*, theorizes that in some primitive cultures, such as the Fore Tribe in Papua New Guinea, cannibalism occurred during a period of famine, and coincided with an arrival of Europeans who rationalized the foreign behaviour as a religious rite.⁹

Christian tradition itself relies on a form of conceptual cannibalism - the ritual consumption of human flesh and blood in the quest for immortality. The personification of flesh transferred from one body to another is exemplified by Christ's declaration "he that eateth my flesh and drinketh my blood dwelleth in me, and me in him"¹⁰ and acted out through the sacrament of holy communion - the consumption of Christ's flesh and blood.

Themes within Christianity relevant to this investigation begin with the gradual iconographic replacement of reverie for God with reverie for science. Parallels between Christian and biomedical attitudes towards flesh are linked in various ways:

- the navigation of the subject/object binary through the body versus the flesh.
- the collection and preservation of specimens in holy relics and anatomy.
- the ability for the mind/spirit to overcome the weakness of the flesh and the revered sacredness of flesh/body.
- resurrection in regenerative medicine and the use of bodily material for protection against death, as with bodily relics.

⁹ Harris, M 1991, p173.

¹⁰ *Holy Bible; Contemporary English Version*, 2000, Passage John 6:56. American Bible Society, NY 2000, John 6:56.

- consumption of flesh and blood by other living bodies for the continuation of life/eternal life in Holy Communion and through organ transplantations, blood transfusions and cryogenics.

Attitudes towards bodily relics differ throughout cultures and history, for example, in Europe during the 16th Century it was highly popular to consume the corpses of mummified Egyptian bodies, which were ground up and sold as medicine.¹¹ The practice developed into a wide-scale business which ended, only, when the mummies were revealed to be recently killed slaves rather than the high priests whose spirit and wealth the consumers sought to ingest. In fact, up until two hundred years ago, mummies were still believed to have medicinal properties against bleeding, and were sold as pharmaceuticals in powdered form.¹²

Parallels can be drawn between the use of bodily relics and amulets worn for protection against disease and death and the use of bodily material from the living and deceased within biomedicine and in their creation of preventative medicines to protect from disease and ultimately death. Amulets, as fetishistic objects imbued with specific meaning and often including bodily relics, are worn for protection against evil forces, including other human beings. Aesthetically, they are frequently derived from religious iconography and include relics of bodily material, commonly fingers, toes, pieces of flesh, amniotic sacs from childbirth and animal feet. Catholic iconography has been used in amulets throughout history. For example, Spanish soldiers wore the sacred heart of Jesus around their necks with the inscription, 'stop bullet', and prostitutes in countries such as Thailand wear them as protection against HIV.

Commodifiable bodily 'waste' is also like resurrected consumable flesh - it is removed from the host and transformed outside the body, into new form. Catherine Waldby confirms, "new surgical and clinical practices enable the

¹¹ Mummytombs website, Medieval Doctors and Their Patients, viewed 3rd December 2007. <http://www.mummytombs.com/dummy/doctors.htm>

¹² Daly, N 1994 "That Obscure Object of Desire: Victorian Commodity Culture and Fictions of the Mummy", *NOVEL: A Forum on Fiction*, Vol. 28, No. 1 (Autumn, 1994), pp. 24-51

donation of new kinds of biological fragments to others and the reciprocal incorporation of others' 'fragments'¹³ into our own bodies.

13: Waldby, C. 2002, "Biomedicine, Tissue Transfer and Intercorporeality", viewed 21st September 2006. P239.
<http://www.soc.uoc.gr/kousis/KOIN1/Health/BiomedicineTissueTransferIntercorporeality.pdf>

Methodology and Process

Works created throughout the project address the human relationship with the self, other organisms, and the wider environment. Most are cross media works that span traditional modes of making and range from purely artificially manufactured forms to biological artworks made through direct experience with biotechnology.

Throughout the course of investigation, the project developed both aesthetically and conceptually within three discrete suites of work.

Suite 1. Imagining

The first suite, exclusively concerned with hybrid human-animal sculptural forms, focuses on the significance of bodily rupture and transformation inherent within biotechnological processes. These works explore a rupturing of the animal through merging animal bodies in the object-based forms created.

Both materials and form allude to a morphosis of the physical body and space in which elements of animal and plant life merge with fluid, unspecific 'fleshy' organic objects. Specifically, the work has resulted in a dissolve of distinct bodies and species into amalgamated growth and mutation. These object-based works are highly figurative. They incorporate a layering of artificial cells (plastic beads) and fur/skin/moss-like substances that merge into or out of recognizable animal form.

The intention in this suite of work was to commodify animals as objects, without using actual animal materials. I have come to realize, however, in working with human biotechnology, that the separation of one from the other is less straightforward (as discussed in more detail throughout this exegesis).

Under the cover of our skin specifically addresses aesthetic issues involved in the dissolve and camouflage of species. Similarly, *Isn't that what life is made of...* and *Cave creepers* explore notions of excess growth and flesh within the

biosciences. *Deep deep down* and *In the Hollows of our hearts* manifest ideas about the categorization of life and form beyond everyday notions of the 'living'.

Suite 2. Engaging

The second suite of works focuses on ideas about the physical human body as a site of rupture and fluidity by using human cells in object-based form.

These works have resulted from an ongoing preoccupation with the resonance of medicalised rupturing of the body on individual embodiment. They explore the value of bodily material as an object to be fragmented and commodified through biomedical developments. They address attitudes towards medicalised bodily material and ritualistic attitudes towards flesh in primitive and religious history. They also engage with bodily material through a direct navigation of physical form, involving experiences or processes which induce a heightened realization or awareness of a physical body. In addition, the works seek to encourage an extended notion of embodiment, outside the traditional form of the individual's body. The process of tissue culturing itself induces this heightened sense of one's own body and mortality because the processes are so evidently involved in states of life and death.

Works created throughout the second stream of the project combine laboratory cells and tissue with studio based forms and materials. This approach seeks to engage the viewer with the work visually before confronting them with the materials involved. Tissue from an anonymous donor has been used in *Slip me some skin*, while the *he_la* cell line¹⁴ has been used in *On and on while you're gone*. Both tissue samples are exhibited in preserved states.

Suite 3. Navigating

The third suite of work encompasses first hand exploration of the body as a site of physical manipulation. Works created involve rupturing my own body and the

¹⁴ The *he_la* cell line is a type of immortalized human cell line now used internationally. Unlike primary and secondary cells (taken directly from the body), immortalized cells continue to grow and divide indefinitely in vitro for as long as the correct culture conditions are maintained. *He_la* cells are the classic example of an immortalized cell line. These are human epithelial cells from a fatal cervical carcinoma transformed by human papilloma virus. See personal background section in this chapter for further explanation.

bodies of other animals. These works are presented through video and photographic imagery. The performative piece *transformations of the flesh* involves photographic documentation of an exploration in awareness and understanding of *other* bodies - bodies of animal otherness. The video piece *HE BEING DEAD YET SPEAKETH*, presents a ritualistic performance in which I re-anoint my body with cells grown from my own skin tissue. Visceral video and photographic documentation, illustrating the journey from body to cells to object, are presented in *The Ephemeral Flesh Projects*.

Aesthetics

Underlying all the work is an aesthetic preoccupation with the grotesque. Historically, the term grotesque derives from the same Latin root as 'grotto', a natural or artificial cave or hollow used by humans. From 1250 until the 15th century, grotesque objects were characterized by their combination of human, animal and plant forms. These hybrid forms were generally found in places of ritual worship which often contained religious iconography and relics for ritual exchange. It is said that in grottoes and sites featuring grotesques, such as 15th century chapels, an inherent sense of ritual was induced and, that "the mystery and perceived danger of these sites easily led to the formation of myths and gods"¹⁵ and in this way also dealt with thinking about the human relationship to the 'other' in theology and the natural world.

The position of the extended body can be seen as parallel to these forms of organic growth and 'life' appearing throughout the object based works created during this project. As uncategorized forms of life and growth in the environment, stalactites, abstract growths, and underground spaces such as caves where much life occurs, exist somewhere between the classification of life and non-life. So too, the place of the extended body exists in an undefined and uncertain limbo between body and object, life and non-life, value and waste.

It is critical that the project progressed to using real tissue culture and forms, rather than fictional representations of such. By doing so, it extends beyond the

¹⁵ Absolute Astronomy, exploring the universe of knowledge, viewed 10th August 2007, <http://www.absoluteastronomy.com/topics/Grotto>

fictional/fantasy realm. The works engage with the technology, tissue and ethical issues in a significant way which is grounded in visceral first hand reality and could not be experienced or achieved through mere representation or speculation. Critical intervention into the body would not be possible without engagement with actual bodily material. To maintain critical integrity in focusing on interventions of the body through biotechnology, engagement with the technologies and the bodily materials being manipulated by these technologies is crucial. The representation of form stays within the realm of the imagination – both the artist's and the viewer's - and thus negates engagement with real and critical issues within the field. First hand engagement is also crucial in gaining an understanding of the technologies involved, and the experience of human and animal material in its use of wet biology practices.

Personal background to the project: *life outside the body.*

I have always been fascinated by amalgamations of the body and technology. Growing up on a farm I spent a lot of time in close proximity to animals and became engaged in the different treatment of, and relationships between these animals, for example, the different attitudes towards livestock as compared to the farm dog or the stray cats my Grandmother would feed. Being engaged with relationships of this kind attracted my interest in the differing hierarchies between different forms of life, and the ability humans have to psychologically distance themselves completely from other animals.

At seventeen, a post-operative experience considerably altered my perceptions of self and spurred an interest in issues of embodiment and identity. This was a maxillary advancement operation in which my upper jaw and facial palate were moved forward to correct an under-bite; considerably changing the shape and form of my face. Upon viewing my image a few of days after surgery I vividly recall a sense of contradiction and shock as I glanced at my image. Although I knew that the form in the mirror was my own, as I was alone in the room, my swollen, bruised, manipulated image was completely unrecognizable to me. In that moment I felt my relationship with my body flip from a subjective and familiar symbiosis, to an objective inhabitation of a physical form; I no longer felt an innate relationship with my physical form, but an alien disconnection from my body.

Both experiences sparked my interest in the infiltration of less tangible, biological technologies upon the body, and through my artwork I have explored fragmented, manipulated, and hybridized bodies. Unlike physical, identifiable, non-living components such as the titanium plates inserted to hold my new face together, biomedical technologies introduce elusive, almost invisible properties such as tissue and organs, containing products taken either directly from, or derived from, other human and animal bodies. These bodily materials are layered with social and cultural meanings of their own, and thus introduce far more complex elements into the human body and psyche.

Interest in these issues became artistically focused in a BFA Honours project, which constituted a fictional scientific enquiry into the significance of the

amalgamation of human and animal bodies through genetic engineering. The outcome was a flesh toned installation room, loosely imitating an animal laboratory of sorts, which housed several human-animal hybrid organisms. Each organism was covered in a cellular membrane made from thousands of flesh toned cylindrical beads, applied painstakingly by hand and alluding, metaphorically to the billions of growing cells that create the formation of a whole entity.

It was during this time that I first came across *SymbioticA*¹⁶, an artist-run science laboratory in Perth, Western Australia that had as its focus artistic explorations into the life sciences. Contact with *SymbioticA* led to an invitation to take part in their *Art and Life Manipulation Unit* in early 2005. The involvement in biological art practices helped me to gain invaluable skills and experience with wet biology practices, including tissue culturing. These practices became the focus of my doctoral proposal. To enable me to continue working with wet biology I negotiated access to the UTAS School of Medicine's pathology labs to carry out artistic research.

In initial experiments with wet biology, my interests lay strongly in the human-animal realm, and I began growing and forming human and animal cells over glass objects. The cells used to grow tissue were taken from the generic human cell line he_la, and mouse cell line 3T3,¹⁷ which were used to create a hybrid human-animal chimera form, inspired by the concept of the homunculus. The tale of the homunculus, Latin for little man, can be found in various origins and genres, both historical and contemporary, and generally denotes the creation of a miniature hybrid human-animal organism, created by human hand. The alchemist

¹⁶ *SymbioticA*, formally known as the Art and Science Collaborative Research Laboratory operates as the first International Centre for Excellence in Biological Arts. It is located in the School of Anatomy and Human Biology at the University of Western Australia. The centre is essentially an artist-run organization and Laboratory, which houses local, national and international artists and researchers, in facilitation for artistic research into the life sciences. TC&A artists are key to the foundation of *SymbioticA* itself, with Oron Catts and Ionat Zurr as respectively Director and Academic Coordinator, while Guy Ben-Ary is a member of the *SymbioticA Research Group (SARG)*. The centre has hosted internationally recognized artists such as Orlan, Stelarc, Steve Kurtz, and the *Critical Art Ensemble*. In 2007 *SymbioticA* was recipient of the prestigious *Golden NICA for Hybrid Arts* in the *Prix Ars Electronica*, recognizing the organisation's reputation as the key player in biological arts internationally. *SymbioticA* website, viewed 15th October 2008, <http://www.symbiotica.uwa.edu.au>

¹⁷ 3T3 cells are also of an immortalized cell line. They originate in a mouse embryo.

Paracelsus claimed to have created a human being 12 inches tall, from a bag of bones, skin fragments and animal hair, which was laid in the ground surrounded by horse manure for forty days.¹⁸ “‘Preformationism’, one early theory of heredity, claims either the (human) egg or sperm contained a completely formed individual called a homunculus”.¹⁹ The homunculus, a human-animal hybrid form, seemed an appropriate embodiment for my concerns.

Dealing with animal tissue in a direct and intense way in the laboratory forced me to address my feelings in relation to animal ethics, particularly the use of animals in science. While not fundamentally opposed to eating meat, I do have specific ethical issues with the ways in which animals are farmed, housed and treated in general. Growing up within a farming family I witnessed cruelty towards animals, through their treatment more as commodities, than living organisms. I had always been of the belief that other animals should be treated with respect, yet the interventions into cell growth and my wet biology practices challenged and tested my personal ethics in an immediate way. At *SymbioticA* the lack of alternatives to the generic cell line, and the short time frame with which I was working left me no other option than to use the mouse 3T3 cell line. At the conclusion of the project, I decided that if I were to use animal tissue again it would be under specific circumstances that were not associated with the death of an animal, but may involve taking a small biopsy from an anaesthetized animal. Since that decision, my unease with animal tissue has grown consistently stronger, and I no longer feel ethically comfortable using material accessed through non-consensual means, precluding the use of animal tissue.

It was also while at *SymbioticA* that the link between physical tissue and subjectivity became firmly grounded for me, specifically through hearing about the life of a woman named Henrietta Lacks. I was introduced to Henrietta’s story through an artist talk given by new-media artist, Cynthia J. Verspaget. Focusing upon issues of bodily space and ownership, Verspaget’s project entitled *The Anarchy Cell Line*, explores a social, ethical and physical navigation of the human

¹⁸ *National Library of Medicine*, ‘Paracelsus, Five Hundred Years’, viewed 5th September 2007, http://www.nlm.nih.gov/exhibition/paracelsus/paracelsus_3.html

¹⁹ *Stanford Encyclopedia of Philosophy*, “Epigenesis and Preformationism,” viewed 11th October 2005 <http://plato.stanford.edu/entries/epigenesis/>

tissue culture cell line, known as he₂la. Although used as a standard generic human cell culture in scientific laboratories all over the world, he₂la is no ordinary cell line. It originates from an African American woman called Henrietta Lacks, who in 1951 was diagnosed with a malignant cancerous growth in her cervix. Upon analysis of a sample taken from her tumour on February 1st 1951, it was found that she possessed the most rapidly growing cancer ever seen. These cells are now known as immortal cells because they continuously replicate within the body, doubling in size every 24 hours.

Henrietta's doctor, George Gey, continued to take samples of her tumour up until her death on October 4th 1951. Unbeknownst to her, he was not in fact testing the cells further, but was growing them within a laboratory and distributing them to other medical and scientific laboratories throughout the world. By 1975, when Henrietta's family finally, and only through coincidence, found out about the use of her cells, they were already established as a standard human cell line, and had been used to create the Polio Vaccine. There were few molecular biologists in the world who hadn't worked with Henrietta's cells. There are many ethical issues which arise with the case of Henrietta Lacks. As Ruth Faden, executive director of the Johns Hopkins Bioethics Institute explains, "One is the question of consent, and the other is what, if anything, is morally or legally due to a person if something of commercial value is developed from their cells".²⁰

The proliferation of Henrietta Lacks' cells as the main source of human cell line in the last 53 years, within human and animal medicine, results not only in the physical extension and proliferation of her living body, but also of the dissolution of her body into the flesh of many millions of test subjects and tissues. In this global amalgamation, her body transcends gender, race, sexuality, species barriers and individual physical containment. Possibly billions of bodies have been influenced and affected by the body of Henrietta Lacks, which continues to live, now estimated to be countless times the mass of her original form.

²⁰ Skloot, R 2000, "Henrietta's Dance", *Johns Hopkins Magazine*, viewed 12th January 2005 <http://www.jhu.edu/~jhumag/0400web/01.html>

CHAPTER ONE: PERSONAL BACKGROUND

Similar to my feelings concerning the use of animal tissue, the use of the *he_la* cell line also fills me with unease. I have used Henrietta's cells in my work to address and highlight these feelings of unease and discomfort in the situation which brought about the existence of the *he_la* cell line. When exhibiting an artwork which contains Henrietta's cells, I have added an artist statement detailing the origin of the cells, Henrietta's story and information regarding relevant ethical concerns accompany the work because I want to engage the viewer not only with the physicality of the tissue, but also with its social and political relevance.

While the approach taken to Henrietta's tissue could also be taken with animal tissue, to highlight the plight of the animal in biotech developments. Because the use of animal tissue itself (even though the tissue may be scavenged) raises ethical issues about the use of animals within science and industry developments, I feel more comfortable with the use of human tissue, as I am more able to efficiently navigate the issue of consent. The inevitability of implication in animal experimentation through the use of laboratory animals, even though they are scavenged corpses that would otherwise be incinerated, is too uncomfortable and complex a terrain for me to navigate at this point in time.

CHAPTER TWO – Part One: Theoretical Context

Slippages of self: the imagined and the real

Thomas Csordas states that as an embodied existence of lived experiences and social relationships, our bodies are central to our identity, with perceptions of self created through the lived body²¹. The idea of the body as inherent to emotional identity features strongly in literature and film. As a recent example, the film *21 grams*, 2003²² portrays college Professor Paul Rivers (Sean Penn) as the recipient of a heart transplant who seeks out his organ donor's family in a desperate and emotionally driven attempt to forge a connection with his new physicality. For Rivers, the forging of a physical connection with his organ donor's next of kin becomes fundamental in the psychological acceptance of his new heart and in understanding his identity.

Fiction writer, Jeanette Winterson, has explored relationships between body parts, emotion and psychological attachment. Winterson's novel, *The Passion*²³, makes strong connections between the body and psyche. It explores intimate relationships in which characters shift between different bodily forms, and culminates with the main character seeking out bodily relics of a loved one hidden in a house. The body parts are found through the heart beats they emit as she approaches them, as if her dead lover's presence – spiritual or otherwise - is re-activated by her closeness.

A more historical and scientifically related piece of literature is J. Huxley's *The Tissue Culture King*, 1926,²⁴ which, for its time, provides an insightful portrayal of correlations between biological science and ritual governing of the body. Published only eight years after tissue culturing was first practiced by Alexis Carrell in 1918, and before body and medical law as we know it today, *The Tissue*

²¹ Csordas, T 1990, 'Embodiment as a paradigm for anthropology' *Ethos*, No 18, p5 – 47.

²² *21 grams*, 2003

²³ Winterson, J. 1997, *The Passion*, Grove Press London.

²⁴ *The Locus Index to Science Fiction*, viewed 12th November 2008
<http://www.locusmag.com/index/s368.htm>

Culture King provides a telling prediction of contemporary ethical issues surrounding the human body and biological technologies.

The text relays the story of a lost British scientific expedition which stumbles upon a primitive tribe, who, under the influence of a scientist who had also lost his way, live by a scientifically mediated theology. The scientist, known as Hascombe, describes how he used his skills in wet biology to play upon the islanders' sense of ritual which is grounded in bodily worship; he convinced them that extension of the body (through science) is also an extension of the life-force and self. He attributes equal properties to tissue cultured cells as to embodied physical flesh, and the island community ends up operating as a factory of sorts, culturing their peoples' tissue within organisations such as *The Institute of Religious Tissue Culture*, *Wellspring of Ancestral Immortality* and the *Sisters of the Sacred Tissue*.

The exploration of emotional correlations between the body and spirit through ritual and scientific practices is exemplified through the use of tissue culture to create bodily material, the worship of which replaces ashes and relics of ancestors, and allows the worship of a 'living' relative after death. This is further reinforced by Hascombe ordering the indefinite culturing of the King's tissue, convincing the native people that the power the King emitted (through his physicality) would carry on post-mortem, that is, that he would never completely die²⁵.

In addition to links between bodily tissue and life-force, the story also describes the exploitation of a minority group (in this case an ethnic community) for scientific profit, through the equivalent of a National Tissue Bank, "a histopolis...not a cemetery, but a place of eternal growth"²⁶ in which cell samples from the entire community were stored. While tissue banks today may not be driven in pursuit of rare material from ethnic or minority groups, National Tissue banks operate globally.

²⁵ Huxley, J 1926, 'The Tissue Culture King' in Gunn, J 1979, *The Road to Science Fiction*, The Scarecrow Press, Maryland, USA. viewed 1st September 2006, <http://www.revolutionsf.com/fiction/tissue/index.html>

²⁶ Ibid

Nineteenth century Romanticism predominantly reacted against the scientific validation of nature. Romanticism also brought about anxieties about technological development. Mary Shelley's novel *Frankenstein*, (1818) embodies these anxieties. Sarah Kember wrote that the book illuminated "some modern archetypal anxieties such as scepticism about science and technology"²⁷ and raised issues of creation and responsibility regarding the relationship between self and other, a key issue in the creation of semi-living biological forms.

Emotive attitudes towards the body and its relationship to the soul or self were embraced by Shelley. Following the death by drowning of her husband, Romantic poet and philosopher Percy Bysshe Shelley, 'friends salvaged his heart and gave it to his widow Mary. She wrapped it in silk and carried it wherever she went.'²⁸

Romanticism is also relevant to this project for its alternative engagement with scientific processes, also carried out by biological art. The emphasis on such emotions as trepidation, horror and awe in relation to biology also relate strongly to attitudes towards the use of the body through biotechnological developments.

Also around the beginnings of Romanticism, the first literary references to the homunculus were recorded. It is thought that theories of the homunculus, together with reproductive beliefs of the time, contributed to Shelly's beliefs about life. Today the homunculus features in contemporary literature in a similar way. Hugh Paxton's novel *Homunculus* (2006) features homunculi derived from human body parts and used as biological weapons in war torn Sierra Leone.²⁹

Unlike the homunculus or the creation of monsters in *Frankenstein* however, the semi-living forms created through tissue culture techniques are highly vulnerable beings, which need specific sterile conditions and constant care if they are to continue to live. This necessity of care creates a model of nurture, in which the artist creators must care for their particular creation, and also decide the period of

²⁷ Kember, S 1980, *Virtual Anxiety; Photography, New Technologies and Subjectivity*, Manchester University Press, p80.

²⁸ Andrews, L and Nelkin, D, op. cit., p131-2

²⁹ Paxton, H 2006, *Homunculus*, MacMillan New Writing, London.

that creation's life-span, that is, when and how the form shall be killed. These parameters are inherently subjective and subsequently create a context in which a first hand relationship is formed between the artist and the partial life-form. These living forms not only require human creation to bring about their existence, but like any living organism require constant nurture, cleaning and feeding to survive - they exist in a permanent state of dependence upon their creator.

Transferred identity and transplantation

Unlike the themes underlying *The passion*, *Written on the body* and *21 grams* that link the emotional and psychological dimensions with bodily material, Surrealist visions of the future exist within a panic arena through concerns with the body and technological interactions. While the imagery of Surrealism is of little interest to this project, the conceptual preoccupations of Surrealist theory and action provide a strong pre-cursor to current perceptions of the fragmented body.

There is an innate tension that arises when parts of a persons' body exist outside of and in addition to the whole body. As Sitch points out, the impact of this upon the definition and sense of physical and psychological self can be seen in the aftermath of WWII in Surrealist imagery of the human body which "convey(s) the body in a fragmented, emerging/decaying, deformed, uncertain and changing state."³⁰ This manipulation of the body induced a 'techno-anxiety' which continued throughout biological warfare, and resonates deeply in our relationship to technologically mediated bodies today.

The sense of rupture to physical embodiment is well illustrated in psychological studies of humans who have experienced organ transplants. Recipients validate a view of the body as a highly personalized and multi-layered site, in which physical manipulation and transference of bodily materials between species present problematic psychological consequences. Sharp argues that transplantation has been shown to be "a personally transformative experience in which the transfer of organs...often radically alters an organ recipient's definition of self".³¹ Woods describes the postoperative struggle in which patients are

³⁰ Sitch, S 1990, *Anxious Visions: Surrealist Art*, Abbeville Press, p12.

³¹ Sharp, L 1995, p360

confronted with their new sense of self, and how they begin to redefine this new self around the existence of the new non-self organ within them. Woods claims that this “transplanted organ becomes the most important referent through which recipients reconfigure a new identity”.³²

Recent discoveries in biomedicine of neural cells located within heart and gut tissue,³³ give some weight to the possibility of psychological transference occurring with the transplantation of organs; transplanting ‘memories’ or experiences of the donor in the new organ.

Transplantation with the nonhuman animal body through xenotransplantation,³⁴ takes these issues further into unstable territory. Tania Woods asserts a view of xenotransplantation as a cultural phenomenon, in that it transgresses preconceived “dichotomies of life and death, self and non-self, and human and animal, manipulating and blurring the boundaries of the human body and thereby human identity and culture”.³⁵

Considering the dramatic effects of human to human transplants, it is likely that the introduction of a non-human animal component into one’s body stands to heighten this experience dramatically. As Woods states, particularly “in the traditional cosmologies of the West, where the human animal dichotomy is our ontology, xenografting threatens an axiomatic and immutable boundary. For

³² Woods, T 1998, “Have a Heart: Transplantation, Nonhuman Death and Human Distress”, *Society and Animals, Journal of Human-Animal Studies*, Vol 6. Number 1. 1998, pp 1-15, viewed 27th April 2005, <http://www.psyeta.org/sa/sa6.1/WOODS.html> p5.

³³ ‘Neurocardiologists have found that 60 to 65% of the cells of the heart are actually neural cells, not muscle cells as was previously believed. They are identical to the neural cells in the brain, operating through the same connecting links called ganglia, with the same axonal and dendritic connections that take place in the brain, as well as through the very same kinds of neurotransmitters found in the brain. Quite literally, in other words, there is a “brain” in the heart, whose ganglia are linked to every major organ in the body, to the entire muscle spindle system that uniquely enables humans to express their emotions’. Mercogliano, C; and Debus, K. 1999. “Expressing Life’s Wisdom: Nurturing Heart-Brain Development Starting With Infants” *Interview with Joseph Chilton Pearce by Journal of Family Life*, Volume 5, No.1, 1999, viewed 2nd December 2008. http://www.ratical.org/many_worlds/JCP99.html

³⁴ Transplantation of an organ, tissue, or cells between two different species (as a human and a domestic swine). Merriam Webster Online Medical Dictionary, viewed 2nd December 2008, <http://medical.merriam-webster.com/medical/xenotransplantation>

³⁵ Woods, op. cit. p2.

potential transplant recipients, whose self must embody something “other” than human, xenotransplantation is a troublesome vision”.³⁶

Body commodification: ownership and the breakdown of the individual

The extension of the body through biotechnology significantly alters the state of the body, both conceptually and practically. It places the extended body in the realm of commodity, creating a tissue economy and endangering the values of subjectivity and individuality in the conception of human ‘life’. In such interventions, tissue removed from the body becomes ‘other’ to the body, placed in a state between waste and commodity, estranged from its owner.

*Tissue Economies: Blood, Organs and Cell Lines in Late Capitalism*³⁷ by Catherine Waldby and Robert Mitchell provides a comprehensive overview of the contemporary politics surrounding human tissue, the subsequent changing status of the body and its function within contemporary culture. Waldby accounts that under medical legislation, material removed from the body is technically considered ‘waste’. This classification of the extended body as waste (a thing not granted the status of ‘life’, though it technically remains ‘living’ for an amount of time before intervention), allows for it to be conceptually disassociated from the body and to take on the status of a ‘thing’, as opposed to that of an entity.

In 1990 the supreme court of California ruled that human patients have no property rights in cell lines derived from organs removed with their consent.³⁸ Because this material is considered ‘waste’ it has no commercial value and therefore is technically unable to be considered property. But, when bodily material is technologically manipulated into a form that can be sold or acquired its status changes from waste; it becomes a ‘good’ that falls under the legislation of property law. Property law is exclusive to substances that have market value and that are commercially viable. Interestingly, ownership falls to the institution, as

³⁶ Ibid, p4.

³⁷ Waldby, C; Mitchell, R 2006, *Tissue Economies: Blood, Organs and Cell Lines in Late Capitalism*, Duke University Press, Durham and London.

³⁸ Moore v. Regents of University of California, 1990, 51 C3d 120, viewed 8th April 2006 <http://online.ceb.com/calcases/C3/51C3d120.htm>

opposed to the individual, thus in Australia, Canada and the United Kingdom donors are unable to claim property rights to their tissue once it has been taken. "In this sense, the biological fragment is understood to no longer refer to the donor after donation".³⁹

This commodification of the human body through the de-subjectifying of extended bodily tissue parallels that of the commodification of animal and plant life. In *Body Parts: Property Rights and the Ownership of Human Biological Materials*, Richard Gold examines whether the body and materials derived from it - such as human organs and DNA - should be thought of as market commodities and subject to property law. Gold questions the prescription of value to 'waste' tissue, transporting it onto the realm of market forces as a desirable commodity, and its possible resonance in our thinking of the body in a cultural sense. He asserts the need to understand human biological materials within the context of human values, rather than economic interests.⁴⁰

Similarly, Eugene Thacker in his text *The Global Genome* highlights the "enframing of the social as a biological population (that is defined by patterns of growth, reproduction, demographics, disease, mortality)", which he argues essentially reduces the social to the biological,⁴¹ changing conventional definitions of individuality and subjectivity.

Thacker uses the example of increased blood and tissue donation after the World Trade Centre attacks to illustrate "the affective significance of human tissues, their ability to represent complex ideas and feelings about human identity and community".⁴² He speaks of this in terms of human compassion. "Giving blood and body tissue is a way to affirm social connectedness by linking donors to strangers and donations to the public good".⁴³ Lori Andrews and Dorothy Nelkin's text *Body Bazaar; the market for human tissue in the biotechnology age*, warns

³⁹ Waldby, C 2002, "Biomedicine, Tissue Transfer and Intercorporeality" p240, viewed 21st September 2005.

<http://www.soc.uoc.gr/kousis/KOIN1/Health/BiomedicineTissueTransferIntercorporeality.pdf>

⁴⁰ Gold, E R 1996, *Body Parts; Property Rights and Ownership of Human Biological Materials*, Georgetown University Press, Washington D.C.

⁴¹ Thacker, E 2005, pp311 - 312.

⁴² *Ibid*, pp311 - 312.

⁴³ Andrews L and Nelkin, D 2001, p37

that “ignoring the personal and social meaning of the body may be hazardous to the psychological well-being of individuals, to the maintenance of important societal values”.⁴⁴ As they state,

“Many of the products made from bodily material may ultimately yield useful treatments for patients, but there are serious problems in the way they are being developed, distributed and turned into commodities. The market mania encourages actions that violate bodily integrity, intrude on community values, distort research agendas and weaken public trust in scientists and clinicians. When commercial interest and a quest for profits are a driving force, questions for human safety and respect for the human sources of the tissue - the person in the body – take second place”.⁴⁵

As Bioartist Eduardo Kac astutely explains, “ethical concerns are paramount in any artwork, and they become more crucial than ever in the context of bioart”.⁴⁶ Andrews reinforces Kac’s view and raises a significant point when she asks “if we [artists] don’t take charge and use these technological media to raise questions about contemporary life, who is going to do that?”⁴⁷

As biological technologies continue to be developed and legitimised in the realm of scientific rationalism, they remain sheltered from larger social issues and debates on the philosophical and ethical implications these technologies generate. As a result, Loverro states that, “the question is not how do these technologies mediate our exploration of the world...but how they actually shape the very world we inhabit.”⁴⁸

Waldby confirms this view with her belief that “blood, organs, bone marrow, sperm, ova and embryos can all be transferred from one person to another. Within the technical frameworks of biomedicine, such fragments are generally

⁴⁴ Ibid, p 23.

⁴⁵ Ibid, p 27.

⁴⁶ Kac, E, *Transgenic Art*, originally published in Leonardo Electronic Almanac, Vol. 6, No 11, December 1998, viewed 5th August 2002, <http://eksc.org/transgenic.html>

⁴⁷ Andrews, L 2000, p22

⁴⁸ Loverro, T 2001, “Eduardo Kac: Challenging Norms through Art”, viewed 17th April 2003 <http://www.stanford.edu/class/sts129/essays/Loverro2.htm>

treated as detachable things, severed from social identity once they are removed from a particular body”.⁴⁹ Their classification under property law as commodities, able to be bought and sold by personnel in the bioscience and biomedicine fields, act to further solidify and perhaps validate their objectification. However, as Waldby has found through anthropological and sociological literature, “for donors and patients, human tissues are not impersonal. They retain some of the values of personhood and identity, and their incorporation often has complex effects on embodied identity”.⁵⁰ She continues,

“Despite the clarity of this commodity model for tissue transfer, an abundant anthropological and sociological literature testifies to a quite different experience of tissue transfer among donors and recipients. For those whose fragments are directly involved, tissues retain the trace of their donor to a greater or lesser extent. Human tissues are not impersonal or affectively neutral; rather, they retain some of the values of personhood for many if not most donors and recipients. Hence, circuits of tissue exchange are not only technical and therapeutic, but also relational and social. To give an organ, blood, ova, embryos, sperm or cells is to be caught up in asocial and embodied circuit in which the significance of one’s personhood imbues the fragment. To receive and incorporate another’s organs or tissues involves a complex modification of the recipient’s embodied identity, as the habitual equation between the limits of the body and the contours of the ‘I’ is thrown into question.”⁵¹

While the cases of Henrietta Lacks and John Moore are underscored by issues of ownership, the unique case of John Wood and Shannon Whisnant illustrates the significance of the personal value placed upon body ownership, property rights and ethics outside of the medical institution.

In 2004 John Wood incurred a leg amputation following a plane crash which killed his father and injured other family members. For ‘religious reasons’, Wood

⁴⁹ Waldby, C 2002. “Biomedicine, Tissue Transfer and Intercorporeality”, p239, viewed 21st September 2006,
<http://www.soc.uoc.gr/kousis/KOIN1/Health/BiomedicineTissueTransferIntercorporeality.pdf>

⁵⁰ Ibid, p239

⁵¹ Waldby, C 2002, “Biomedicine, Tissue Transfer and Intercorporeality”, pp240-241, viewed 21st September 2006.
<http://www.soc.uoc.gr/kousis/KOIN1/Health/BiomedicineTissueTransferIntercorporeality.pdf>

wished to keep the amputated leg so that he could be cremated as a whole body upon his death.⁵² His wish was granted by the Hospital in question and the leg was kept first in Wood's freezer. Upon encountering substantial financial difficulties, Wood was forced to transfer all of his belongings to a storage facility, from which they were later sold when he could no longer afford the payments. Wood's leg, wrapped within a Barbeque smoker, was purchased by one Shannon Whisnant.

Upon its discovery Whisnant feared foul play and handed it to authorities, who traced the leg to Wood. Despite Wood's request to have the leg returned to him Whisnant, recognizing the media interest, declared himself as owner through legal purchase. His intention was to profit from interest by opening a museum and charging a ten dollar entrance fee to view the leg. The dispute ended in court at a hearing presided over by the televised celebrity *Judge Mathis*. While Whisnant was not granted ownership of the leg, Woods' claim for emotional distress was dismissed by *Judge Mathis*, and he was ordered to pay Whisnant \$5000 in damages.⁵³

While humorous and bizarre, the Woods case is significant because it brought into the public domain complex issues relevant to the cases of Lacks and Moore. It demonstrates an individual's psychological and religious attachment to their own bodily material, even once it has been removed from the body and is clearly defined as an inanimate object, no longer capable of living. It also illustrates the potential for exploitation of bodily material, and the lack of respect and ethical consideration for bodily material in the face of possible economic gain. Were it not for the possible financial gain or associated fame from the case, it is assumed that Whisnant would have had no interest in legal ownership of the leg.

Let's get physical: the body and identity

Richard C. Lewontin, (aka, Alexander Agassiz), Professor of Zoology and Biology at Harvard University, has written extensively about the effects of scientific

⁵²Version Zero Zero website, viewed 10th November 2007, <http://v00.org/content/view/39/32/>.

⁵³Associated Content website, viewed 25th November 2007, http://www.associatedcontent.com/article/438351/mans_leg_found_in_a_bbq_smoker_in_north.html?cat=47.

knowledge upon the human conception of physicality and identity. He defines the lay publics' general relation to biology as that of ideology, in which the association between the physical and psychological self is purely a social construct, with no basis in scientific truth. Lewontin describes epic projects such as the Human Genome Project as contributing to this ideology, through the implication that scientific knowledge can unlock the secrets of *who* we are as a species, and what it *means* to be human. He bases this problematic connection between the genetically negated body and the socially experienced self, upon the exclusivity of scientific knowledge and language.⁵⁴

It is interesting that in language we talk about elements of the body as functioning rather than living or being alive; for instance, in the case of a kidney, we would describe it as 'still functioning' rather than 'still living', or 'no longer functioning' rather than 'dead'.

This reductive approach to biology could be said to stem from the influence of Descartes' well known metaphor of the world as a clock, "a large and complicated system of gears and levers".⁵⁵ Descartes' approach dictated a method of scientific study in which the body is dissected and isolated into independent elements which, once separated from the body, take on individual, autonomous qualities. These are, generally, viewed as non-living entities which combine to become one living form. In Lewontin's view, the relationship between one's physicality and sense of self does not arise from any innate psychological unity, but through a powerful historical, social construction.⁵⁶

This role of the visual in the relationship between physicality and identity relates directly to the philosophical writings of Jacques Lacan, who shares Lewontin's view about a dislocation between the physical body and the conception of self in his formulation of *The mirror stage* (1949).⁵⁷ The concept of the mirror stage represents the point at which an individual's sense of self manifests through

⁵⁴ Lewontin, R C 2003, *Biology as Ideology: The Doctrine of DNA*, Harper Collins, New York.

⁵⁵ Ibid, p 12.

⁵⁶ Ibid, p 1 – 18.

⁵⁷ 'Lacan's Mirror Stage' from Jacques Lacan, *Écrits: A Selection*, viewed 21st July 2006, <http://courses.essex.ac.uk/LT/LT204/Mirror%20Stage.htm>.

viewing their reflection for the first time. Lacan describes this formation of self as occurring at a point, usually in early infancy, which sets the basis of the individual's relationship between the body and psyche.

Lacan describes the formation of a subject's 'self' as occurring in-between the subject and the image it views in the mirror, with the actual 'self' manifesting in the intangible space between the two. As the image of the body in the mirror is only a representation of self, which is, in fact, based upon a manipulated and reversed image of the viewer's body, the conception of the subjects' physicality as their self is therefore a problematic one. The fact that the infant views its image as a complete form, at a time in which its experience of its body is not that of a whole independent being, but a physically incomplete and vulnerable one, posits an immediate disjunction between body and psyche.⁵⁸ As "the primary identification (of the subject) is with the image itself, Lacan's main concern here is to show that this identification is fictional",⁵⁹ that the image does not equal the subject's actual experience of their physical existence, and therefore sets the basis for a relationship between subject and physicality that is innately ruptured.

Margaret Morse questions this view of embodiment as described by Lacan, stating "What Lacan doesn't elaborate upon is the (changing) space between the body and the mirror, on which embodiment implicitly depends".⁶⁰ In her paper, *Sunshine and shroud: cyborg bodies and the collective and personal self*, she states "Embodiment is not a process that occurs solely in stasis before an image, but in motion with changing tools and shifting relations between felt and seen".⁶¹ It is important to note however, that although Lacan establishes a connection between the subject and their physical image, he bases this connection upon a *relationship*, as opposed to a *unity* between the two, implying that there is room for the development and change of this conception.

⁵⁸ University of Hawaii System website, viewed 25th July 2006, <http://maven.english.hawaii.edu/criticalink/lacan/guide2.html>

⁵⁹ University of Hawaii System website, viewed 25th July 2006 <http://maven.english.hawaii.edu/criticalink/lacan/guide2.html>.

⁶⁰ Morse, M, *Sunshine and Shroud: Cyborg Bodies and the Collective and Personal Self*, viewed 6th May 2005, http://www.medienkunstnetz.de/themes/cyborg_bodies/collective_bodies/1/

⁶¹ Ibid

Perhaps the current dislocation between the physical and subjective body has evolved, as Lacan believes, from this visually induced gap between physicality and psyche, which in contemporary culture is now further challenged by an infiltration of new technologies upon the physical body, subsequently altering its conceptions.

Lacan's interest in how psychological events, such as identification, connect to physical reality (the body and the physical environment the body occupies), parallels the work of Anthropologist Roger Caillois. In 1984, Roger Caillois theorized about 'legendary psychasthenia', the physical longing to dissolve into one's surroundings, perceived as a survival mechanism (manifested through a perceived survival adaptation). Caillois studied a range of insects, such as stick insects and moths, which mimic their surroundings, and discovered that the physical act of mimicry serves no survival function, as the predators of these insects do not in fact rely upon vision to catch their prey, but hunt through their sense of smell. In Caillois' portrayal of this phenomena, the relationship between the physical body and the psyche is paramount. In this way mimesis is seen as a form of collective embodiment, induced by a psychological transgression into space.

This function of physicality as described by Callios can be understood as a psychological yearning to break through the confines of physicality and merge into outer physical matter, the space which simultaneously defines and separates bodies and solid matter. It is this desire to leak out of one's body which tissue culture makes tangible. The confusion of one's special location in psychasthenia can be paralleled to human organ or tissue transplants, where issues of embodiment can be extended from one body to another or out into open space separate from the body.

Caillois relates this behaviour to the human psyche through psychologist Pierre Janets' description of 'psychasthenia', as a "disturbance in the relations between personality and space".⁶² Psychasthenia is described as a form of psychosis in which an individual is no longer able to psychologically locate themselves within

⁶² Referenced in Grosz, 1994, p 46

their own physical body. He explains that “in some cases of psychosis, the...meshing of the subject and the body fails to occur”, instead, “the subject is captivated by and replaced by space, blurred with the positions of others”.⁶³ Therefore “psychosis is the human analogue of mimicry in the insect world: both represent what Caillois describes as the ‘depersonalization by assimilation to space’. Both the psychotic and the insect renounce their rights to occupy a perspectival point, abandoning themselves to being spatially located by/as others”.⁶⁴

This proposed state of being parallels a psychical transgression, resulting in an awareness of a fluid sense of self; no longer exclusively confined to a discrete physical form or species, through which the tension between the fixed and extended body dissolves as self moves from individual to plural.

⁶³ Ibid, p 47

⁶⁴ Ibid, p 47

CHAPTER TWO – Part Two: Artistic context

This chapter focuses on a selection of artists dealing with embodiment and technologically mediated biology. Their approaches range from those with an interest manifesting in the ambiguous or fantastical, those focused strongly on ethical engagement, and those who directly navigate the physical body through their art practice. The works of several artists are discussed in order to present an overall picture of the diversity within the growing realm of biological art practice today.

Where the wild things grow: aesthetics and fantasy

Artists dealing with issues related to the body, particularly the internal body hidden from our gaze, often employ aspects of playfulness and fantasy. Luke Roberts and Motohiko Odani explore issues relating to bodily material, informed by varying degrees of science and fantasy. Both engage within fictional realms in which life exists within biotechnologically mediated dimensions.

The idea of the natural world as a sacred object that should not be interfered with maintains a strong resonance throughout many societies and cultures around the globe, and within both academic and secular communities alike. There exists a general view that ‘evolution’ is a natural transition towards improvement and that what changes naturally is right or good, and what changes unnaturally – or through human intervention - is always negative. Performance artist Luke Roberts’ exploration of the natural world and human evolution presents a comical and absurd vision of ritual and hybrid embodiment. Roberts’ unnatural applications of life are led by *Pope Alice* - Roberts’ extra-terrestrial alter ego, a royal inhabitant of the planet *Mu* and leader of the fictional alien species which Roberts has conjured. Using the *Pope* as his spokesperson, Roberts engages faux-science notions of cloning and genetic modification, arenas he believes can provide artists with platforms for revolution.

Roberts has no engagement with biological technologies in a physical sense; instead he focuses upon the possibility of future genetic modifications, presenting these as if as occurring ‘naturally’ through the influence of extra terrestrials, as compared to present-day science. The Surrealist belief that “evolution proceeds by explosive, unexpected cross-connections and not by linear progression”⁶⁵ resonates strongly in his work. Through paralleling the pseudo-scientific with ritual and spirituality, Roberts uses ‘weird science’ as a substitute for institutional religion.

Roberts has created controversy in his recent embrace of Raëlism, a cult focused on extraterrestrial life, to which he is appointed a High Priest. Raëlism, a spiritual cult originating in Paris in 1974 and established by Claude Vorilhon (now Raël) is particularly significant to Roberts’ practice. Raëlism parallels his views on genetic modification and human clones as forming the next incarnation of the human race.

Claiming to be an atheist organization, Raëlism presents an interesting blending of belief in pseudo and mainstream science with structure and hallmarks of an organized religion and is based on commercialisation of the human body and bodily materials. Raélians believe that life on Earth was created scientifically by scientifically advanced extra-terrestrials. They encourage technological advances to improve the human condition, and believe that ‘accelerated growth process and mind transfer, in combination with cloning, are



Fig 1: Luke Roberts Giza circa AD 1500, from Appearances series, ongoing



Fig 2: Luke Roberts, you are not alone, 2006

⁶⁵ Sitch, 1990, p12.

mechanisms by which eternal life may be achieved”⁶⁶ However, their statement that “[Just as] children need to understand that there is no Santa, people need to realize there is no God,”⁶⁷ is curiously contradicted by their shadowing of mainstream religious elements. For example, the major initiation rite in the Raëlian Church is the Raëlian baptism or transmission of the cellular plan. Their creator is referred to as *Yahweh Elohim*, and the first cloned child named after the biblical Eve. Their practices seem to be mimicry of Catholic ritual, for example “in 1994, Raëlians began implementing their own version of baptism in front of a baptismal font inside St. Peter's Basilica”.⁶⁸

The international symbol of Raëlism, featuring the swastika with the star of David, claims to represent ‘the choice between paradise, which the peaceful use of science makes possible, and the hell of returning to the primitive stage where humanity submits to nature instead of dominating and benefiting from it.’⁶⁹ This mantra, while disconcerting, clearly displays their views of science as a ‘higher calling’, above God and nature. Raëlism is therefore a reactionary sect, rebelling against the dogma of traditional Christianity and using science to fight against ‘God’ (and nature).

Raëlism appears to consist of two sects which seem inherently opposed - part spiritual cult, part commercial enterprise. As such, Raëlism reflects the more general conflicts between the sacred/social body and the commercial/scientific body within capitalist, technologically driven culture. It incorporates a solely commercial enterprise: Clonaid, a human cloning company founded in 1997. On December 26th, 2002, Clonaid's President, Brigitte Boisselier,⁷⁰ announced Clonaid's first success – “the birth of baby Eve,”⁷¹ a human clone.”⁷² Though

⁶⁶ Bowser, B. 27 December 2002, The Cloning Debate, *MacNeil/Lehrer Productions*, viewed 11th August 2007, http://www.pbs.org/newshour/bb/science/july-dec02/cloning_12-27.html

⁶⁷ Lev, E 2004, Rome Gets Rael; Blessing of the Baminelli, *Zenit News Agency*, viewed 10th August 2007, <http://www.zenit.org/article-11815?l=english>

⁶⁸ Palmer, Susan, J 2004 *Aliens Adored*, Rutgers University Press, New Jersey, p 91.

⁶⁹ Rael, 2006, p 62.

⁷⁰ Dr. Brigitte Boisselier, Clonaid's President, Raelian Bishop and Ph.D. in physical and biomolecular chemistry, runs the organization with a team of well-trained scientists, members of the Raëlism sect who see cloning as the first step in achieving immortality⁷⁰ but whose identities and qualifications remain conveniently disclosed. Clonaid website, viewed 2nd July 2008, <http://www.clonaid.com/page.php?7>

⁷¹ “Dr. Boisselier testified under oath that she saw videos of a cloned child born in Israel.” Though despite her credentials, the only experience Boisselier is sited to have is as “marketing director for a

discredited by the scientific community, because Clonaid was unable to “present demonstrative evidence that the child really existed”,⁷³ their claim has nevertheless generated much international attention. These claims place Raëlianism within the realm of science fiction.

Raëlian ideology, like Roberts’ practice, engages with the future of the human in a fantastical, scientifically mediated world, free from the constraints of mortality and religious dogma. The issues marrying the sacred and the scientific resonate deeply within human biotech developments today.

The idea of a fictional world, transformed by technological intervention, feature strongly in the work of Japanese cyberpunk Motohiko Odani. His practice combines aspects of science fiction, fantasy, and viscosity with direct engagement with bodily materials in a more critical way. Odani uses sculpture and video to create “works depicting mutations of human bodies or spaces that evoke alteration/permutation/mutation or hybrid oddities”.⁷⁴ *Rompers*, (2003), and *Fair*



Fig 3: Motohiko Odani, *Rompers*, 2003

Completion (1997), in particular, play with mutation and bodily hybridity alongside a visceral and direct vision of the body, through the incorporation of the artist’s own blood. *Rompers* is a three minute video piece depicting human and animal-like mutant creatures within a fantastical landscape setting. Initially the scene appears playful and innocent, until it becomes clear that “all the living creatures seem to be in the middle of a process

large chemical company in France,” hardly qualifying her for the practice of human cloning, or the expertise to recognise cloning processes or their results. Clonaid website, viewed 2nd July 2008, <http://www.clonaid.com/page.php?7>

⁷² By March 2004, Clonaid claimed that eight extra baby clones had been brought to term for a total of thirteen baby clones. Clonaid website, 2004, *Alive and Well*, viewed 10th October 2008, <http://www.clonaid.com/news.php?3.4.5>

⁷³ Clonaid website, viewed 2nd July 2008 <http://www.clonaid.com/page.php?7>

⁷⁴ Site Gallery website, viewed 5th October 2008, <http://www.sitegallery.org/exhibitions/view.php?id=29>

of genetic mutation".⁷⁵ In contrast, Odani's sculptural piece, *Fair Completion*, seeks to bring the viewer closer to the reality of their own embodiment through proximity to blood, the substance which sustains life. The viewer encounters a blood-bubble machine that produces soapy bubbles, each enclosing a drop of his blood. These 'blood' bubbles float from a three meter steel and plastic structure in a far end of the gallery and slowly advance toward viewers. "I know people will feel uncomfortable with it," says Odani, "but imagine if one of your relatives or loved ones were bleeding - you wouldn't worry about their blood, would you? I want to bring people to this point with my art".⁷⁶ The writer Justus Jonas emphasises the emotive and subjective power of blood, "that transformable material, equally physical and psychical, the appearance of which has always evoked a maximum of human emotions – vulnerability, horror, power and helplessness".⁷⁷ The horror of close proximity to Odani's blood is, in reality, misplaced; hot lights situated inside the structure slowly bake the blood, so that the liquid contains less of a feeling of fresh blood and life and more of decay or a body factory.

As Natsumi Araki explains, "physiological responses to stimuli received by the body have always been an essential factor in Odani's work".⁷⁸ Araki continues "in a world offering virtual reality, he goes in the opposite direction, boldly exploring the boundless potentialities of the human body and pursuing the prospects and vitality that art affords there".⁷⁹ Odani's use of blood blatantly highlights our relationship to the visceral in our increasingly technologically driven Western culture.

Odani's use of blood and its proximity and gentle attack upon the audience also conjures notions of biological agents as biological weapons. It recreates the idea of the body as a tool of biological terrorism. Also brought to mind are forms of biological weaponry, hybrid mutations occurring when differing bodies and

⁷⁵ K.G 2007, Museo de Arte Contemporáneo de Castilla y León website, viewed 3rd September 2007 http://musac.es/index_en.php?obr=238

⁷⁶ DiPietro, M, *Motohiko Odani at P-House*, viewed 4th July 2007, <http://www.assemblylanguage.com/reviews/Odani.html>

⁷⁷ Jonas, J 2003, p 14.

⁷⁸ Araki, N 2005, p 83.

⁷⁹ Araki, N 2005, p 85.

species come into contact, such as HIV/AIDS and Avian Influenza. Such ideas also resonate within *Rompers*.

The use of human blood also plays directly upon fear of bodily materials surrounding the HIV virus, the first known case of virulent infectious disease resulting from human contact with the blood of another animal species.⁸⁰ The virus itself as a rogue organism involves complex hybridities surrounding human-animal boundaries, sex and death, organisms as parasites and, as with many diseases, presents a significant rupturing of the unity between tissue and psychological embodiment, host and parasite.

Ethics

Working in the realm of biological technology encompasses many complex and layered ethical issues, one of the most prominent being the use of both human and animal bodily material, of which the use “for artistic and ritualistic purposes is as old as human history”.⁸¹ The following artists engage directly with these materials in differing ways to explore ethical and political inequalities, challenge ethical views on related values of bodies and their materials, and to enhance the lives of other organisms and, in doing so, our understanding of them.

The Critical Art Ensemble (CAE) is a collective of five tactical media practitioners engaging in projects that help the general public understand biotechnology and various issues surrounding it. They encompasses “various specializations including computer graphics and web design, film/video, photography, text art, book art, and performance”.⁸² CAE are well known for their highly critical anti-authoritarian stances towards governmental control concerning the relationship of biological technologies to the public, in particular GMO food legislation and production and biological warfare.

⁸⁰ AVERT (Averting HIV and AIDS) website, viewed 13th August 2007, <http://www.avert.org/origins.htm>

⁸¹ TC&A website, viewed 7th October 2008, <http://www.tca.uwa.edu.au/publication/TheArtoftheSemi-LivingandPartailLife.pdf>

⁸² Critical Art Ensemble website, viewed 20th August 2008, <http://www.critical-art.net/>

In their approach to tackling political issues through contemporary art, CAE advocate “fighting fire with fire in developing tactics using biological materials and processes”.⁸³ Though they may be philosophically associated with views of many hard-core activist groups in their encouragement of activism and intervention, their preference is to opt for fuzzy biological sabotage (FBS)⁸⁴ as a critical, educational and non-aggressive alternative.

For example, the work *Contestational Biology* (2003) involved an “attempt to reverse engineer the genetically modified canola, corn and soy plants through the use of non-toxic chemical disrupters”.⁸⁵ In this project they worked with high school children and the public in an open and transparent way, focusing on hands on interaction with living plants, a seemingly non-subversive act.



Fig 4: CAE, *Contestational Biology*, 2003



Fig 5: CAE, *Contestational Biology*, 2003

In relation to the US government’s focus on biological terrorism threats, CAE holds a strong belief that the preparation for these possible threats “is a euphemism for biowartech development and the militarization of the public sphere

⁸³ Critical Art Ensemble website “Fuzzy Biological Sabotage”, viewed 20th August 2008, <http://www.critical-art.net/biotech/conbio/index.html>

⁸⁴ Ibid, viewed 20th August 2008

⁸⁵ Critical Art Ensemble website, viewed 20th August 2008, <http://www.critical-art.net/biotech/conbio/index.html>

...it gets votes for politicians, audiences for media venues, profits for corporations, and funds for militarized knowledge production”.

They state that, “If there is any real threat to our bodies and health, it is not coming from weaponized germs, but from the institutions that benefit from this weaponization”.⁸⁶ Their beliefs are exemplified by the situation of CAE member Steve Kurtz, who has recently been acquitted of charges of mail fraud, initially resulting from an accusation of biological terrorism.

The experience of Kurtz, American artist and Professor at SUNY Buffalo, is strongly indicative of the growing paranoia surrounding the use of biological agents by ‘laypeople’, including artists, and its direct association with biological terrorism. As the following account of Kurtz illustrates (and resonates within my own experience with the Royal Hobart Hospital⁸⁷) at a time when fear of terrorism remains high, engagement with biological technologies by artists also draws suspicion and fear.

In May 2004 Steve Kurtz awoke to find his wife and artistic collaborator of CAE, Hope Kurtz, had passed away next to him in their bed. Upon the arrival of police following Kurtz’s 911 call, officers entered the home and became suspicious of scientific equipment there, including a number of Petri dishes containing three harmless bacteria cultures, and a mobile lab to test food labelled ‘organic’ for the presence of genetically modified ingredients.

The mobile lab was not, in fact, for the purpose of bioterrorism, but part of an upcoming exhibition, *Free Range Grains* at the Massachusetts Museum of Contemporary Art (MASS MoCA). Alongside the scientific equipment were a number of books containing anti-governmental literature, which raised terrorism suspicions to a higher level. Local police alerted the FBI to possible bioterrorism, after which the Joint Terrorism Task Force, Homeland Security, the Department of Defense and the Buffalo Police, Fire Department and State Marshall’s Office

⁸⁶ Critical Art Ensemble website, “Bodies of Fear in a World of Threat”, viewed 20th August 2008, <http://www.critical-art.net/biotech/marching/index.html>

⁸⁷ I received ethics approval to carry out a project involving patients from the RHH. Following controversial publicity they withdrew their support for the project. See chapter three for further explanation.

descended on Kurtz's home in Hazmat, or biohazard suits.⁸⁸ The *Joint Terrorism Task Force* seized Kurtz's "cat, car...documents, computers, and equipment... including scientific equipment used to test food for the presence of genetically modified organisms".⁸⁹

Steve Kurtz and Robert Ferrell, Professor of Genetics at the University of Pittsburg Graduate School of Public Health, who had supplied Kurtz with the bacteria, faced the possibility of twenty years imprisonment.

Throughout Kurtz's and Ferrell's lengthy trial process it become increasingly clear that the attack on Kurtz was "a politically motivated attempt to silence an artist and scientist whose work is critical of government policy,"⁹⁰ rather than a response to materials posing a danger to the public or involvement in terrorist activity. The vilification of Kurtz by the US government and mainstream media can be seen as a tool for enforcing fear about the use of biological agents and technologies upon the public. In this way his experience confirms CAE's ideas about focus upon biotech as a tool to instil public order and control.

I saw CAE's most recent art piece in the 2007 *Biennale of Electronic Arts Perth (BEAP)* exhibition *Still, Living*. The piece titled *Immolation* (2007) included video documentation of a project created in the *SymbioticA* Laboratories. The project involved Kurtz subjecting pieces of pig flesh to the same chemical weapons inflicted upon the flesh of individuals in war crimes by the United States. Kurtz's use of the physical body in this case substitutes a non-human animal flesh to parallel the body of prisoners and casualties of war.

As CAE describe, *Immolation's* goal is to "provide a different way of imaging, viewing, and interpreting the human costs of



Fig 6: CAE, *Immolation*, 2007

⁸⁸ *Critical Art Ensemble Defense Fund*, 2007, viewed 10th December 2007, <http://www.critical-art.net>

⁸⁹ Ibid

⁹⁰ Ibid

these war crimes, in contrast to the barrage of media imagery to which we have become so desensitised.”⁹¹

CAE’s work is somewhat of a physical manifestation of what Elizabeth Grosz references through Nietzsche and Kafka’s writings of “the ways in which social power, especially punitive and moral systems, mark bodies in more or less violent, brutal and socially sanctioned ways, through institutionalised cruelty and torture”.⁹²

As Grosz describes, “the bodies and behaviours of individuals are targets for the deployment of power, and they are also the means by which power functions and proliferates.”⁹³ However, as the artwork and actions of Kurtz and *The Critical Art Ensemble* communicates, alongside politically motivated artists internationally, that “as well as being a site for knowledge-power” which is regulated by higher regimes, “the body is also a site of *resistance*, for it exerts a recalcitrance, and always entails the possibility of a counter-strategic re-inscription, for it is capable of being self-marked, self-represented in alternative ways.”⁹⁴

The use of living materials, such as the *ecoli* bacteria in Kurtz’s possession, is becoming increasingly regulated by governmental and economic powers. Paralleling this is growing regulation over our own physical bodies and privacy, through increased governing upon the applications of life, as if life itself is a dangerous substance.

The TC&A (Tissue Culture and Art) research group, based within *Symbiotica* have, for the past ten years, been using wet biology practices to explore political and ethical issues related to the life sciences.

TC&A is “an ongoing research and development project into the use of tissue as a medium for artistic expression”.⁹⁵ It was set up to “investigate relationships with

⁹¹ Still Living Exhibition Website, viewed 10th October 2008, <http://www.stillliving.symbiotica.uwa.edu.au>

⁹² Grosz 1990, p 63.

⁹³ *Ibid*, p 64.

⁹⁴ *Ibid*, p 64.

⁹⁵ *Symbiotica*, viewed 12th September 2008 <http://www.symbiotica.uwa.edu.au>

different gradients of life,”⁹⁶ such as cells and tissue. Their projects have explored varying aspects of biotech developments, the most relevant to this project being *Victimless Leather*, (2004) and *NoArk*, (2008). As they state, TC&A explore alternative uses of biological technologies to “generate greater questioning of the current power structures hold on knowledge and its applications”⁹⁷ – essentially a democratic use of technologies and its applications.

Victimless Leather explores issues relating to laboratorial meat production, which has become a hot topic following research by scientists into the production of meat without the need for intensive animal farming.⁹⁸ Theoretically, production would involve a tissue sample (or biopsy) taken from a living animal, which would not die as a result. The tissue would then be cultivated in large vats to produce blocks of tissue cultured meat, including pork, beef, chicken, kangaroo, whale, and shellfish. It is claimed that “the product will have the structure and taste of lean meat, but animals won’t have to suffer for it”.⁹⁹

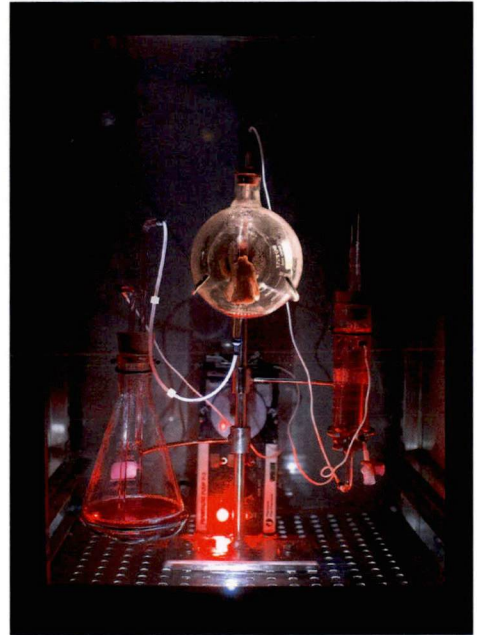


Fig 7: TC&A, *Victimless Leather*, 2004

The production of one small, laboratory grown steak uses approximately the same amount of fetal calf serum¹⁰⁰ as is in a living animal, therefore using the same bodily resources which still result in the death of animals, just in a different manner. In addition to the bodily material, the level of hard rubbish in the laboratory – mostly plastic waste - is extremely high, adding to the environmental toll of the process.

⁹⁶ TC&A website, viewed 24th October 2007 <http://www.tca.uwa.edu.au>

⁹⁷ TC&A website, viewed 16th August 2007, <http://www.tca.uwa.edu.au/publication/TheArtoftheSemi-LivingandPartailLife.pdf>

⁹⁸ *Annova*, “Scientist says he can create meat without killing animals”, story filed Thursday 20th Sept, 2001, viewed 31/07/2003 http://www.ananova.com/news/story/sm_403735.html

⁹⁹ *Ibid*

¹⁰⁰ Fetal calf serum derives from blood drawn from the hearts of calf fetuses. The serum is then separated from the whole blood. Growing laboratory meat utilizes a similar amount of blood as is in a living animal’s body. Therefore laboratory grown meat still results in animal suffering and death.

TC&A's research into this seemingly accessible utopia reveals significant complexities for human and animal material, which has deep resonance within the life sciences. The paradoxes exposed by their work have also heralded significant ethical issues within my own work, and

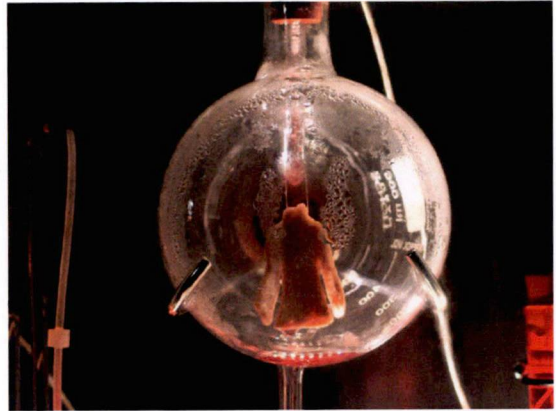


Figure 8: TC&A, *Victimless Leather*, 2004

biological art practice in general. In unveiling a dystopian reality within scientific development claiming to enrich living the lives of non-human animals, TC&A highlights substantial complexities within animal ethics and the life sciences.

However, creating tissue engineered objects is also an ironic act in itself, in that as artists critically engage with the technologies, they are also inducing a normalization of the technology itself. In their defence TC&A emphasize that “the political and ethical issues raised by the introduction of biomedical and biotechnological products into mass culture are demanding urgent attention”.¹⁰¹ They advocate the use of the technologies they critique as “the best strategy to deliver the notion that these entities are alive and need care, while also problematising the technology used and the process of creating these semi-living artistic entities”,¹⁰² while also engaging their “critical non-positivistic approach”¹⁰³ to tissue cultured artworks.

Their most recent work *NoArk* presents a contemporary version of Noah's Ark, in which the vessel is a portable bioreactor (a machine which houses and supports cell growth in vitro), and the animals are, essentially, miniscule tissue blobs – a mix of cells from differing organisms, growing in one primordial soup. The

¹⁰¹ TC&A website, viewed 3rd September 2008

<http://www.tca.uwa.edu/publication/TheEthicalClaimsofBioart.pdf>

¹⁰² TC&A website, viewed 27th July 2007, <http://www.tca.uwa.edu.au/publication/TheArtoftheSemi-LivingandPartailLife.pdf>

¹⁰³ Ibid, viewed 27th July 2007

'organisms', so small in scale they're barely visible to the viewer's naked eye, allude to a new kind of eco-system in which the 'two by two'¹⁰⁴ species mantra no longer applies. Contrasted with various taxidermy specimens the piece draws the viewer to consider the relationships between traditional and accepted forms of life and those of new and uncategorized form.

Read literally *NoArk* can be viewed as a comment on ideas related to salvation – that there is no ark to save our species from hybridization through biological technologies.

As TC&A describe, the vessel “can be seen as an introductory platform to a new form of life that combines the familiar with the other”.¹⁰⁵ Unlike the display of organisms presented in “Natural History museums, contemporary biological research is focused upon manipulation and hybridisation, and rarely takes a public form.”¹⁰⁶ Though hidden in laboratories, out of the public view, these forms of life also require public understanding and consideration.

NoArk bears strong reference to a historical cabinet of curiosity, in this case a 'collection of unclassifiable sub-organisms', hybridized via

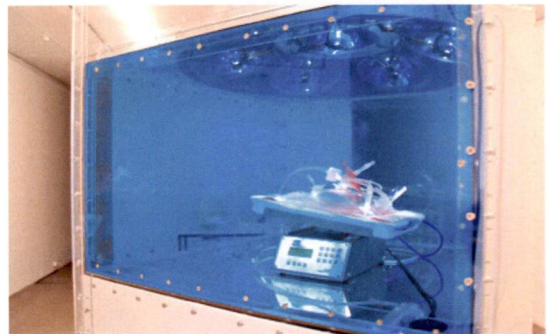
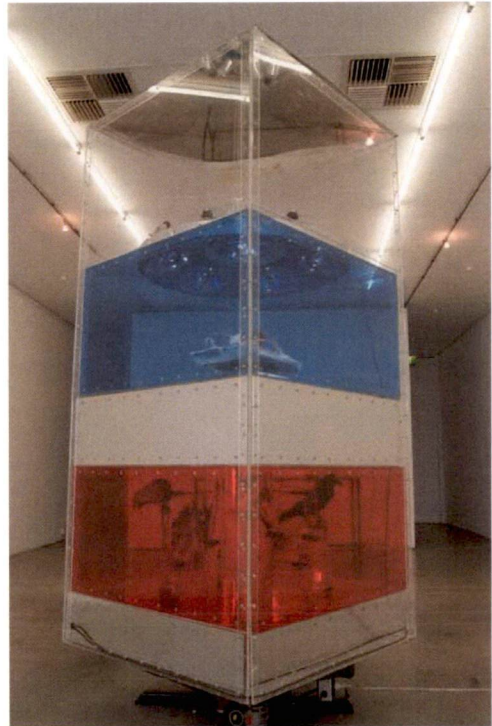


Fig 9 &10: TC&A, *NoArk*, 2008

¹⁰⁴ The two by two species mantra in regards to the two of each distinct species on Noah's Ark. This no longer applies in the *NoArk* ecosystem where all species have become hybridized.

¹⁰⁵ Still, Living website, viewed 9th October 2008,

<http://www.stillliving.symbiotica.uwa.edu.au/pages/artists/tcanda.htm>

¹⁰⁶ Ibid, viewed 9th October 2008

technological intervention beyond all point of recognition. The relationship between traditional forms of life (taxonomy specimens) and new life forms – tissue blobs - allude to a future in which organisms have no physical connection to the natural external world. No Ark's natural world, therefore, becomes a solely human family; "the social body that receives and responds to it".¹⁰⁷ TC&A present the future of life as human-centric in interest and ultimate control.

Rather than exploring the status of the animal organism within the realm of biotech developments, the work of Ken Rinaldo aims to put technological control back into the lives of non-human animals. His work is inspired by ideas related to *biophilia* - the need for living things to connect with each other.¹⁰⁸ Tentative, confronting, and laden with emotional engagement, his kinetic interactions employ technology as a tool for different organisms to engage. With a goal to enrich interspecies experience and communication his practice aims to mediate experience between humans and the natural world.

I first encountered Rinaldo's work through *Augmented Fish Reality*, exhibited at the 2004 *Biennale of Electronic Arts Perth (BEAP)*, *Same Difference*, in a biological art exhibition, curated by Oron Catts and Ionat Zurr of *SymbioticA*. The piece empowers the movements of Siamese Fighting fish, allowing them to control their individual fishbowls and to navigate their physical surroundings.

The work consists of six bio-cybernetic robotic fishbowl sculptures - seemingly ordinary fishbowls on individual wheeled metal stands. Each stand is delicately adorned with plants

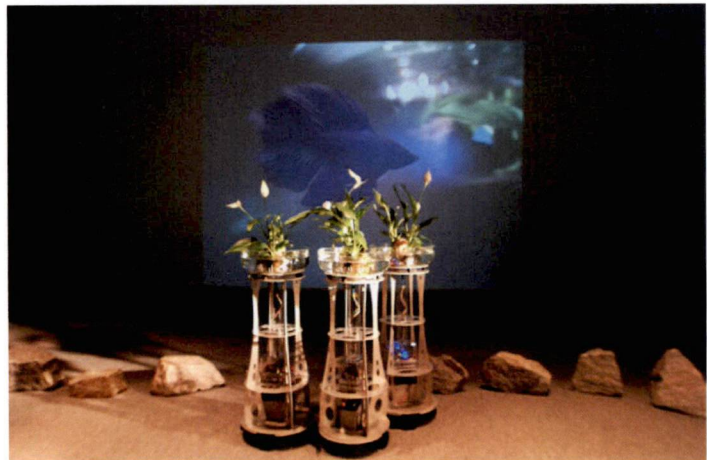


Fig 11: Ken Rinaldo, *Augmented Fish Reality*, 2004

¹⁰⁷ Vida 10.0 website, viewed 12th October 2008.

<http://www.fundacion.telefonica.com/at/vida/popUpPremiados/html/NoArk-en.html>

¹⁰⁸ *Biophilia*, as coined by sociobiologist Edward O. Wilson in Wilson, E 1986, *Biophilia*, Harvard University Press, New York.

base, amongst fine wiring. The use of infra red technology allow the fish to control the movement of their robotic habitats: “by swimming to the edge of the bowl the fish activate motorized wheels that move the robots forward and back and allow the fish to turn the robots to switch direction”.¹⁰⁹ Thus the fish are capable of controlling their movement within the room; to literally operate the fishbowl like a vehicle of transport, driving their vehicle around the room.

In providing these organisms with the ability to move and communicate in ways which we humans recognize and can relate to as some form of decision making or consciousness, Rinaldo illuminates and reconfirms our immediate proximity, relationship, and in turn, responsibility to other organisms and the natural world.

A further work by Rinaldo, the installation piece *autopoiesis*, presents a space for intimate, yet eerie, exchanges between humans and other life - in this case robotic-plant life. The kinetic installation involves the viewer in a kind of interactive



Fig 12: Ken Rinaldo, *Augmented Fish Reality*, 2004 (detail)

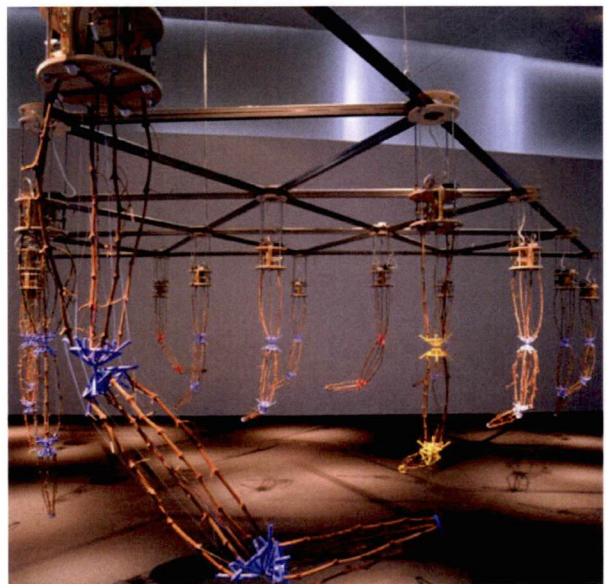


Fig 13: Ken Rinaldo, *Autopoiesis*

¹⁰⁹ Rinaldo, K 2004.

dance with the organic vines, encouraging a level of physical and psychological interaction between differing organisms. The work illuminates our immediate proximity to life and reminds us that we live in a natural world which is alive itself.

However, the inability of the viewer to communicate in a traditional sense with these highly active and seemingly aware organisms instils a sense of vulnerability in the viewer, through which the fear of 'otherness' becomes paramount. This is partly induced by a lack of recognition of a conscious being within the plant forms. This endows them with a presence which is eerie and unfamiliar. In this terrain, the physical relationship between the viewer's body and the plant forms appears to induce a heightened sense of embodiment, through proximity to an active, living form of 'otherness'.

The work of Chilean artist Marco Evaristti investigates both animal and human bodies and human attitudes towards them. His work invites contemplation on our responsibility for other living things - though from a human-centric point of view. Evaristti gained notoriety in 2000 for his controversial exhibit



Fig 14: Marco Evaristti, *Helena*, 2000

Helena, at the Trapholt Art Museum, Denmark¹¹⁰ in which gallery viewers were invited to kill goldfish by pressing the button on live blender 'fish tanks' the fish were held in. While the tension of the exhibit may have held more power if the blenders (unbeknownst to the viewer) had not been turned on, *Helena* does force us to consider an action which, somewhat mediocre in the scope of the atrocities

¹¹⁰ Following complaints from viewers, Museum director Peter Meyer's was charged with, though later acquitted of, animal cruelty as it was ruled that the fish died instantly, and therefore humane. Washington Post 19th May 2003, viewed 13th January 2007, <http://www.washingtonpost.com/wp-dyn/articles/A10216-2003May19.html>

inflicted upon animals by humans, is reflective of wider views on relationships to animal life.

Evaristti's work also encompasses the use of his own bodily materials. For example, in 2007, Evaristti hosted a dinner party performance *Polpette al grasso di Marco* (meatballs in the fat of



Fig 15: Marco Evaristti, *Polpette al grasso di Marco*, 2007

Marco) in Santiago's Animal Gallery. The main meal was agnolotti pasta, topped with a meatball made from the artist's own fat¹¹¹ which had been removed earlier in the year in a liposuction operation, and preserved in cans.¹¹² Evaristti asked his guests whether "The question of whether or not to eat human flesh is more important than the



Fig 16: Marco Evaristti, *Polpette al grasso di Marco*, 2007

result".¹¹³ This work addresses contemporary attitudes towards bodily materials and their social values.

¹¹¹ Evaristti produced 48 meatballs with his own fat, some of which would be canned and sold at \$US4000 dollars for 10. Sadowsky, T, viewed 10th June 2008, <http://www.evaristti.com/defaultF.html>

¹¹² News.com.au website, January 13th 2007, *Artist Cooks meal in own Body Fat*, January, viewed 24th May 2008, <http://www.news.com.au/story/0,23599,21052655-13762,00.html>

¹¹³ Ibid, viewed 24th January 2007

He describes the liposuction work as “a criticism of the plastic surgery industry”,¹¹⁴ stating “we consume other creatures and afterwards, for cosmetic reasons, we have a surgeon remove the visible signs of abundance”.¹¹⁵ The work suggests cannibalism as sacrament, as well as the commodification of the body through the art market. It also recalls the work by Piero Manzoni, *Artist's Shit* (1961), in which 90 cans of the artist's own excrement produced for sale, (at the then current price of gold) which brought focus on the role of the artist's body in contemporary art. The work has been described as the “results of a process of expropriation and regeneration of the artist's corporeality... [as] Manzoni offers his own body as an artwork, the vestiges of the transfigured body become precious relics”.¹¹⁶



Fig 17, 18: Marco Evaristti, Polpette al grasso di Marco, 2007

Evaristti's latest work addresses questions of the value of human bodily material after death, through his use of another individual's body. The artist plans to use the body of forty-seven year old prisoner Gene Hathorn, currently on death row, as fish food should the prisoner's release appeal be denied. The proposed exhibition will involve “a huge aquarium filled with hundreds of goldfish. Visitors would be able to feed the fish using food made from Hathorn's body”.

Though Evaristti's work claims to “raise awareness of the fact that there are people killed legally in our Western civilization,”¹¹⁷ Evaristti callously comments “I

¹¹⁴ Never yet melted website, viewed 30th May 2008, www.neveryetmelted.com/index.php/category/decadence

¹¹⁵ Sadowsky, T, viewed 10th June 2008, <http://www.evaristti.com/defaultF.html>

¹¹⁶ Pier Manzoni website, viewed 30th May 2008, http://www.pieromanzoni.org/EN/works_shit.htm

don't think his appeal will work, so if he is executed, we will ship the body to Germany, deep freeze it there and turn it into fish food... Visitors to my exhibition will be able to feed goldfish with it"¹¹⁸ Evaristti claims that viewers will not have to feed the fish with Hathorn's body, but if they do not, the fish will die – forcing people to confront their ethics in regards to the value of both animal life and human remains.

Of interest is the process of negotiation for the use of Hathorn's corpse. Although Hathorn has agreed to bequeath his body to Evarissti after death, US lawyers are doubtful of the body becoming Evarissti's legal property.¹¹⁹ This process is part of an ongoing effort by Evaristti to gain legal access to other dead bodies for use in his artworks, for example for his work *Ferrari Forever*, the artist has placed requests, on his website, for an individual to donate their corpse to be embalmed and placed inside a Ferrari.

Evarissti's use of a prisoner's body resonates with the use of executed prisoner Joseph Jurnigan's corpse in the Visible Human Project,¹²⁰ as well as the use of bodies in Gunther von Hagens Body Worlds exhibitions (discussed later in this chapter). The process by which these individuals obtain bodies, and the means for which they are pursued, reflect strong contemporary interest in addressing attitudes towards the significance of the human body and its components.

¹¹⁷ Bomsdorf, C. 2008.

¹¹⁸ Ibid

¹¹⁹ Ibid

¹²⁰ National Library of Medicine website, "The Visible Human Project[®] is an outgrowth of the NLM's 1986 Long-Range Plan. It is the creation of complete, anatomically detailed, three-dimensional representations of the normal male and female human bodies. Acquisition of transverse CT, MR and cryosection images of representative male and female cadavers has been completed. The male was sectioned at one millimeter intervals, the female at one-third of a millimeter intervals. The long-term goal of the Visible Human Project[®] is to produce a system of knowledge structures that will transparently link visual knowledge forms to symbolic knowledge formats such as the names of body parts," viewed 6th September 2007, http://www.nlm.nih.gov/research/visible/visible_human.html

Going in: biotechnology as a physical navigation of one's body

Artists have consistently engaged with ideas related to the visceral and political, which are disturbingly often one and the same. Inherent to working with bodily material, such as human cells and tissue through biological technology, are issues relating to the visceral, ritual and sacred nature of flesh. Contemporary artists Stelarc and Kira O'Rielly explore issues of embodiment primarily through the physical navigation of their own bodies. Their approach exemplifies William Ewing's statement that "the path to understanding of the larger social body – the body politic – lies in a fuller knowledge of one's own flesh".¹²¹

At the forefront of explorations into technology and the body is the Australian artist Stelarc. His practice, focused solely upon the human body, has moved through visceral body performance, electronic machine-like technological artworks and biotech art. The artist has consistently created challenging work addressing the relationship between the raw and the technological. Bodily ownership, autonomy and relationships between the body and psyche inform his practice.

Throughout the 1970s and 1980s Stelarc enacted many hanging performances, in which his body was suspended solely by fishhooks pierced through his skin, for example, the body suspension in which he hung naked, suspended 12 meters above the



Fig 19: Stelarc, Obsolete hanging performance

ground over a crowded intersection in Manhattan, New York. Stelarc described his motive as the desire "to explore the body's limits, as well as its future".¹²² The works involve manipulation of the body as a living organism, and in this way can be viewed as an early form of biological art. The performance works provide a

¹²¹ Ewing, W 1992, p335

¹²² Kazil, P, p3

solid grounding in his interest in manipulating the body to achieve heightened psychological states of embodiment. Through these performances Stelarc illustrates his preoccupation with bodily politics; as he states, “In this age of information overload, only physical commitment is meaningful... what is significant is not freedom of ideas, but rather freedom of form. Will society allow you freedom of form, freedom to tamper with your body?”¹²³

Stelarc’s work has also engaged with high tech robotics, including pieces such as *Third hand*, 2000 in which a robotic arm attached to his own arm replicated his movements. These machinic works dealt with an enforced symbiosis upon the body, invoking a power struggle between biology and machinic technology. Similarly,



Fig 20: Stelarc and Nina Sellers, Blender, 2005

Blender, 2005, presents the human body as liquid mass within a technological body. The work, exhibited at *Meat Market Gallery B*, North Melbourne in 2005 is a record of an intense process in which the artist and collaborative partner Nina Sellers underwent liposuction surgery to remove a total of 4.5 litres of subcutaneous fat from their bodies.



Fig 21: Stelarc and Nina Sellers, Blender, 2005

This ‘waste’ material¹²⁴ is housed in an industrial machinic casing, only associated with the body through its form which is “anthropomorphic in scale and structure”¹²⁵ – mimicking basic human body proportions. Like *NoArk*, the presentation of human bodily materials in

¹²³ Warr, T 2000, p285.

¹²⁴ The mixture includes 4.6 litres of subcutaneous fat taken from Stelarc's torso and Nina Sellers' limbs, zylocain (local anaesthetic), adrenalin, O+ blood, sodium bicarbonate, peripheral nerves, saline solutions and connective tissue. Stelarc's website, viewed 12th November 2008, <http://www.stelarc.va.com.au>

¹²⁵ Stelarc, viewed 12th November 2008, <http://www.stelarc.va.com.au>

Blender denies all reference to subjectivity; the individual is overridden by the body's biological contents. The way in which both works present organisms as a mass of liquid form, housed in a technological body, alludes to similar ideas of excess and proliferation of bodies for scientific commercial gain.

Unlike Evaristti's critique of the cosmetic surgery industry, *Blender* brings up issues about the legal obtainment of bodily waste material for the artists' own use, issues that Stelarc and Sellers claim to be the most important aspect of the work.¹²⁶ The work, then, stems more from a concern with body politics and ownership than with the medical industry through which it was created.

Stelarc's more recent biological creation, the *Extra Ear 1/4 Scale* project, 2003, is investigative of a purely biological microscopic body aided by



Fig 22: Stelarc, *Extra ear 1/4 Scale*, 2003

invisibilised technology.

A 2003 collaboration with TC&A, this piece involved growing a 1/4 scale replica of Stelarc's ear, using human tissue. The project was the first part of the *Extra ear* project, Stelarc's investigation of bodily architecture and excess through the addition of a body part which is neither functional nor required by the body to live. The re-

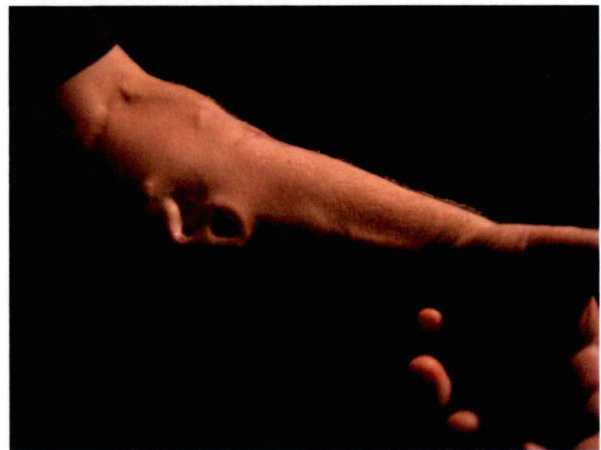


Fig 23: Stelarc, *Extra ear*, 2007

Stelarc alludes to the tissue economy's mass production of bodily material.

¹²⁶ Ibid, viewed 12th October 2008

Stelarc's history of interaction with technology provides a valuable charting of technological developments and the changing relationship of technology and the body over the last 30 years. His engagement with the internal biological body in the recent works is reflective of the global focus upon development of the cellular biological body.

As Gabrielle Giannachi writes "cells are the smallest but also most crucially politically strategic units of biological, corporate and social bodies...Within this economy, it is crucial that artists engage with biotechnological practices, and do so by foregrounding the complex ethics of what it means to 'perform' within a lab."¹²⁷ She continues: "bioartists such as Oron Catts, Stelarc and O'Reilly revolutionise our understanding of what an art object can be, aesthetically and ontologically, but also ethically, politically and philosophically".¹²⁸

I became introduced to the work of Irish-born performance artist Kira O'Reilly during my first visit to *SymbioticA*, at which time O'Reilly was Artist-in-Residence. O'Reilly is a performance artist who uses her body in visceral investigation of the political, sexual and animal to direct 'the impact and appropriation of technologies into a multi-layered discourse around re-conceptions of the body and embodiment'.¹²⁹ Much of O'Reilly's work brings together her body, animal bodies and intimate interaction with individual audience members through which blood is often spilled. Although O'Reilly's work is predominantly performance based, her concerns with culturing of human skin, her preoccupation with the human-animal relationship and the ritual dimensions of her work, form a strong connection with my own practice.

While at *SymbioticA*, O'Reilly undertook research project *Marsayas – running out of skin* 2005. The project drew upon the ancient Greek myth of Marsayas who was flayed alive by Apollo. It fused the myth with aesthetics of traditional

¹²⁷ Giannachi, G 2006, "Kira O'Reilly", *Information Society Network*, viewed 8th May 2006, <http://foresight.stanford.edu:3455/3/98>

¹²⁸ *Ibid*

¹²⁹ O'Reilly, K 2004, p3.

lacework construction in a work which would cultivate O'Reilly's own skin tissue into a lacework of intricate flesh.

O'Reilly states that she uses her work to “disarm, problematise and contribute towards a re-evaluation of the body as site and as material as notions of the body's integrity, identity and presence/absence are destabilized beneath the impact of biotechnical destabilization”.¹³⁰

Whilst *Marsayas* never came to fruition, O'Reilly's research at *SymbioticA*, “with skin biopsies from newly dead pigs in preparation to work from a biopsy of (her) own skin”¹³¹ led to a durational performance piece involving physical engagement with an animal corpse at Newlyn Gallery in South-west England. *In the wrong placeness* (2005) comprised a peep-show-like booth, kitchily decorated with a taxidermy swan and plastic flowers, that were installed to allow individual viewers to observe the artist lying naked on a bed and performing “a slow crushing dance with a pig”¹³² corpse bought from a local abattoir. This highly emotive, visceral and eroticized performance, involving “unexpected fantasies of emergence and interspecies metamorphoses”¹³³ climaxed with O'Reilly



Fig 24: Kira O'Reilly, *In the wrong Placeness*, 2005



Fig 25: Kira O'Reilly, *In the wrong placeness*, 2005

opening the chest cavity of the pig and

¹³⁰ O'Reilly, K 2004, p3.

¹³¹ Smith, R 2006, 'Art...or pig sick?', *The Daily Mirror*, 18/08/06, viewed 10th December 2007, <http://www.thedailymirror.com>

¹³² Ibid, viewed 10th December 2007

¹³³ Ibid, viewed 10th December 2007

plunging inwards. She elucidates, “when I cut pig I have an urge to delve into the belly, to meld into her warm flesh, my blood and her blood for a moment at the same temperature”.¹³⁴

Dr David Houston Jones views *In the wrong placeness* as,

“a striking challenge to the subjection of bodies which takes place in biotechnology...instead of being viewed as lab animals, as pieces of flesh to be dissected, these are compellingly, although ambiguously, valorized”...¹³⁵ “When Kira holds the pig in her arms before entering the chest cavity there is a suggestion of compassion, even of reparation to the dead animal.”¹³⁶ *In the wrong placeness*, perhaps, represents the ‘intermediary’ being which Agamban theorises, inhabiting a space between species, ‘in which the human is contaminated by the attempt to exclude the animal, the other, the alien presence of homo sacer’¹³⁷.

One element that links the work of Stelarc and O'Reilly, and which this investigation also draws strongly upon, is that their practices derive from an almost primal ritualistic understanding of the body through direct exploration of its viscosity and boundaries. Both artists use their bodies and the bodies of others (tissue and cell lines) as a tool to induce an emotional and/or psychological ritualised experience. Particularly in his earlier obsolete body suspensions, Stelarc was heavily focused upon exploring the relationship between body and psyche, using deep meditation to engage in an act of extreme physical pain.

O'Reilly's practice, however, engages more heavily in a navigation of the body through a sexualized viscosity, which produces an exchange of heightened intimacy between artist and viewer. Further examples of this are O'Reilly's performance *Quiver (Pieta Performance)* in which the viewer is invited to be held in O'Reilly's naked body in a pose reminiscent of Michelangelo's sculpture of

¹³⁴ Ibid, viewed 10th December 2007

¹³⁵ Houston Jones, D 2006, 'Kira O'Reilly', *Information Society Network*, viewed 1st June 2006, <http://foresight.stanford.edu:3455/3/98>

¹³⁶ Ibid, viewed 1st June 2006

¹³⁷ Ibid, viewed 1st June 2006

Christ *La Pietà*, and *Close/d* in which the viewer is invited to sit intimately with O'Reilly and cut into her skin with a razorblade.

In the text *Inscriptions and body-maps: representations and the corporeal*, Grosz argues that “consciousness is an *effect* or result, rather than the cause of the inscription of flesh and its conversion into a social body”.¹³⁸ While Grosz’s context for this relates more to a sociological point of view, taken literally it can be applied to the notion that direct visceral experience of the body reinforces one’s consciousness of the body’s existence.



Fig 25: Kira O'Reilly, *Close/d*, 2000

¹³⁸ Grosz, 1990, p63

Excess and consumption of the body

The bio-politics involved in biotechnology are complex and at times contradictory. While there are seemingly endless possibilities for the improvement of human life (that is, a particular socio-economic sector of human life), these improvements do not come without a cost. As Waldby has relayed, the bearers of the biotech industry and its success cannot only be found in various laboratories, factories and farms around the world, but are also in the shanty towns of developing nations. A percentage of reproductive and human centred genetics involves bodily material of socially outcast people – ironically it is these people who are generally excluded from the benefits the technologies bring.

An example of this type of concern is evident in the work of Gunther von Hagens, who has been reported to use body materials of unknown origins in his displays of the human body, in varying degrees of dissection. His activities, which he describes as a marriage beyond art and science, exemplify a mix of aesthetics and commerce.

In 1977, during his time as a researcher at the University of Heidelberg, von Hagens developed a unique method of preserving cadavers, now referred to as 'plastination'.¹³⁹ As the result of his international touring *Body Worlds* exhibitions and a TV Documentary series, he has all but become a household name. Each exhibition displays hundreds of dissected human corpses of men, women, children and animals in lifelike poses that mimic characters from Hollywood films. An example is a setting from the James Bond Film *Casino Royale* (2006) in which figures appear to be smoking, with cigarettes in mouths, posed around a table of playing cards.



Fig 26: von Hagens with a body specimen

¹³⁹ Plastination (a process involving fixation and dehydration and forced impregnation and hardening of biological tissues; water and lipids are replaced by curable polymers (silicone or epoxy or polyester) that are subsequently hardened. Online Dictionary, viewed 21st 12 2008, <http://wordnetweb.princeton.edu/perl/webwn?s=plastination>

Body Worlds has led to 'spin-offs' being produced and toured internationally. The abundance of these body exhibitions heralds the question of why so many are needed, and why these plasticized bodies are continually being produced. While it is claimed that there is high demand for plastinated bodies for use in medical education, specimens in *Body Worlds* exhibitions attract high financial profits, making the body factory business a very lucrative venture. Although described as a "socio-political revolution... bringing anatomy again to the people",¹⁴⁰ these events are not providing free, or even affordable public education. With an estimated twenty-five million¹⁴¹ visitors to the *Body Worlds* exhibitions, income from entry fees lies in the hundreds of millions of dollars.



Dubbed Dr Death,¹⁴² van Hagen also operates plastination centres in the low socio-economic regions of Kyrgystan, Bishkek, and in China.¹⁴³ At the small German town of Guben the host of his latest body factory, von Hagens met with a small yet firm level of resistance, with one resident claiming, "This is a place where human body parts are exploited as if they are commodities,"¹⁴⁴ a sentiment reinforced by the fact that, in addition to the body exhibitions, von Hagens does sell some of the bodies that are donated to him.¹⁴⁵

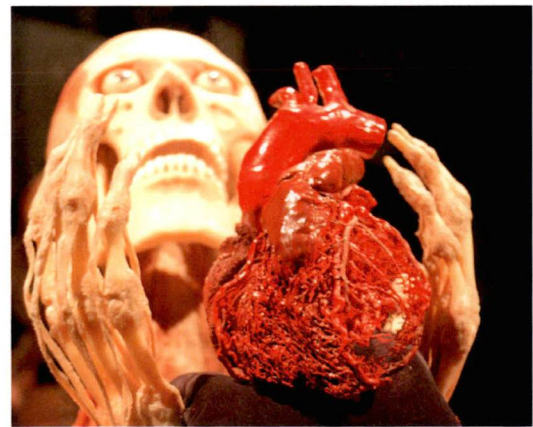


Fig 27, 28: Body Worlds specimens

¹⁴⁰ The Guardian Newspaper website, viewed 12th December 2008, <http://www.guardian.co.uk/education/2001/may/20/arts.highereducation>

¹⁴¹ The Corpse Show Industry website, viewed 17th December 2008. <http://www.corpshow.info/The%20Corpse%20Show%20industry.doc>

¹⁴² by the newsmagazine *Der Spiegel*, Bhatti, J 2006.

¹⁴³ Bhatti, J 2006.

¹⁴⁴ Ibid

Although von Hagens publicly claims that all of his bodies come from consenting donors, when asked directly he confessed that he “had stopped using bodies from a mental institution in Siberia after question marks were raised over whether consent had been properly given by the patients.”¹⁴⁶ Von Hagens also “uses unclaimed corpses provided by public welfare agencies”,¹⁴⁷ individuals who obviously did not consent to their bodies being used in the exhibits. A spokesperson for the *Body Worlds* exhibitions, while confirming that all of the whole bodies in the show were legally accounted for, also stated “I can’t say that of all the individual organ specimens. They come from all over the place”.¹⁴⁸ These practices lie in outright contradiction to the image that von Hagens presents of himself as a saviour, and brings into question his own ethical standards and motivations.

“When asked who owns the plastinated bodies von Hagens responds that he does, because he uses his technique to transform the natural entity”¹⁴⁹ of the body. He therefore uses the same premise of body ownership as dictated by body property law, in its focus upon the transformation of the body into a new entity, and its’ potential for commercial gain.

Von Hagen’s work has been attacked for ethical misconduct for a number of reasons, one being the sheer multitude of body factories he runs. Despite the claims of body part production for medical Institutions, the encouraging of body bequeathing for ‘educational’ entertainment at a time in which organ donations are drastically in need is arguably unethical.¹⁵⁰

¹⁴⁵ Connolly, K; Harris, P 2002, ‘World trade in bodies is linked to corpse art show’, The Guardian website, viewed 12th December 2008,

<http://www.guardian.co.uk/world/2002/mar/17/paulharris.kateconnolly/print>

¹⁴⁶ BBC News Online website, viewed 15th October 2008,

<http://www.news.bbc.co.uk/1/hi/entertainment/arts/1887976.stm>

¹⁴⁷ Andrews, L 2001, pp126-127

¹⁴⁸ Connolly, K; Harris, P 2002, op cit, viewed 12th December 2008

¹⁴⁹ Andrews, L; Nelkin, N 2001, p127

¹⁵⁰ His practices have been subject to continual investigations regarding the origins of the so-called donated bodies he has sourced: In 2001 he ‘was accused of using a body from a Russian prison camp’. In 2003 he ‘appeared before Kyrgyzstan parliament to answer charges of obtaining bodies illegally from central Asian state hospitals and prisons’. In 2004 in Germany he ‘faced allegations of tax evasion, falsifying credentials and using the bodies of condemned Chinese prisoners without their consent. Bhatti, J 2006

In his defence von Hagens denies all allegations of unethical behaviour. He claims “the goal has always been to use the corpses as an instrument to increase awareness and knowledge and anatomy. We are trying to democratize anatomy”.¹⁵¹ However, regardless of ethics and doubt about the origins of the bodies, the large audience numbers worldwide illustrate a continuing fascination with the internal body. The desire to gain some understanding of the body, if only on a visual level, outweighs the general public’s interest in the ethical implications surrounding bodily material

¹⁵¹ Ibid

CHAPTER THREE – PART ONE: ISSUES, METHODS AND MATERIALS

Chapter Three is organised into three parts. First is a discussion on processes and events involved in obtaining laboratory access and ethics approval, as well as an outline of materials used throughout the project. Part Two includes descriptions of all works submitted for examination. Part Three outlines other works created throughout the project. The chapter concludes with an analysis of outcomes.

From Embryonic Beginnings

Upon my return to Tasmania to commence my PhD, I negotiated access to the University of Tasmania's (UTAS) School of Medicine's Pathology Labs, under the supervision of Associate Professor Gregory Woods¹⁵².

I first began culturing cells over very small glass forms¹⁵³ reminiscent of globular growth nodules. I used *he_la* cells to culture, as I wanted to create work focusing on Henrietta's story, which was firmly implanted in my mind. I also began with these cells because I was confident about using them from previous work undertaken at *SymbioticA*.

Growing my own tissue

While working in the *UTAS School of Medicine* with the *he_la* cells I was also in the process of consultation with Associate Professor Woods about my intention to apply for ethics approval for a project involving my own primary skin tissue.

I first received ethics approval to culture my own tissue through the University of Western Australia (UWA). The ethics application was a sub-project of previous *SymbioticA* resident Kira O'Reilly's project (see Chapter Two, Part Two), involving the culturing of her own skin cells into a lacework pattern. It became problematic to relocate to Perth to carry out the project there, so I later lodged an ethics application to The University of Tasmania's Human Research Ethics Committee,

¹⁵² With a support letter from *SymbioticA* and after attending a Health and Safety seminar, and participating in a supervised run through of basic tissue culture techniques I was able to access the laboratories.

¹⁵³ These glass forms were created by Mike Brandon, the UTAS Chemistry Glass Technician.

using the previous UWA approval as a precedent. My ethics application was approved by UTAS on May 4th 2006, allowing me to access my own skin tissue, via a biopsy, to be cultured into sculptural form.

I was however, unable to access the expertise to learn how to successfully grow the tissue in Tasmania. As such I began experimenting with similar methods witnessed at *SymbioticA*, of growing pig tissue from a butcher. Attempting to culture the pig tissue made me think about the process of growing tissue culture as an act of re-animating 'dead' tissue, or tissue that is thought of as being dead. This tissue can be a waste product or a commodity, depending on how it is viewed, and used. This relates directly to my ideas about the extended body existing in a state in between living and dead, in a new and so far undefined category, as well as the strong links between flesh and ritual.

I later undertook a one month Residency at *SymbioticA* to learn specific primary tissue culturing techniques, in preparation for culturing my own tissue. During this time I used mouse tissue left over from existing experimentation. The Residency equipped me with the knowledge and skills to competently culture primary tissue. Upon returning to Hobart I carried out the culturing of my own primary tissue, taken from my thigh via biopsy by a local Surgeon who wishes to remain anonymous.

Accessing hospital patients' tissue

My ethics application to UTAS also included a request to undertake a project involving the use of excess bodily tissue from existing surgical patients at The Royal Hobart Hospital.

Access to hospital patient's tissue was organized through a step by step process in which each prospective patient would be met, individually, to discuss possible donation. Following a patient's consent, the leftover tissue from their medical testing/surgery was to be donated to me, for the purpose of tissue culturing into sculptural forms.¹⁵⁴

¹⁵⁴ I was very interested in the process involved in gaining ethics approval for an activity of this kind; namely, whether an ethics board would approve a project of this nature, given the level of focus on

My intention to culture together tissue of different persons also addressed the idea that the individual is overridden by the biological. Also relevant is the fact that once cells have entered into another 'body', or in this case have been cultured with cells from another body, they are visually indistinguishable from each other. In this way, growing the cells of a person outside of themselves encourages an extended and external notion of self and embodiment, which expands beyond the idea of a fixed individual form, and melds individuals with the bodies of others.

Animal relations

The ethical complexities involved in engagement with biological technologies and the creation of biological art has at times brought me extremely close to walking away from the field entirely. My reasons for first engaging in biotech stemmed from my ethical interest in the human-animal relationship, and it is this element of the non-human animal which I have found consistently frustrating. My first hands-on bioart piece did involve non-human animal material, in the form of Mouse 3T3 Cells, a generic Mouse Cell line. While uncomfortable with this aspect of the work, the inclusion of the animal component was a result of limited time and experience, and following the conclusion of this piece I was determined that I would not work with animal material again. The reason for this is the issue of consent. To put it simply, humans can give their consent for use of their material, while non-human animals cannot. This project set out to engage with the human-animal relationship through biotechnological practices in a way which was ethically sound in relation to non-human animals. I approached the concept of ethics in relation to the body within a framework of informed consent. As it is not possible to obtain informed consent from a non-human animal I found the prospect of using living animal material in my work to be unethical. With this resolve in mind I set out to engage with the issues surrounding the human-animal relationship through biotechnology via the sole use of human materials. Throughout my engagement with life sciences, through tissue culture techniques,

the individuals involved. The level of subjectivity involved in the identification of patients, and the level of risk and pain involved in the procedures, for an outcome which is 'artistic' would present an interesting challenge for the ethics committee.

it soon became clear that separating the human from the animal in biomedicine was next to impossible.

As a result, I began to move away from a direct focus on the human-animal relationship, choosing instead to address the topic of the human body and its psychological relationship with other animals and the wider environment within a framework of biotechnological intervention. I began to work solely with he_la cells - a human cell line - (with its own complex ethical situation, discussed within the Introduction), and began to orchestrate projects involving human tissue from individual consenting patients, including myself.

My experience and feelings in relation to animal materials became most heightened during my residency at *SymbioticA* in October 2007, the purpose of which was to learn the process of growing primary mammal tissue – i.e. tissue taken directly from the body – in preparation for the culturing of my own tissue.

In order to learn primary tissue culture techniques I needed to practice on fresh tissue. The tissue I used was from the carcass of a mouse that had been freshly killed for research. I took the carcass and I dissected the front arms to isolate the muscle tissue, from which I successfully cultured fibroblast cells.¹⁵⁵

The use of animals in scientific research is an issue I struggle with because of the complex issues involved. I think it is a positive action to constantly assess my ethical viewpoint, and feel that if a time comes when I am not questioning my ethical viewpoint throughout these projects, that is the time I should stop engaging with human tissue culturing. I felt that by using the animal carcass in this instance, I had become complicit in the entire process of institutional animal experimentation, which made me extremely uncomfortable, and I resolved against using animal tissue in this way again.¹⁵⁶

¹⁵⁵ Fibroblast cells form scar tissue. For further explanation see the section of scar tissue in part two of this chapter.

¹⁵⁶ I realize there is a contradiction here with the use of the he_la tissue, as the donor did not give consent for her body to be used in this way. However, this is a contradiction I am prepared to live with, and justify by directly addressing the issues of consent in works involving the he_la cells.

While this may have seemed an easy decision to make, it by no means removes me from the actuality of using animal materials in my work. Many of the materials involved in the maintaining of cell life contain non-human animal derivatives. For example, the nutrient solution which provides the nutrition for the cells to grow in usually contains 10% Fetal Calf Serum (FCS), while trypsin, which is used to separate the cells from their adherence to the base of the flask or vessel in which they are growing, also contains animal derivatives.

In the mid stages of the project I investigated the possibility of deriving serum from my own blood, so that I would be feeding human cells with human rather than animal material, however, it was too problematic in regards to health and safety issues. Viewed in this way, the processes of tissue culture in which human cells are fed with animal derivatives, directly reflect the general practice of the western world in which humans nurture their body with high amount of animal material.

Public Disturbances

Following the broadcasting of a feature story of my work on *Triple J* radio, I was approached by ABC TV journalist Nisha Harris for a possible television story. Events following our contact resulted in a scenario which gives insight into the controversial place of biotechnology in society. The publicity had substantial ramifications for my project.

Harris filmed *On and on while you're gone...* in my studio, accompanied by visuals and audio in which I spoke about the process and motivation behind the work. Footage of myself fixing and staining the he_la tissue which I had cultured over glass skulls followed. After filming in the Medical School, Harris contacted a Royal Hobart Hospital (RHH) spokesperson for comment on their involvement. The RHH point of contact was unfamiliar with the project, and perhaps also thinking worst case scenario, in light of the simultaneous stem cell debate, denied any involvement, deeming the project inappropriate. It was this angle that the news story focused upon.

The footage aired nationally on ABC TV on the night that the headlining story was the then Prime Minister John Howard's announcement of a 'conscience vote' on stem cell research for coalition M.P's (August 15th 2006). The two stories (my own and the stem cell vote) were connected by the newsreader, as if part of the same issue and as such, my story was coincidentally linked to the use of stem cell technology - obviously a highly contentious issue - which also drew attention to my work.

The Hobart newspaper, *The Mercury*, followed the television coverage with an article titled "Art gets under skin of tissue debate". The author wrote that my work had "sent authorities into a spin"¹⁵⁷ and reconfirmed the RHH's stance in relation to the project. RHH chief executive officer John Menzies stated "while we appreciate an artist's creative desire to use various and unusual materials in the creation of artworks, the Royal Hobart Hospital does not and can not authorise the use of human tissue or clinical waste for the purpose of or the use of such materials in art".¹⁵⁸ As a result of this apparent controversy, the project was never able to be brought to fruition as a biological artwork in Tasmania.

What was interesting about this, for me, was the implication by the ABC news story that the project was somehow unethical because the tissue was for use in artistic, rather than standard scientific research. This seems to indicate a blanket level of acceptance in the use of the body through science. It also implies a lack of interest in the exploration of ethical or cultural significance of those practices. The knee-jerk reaction from the RHH and mainstream media indicates a general level of misunderstanding and fear in regard to the use of biological technologies and dialogue addressing it. Use of these technologies and processes by an artist clearly blurs the line further and causes a level of anxiety and unease (an issue discussed further in chapter three).

Due to the RHH's withdrawal of support, I applied to the University of Western Australia to undertake the same project through *Symbiotica* (with Canadian artist and researcher Tagny Duff, who is co-collaborator in the ethics application),

¹⁵⁷ Paine, M 2006, 'Art gets underskin of tissue debate' *Hobart Mercury*, 17 August, p3.

¹⁵⁸ *Ibid*, p3.

though with one difference – tissue samples came from cosmetic surgery patients (from a Perth cosmetic surgery), rather than from public hospital patients.

Due to the difference in the process of recruitment of patients, it was arranged for the surgeon to approach those patients he thought would be suitable and interested in donating their tissue to the project. The surgeon had the ethics ‘Information Sheet’ and ‘Consent Form’ to show patients in question, so they could be fully informed of the project. Once the patient consented and signed the appropriate forms, I was contacted to organize collection of the tissue specimen, and the process of culturing the tissue could begin.¹⁵⁹ The tissue donor was also able to pull their donated tissue from the project at any point if time if they wished to, so while the tissue was in my possession it was still technically under legal control of the donor.

Other materials

In addition to the ongoing ethics issues and tissue culture engagement and experimentation in the laboratory, I was also experimenting with a range of non-biological materials and processes in the studio, which are outlined below.

Foam

Experimentation with foam (expanding foam, preformed foam animal armatures and Styrofoam) occurred throughout the entire project. Foam, in various forms, constitutes the basis of most sculptural forms submitted for examination. The use of expanding foam held particular resonance with ideas of growth and excess, through its natural tendency to form organic flowing globular structures. Through merging these globular forms with more recognisable form I found it possible to create objects which were in between a state of primordial blob and representational form. In this way they reflected a state of morphosis between a unified body, and a tissue fragment separate from the body.

Wax

Similarly, the fluid semi-transparent nature of wax was very appealing for the creation of organic looking object-based forms. Experimentation with wax occurred in the first twelve months of the project, though overall I found the

¹⁵⁹ See Appendix C for tissue culture processes and protocols.

resulting forms less visually successful. The temporal nature of wax was also problematic for the work, as I wanted to create stable object based forms. I found working in wax as an armature, and then casting into another material, such as resin, as was done in *On and on while you're gone...* was an effective way to resolve my issues with wax. As such there are no wax artworks included in the submission exhibition.

Glass

The use of glass is important to the project as a sterile armature over which cells can be cultured. As an armature for tissue culturing, glass is partly a laboratory necessity, and partly it is suited the conceptual underpinnings of some works. Materials to be used in the tissue culture process must be kept in a sterile environment in specific conditions, and those materials which have direct contact with cells must first be sterilized via autoclaving – a process which uses heat to clinically sterilize laboratory materials and equipment. This process means that materials such as glass, metals and industrialized plastics are most appropriate. However, I have chosen to use glass, as opposed to plastics or metals, because of its fluid nature - it is a material which is in constant motion and therefore in constant metamorphosis. Glass is an ideal material for navigating my conceptual interest in the transgressive nature of the body, due to its state between solid and liquid. Glass is also a material which can be easily sculpted and shaped by hand, as I have learnt to do over the past three years both in Australia and overseas.

In June 2006 I travelled to Europe to present a paper at *Close Encounters; The Fourth European Biannual Conference for Science Literature and Art*, held in Amsterdam. While in Amsterdam, I also had the opportunity to visit the Vrij Glas Foundation, an international research centre and laboratory for artists, designers and architects, whose purpose is to encourage experimentation and innovation in glass, and provide artists with key infrastructure and vital expertise.

At Vrij Glas I was introduced to basic hot glass techniques and created an array of fluid globular forms in clear hot glass to be used as armatures for tissue culture pieces upon return to Tasmania. I experimented with techniques including hot and cold working glass, as well as glass blowing, slumping and lamp-work. While

the forms created in Amsterdam were only test pieces, the engagement with glass resulted in further experimentation with glass objects, including the glass bones and skulls which are used within some of the works submitted for examination.

I also returned to Vrij Glas the following year to undertake a three month Residency in more intensive experimentation with hot glass techniques.

Flock

Flock has many visual associations including fur, moss and skin, which have been exploited in the object based sculptural forms. Surfaces of the animal based works as well as the more neutral forms, such as *Deep Deep Down* and *In the hollows of our hearts*, are layered with flock, blurring the line between animal flesh and organic plant matter.

Performance

Performance was integral to several works undertaken throughout the research. The experience of working with living tissue in the laboratory was paramount to the way I thought about and related to the body. As the project developed I became more interested in expressing this through exploring the living tissue in a direct and physical way. This engagement, as carried out through *HE BEING DEAD YET SPEAKETH* and (to a lesser extent) *Transformations of the Flesh*, set out to express a physical relationship with the bodily materials that the clinical atmosphere of the laboratory space negated. These performative dimensions of the project are discussed in greater detail in part two of this chapter.

PART TWO: WORKS SUBMITTED FOR EXAMINATION

An exploration of bodily form in its location between subject and object, living and non-living, waste and commodity is fundamental to this investigation. Inherent within these relationships are complex, layered and often contradicting forces, which bring into question the values placed upon differing forms of life.

The complex forces acting on the ethical dimension of human and animal are at the forefront of my interest in biomedical developments and technologies. Central too, are the ways in which bodies are controlled and manipulated under the guise of development, and the relationship between the body as subject and body as commodity.

Throughout this project my artwork has moved into new aesthetic and conceptual directions. There has been a distinct break with representational human and animal sculpture, towards more abstract forms that allude to a morphosis between elements of human and otherness; and between form and formlessness. While previously exclusively focused on the human-animal relationship, the work has come to address a broader relationship between body, tissue, object and space. Overall, the works created throughout this investigation deal in some way with experiences, processes, spaces and situation which involve a heightened awareness of how we inhabit our body.

The objects produced allude to unrecognized forms of life and unexpected forms of growth, paralleling the place of the augmented body in its capacity for abstract and sometimes continuous transformative growth within the current technological environment. The later incorporation of tissue cultured elements into sculptural forms infer this relationship.

Dominant in the work is an element of excess which has developed from my interest in tissue engineering technologies and is related directly to the field of stem cell and tissue engineering technologies. Melinda Cooper reminds us that these are “precisely concerned with experimenting with the body’s own capacity

for surplus growth”¹⁶⁰ in producing large amounts of bodily material outside of and in addition to the capacity of individual bodies.

Like the process of tissue culture, the works *I'm growing to love you; HE BEING DEAD YET SPEAKETH*, *Transformations of the flesh* and *Slip me some Skin*, relate to the idea of bodily realization through direct experience. The more figuratively based animal works, *Isn't that what life is made of*, *Cave Creepers*, and *Under the cover of our skin*, differ to this approach in my intent to sculpturally represent growth outside the everyday category of the living through representation of ruptured bodies. These sculptural forms are also specific to ideas surrounding the necessity of animal material use in tissue culture practices, and thus, the inseparability of human and animal in biomedicine. In a similar way, the performance piece *Transformations of the flesh*, is an exploration in awareness and understanding of *other* bodies, while *HE BEING DEAD YET SPEAKETH* seeks to engage the idea of the primal human animal within.

Under the cover of our skin

The making of *Under the cover of our skin* has spanned almost the entire length of the project. It was the first work begun on commencement of my candidature, and one of the last works to be completed, having undergone various transformations throughout its creation. The piece began as an exploration of the Quagga species, and the aesthetic issues involved in the dissolve and camouflage of species through biotechnological developments.

The Quagga is a close relation of the horse and zebra families which roamed the desert areas of Africa until complete extermination through hunting in the 1870s. Scientists at Cambridge University recently attempted to bring the Quagga ‘back to life’ through cloning DNA taken from the only surviving taxidermy specimen in the world. After proving unsuccessful, scientists are now interbreeding different zebras with less stripes, to create an animal which looks like a Quagga, although it will actually be its cousin, the Plains Zebra.

This issue of aesthetics in biological technologies, made evident in this case, is

¹⁶⁰ Cooper, 2006, p 186.

also echoed by scientists working in transgenics.¹⁶¹ A view of scientists in the field is that transgenic species are acceptable as long as the animal does not appear to be transgenic, but resembles their original species as closely as possible. This parallels xenotransplantation, practices. The general consensus of the British scientific community is that xenotransplantation is ethically and morally sound as long as the interspecies manipulation is not visibly obvious. As the Advisory Group for the Ethics of Xenotransplantation (AGEX) describes, the British Government takes the stance that “genetic modification (to pigs) is ethically acceptable, providing the pig...does not cease recognizably to be a pig”.¹⁶²

The first incantation of this piece existed as a full scale sculptural form of a horse/zebra hybrid, lying on its back, legs flailing in the air as if undergoing or experiencing some kind of physical transformation. I had planned the piece to have a hollow stomach, in which a fluid, transparent fleshy substance would slowly bubble out through small lesions on the surface. The final manifestation exists, however, as a ruptured and fragmented section of this form: a dissolving trophy piece testament to the fracturing of the animal form, frozen in a state of growth, dissolve, flux or decay.

The form comprises of artificial cellular beaded and flocked faux skin surfaces competing in flux over the ruptured terrain of the form. Through this the beaded surface shows stripes of the zebra seeping through in cellular form - as if from beneath the disguised surface. The darkness of the black flocking which festers at the base of the form denotes an ominous element to the work, alluding to the transformative nature of (un)dead or tumourous flesh.

The visual aesthetic of the piece, and its representation of rupture is explored further through the works *Isn't that what life is made of* and *Cave creepers*.

¹⁶¹ Of, relating to, or being an organism whose genome has been altered by the transfer of a gene or genes from another species or breed: *transgenic mice*; *transgenic plants*. The American Heritage Stedman's Medical Dictionary. 1995, viewed 10th September 2007, <http://medical-dictionary.thefreedictionary.com/transgenic>

¹⁶² Woods, 1998 viewed 27th April 2005, <http://www.psyeta.org/sa/sa6.1/WOODS.html>

These animal works which form the first stream of investigation allude to forms like growths and tumours that have a different status to other body parts because they are not considered to be living in their own right; they exist somewhere in between living and non-living. They are also very objectified, representational forms, and have come about in this way as a result of my issues with using animal materials in the Laboratory. Due to my un-comfortableness with using animal bodily materials in my work, the animal components in these works exist in representational form. I have presented them in highly recognisable animal forms, as I wanted to distinguish them from possibly being read as human. Through experience with tissue culture techniques I found it was difficult to engage in the technologies without the use of some animal derivative. Animals bred to be drained for their blood, which is syringed from their hearts while still alive, also exist in a status between subject and object, life and commodity.



Fig 29: Under the cover of our skin, 2005 - 2008

Cave Creepers

Similarly, *Cave Creepers* explores the breaking down of natural form and the distinction between bodies and species in relation to artificially induced growth and mutation. The work explores excess growth and flesh within the biosciences. The melding of the animal body with the tumorous forms seeks to blur the inside and outside of the body, as well as the self and other.

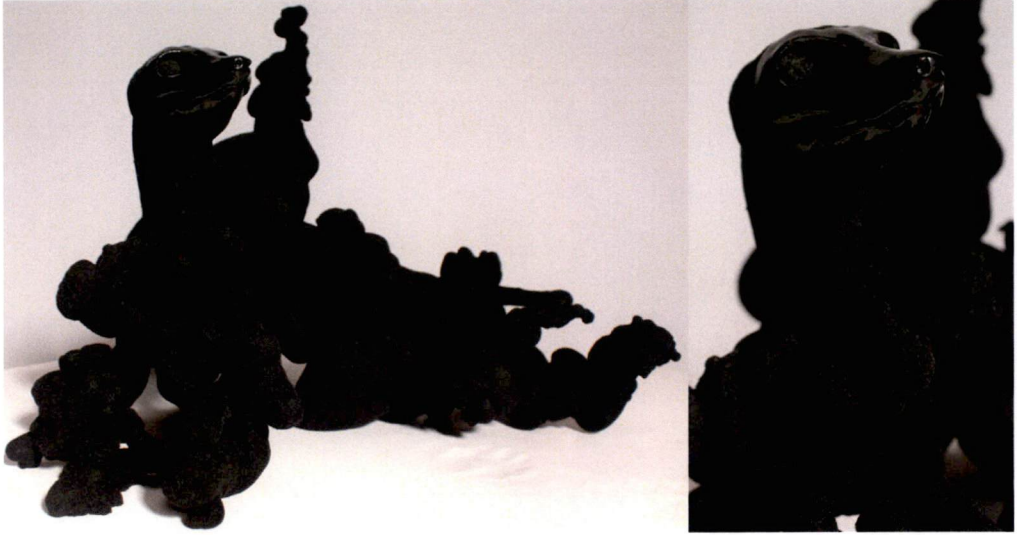


Fig 30: Cave creepers, 2008

The darkness of this work is quite important. The black flock focuses upon the dystopian in biological growth, alluding to growth of tumours, the lack of life or the growth of 'dead' flesh. The dark tumorous aesthetic of the work has also come about as the result of my interactions with animal bodily material in the laboratory. These interactions left me with feelings of unease about the ways that animals are used in scientific research. Having witnessed animals killed for their tissue, or infected with diseases in the name of human research left me with a pessimistic view. I wanted to present a view of these animals as blackened tumorous commodities in a state of static death - the living dead.

Deep deep down and In the hollows of our hearts

Deep Deep Down and *In the hollows of our hearts* were inspired by walking through the catacombs in Paris in 2005. The works explore the site of human remains in underground spaces, in this case referencing the cemeteries in subterranean Paris. In response, these works incorporate housings of tissue cultured bones in miniature grotto-like cave spaces. Through their combining of the dead (bones) with the living (tissue culture), they allude to the notion of undead – the state between life and death.

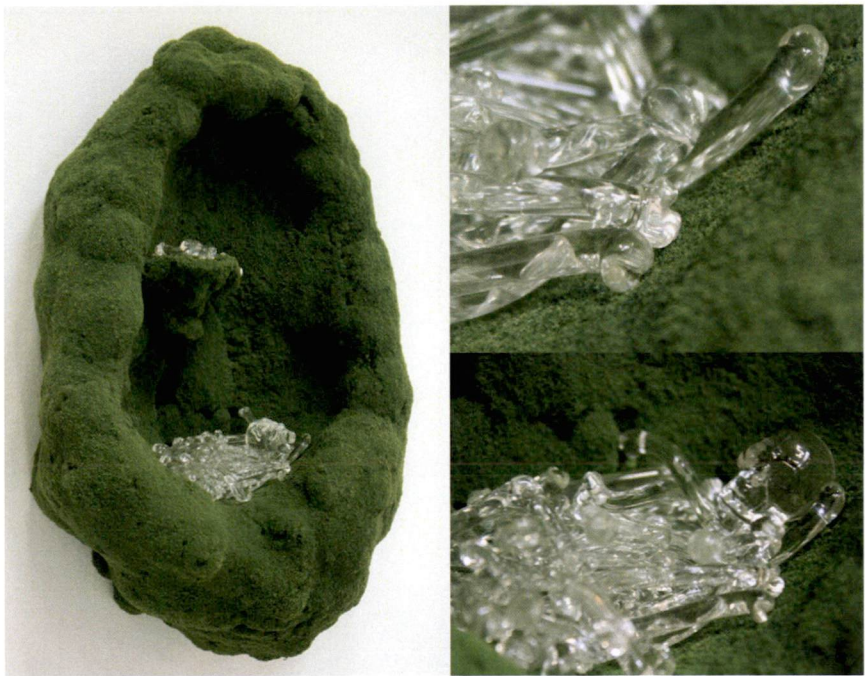


Fig 31: Deep deep down, 2007



Fig 32: In the hollows of our hearts, 2008

The works call to mind accounts of grave robbing and transactions involving body parts of natives, which have been considered to be kinds of trophies, in a similar fashion to those of hunted animals. However, contemporary body trade now no longer focuses solely on the procurement of the bodies of the dead, but also the materials of the living. The work also refers to the Lee Miller photograph *Prisoners with Human Remains, Buchanwald, 1945* depicting a group of prisoners standing around a large mound of human bones, presumably contemplating their mortality while awaiting their fate.



Fig 33: Lee Miller, Prisoners with Human Remains, Buchanwald, 1945

The pieces consist of tissue cultured cast glass skulls, and lamp-worked bones, nestled within miniature mossy grottos, constructed from foam and faux moss. As alter like grottoes, these pieces draw upon the ritual of tissue culturing itself, as well as the well established connotations of human relics such as flesh and bone having sacred properties. The small scale of the works is important. The viewer must come very close to the pieces to view the glass bones, and in doing so is forced into a moment of physical intimacy with the work.

The use of cell-lines in these works (the tissue cultured over the glass surface) is again specific to the conception of the cave – a living space considered outside of the every-day realm of the living, as well as the idea of the undead, invoked by

the tissue cultured bones. Cell-lines hold a fascinating conceptual narrative, because as cells which are essentially considered to be “undead”, they are located somewhere between the slippage of the living and the dead - outside the body, yet still a part of it; not quite the body, yet not really waste either. He_la cells (like many other human and animal cell lines) have the ability to divide an infinite number of times. They are altered – essentially programmed - to be immortal, unlike normal cells within the body which have a limited cell division and therefore a limited lifespan. Theoretically, given the right conditions, they will continue to grow forever. However, cultured cells and tissue within an artistic realm do have a lifespan. While in theory they can live forever as a cell line which continually replicates, as artistic forms they generally only survive until they have reached a conceptual or aesthetic objective. They then remain fixed, frozen in time, much like the tissue and body specimens displayed in anatomy museums.

The differing aesthetic in the works is indicative of my changing attitude towards the potential of biological technologies to bring forth positive change and development. I created *Deep deep down* through 2006/7. Its green moss surface, evocative of growth and life has progressed to ominous dark flock, devoid of life, as with *In the hollows of our hearts*, created at the end of 2008. This progression is reflective of a wider change in my attitude towards the use of bodily material in biotechnological developments, which resonates throughout the other works created.

On and on while you're gone

On and on while you're gone was first created for solo exhibition in September 2006 at *Linden Gallery, St Kilda Centre for Contemporary Art*. The work stemmed from ideas about organic growth and excess, and the commodification of human bodily material. Similar to the previously created works it incorporated organic forms that exist in the space between the categories of living and non-living. The intention of the work was to combine fluid abstract forms with elements of recognizable form, like antlers, to create a relationship between organic life and excess growth.

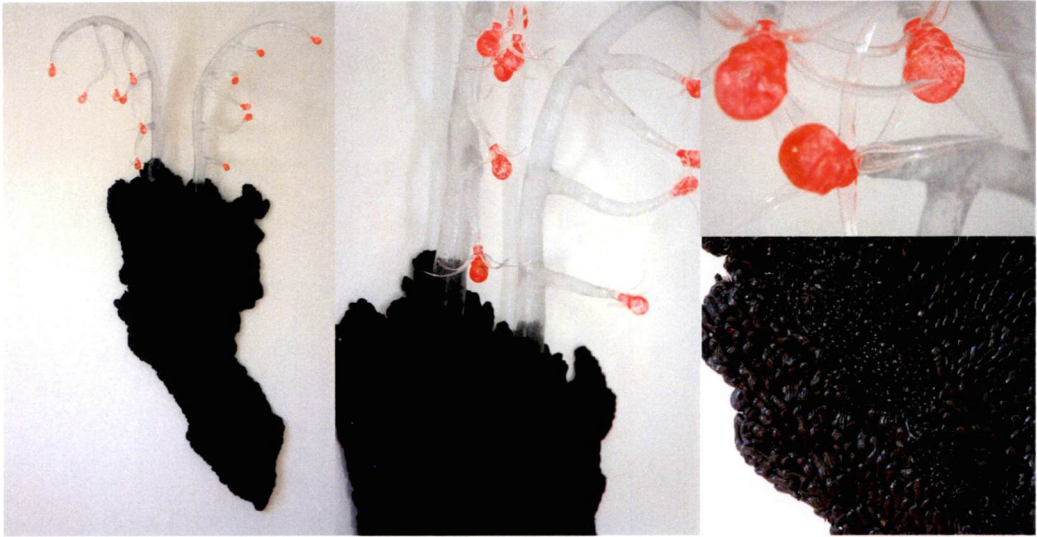


Fig 34: On and on while you're gone, 2006

The significance of the antler forms lies in their own categorization between life and non life. Although a part of the animal body which grows, they are thought of as external objects rather than the living body, and are often removed from the living animal, without hindering its functionality or completeness as an organism. Antlers metamorphose between being a 'felt' part of the body in the early stages of the animal's life, in which they are coated in a living skin, blood vessels and nerves intact. However, as the animal matures this skin subsides, and with it all sensitivity and connection to the receptive body is lost. Their visual placement outside the form and aesthetic of the body, as understood through flesh, also allows them to be easily translated to the status of an object.

The manifestation of the antlers in the work in the form of an object alludes to the body's ability to continue 'living' after death through technological intervention. At the tips of the antlers are miniature human skulls, over which he₁a cells have been cultured. In this way, similar way to *Deep deep down* and *In the hollows of our hearts*, the growing of tissue onto skulls also seeks to conjure notions of the undead.

This was the first work in which I chose to focus directly upon the story of Henrietta Lacks, and the commodification of her cells through the field of

biological science. In exhibition it was shown with a plaque which described the story of how her cells were obtained, and the associated ethical issues. As a resolved work it marked the beginning of a series using human tissue to explore issues related to the use of bodily material in biotechnological development.

The ephemeral flesh projects

The ephemeral flesh projects bring together works that incorporate primary tissue collected from living bodies: *HE BEING DEAD YET SPEAKETH*, *Slip me some skin* and *Transformations of the flesh*. Documentation of the process from biopsy to laboratory to cellular form is presented in *This is how we do it*.

He being dead yet speaketh

The title *HE BEING DEAD YET SPEAKETH* is an inscription found on the stone walls of the Multicultural Christian church located on Elizabeth Street, Hobart, which I walk past most days. The inscription frames a board featuring regular messages from God, usually in the form of a cryptic saying or proverb. This Christian notion of continued life or presence physically manifesting after death finds parallel in the readings of biomedicine's continuations of the body. In a way, creating works with he_la cells to tell Henrietta Lacks' story (as with *On and on while you're gone...*) draws direct parallels with the idea of the message board as a form of her post-mortem presence.

As inferred by the title, *HE BEING DEAD YET SPEAKETH* conjures notions of life continuing beyond the grave through alternative bodies or vessels, specifically transformation of embodiment and psyche within ritual. The work arose in part as a continued exploration of my relationship with my own body and self perception, as first informed by my facial surgery (as referred to in Chapter one). It is also a continued exploration of the conceptual relationship between the ruptured body and identity. Removal of my tissue for the purpose of tissue culturing was of great significance to me, as I wanted to explore whether it would further alter my perception of self.

On 18th March 2008 a local surgeon removed an elliptically shaped piece of tissue from my thigh (approximately 3cm x 1cm). The tissue was then taken

straight to the UTAS Medical School, where I spent the evening harvesting it. Once harvested into a liquid solution (minced to a pulp with scissors and separated via centrifugation) the tissue was placed in a vessel of nutrient solution and into the incubator to begin growing.

I had intended my fibroblast cells to be cultured over a three dimensional form, which would later be incorporated into a larger object based work - in a similar process used to create *On and on while you're gone...* However, the experience of working with my own tissue changed my approach: I no longer sought to create an object. The experience of the biopsy did affect my sense of embodiment, in that it re-connected me with my body in a very visceral and immediate way, however, the process of culturing my cells was less of the subjective experience I had expected. I felt disconnected from the tissue and compelled to engage with the cells from my body in a more direct way. The flask and the sterile hood in the clinical laboratory space created physical and psychological barriers that prevented me from a satisfactory engagement with the tissue sample.

To resolve the anxiety around this experience, I created the performance piece *HE BEING DEAD YET SPEAKETH*. In the performance, recorded on video, I re-anoint my body with my liquid tissue cells, using playful yet trance-like movements that draw upon rituals associated with bodily material seen in primitive culture and organised religion. To emphasize a sense of the ceremonial I wear an animal headdress inspired by the "supreme priest's" (aka the Pope) *mitre*¹⁶³. This headdress is a symbol of power and is made from blue plastic, a reference to the utilitarian surgical gown and the power invested in its wearer.

My body is coated in a layer of soft white fur (flock), mimicking the down of a newborn lab mouse. Covered in this metaphorical fur I am part human part animal. The trance-like atmosphere of the performance represents a primal reconnection to body and psyche through a form of ritual bodily sacrifice (the sacrifice of my liquid cells). In using the cells within the liquid of the nutrient solution I am also invoking a form of homage to the animal presence within the liquid - the Foetal Calf Serum (FCS).

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As I move I rub my body with the cellular slime in slow sweeping movement, rubbing it back into my body, through the pores of my skin. I wipe my face with the slime, in a gesture of self-cannibalism, and in doing so I recall the place of the tissue within the bloodlust of the tissue economy. As described by Waldby¹⁶⁴, modern day tissue economy's attitude to flesh links with that of primitive cultures, in which sacrificed flesh was consumed to take in the spirit of the dead and used as a protection against 'evils' such as illness and death.



Fig 35: Stills from HE BEING DEAD YET SPEAKETH, 2008

The video footage is edited to fragment the imagery, a reference to the way bodies are fragmented through tissue culturing. The visual style of the work, in which light blurs the body into the background of the space, alludes to a metaphysical experience of the body, as well as the slippery state of transition between body and extracted tissue.

Preoccupations with skin have existed since visual recordings were first created. Of lesser interest has been the layer beneath the skin, under which lies a substance enough to cover the whole body with a new outer layer. These are fibroblasts - the cells which form scar tissue, merging upwards from beneath the skin to fill the space which rupture has created in the body. It is these cells that are cultured in *HE BEING DEAD*

¹⁶⁴ Waldby, C; Mitchell, R 2006.

YET SPEAKETH.

The role of fibroblasts in scar tissue is as a substitute skin, keeping the body sealed from foreign bodies. The more the body is ruptured, the more fibroblasts proliferate to fill the space. The culturing of fibroblasts can be likened to the culturing of a rupture.

Like immortal cell lines, fibroblasts have the potential for excess growth, for example with keyloid scarring, which grows continuously through organic tumour-like protrusions, similar to those in sculptural works created in this project. As with the accidental cutting of flesh, the rupturing of the body through biotechnology results in an excess growth of bodily material – a proliferation of cell growth. In previous eras of lesser medical resource, the wounded body resonated with death. As James Elkins describes of the connotations of viewing the internal body - “the inside of the body is a powerful sign of death”.¹⁶⁵ In contemporary western culture however, with advances in medicine, imagery of the internal body now also relates to a potential for continued life, through the application of developing medical technologies, for example through organ transfers. When the internal body is revealed it no longer precedes certain death.

The act and process of tissue culturing induced a heightened sense of my own body and mortality. Similarly, the origin of my scar - the incision through which this artwork began - occurred in an event in which the physical inscription of the wound on my body heightened my awareness of being and contributed to a subjective experience of my physical body.

The inscription of the internal body on the external body is also a layering of the biological over the individual, the exact process which the objectification of tissue through biotech development can induce.

The issue of subjectivity arises in using tissue, and in tissue culturing. Tissue culturing itself is a process of nurture, a routine of continual feeding, cleaning and monitoring with the utmost care and commitment. Engagement with cells, especially those of he_la, that

¹⁶⁵ Elkins, J 1999, *Pictures of the body; pain and metamorphosis*, Stanford University Press, California, p109.

have a well-documented origin and history, form immediate connections with subjectivity and individuality. Awareness of subjectivity within the lab makes for a heightened experience of one's own body and subsequent relations to other bodies, both human and animal. By using primary tissue, the work reinforces the subjective in a generally objective scientific realm. The anonymity of the numerically coded, synthetically-coloured vials in which tissue is collected is challenged by knowledge of the origin of bodily materials, and hence knowledge of the individual. The use of my own body, my cells, was an important aspect of this project, as tissue used in research is generally prohibited from being publicly identified with its host body/individual.

By cultivating this tissue outside the body, the work also encourages an extended vision of embodiment, as compared to fixed bodily form.

Slip me some skin

The ethics application to use my own tissue in Tasmania also included approval to use excess tissue of patients undergoing surgery at the Royal Hobart Hospital. I later applied for ethics approval for the project in Perth, in collaboration with Tagny Duff who was also interested in working with surgical tissue. Approval through UWA was granted in early 2008.

In obtaining parts of peoples' bodies and growing them, the work sought to question and challenge the boundaries of body ownership. Considering that we are not legally able to own our own bodies or the bodies of others, I was interested to see if it was possible to own the fragment of the body that I had scientifically manipulated, be it from my own body or someone else's. Do I have the right to manipulate it, kill it, or financially gain from it? All of these things I am able to do to a fragment of tissue, but not to a whole living body. How much of a person's body would I have to grow for it to be considered their body rather than a waste material?

The resulting work, *Slip me Some Skin*, involved excess cosmetic surgical tissue taken from an anonymous donor. In doing so it involved a further exploration of the body, and its components as commodity. The work engaged with tissue from a less personal perspective than when I was working with my own body tissue. The result was an engagement with an unknown other.

The tissue specimen in this work was a piece of skin removed from the breast of a female donor. On August the 3rd at 6:00pm I collected the specimen from the hospital and took to the UWA *SymbioticA* Lab to harvest. Surprisingly, harvesting and culturing this tissue involved a much more heightened and subjective experience than working with my own body. The sheer quantity of tissue, its still warm temperature and its origins from another body contributed to an intense experience, which alienated me enough from it to firmly re-embody me within myself. The otherness I experienced with the donor tissue caused me to feel very connected with my own body.

Throughout the process of harvesting the tissue, which took approximately five hours, the repetitious actions of mincing it down (with scissors) and centrifuging began to make me question if I was a part of the conveyor belt of the tissue economy itself, mindlessly processing human tissue for absurd means. I felt the tissue should be with the anonymous donor, whose motives to be involved in the project I would never know. I began to obsess about her identity, and immediately felt I understood, on a basic level, a kind of psychological distress that organ recipients may feel. I imagined the incorporation of this tissue into my own body would have a strong impact on my sense of self.



Fig 36: Laboratory images, making Slip me some skin, 2008

I harvested enough tissue from which to grow an abundant amount of cells. The remaining tissue I used as armatures for the harvested cells by coating the tissue in a

layer of fibroblasts, thus sealing the outer tissue with inner scar tissue. In this way, sealing the skin tissue with fibroblast tissue, and the anointing of my body with my own skin cells (in HE BEING DEAD YET SPEAKETH) are both acts of inscribing the scientific body onto the literal, physical (social) body. This is achieved through the layering of the internal body onto the external body.

Two tissue forms were created from the donated tissue specimen – vampire fangs and a crucifix. In adopting popular iconography of vampire fangs I sought a playful form with which to engage ideas of the use and ‘consumption’ of human tissue through biotech and biomedical practices. In contrast, the

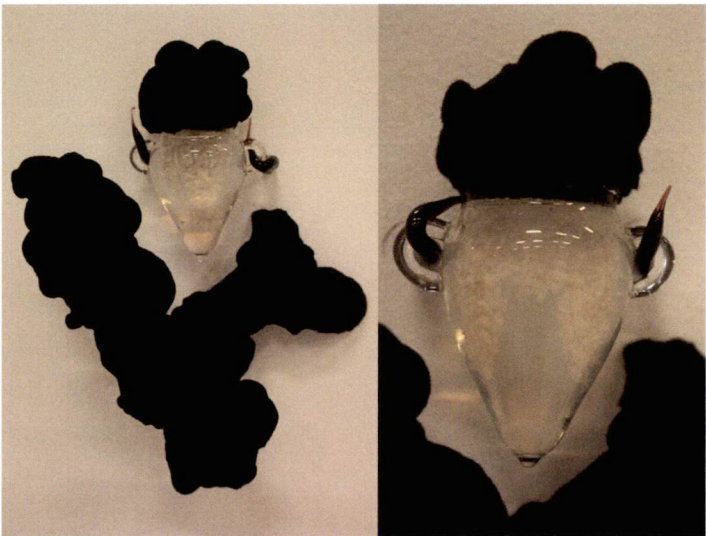


Fig 37: Human tissue amulets in Slip me some skin. 2008

crucifix alludes to ideas of ritual and sacrifice, a reading reinforced by the presentation of the tissue in glass vessels, reminiscent of ritual sacrifice vases and amulets.

The two tissue forms in glass amulets, also seek to recall holy water receptacles or reliquaries in sacred spaces. I chose to incorporate the glass vessels into a growth-like sculptural work, using the black flocked forms (as with previous works) to allude to ideas of growth, death and the ‘undead’. These ideas are reinforced by the video footage playing in the space behind them. The video comprises of animated footage of the tissue which I documented throughout the laboratory process. In the video footage, the tissue pieces are suspended in transparent agar, in a petri dish which is held upright, between my fingers. The forms appear to have a life of their own, as they rotate, flickering, between my fingers, morphosing between fangs and crucifix as if possessed.



Fig 38: Video stills in Slip me some skin, 2008

Although the work involves processes of life and growth, the cells inevitably end in death, in a transition of the body from a living subjective entity to a thing for the taking/growing/breeding for biomedical capital, or in this case, artistic form.

Transformations of The Flesh

In 2007, I was invited by curator Thea Mai Baumann to exhibit in a performative group exhibition *The Last Vestige* in Ho Chi Minh City, Vietnam. Baumann curated the exhibition to engage ideas of hybridity and mutation on a post-apocalyptic island – its form a junk boat, sailing down the Mekong Delta River towards a new world. I exhibited together with four artists - Alice Lang, Madeline Allen-Cawte, Madeline King and Vivian Hogg.

Each artist was allocated a cabin space aboard the chosen vessel, *The Hardship*, in which to create their installation/performance piece. The opportunity to exhibit in Vietnam presented a very alluring opportunity, however it also presented various difficulties which in turn largely determined the style of work. As Vietnam's postal system is quite unreliable, sculptural work is particularly difficult to send into the country, and was thus not advised by the curator. This led me to work with photo-based digital imagery, an effective means for combining the different aspects of my practice into one visual statement.

Transformations of the flesh, 2007, focused on the performative element inherent within the laboratorial creation of biological artworks, in which the experience of the process-as-practice is as integral as the artistic forms which result from it. The work involved a darkened cabin, lit only by small light-boxes hanging on the back wall. As the sole performer I was seated on a clinical white platform, covered, like the rest of the room, in clear plastic that glistened in the light.



Fig 39: Stills from *Transformations of the flesh*, 2007

The performance involved dissection, and therefore engagement with, the dead flesh of freshly killed frogs and squid purchased from the main food markets in Ho Chi Minh City. The animal corpses were visible during the entire piece, piled on top one another in a stainless steel ice bucket next to the dissecting trays. Being summer, the extreme heat acted on the smell of corpses as the ice melted, and the small size of the cabin intensified the smell.

Dressed as alter-ego, *Ladylump*, a hybrid human/animal visionary, I placed myself between the personas of executioner, gimp and scientist/doctor. The performance mimicked a public dissection, a practice that reached its height during the 1500s, in which human bodies, generally those of prisoners, were dissected in public locations as a form of post-mortem spiritual punishment and re-installation of public obedience, as well as education in human anatomy. Use of prisoners' bodies in medical experiments has a long history, As MacDonald states, "In Nineteenth-century London, those who were hanged for murder became the property of that city's Royal College of Surgeons"¹⁶⁶. Autopsies were thought of as a gateway to hell, a punishment that excluded the individual from eternal life in heaven. The practice still operates in contemporary culture, for example the body of 'Adam', used in the *Visible Human Project*, was Joseph Jernigan, a prisoner executed by lethal injection. His body was frozen and sliced into 1,878 pieces, photographed and converted into digital slides¹⁶⁷ for scientific purposes. There is also speculation that some bodies used in the Von Hagens' *Body Worlds* exhibits are those of prisoners.

¹⁶⁶ MacDonald, H 2005, p 11.

¹⁶⁷ Waldby, C 2000, p 184.

By appropriating this idea of public dissection, and switching the focus from the human subject to the non-human animal, I inverted the gaze and wonderment inherent in the public dissection of the human form to the animal body. I sought to generate a level of awe and compassion for the animal body, which is normally only afforded to humans.

Paradoxically, my role as authority figure highlighted ideas about obedience and control in relation to humans and the animal body, where the human is in a position of power. The work thus re-problematized the human/animal power play through reinforcement of it. Concealing my identity through costuming also emphasized the spectacle of the event, creating an aura associated with the somewhat 'mysterious' knowledge which scientific discoveries still maintain.

The performative element explored in this work is crucial to this doctoral project in two ways. First, the performance is the result of my physical understanding of the experience of the process of tissue culture harvesting; and second, it offers an experience that is subjective and personally accountable in relation to issues about life, death and living tissue.



Fig 40: Transformations of the flesh, 2008

The reference to death in the performative work is in direct opposition to the conceptual focus of the tissue cultured elements. While the tissue cultured forms are derived from living bodies and focus on the continuation of life, *Slip me some skin* uses the carcasses of deceased animals to reference a visceral and anatomical understanding of the mortal body. The future of the universal body may be fantastic in the face of scientific development, which seems to exist in a constant state of impending breakthroughs leading us towards disease free immortality, however, as Ewing describes, “ultimately each person has to confront his or her own corporeal reality. This discrepancy must

always be a source of great anxiety for the individual, because at its root is a certain knowledge of eventual death".¹⁶⁸

The disparity between the conceptual focus on life and the physical exploration of death provides a distinct contrast between the tissue cultured works, which are mainly composed of he_la cells, and the decomposing flesh of the animal carcasses. The final manifestation of the work exists as image printed onto Perspex; a cold-cut of meat, a slice of artificial, pressed, flesh.

¹⁶⁸ Ewing, 1992, p 17.

PART THREE: OTHER WORKS



Fig 41: Where do we come from/where are we going, 2007

Where do we come from/where are we going

The series of digital images *Where do we come from/where are we going*, were created in Vietnam alongside the performance piece *Transformations of the flesh*, also exhibited as part of *The Last Vestige*. These works were presented as small Vietnamese style light boxes, most commonly used to display religious imagery within the home. The light boxes were installed along the back walls of the space, forming the backdrop to the performance and providing a source of light within the space.

The individual images combine imagery derived from laboratory documentation, work-in-progress, non-living objects and scientific/medical/fantasy imagery sourced from the internet. This combination of real and imagined elements sought to heighten the playful aspect of the work, bringing it almost into the realm of a science fiction, or a fictional scientific experience that has been created

through them, while also tying in with the curatorial premise of *The Last Vestige*, exploring a fictional hybrid landscape.

The works can also be linked to surrealist theory and artwork through their fragmentation of imagery, in particular, imagery of the female body. The fragmented imagery involving placement of my body in alternate technological realms recalls Ewing's writing of fragmented imagery as "a new and potent metaphor for the turbulence and fragmentation of the machine age".¹⁶⁹ With intense focus today on advances in biological rather than machine technologies, this fragmentation of the flesh and subsequently the psyche, applies further to the tissue cultured artworks created throughout this project.

The friendly stranger

The friendly stranger is an exploration of the boundaries inherent within the human-animal relationship. This work addresses the mutual advance of humans and animals upon each other's environments: externally through urban developments, and internally, through the proliferation of new biological technologies which seek to amalgamate human and animal materials and bodies. Amidst the fervour of these developments the status of the animal becomes ambiguous, a strange and cumbersome embodiment of 'otherness'. With the evolving nature of these technologies we must remain aware of, and be prepared to face, the (friendly) strangers of our own creation.

The friendly stranger came about as a temporal public art commission by CAST Gallery and Hobart City Council for the 2005/6 Hobart Summer Festival, as part of a group exhibition titled *DOCKWORKS*, curated by Mish Meijers. For this exhibition, installed along the Hobart Waterfront, I created an outdoor sculptural form which lay somewhere between human, animal, and obscure flesh entity. The friendly stranger appeared as an apparition of sorts, a strange creature caught in mid movement, climbing from the river up the concrete wharf wall, one tentacle creeping onto the boardwalk. The creature appeared 'frozen', as if in an attempt to camouflage with its environment.

¹⁶⁹ Ewing, W 1992, p389.

Like a living body, composed of infinite cells, the creature was generated from thousands of cylindrical plastic cell units, applied individually in a process of scientific mimicry, a replication of life. As a paradigm for scientific growth and structure, these cells use a contemporary cell structure that alludes to the natural flesh of the human body but is undeniably synthetic and unrecognizable as either human or other. This piece was the beginning of my move away from purely representational forms to a more obscure aesthetic that involves the visual morphosis of form and lies somewhere between the fixed aesthetics of human and non-human animal.

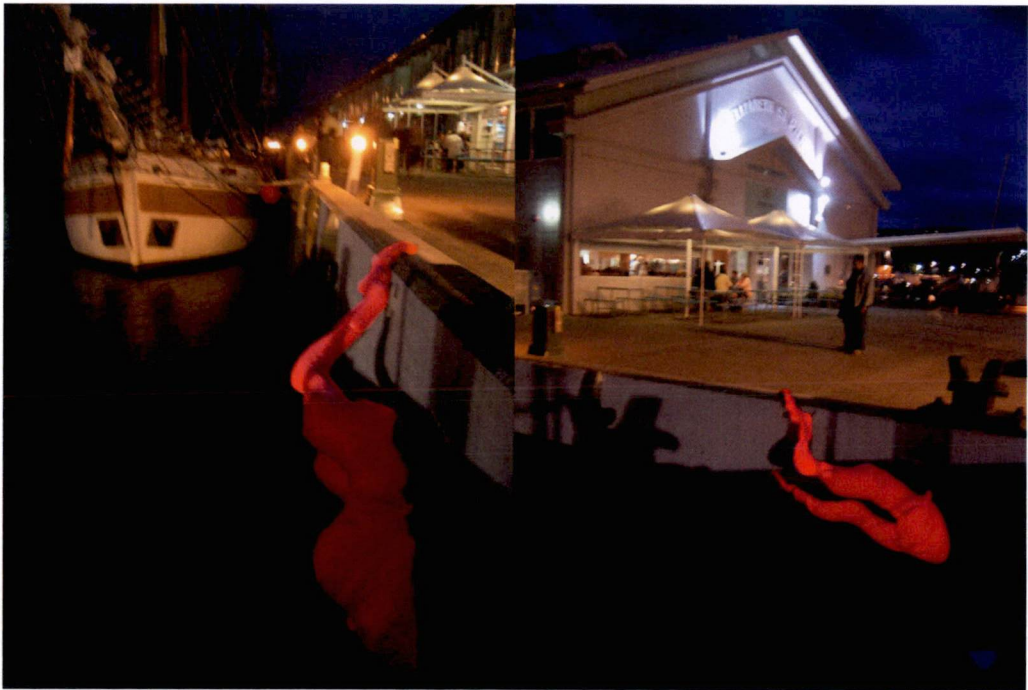


Fig 42: *The friendly stranger*, 2006, installation views

Unfortunately, during the festival the work was vandalized. A section of the resin and beadwork was damaged and ripped off the armature. Although I feel *Friendly stranger* marks an important part of the development of my work throughout this project, and was generally successful as a site specific work, in retrospect I think it sits outside the primary aims of the research. Its focus on human-animal relationships within an urban environment sits outside of the research focus upon the rupturing of the human body.

Isn't that what life is made of...

From beneath the grave the unravelling of the undead has begun. Sprouting undergrowth, a bubbling embryonic expansion emerges to reveal a mutant inhabitant? within. A molten growth of moss unearths a psychoactive emergence of the fledging hybrid...

As previously discussed, throughout this project the physical engagement with animal tissue and materials in tissue culture has continuously informed and shaped the work I have produced in the studio. *Isn't that what life is made of...* was my first resolved return to representation of the animal, after grappling for the most effective ways to deal with 'the animal' through less direct forms of representation. It also formed an aesthetic and conceptual link to *Under the cover of our skin*, most notably through the zebra stripe motif. Through working within the life sciences, the inseparability of human and animal materials became so evident that I could no longer deal with these as separate elements, even in a visual sense. I feel the physical inseparability of human and animal material through biomedicine is a fundamental aspect of human and animal life within our society and subsequent perspectives of what it means to be human.

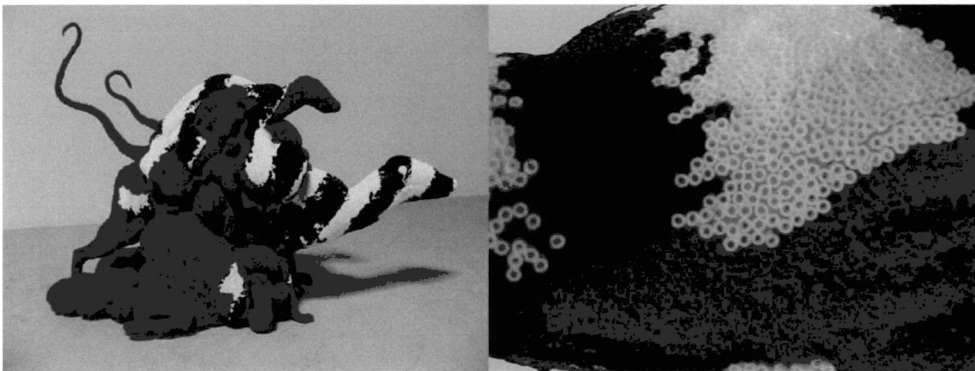


Fig 43: Isn't that what life is made of..., 2006

The inseparability of human and animal materials is also fundamental when thinking about developments in the life sciences which seek to avoid the use of animal material, such as alternative productions of meat as mentioned in my account of the TC&A Project's *Victimless Leather* (as discussed in Chapter Two – Part Two). The project reveals the inherent paradoxes of a future in which human life? is apparently devoid of the animal.

Isn't that what life is made of... was also an amalgamation of differing elements of previous work such as distinct animal form and fluid amorphous forms produced with foam. As such, the merging bodies and surfaces are also an amalgamation of those approaches and perspectives of the human, animal, and other, which I had been addressing in fairly separate ways.

I'm growing to love you

I'm growing to love you came to fruition in a solo show at INFLIGHT Gallery, Hobart, in early 2006, and was also the first substantial artwork I had made which broke away from the exclusive human/animal aesthetic and did not involve tissue cultured elements.

This installation piece took the form of a cave-like space, (approximately 5m x 3m x 2m) consisting of soft white walls overrun with stalactite like protrusions and sprouting organic growth-like forms within its far corner. As the viewer approached the entrance to the space, green bulbous forms could be seen on the far wall. On walking into the centre of the space, a heat sensitive mechanism acted on the bulbous forms which slowly changed colour from green to white, and dissolved into the surrounding hue of the white walls of the cave. On leaving the space, the heat activation ceased and the forms slowly turn to green, as if growing back.



Fig 44: I'm growing to love you, 2006

I'm growing to love you entailed my first experimentation with time based heat sensitive medium. The cave created a time based, heat reactive space, which utilized motion sensor technology to respond to the viewer's presence by activating hidden heat lamps which slowly heated the painted surface of the bulbous growth forms, dissolving the green heat sensitive paint as it did so, and revealing the layer of white paint beneath.

The cave space also acted as a life-size version of the work *Deep deep down*. The aim was to create a walk-in altar or grotto in which one could engage with other kinds of "life", in this case, the organic forms of reverie. The space created was organic like a body and also like an environment in which life may exist in unrealised or uncategorized form. The position of the body, extended through biotechnology, can be seen to parallel these forms of organic growth and "life". Just as abstract growths such as stalactites, and spaces such as caves where much life occurs, exist somewhere between the classification of life and non-life, so too, the place of the extended body exists in an undefined and uncertain limbo between body and object, life and non-life, value and waste.

Although *Deep deep down* is conceptually relevant to this project, as a site specific work it was difficult to recreate in the gallery for the submission exhibition.

Go Forth and Multiply

Go Forth and Multiply was carried out while in Residency at *The Arts and Genomics Centre*, Holland. The work involved infecting the tissue cultured skin of a miniature glass soldier figurine with the HIV virus through a process in which the infected cells turned blue, becoming visible to the naked eye.¹⁷⁰ The work was a

¹⁷⁰A he₂la cell line (TZM blue) that expresses the enzyme b-galactosidase when it is infected with HIV-1 was chosen as the appropriate source for visualizing the infection. When stained with a substrate including X-gal, the X-gal reacts with the b-galactosidase in the infected cells, causing the expression of a blue colour, which can be seen with the naked eye. Two glass soldier figurines were commissioned to a local glassmaker. The figurines were sterilized with 70% Ethanol, in the sterile hood and soaked in Gelatin over night, to enhance the cells adhesion to the glass surface. The following day the figurines were seeded with TZM-bl he₂la cells and incubated for four days. When the tissue had grown enough to be seen with the naked eye, the figurines were infected with approximately 3 ug of p24 HIV-1 and incubated for 3 days to allow for the infection to infiltrate the tissue. The nutrient media was then removed and the figurines were washed three times with PBS, and fixed with paraformaldehyde. The substrate was then applied to the figurines, and let develop

collaboration with Lotte De Witte, an immunologist at the *Vrij University*, Amsterdam, and Eden St James, an Australian artist who is HIV positive. Initially the intention was to use St James' own viral material in the work, however due to health and safety issues it was not possible to do so. As such, a HIV-1 virus that was already in use at the *Vrij University* was used to infect human *he_la* tissue, which was cultured over the surface of the glass army figurine.

Works using primary tissue, including *Go Forth and Multiply* raise issues of governance and manipulation of the living body that can significantly alter its state physically, conceptually and politically. HIV-positive bodies are subject to more strict governance and legislation than healthy bodies. The work address the categorizing of HIV-positive bodies as property of the State and as potential weapons of bioterrorism. This reference to the body as a chemical agent, rather than a subjective entity, is also significant, adding yet another level of objectification onto the body, through which the individual is reduced to the biological.¹⁷¹ In addition, the process employed in the creation of the work involved a level of control over, and manipulation of the virus, which disrupted St James' experience of his body as a



Fig 45, Alicia King and Eden St James, *Go Forth and Multiply*, 2007.

for approx 5 hours. Finally, the figures were washed with PBS, fixed with Ethanol and were taken out of the laboratory.

¹⁷¹ This stance is clearly illustrated by tightening immigration and tourism laws for HIV-positive individuals, through which countries have the right to deny entry on HIV status alone. The relevance of HIV discourse internationally remains high, with several countries including China and the USA prohibiting HIV-positive immigrants and even tourists. Australia is not exempt from HIV related politics. Recent key events including an Adelaide court case debating the existence of the HIV virus itself, following the intentional HIV infection of two females by a HIV-positive male has reignited debate on HIV related legislation in Australia. The previous Liberal Government's public announcement to prohibit HIV-positive immigrants' access to Australia is a strong point of agency that has attracted a myriad of responses through the press, including the debate of the status and contagiousity of the virus itself; pointing to a lack of information in regards to the virus's contagious capacity. Attitudes such as the aforementioned also conjure a view of the HIV positive body as a tool of biological weaponry, which needs to be geographically confined. This kind of stance imparts particular prejudices in relation to the assumed behavior of HIV positive individuals, in these cases considered too dangerous to allow free reign in the Australian community. This analogy of the HIV positive person as potential biological terrorist is one of great interest and concern. The growing number of countries prohibiting HIV immigration and tourism exhibit an extreme form of physical control over a minority group, expanding the notion of house arrest to a specific geographical location.

passive host subject to an invisible invader. Through viewing the virus outside his body, the subjective links between the virus, his sick body, and himself were able to be ruptured.

In *Go forth and multiply*, intentionally infecting Henrietta Lacks' tissue (he₂la cells) with HIV-1 was an intense experience, as I'm sure it's something she would never have chosen to do with her own body. While seeking to empower one community (the GLBT and HIV positive community) the project inadvertently disempowered another. It's never clear-cut; every use of biological materials has its own layering of complexity and paradox.

Analysis

Works created throughout the project were largely steered by my relationship to what I was engaging with in the laboratory. Due to my experiences in the lab, my focus moved from the fantastical potential for growth and life, to the reality of the exploitation and death of the organisms (particularly those of animals) which occurs through that process. At the beginning of the project my approach to the work was quite playful and positivistic. As my engagement with bodily materials became more intense and problematic, works created took on a darker, more visceral and critical aesthetic. While I enjoyed the lighthearted approach I had to the work in the beginning, I feel that works created through the later streams of the project engage with the research issues more critically and realistically.

I also engaged in a range of other relevant activities throughout the research period, which influenced and contributed to the research outcomes (see Appendix D).

CHAPTER FOUR – CONCLUSION

The purpose of the project was to investigate ways in which contemporary art could participate in and add debate to the relationship between biotechnological interventions, human embodiment and self perception. Through engagement with biological technologies, and exploration of related artists and theoreticians, the project has found that contemporary art practitioners explore embodiment through a variety of approaches, ranging from the fantastical to the political and visceral.

As the project developed I worked through experimentation with various materials and forms to express the research interests. These included traditional materials such as foam and resin, as well as works through video, performance, and human bodily materials through tissue culture techniques.

Through literary research and laboratory experience the project opened up new perspectives of how animal and human bodies are used in biotechnological development. As an outsider to the field, my initial imaginings of biotechnological development were quite positive and optimistic. However, through my experiences with human and animal flesh in the laboratory, which were viscerally raw and intense, the morbid reality of how physical bodies are used within the lab, and associated ethical complexities left me with a pessimistic view of the field. The de-subjectification of tissue within the laboratory environment, which removes all trace of the donor, reducing the individual to the biological, conjured for me a contemporary flesh factory. This new perspective on engagement with bodily materials in the lab had a strong and critical impact on the aesthetic of the works produced, which became darker and more ominous as the project progressed.

Throughout the process my interest and engagement with bodily materials became increasingly drawn to the visceral, which is evident in works produced in the later stage of the project that utilize bodily materials. My use of materials, which moved from green organic growth forms to black flock, tumorous forms and iconic symbols such as the vampire fangs, exemplify my change in perspective. My interest in ritual attitudes and uses of the body also grew throughout the project, and were heavily informed by Huxley's *The Tissue Culture King*, as well

as the work of contemporary artists such as Kira O'Reilly and TC&A.

The results of this investigation support the idea that contemporary art has the ability to achieve a substantial level of engagement with issues surrounding embodiment, and to bring these ideas into the public realm. Critical engagement with biotech practices allows for the creation of artworks that speak critically and directly to the audience of the technologies that they critique. In the purely representational works created throughout this project, a layer of fantasy exists between the artworks created and the concepts they address. Experience with the actual biotechnological processes can achieve a level of engagement – more direct and critical than representational work, in that it removes the element of fantasy and deals directly with the source – bodily materials.

The current findings add to a growing body of contemporary art addressing relationships between biological technologies and the body. Inspiration for this project lay partly in ethical issues of human-animal relationships. The project was also governed by ethics regulations, which are to some extent informed by and reflective of current public opinion about bodily materials and their appropriate uses. My interest in exploring these ethical boundaries felt somewhat limited by the regulations imposed through ethics application processes. This generated a tension that is expressed through the dark aesthetic which dominates the later suites of work. The project was also limited by my level of access to biological technology, equipment and expertise, as well as complications such as the Royal Hobart Hospital withdrawing their support. Having to travel to *SymbioticA* in Western Australia also limited what I could create and how it would be presented here in Tasmania. As such, all works submitted for exhibition were limited to those that involve preserved tissue specimens.

I am continuing to investigate alternative possibilities in working with and presenting bodily material. This is occurring through the development of a bioreactor – a transparent glass machine which houses living, growing tissue - which will allow for new dialogue between the viewer and tissue cultured forms. The bioreactor will be created during Residency at *SymbioticA* and exhibited in an upcoming exhibition at the *Tasmanian Museum and Art Gallery*, in which the

tissue will be able to be seen growing live in the gallery space.

Relationships between biotechnological developments and embodiment will continue to inform my practice.

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Fig 33: Lee Miller, *Prisoners with Human Remains, Buchanwald, 1945*. Scanned from Ewing, W 1992, *The Body; Photoworks of the Human Form*, Thames and Hudson, London, p167.

Fig 34: On and on while you're gone, 2006. Resin, glass, rubber, human tissue (he_la). 1.7m x 1.1m x 90cm. Photo credit: Amy Spiers.

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Fig 45, Alicia King and Eden St James, Go Forth and Multiply, 2007. Glass, human tissue (he_la), HIV-1. 10cm x 15 cm. Photo credit: Alicia King.

APPENDIX C: TISSUE CULTURE DESCRIPTION AND PROTOCOLS**Tissue Culture description - he_la cell line:**

Culturing the he_la cell line: Initially, a tiny plastic vial of cells are removed from their home in the -800 degree Celsius cryogenic flask, and taken immediately to the laboratory's sterile hood to be awoken from their frozen sleep. They are thawed with the help of a chemical agent, and are ready to be removed from the solution in which they lie. The cells undergo a cell suspension, in which they are placed in a centrifuge, and spun at speed defying gravity until the cells are forced to the base of the vial, clumped together and easily visible to the naked eye. The liquid sitting above the cells is extracted, leaving the cells ready to be introduced to their new home of a small glass sculpture.

To encourage the cells to grow over the sculpture itself, instead of the glass vessel which surrounds it, the sculpture is first coated with a liquid collagen. While the collagen dries, the cells, now existing in their most concentrated form are given a small amount of nutrient solution. Once the collagen has dried the cells are slowly dripped onto the surface of the sculpture until they cover the entire form. After sitting for a few moments, the vessel is filled with a nutrients solution, immersing the sculpture in a vibrant pink liquid. The vessel is then placed inside an incubator, which acts as an artificial body, mimicking the internal mammal form, complete with regulated body temperature and the exchange of oxygen and CO₂. It is this artifice which will allow the life of the cells to continue living outside of their original human form.

Now the sculpture is ready to begin its 'life', aided by the cells which will gradually grow to envelope the entire surface. In the first days of life, the cells are monitored regularly for signs of growth. On alternative days the vessel is removed from the incubator, to clean and feed the cells. Once the pink nutrient solution has been consumed, the fluid left in the vessel is a yellow wash of waste. This waste is siphoned out of the vessel with a pipette, and replaced with fresh nutrients. The vessel is then returned to the incubator to continue growing.

This process continues until the cells have reached their aesthetic peak, and visibly overcome the sculptural surface; transforming the inanimate glass into a life form which bears the characteristics of the cells' own creation.

The first artwork I completed in the Laboratory using he_la cells resulted in the piece *on and on while you're gone*. The biological components of this work consist of small glass human skulls, which are tissue cultured with he_la cells and stained with a pink histology dye.

PROTOCOLS:

Culturing He₄a cells over glass forms

he₄a Cells

RPMI

L – Glutamine

FCS

Trypsin EDTA

PBS

Ethanol

Methanol

Eason stain

Collagen

1. Preparation of Glass:**1.1 Autoclave:**

A hanging device was created for glass pieces with surgical thread, sourced from Clinical School. The glass specimens were placed within plastic vials, and were then put into an autoclave bag, with their lids off. The bag was sealed with Autoclave tape and labeled with my name. The Autoclave was placed on a short cycle, running for 2hrs onDegrees Celsius. The bag was then taken to the sterile hood to begin collagen coating.

1.2 Collagen:

The Sterile Hood was turned on, and cleaned with 70% Ethanol. The Autoclave bag was placed inside the hood. Enough Collagen was added to each vial to adequately immerse each glass specimen. The glass remained soaking overnight.

1.3 Recommendations:

The surgical thread appeared to have shrunk in the autoclave. As such the pieces were suspended too far from the bases of the vials and were cut so that

they rested on the base of the vials. A material such as fishing line would be more appropriate, to avoid shrinkage in future pieces.

2. Obtaining the he_la Cells:

2.1 A vial of he_la cells were removed from the deep freeze. The vial was placed into a 37 Degrees Celsius water bath to thaw the cells. The cells were removed from the vial and transferred to two separate flasks.

The flasks were placed within the incubator.

3. Seeding the Cells:

A flask of he_la cells was removed from incubator and placed under sterile hood. Waste was removed from flask and put into waste jar. Flask was rinsed with PBS. Approximately 1.5mls of Trypsin was pipetted into flask, and allowed to sit for approx 5 mins. Flask was checked under microscope to ensure that cells had detached from surface of flask. Cells were then transferred into vial, and placed in the centrifuge on 1400 rpm for approx 7 minutes. Vial was removed and placed back under sterile hood. Fluid of vial was tipped into waste jar, leaving the palette of cells remaining visible at the base of the vial, in approximately one milliliter of liquid. Cells were re-suspended, by tapping the vial vigorously, until cells had visibly mixed with the remaining liquid. Vial was filled to the 10ml mark with nutrient solution. Waste was pipetted out of each glass specimen vial, and approx 5mls of media was pipetted into each vial. Vials were placed back into the incubator.

4. Propagating the he_la Cells:

Flask was removed from the incubator and placed under sterile hood. Waste was removed from flask and put into waste jar. Flask was rinsed with PBS. Approximately 1.5mls of Trypsin was pipetted into flask, and allowed to sit for approx 5 mins. Flask was checked under microscope to ensure that cells had detached from surface of flask. Cells were then transferred into vial, and placed in the centrifuge on 1400 rpm for approx 7 minutes. Vial was removed and placed back under sterile hood. Fluid of vial was tipped into waste jar, leaving the palette of cells remaining visible at the base of the vial, in approximately one milliliter of liquid. Cells were re-suspended, by tapping the vial vigorously, until cells had

visibly mixed with the remaining liquid. Vial was filled to the 10ml mark with nutrient solution. The media was transferred into two separate flasks. Approx 5 mls of media was pipetted into each flask. Flasks were placed into incubator.

5. Freezing the he₁a Cells:

Flask was removed from the incubator and placed under sterile hood. Waste was removed from flask and put into waste jar. Flask was rinsed with PBS.

Approximately 1.5mls of Trypsin was pipetted into flask, and allowed to sit for approx 5 mins. Flask was checked under microscope to ensure that cells had detached from surface of flask. Cells were then transferred into vial, and placed in the centrifuge on 1400 rpm for approx 7 minutes. Vial was removed and placed back under sterile hood. Fluid of vial was tipped into waste jar, leaving the palette of cells remaining visible at the base of the vial, in approximately one milliliter of liquid. Cells were re-suspended, by tapping the vial vigorously, until cells had visibly mixed with the remaining liquid.

1 ml of media was added to the cells to maintain their cell structure while frozen. Equal amounts of supernatant and nutrient solution were added to the vial. Vial was dispersed into 4 separate vials each containing exactly 1ml of liquid, as measured with an accurate push button pipette. Vials were placed within the deep freeze.

Rinse with PBS (x2).

Add 1.5 mls Trypsin.

Wait 5 mins.

Check cells under microscope.

Transfer into vial

Centrifuge 1400 rpm for 7 mins

Empty fluid, leaving 1ml.

Resuspend by tapping vial vigorously

Fill with nutrient solution

Transfer into two flasks

6. Preserving the Tissue:

Specimen was removed from its vial and placed within a clean vial. Specimen was soaked in methanol to fix the cells, for approximately five minutes. Specimen was removed from liquid and let to dry. Specimen was then covered with Eason to stain the tissue, for approximately five minutes, then let to dry.

Recommendations:

The vials in which the specimens grew, touched the sides and base of the specimens, dislodging and scraping at the tissue growing there. It would be more beneficial for the specimens to be placed within larger containers, in which they are fully suspended within their solution.

The tissue grown on the sides of the globular specimen were also scraped whilst removing the specimen from the vial following the fixing and staining. More care should be taken to limit physical contact with the glass to avoid this occurring.

HUMAN FIBROBLAST HARVESTING PROTOCOL**Preparation:**

Autoclave enough scissors and tweezers (4 of each) to work with tissue.
Have 2 sterile Petri dishes and cutting equipment ready.
Have 2 Petri dishes with media, antibiotic and serum to transfer tissue into.

In Surgery:

Take 2 prepared sterile 50ml vial to surgery (both media with anti-biotic, 1 without serum).
Cut tissue in half and place in each vial. Take straight to PC2 Lab.

In PC2 Lab:

(Working Under sterile hood)
Wash tissue thoroughly with cold sterile PBS.
Transfer tissue into two separate single Petri dishes (medium, antibiotic, serum).

Incubate for 2 Hours.

Using scissors, cut tissue down as small as possible. Take no longer than 30 mins for each piece.
Centrifuge at 500 RPMI for 5mins. Make sure centrifuge temperature is set at room temperature or above.
Take centrifuged vial back to sterile hood.
Tip out liquid till just above tissue.
Top-up with new media.
Re-suspend.
Distribute contents into 6 well plates.
Incubate.

Do not change media until a substantial amount of cells are visible –
Then pipette all tissue and media, and add new media (DMEM, 10% FCS).

When the cells have reached 60% confluence in the 6 well plates (roughly two weeks later): Pipette out media, wash with PBS (3 times), trypsinize

(put in incubator for 1 min, then check under microscope – remember that these cells trypsinize VERY quickly compared to he_la cells). Transfer ½ media into new flask and incubate. Freeze down the other half of the media, using the *Freezing Primary Human Tissue Protocol*.*

*Do this each time cells reach 60% confluence. Make sure to remember to freeze half the cells with every passaging. The cells have limited divisions (approx 50).

FREEZING DOWN CELLS PROTOCOL

1. Obtain cell count using trypsinisation.
2. Spin or dilute cells to give count of 1.5 million/ml medium.
3. Label vials with cell type, passage number, date, initials, number of cells.
4. Add 100ul (microlitres) DMSO to each vial.
5. Add equal volume of neat FCS (or NCS depending on cell type) and mix well.
6. Add 0.8ml cell suspension per vial and mix well.
7. **IMMEADIATELY** start the freezing process which should be relatively slow, by placing vials on dry ice covered with tissue lagging (blocks of polystyrene) for 1hr, then transferring to liquid nitrogen, **or** -70 freezer **or** placing in heavily lagged (polystyrene) container into -70 freezer.

THAWING FROZEN CELLS PROTOCOL

1. Place vial of cells in 37 degrees water bath. Shake vial frequently.
2. When contents is liquid, centrifuge at 1400RPM for 5 mins to separate cells from supernatant.
3. Pour out top of liquid
4. Re-suspend in media.

CURRICULUM VITAE

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EDUCATION

(Currently affiliated artist with the *University of Tasmania's School of Medicine*, Hobart.)

Current: PhD Candidate

University of Tasmania: Hobart School of Art.

2004 : Independent study (Art and Life Manipulation Unit) into tissue engineered sculpture and biological art, at *SymbioticA, The Art and Science Collaborative Research Laboratory*, University of Western Australia, Perth.

2003 : BFA (Hons) 1st Class

University of Tasmania, Hobart School of Art.

SOLO EXHIBITIONS

2009: *The Ephemeral Flesh Projects*, Tasmanian Museum and Art Gallery (TMAG), Hobart.

2006: *Human Biotechnology and Public Trust* Conference, Swinburne University, Melbourne.

2006: *I'm growing to love you too*, Linden, St Kilda Centre for Contemporary Art, Melbourne.

2006: *growing to love you*, INFLIGHT Art, Hobart.

SELECTED GROUP EXHIBITIONS

Upcoming: *1200cc Mary*, CAST Gallery, Hobart.

2009: *The Hobart City Art Prize*, Tasmanian Museum and Art Gallery

2009: *The arresting image*, Plimsoll Gallery, Hobart. Curated by Pat Brassington and Fiona Lee.

2008: *X*, Griffith University Queensland College of Art Galleria, Brisbane.
Ecchymosis Criterion Gallery, Hobart

Membrane, Next wave Festival, Federation Square, Melbourne.

we'll make good pets, Metro Arts, Brisbane.

Stendahl Syndrome, George Petelin Gallery, Gold Coast, QLD.

2007: *The Last Vestige*, ALBB Space, Ho Chi Minh City, Vietnam.

Animumbiliqua, Queensland College of Art Galleria, Brisbane.

nanimals, Dokhuis Gallery, Kanaal Ten, Amsterdam, The Netherlands.

Board of INFLIGHT, Firstdraft Gallery, Sydney.

2005: *Dockworks*, CAST Gallery, Hobart.

2005: *Toytakeova*, Whitehouse, Brisbane; Yarra Sculpture Gallery, Melbourne.

2004: *Killa Chinchilla*, The Belvedere, Brisbane.

Phundraiser, Phatspace Gallery, Sydney.

Skylounge, National Museum of Australia, Canberra.

2003: *BFA.HONS*, Plimsoll Gallery, Hobart.

Art Tourist, Monahan Design, New York City, U.S.A.

Fingering Glover, Long Gallery, Hobart.

Inside Out, Fine Arts Gallery, University of Tasmania, Hobart.

GRANTS

2008: Arts Tasmania Dombrovskis Award for Innovation in Art

2008: Arts Tasmania New Work Grant

2008: The Moorilla Scholarship

2007: Australia Council for the Arts, RUN_WAY Inter-Arts Grant.

2006: Australia Council for the Arts, Skills and Arts Development Grant.

2006: Australian Network for Art & Technology (ANAT) Professional Development Traveling Grant

2006: Arts Tasmania, New Media Industry Residency Grant.

2006: National Association for the Visual Arts (NAVA), Visual and Craft Artists' Grant Scheme.

RESIDENCIES

2008: *SymbioticA*, Centre for Excellence and Biological Arts, Perth.

2007: *Foundation b.a.d*, Rotterdam, The Netherlands.

2007: *SymbioticA*, Centre for Excellence and Biological Arts, Perth.

2007: *The Arts and Genomics Centre*, Amsterdam, The Netherlands.

2007: *Vrij Glas Foundation*, Amsterdam, The Netherlands.

2007: *Kanaal 10*, Amsterdam, The Netherlands

COMMISSIONS

2006: Temporary Public Sculpture Commission from Glenorchy City Council for the *Works Festival*, Glenorchy, 20-22nd May 06.

2005: Temporary Public Sculpture Commission, from Hobart City Council and CAST Gallery, installed along the Hobart Waterfront Precinct for the Hobart Summer Festival.

PUBLICATIONS/MEDIA

2009: *a minima*, 'Alicia King: The ephemeral flesh projects', Issue 25, 2009.

2009: *Slit Magazine*, Weird Science Issue 'Alicia King and Eden St James: Kitsune Collective' Issue 14, 2009.

2008: *Australian Art Collector*, 'Smart Art' Issue 45 July-Sept 2008. Pp 163, 176 & 177.

2007: Australian Magazine for Art and Technology (ANAT) *Filter*, Issue 65: "This is not Open Source", Autumn 2007. Pp 1-5, 12-13, 19, back cover page.

2007: AJETS: Australian Journal for Emerging Technologies and Society, Vol 5, No 1, 2007.

2007: *Veolcity: Science in Motion*, "Fusion: Art, Science and Technology", September 2007. <http://velocity.ansto.gov.au/velocity/ans0019/article6.asp>

2006: *Artlink Magazine*, Spiers, Amy (2006) "i'm growing to love you", Vol 26, No 4. p127.

2006: *Herald Sun*, Ryan, Kelly (2006) "Art to Sell Science" 22 Aug. p23.

2006: *The Mercury*, Paine, Michelle (2006) "Artist's skin cell work cultivates concern" 16th Aug. p3.

2006: *ABC TV 7:00pm National News* "Skin Art", 15th Aug, 06.

2006: *RealTime*, Klaosen, Diana, (2006) "Growing art, shaping perception", June – July 06 No 73. p46.

2006: *JJJ Arts Crew Program, Triple J, ABC Radio*, Hogg, Fiona, (2006) "Skin Art", June 2006.

2005: *ABC Radio*, ABC Radio Breakfast Show, Interview with Chris Whisby. November 2005.

2004: *LocalART*, Cuyler, Amanda (2004) "The Miniature Hybrid Project; Interview with Alicia King", The Farm Contemporary Art Space, Brisbane, pp 10 -12.

CURATORIAL/PROFESSIONAL

2009: CAST Project Space exhibition curator of *Decoy 2* by Alice Lang.

2007/8: Board Member (Secretary) *6a inc ARI*, Hobart.

2006/7: Board Member (Artist Liaison), *INFLIGHT ART* Gallery, Hobart.

2005: Gallery Projects Officer, *Fine Arts Gallery*, University of Tasmania.

COLLECTIONS

2009: The Collection of the Museum of Old and New Art (MONA)

2009: The Collection of Ken and Lisa Fehily.

2007: The Collection of John Wregg.

CONFERENCE PAPERS/PRESENTATIONS

2008: *SymbioticA, Centre for Excellence in Biological Arts* – Artist Talk.

2007: *RMIT International University*, Ho Chi Minh City, Vietnam - Artist Talk.

2006: *Human Biotechnology and Public Trust Conference*, Swinburne University, Melbourne. (Artwork presentation).

2006: *Close Encounters, the Fourth European Conference for Science, Literature and Arts*. Amsterdam. The Netherlands, June 2006 (Conference Paper).

2005: *The Power of the Human-Animal Bond: Animals and Society*. Hollywood, USA. (Poster presentation)

2005: *The International Society for Anthrozoology: Exploring Human-Animal Relationships*. New York. USA (Poster presentation).