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Genetic Gold: The post-human homunculus in alchemical and visual texts

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DECLARATION

I declare that the writing and technical production of *Genetic gold – The Posthuman Homunculus* is entirely my own work. All sources that I have used or quoted have been indicated and acknowledged by means of complete references.

I want to express my gratitude to my supervisor, Dr. Elfriede Dreyer, for her professionalism and kind support in the writing of this paper. I would also like to acknowledge the University of Pretoria and the Visual Arts Department for the facilitation of my research, as well as Dr. Allan Munro of the Tshwane University of Technology whose book, *An Introduction to Research in the Arts,* was a great help in the formulation of the style of this paper. Finally I would like to express gratitude for the bursary granted by the University of Pretoria for the completion of my studies, without which this research would have been impossible.

The opinions expressed and arguments presented in this paper are entirely my own and should in no instance be considered as those of the abovementioned people or institutions.

Signed:

Andrew James Smith on the twenty third day of August two thousand and eight.

For Jane and Deon Smith
who never gave up hope.

Abstract

The phenomenon of the homunculus as an aspect of creating life in the laboratory is a documented attribute of Western premodern and medieval Arabic alchemy. Early alchemical texts can be seen to reveal the archetypes and myths present in the contemporary practice of creating life in the laboratory. Current genetics research endeavours to create ever-more complex genetic chimeras using human DNA and the creation of such creatures can be seen to constitute a return to the homunculus mythology. The extent to which this creature, this *genetic* homunculus, manifests in contemporary society is revealed in popular visual culture and the arts to be a prominent feature of the contemporary psyche. Ontological means of negotiation of a genetically engineered being falls to arguments of natural versus artificial in terms of post-humanism. The homunculus is shown to be impossible to arbitrate in terms of a transcendent mythology in this sense and the provided examples from visual culture reveal that this marvel is, as a result, myriad in teleological outcomes.

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GLOSSARY OF KEY TERMS

Alchemy – Alchemy, according to C. G. Jung (1953) is a spiritual pursuit aimed at the perfection of base things to their 'intended' higher states of being (transmutation) which has its origins in Ancient Egyptian science. The etymological origins of the word alchemy can be traced through Latin and Arabic to the Ancient Greek *Chemeia* which means "Egyptian." Alchemy is concerned, in essence, with the search for the ultimate transmutative substance (the Philosopher's Stone); with the transformation of metals through purification and distillation; and with the transcendence of the alchemist's soul to immortality.

A seventeenth century English author and physician, Thomas Tymme, in his translation of Joseph Quersitanus's *Chymicall and Hermetical Physicke* (1605) defines alchemy thus:

> "For Halchymie tradeth not alone with transmutation of metals (as ignorant vulgars thinke: which error hath made them distaste that noble Science) but shee hath also a chyrurgical hand in the anatomizing of every mesenteriall veine of whole nature: God's created handmaid, to conceive and bring forth his Creatures."

Chimera – An appropriation of the name of the mythical Ancient Greek monster, a chimera, as it pertains to genetic engineering, according to Baylis and Robert (2007:41) comprises "a mixture of cells from two or more genetically distinct organisms of the same or different species. They are mosaics at the cellular level; individual cells are derived from either the host or the donor but not both." Chimeras are created using recombinant genetic technology.

DNA – The common abbreviation for deoxyribonucleic acid. The material inside the nuclei of the cells of any organism that carries all the genetic information of that organism.

Genetic engineering – This is the term used to describe any biological technology that is involved in the isolation of one or more genes in an organism, (Kimmelmann, Baylis and Cranley-Glass 2006) alter or manipulate genetic material in an organism and recombine genetic material of one or more organisms. It comprises single-cell parthenogenetics (cloning), the recombination of DNA and gene therapy (Kirby 2000).

Genetic homunculus – In this study, the term genetic homunculus is used to describe genetically enhanced, altered or created beings, whose technological genesis involves the use of human DNA. This use of the term homunculus in this sense is always preceded by the word 'genetic' for the sake of clarity. The genetic homunculus can be understood as the product of any artifice that deals specifically with the creation, perfection, augmentation and prosthesis of human life, where there is mediation of that organism prior to birth. It can be taken to refer to any scientifically created creature produced (partially or wholly) from human DNA that deviates from its original form.

The genetic homunculus is not 'human' in any traditional sense. The genetic homunculus can be understood as a being fashioned from *altered* human DNA in that it is a cellular chimera of specific human traits which have been augmented by science, changed and possibly even hybridised with other species. A fuller definition of the term is provided in the body of this dissertation.

Hybrid – According to Baylis and Robert (2007:41) "Hybrids are created by breeding across species. Hybrids are generally the result of combining an egg from one species with sperm from another to form a single embryo. Hybrids contain recombined genetic material throughout their genome and throughout all the tissues in their body," for example, a mule is a hybrid of a donkey and a horse.

Homunculus – In this study, the term homunculus refers to the human-created being – a notion established by the medieval physician and mystic Paracelsus, as a creature created out of human generative fluids by the alchemist's hand, through his technology. Taken from the Latin for 'small man,' (*homo* – man + *culus* – diminutive suffix) 'homunculus' is the term used by premodern Western alchemists to describe the product of human genesis in the retort (most often through the cultivation of human semen). For this reason it is practical to appropriate the term to refer to the genetic endeavours of modern science, which leads to its other definition.

Opus magnum – The *opus magnum* or great work refers to the process of extracting the philosopher's stone from the so-called 'first substance' or *prima materia.* This was the alchemist's life-long goal and vocation.

Prima materia – The initial substance from which the philosopher's stone could be extracted. This was never explicitly defined by the alchemists, supposedly to protect the secret from laymen.

Prosthesis – Any object or technology that enhances or extends human activity or control beyond ordinary bounds; especially any object or technology that is required to fill a lack of agency. Prosthesis is usually non-essential for human survival, but enhances quality of life to such an extent that it seems essential. For example the cellular telephone is a portable device that allows people to communicate over long distances without the need to be in a certain location while doing so (unlike the conventional telephone); or the prosthetic leg that allows an amputee to participate in a race.

Singularity – This is the term used by Vernor Vinge (1993) to describe an event so momentous in importance that it causes the definitive end of one state of affairs and the commencement of another. A singularity may be defined as a watershed of eras. Examples of singularities may include specific, localised events such as the invention of the wheel; or relatively gradual events like establishment of Christianity as the official religion of the Roman Empire by Emperor Constantine.

Transcendence – The alchemist's transcendence of time, according to Mircea Eliade (1971), is one of the chief goals of the alchemical *Opus Magnum*. This goal was brought about by the hastening of the processes of nature in order to achieve the technological ends of alchemists. The transcendence motif is pervasive throughout alchemy: the metals transcend their base or impure forms; the alchemist's soul surpasses mortality; and the furnace transcends nature. Transcendence of the spirit always comes about subsequent to the torment and death of the subject, and is a common theme in Buddhism, Tantrism and Christianity.

CHAPTER 1: INTRODUCTION

What we extolled as Nature's deep conundrum,
We venture now to penetrate by reason,
And what she did organically at random,
We crystallize in proper season. – Johann Wolfgang von Goethe, *Faust.*

There is an ever-increasing impingement of the realm of technology upon the realm of nature. Although this phenomenon is not a new one, it is in our time rapidly spiralling into areas never before imagined. Jean Baudrillard (1995) notes that whereas the prostheses[1] of the industrial age were still external and "exotechnical, those that we know have been subdivided and internalized: esotechnical. We are in the age of soft technologies – genetic and mental software" (Baudrillard 1995:68). Our technologies are encroaching upon our inner space, invading our bodies and consciousnesses. When one considers, for instance, the prevalence of reality TV shows about plastic surgery, the existence of brain implants that allow humans to extend their agency beyond the physical, or the numerous fields of genetic research into food production, veterinary science, medical science and above-all genetic engineering, the extent of this intrusion seems less like a random foray into Nature's dominion than a focused annexation thereof. Baudrillard (1995:70) provides a diagrammatic description of the internalisation that has softened and shaped much of the technology of the latter half of the last century, culminating in the ultimate soft technology – the genetically engineered being:

> The stage of the body changes in the course of an irreversible technological "progression": from tanning in the sun, which already corresponds to an artificial use of the natural medium, that is to say to making it a prosthesis of the body (itself becoming a simulated body, but where lies the truth of the body?) - to domestic tanning with an iodine lamp (yet another good old mechanical technique) - to tanning with pills and hormones (chemical and ingested prosthesis) - and finally to tanning by intervening in the genetic formula (an incomparably more advanced

[1] Simply, those technologies whereby our agency is extended, augmented and arbitrated by making them a part of our body.

> stage, but a prosthesis nonetheless, that is, it is simply definitively integrated, it no longer even passes through either the surface or the orifices of the body), one passes by different bodies. It is the schema of the whole that is metamorphosed.

Such impositions of technology on nature, the appropriation of natural processes in science and the internalisation of technology would appear to be realised in the genetically engineered being – an android created of synthetic and altered DNA – which forms the focus of this investigation. This study aims firstly to establish whether a genetically engineered being created from human DNA can be seen as an alchemic homunculus; secondly to examine the ideologies that inform the creation of the artificial human; and thirdly to scrutinise the representation of this post-human, genetic homunculus in visual texts.

It focuses primarily on the genetically engineered 'human'[1] being as an area of post-human discourse. The notion of the alchemic homunculus is used to describe this being, in order to illustrate the relationship of the natural and artificial with regards to its ontology. As such, the phenomenon of the genetically engineered being is shown to be a product of a merging of the natural and artificial realms. It is shown how this genetic homunculus is manifest in contemporary popular discourse by the evidence provided in several visual texts.

The homunculus, in its original alchemic sense, may be concisely described as the theoretical product of the alchemic creation of human life in the laboratory. Since this feat was, for obvious reasons, never proven to have been performed, the various accounts of and methods for creating the homunculus differ greatly, but most involve specific, mystical prescriptions for the incubation of semen outside the womb of the mother. According to religious scholar, Kathleen O'Connor (1994), medieval Arabic alchemist, Jabir Ibn Hayyan, propounded the notion of artificially creating human life in the laboratory as an emulation of divine

[1] I use parenthesis because it will be shown that no being whose genesis is artificially mediated can be considered even ostensibly human, regardless of whether it was created from human DNA or not.

creation, an act through which the alchemist himself was spiritually transmuted and sanctified[1].

Figure 1: Salomon Trismosin. *Splendor solis* plate 17. Illuminated tempera on parchment. Sixteenth Century. (Roob 1996:152).

The genetic homunculus can be understood as the product of any artifice that deals specifically with the creation, perfection, augmentation and prosthesis of human life, where there is mediation of that organism prior to birth. It can be taken to refer to any scientifically created creature produced (partially or wholly) from human DNA that deviates from its original form. Taken from the Latin for 'small man', (*homo* – man + *culus* – diminutive suffix) 'homunculus' is the term used by premodern Western alchemists to describe the product of human genesis in the alchemist's retort. There are, of course, references to human-

[1] In addition to this, alchemical illustrations often personify stages of the alchemical labour or specific qualities of a substance and thus images like the one presented in figure 1 are commonplace. While not strictly a homunculus in the sense that the word is used in this study, the figure of the white queen in the hermetically sealed retort is nonetheless evocative of the image of the homunculus.

made beings predating the Western premodern homunculus in Arabic, Indian and Chinese alchemy, however the term 'homunculus' is the most widely used today.

In the alchemic context the word refers to any attempt at the creation or cultivation of new life (life not created by God) through human artifice. The attendant philosophical questions, such as whether or not the creature could be considered human, were seen as legitimate questions of the alchemical art[1] (Newman 2004). Today such questions as whether or not life should be created through human labour are once again valid in the eyes of contemporary empiricism. For this reason it is practical to appropriate the term to refer to the genetic endeavours of modern science. In this study it will be shown that within post-human discourse it is apposite to make use of this alchemical term to refer to the product of genetic engineering involving human DNA.

It must be stated that alchemy and the concept of the homunculus are part of a dominantly male-oriented philosophy, indeed there were very few female alchemists until the pre-modern era (the ancient Egyptian monarch, Cleopatra, being the most notable exception) and the homunculus's genesis outside the womb serves to further remove it from the feminine. Judaeo-Christian creation mythology details the creation of the male before the female, as does Hesiodic Greek Myth. The alchemic conception of the homunculus follows these ancient precepts, in that the Biblical Adam was used in many instances to symbolise aspects of the alchemical adept's transcendent spirit (Jung 1963). Since the homunculus was intended as a means of spiritual transformation, the first homunculus would be a kind of pseudo-Adam in its own right. Although the treatises do not preclude the creation of female homunculi (in fact quite the contrary) the concept's origins are firmly rooted in masculine traditions.

[1] The term 'alchemical art' is used in this context to signify any alchemical labour. According to William Newman (2004) the term 'art' was used universally to signify any form of artifice – artistic or otherwise – as there was no extant distinction between art and science before the onset of materialist and empirical science.

However, this notion has since changed in the post-human paradigm to become more androgynous and even feminised, mostly as a result of popular understanding of the science involved in creating clones,[1] and the prominence of feminist literature in advocating the terms of the post-human body. For the most part, the use of gender-specific language is avoided in this study except where pertinent to specific, seminal authors' quoted argumentation, since a feminist position is taken with regards to nature in this dissertation and this, coupled with posthuman ideologies, requires a more androgynous orientation.

The word 'God' is used frequently in this study. Where it is not used to refer to the gods of specific myth systems, Christian or otherwise, within the context of elucidating a fact about that mythos, the word God is used in the Einsteinian sense: with the intention of denoting nature and the wonders of the natural realm as can be understood from a purely scientific perspective. God, in the sense of a supernatural creative intelligence, should not be inferred.

Because cloning is mentioned so often in this study, it is important to distinguish between the genetic homunculus and the genetic clone. Single cell parthenogenesis (cloning) is not a perfective process. The clone merely represents the cellular twinning of an embryo to create an amoebic doubling of a particular organism, whereas the genetic homunculus is a being that is augmented or changed by science into something that can be perceived as better than the original subject (most often from multiple genetic parents). The genetic homunculus is not a clone, although, like any other life-form, it can be cloned.

In fact, it can be argued that the genetic homunculus is not 'human' in any traditional sense. The genetic homunculus can be understood as a being fashioned from *altered* human DNA in that it is a combination of specific human traits which have been augmented by science, changed and possibly even

[1] Clones can only be created female, from female oocytes (egg cells). Parthenogenesis is literally translated as "virgin origin."

hybridised with other species. The result of changing the fundamental nature of what it means to be human, even slightly, is surely a wholly different species. The use of human DNA itself is currently ethically regulated for this very reason.

Fusions of multiple distinct DNA subjects of the same or different species have been dubbed chimeras in the scientific community, after the three-headed monster of Ancient Greek mythology slain by the hero Bellerophon. While this metaphor aptly describes such *animal* fusions and even hybrids[1] (the Greek monster was a fire-breathing lion with a goat's head on its back and a snake where its tail should be), to lump creatures created using human DNA together with any other abortion of nature created for profit, is hugely disenfranchising to any sentient being created from such a process, as well as humanity itself. This is because it preemptively devalues the sanctity of humanity in a very essential way. The 'parts' that make up a genetic chimera are interchangeable and thus meaningless (the term chimera is, quite simply, a blanket-term for a vastly varied arm of genetic science, comprising any result of recombinant DNA testing). The mere fact that no terminological distinction is drawn between chimeras created using human DNA and other chimeras also lends further opacity to the already clandestine practices of genetic researchers. It is for this reason that it is necessary, even from legal and scientific standpoints, to refer to genetically engineered humans as homunculi and this study aims to show why this term is suitable.

Initially, the genetic homunculus may seem to be similar to Donna Haraway's (1991) *cyborg*[2] in that they both represent a form of neo-human that is created and prosthesed (augmented by prosthesis) by technology. Both are marriages of technology and nature; and both belong to a separate ethos of non-uniform nature, that is, a nature without laws. The exception is that the genetic homunculus is merely created from human parts and so it can be argued that it is

[1] There is a definitional distinction between hybrids and chimeras. See the glossary of key terms.
[2] Cybernetic organism. This term refers to Donna Haraway's (1991) notion of human dependency upon technology.

not specifically human. It is also changed *prior to* birth and its birth would not occur without the intervention of technology. This is different from the *in vitro* fertilization methods and fertility enhancers of the cyborg. As Baudrillard (1995:70) notes, genetic intervention is a "definitively integrated prosthesis" and what this means is that there is no longer distinction between the prosthesis and the prosthesed. The term 'genetic homunculus' describes a being that has benefited from genetic alterations that enhance aspects of its physicality and/or intelligence, where human genes have been used only as a point of departure – the genetic homunculus is itself a prosthesis. For example, a genetic homunculus could potentially be a hermaphrodite that can even determine how it reproduces, just as the human cyborg can, but whereas the cyborg is an augmented human and uses its technology to achieve these ends, the technology whereby the genetic homunculus does this is invisible – it precedes and mediates its birth.

The available literature on the subject of alchemy in post-humanism is pitifully sparse and for this reason alone this research is justified and important. However it is not only this absence which needs to be addressed, but there is also a profound need for an understanding of this new and frightening phenomenon of human genetic engineering.

1.1 Scope and nature of the study

In this dissertation, the research is aimed at the investigation of the genetically engineered being in terms of its artificiality versus its naturalness, its social implications and its applicability to post-human discourse in order to form a cohesive theoretical framework around which a genetic homunculus can be posited. Various representations of the genetic homunculus in visual culture are examined to this end.

The tropes of 'natural' and 'artificial' form the central vein of argumentation in this research. While the homunculus is grounded in the domain of the technological,

or artificial, the area of influence of all genetic technology is the natural realm;[1] and the extent to which the two domains appropriate each other's processes and systems of control is under scrutiny. The main premise of this study is that the natural and artificial domains have become indistinct from one another in a posthuman milieu. The various forms and manifestations of the genetically engineered being and the notion of the homunculus both as ideal and dystopian are also dealt with.

The main objective of this study is to demonstrate the relevance of alchemic thought to current research endeavours into genetic engineering, especially human genetic engineering and prosthetic technology, but also to the field of the visual arts and popular culture. In order to demonstrate this, a natural / artificial dichotomy is proposed in terms of the genetically engineered being by first delineating the alchemic homunculus as an area of focus and identifying the key themes inherent to the understanding of the philosophy of alchemy, namely: torment, death and transcendence; the separation and conjunction of opposites in matter; the concept of stone as the genitive substance and, most importantly; the perfection and immortalisation of man through technological works.

These themes are identified and explained with the aim of applying them to a post-human theory of nature, in order to show the genetic homunculus as a post-human, technological being, with a unique genesis based in the spheres of both nature and technology. The idea of permanence through artifice and the transcendence of natural death is explored to this end. The themes that inform the alchemic homunculus are thus shown to relate to modern genetics and thus to have relevance to contemporary post-human discourse in this sense.

Further significance is demonstrated by examining seminal theorists that deal directly or indirectly with the homunculus, namely Robert Pepperell (1995), Jean

[1] The homunculus of Paracelsus is undoubtedly a technological being; however it is also created by the alteration of natural processes.

Baudrillard (1995), Donna Haraway (1992), Carl Jung (1966) and Mircea Eliade (1971) and examining their theories of nature, technology and humanity. The question of whether the creation of a genetically augmented being constitutes extension of agency is also briefly brought under investigation.

The phenomenon of the homunculus is examined in visual culture to give immediacy to the arguments presented in this study and to show the effects of this mythology on a social level. The homunculus in the fields of the visual arts and popular culture is almost always presented in connection with utopian or dystopian designs for nation or state. This handling of the homunculus as a teleological text is examined briefly. The aim of including these visual texts is to give immediacy to the technological grounding of the homunculus as it is presented in the study, as well as serving to contextualise the phenomenon of the alchemic homunculus within a contemporary format.

For the most part, this dissertation encompasses the negotiation of the genetically engineered being in terms of its ontological boundaries, being rooted in the technological and the artificial. The social consequences of and conditions *a priori* creating a genetically engineered being are explored in terms of the relationships between nature, technology and humanity. This is examined from both a post-human perspective and an alchemical perspective, in order to establish post-humanism as a theoretical structure for the negotiation of a genetically engineered being and in order to establish whether or not the alchemic homunculus is a relevant terminological vehicle for describing such a being. This study attempts to establish the alchemical term ‘homunculus’ as a synonym for the genetically engineered being mostly, although not entirely, because the comparison draws attention to the question of the artificiality of both.

Genetic engineering is examined in this study in terms of a brief history of the subject and a presentation of some of the key ethical issues that could conceivably affect the genetic homunculus. Although it is not the intention in this dissertation to discuss the ethics of the question of creating or altering life, any

discussion of this contentious topic must involve some question of ethics and thus certain ethical arguments cannot remain wholly unexplored.

Another goal of this text is to examine the notion of the technological as an alchemic concept in order to present the relevance of the argument. This is achieved by submitting examples of visual culture as evidence of this new post-human concept. In the study, three visual texts are examined in detail – Andrew Niccol's film *Gattaca,* (1997) Orlan's *Hybrids* series (1992 - 2002) and Patricia Piccinini's installation for the 2003 Venice Biennale, *We Are Family* (2002 - 2003). These visual texts were chosen for their presentation of the possible futures and consequences facing a society that chooses to dabble in godhood, that is, to autonomously 'create' a new species, a homunculus. Each visual text explores different possibilities with regard to the exploration of the homunculus: Niccol's film presents a society in which a genetically engineered elite has rights and privileges that are not granted to the genetically inferior human population. The film focuses on a human protagonist who overcomes these prejudices and legal restrictions through subterfuge. The film presents a utopian society with a dark underbelly, similar to the dystopia of Aldous Huxley's novel *Brave New World.*

Orlan's series of artworks shows a comfortable melding with prosthetic technology, in which the means of control is in the hands of the homunculus itself. The homunculus is shown in her works as a hybrid gleeful of its freedom to mix and match gender, ethnicity and culture, presenting a utopian view of a race that can alter its means of reproduction.

Piccinini's hyper-realistic sculptures illustrate precisely the opposite scenario. Her sculptures present wretched and pathetic animal/human chimeras exploited as 'endearing' pets and curiosities for infantile and overly-curious human masters. Her notion of this new technology is a frightening dystopia of scientific imperialism. The genetic homunculus has specific and real social consequences for humanity in the near future, which are illustrated by these visual texts.

In summary the research aims are:

- To establish the alchemic homunculus as a framework for the understanding of the genetically engineered being.
- To institute a theoretical framework encompassing nature, technology and humanity within which to postulate these arguments.
- To ascertain whether the genetically engineered being can be seen as real or artificial.
- To examine representations of the homunculus in visual culture with regards to its specific ontology as presented in the study.

1.2. Theoretical framework

The fundamental question of artificiality versus reality is the essential dilemma which faces the genetically engineered being and is one of the core elements of this study. Whether or not the genetically engineered being can be considered a homunculus depends upon this, because an alchemic homunculus is undoubtedly artificial and yet it remains to be clarified whether or not a genetically engineered being can be considered artificial.

To establish this, the works of Donna Haraway (1992), Jean Baudrillard (1997) and Robert Pepperell (1995) are drawn upon in order to pose a framework in which to consider the genetically engineered being and the homunculus. This consists of a view of nature, technology and humanity that is mutually creative and destructive.

Technology (the agency of humanity's artifice) according to Robert Pepperell (1995) has an intimate relationship with humanity in that the two are becoming increasingly blended. The extension of human agency through technology is becoming further-reaching the closer it becomes to the human body; disappearing inside the human body until the ultimate soft technology emerges to extend human agency beyond humanity itself and into the hands of something else entirely. A technological singularity (a kind of watershed of eras) is brought

about by the insurmountable differences between humanity and our genetic progeny, both physical and ideological, that the latter's total union with technology engenders. I intend to show that this singularity represents a death of humanity and a subsequent rebirth; and is equivalent to ancient transcendence mythology that permeates alchemical rites. When the genetically engineered being and the homunculus are examined under these criteria, the unique artificial nature of the genetically engineered being becomes apparent and it is possible to apply terms of negotiation to it, whereby it is established as a post-human being and a homunculus.

The human-made being is a common archetype featuring not only in alchemical constructs but also in Greek and Jewish mythology. The archetype of the ideal, transcendent being (of which the homunculus mythology forms a part) is even more common. At least for the alchemists, the notion of the homunculus was an idealised one (Newman 2004), however it was quickly relegated to the archetype of the monster, as is evident in many literary sources such as Goethe's *Faust* and Mary Shelley's *Frankenstein.* It is likely that the term became maligned as a result of the discrediting of alchemy as a 'counterfeit science' with the advent of modern scientific theories and the ethical and moral anathema that the creation of a homunculus represents. Nonetheless the homunculus is still being articulated as the product of human generation through the alchemist's technological labours and represented as an immortal and thus transcendent being.

Already popular culture has seen countless appropriations of the homunculus idea in popular fiction, in Japanese anime series such as *Full Metal Alchemist* and in films such as Andrew Niccol's *Gattaca* (1997) with the advent of genetic engineering in the agricultural sector on a commercial scale. The scientific intervention in human DNA is currently a topic of great contention among many scholars, scientists, religious organisations and philosophers alike. Social objections to the dehumanisation that human genetic engineering represents are

similar to those raised by the opponents of Paracelsus[1] (Newman 2004). The genetically engineered being would appear to be a new social manifestation of the homunculus.

Carl Jung, Swiss analytical psychologist and author, provides the basis for much of the investigation into the homunculus and alchemical philosophy. Of the eighteen volumes of *The collected works of C. G. Jung,* three are exclusively dedicated to interfacing modern depth psychology with alchemic concepts. While this may seem at best incidental to this investigation, these volumes are, in fact, invaluable in that they offer contemporary, interpretive handling of a difficult and often misunderstood subject and, even more importantly, they offer synthesised, comprehensive information on the alchemical mysteries. These works all offer understanding of the five principal alchemical notions (as already mentioned) under which the homunculus symbol can be understood. The richest volume in this regard is *Mysterium coniunctionis, an inquiry into the separation and synthesis of psychic opposites in alchemy* (1963). *Mysterium coniunctionis* (1963) provides complete investigations of the symbols and themes in alchemic philosophy. This is key to the identification of alchemical themes in modern genetics.This seminal work will be examined in this review.

Mysterium coniunctionis, translated as *The mystery of the conjunction,* is tacitly geared towards explaining the psyche as a collection of dialectical opposites. The value of the volume to this study however, lies in its detailed descriptions of the symbols which make up these dialectical diameters, which fall into the categories of the opposites themselves and the mediation of mercurius (the intervening chaos – the earth-mother controlled by the alchemist).

Mircea Eliade, Romanian historian of religion, fiction writer, philosopher and professor at the University of Chicago, authored a number of books on the subject of alchemy which are invaluable to the subject's study outside of the

[1] Sixteenth century philosopher and physician who first posited the term homunculus for species-creating alchemy.

original Greek, German and Latin treatises. The most notable of these is *The forge and the crucible* (1971), an invaluable resource for ideas on transcendence mythology in alchemy. Since this research focuses heavily on the notion of transcendence in genetics (the supposed 'perfection' of nature), *The forge and the crucible* is essential to gleaning such insights. According to Eliade, the key element of all alchemical philosophy is that all matter is subject to transformation or rather, transfiguration. The alchemical opus amounts to forcing this transcendence of the base or impure state through human labours (Eliade 1971). The agency of these labours is now, as it was for the alchemists of pre-modern Europe, technology.

Mircea Eliade's *The forge and the crucible: The origins and structures of alchemy* (1971) focuses predominantly on myths common to medieval Arabic alchemy, ancient Chinese alchemy and ancient Indian alchemy, putting forward the motifs that permeate almost all alchemic works up to and including the modern era. These myths include the symbolic importance of the *Terra Mater* (the Earth Mother) and the re-enactment of her processes in the alchemist's tools; the genitive nature of stone; the significance of initiation rites; and the value of fire to these rituals. Eliade (1971) tracks these themes through time, postulating that alchemical mythology informs and is vindicated by the era of rapid production that occurred in the late nineteenth century with the Industrial Revolution.[1]

Author and scholar of alchemy, Prof. William Newman (2004) provides correlations between alchemic philosophy and biotechnology, most notably highlighting the philosophical and ethical dilemmas surrounding both. Newman shows the origins of the art/nature dichotomy and how these categories were discussed and contested in the ancient, medieval and early-modern periods of Western history and how they came to hold their ambiguous status today.

[1] This particular view is common to rationalist, materialist thought and it is commonly held that that alchemy is indeed the progenitor of modern chemistry (Stillman 1960), particularly in the invention of apparatus and the discovery of chemical composition. However, this masculine scientific paradigm has been replaced in recent years by more androgynous homunculus ideology (Cf. Chapter 3, p 51, Homunculus as culmination of prehistoric alchemy).

According to Newman (2004), the alchemists sought in their art the fulfilment of nature and saw no such dichotomy. Newman (2004) proffers invaluable ideas on "perfective" art or artifice (for example, medicine) that is intended to perfect, or accomplish the expression of nature by removing obstacles.

Newman (2004) avers that alchemical discussions of the admissibility and permissibility of interventionist approaches to nature had already set the terms of negotiation of nature for such pioneers of empirical science as Robert Boyle and Francis Bacon. A new kind of natural inquiry that differed considerably from the long-established natural philosophy of Aristotle, including early-modern ideas of the proper goals of inquiry into nature and consequently the different kinds of "interventions" that were or were not seen as legitimate in pursuing those inquiries, was justified by alchemical arguments about art and nature, alongside the idea of the alchemical perfective art (Newman 2004).

With the aim of contextualising alchemy within a post-human ideological framework, American biologist Donna Haraway's (1992) theory of nature as a topic-place is used to propose a kind of profane sacred nature as a framework for the creation of the genetically engineered being – a proposal of a synthesis of nature and technology. I also work towards uncovering the facilitators of the creation, fusion and deconstruction of the homunculus within the framework of the natural and the technological, the human and the artificial. The ideas which inform our conceptions of what is natural and what is artificial form the ground-base upon which this research will be conducted. Donna Haraway's (1992) conception of nature as a 'topic place' is crucial to this study. Haraway (1992:296) highlights the need for a fluid conception of nature rather than a fixed, imperial one: "We must find another relationship to nature besides reification and possession", she states.

Haraway calls for a view of nature as a 'topic place', as "a rhetorician's place or topic for consideration of common themes" (Haraway 1992:296). This places nature in the role of being a discussion or interaction between various actors and

things that are acted upon - as a kind of stage (Haraway 1992:297) that is reflexive to itself. Positioning nature in this role as the stage for discussion, rather than the discussed, even in the abstract, allows that human labour itself forms nature when enacted upon the natural realm. In this dissertation this conception of nature is crucial to an understanding of the genetically engineered being in a post-human milieu because it is, of course, brought about by human intervention in natural processes.

Calling the artificiality of the homunculus to question leads to the examination of what is real and what is artificial. To understand this rather grey conception of what is natural, it is necessary to define what is considered to be the boundary between real and unreal, especially in terms of a genetically engineered being. French post-modern philosopher Jean Baudrillard (1995:66) provides such definition:

> Of all the prostheses that mark the history of the body, the double is doubtless the oldest. But the double is precisely not a prosthesis: it is an imaginary figure, which, just like the soul, the shadow, the mirror image, haunts the subject like his other, which makes it so that the subject is simultaneously itself and never resembles itself again, which haunts the subject like a subtle and always averted death. This is not always the case, however: when the double materializes, when it becomes visible, it signifies imminent death. In other words, the imaginary power and wealth of the double - the one in which the strangeness and at the same time the intimacy of the subject to itself are played out (heimlich/ unheimlich) - rests on its immateriality, on the fact that it is and remains a phantasm.

Reality, or rather the image of the real, is always preceded by simulation. Baudrillard (1994) shows that the simulated reality no longer has a referent in truth. As in film, advertising and the technological realm, the new reality is created simply from simulation itself, rather than having an anchor in reality. The simulation becomes the ephemeral and ever-shifting *hyperreal* – that which is more real than real – the simulated world, images, film, computers and so forth, are more intense than the mundane world outside.

All organising forms of society – politics, economics, culture and the sciences – are mediated and dominated by simulation and they lose power under the new order of signs and instead only the simulation has power. The mirror image becomes more concentrated than that which it reflects and the real disappears. For Baudrillard (1994), the replacement of the real by its double represents its death. This destruction must therefore retain its imminence and must never actualise in order to retain the fantasy of the double, which is the romance of the avoidance of death. This relationship between real and unreal is examined critically in terms of the genetically engineered being and its human progenitor.

Francis Fukuyama (2002) describes human nature as all genetically determined behaviours and characteristics unique to human beings. He argues that this will be lost completely if genetic engineering is allowed to infiltrate our means of reproduction. Similar to Baudrillard, Fukuyama avers that the materialization of the double – in this case our genetic progeny – will mark the doom of humanity as we know it. This position is investigated in this paper.

Robert Pepperell, in *The post-human condition* (1995) posits that the boundary of the human organism is not only no longer visible but no longer delineable. According to Pepperell (1995), the boundary between the human organism and its environment, as well as the human organism and its technology is also no longer clearly definable. As humans, we continue to extend our physical presence through our technology and our technology becomes less distinguishable from our bodies, to the extent that it is disappearing inside us. Pepperell maintains that the extension of human agency, (technology) is as natural as human agency itself. In order to contextualise the argument of a genetic homunculus within a post-human framework, this position of humanity is investigated to see whether it can pertain to the homunculus.

1.3 Methodological framework

In this study, existing post-human philosophies of nature, technology and humanity are critically examined with reference to alchemic philosophy. To achieve this end, the comparative study of alchemical philosophies with reference to an integrated synthesis of the various post-human theories already mentioned as well as visual texts is required. These data are clearly multifarious and as such a research methodology that deals with this diversity is necessary. The interdisciplinary nature of this study calls for an integrated approach to the theory, while maintaining a specific focus, namely the genetic homunculus. However, this requires that the theoretical framework be examined carefully before any inferences about the homunculus in contemporary society can be drawn. To get around this problem I have chosen the grounded theory research method as proposed by Glaser and Strauss (1967) so that the post-human theoretical framework may be examined alongside the alchemical theory.

Grounded theory research requires exhaustive and constant comparison and integration of research data. After each bout of data collection, the key issues are noted and compared. This rapidly begins to formulate theory, which is again compared to more data. Categories and themes within these results are then identified, as well as their properties (subcategories). This research method applies well to the diverse data that is applicable to this study.

Because this research also involves the examination of interpretive data and the discussion of visual references, it is crucial that the research remains objective. For this reason, the validity, applicability and strengths and weaknesses of the argument will be closely examined.

1.4. Outline of chapters

Chapter two: Historical and theoretical overview

In this chapter the existing literature on the homunculus is examined and the alchemic roots of this dissertation are made clear, drawing upon the works of Jung (1963) and Eliade (1971) to establish the various alchemic premises upon which the homunculus is based. These include five main ideas, namely: death and transfiguration; the separation and synthesis of opposites; purification; the genitive stone and the perfection of man.

The section of this research that deals with post-human theory draws heavily upon the works of Haraway (1992), Pepperell (1995) and Baudrillard (1995) and the main premises of these theorist's seminal works relevant to this study are examined. Haraway's (1992) theories of nature and the natural are examined, followed by an exposition of Robert Pepperell's (1995) position on post-humanism. Jean Baudrillard's (1994) *Simulacra and Simulations* is also featured in order to establish the structure upon which notions of the real and artificial are based in this study. A brief examination of the history and extant ethical literature on genetic science is then presented.

Chapter three: The homunculus in post-humanism

This chapter serves to contextualise the problem of the homunculus as a post-human being within a theoretical framework and it is maintained that the homunculus can be considered both natural and unnatural. This chapter focuses on the examination of the homunculus mythology from a bio-political standpoint. The formulation of a theory of nature, technology and humanity for the post-human, genetic homunculus is crucial to this section and as such the proposal of a unified post-human theory of negotiation for the homunculus is presented.

This entails applying the problem of the genetically engineered being within contemporary post-human theory and correlating this data with the archetypes

prevalent in alchemy that deal with the alchemic homunculus. A clarification of homunculus mythology is provided, followed by an exposition of recent developments in genetic science that relate to genetic engineering and the genetically enhanced or engineered being. This is in turn followed by a detailed theoretical structure for managing the genetically engineered being or homunculus in contemporary society.

Chapter four: The genetic homunculus in visual texts

The representation of the homunculus in three visual texts is discussed at length in this section and the arguments presented in the previous chapters are applied and examined with regards to how the homunculus is handled in all three of these texts. This section focuses on the interpretation and consideration of the results of the research, as well as the drawing of inferences from the theoretical framework posed in the previous chapter, with the aim of forming part of the pursuit of a solution to the problems posed by the genetically engineered being, as well as showing the extent to which the homunculus manifests as a phenomenon of contemporary visual culture.

Conclusion:

This retrospective summary draws together the arguments presented in the chapters in order to finalise the inferences and conclusions made there, bringing the research to conclusion. A summary of the preceding chapters is presented with an examination of the study's contribution to the field. The limitations of the study are then discussed and suggestions for further research are given.

CHAPTER 2: HISTORICAL AND THEORETICAL OVERVIEW

By comparing the historical development of alchemy and the homunculus with several significant works by various modern authors, this chapter presents the fundamental ideas that will be dealt with in this study, as well as briefly identifying some that are investigated more closely in the following chapter. Seminal works penned by theorists Mircea Eliade, Carl Jung, Donna Haraway, Jean Baudrillard and Robert Pepperell provide the bricks and mortar for the foundations of this research and their works must be examined in order to lay a solid grounding for this study. These works are as follows: *The forge and the crucible: The origins and structures of alchemy* (Eliade 1971); *Mysterium coniunctionis, an inquiry into the separation and synthesis of psychic opposites in alchemy* (Jung 1963); *Simians, cyborgs and women: The reinvention of nature*. (Haraway 1991); *Simulacra and simulations* (Baudrillard 1995); and *The post-human condition* (Pepperell 1995) This overview is provided to help elucidate the ideas put forward in these works that pertain directly to this dissertation and, as such, the final section of this chapter offers a brief and succinct history of the genetic sciences that are pertinent to this study, as well as an overview of several ethical essays and papers on the topic of genetic engineering and, in particular, chimera research.

2.1 Alchemy and the homunculus

The notion of the homunculus is dependent on certain ideas or motifs within alchemy. These mythologies include the idea of torment, death and subsequent transfiguration; the separation and synthesis of opposites in matter (tied to this is the symbolic nature of purification); the idea that stone is the source of life and, finally, the perfection and immortalisation of man through technological labours. These ideas are fundamental to the understanding of the homunculus as a cultural phenomenon in contemporary society, because they are mirrored in a contemporary understanding of nature and the human condition.

These particular notions have not previously been grouped in this way in order to describe the homunculus, however in context of the genetically engineered being this is warranted, as will be shown. Historically, the concept of the artificial creation of life has been aligned with other fundamental precepts in alchemy, as is indicated in Robert Russell's translation of Jabir Ibn Hayyan (more commonly known by the Latin name Geber) which suggests that all his prominent alchemist's chemical experiments were, in some way, focused on this goal (Holmyard 1928).

According to Eliade (1971:8), "[m]ineral substances shared in the sacredness attached to the Earth-Mother" This stems from the primeval notion of the embryonic growth of ores inside the 'womb' of the earth (Eliade 1971). Eliade (1971:8) notes:

> Metallurgy thus takes on the character of obstetrics. Miner and metal-worker intervene in the unfolding of subterranean embryology: they accelerate the rhythm of the growth of ores, they collaborate in the work of Nature and assist it to give birth more rapidly. In a word, man, with his various techniques, gradually takes the place of Time: his labours replace the work of Time.

The world of the ancients, Eliade (1971) suggests, is sexualised[1] in order to confer the attributes of femininity and motherliness to the earth.[2] Meteors and lightning strikes become the heavenly fertilisation of the feminine earth by the masculine air. Any celestial contact with the earth is considered "the 'first form', the immediate manifestation of the godhead" (Eliade 1971:20). According to Eliade (1971), the result of this union is the embryo-ore. The divine and sacred union of the celestial and the earthly not only bestows the ores of the earth with

[1] Eliade states: "It is the idea of life which, projected onto the cosmos sexualises it. It is not a matter of making objective or scientific observations, but of arriving at an appraisal of the world around us in terms of life, in terms of anthropocosmic destiny, embracing sexuality, fecundity, death and rebirth" (Eliade 1971:34).

[2] Although, for the ancients, the ability to gestate and produce offspring was inherently the domain of the earth rather than women, since the earth initially gave birth to humankind. Although the qualities of fecundity were really transferred from women onto a numinous and sexualised earth, Eliade (1971) states that this would not have been how the Ancients saw the relationship, rather, women would be seen to have earthly properties.

great sanctity, but, of course, the instruments that are made from such metals or that handle them. Eliade states: “All these beliefs do not stop at the sacred power of the metals but extend to the magic of the instruments. The art of creating tools is essentially superhuman – either divine or demoniac” (Eliade 1971:29).

The significance of the alchemist’s tools is affirmed by the sanctity of the ores as well as the sacred re-enactment of the natural process. They serve to simulate the gestation of the ore in the womb of the Earth, hastening its journey to gold. The alchemist’s vessels and retorts were the sacred representations of the earth’s womb. The process of the maturation of the ores could not take place unless their natural environment was simulated perfectly. The warmth of the furnace simulates the gynaecological process, whilst the flame also serves to catalyse the process of gestation. The idea that a small being could be created in the retort held fast to the notion of *petra genitrix,* in that the created being was essentially a product of human fluids and various other materials gestated within a false womb – the replacement of the earth mother. Thus any homunculus is born of the earth, rather than of a woman in this idiom.

Medieval Islam changes this notion slightly, but the fundamental principle remains the same. It is suggested by Geber (Holmyard 1928) that life comes directly from God and that the alchemist’s ability to produce life in the retort is less an appropriation of divine power than a gift bestowed by the divine as a reward for prayers for knowledge. This shows how the domain of creativity is always delegated to the divine and, beyond prehistoric lithic culture, accorded to God instead of women with the onset of organised religion (in this case Islam). Nonetheless the genitive process is always *reclaimable* as a divine ‘gift’ or through human technology. With the secularisation of modern society, we see a return to the feminine in this regard, especially since the latter half of the nineteenth century and the beginnings of women’s liberation finally reaching a

kind of reversal in feminism, where the androgynous is seen as the ideal – like the archetype of the immortal God.[1]

The principal lithic mythology with regards to the homunculus is that of men born from stone. This type of mythos also has implicit in it "the notion that stone is the source of life and fertility" (Eliade 1971:43). The belief in the stone parentage of the first men (*Petra genitrix* – the genitive stone) occurs in Ancient Greek and Judaeo-Christian mythology, as well as a large number of myths throughout the world (Eliade 1971). This type of mythology informs many of the notions pertinent to the homunculus (Cf. Chapter 3, p51). Indeed the earliest mention of homunculi (although they were not named as such) in the writings of Zosimos of Panopolis, held that the ores themselves were actually homunculi (Jung 1963).

The importance of this imagery is evident in the human use of tools and technology to further their ends. Not only is the use of tools one of the defining characteristics of higher intelligence, it is also, according to Haraway (1991), a means of changing aspects of the physical self. The technology that stone represents in that first primitive blade, is the ability to alter the natural realm and the things in it, including humans themselves. The manipulation of stone is a becoming of divinity, it represents the primary genitive creativity. This notion of the ability to seize the power of the gods has not departed from the human psyche.

Schwarz, (1980:57) in exploring the alchemical view of reclaiming natural processes, explains the symbolic importance of genitive creativity in alchemical thought:

> In the same way as Prometheus is the mythological archetype of the rebel and Lucifer (Luci-fer – bringer of light) is the theological archetype of the rebel, the alchemist is their human reflection: Prometheus, Lucifer,

[1] The concept of the monotheistic God is completely de-sexualised to the point of androgyny – evidenced in the way that some people refer to the Christian God in the feminine 'she'or even the non-pejorative 'it.' The essential way that the human conception of immortality has changed in recent years is in the acceptance of the androgynous as ideal, as a part of the transcendent.

> the alchemist all strive to equal the feats of the gods to reconquer the two complementary qualities: immortality and creativity.

If humans can manipulate stone they can manipulate the technology of the gods themselves. Immortality and creativity are complementary aspects because the notion of technologically altering nature through creativity is inclusive of altering the nature of humanity itself. In this manner, the manipulation of stone becomes the manipulation of life itself.

The idea of human transcendence has been a feature of human religion since its antediluvian beginnings. The ritualised sacrifice that Andrew Lang (1901) witnessed in the so-called 'primitive' cultures Eliade (1971) elaborates upon in the relationship of sacrifice and fire to the symbolic process of removing ores from the earth by explaining the various creation mythologies that require the sacrifice of a deity or hero to bring about the life of humankind, the earth or the cosmos. Eliade establishes that throughout history, the notion of sacrifice has been coupled with the idea of subsequent rebirth. Similarly the notion of sacrifice is tied to the extraction of metals from the earth. Because of the sacred nature of the Terra Mater and the sanctity of her ores, those who handle these metals must themselves be made sacred (Eliade 1971) and undergo personal sacrifice before commencing with such a sacrilegious act. Eliade (1971) shows how, in ancient cultures and as recently in Europe as the end of the Middle Ages, rituals of abstinence and/or purification were observed before the undertaking of any metallurgical endeavour. This is both because mining signifies the consummation of the metalworker's marriage to the earth that comes about when he undertakes to simulate her processes; and because it is necessary for the miner to sacrifice of himself in order to quicken the 'life' of the ores.

Coupled to this idea of sacrifice is the symbolism of flame and immolation. The alchemists, like their prehistoric counterparts, believed that transcendence can not come about without prior torment and death, according to Eliade (1971). This relationship of trial and death and final transcendence is alive in almost every

major religion today, one of the most familiar of these symbols being Jesus Christ. Eliade (1971) puts forward that the rite of initiation is key to the alchemist's ability to intervene in the natural process. Immolation represents the sacrifice necessary for rebirth and alchemic initiation rituals include the symbolic torment and death of the initiate so that he can be born anew. The significance of fire to the alchemic process is twofold: immolation begets new life (reiterating the deific sacrifice to bring about mankind) and warmth hastens growth.

Eliade (1971) shows that it is only through a process of purification through sacrifice, death and transcendence that corresponds to both the ores and the alchemist himself, that the alchemist may conquer Time to bring Nature's ores to their ideal state – gold. Mircea Eliade (1971:173) avers that it was in the Industrial Revolution of the nineteenth century that the Western alchemist's desire to supersede Time was finally realised in that ultimate rapidity that the machine age brought upon nature:

> It is in this nineteenth century … that man succeeds in supplanting Time. His desire to accelerate the natural tempo of things by an ever more rapid and efficient exploitation of mines, coal fields and petrol deposits, begins to come true … [a]nd we know full well to what extent the synthetic preparation of life, even in the modest form of a few cells of protoplasm, was the supreme dream of science throughout the whole second half of the nineteenth century and the beginning of the twentieth. This was the alchemist's dream too, the dream of creating the homunculus.

To Eliade (1971), this age was the culmination of the smelters and smith's work and the predication of the alchemist's dream – a previously unmatched speeding up of the processes of nature and the explicit power over time itself that this brought with it, would have reiterated the immortality of the alchemist. But it is not only in the artificial gestation of ores that the alchemist sought dominance over time – the supreme goal of alchemy throughout is the purification of a base state to one of perfection and permanence, such as the transmogrification of mortal to immortal (Eliade 1971).

While it must be noted that the homunculus is dealt with only briefly in Eliade's *The forge and the crucible*, the ideas and philosophies behind alchemical practices are as important as the works the alchemists purported to have been able to perform. All alchemical works and indeed the creation of the homunculus are invested with occult significance that is tied inextricably to these archetypes. This work is atypical of books on the occult published at the same time (with the significant exception of the then newly published collection of C. G. Jung's life-works), in that it offers a unified collection of "motifs", that is, archetypal notions of the ancient world, which work towards explaining particular principal theories and spagyric themes, rather than simply chronicling various occult beliefs for comparison. Also, this publication is free of the subtle Western, Judaeo-Christian derision of the beliefs it submits for evaluation, typical of many earlier works on the occult and the so-called "savage religions".

This volume is significantly influenced by the contributions to the field of research into alchemy of Eliade's contemporary Carl Gustav Jung. And much of his research follows the same Jungian paradigm of alchemy as a 'spiritual art'. It must be noted that another school of alchemical study exists (the chief contemporary proponent of which is Lawrence Principe) which is that which focuses upon the contributions of alchemy to chemistry and to contemporary science, rather than on the so-called 'philosophical arts'. This school aims to debunk the notion that alchemists were superstitious smelters and charlatans and rather focuses on the field from a historical-scientific standpoint. Nonetheless, the fact remains that the proposal of the homunculus was influenced by the principles detailed in Eliade's study of ancient religions and by those described in Jung's examination of alchemical symbolism.

Another central theme of the homunculus idea is the symbolism of the conjunction described by Jung, which focuses on the relationships between the opposing symbols of Rex (King) and Regina (Queen); Sol (Sun) and Luna (Moon); Adam and Eve; soul and body within the arcane substance, as a system

of factors striving for transformation. These binary systems play upon the masculine/feminine dialectic, elemental oppositions, competing planetary positions and similar dialogues that are seen as symbolically significant according to alchemic and gnostic tradition.[1]

According to Jung, the substances that the alchemists sought to combine "always had – on account of their unknown nature – a numinous quality which tended towards phantasmal personification" (Jung 1963:458). So all matter was accorded spiritual symbolism which directly influenced the way the alchemists conducted their experiments. The most important substance subject to transmutation was the *prima materia* – the unidentified first matter from which the Opus Magnum must begin. Jung (1963) identifies the arcane substance as Adam – the first man and the symbol of humanity itself.

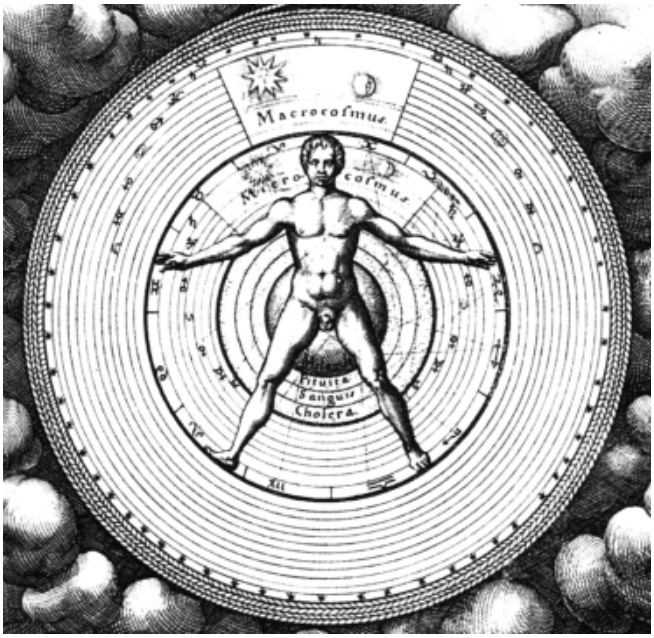

Figure 2: Robert Fludd. Detail of frontispiece for *Utriusque Cosmi* 1617 Engraving. (Roob1996:543).

[1] Jung was at odds with the Freudian psychoanalytic school and although he vitriolically disputed Freud's views on sex, he was nonetheless concerned with the sexual aspects of the psyche as symbolic metaphor. While Freud focused on the sexual drive as a motivator for behaviour, Jung used the allegory of the alchemic conjunction to portray psychical union. The achievement of union represented self-realisation.

To illustrate this, Jung (1963) points to the phenomenon of like-opposites within the combination of metals such as iron and copper (Mars and Mercury respectively). Each of these held binary properties such as “man/woman god/goddess and son/mother” (Jung 1963:458), which are very important for the adept because, according to Jung (1963), opposites are arranged in a quaternity, like the four elements, the four humours, the four corners of the world and the four colours (Jung 1963). The symbolic meaning of the quaternity is “circular movement in time” (Jung 1963:7) and “the aim of the circulatio is the production (or rather, reproduction) of the Original Man, who was a sphere” (Jung 1963:7) (Figure 2). This reproduction of the microcosm (man) is repeated in all phases of the *Opus Magnum* and is symbolic of the quaternary nature of the world (macrocosm). Adam is also the symbol of *aqua permanens* and according to Jung “[w]ater is the prime arcane substance and is therefore the agent of transformation as well as the substance to be transformed” (Jung 1963:382).

Alchemical thought is notoriously confusing, because at the same time, Adam is also fashioned out of clay – a feminine earth symbol and not water (a masculine symbol) – however, the relationship of Adam to water is symbolic, whereas his relation to clay is genitive. Jung (1963:385) explains that this further implicates Adam as the prime transformative substance:

> We must now turn to the question of why it was that Adam should have been selected as a symbol for the prima materia or transformative substance. This was probably due, in the first place, to the fact that he was made out of clay, the ubiquitous *materia vilis* that was axiomatically regarded as the as the prima materia … It was a piece of the original chaos of the *massa confusa*, not yet differentiated but capable of differentiation; something, therefore, like shapeless embryonic tissue.

The identification of Adam as a symbol for the arcane substance is important because the image of Adam is echoed in the ideal of the homunculus, or rather, the homunculus represents Adam - the created being. According to Jung (1963), Adam himself is the product of the union of opposites – binaries within himself that represent the un-united whole which must be re-joined through purification. These opposites are an aerial Man and earthly Man – spirit and body.

This rings true for the genetic homunculus which is quite literally a union of opposites. The homunculus's physical form manifests in every conceivable sexuality, from androgyne to asexual, through the manipulation of the chromosomes in the subject. This is not to mention the amalgam of traits from various ethnic groups and even different species that might form a part of the genetic homunculus. However, beyond this superficial similarity lies the notion that the conjunction is a perfective process. The concept of a transcendent soul and an earthly soul that one finds in the Adam symbol is vital to the idea that the genetic homunculus is a transcendent being.[1] The idea of perfection arising through conjunction and separation – the process of distillation – as it applies to the genetic homunculus is a crucial debate (Cf. Chapter 4 p117-118).

Jung (1963:457) states that the adepts were "ultimately concerned with a union of the substances – by whatever names they may have been called. By means of this union they hoped to attain the goal of the work: the production of gold or a symbolic equivalent of it". The reconciliation of the opposites is therefore always intended to bring about a third state, a state of two-being-one often by sexual union. This hierogamy of essences could never happen without the ritual journey through the planetary houses and the sloughing off of impurities. This distillation was necessary to attain worthiness of transfiguration (Jung 1963) and would bring forth the incorruptible third, the quintessence.

Jung (1963) has a clear view of the reasons for this symbolic union. The forces which enable the adept to alter matter are akin to the liberation of the soul from its corporeal prison. In the same way, the emancipation of spirit appears to be the Philosopher's Stone, because the alchemist's progression of self, his soul, provokes a parallel progression in the 'spirit' of matter.

Jung (1963) offers a reproductive view of the alchemical conjunction. He avers that the sexualised nature of chemical relationships is motivates the

[1] The right to separate and isolate (by ownership) essential parts in humans is the focus of ethical debate surrounding the Human Genome Project.

understanding of the alchemist's notion of conjunction. This idea is important today in the face of contemporary reproductive technology, which is central to the section of the genetics industry that deals in fertility, pre-selective genetics and assisted pregnancy. Jung's exposition on the spirit-body or the spirit of matter follows archetypes that correspond to modern genetic determinism in that genetic determinism is based on the notion that all life and all aspects of life, both physical and insubstantial, stem from the genetic code found in DNA. The reduction of matter to essences was at the heart of alchemic distillation – the alchemic process known as the *extractio.* The combination of "essential bodies" corresponds further to recombinant genetics.

2.2 Post-humanism

Post-humanism and transhumanism deal with the specific notion that the state of being human is impermanent, in some senses undesirable and capable of perfection through technology. Post-human theorists such as Robert Pepperell and Donna Haraway advocate human enhancement through synthesis with technology and advocate alternative readings of fundamental philosophical conceptions of nature, humanity and technology. Post-humanism is defined by the re-evaluation of boundaries for humans in light of emergent technologies. This arena welcomes the genetic homunculus in light of the fact that the homunculus is in essence post-human – unable to assume a fixed (biased) attitude about the nature of being human. But it is also transhuman – it represents the pinnacle of human synthesis with technology, it is created with the perfection of the human organism in mind and it calls for a fundamental re-figuring of traditional modes of engagement for human beings.

The boundaries of sex and gender are altered by the genetic homunculus, as are concepts of ethnicity and culture and notions of otherness. Technology in this sense plays a crucial role as it always has in post-human thinking, but in the sense that it becomes the arbiter of the post-human condition – a potentially dangerous and even lethal proposition. The genetic homunculus is defined by its

emergent ontology, however. Given its instability of definition, it is in the unique position of being able to *become.* Given that it can assume diverse identities and understand the world from heterogenous perspectives, the genetic homunculus is certainly a hopeful site of post-humanity in this sense, but it can not be forgotten that the technological plutocracy is never beneficent.

The fusion of sex and technology that the genetic homunculus represents yields yet another strange situation in which a fundamental aspect of life is prosthesed and perhaps even made redundant by technology. This is not to say that the traditional means of procreation will ever be done away with, but it will certainly find new avenues of expression, perhaps in a fusion of the traditional and the novel. Such a crucial digression from the path of humanism leads one to the question: Where does nature begin and technology end? What, if anything, is the fundamental difference between Natural and Artificial?

In *Simians, cyborgs and women: The reinvention of nature*, Donna Haraway (1991) attempts to find a contextual way of dealing with nature - one that is self-reflexive with regards to history, place, economy etc. Haraway (1991) reinstates the modernist viewpoint of a finite and inalienable truth, but acknowledges that there is an inevitable distortion of this truth, which is based on partiality. However she advocates an awareness of this myopia, so that dialogues can be formed between the (objects) actors and their (subject) environment. She reworks notions of historical, social bias and partiality into “discussions”, or dialogues between subject and object – allowing for bias rather than vilifying it. She does this using the metaphor of vision, or *views*, stating that observers are subject to their own extent of vision and the particular dialogue between themselves and their environment. This idea, for Haraway, means that theoretical or positional bias denatures or distorts everything (Haraway 1991), much like a pair of spectacle or goggles; however an awareness of this establishes reflexivity, which begins to merge the notions of subject and object. For the genetic homunculus, this is a useful way of seeing nature by virtue of the fact that it allows for the

unique position of artificial genesis to be at once subject and object – to be simultaneously artificial and natural (Cf. Chapter 3 p62-69).

It is Haraway's contention that localised ideas do not *reproduce* truth, but rather *regenerate* contestable, novel forms. They produce new patterns of interference and distortions, dispensing with the traditional borders of subject and object (Prins 1995). All of nature becomes a discursive web where each action and interpretation is incorporated into the whole. Nature, for Haraway (1991), is an inalienable topos or stage which is acted upon by various bodies, whose visions interact with nature to form new "monsters", which, in turn, become a part of the stage and that act, are interacted with and are acted upon. This denotes an interactive meaning-forming process, which she advocates in favour of the one-sided process of meaning-formation that is representation. In the age of the genetic homunculus, the traditional forms for remaking the self through narrative and performance art will collapse into a far more extreme form of self-re-creation – the altering of DNA. The processes of connotation and denotation of representation can not contain a completely chaotic and deliberately fluid conception of a non-fixed entity such as the genetic homunculus. The genetic homunculus, in terms of ontogeny, is completely unpredictable,[1] and thus incapable of being *re*presented.

For Haraway (1991), representation is defunct in the sense that it tries to possess its subject – it tries to reproduce and dominate it. This, to Haraway, is unacceptable as a mode of dealing with nature. This is because it infringes upon the body which, as an object of scientific discourse, is not a natural or given entity, but rather an object of knowledge and as such, an object brought into being by biased subjects (Prins 1995). The body can create new bodies and distortions that interact with nature and is thus not a flaccid or passive object, but rather "an active, meaning-generating axis of the apparatus of bodily production"

[1] Of course the genetic homunculus can be predicted inasmuch as it is a created being with an author, but it is subject to the unpredictable courses of technological advancement and human whim.

(Haraway 1992:200). Nature is thus seen as a purely discursive process between actor and stage; the actor becomes a material participant in nature and, in this way, denies representation and domination of nature (Haraway 1991).

For Haraway (1991), nature is no longer autonomous or transcendental, but constantly created and creating. Since she establishes that bodies can create other bodies by creating meaning, the distinction between subject and object is blurred (Prins 1995) – the object is no longer passive, but rather it is empowered as a creator of meaning itself – it is also a subject. This denial of innocence is a way of divorcing knowledge from representation. In this way Haraway (1991) re-enfranchises identities that have traditionally been troped as passive or subservient. The contingency of identity is a source of empowerment for Haraway (1991).

Understanding the makeup of identity, the body and nature are highly important in terms of the genetically engineered being. Haraway's techno-feminism provides the basis for an integrated theory of post-humanism that is inclusive of genetically engineered beings.

Other advocates of the post-human condition would advocate a more literal interaction between the genetic homunculus and its environment and argue for the genetic homunculus as a completely natural phenomenon, rather than an interplay of natural and artificial. Robert Pepperell, in *The Post-human Condition* (1995) posits that present-day technology effects fundamental changes in all aspects of human life and society, from arts and culture to politics and economics. These areas are becoming ever-more saturated with "essential" technologies and all human experience is becoming integrated with ever-more rapidly advancing technology. This technology threatens on an escalating scale to overwhelm and destroy humanity. However, this destruction is as inevitable as entropy itself and is itself an extension of evolution. Francis Fukuyama (2002)

argues that this coming death is only the death of humanity. Other systems, such as democracy and religion will continue. According to Abrams (2004:255):

> The debate over self-fashioning and its relation to cosmopolitan democracy stands to become re-configured in the coming decades. Self-fashioning will evolve with the new technologies, radically changing the human biological form and its experience. These technologies, which have long been integral to posthumanist science fiction, are now converging with science fact. As this happens, both the public and private spheres will also be irrevocably transformed.

The growing intimacy humanity fosters with its tools is resulting in a blurring of boundaries between the two entities. According to Pepperell (1995), this confusion of externalities is a natural process and is linked to the way our own consciousness functions. Pepperell suggests that total integration with technology will therefore come about as a seamless transition that has already begun.

Pepperell (1995) explains consciousness as a complex, non-linear process that can not be reduced to simple linear systems, stating that consciousness is “a property that is distributed throughout the living body rather than being located in any one part” (Pepperell 1995:14). Pepperell also states that any organism interacts with its environment to such an extent that the two are not as distinguishable as is immediately apparent – it eats, drinks, excretes, produces sounds, smells and actions that affect the environment. Because of this, traditional, humanist and modernist views such as the separation of mind and body or the separation of organism and environment are of no use to the post-humanist. Instead Pepperell (1995) proposes a model of human existence based on four interconnected media: the environmental medium (the domain of the physical sciences); the organic medium (the life sciences); the sensory medium (consisting of the various neurosciences) and the conscious medium (traditionally the realm of psychology and psychiatry as well as sociology politics, philosophy and so on.) Within this paradigm he posits that the mind and reality are indistinct and do not interact inasmuch as the whole performs a function (Pepperell 1995). This contradicts the premise of the traditional idealist and traditional materialist

distinction between the two. Pepperell (1995) advocates the death of philosophy and its integration with science. Other advocates of posthumanism such as Jerold Abrams (2004) are less militant. Abrams advocates a pragmatic, *laissez faire* approach to conflicting dogmas and pluralities, with facilities for forum, hoping that the interaction between the proponents for each side will yield, if not resolution, at least an end to conflict.

For the genetic homunculus and indeed other forms of post-human and transhuman intelligence, the real issue is what types of intelligence they would create, whether they would do so at all and whether they would seek, as humans do, to imitate their own genesis. Pepperell (1995:124) likens creativity to the process of evolution through natural selection:

> Applying such a mechanism to the process of creativity we could say that whilst it is possible to generate a seemingly infinite number of new combinations (of paint, sounds, words) only certain of these will fit the requirements and constraints imposed by the medium in which we are working. Therefore it is only these that will be selected – a process which we could call *creative selection*

Pepperell (1995) shows how creativity has been synthesised according to this example in recent computer history. He admits that this is not yet true creativity, but shows how the increasing complexity of machines is speeding up technological advancement in a dialogic way, so that it may be possible for computers to reach the complexity of human thought within the next five hundred years (Pepperell 1995). This distance of time has since been drastically shortened in more recent discussions. Kurzweil (2005) places the distance closer to fifty years and others even less. Creativity, for Pepperell (1995) is an unpredictable function of intelligent life and to a large extent defines human existence. He states that “currently the output of computers is predictable. The post-human era begins in full when the output of computers becomes unpredictable” (Pepperell 1995:135). When computers show true creativity, rather than simulated creativity, they will be unpredictable.

As human technologies disappear inside human bodies, they lose distinction from the human organism even further and yet, the distinction between the human of today and the human of yesterday becomes ever greater. Pepperell states that “[a]ll technological progress of human society is geared towards the redundancy of the human species as we know it”. The loss of distinction between natural and artificial is demonstrable in several posthuman technologies. Artificial intelligence gives humans pause to ponder the definition of humanity.

In terms of this dissipation of disparity between real and artificial, one must look at Baudrillard’s *Simulacra and Simulation* (1994), in which he presents a world in which society has foregone the modern era’s organisation by consumption and production and entered into an era of image–fascination, a complete dependence upon the interplay of images, signs and codes. The new Imperial order is that of simulation – the real without referent. According to this new post-modern order, ideas and identities are constructed through the appropriation of images, signs and codes, rather than from a real and finite truth. Because of this, dominant modes of thought and trends influence human interaction and self-perception. This completely rejects the modernist logical paradigm. Baudrillard (1994) ultimately dismisses this finite truth (the paradigm of the modern era) as a fallacy. It can be argued, from a post-human viewpoint that instead of image-culture and image-fascination, one might now say techno-culture and techno-fascination. Concerning a genetically engineered being, it may be said that the artificial or real is dispossessed of the real or natural. There is no sission of one from the other – it is more a complete blurring to a point of rupture. This instance of simulacrum is the dilemma of the genetic homunculus alone – the alchemic homunculus did not suffer this perfect blurring of artificial and natural – rather, its naturalness was always in doubt.

The greatest of Baudrillard’s tragic simulacra is undoubtedly the clone. The clone, or the human double forced into reality, destroys the romance of the dream-double, the avoidance of death. The clone, according to Baudrillard,

"represents a regression to a primordial state – prior to sexuation" (Baudrillard 1994:64) – the need for procreation by sexual intercourse. The removal of sex, for Baudrillard (1994) is succeeded immediately by an eternity of sameness – the paradox of the simultaneous removal of Death and Death's triumph. The process of cloning, for Baudrillard (1994), represents the death of sex, the death of parentage and the death of birth and as such the death of death itself. Autonomous reproduction, for Baudrillard (1994:67), devalues and destroys the original in a fundamental way:

> It is necessary to revisit what Walter Benjamin said of the work of art in the age of its mechanical reproducibility. What is lost in the work that is serially reproduced, is its aura, its singular quality of the here and now, its aesthetic form (it had already lost its ritual form, in its aesthetic quality) and, according to Benjamin, it takes on, in its ineluctable destiny of reproduction, a political form … . It is the irruption of technology that controls this reversal, of a technology that Benjamin was already describing, in its total consequences, as a total medium, but one still of the industrial age - a gigantic prosthesis that controlled the generation of objects and identical images, in which nothing could be differentiated any longer from anything else - but still without imagining the current sophistication of this technology, which renders the generation of identical beings possible, though there is no possibility of a return to an original being.

The ultimate prosthesis of life, according to Baudrillard (1994) is the reduction of humanity to genetic formulae, to codes. This is the simulation of humanity. For us, he argues, simulation has passed into the realm of the physical. The collapse or implosion of meaning has resulted in the fact that the order of simulation has not passed humanity by. The image, the code, is the prosthesis of reality and it is the same for humanity - our prosthesis is the code of our DNA. In today's age, it is the simulation which is surviving and no longer the real and this includes all life, even humanity itself. The concept of the homunculus has progressed from medieval divine fallacy to modern biotechnological marvel and on the way it has changed sex, origin and ideology, but the fundamental question of its existence remains rooted in the contested realm between nature and artifice, between sacred and profane.

2.3 Genetic engineering

It is safe to say that biotechnology is the one of the most hotly contested, lucrative and cutting edge industries today. At the heart of this creature of commerce and research are the genetic sciences that involve gene isolation and manipulation. Genetic engineering is the quintessential transhuman technology – it interferes with the fundamental structure of humanity's constituent parts – our DNA. The science offers humanity's greatest hopes – the transcendence of terminal diseases and the ultimate outstripping of mortality itself; while simultaneously presenting some of our deepest fears – the abnegation of individuality, the denial of the sanctity of life and the abomination of nature. However, this beast is no mere amphisbaena – it is a veritable hydra of mixed ideologies and conflicting parts.

It is therefore necessary to define the term genetic engineering and discuss how it will be used in this study. Although the ethics and sciences involved are multifarious, genetic engineering as a whole pertains to the post-human being that will be spawned of its processes and can be seen as rather monolithically responsible for this outcome. There is no aspect of genetic engineering that will not affect such a future being, even to the point of governing its creation. Consider for instance the production of genetically modified crops designed specifically to be a low-cost high-nutrition feed for a genetically modified human population, or a human population designed to require less nutrients of a certain type in response to a global shortage.

In this study, the term 'genetic engineering' is taken largely *en masse*, with little distinction drawn between what are essentially myriad scientific practices. This is not to say that these distinctions are irrelevant: on the contrary, only that for the purposes of this study it is only necessary to draw these distinctions where pertinent to a specific argument. For this reason, the phrase 'genetic engineering'

refers to human genetic engineering unless stated otherwise specifically or contextually.

'Genetic engineering', for the purposes of this dissertation, is a phrase that encompasses any methods of bio-technology that are involved in the manipulation of and intervention in hereditary functions and characteristics of an organism, although three main, independent branches of genetic science exist within the various sectors which span the vast spectrum from agriculture to medicine to commerce. The first of these involves the cloning of multi-cellular organisms, whereby a new organism is created from a single egg cell without fertilisation, known as genetic parthenogenesis. The second is known as recombinant DNA technology, which is concerned with combining DNA from two distinct genetic parents, such as two separate human subjects or subjects of separate species, including germline therapy which involves the altering of the sex cells of the parent entities. Lastly, gene therapy allows scientists to directly interfere with the genes of a living subject. Although each of these presents certain unique ethical dilemmas and questions, many ethical considerations apply to all aspects of genetic engineering (Kirby 2000). Certainly the impact of all these innumerable technologies upon human existence is enormous. It must be stressed, however, that the chief concern of this study is the genetic engineering that involves human DNA and that, unless stated otherwise, the term genetic engineering, as it is used in this study, refers to this aspect of bio-technology.

Although the history of genetic engineering can probably only be traced as far back as Walter Sutton's 1902 discovery of the function of chromosomal heredity, the *dream* of improving upon humanity can be dated far further back. One might be tempted to say that it was with Francis Galton's eugenics in 1865 that humanity first saw a desire to intervene in the evolution of humankind, or to reach even further back and place the seed of the idea in the pen of Darwin himself. One might even be tempted to place the origins of the notion of improvement

upon humanity in the musings of the alchemists, or their Ancient Egyptian progenitors. However, the fact is that the true origin of the idea is lost to the vagaries of time and is, as with all history, limited to record and the 'discovery' of writing, or surviving oral tradition.

2.3.1 A brief history

Nonetheless, contemporary genetic engineering is easier to trace in a timeline. The recent history of genetic science is both vast in scope (geographically as well as epistemologically) and extremely rapid in advancement. Because this rapid advancement is incremental and dispersed over many fields of study, there is no single source that covers every aspect of genetic science that is relevant to this thesis. The scope of this investigation is defined as dealing with human genetic engineering, that is, *any* aspect of genetic science that involves the alteration of human DNA and therefore it serves the purposes of this study to utilise a selection of sources that have specific relevance to the foci of this research. It would be lengthy and almost counterproductive to give a complete and comprehensive chronicle of modern genetic science since its inception, but it is important to state some relevant historical discoveries that are pertinent to this study. Although the number of ethical treatises and case studies presented here can not, by any means, be considered to be a single source, these myriad smaller sources provide such a wealth of pertinent information as to be crucial to this literature review. So, for the sake of clarity, they are submitted here as an integrated whole.

The model of chromosomal heredity discovered by Walter Sutton in 1902 and early experiments with embryonic development led to the proposal by Hans Spemann, a German embryologist, in 1938 that the cloning of higher organisms is theoretically possible (Judson 1996). This early work set in motion a larger movement that made possible the discovery that genetic information is contained within the nucleic acids of cells and the eventual cloning of a leopard frog embryo

by nuclear transfer in the 1950s. These early discoveries paved the way for modern genetics as it is known at present.

Following the establishment of the complete genetic code in 1966 and the first successful experiments in gene isolation in 1969; Paul Berg, an American geneticist, created the first recombinant DNA molecules by combining the DNA of two different organisms in 1972 (Judson 1996). Within a year, geneticists Stanley Cohen and Herbert Boyer had created the first recombinant DNA organism using Berg's technique. This technique constitutes splicing DNA from two separate organisms and implanting them into *E. coli* bacteria cells. The bacteria then reproduce the recombined DNA sequence. These experiments established the techniques employed by the contemporary genetic engineering industry for splicing the genes of separate organisms (Judson 1996).

In 1980 the United States supreme-court ruled that living, human-made organisms are patentable material, after awarding a patent for genetically-engineered microbes in a detergent to Anada Chakarbarty, whose employer, General Electric had attempted to file a patent for his discovery. Following this decision, the Human genome project was initiated in 1990 (Judson 1996). This project, an enormous international collaborative effort to identify the twenty thousand to twenty five thousand genes in human DNA and determine the sequence of the estimated three billion nucleotides making up the entire human genome, was completed in 2003 (Human Genome Project Information 2008).

Although the recombination of humans and other animals has been a feature of genetic science since 1989, human DNA spliced into animal embryos which are subsequently allowed to grow to full term, has only been a feature of genetic science since 2001, when researchers at the University of Nevada in the United States injected human stem cells from umbilical cords into developing sheep embryos. The resulting sheep showed traces of the human cells throughout their bodies. Earlier splicing attempts, such as the insertion of human DNA into *E. coli* bacteria in order to produce insulin, were not considered as ethically

questionable as these experiments because they did not involve the full development of higher organisms – before this decision, multi-cellular organisms with implanted human DNA were always destroyed before they could mature to full term.

2.3.2 Ethics and genetic technologies

In the wake of the discoveries made in genetic science in recent years, genetic science has sparked fierce ethical debate, most notably over allowing clinical trials of genetic medicine to be performed in third world countries and the supposed right of corporations to patent human DNA. Gary Stix (2006:76), senior editor of *Scientific American* magazine notes the incredible rush to patent the human genome:

> As of the middle of last year, the U.S. Patent and Trademark Office had issued patents to corporations, universities, government agencies and non-profit groups for nearly 20 percent of the human genome. To be more precise, 4,382 of the 23,688 genes stored in the National Centre for Biotechnology Information's database are tagged with at least one patent, according to a study published in the October 14, 2005, *Science* by Fiona Murray and Kyle L. Jensen of the Massachusetts Institute of Technology. Incyte alone owns nearly 10 percent of all human genes.

This has innumerable implications for humans, not the least of which is the question of whether it is legal to own a person. Such matters, which concerned Western civilization when slavery was abolished, are now being re-evaluated. According to Linda Macdonald-Glenn, a senior fellow at the Institute for Ethics at the American Medical Association, legal classifications of ‘human’ or ‘person’ lack proper definition, at least under U.S. law. Macdonald-Glenn (2003:251) notes that the pliability of these definitions has implications for the ethical considerations of altering or perverting human life:

> Currently, human beings cannot be patented, but the definition “human being” has yet to be defined by the courts or the legislature. Arguments as to what constitutes “personhood” are being closely scrutinized and debated in the fields of religion, ethics, psychology and law.

This means that many laws have to be rewritten in order to make provision for genetic technologies. As such, laws that restrict or defend a 'person's' rights are unclear as to what is actually meant by 'person'. At least for the interested parties (bio-technology corporations such as Incyte and Monsanto) this debate has the potential to swing the pendulum either way – massive profits in the event that personhood is considered not to extend to recombinant organisms created from human DNA, versus massive losses if it is. In the meantime researchers operate, to a large extent, with impunity. Although there have been recent efforts to rectify this legal loophole in the United States of America and Canada, there are many countries where definitions of personhood are even greyer.

Today, in the countries where this type of research is spearheaded, such as Canada, Great Britain and the United States of America, human/animal chimeras are created under restrictions that limit the extent to which the resulting organism can be considered technically able to reproduce. The creation of genetic chimeras is already sanctioned under law. To cite just one example, the research of Fred Gage at the Salk Institute for Biological Studies, has shown "that human embryonic stem cells implanted in the brain ventricles of embryonic mice can differentiate into functional neural lineages and generate mature, active human neurons that successfully integrate into the adult mouse forebrain" (Muotri, Nakashima, Toni, Sandler & Gage 2005:18644).

The creation of non-human chimeras, such as the spider/goat chimera, is treated with far less censure (MacDonald-Glenn 2003). In this case, a Canadian biotechnology company spliced spider genes into the genome of a goat to manufacture a creature that produced a substance not unlike spider silk from its mammary glands. The resultant substance is patented as BioSteel®, while the creature itself is also patented (MacDonald-Glenn 2003). Countless other genetic chimeras exist in various stages of research or completion, ranging from DNA of human and nonhuman animal tumour fragments inserted into tobacco DNA and

harvested to produce a potential vaccine for lymphoma (MacDonald-Glenn 2003) to a bioluminescent rabbit created by injecting green fluorescent proteins from jellyfish into a rabbit embryo (Dobrilla & Kostic 2000) for the purposes of art-making.

According to MacDonald-Glenn (2003), the question of ownership of sentient life is a crucial ethical dilemma, but it is one that has yet to be resolved. This in light of the fact that large sums of money fund genetics research, but a comparatively miniscule amount goes into studying the ethical considerations of such research. All genetics research that deals directly with the human genome faces these ethical problems. Most ethical observations of the phenomenon of genetic science (particularly those of Linda MacDonald–Glenn (2003) and Kimmelman, Baylis and Cranley-Glass (2006)) acknowledge that despite exponential growth in new technologies in the past thirty years, there should be more mechanisms in place that regulate these technologies and police their ethics properly.

Research into stem cells is often hailed as research into its most noble possible applications. Among these are the identification of drug targets and the testing of potential therapeutic medicine, toxicity testing, the creation of tissue cells for transplantation (for example bone marrow for leukaemia patients) and the study of cell differentiation and the study and prevention of congenital diseases and birth defects (Thompson 2005). It is notable however, that stem cell research, according to Kimmelman, et al. (2006: 23), is aimed at producing a basis of data rather than solving specific problems for patients. This, of course means that this research is not necessarily intended for noble purposes:

> Patient advocates have often misconstrued gene transfer trials as aimed at delivering therapy and researchers have frequently contributed to this conflation of research and therapy. However, trials impose requirements (for example, in phase I studies, doses are administered that are anticipated to be subtherapeutic) that abrogate medicine's mandate to provide personalized care. Whereas the primary goal of clinical practice is patient care, the primary goal of research is knowledge production.

Since this type of research is not bound by specific goals, it could conceivably be used in any number of different ways. However, the ethically impossible genetic science notwithstanding, a great deal of the current research into genetics is focused on such endeavours as the search for an end to congenital diseases, cancer and other genetic disorders. Presently, the efforts of many geneticists are focused on diseases of the nervous and cardiovascular systems and on diabetes, autoimmune disorders and diseases involving the blood and bone marrow. Other areas of research involve the creation of nervous tissue for the treatment of Parkinson's disease and Alzheimer's disease (which both involve the degeneration of brain tissue, which can be grown parthenogenetically) and the creation of cardiac tissue for the treatment of diseases like congestive heart failure (Cibelli, Ezzel, Lanza & West. 2001). This would seem to indicate that the goal of genetic science is a kind of prophylactic perfection of the human organism, a situation highly agreeable to transhumanists.

The use of genetic engineering to form a new type of 'human', recombining human DNA with aspects that are perhaps more suited to longevity, disease resistance and even athleticism, intelligence and beauty would have rung true for the alchemists of old. The alchemic homunculus is also designed as a perfective being. Its function is the spiritual perfection of the alchemist – more than a vicarious destiny transposed from parent to offspring. The genetic homunculus can only fulfil human desires of transcendence by deputation, but it is no less a homunculus for this fact. The use of the laboratory as a substitute for the womb at the moment of conception is the essential commonality of the alchemist's homunculus and the genetically engineered being, where the natural process is supplanted by artificial intervention.

CHAPTER 3: THE HOMUNCULUS AND POSTHUMANISM

The creation of life has been a preoccupation of humankind since the question was first asked “Where do we come from?” and the creation myth is one of humanity’s most pervasive archetypes. The question of creation is always resolved in the divine. Any subsequent creation of life, separate from the original creation, is seen as hubris and even perfidy. Human hubris in wishing to acquaint themselves with the divine is always met with punishment in mythology. This is evident in the biblical myth of Babel and the Ancient Greek myth of Icarus, both myths showing the symbolic relationship of height to divinity and the just desserts for pridefulness. Similarly, many myths of human annexation of divinity, particularly those of humans creating humans, are tempered by some divine intervention. Ancient Greek tradition holds that Pygmalion, a king of Cyprus, created an ivory sculpture so perfect, he fell in love with it, prompting Athena to bring it to life. Although the creature is created by his hand, it is given the spark of life by a divine element.

The usurpation of the gods’ power has also been a feature of mythology. When Zeus withheld fire from the people of the earth, Prometheus stole it from him and gave it to his mortal creations. Jewish mythology tells of the golem, a mindless, soulless construct shaped from clay to protect or serve its creator; the word truth is etched into its forehead to bring it to life. In the case of the golem, the inanimate clay can only be brought to life by the holiest of rabbis. The most sacred technology has always been stolen from or given by the gods.

3.1 The homunculus in ideological and mythological context

Although definition of the homunculus is provided in the introduction, it is useful to examine some of the ideologies and myths attendant to the concept of the homunculus. This provides a richer understanding of the model of the homunculus in history, so that it can better be understood as a feature of contemporary culture later on in this study.

Eliade (1971) shows that traces of transcendence tradition are evident in the alchemic notion of the homunculus. The equation of man with god goes hand in hand with the creation of life and the idea of immortality. This is evident in alternate homunculus mythology too – the homunculus itself is not only a phenomenon of Western alchemy. According to Jung (1967), the dream of creating artificial life was a feature of Chinese Taoism and Indian Tantrism as well. The medieval Arabic concept of *takwin* is also a simulation of human creation through the generation of a homunculus in the alchemist's laboratory, which brings the alchemist closer to a divine spiritual state (O'Connor 1994). The homunculus represents for the alchemist the dream of immortality and the possibility of perfection, but it also represents one of the greatest apostasies – the anathema of unseating God.

Although the homunculus was, at least for the alchemists, a transcendent being, the literary convention is to portray it as a lowly deviation of science – as something freakish, evil or half-formed, because its creation was anathema. For example, in the second act of Johann Wolfgang von Goethe's play, *Faust*, the homunculus is given the spark of life by the demon Mephistopheles which, in the play, serves to illustrate the inherent diabolical nature of life not created by God. In Mary Shelley's *Frankenstein,* her monster is an aberration created from the parts of corpses which serves as a warning against scientific conceit. According to William Newman (2004:3), alchemic philosophers Cornelius Agrippa and Paracelsus, appear as early tutors of her character, Victor Frankenstein: "In Shelley's novel it is again the traditional upholders of the occult sciences—and particularly alchemy—who profess the wisdom that Frankenstein updates by more modern means to produce his monster". It is apparent that the creation of life without some kind of divine intervention would seem as abomination. Could this simply be a form of vicarious jealousy, where the proud human refuses to believe that anything other than a god could create a being as perfect as a human; or could it be that humans fear to surrender their sacred intelligence more than they fear the annexation of godly power?

The crucial element of the homunculus mythology is that it is created by humans. It represents the efforts of humankind to attain godhood, immortality and perfection. According to Newman (2004), Paracelsus and his followers held that through the segregation and incubation of the generative fluids of either a man or woman, one could create the *perfect* male or *perfect* female. Newman (2004:6) states:

> The ruminations on this experiment are strangely reminiscent of the infatuation that ectogenesis and artificial parthenogenesis hold for modern advocates of biotechnology as a tool of attaining sexual equality, from J. B. S. Haldane in the 1920s to contemporary exponents of radical lesbian feminism. Babies produced in bottles, their sex and other characteristics predetermined in the laboratory, form a desideratum extending well into the Middle Ages.

This perfection of fluids coincides with the spiritual perfection of the alchemist himself and the extension is not difficult to reconcile with reality. Any parent is concerned with to what extent their child resembles them. The homunculus is therefore both sacred and profane: the homunculus is different from other monsters inasmuch as it is created by man, but it offers hope of transcendence through science and technology, whilst simultaneously destroying the notion of a creator god and transcendence through spirituality. As such it still appears monstrous.

According to Jung, (1967) the first recorded example of the homunculus is in the text known as the *Visions of Zosimos*, written sometime around the third century AD by the Gnostic mystic, Zosimos of Panopolis. In this text, Zosimos describes dreams in which he encounters ‘men’ who submit themselves to unendurable torment. These men, according to Jung (1967), are really the metals anthropomorphised and their torments are symbolic of the alchemic process. Although this is significant, it was not until Paracelsus that we saw the idea of the homunculus as a species created in the retort, indeed Zosimos does not use the word ‘homunculus’. Nonetheless, the idea of the alchemic opus as a torment of persistent spirits or souls is revealed in this text. This idea of symbolic torment and death permeates alchemical literature and corresponds, according to Eliade

(1972) to a rite of initiation of the alchemical adept and to the creation of the homunculus. The symbolic death of the adept allowed his soul to be reborn in a purified state, just as the purification of a metal would allow it to achieve the 'pure' and most desirable state of gold. For his reason, the alchemical process is a process of self-purification, of self-distillation and remaking the self anew.

Humanity's dream of authoring the self is not new. The archetype of the created being is much older than the sixteenth century. The early Arabic alchemists and Chinese Taoists had theories of creating humans through their magical technologies (Jung 1963). Although the premodern alchemists were not the originators of the notion of the created being, Paracelsus did coin the term homunculus. In the sixteenth century, Paracelsus, one of the pre-eminent medical scholars of the time, posited that through the correct treatment of bodily fluids, a human might be created artificially by alchemic means. According to Newman (2004), Paracelsus and earlier writers, like Aristotle, thought that the key ingredient for generating offspring was semen and that the mother only contributed the incubation of the child.[1] So, Paracelsus put forward that provided that the alchemist maintained its warm temperature and provided it with suitable nutrients as it developed, one should be able to cultivate human semen in the retort into a viable living being (Newman 2004). This notion became widely known in Europe and was, to a large extent, accepted as credible science in the seventeenth century (Newman 2004). The possibility of the homunculus presented the same promises to the early writers as genetic technology does today.

[1] The uterus was considered by many scientists and alchemists of the time to be merely the incubator of a naturally born child and it was generally held that women did not contribute any of the 'matter' needed to create a child. William Newman (2004) explains that even the early microscopists overlooked the possibility of fertilisation, opting rather to see the spermatozoon as the only important element in the development of young. This follows the reasoning of the alchemists, in that they believed that their furnaces could substitute for the womb and even refer to the furnace as 'womb' or 'mother' in some texts and drawings. This of course also stems back to the earliest forms of alchemy and belief in the earth mother, who gestated ores in the 'womb' of the earth. The method of the homunculus' generation in the retort would thus not have seemed at all implausible to Paracelsus or his proponents.

One way in which this so, is in that the homunculus is a potential hermaphrodite – at its genesis it is certainly hermaphroditic, given that when we engineer with human genes, we must first ask whether the resulting being will be male or female or something in-between and it is also the result of a reproductive amalgamation of different genes – a result of the union of opposites (although in the case of the genetic homunculus, unlike the hermaphrodite, not necessarily male and female). As an alchemic image, the hermaphrodite represents the summation of the creation of the philosopher's stone and the fullness of the alchemic process itself. It is the combination of opposites - mercury and sulphur, *sol* and *luna* male and female – the completion of the opus on the path to gold. The binding and blending of the male and female, which to the alchemists represented the utmost in diametrical opposition, was the union of form and matter and represents the conclusion of the opus magnum in the creation of what to them was incorruptible (Jung 1967). The body of the homunculus is arbitrated in such a way – alchemically arbitrated and the hermaphroditic genesis of the homunculus represents a perfect intermediary between transcendence and mortality.

However, the traditional *heirosgamos* symbolism of alchemy is somewhat vitiated by its comparison to genetic engineering, because although the union of opposites was intended as a metaphor for what was seen as a sexual union of substances to form what was in the eyes of the alchemists a living being,[1] the alchemical process was far more a spiritual 'art' than the clinical process of genetic engineering and the alchemic hermaphrodite represents an undeniably coital union which is absent from the parthenogenetic process (albeit that this coitus of opposites is purely symbolic, the reproduction process of the genetic homunculus is specifically anti-coital and does not necessarily deal with male and female parties). But here we see another similarity: the alchemists believed

[1] The conjunction of male and female was intended as a symbol of the goal of the alchemic opus: "the production of gold or its symbolic equivalent" (Jung 1967:457) and represents a 'philosophical' union of opposites that would fertilise each other "and thereby produce the living being sought by the Philosophers" (Jung 1967:458) – the *lapis philosophicum*, or Philosopher's Stone.

that the extraction of the pure form of a male or female involved separation of their respective generative fluids. The hermaphroditic homunculus could only come about in the union of the fluids. However it is nevertheless interesting to note the comparability of the process of the creation of the genetic homunculus to the hermaphrodite, especially considering the implications it has as a philosophical standpoint on which to base our own homunculus. The creation of any genetically engineered being, but specifically recombinant beings like genetic homunculi or chimeras, explicitly involves intervention at genesis with the goal of altering the resulting being (Kimmelman et al 2006). The fusion of opposites in that the initial purification and extraction of the humours from the genitive parents (their DNA) and their union within the retort – a substitute for the womb – to form the 'pure soul', quintessence (a zygote), is similar to the alchemic axiom of conjunction.

According to Jung, (1967) the derivation of a male and female pair of opposites through the purification and sanctification of the three principles (sulphur, mercury and salt) can be likened to the formation of an idea of what constitutes the perfect being. Mercury, the moon, represents knowledge and enlightenment. Sulphur, the flame and the sun, represents strength and sanguinity. Salt, the passive principle, is mediated by Mercury and is the essence that represents a harmony between male and female – beauty. It is not difficult to draw parallels between the three principles and the qualities of humanity we find appealing. This would be in keeping with alchemical philosophy because the principles were thoroughly personified. From this step, we have the extraction of relevant genetic material from the genitive parents – the formation of a perfect sol and luna - and its treatment in the laboratory to create a zygote (that which can essentially be seen to be equivalent to the philosopher's stone[1]). In other words, our own key to becoming immortal, the genetically engineered being is the result of an alchemic

[1] According to Jung (1963), the Christ, or the total man can be seen as the philosophers stone and, since the prime material can be bestowed the personification of Adam, the transmutable substance is thus granted the symbolism of humanity and the transcendent substance that of purified, or sanctified humanity.

dream that takes place in modern-day laboratories. Obviously, the metaphor of homunculus works well for the genetically engineered being.

In the process of creating the elixir of immortality, the idea that substances should be personified and spiritualised, let alone accorded sexual properties comes from the notion that stone is genitive.[1] Mircea Eliade (1972) has shown how this type of mythology suffused the Ancient world, with surviving tales in contemporary culture - the Biblical Adam was first made out of the red clay of the earth and Prometheus fashioned the first men out of clay, then out of iron and finally bronze. The Egyptian god Khnum also made men from clay. This idea of creation from the substances of the earth and the sexualisation of the processes of union, is a type of sanctification in alchemical terms. The homunculus is equivalent to the Philosopher's Stone in this sense – the spagyric union of male and female.[2]

These are the processes (the symbolic sexual union of opposites) of purification, as indicated by Jung (1963). Similarly, processes of distillation were also afforded the properties of death, whereby the splitting of impurities from the persistent spirit was attributed the notion of mutilation, rotting and rebirth. The transferral of these sanctifying principles onto matter has particular significance to the homunculus, since it is itself a product of the process of distillation, purification and sanctification. The creation of the 'perfect' man or woman in this case constitutes a splitting of one from the other and a rebirth through human labour.

[1] The notion of inanimate matter as the source of life in pre-historic cultures is central to the notion that life can be created outside the human womb. Coupled to this is the idea that humans can shape tools of the same substance that the divine powers used to fashion humans (stone) presenting an archetypal hubris of humanity – to think it possible to imitate the divine. The genetic homunculus, while not made out of clay, may yet literally be seen as a product of the earth – the glass and silicone of its prosthesis and the tools of the scientists mediating its birth all represent and simulate the earth, just as the alchemist's furnace did.

[2] In the alchemical opus, this marriage was symbolic of the union of opposites – Rex and Regina, sol and luna, sulphur and mercury, equivalent to antediluvian heirosgamos mythology.

In support of Mircea Eliade's (1971) postulation that the Industrial Revolution was the culmination of the alchemical metallurgic dream, I would like to put forward another idea. This is that although the industrial age did indeed bring with it an unprecedented fast-forwarding of mining and production, (which certainly was a great culmination of the ancient and mystic arts of mining and smithing) it is in this contemporary society, at the dawn of the twenty first century, this age of medicine and mind-links, that we see another realisation of ancient dreams. It is in our time that we will see the ultimate achievement of the alchemist's search for immortality – the creation of the homunculus. We stand on the brink of the age of the first genetically engineered being made from human DNA. This immortal creature was the desire of the alchemists since it was first conceived, because it represents the self so perfectly (Jung 1963). The dream of self-authorship is an ambition humanity attaches much meaning to. According to Baudrillard (1994:64), "such a fantasy still passes through the figures of the mother and the father, sexed parental figures that the subject can dream of effacing by substituting himself for them, but without denying the symbolic structure of procreation at all: becoming one's own child is still being someone's child".

However it is when we sever this bond between child and parent by creating chimeric species (where there is a specific denial of parentage, not least because of the fact that the process of creation is necessarily laboratory-based and anonymous; and because the resulting embryo is divorced of either parent's original genetics (Baylis & Robert 2007)), that this becomes ethically questionable. The model of parentage is certainly not simply genetic. The homunculus of the alchemists, even at its most artificial, can yet claim the solitary alchemist as its parent, but in the cold halls of modern genetics research institutions, with their teams of scientists and interns, who or what can be considered the parents of the genetic chimera, created for the sole purpose of research? It is an undeniable fact that the creator of any type of consciousness born of such a process bears a moral responsibility towards it.

Unfortunately the ethical arena is often used as a podium for dominant religious rhetoric. It is often asked whether a creature created by artificial means would have a soul. However this is not ethically pertinent and is certainly unnecessary since the logical, scientific position is that the perception of a soul is simply an aspect of human self-awareness. If the soul is merely an aspect of self-awareness or even essence of life, then it is easy to say that the homunculus will indeed have a soul. This is because it will unquestionably be even more self aware than we ever can be through enhanced genetics that make it more intelligent, physically stronger and more sensitive to emotions and sensations; and bio-mechanical implants that make it better able to tell exactly what is going on inside and outside its body, prosthetics that give it greater control of its body, brain implants that make it better able to compute complex problems, wireless connection implants that make it better attuned to its environment and implants that augment its memory. Self-awareness merely describes is intelligent life, not humanity itself.

3.2 The homunculus in contemporary science

The genetically engineered being must be examined in terms of evolution, because it constitutes something unprecedented in nature – conscious evolution. Any genetic technology, from eugenics to parthenogenetics is an intervention in the evolutionary process. Taylor (1966) states that if evolution exists, there must be "real *ends* in the physical order. And ends can only be real as subjective interests of individual beings which are actualised by the process of change" (Taylor 1966:xxiii). In other words, evolution must have a goal according to subjective individual needs which must be fulfilled by that evolution. Thus it may be said that by this reasoning, the genetic homunculus will be the first being to truly evolve, because it will govern its own evolution, according to its specific individual needs. It exists within these individual's ability to manipulate themselves and not merely their environment to better suit their survival.

Terms of popular Darwinian evolution theory are perhaps inadequate to describe the processes that affect and effect the changing homunculus. It is far more useful to explain evolution as a discursive process between organism and environment, because it most accurately describes the process. Evolution is a process of interaction between environment and organism – to the ends that the organism changes to adapt to its environment, makes changes to the environment to better suit its needs and eventually changes again as a result of its interactions.

This is important because it also means that the creation of the homunculus is an active attempt by humanity to evolve, but in terms of a social environment. However, we can not be so foolish as to think that we will be in any way able to survive the change. Traditionally, the distinction has always been made between evolution and extinction, but it can be shown that they are, paradoxically, one and the same. This is because any change in a species, genetic or otherwise, brings about the tiny and nearly invisible death of what was before. In addition to this, the sheer vastness of the changes that will take place in humanity's step towards immortality will be such that the laws that govern the one organism will not be the same as those that govern the other.[1] Evolution is traditionally seen as the alternative to extinction, but really they are one and the same – because what was before the change is no more after it. After-all, this is no mere change in colouration of a moth's wings to better suit a city's concrete greys, this is a shift from *homo sapiens sapiens* to an entirely new species.

Just as we can see an organism as an entity that is 'created' through an entirely discursive process between entity and its natural, technological and cultural environment, rather than a pre-existing entity given social and gender roles as

[1] To cite an obvious example, the homunculus will require a total re-structuring of age demographics – they will be able to work longer, harder and more efficiently during their long lifetimes and eventually will need better pensions and long term retirement plans – a ninety-nine year-old homunculus could still be considered to be in its prime, whereas a human of the same age might be too old to work. This is a simple example, but it illustrates how a complete socio-economic paradigm-shift will have to take place naturally in order to deal with the changed needs of the homunculus.

part of its nature from the time when it is born until the time it dies (Haraway 1991), so can we see in a far more physical sense, how this applies to evolution. It is impossible to miss the parallel between the discursive of roles of organism and environment in evolution and those same roles in nature – by becoming nature and creating life that is wholly different from ourselves we affirm nature as reproductive, able to produce within itself another version of itself, just the homunculus will be another version of humanoid created within and by itself. Our evolution both affirms our immortality and brings about our death, but we can not deny that any of this is natural process.

The fact that this implies equity with nature is important because this was at the core of alchemic philosophy, especially with regards to the homunculus. The alchemists believed that the human body and soul could be purified to attain transcendence through their art (their alchemical technology). That this was a belief in an ultimate truth or unity of nature is immaterial; that this is a belief in a human evolution through a marriage with nature is far more relevant. Paracelsus believed that human transcendence could be achieved through the homunculus, because it constitutes the ultimate transcendence of time, given that the alchemically created being would be perfect in every way, including that it would be immortal. Evolution is the method that most organisms use to escape the ravages of time and the disappearance of their genetic material from the face of the earth – ironically by altering it. The genetic project will see our evolution come into fruition, in that humanity will finally see a new being created and the laws that govern the natural world and humanity itself questioned.

Haraway (1991:298) states that, “like other scientific bodies, organisms are not ideological constructions. The whole point about discursive construction has been that it is not about ideology. Always radically historically specific, always lively, bodies have a different kind of specificity and effectivity; and so they invite a different kind of engagement and intervention”. However, because even now human organisms are not the only players in the construction of the homunculus

(animals and machines are major players in the genetic arena and are set to remain so), nature after the homunculus can not be regarded on any predictable terms of physical or even ideological intervention, especially evolution. All we can predict is that an evolution will happen, but the way in which it will manifest is beyond predictability, other than that, to some extent it will follow technology and the needs of the being as time progresses.

This at least tells us that the treatment of the homunculus beyond the first generation, at least on a macrocosmic scale and in a post-human and postmodern sense, will be independent of humanity's ideological arbitration.[1] There is no way of predicting how we should deal with a scientifically created species in this sense, nor should there be, because the homunculus, after the first generation, will have the ability to set the conditions for its own reproduction, gender identity and body through self-upgrading, implants and enhanced genetics, the neo-human will be able to govern its own evolution; and thus set the terms for the engagement of nature as it sees fit. In light of these theories, it is possible to view the homunculus as a siting of post-humanity, because it will assume the role of its genitive creator when it has replaced its creator on the natural topos. This is not to say it will have exactly the same role, because its identity and even how it deals with nature will certainly be greatly affected by its manufacturedness, but this is simply a differential siting of its role. Nature has, in the end, revealed that it is intrinsically adaptable.

That nature and evolution are dialogic processes influences the homunculus in a very specific way: if nature and evolution are discursive, then we can no longer see things in terms of nature, god, technology, humanity. As we realise that the players themselves are created by the natural stage, we become aware of an unsettling fact: that we are all nature. As Robert Pepperell (1995:182) states:

[1] Of course there is no way of telling how individuals will choose to trope their neo-human state and this of course will lead to the formation of ideological groups, but once the homunculus has outlived mankind (and most likely before then) it will be the homunculus who governs the ideology and not the other way around.

"The rationalists dispensed with God, leaving humans in perpetual conflict with nature. The post-humanists dispense with humans leaving only nature". The distinctions between nature, technology, humanity and god only exist inasmuch as they reflect the purposes and the prejudices of the societies which maintained them (Pepperell 1995). The becoming of nature through our technology, the final amalgamation which has led us to the point of Singularity, has allowed us to reveal the final reproductive process of nature. The homunculus is the proof of this genitive process.

Even so, in this time of new, history-changing events and technologies which are exponentially growing closer and closer together on the scale of time, as direct results of our technology, it is not hard to imagine a time in the near future when a homunculus might even be made to order, with the 'client' choosing traits, abilities and physical characteristics they find desirable. In an article on human evolution, Katherine Douglas (2006:37) states:

> Within a few generations, market-based genetic technology will eclipse natural selection as the driving force in human evolution … There are human characteristics that will probably always be seen as desirable and are likely to be actively selected for by genetic technology. In 1000 years, people will be much more beautiful, intelligent, symmetrical, healthy and emotionally stable, due to 40 generations of genetic screening against harmful mutations.

3.3 Technology and post-humanism

Today most arguments for the creation of the genetic double are couched in the philosophies of beneficence or in the name of seeking prophylaxis or cure against disease. Not only this, but software development corporations are working closely with bio-electronics hardware developers to create implants that will ensure better and more seamless integration with our technology: already predictions of computers disappearing inside our bodies, the mental e-mail and the entirely mind-controlled computer interface are being made based on the

same type of bio-electronics that gave us the mind-controlled prosthetic limb (Douglas 2006).

Robert Pepperell (1995) posits that the boundary of the human organism is not only no longer visible but no longer delineable. According to Pepperell (1995), the boundary between the human organism and its environment and the human organism and its technology is also no longer clearly definable and, because human consciousness can not be seen as located solely in the brain, but in the entire organism. Since we can not separate human consciousness from the equation, we are left with the paradoxical situation of human consciousness being a .fuzzy entity as well (Pepperell 1995).

Like Robert Pepperell (1995), Haraway does not see an organism as a pre-existing entity, with boundaries set in place in some undetermined past, but as an entity that is made through a wholly interactive (discursive) process between entity and (social) environment. Haraway (1992:297) “tropes [her] view through artifactualism”. She states that for us nature “is made ... If organisms are natural objects, it is crucial to remember that organisms are not born; they are made in world-changing technoscientific practices by particular collective actors in particular times and places” (Haraway 1992:297).

If Haraway and Pepperell are to be believed, in the post-human paradigm, the human body and indeed even the human mind, are constantly subject to augmentation and thus are, to a large extent, improvable. The human organism can be said to exert a certain amount of control over all aspects of its *self*. (If this is true we actually also exert the same (or similar) influence over others, according to Pepperell.) This improvability extends to three main regions of control. Firstly, the physical corpus, as posited by Haraway (in Badmington, 2000:103), is capable of extension through prosthesis and “technological symbiosis”. Secondly the human body is capable of prophylaxis and complete physical control through genetic technology. Lastly, the human mind and body

are capable of telematic extension, augmentation and duplication via the internet and other cybernetic matrices.

Moving towards a definition of the genetic homunculus as post-human and as a being that is not only augmented by the technology of its genetic predecessors, but by the technology created by its own kind, it is important to take these factors of changing technology and areas of control into consideration, as the intercession of the technocracy will certainly mediate the homunculus, physically, socially and otherwise. Haraway (1992:324), in discussing the distribution of knowledge with regards to AIDS and other terminal illnesses, strikes upon the dilemma of distribution of knowledge by the technocracy and causes us to examine the homunculus in terms of its arbitration and the access it would have to the technologies that provide prosthesis, as well as who would have access to them:

> Unable to police the same boundaries separating insiders and outsiders, the world of biomedical research will never be the same again. The changes range across the epistemological, the commercial, the juridical and the spiritual domains. What are the consequences of the simultaneous challenges to expert monopoly of knowledge and insistence on both the rapid improvement of the biomedical knowledge base and the equitable mass distribution of its fruits? How will the patently amodern hybrids of healing practices cohabit in the emerging social body? And, who will live and die as a result of these very non-innocent practices?

These questions once again bring us back to the dilemma of the intelligent, living being as artifice – the dilemma of soul and of the rights of the body. The creation of biological artefacts is fraught with the ethical and moral peril, simply by the very fact that the distribution of knowledge, technology and prostheses is not equitable and is based well within Western capitalist hegemony. The homunculus is seen as an artefact created for the monetary gain of the corporations that control the technology that can create it and as such it is itself a commodity and its parts are commodities. Indeed, entire genes are patented and are owned by the corporations that ‘discovered’ them – does this mean that a sentient being could be owned by a corporation? This is surely ethically and morally

questionable and to a large extent these questions and how they are answered by society and government, have thus far determined whether or not the creation of a genetically altered human being has come to pass.

3.3.1 Nature and the natural

In this study, a contemporary, feminist position of nature is taken in order to call traditional, materialist[1] views of nature to question and juxtapose contemporary theorist's views on the subject. Haraway's (1991) interpretation of the role, function and character of nature is oppositional to the humanist, materialist views that dominated before the existence of computers or genetic science, because it is based on the equitable sharing of knowledge. Taking this stance helps provide views to dealing theoretically with the realisation of the genetic homunculus via nature, technology and art.

Past conceptions of nature stem from the Platonic or Aristotlean conceptions of nature as other, the archetypal Nature, that which gives nurture and sustenance, that which is pitiless and powerful - the fickle provider. This has led to the exploitative treatment of nature and the natural world since the Industrial Revolution – as a mere resource or tool to be utilised by 'Man'. The dream of the materialist scientific project is that it has within its methodology the capacity to understand all aspects of natural phenomena and given enough time and resources, all aspects of nature will succumb to scientific comprehension (the Western, capitalist, humanist, materialist ideas of nature).

[1] The materialist scientific project is often characterised by its arrogant, imperialistic (and now oft ridiculed) dogma, which is now a favorite villain of popular feminist theory, not least for its objectification of nature and the natural universe. As a working philosophy, it was spurred on greatly by the Industrial Revolution of the late eighteenth and early nineteenth centuries and its empirical rhetoric is epitomised by Hegel's famous quote "All that is real is rational; and all that is rational is real." Indeed, Hegelian philosophy and of course even older scientific philosophy (pre-dating Aristotle) informs materialist science. Materialist ideas of pure-reason, ultimate truth and the governance of the natural realm are difficult to quash, even in light of discoveries made by physicists in the twentieth century (especially in quantum physics) that fundamentally discredited the position of the scientific project as a unified progression of knowledge that led increasingly and inexorably towards a final answer. Even much of contemporary science still holds fast to this imperialistic view and many believe that a unified theory of everything is still possible to achieve – that all nature can be deconstructed and proven to be governed by fundamental laws.

Mircea Eliade (1971) delineates alchemy within the search for the perfection of nature (transmutation) and the quest to create nature anew. Baudrillard (1997) argues that, with this type of control, the sciences are rapidly advancing to a ghastly state of Frankensteinian technology and that the ultimate squashing of nature, the final insult and anathema lies in the homunculus that may be born of genetic cloning. Nature has, in the eyes of many, taken a back seat in the fields of genetic research and many of the practices in these fields are repugnant, being banned in even the most permissive countries. However, the idea that what is occurring here is not 'natural' can not stand up to criticism when one takes Donna Haraway's position on the discursive natural topos.

Our new world of artifice seems to be becoming naturalised to an extent that it can no longer be considered on separate terms to nature and what is natural, especially when considered in light of cyborg theory as postulated by Haraway (1991); and the holistic post-humanism and technological extensionism put forward by Pepperell (1995). Already, the Human Genome project has mapped all of the approximately 25000 genes in human DNA and determined its approximately three billion chemical base parts – it is already possible to clone a human being. When this happens, the line between artifice and nature will become so blurred as to be almost completely indistinct, because technology will have assimilated into its vast operational process the very means of the production of human life – an area we had deemed inviolably natural. Although cloning and genetic engineering are not purely creative (we can not yet *create* life, we can only mediate the process by which it comes about), human technology has nonetheless impudently stepped into the arena of the homunculus.

It is useful at this point to examine Haraway's position of nature more thoroughly. Haraway (1991:296) thus describes the dilemma of the human relationship with nature as follows:

> Nature is for me … one of those impossible things characterized by Gayatri Spivak as that which we cannot not desire. Excruciatingly conscious of nature's discursive constitution as "other" in the histories of colonialism, racism, sexism and class domination of many kinds, we nonetheless find in this problematic, ethno-specific, long-lived and mobile concept something we cannot do without, but can never "have". We must find another relationship to nature besides reification and possession.

She finds this relationship in her view of nature as a topos or place, not in the physical sense, but “in the sense of a rhetorician's place or topic for consideration of common themes” (Haraway 1991:296) by rejecting post-modern deconstructionist reductions of Nature. In an alchemic model, her view also diverges from the traditional modes of viewing nature: “as that which is hidden and must be unveiled; as the ‘other’ who/which offers origin, replenishment and service; as mother, nurse, or matrix, resource, or tool for the reproduction of man” (Haraway 1991:296). However, this view of nature as discourse is congruent with the idea of biology as a discourse between environment and organism, mind and organism and mind and environment.

According to Haraway (1991), nature is ‘made’ by ourselves, our technology and our experience, through the mutually creative interplay of various ‘artefacts’ (the players on what she sees as the stage of nature) which are loaded with meaning to varying degrees. This rather pliable, Shakespearean view allows for the possibility that even what we view as the most aberrant perversion of nature – the genetic chimera – is a part of nature. The genetic homunculus must be considered under such a theory not only because it allows us to consider the homunculus beyond the confining and narrow strictures of scientific method, but also because it is a way to argue the homunculus as a position of post-humanity without becoming embroiled in ethical complexities. Nature has become so entwined with how our technologies affect it, that we can not consider the natural realm without looking at the technologies that influence it at the same time. Our cultural process has become inextricably linked to nature and, with the first

human clone, as production becomes reproduction, the ever-burgeoning cultural amoeba will assimilate it.[1]

Haraway (1991) puts forward that in contemporary society, global technology *appears* to denature everything, to make everything a matter of tactical judgments and mobile production and reproduction processes. However, this "technological decontextualisation", she suggests, is not as much a denaturing as much as a certain construction of nature, because we have recast the players (human beings, other organisms and technology) in the creation of the categories of nature and culture. She states that "the actors are not all 'us'. If the world exists for us as 'nature', this designates a kind of relationship, an achievement among many actors, not all of them human, not all of them organic, not all of them technological" (Haraway 1991:297). In its scientific embodiments as well as in other forms nature is made, but not entirely by humans; it is a co-construction among humans and non-humans.

The fact that we can see nature as a discursive process means that we can consider that humanity, technology and nature all play an equally significant role in the formation of mobile ideas and physical bodies, including (but not limited to) humanity, technology and nature themselves. This allows us to see natural

[1] It may at first seem absurdly contradictory to reconcile such a deviation from the materialist scientific construct as Haraway's (1991) "discursive natural topos" with alchemy - the parent of early chemistry and grandparent of empirical science and rationalism. However, although early-modern alchemy was essentially the progenitor of materialist science, the ideas presented by alchemy are really quite dissimilar to rationalist thought, in fact being quite the opposite. The examples are myriad and obvious without going too deeply into the matter: alchemical philosophers deliberately confound the meaning of their texts and symbols to make them difficult to decipher by the uninitiated; base much of their theory on observations on unrepeatable experiments and base a lot of their theory on 'common sense' reasoning and established natural philosophy such as astrology and mysticism. It is impossible to view alchemy as a credible science, however it is for precisely this reason that it is useful for establishing views that are contrary to materialist dogma. Alchemical philosophy leans towards the interconnectedness of nature, which was consummated by the alchemist's intervention in natural process. The alchemists believed their art to be an acceptable and even necessary part of the natural process. The ideas presented in this chapter are based largely upon a synthesis of proto-alchemic earth-mother attitudes towards nature, Haraway's discursive, artifactual nature and Robert Pepperell's Buddhist-influenced post-humanism.

science in a wholly different light – as something which we are a part of, creator of and created by. Taking this concept even further, this text hopes to offer the idea that humanity has *become like* nature and thus has realised nature's reproductive potential.

Haraway's (1991) contention is that knowledges are *made*, through dialectical processes such as self/other, nature/culture or human/not human. She states: "If organisms are natural objects, it is crucial to remember that organisms are not born; they are made in world-changing technoscientific practices by particular collective actors in particular times and places" (Haraway 1991:297). This equates nature, technology, culture and humanity on a homogenous plane of creative power and gives each the ability to create or influence the creation of the other, at least in terms of discourse. "The 'collective', of which "nature" in any form is one example … is always an artefact, always social, not because of some transcendental Social that explains science or vice versa, but because of its heterogeneous actants/actors" (Haraway 1991:332). This equity of creative power allows for the view that we make nature just as nature makes us. Haraway seeks to naturalise the course of nature creating organism creating technology creating organism creating nature. Of course, this does not necessarily mean a physical creation of all organisms, but it is apt to take the discourse onto the topos of genetic cloning and cybernetics.

What this means, essentially, is that to Haraway (1991) technology, human beings and all other marginalised organisms all produce nature, or at least, ways of seeing nature. This means that nature is both: a) malleable and pliable under the auspices of discursive process; and b) subject to as much as producer of creation, be this of humanity, other organisms or their technology. This goes against Platonic views of nature being 'outside' or 'other' and essentially places these 'actors' in an almost godlike role – as mothers of nature. Since nature has produced a species that can create itself (humans - like nature) and that species will produce a species that can create itself (homunculi- like humans), we may

see nature as reproductive, able to reproduce itself – or at least, its creative process.

Nature is not innocent of this process. Although we form nature for ourselves, this is not to say that the natural system has not allowed this to happen by creating a species that can reason and create technology; that can change itself and nature and that is chaotic and unpredictable because of this ability to reason. Human beings (created by nature) have discovered that they can also create a being that can create, (through their technology via the homunculus) lending credence to the argument that nature is reproductive. This is not to assume that the natural system has some kind of motive, or even to personify it and grant it some kind of deific status. It is merely to say that if these things were prohibited by nature, they would have been contra-allowed by it. The view of nature as a collective of discursive knowledges implies non-innocence, but this must not be confused with some kind of fatalistic, deific, numinous nature. Because the view of a unified, lawful nature is no longer possible in the light of quantum theory, or the notion that it is made up of these 'moving parts', it simply does not have the function of stopping processes and never did. Through humanity, technology and culture, nature has first bound itself by and then unbound itself from laws of unity and temperance.

It must also be noted that Haraway's (1991) actors and actants are all *productions of nature* itself. It is reasonable to assume that nature simply *is*, in fact, merely a complex interplay of these factors, rather than something *produced by* these factors. Nature is indeed a stage, but it is a unique stage that produces the actors. The way in which relationships are formed between the actors and actants and the nature of these relationships make up the 'stuff' of nature and determine what the effects of nature are, but nature simply comprises such complex systems – it is always a ball of chaos – regardless of the factors that play out inside its confines. Nature will, when we are gone and replaced by our

own technological seed, claim dominion over our artifice. Nature is reproductive and also quite maternal.

In producing us with the ability to form a creative force, nature has also proven itself to be reproductive of itself – generative of a species-creating species. Nature is reproductive as a specific result of our technology. This theory allows that nature itself is active in its own discourse. Nature, by creating in us the ability to create life, by being complicit in the discursive process that defines itself, has profaned itself. Anything that humanity does to this planet, even if they succeed in wiping out every living organism on it, is a function, a production of nature. To assume that humans are special and above nature is arrogance, but to recognise that they are merely creators of a species-creating species and that this is simply a function of nature may help humans to understand their minor role in this process of human self-evolution. It may be prudent always to defer to nature in cases where humanity challenges its function and productions, because by doing so, it is shown that nature was never sacred; it was, by creating self-aware and intelligent life through humans and our technology, always profane. By the fact that our culture of commodity has finally assimilated nature and creation, we are made aware of the fact that we have never been separate from nature at all, but have been a production of it and have been like nature ourselves. As Haraway puts it: “nature is not a physical ‘place’ to which one can go, nor is it a treasure to fence in or bank, nor an essence to be saved or violated”, (Haraway 1992:296) but it is an area of discourse in which we all take part.

However, it must be considered that our attitudes towards our environment and nature no longer conform to the traditional tropes of beauty and the sacred – the invasion of the technocracy has induced a state of profane natural. That which was once sacred and inviolate (the creation of life) has become arbitrated and has progressed to being something that we have a limited ability to control within the restricted scope of our physics. We are called upon to postulate that nature itself may be the architect of the genetic homunculus, because, in light of the theories of Haraway (1993) and Pepperell (1995) it can be shown that nature is

not innocent of our creation, nor, therefore, of the creation of the homunculus, nor of our specific mode of evolution, nor even of how we view nature itself.

In our current socio-political milieu, as Haraway predicted in the *Cyborg Manifesto* (Haraway in Badmington 2000), nature and culture are reworked; the one can no longer be the resource for appropriation or incorporation by the other. This is especially true if one realises that they are the same entity in the world of the genetic homunculus. The relationships for forming wholes from parts including those of polarity and hierarchical domination may in fact issue forth from the homunculus's world, but not in the way that we are used to. In fact it is necessary to completely re-structure our views of nature to something more pliable and subject to change. The very concept of natural 'law', as it was traditionally seen, is preposterous, as any concept of law as dreamed up by human beings has thus far been unable to make nature fit its shape. Our scientific formulae are only exact insofar as they remain abstract and hypothetical and physics, beyond the shaky chaos of quanta, begins to denature the larger or smaller the scale of view, that is to say, it only works on a human scale of magnification– the scope or range of our most powerful microscopes and telescopes (Pepperell 1995). For this reason, it becomes necessary to dismiss any conception of nature that assumes a uniformity of nature. This is not to say that we should abandon science in order to understand the genetic homunculus, after all, it is the culmination of the scientific project since pre-modern chemistry; only that the imperialist traditions of science are flawed and impossible to reconcile with a being that by its very existence refigures the way we see nature and can not conform to any idea of uniformity of nature.

3.3.2 Artificiality versus realness

If something is created artificially, a distinction must be drawn between the real and the fake. A real must therefore exist. However, as Baudrillard (1983:5) states:

> Abstraction today is no longer that of the map, the double, the mirror or the concept. Simulation is no longer that of a territory, a referential being

> or a substance. It is the generation by models of a real without origin or reality: a hyperreal. The territory no longer precedes the map, nor survives it. Henceforth, it is the map that precedes the territory – precession of simulacra – it is the map that engenders the territory.

So by this very rationale, we can not exclude the fact that something created artificially is real unto itself, even if that realness is a state of hyperreal; and so, if one could apply simulacrum theory to an artificial child, would that child not still be in possession of the rights it has as a sovereign being? Clearly these issues must be investigated more closely, but that is not the intention of this paper. Rather it is to expose the realness or unrealness of the post-human immortal, the genetic homunculus, so that such debate might be entered into with some basis of knowledge.

Siting artificiality and realness as oppositional is inherently problematic, however logical it may seem. For instance, when placed in front of an object and its mirror image, one automatically distinguishes the real object from the reflection. Or in front of a genuine Kandinsky and a perfect forgery, we ask “which is the real one?” but because any physical object we can hold and touch and prove to exist is undoubtedly ’real’ unto itself, we are faced with the problem of this consideration when there is a lack of the referent. We are not forced to question the reality of the cloned sheep when it is not standing right next to its mother/twin. So the question becomes one not of realness but of naturalness.

But this seems too easy – surely the natural and the artificial are obviously distinguishable? It would seem to be so, but, according to Baudrillard (1995) the copy instantly devalues the original to just another copy – the instant there is a twinning, the infinity of reproduction is established and there is a removal of the need for the original. Artificiality itself constitutes a removal of the original, or denial of originality. This is a denial of the natural. This dialogue also presents the problem of the real without referent.

Baudrillard (1995) notes that the removal of sex from the production of the genetic clone constitutes a similar problem – the removal of death. If the genetic clone can be created from any single cell of its progenitor, then not only has death lost its meaning entirely, but also the subject itself – thus, according to Baudrillard (1995:65) the creation of a genetic clone constitutes the annihilation of its progenitor:

> This is how one puts an end to totality. If all information can be found in each of its parts, the whole loses its meaning. It is also the end of the body, of this singularity called body, whose secret is precisely that it cannot be segmented into additional cells, that it is an indivisible configuration, to which its sexuation is witness.

The notion that one can or should perfect nature implies that it is in some way inherently defunct. Indeed, as Jean Baudrillard (1993), in his essay *Prophylaxis and Virulence* intimates, the very idea of a pursuit of perfection is nothing short of hubris, but *man* has always sought to reshape nature in *his* image, arrogance notwithstanding. William Newman (2004:2) notes that "the alchemists imagined themselves to have acquired from the investigation of nature a power over nature" and the same likely can be said for the geneticists in our contemporary society.

The whole point of Baudrillard's essay is not to posit simulacrum as the new real, but rather to re-affirm the existence of a *real* real. He (Baudrillard 1983:8) hints cryptically at this purpose by using the example of the iconoclasts:

> Their rage to destroy images rose precisely because they sensed this omnipotence of simulacra, this facility they have of effacing God from the consciousness of men and the overwhelming, destructive truth which they suggest: that ultimately there has never been any God, that only the simulacrum exists, indeed that God himself has only ever been his Own simulacrum. Had they been able to believe that images only occulted or masked the Platonic idea of God, there would have been no reason to destroy them. One can live with the idea of a distorted truth. But their metaphysical despair came from the idea that the images concealed nothing at all and that in fact they were not images, such as the original

> model would have made them, but actually perfect simulacra forever radiant with their own fascination.

We have progressed to such a state where we have it within our reach to create a human simulacrum and the lure of technology, the lure of the artificial, will see this come to fruition. Already, in the world of images this has been done, as Baudrillard (1983) well notes, on television, in advertising, in print media and even in books. But for the first time the *real* real is being encroached upon, (inasmuch as humanity can be considered real) and we are forced to question once again what is in fact real, or natural. Natural processes will have to be re-evaluated.

After the first generation of cloned beings "there is no possibility of a return to an original being", (Baudrillard 1995:66) because the clone has precluded its *sexual* reproduction and therefore any hope of an original being is lost when the clone itself (*re*)produces sexually, because its sexuation is no longer a necessity of its being, merely an adherent function inherited from its genitive twin (Baudrillard 1995). However, the reader must bear in mind here that Baudrillard is speaking of the productive process of cloning and not of the *re*productive process of genetic engineering, although the end result of both is indeed that *humanity* will be lost, because only the genes for creating humans will remain (and even then, most likely in an altered form). Baudrillard (1995) states that by removing sex and death (a being that is infinitely reproducible has no need for a fear of death) from the process of life, i.e. turning what is essentially a reproductive process into a process of simulation, humanity is destroyed. The homunculus precludes human existence for the same reasons, because its genesis is also non-coital and by its genetics and the prosthesis of its body, as well as other prostheses it acquires throughout its life, is quite immortal (this despite the fact that the things that threaten humanity's existence will, if Baudrillard (1993) is to be believed, evolve alongside the homunculus to threaten it), although there is a difference in that the homunculus is not mere production – it can reflect the genes of multiple parents. That it is a product of sexual (although non-coital) reproduction and not a 'cutting'

means there are slightly different terms of negotiation for the homunculus. The fact that it is a result of reproduction indicates a furthering of genetic material that is prone to mutation and evolution (just as human genes are), however it is itself a result of an artificial, deliberate mutation. The furthering of the process of evolution beyond the homunculus means that like humans, *it is not finished*.

Even so, remember that the homunculus is itself not asexual, although it can not be regarded as human, because it is not like a human – although it is prone to mutation, (further deliberate mutation) and to sexual reproduction – the cross fusion of DNA that occurs between two human beings – all potential for human defect, all imperfections, malfunctions and idiosyncrasies are removed (for instance the defect of *spina bifida* would not appear in a homunculus) and we can define our humanity by this – our mortality. The homunculus is not mortal. Unlike the clone that can still die, the homunculus, provided that favourable conditions are maintained, can live almost indefinitely in the infinite adaptability of its prostheses. The existence of the altered gene-immortal prohibits that it be regarded as human, as it can not be dealt with on the same terms.

According to Baudrillard, (1995) the cloned being is completely divorced from natural (sexed) production by its very nature. However it can be argued that sexual coitus is not the only form of natural production – that what is original is perhaps not the only form of the natural. While the technological age has seen the formation of a separate nature, an alternate nature that is other to the original, the genetic age will see a refiguring of the original, through the revelation of the reproductive arm of nature. Although the pre-modern alchemists also held the belief that species creation was possible and indeed many of their views inform present day genetic practice, the fact that empirical science has *proved* the homunculus to be a possibility has greatly altered our views on the subject. In fact, the culmination of the materialist scientific project was to consider nature to be something that humanity has a right to control and to consider that the views offered in this research might be oppositional to this view requires analysis

beyond the obvious similarities that the imperialist dogma of the industrial revolution has to the new alchemy. Both seem at first glance to be fairly heinous, but the position can be taken that the real (the natural) and the artificial are indeed parts of the same monster.

Pepperell (1995) avers that humanity has always viewed technology as both threatening and helpful, as something alien to humanity and as a kind of power that must be controlled or it will destroy us - after all, one of humanity's first technologies was the discovery of fire. However humanity can not see its technology or the fruits of its labour as anything other than natural if it is taken into consideration that nature is formed and transformed constantly through the dialogue of the players on its stage. The idea that humans (original) may not retain their original status when the suckling genetic homunculus arrives is irrelevant. The transition of natural to artificial is incidental to the process.

This image of the simulacrum describes the homunculus as a created being that will ultimately destroy its genitive creators by replacing them. The representation of the human will outlast the human itself.

3.3.3 The singularity

Raymond Kurzweil (2000) shows an exponential increase in rapidity in the evolution of the species, the countdown to what Vinge (1993) calls "singularity".

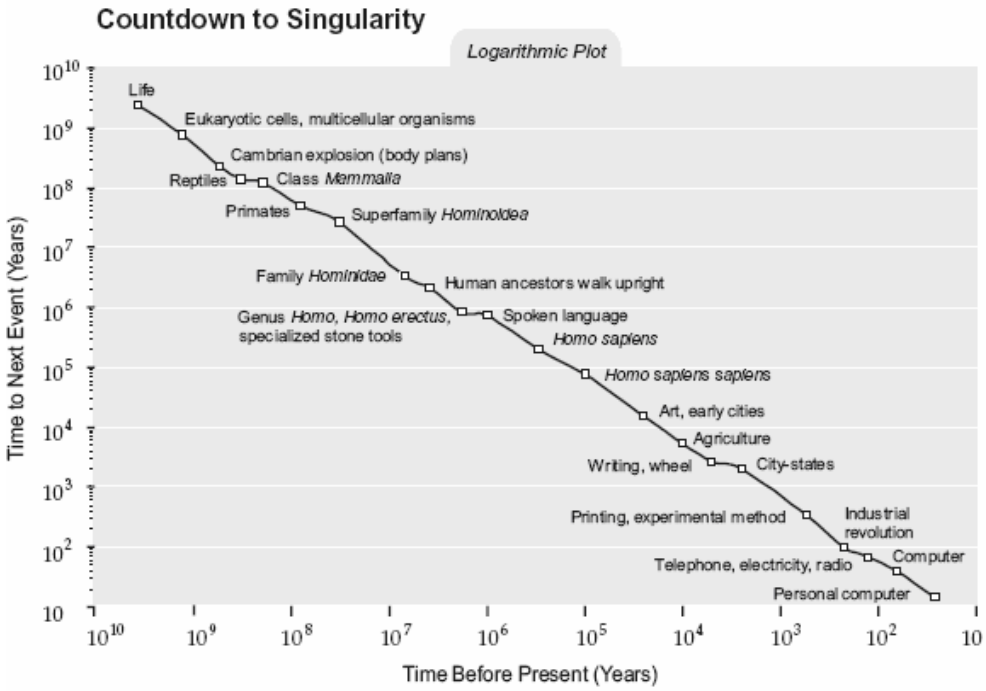

Figure 3: Countdown to singularity. (Kurzweil 2005:17).

Singularity is the term used by Vernor Vinge (1993) to describe a critical point in time when one state of affairs ends and a new, completely different state of affairs commences. The big bang, for instance, marks the 'first' singularity; the change of the dominant species from *homo neanderthalensis* to *homo erectus* is another example (Figure 3). Vinge uses the term to describe the time when the conflict between man and machine, biology and technology, nature and culture; will end. This will manifest in one of two ways: it may manifest in the form of a completely seamless fusion of human and technology; and it may manifest in the form of a deciding war between the two (as envisioned, for example, by films like *The Terminator* (1984) and *The Matrix* (1999)). Either way, it will be marked by the first self-aware, man made machine, (for example, a human clone) and it will be the end of the human race as we know it.

Vernor Vinge (1993:2) states some of the implications of the creation of non-human intelligent systems:

> What are the consequences of this event? When greater-than-human intelligence drives progress, that progress will be much more rapid. In fact, there seems no reason why progress itself would not involve the creation of still more intelligent entities—on a still-shorter time scale. The best analogy that I see is with the evolutionary past: Animals can adapt to problems and make inventions, but often no faster than natural selection can do its work—the world acts as its own simulator in the case of natural selection. We humans have the ability to internalize the world and conduct "what ifs" in our heads; we can solve many problems thousands of times faster than natural selection. Now, by creating the means to execute those simulations at much higher speeds, we are entering a regime as radically different from our human past as we humans are from the lower animals. From the human point of view, this change will be a throwing away of all the previous rules, perhaps in the blink of an eye, an exponential runaway beyond any hope of control.

For this reason it is impossible to continue to deny the connectedness of technology and nature, technology and humanity, nature and humanity. It is most useful to look at the inclusive ways of dealing with this holy trinity that no longer separate and create distinction. The only way to deal with this coming singularity, this amalgamation of technology, humanity and nature, is to go beyond the traditions of logical positivism and look to holism and inclusivism for ways of dealing with our own demise – the intelligent systems beyond the human. We may be forced to look beyond the corporeal and into the metaphysical realm of the soul, as the alchemists did.

3.3.4 Transcendence and the soul

Key to the idea of creating the homunculus is the notion of humanity's intercession in nature through our extended technological agency. It has been shown that this dialectic has always been one that is mutually creative and destructive, in that it is a completely discursive and symbiotic relationship. This is leading humanity further and further into a state of oneness with technology, to the detriment of a cohesive and unified theory of humanity. The continuation of this state of affairs will see humanity lose all distinction in terms that are understandable to contemporary society and culture. It is impossible to deny that

this technological (trans)fusion represents transcendence: transcendence of disease; transcendence of humanity; transcendence of mortality, but we see here that the notion of transcendence is coloured by death and there can be no hope of transcendence without it – our genetic offspring must bring about our demise. This is because it requires that humanity evolves – self-evolves – from its current state, which inevitably must come hand in hand with the extinction of the previous state. Of course this implies that the creation of the homunculus is really sought because we *believe* that it will bring about our own immortality, but it has been shown that transcendence (in alchemical and evolutionary terms) must and can only succeed death.

The transcendence of mortality was the ultimate goal of the opus – to reach a state of truth. Jung (1963:348) states:

> The inner spiritual man of the Gnostics is the Anthropos, the man created in the image of the Nous, the true man. He corresponds to the *chen-yen* (true man) of Chinese alchemy. The *chen-yen* is the product of the opus. On the one hand he is the adept who is transformed by the work, on the other he is the homunculus or *filius* of Western alchemy, who also derives from the true man

From this statement we see that the homunculus was presented in alchemy as a state of enlightened or pure humanity – a transcendent and immortal state – but different from humanity in its fundamental nature – it requires a radical transfiguration of the base state through the alchemical opus. Thus, in order for humanity to transcend time, the human body and soul must be altered by the *Opus Magnum* (Great Work) – the alchemical arts. Here the transcendence of the ravages of Time is once again presented as possible through technology, through the extraction of essences.

The alchemical idea of the soul was that the soul was a subtle body – that is, something that manifested both corporeally and incorporeally – and as such could be altered by spiritual as well as physical change. The soul was a type of quintessence of which all things were possessed. For the alchemists, the soul is

the malleable substance which can be extracted from matter through the opus – an essence which can be purified. The alchemist's soul goes through a similar process of purification to that matter, on its way to transcendence. This transcendence was, for the alchemists, both a physical transcendence of their corporeal flesh through the design of their own immortality, as well as a spiritual cleansing that lasted the alchemist's whole life.

The extraction of the 'soul' from the fixed body had countless meanings and representations in alchemic philosophy. The 'soul', according to this philosophy was the quintessence of any object (Jung 1963). Jung (1963:491) reiterates the importance of this symbolism as transcendent mythology:

> The *extractio* is depicted figuratively in an illustration in Reusner's *Pandora:* a crowned figure, with a halo, raising a winged, fish-tailed, snake-armed creature (the spirit), likewise crowned with a halo, out of a lump of earth. This monster represents the *spiritus mercurialis,* the soul of the world or of matter freed from its fetters; the *filius macrocosmi,* the child of sun and moon born in the earth, the hermaphroditic homunculus, etc. Basically all these synonyms describe the inner man as a parallel or complement of Christ.

The extraction of essences has always been scientifically important. It represented for the alchemists a physical, though spiritually significant process of purification – a sort of divine form of distillation (Jung 1963). The blending of these essences was of equal magnitude, as each essence was afforded certain human qualities, such as sanguinity or dolour.

For the alchemists the soul was the quintessence of all matter and could be subjected to purification through the torments of the Opus. The physical corpus always represented the soul, just as the soul was equivocal to the body. Most alchemic representations of the soul are figurative, rather than abstract and this illustrates this connection adequately: "The mystery of everything is life, which is water; for water dissolves the body into spirit" (Jung 1963:238).

Of course the idea that the body can be eradicated to leave only the spirit is not unique, but the metaphor extends even further, because for the alchemists, the body could become soul and, likewise, what affected the body affected the soul, according to Jung (1963:535):

> Though the goal of the opus alchymicum was indubitably the production of the lapis or *caelum,* there can be no doubt about its tendency to spiritualise the "body". … It represents nothing less than a *corpus glorificationis,* the resurrected body whose relation to eternity is self-evident.

Clearly the soul played an important role in the movement towards transcendence in alchemic philosophy. The body needed to be purified through torment (Eliade 1971) in order to be a fitting vessel for the soul. The soul can be seen as an interesting point of reference for modern science too, as it is largely the ethical issues surrounding it that concern the creation of a genetic homunculus. The soul, taken by many to mean that spiritual essence of our consciousness that 'lives on' after we die, the essence of human life, unfettered by the constraints of corporality or time (the ultimate transcendent mode of being), has long been the crux of every major religion in the world to date. All state that after one dies, life persists in a transcendent form and that our deeds in our mortal life are the trial that determine the fate of this continued existence.

The soul was greatly discussed by the alchemists, who saw as a viable question of science the problem of its role in their chemistry. Alchemic philosophy dictates that before an alchemist can be ready to create the philosopher's stone, the elixir of life; he must first purify first his body and then his soul, so as not to taint the production with the impurities of body, mind and spirit (Eliade 1971). The 'soul' spoken of in most alchemic literature and alluded to in most illustrations actually refers to a trinity of 'essences'[1] possessed by the transforming substances at

[1] This was seen by Western alchemists to represent a "Christological path of purification, which, with the help of the trinity of the most subtle spirit (quintessence (God), pure body (Christ) and immaculate soul (Holy Spirit)), leads via the seven stepped ladder of sublimation to [the] success" (Roob 1996:203) of the *Opus Magnum*.

their various stages during the creation of the Philosopher's Stone.[1] This 'soul' was, in effect, nature refined. This essential trinity was often equivocal to the soul of the alchemist himself and required that certain rituals of symbolic torment be observed in order to ensure its proper treatment.

According to Mircea Eliade (1971), this treatment of all matter as entities that can be reduced to essentialities through torment is important. Much of Western alchemic symbolism from the middle ages onwards deals with the idea of trial, death and resurrection. In the alchemist's crucible, the substances of the *Opus Magnum* could only be transmuted through torment and 'death'. According to Eliade (1971), the idea of torment, death and subsequent resurrection and transformation borrowed heavily from the Christian mythology dealing with Christ's suffering, not only to avoid the censure of the church, but also because of the similarities that Christ bore to the philosopher's stone. For this reason the opus magnum also took on the characteristics of the Christian passion. In the crucible the *materia prima* suffered the torment of 'death', putrefaction, resurrection and sublimation like Christ himself. There it died to be re-awakened, purified, spiritualised and transformed.

According to Christian mythology, there was no hope of transmutation without prior 'death'. The alchemical symbolism of torture and death is sometimes equivocal; it can be taken to refer either to man or to a mineral substance. The essence of "initiation of a neophyte into the Mysteries of alchemy consisted of participation in the passion, death and resurrection of a God" (Eliade 1971:149). "Western alchemists integrated their symbolism into Christian theology because

[1] All labours of the alchemist contributed in some way or another to the *Opus Magnum* or Great Work. The Great Work was essentially the goal of Western alchemy since its inception – the philosopher's stone. The stone was attained by the ritual purification and distillation of the *materia prima* (an unidentified substance supposedly "known to only the most enlightened practitioners of the art" (Klossowski de Rola 1973:10) that is, simply put, the 'ultimate' ore which makes up all matter) through the four elements and the transmutation of metals. Once distilled from the dross and impurities inherent in the *materia prima*, the philosopher's stone, with its transmutative powers, would grant its creator good health and, supposedly, eternal life.

the 'death' of matter was sanctified by the death of Christ who assured its redemption" (Eliade 1971:157). Initiatory rites would therefore have included the symbolic suffering, death and resurrection of the initiate, equated with the passion of Christ, "because the meaning and finality of the Mysteries were the transmutation of man, the initiate changed his mode of being – he became immortal" (Eliade 1971:150). The alchemists, according to Eliade (1971:151), "projected onto matter the initiatory function of suffering" and the alchemical operations corresponding to suffering, death and resurrection of the initiate, caused the substance to transmute, to become gold. It is for this reason that gold is the symbol of immortality. Thus the transformation of the metals became a metaphor for the transformation of man – of man's becoming immortal.

Because the transmutation of the metals was allegorical for the transmutation of man, the metals and ores, already personified, became anthropomorphized, each new metal on its way to becoming gold became a hybrid being. According to Eliade (1971:172), "The concept of alchemical transmutation is the fabulous consummation of a faith in the possibility of changing Nature by human labours". This consummation manifested in the alchemist's act of speeding-up nature. This was not only attained in the realization of eternality through the initiatory practices, but through the conquering of time itself, through no longer being a slave to temporality. Eliade (1971:171) states: "… the freeing of Nature from the laws of Time went hand in hand with the deliverance of the alchemist himself … the redemption of Nature completed the redemption of man by Christ".

In alchemical illustrations, the soul is almost always represented as some kind of figure and often by the human form (which to the alchemists was both divine and malign). The masculine element of the alchemic *mysterium coniunctionis* – the conjunctive heirosgamos that represented the alchemical opus[1] was separated

[1] It must also be noted briefly that the alchemical notion of *imaginatio* was represented by a star. (Jung 1967) The act of imagining was a physical activity that could be fitted into the cycle of material changes for the alchemists – it brought about these changes and, in turn, was brought

into two distinct forms – the spiritual and the material – these essences had to correspond in order for transcendence to occur. This relationship within man, according to Jung (1963) is established in Jewish gnosis and Christian mysticism as being of the earth and of the air. In I Corinthians 15:47 this is presented in Paul's cryptic description of the soul: "…'the first man was of the earth, earthy; the second man is from heaven, heavenly' and verse 45: 'The first man, Adam, became a living soul; the last Adam became a life-giving spirit'. Thus the original hylic-psychic man is contrasted with the latter pneumatic man" (Jung 1963:413).

The extraction and isolation of the DNA sequence has rendered it possible to reduce a living entity to an essential formula, which is equivocal, although not entirely similar to the alchemist's extraction of essential forms. This idea, like that of the alchemists, is coupled with the notion of transfiguration. Like the alchemists who according to Eliade (1971) saw themselves as equivalent to Nature in their intervention in Her processes, humanity now places itself on a plane of dialogic interaction, of simultaneous and mutual creation with nature. The idea of transmogrification goes hand in hand with a coupling of humanity and nature – evolution is itself a natural process.

It has been shown that the ideas of the natural that have permeated culture since the Industrial Revolution have a relative relation to their chronology and reflect ways of dealing with nature that were useful to a particular set of situated knowledges and not necessarily true. Nature is inviolably violable and the technology that performs the critical alterations of her processes and becomes her medium of production and reproduction, must itself have a motivating factor. This is transcendence.

The culture of commodity is a central player in this final passion play (where humanity suffers to transcend mortality through its own self-designed death). The

about by them. Thus the stars in this work can also be seen to represent the notion of a hope for change via the artistic imagination (it is a self-portrait).

driving forces behind human evolution – and the creation of the homunculus – are indeed the research foundations, the software and medical corporations of the world who seek to profit from this enterprise through the creation of highly sought-after commodities like prosthetics, cures to diseases and later even 'on board' computers for implantation into the human body, which of course have countless military, business and leisure applications, not to mention the sex industry. This places them firmly in the driver's seat for the creation of policies regarding the arbitration of human clones and human upgrades and makes them the arbiters of the Singularity.

Haraway (1992:297) states:

> The preoccupation with productionism that has characterized so much parochial Western discourse and practice seems to have hypertrophied into something quite marvellous: the whole world is remade in the image of commodity production. How, in the face of this marvel, can I seriously insist that to see nature as artifactual is an oppositional, or better, a differential siting? ... I think the answer to this … question lies in two related turns: 1) unblinding ourselves from the sun-worshiping stories about the history of science and technology as paradigms of rationalism; and 2) refiguring the actors in the construction of the ethno-specific categories of nature and culture

Because of the traditionally imperialising nature of the patriarchal technocracy, one might be tempted to believe that this may be to the detriment of the future race, or to humanity, but this is immaterial. 'Singularity', for the human race and all systems and mechanisms of power that it created and enforced, will likely be spelled with the letters 'D.O.O.M.' at least for humans. The endeavours for representing and enforcing 'human nature' are notorious for being dominating and the Human Genome Project is no different, but even as a tentacle of the hegemonic monster, it is still a profane tentacle of nature itself and as such it plays out the inevitability of extinction in the face of the final moment of (re)productive creation. The culture of commodity is likely to survive under the homunculus as its technological interlocutor.

Humanity's extinction may not materialise in a culling of humanity *en masse,* as envisioned in the *Terminator* films, but it will certainly come about, whether through a final dying out of non–genetically enhanced humanity or through an assimilation of all humanity into the fold – the culture of commodity will be assimilated into the homunculu's cultural processes – just as everything once belonging to humans will belong to the homunculi after the singularity.

In this final transcendence of humanity through its own death, the *becoming* of nature will be complete. By becoming nature humanity will discover an inextricable link to it. Our becoming is the ultimate affirmation of a natural culture and profanation of the sacred – humanity will become the ultimate in commodifying entities – humanity will commodify the creation of life itself even in the use of the most basic genetic medicine, yet will remain as the alchemists saw themselves – as an arm of nature, not independent of other players in the de/re-construction of nature (ideologically or otherwise) or its generation.

This is the blasphemy of transcendence, but it is not a complete apostatisation of humanity, nor is it deicide. The commodification of natural process brings the market into the house of God, but this only serves to reaffirm the original (higher) process. Transcendence becomes heretical when deities are supplanted in favour of an alternate mode of transcendence – a way to cheat death that does not involve faith in life after death.

Like the alchemist with his charms, rituals and furnaces, our view of the ideal state of being has become infused with and inseparable from our technology. If we take into consideration the extent to which our cybernetic and technological prosthesis is 'essential' to our functioning in contemporary society, this becomes more and more apparent. However, this is not to say that this represents some kind of progression towards an undefined transcendental state. According to Jean Baudrillard (in Badmington 2000:35) "the social system [and] the biological body [lose their] natural defences in precise proportion to the growing

sophistication of [their] prostheses". If this is true, then we can not say that the homunculus will be any more perfect than a human and thus any hope of transcendence that is offered by its creation is false. The alchemic dream of transcendence through the homunculus would appear to be subverted by its very creation. Nonetheless, it is this very dream of transcendence of an unenlightened state that informs genetic science today as it did the alchemists of old.

Haraway (1992:298) states: "Biology is a discourse, not the living world itself. But humans are not the only actors in the construction of the entities of any scientific discourse; machines (delegates that can produce surprises) and other partners (not "pre- or extra-discursive objects", but partners) are active constructors of natural scientific objects". The stage changes and reacts to itself and to the players it accommodates. Can we say that the homunculus is not human because it is created by science and that having human DNA does not constitute being human? The answer, at least legally, is yes. The foetus in the womb is not designated as human until it reaches a certain maturity – it has all the characteristics of a human, as well as all the DNA, but in the eyes of the courts of many Western countries it is merely 'life' and not 'human'. The tissue nurtured in laboratories for transplant is alive and has human DNA, but is not human. However, these views are naturally not held by everyone and clearly there is an ethical problem concerning whether or not the homunculus is 'human', too, that is, worthy of the appellation of human and its assistant terms of negotiation. If we consider that humanity is simply evolving and not transcending at all and that the processes that are arbitrated by the technocracy should perhaps be handled with a greater sense of moral responsibility, the answer most certainly is no.

The question is really how we define humanity – is it defined by our self-awareness and intelligence (the Descartesian *cogito ergo sum*) (in which case the homunculus would be *more human* than a human), our genetics (the homunculus will certainly be created from human DNA but it will be different both physically and mentally) or is there some other indefinable notion of humanity

that is beyond our sciences, courts and our philosophical disciplines? The notion of a homunculus's humanity versus the notion of a human being's humanity (for instance, a life prison sentence for an immortal would have to be re-defined) will no doubt be great cause for contention, especially considering ownership of altered (and patented) DNA.

Should the homunculus be seen as an android? An android is like a human in every way, but it is not fundamentally human – it is a technologically created consciousness that has a technologically created body – this body is an initial prosthesis – it is not simply a body, because it is created and augmented as a prosthesis – as a technology to help to sustain it better than an ordinary body could. This android can reproduce sexually, but it is not human, it needs love and attention but it is not human, *et cetera*.

However, equitable treatment of intelligent life forms has been shown by humanity's own racially turbulent past to be the only viable method of dealing with unfamiliar beings. However, reading the same history shows us that it is unlikely that this will be the case. The 'android' line of reasoning invariably leads to dehumanisation – a problem humanity is ill-equipped to deal with even amongst their own species. It is likely, in fact, that humans will take a back-seat in terms of equitable treatment, when the two briefly co-exist.

3.3.5 Technology – the Laboratory as surrogate womb

Human technology is the key to the intervention in nature's processes and the progression towards immortality that this represents. According to the alchemists, the alchemic art was the only way to achieve the lapis or the homunculus.[1] The human relationship with technology is important to note on the path to seeing

[1] It must be accepted here that the alchemist's art was their technology. According to William Newman, (2004) the distinction between art and technology was hazy to the alchemists, who saw their technologies as a type of spiritual art form. The alchemists employed what was seen to be the most powerful and advanced equipment in their idiom and really it is impossible to view it otherwise.

how it brings them closer to nature, since it is only through technological means that they can imitate her processes. The extension of agency is vital to this dialectic. Human agency is extended and pluralised by technology, becoming a multifarious network of possible actions. Humans are so dependent upon this extension and pluralisation of their actions and so indivisibly linked to technology, that technology is slowly beginning to creep into the inner space, the human body, becoming internalised.

In light of the fact that current human apprehensions about technology mirror those of their predecessors, they can not help but recognise that it has always been a part of human functioning. There has always been a fear of the encroachment of technology on personal space – and there has always been a longing for the perceived 'simplicity' of the previous generation. However the possibility that the *natural* progression of technology (that humans interact with directly) could well be from 'outside' to 'inside', must be admitted. This is certainly the case with genetics, after an initial reversal of this relationship – the 'raw materials' are harvested from human bodies, interfered with in the laboratory and relentlessly experimented upon – then the technologies created from this experimentation become the most intimate human prostheses, disappearing below skin and augmenting and changing from within. Pepperell states that technology can no longer be viewed as a force that is alien and in opposition to the human being. Rather, it should be seen as an extension of human will and innovation.

Contrary to the slow encroachment of technology, the natural topos has not shifted from the external to the internal – it was already everywhere. There is no longer debate upon the existence of dragons at the edge of the world, but upon the chimaeras that could possibly be created within the laboratory (here be monsters) – humans no longer fear the magic of the gods, because they have unlocked the secrets of Prometheus and for them, 'Nature' has been unveiled

and invited into the warmth of the Platonic cave, although 'she' has always hidden there secretly.

Mircea Eliade (1971) shows that in the sexualised natural world of the ancients and the early alchemists, the ores of the earth were subject to gynecomorphic birth – "hence, the comparison of caves and mines to the womb of the Earth-Mother" (Eliade 1971:41). Of course, any mining or harvesting of materials from the natural world was interpretable as a return to the Earth-Mother and was accordingly ritualised. The Alchemists thus imbued their furnaces, retorts, ovens and crucibles with the sexual properties of the Earth-Mother and their art was bestowed with the properties of fertilisation (Eliade 1971). The alchemist's *vas mirabile,* his furnaces, bellows, caducei and retorts had an ambitious role to play in the opus magnum. According to Eliade, "[t]hese pieces of apparatus are at the very centre of a return to primordial chaos, of a rehearsal of the cosmogony" (Eliade 1971:169). The technologies of the alchemist's laboratory were intended to simulate natural processes within that unnatural setting. Among the many aims of the spiritual opus was the modification of matter and the only way that this was possible was through a return to the chaotic womb of the Earth-Mother (Eliade 1971), which the flames of the furnace and the nurturing microcosmic belly of the retort could replicate.

It is important to note the *perceived* shift in the realm of the natural in this relationship. The natural is brought tentatively into the laboratories. Historically, this has always been done with a certain amount of awed deference to 'Nature' and 'her' fickle temperament – the rituals have been as mystically specific and sexualised as nature itself – after-all the danger of these experiments with its power was often great. All the same, this taming of the great and sacred feminine was seen to be one of the most powerful arts of alchemy and we see this realised in the laboratory, which belongs to nature, is engendered by it and plays host to its processes. The chaos-womb of the Earth-Mother must be simulated to legitimise the function of Laboratory.

It has already been revealed that nature has always been profane – that it had been assigned the mystical status of 'sacred numinous feminine' out of fear or spite. It can be said that the laboratories have simply emerged from the womb of Nature through human artifice, to simulate 'her' womb. According to Haraway (1992), nature is a type of plane of discussion between *all* the actors and patients involved. The involvement of the alchemists is to be expected, just as is our involvement. The shift in position is a human illusion, inspired by our arrogance – the natural topos can exist anywhere. Nature is just as at home in our laboratories as in the wild. The natural has always inhabited the laboratory, because even the artificial can be said to be a production of nature. However, the laboratory has nonetheless annexed the natural process and as such, it constitutes a kind of simulated natural – it has become 'Laboratory' rather than laboratory.

But where does this leave technology? It can be said, if one extends the alchemic metaphor a little further, that technology is the medium – the catalyst of nature's processes. It has already been mentioned how the alchemists sought to conquer time through technology and that this is of course because the technology of the alchemists sped up nature's processes. All metals, they believed, were on various stages of the path towards gold – the ideal state of truth for all matter (gold was simply a state of purity and the alchemist himself could achieve this divine purpose) – and thus it should be possible to transmute any one of the metals into gold. Any and all matter could be accelerated towards its ideal state. Technology, for humans, is a catalyst and this idea persists in the thinking that informs those who promote the creation of the genetic homunculus. Technology is always reflexive – aware of itself inasmuch as we build every technology upon prior knowledge of all technologies available to us – and, finally, self-aware in the homunculus. However the human fear of nature has been reflected onto technology and technology is thus still somewhat ritualistic – we

govern it strictly with ethics committees and rigorously initiate those who wish to know its secrets, so that we do not overstep her bounds.

The Laboratory has become the surrogate womb and technology the *in vitro* fertilisation of 'Nature's processes. For the alchemists, this was always the case. The genitive earth could be simulated within the laboratory to facilitate the interference of technology – the artificial stimulation of the genitive material, which was, according to ancient tradition, stone[1]. The alchemist's laboratory was built to bring about the fertilisation of the stone through alchemic process, although this idea of the genitive stone evolved into the notion of the *materia prima* or "first matter". Mircea Eliade (1971:43) asserts that the lithic mythology that is propaedeutic to this idea – "the myths concerning men born from stone and the beliefs regarding the generation and ripening of stones and ores in the bowels of the earth – both have implicit in them the notion that stone is the source of life and fertility, that it lives and procreates human creatures just as it has itself been engendered by the earth".

The alchemic idea of the homunculus sprang from this idea of the genitive stone – the anthropomorphisation of the metals is further affirmation of this relationship – and thus the Laboratory and the technology that is developed inside it is very important to the ends of describing the homunculus. The simulated womb of the Laboratory and the fertilising human agency, technology, together simulate the process of reproduction. This reproduction of nature, of humanity is a type of decompensation of nature through its slow creeping into all areas of life. The processes of creation of the genetic homunculus are not limited to the halls of science, though.

[1] The idea of creating life – a man – from stone is very old indeed. To cite one example, the old Hebrew word for 'red dust' *adam,* comes from a Semitic root *dam* (blood) and formed the name of the Biblical 'first man,' who was created by god from the clay of the earth. The connection between blood and earth is established very early on and appears in countless ancient texts. (Eliade 1971)

The Laboratory is visible almost everywhere, conversely to nature, however, it has a specificity of place – those places where things are created, disaggregated and recombined – the simulation of nature has all but occluded its originator, but it must still have the participation of the actors and patients that make up the natural world. The Laboratory is the simulation of the natural genitive womb. Contemporary society has made it possible to be involved in the discourses of science, (especially in genetics) without ever having a say – those politicians and corporations that mute the din of the masses with all-encompassing and Imperial decrees make it so that it is nearly impossible keep track of the laws passed and the decisions made in the name of the public, while the technocracy relentlessly churns on and on. The Laboratory is a sped-up version of nature - the hundreds of infinitesimal changes that the actors and patients (particularly humanity and our technology) each day are its operational processes.

In order for the Laboratory to function, it requires the record of technology. Humans build everything upon record – especially new technologies. The specific uniqueness of the Laboratory lies in that it produces and functions on record, which nature does not do. The natural realm has a past-history (the history of the *proto-*) but it does not have record, which technology is able to reflexively interact with. The Laboratory revels in preservation, in trapping the instant and measuring, calculating and recording it. Technology is cumulative and grows exponentially more rapid as a result of record-keeping. The Laboratory is the place where humans can extend their agency to the destruction of time – the fertilisation of the genitive stone, the materia prima, or the stem-cell ovum is the example used so far – and it requires that a strange metonymy of immortality for technology be set up. Human technology can be said to destroy time in two ways – in the production of record and in the speeding up of natural process – and for humans it does so by the facilitation of immortality. In the reassembly of human ‘parts’ the Laboratory allows a differential of nature to be brought about. Human collusion with ‘Nature’ in profaning ‘her’ through technology has produced a kind of anti-stasis – a sort of super-fluidity of

attributes such as race, gender, culture, physicality – a culture of the image-body. The genetic homunculus's physical identity is no longer a production of nature that is irrepressible, disobedient and static, but a production of the Laboratory that is fluid, ephemeral and transitive.

A being created using a specially selected DNA sequence – a post-human pastiche of qualities seen by its creator to be desirable – is likely to reset the terms of negotiation for humanity and technology and the artefacts we create. Of course, implicit in this statement is that a genetically engineered homunculus is artificial in nature. Given that a being created outside of normal reproduction is entirely divorced from sexual genesis (Baudrillard 1995) and is also completely in possession of autonomous robotics – biological though they are – we can certainly say this.

3.4 Notes on transcendence and the homunculus

It is important to note that the becoming of the genetic homunculus does not constitute the transcendence of an unenlightened state, but rather, the forging of something entirely new from our genetic raw material. To look at humanity as a state of unenlightened pre-transcendence is in itself flawed, as this approach obviously has its roots in the same hegemonic imperialism that totes reason and enlightenment as the paradigms of intelligence, after all, what is sought by the creation of the first homunculus is the transcendence of this imagined state, as was the invention of the steam engine, the light bulb and all other 'discoveries' made in the name of progress. The genetic homunculus is, after all, a being created by those with the power and influence and money to do so and that means the technocrats and the bureaucrats and the champions of Western Capitalism. But this 'transcendence' will not occur, firstly because it is done under the illusion of progress and secondly, because the genetic homunculus, as mentioned before, will no longer be 'human' in any sense that we can understand, not least physically. The idea that there can be no transcendence

without prior death is witness to this fact. When we are 'reborn' as the genetic homunculus, we will no longer be human – the human will be dead and unable to enjoy its new state of being.

The genetic homunculus is unlike Haraway's cyborg in that it can not be the architect of its own creation, it must be arbitrated, at least initially, by the hegemonic monster, but the genetic homunculus will very likely cause an upset in this precariously balanced power structure, because it will undoubtedly cause a refiguring of how we see nature and humanity itself and, after the first few generations or even the first generation, will be the sole arbitrator of its own identity, body and soul, because humans as we know them will be a thing of the past.

The birth of the first human-homunculus hybrid, the second-generation after humanity, will further seal the fate of humans. The genetic homunculus is such that it looks like us and possibly can even reproduce with us. This, of course assumes that sometime in the future, there will come a time when there is not a single human left alive (and by this, I mean a real human, that is, one not bred from the union of human and genetic homunculus) that has not been altered somewhat by the manipulation of genetics. But this is not even necessary – the change in status quo will come when our intelligent technology holds more sway over things than humans do. It is not difficult to see how this could happen with a being that is more physically and mentally capable than a human.

The position can be taken that the genetic homunculus will always be an oppressed being – one whose physicality will always be governed by the previous generation – that unlike the cyborg, who is able to augment and fine-tune itself through upgrades, the genetic homunculus will be subject to its creators whims. However the genetic technology that creates the genetic homunculus, allows for the arbitration of the engineered being by the engineered being (for instance the growing of biological prostheses and gene-altering

procedures are the technologies of the homunculus). We must bear in mind that the biological organism is a machine. Thus, the better this machine can be understood, the better it can be understood how to augment it using the same 'parts'. The ability to re-fashion a limb or vital organ from a being's DNA and then replace the old one is already practised in medicine – new skin is grown in laboratories from foreskins and certain stem cells can be harvested from umbilical cords and teratomas (the abject has become useful) – and humans are not very far away from seeing the process being performed parthenogenetically. As humans are better able to control this technology, the cosmetic or practical uses of genetics on the human body will become more and more malleable. It is not unreasonable to suggest that an aspect of the cyborg upgrade (a self upgrade, or commissioned upgrade) might be genetic, for example, the growing of an extra finger on each hand to allow one to play the piano with greater proficiency, as proposed in Andrew Niccol's *Gattaca.*

Figure 4: Child born with twelve fingers. (Moore & Persaud 2003:339).

This is because the genetic homunculus is an ever-changing, ever erratic being in terms of its natural evolution. Its evolution is subject to advances in its own and our technology, as well as to *its own whim.* The genetic cyborg with its virtual immortality and technology will be able to govern the niceties of its own body. Its

evolution[1] can therefore be inferred, but never predicted with any kind of certainty.

Beyond a rudimentary understanding, those not fluent in the dialogues that create these technologies are left completely in the dark as to their genesis. They appear as ever-multiplying entities, ever more ingenious, ever more autonomous and self-aware. The popular science-fiction archetype of the technology that surpasses and then destroys its creator is ever in the backs of our minds, even as humanity enjoys the benefits they warily reap from them.

[1] A theory of evolution is propaedeutic to any theory that suggests a neo-human race created by humans. Evolution, in this instance, is taken to mean the process of developing reflexive adaptations to the environment, to the social climate and to the self.

CHAPTER 4: THE GENETIC HOMUNCULUS IN VISUAL TEXTS

Visual representations of monstrous creatures created by man have been common throughout history. Just as there have been countless mythological figures whose magical or technological genesis under human auspices has set them apart from the natural realm, so have these myriad creatures manifested in contemporaneous visual culture. Just as depictions of heroes battling fiends and dragons have survived from antiquity, modern equivalents of the homunculus, like the monster in Mary Shelley's novel, *Frankenstein* (1818), have become prevailing cultural icons with the advent of cinema.

4.1 The genetic homunculus, visual culture and technology

These appropriations of alchemic ideas with regard to the genetically engineered being, especially the notion of the homunculus in a post-human context, are myriad in contemporary popular culture. Although oftentimes superficial or anecdotal, visual references to alchemy or the homunculus in the context of a post-human, genetically engineered being appear in such diverse fields as computer gaming, Japanese *anime* film and the arts. *Bioshock* (2007), a first-person shooting game in which the players assume various upgrades and enhancements to their genetics, contains references to the alchemic idea of conjunction, in that the 'male' and 'female' genetic upgrades (*Adam* and *Eve*) must be used in tandem in order to function. The fantasy role-playing game *The Witcher* (2007) features a genetically modified, mutant protagonist who must consume alchemically created potions and mutagens in order to survive or enhance his potency. *Akira* (1988), a Japanese anime film directed by Katsuhiro Otomo (figure 5) presents a post-apocalyptic view of a genetically enhanced, technologically tweaked individual who discovers ultimate power in his transcendence from man to god.

Figure 5: Film stills from *Akira* 1988. (Otomo 1988).

What was once myth has become reality, at least in popular culture where the phenomenon of the genetic homunculus is manifest and there is room for forum and debate. In addition to this, the visual arts also offer manifestations of the contemporary genetic homunculus and examine the phenomenon from alternative critical standpoints. Visual art plays a particularly subversive role with regards to technology in the formation of views that subvert those imposed by the technocracy.

The discourses that are important to the trans-human, post-human or meta-human are dealt with in a visible, deliberate and physical way most often in the visual arts. Without being too naively reductive in positing the visual arts as some kind of post-human social meliorism, I hope to show how some examples offered by the visual arts and in popular culture can be helpful in illustrating the relationship of the genetic homunculus to the technology that shapes it. The

visual arts can be seen to give humanity license to re-affirm this particular type of simulated real and also subvert the intentions of those who control technology (particularly in recent Bio-art and surgical performance art) and especially in relation to personal identity. Biology and technology also have this re-affirming function, but cultural mediation affects how humans view them greatly and their simulatedness is not transparent, whereas with the arts it is intended that works are critically examined and personal immersion in the work is necessary to question its veracity and purpose.

The art/technology relationship is a strained one. Art annexes and subverts technologies in order to extract them from the hegemonic machine, to disengage them from the Laboratory and make them once again Natural, while the ruling order constantly devours artistic counter-culture, in the form of popular visual culture to stop the decay of the technocracy. This ideological *ouroboros* is important to the genetic being because it represents the negotiations and intercessions between identity and commodity – the genetic homunculus's post-human condition is largely dependent upon which group controls it and when. The genetic homunculus can undermine is creators by employing the same technology used in creating it. Art can show us aspects of the genetic homunculus through the subversion of the controller's technologies and ideological structures that create it.

Consider that the arts can also serve as cultural record markers and destroyers of time, but that the arts are deliberately false in their record-keeping, albeit they also serve a technological function and are intimately linked to new technologies. One is more inclined to accept the reality offered by art as real unto itself precisely because one knows it is not 'real'. (Similarly, the fascination of immortality lies solely in the fact that as yet it remains unreal – the Laboratory has not yet created the genetic homunculus as an intelligent being – but when it becomes real it will bring about the cessation of 'original' sexual reproduction, which for Baudrillard (1995) signifies death). For this reason, art is even more

effective as record than technology and this is apparent when the close connectedness of art and technology is considered – art is also a part of the Laboratory. The relationship between art and new technology has always been very close: one of the earliest instances of the synthesis of visual art and technology is in the Egyptian pyramids, whose techno-religious function required the use of visual art. They are also thus one of the earliest known examples of ergonomics. Today, just as in ancient times, the ruling order creates its own art in the form of popular visual culture in order to ensure its continued functioning.

The arts can use technology as a medium and as a gallery. The visual arts, like technology, are an extension of human action no less useful and no less important than technology itself, in fact it can be argued that the visual arts can themselves act as a kind of technology in that they serve as record (however, unlike technology, a record that is self-reflexively, consciously and deliberately false and mediated) and art aids, facilitates and extends human function, albeit in a less immediate and physical way than most other technologies. It was certainly a technology of the cave-painters – who likely saw it to give spiritual potency to their hunt (Lewis-Williams 1980). Visual art is the technology of the human mind, in that it allows for social, political and philosophical discussion and change. As such, it is our most coveted technology and art, like technology, is distinct to human organisms (conceivably until the arrival of the genetic homunculus) and offers hope of transcendence. Technology can be used as art, however art can not be used as a technology in the same utilitarian way as it does not actually act as physical prosthesis – it is only similar to it in the aforementioned ways.

4.1.1 New art media

Biological art (and certain robotics art) is different in this respect as it does, to some extent, offer physical prosthesis, albeit in a way that is most often redundant or absurd. This type of art comments on prosthesis itself, or at least, the kind offered by the type of technology it annexes and its legitimacy as a

cultural phenomenon and most often it is not intended to be used. In Eduardo Kac's *GFP Bunny* (figure 6), we see one example of how this is so. The creation of the rabbit supposedly involved the injection of green fluorescent protein into a rabbit embryo.[1] The same technology that could be used to alter human genetics medically for the benefit of the subject, is given instead, an apparently useless purpose (I shall not go into the marketability of glow-in-the-dark pets) – the creation of a rabbit that is phosphorescent under blue light. In doing so, it becomes the technology itself that is under scrutiny, rather than the object.

Figure 6: Eduardo Kac, *GFP bunny.* 2000. Live rabbit genetically manipulated to produce green fluorescent protein. Approx. 17 x 35 x 26 cm. (Dobrilla & Kostic 2000).

[1] It must be noted that much Bio-art makes claims that are to a certain extent dubious. Whether for legal, technological or financial reasons, a great deal of bio-art is simply not possible to produce. The claims made by the proponents are stated as truth for the ability such statements have to shock and confuse a public that is all too willing to accept the power of the technocracy, however it is impossible to say whether Kac's fluorescent rabbit is real or simply an elaborate hoax, as the artist himself has provided 'proof' in the form of legal documentation between himself and the universities and institutions he worked with in producing the creature and the rabbit itself appears to glow under blue light. It can not be proven whether this is a genetic trait, however, or merely some kind of dye, because it is technically possible to create such an animal. The importance of the work does not lie in its veracity, however, but rather in its questioning of genetics as a technology and its use as an art medium. Kac states that the work comprises "the creation of a green fluorescent rabbit, the public dialogue generated by the project and the social integration of the rabbit" (Dobrilla & Kostic 2000:101).

It is no new thing that art has used other technology, especially new technology, as a medium, but it is the type of technology that has changed. The arts are currently suffering a profusion of works utilising genetic and medical technology, as well as electronic, prosthetic and cybernetic technology – in other words those technologies that help us to achieve immortality. Art is an aberrant branch of the relationship between humanity technology and nature in that it most often subverts the intention of the technology it annexes.

As mentioned before, the realm of artifice (the creation of objects) is encroaching upon human communication, human function and even human reproduction and this is shocking for various reasons, but not in the least way unnatural. Nature allows that the Laboratory exists – after all it is a product of Nature. Technological art lays this link bare. Even as technology enters the inner human space, humans deny this relationship and art attempts either to bridge or widen the gap.

Humanity's connection with visual art has always been plain to see, as has the connection our art has to technology, yet humans have been reluctant to acknowledge technology as an extension of humanity rather than as some alien force (Pepperell 1995). This is surprising because, after all, our union with art has the same goal as our union with technology – the transcendence of time. Perhaps it is because technology for us has always had some kind of deific status, given that, even in a prehistoric context, it has helped human beings to avoid the wrath of the gods, as in the case of the common umbrella. It is more likely, however, that the fear humans invest in their technology is reflected off the fear of the hubris implicit in altering nature – ever since the alchemists first tampered with furnaces and volatile and poisonous substances humanity has feared what the result of that interference may be – there is always a certain element of danger in trying something new. However, humans are finally beginning to see this connection re-established and the human bond with technology reconciled, if only as a result of the confusion and numb acceptance

that hyper-productionism and the resultant technological profusion has engendered. It can hardly be denied that human beings' sudden sensual intimacy with technology certainly stems from the purely selfish capitalist reasons of the corporations that fund it - such as increasing the productivity of the work force and broadening the consumer field and Bio-art once again seeks to call to question this new cosiness with technology by exposing the strangeness of our genetic ventures.

The created artefacts of nature and technology – the actors and patients in the play of natural production proposed by Haraway (1995) are nearer to each other than they have ever been, because humans are becoming artefacts (or at least, their genetically engineered offspring are) and the boundary between artefact and human is so blurred that the two become indistinct. To continue Haraway's metaphor, one might say that the natural topos has become crowded. Not only this, but the natural stage is also the plane of the Laboratory. Pepperell (1995) avers that as human technology was never a separate and alien construct to humanity, but was always an extension of human conscious systems, this union cannot be considered new, thus it is more of a reconciliation. As humans realise their sensual union with technology and as technology becomes more like humanity, technology becomes more like art. Bio-art helps to make this plain.

The use of new art media, especially the media pirated from our technology, is a particular instance where the closeness of art and technology is revealed. Not only are humans beginning to see our union with technology, but the fact that humanity is coming to realise that technology (like art) is an extension of humanity, (possibly a transcendent one) means that technology, like art, can also be conciliatory. Art has the capacity to comfort and ease a human sense of alienation from technology and technology is slowly becoming a similar source of comfort as its true nature is unveiled. This view is becoming more and more entrenched in art production with the emergence of surgical perfective art (as in the work of Orlan) and later still, transgenic art (Eduardo Kac). In using

technology to create our art (as in video, plastic surgery, robotics, bio-engineering and the like) it is demonstrated that humanity's various technologies only provide a different medium to what is traditionally used, however they reveal an intimacy with technology that is perhaps unsettling at first. Nonetheless, the more these new media are used, the more humans slowly grow used to them and gradually assimilate them into the mainstream. With techno-art technology is decontextualised and thus reintegrated with humanity – even though the two were never separated. Equally, human technology also brings us closer to art – consider the ergonomics of computers and other home appliances, the design of a beautiful car or the production of kinetic sculpture. The intimacy of this relationship runs deeper still.

Nonetheless there is still a perceived distance between human and machine. The films *The Island* (Bay 2005) and *Blade Runner* (Scott 1982) use the image of the human-created intelligent life-form to establish commonality between humans and their manufactured offspring. Both films call to question the relationship of humans to their technology and question whether technology is essentially human. In *Blade Runner*, manufactured androids known as *replicants* replace humans in jobs where the work is either too dangerous or demeaning. The film depicts a post-apocalyptic dystopia where humans are encouraged to live and work in *offworld colonies,* so named because they are located on other planets. The film's protagonist, Rick Deckard is an assassin of sorts – his job as a policeman requires him to *retire* (kill) any androids that have escaped enslavement.

The film shows a reality where many forms of biodiversity are extinct and pet ownership is considered a high status-symbol. The role of biology in the world of *Blade Runner* is that of the precious child. The complete denuding of the environment has led to the treatment of natural objects as holy or religious icons (Cole 1995). In this film, artifice serves to replace the lack of animals. Electronic animals are real in every way, but the mechanical pets are still viewed as inferior.

The realness of the bio-mechanical pets is completely believable, but there is still a perception of that lack. Knowledge of the deception that the animals represent makes them repugnant. The open lie is far easier to stomach. The artistic presentation of technology thus always seems more beautiful than the technology itself.

The arts have always been perceived to tap into the realm of the soul, from shamanic and mystic art (which was used as part of sacred rituals to commune with gods and spirits) to modernist ideas of aesthetic emotion. The human organism has, since art's inception, revered it. Almost everything scholars know about the niceties of prehistoric cultures comes from the paintings they made on the walls of the caves where they lived, or the decorative artefacts (like jewellery) they created and the tools they used to survive. The anthropological evidence gathered from their bones is really purely biological and even the remnants of their meals that lie fossilised on the floors of their caves can only vaguely tell modern anthropologists about how they lived. It is from their art and their technology that one is able to catch a glimpse of their humanness. Shamanistic cultures, like the /Xam people of the Kalahari Desert, bear the closest resemblance to these prehistoric cultures, in that their cave painting until quite recently was still a great technology amongst their people. They created rock paintings that connected them with the spirits of the earth, weather, animals and their ancestors during their rituals (Lewis-Williams 1980). These rituals and the paintings produced for them were the most important technology they possessed in their nomadic, hunter-gatherer lifestyles. Even the tools used in the capture of their food were not as important as this connection to the spirit world that they attained with the help of their art, because it was their very lifeline to the spirit world, their only method of control against the cruel and unpredictable outside (Lewis-Williams 1980). The influence that they were able to exert over their ancestors or over the spirits of the wild through their art-producing rituals was really the only way of maintaining stability in a world that was otherwise chaotic and unpredictable. Today humans are fooled the same way with the mythologies

of science and technology and really, for the /Xam and prehistoric shamanistic cultures, there was no distinction between their art and their technology, because their art allowed them to extend their agency to the spirit realm so that they could exert their influence upon it (Lewis-Williams 1980).

The notion of art as a kind of spiritual technology is alive today in the fact that it is used as a vehicle of social change and as such it has a certain power to challenge and influence society. Art can be used to create new technologies that would be seen as abhorrent or useless to society in order to engender this questioning and bring about change. Because art serves this function, its practice can allow for activities that are perhaps more ethically questionable than those of the technocracy.

Figure 7: Stellarc. *Quarter scale ear.* 2003. approx. 2.4cm x 1.6cm x 0.5cm. Human cells. (Stellarc [sa]).

For instance the artist Stellarc claims to have produced a ¼ scale human ear (figure 7) using human genetic material. The growth of a human ear for artistic purposes is certainly more ethically questionable than creating it for medical purposes because the artistic ear serves no function other than its existence as art piece and the social and ethical message it intends; whereas the medical ear

is there for the betterment of humanity because its function is different – it is empirical. The artistic ear questions this clearly fallacious and contradictory idea. The practice of creating the artificial ear is actually the same in both instances although the two ears serve different functions; and this illustrates how art can be used to call technology to question by the very fact that it is more ethically suspect. This much is obvious. The use of technology as art is often subversive and can have far-reaching implications. However, the technology used to create the genetic homunculus will, eventually, be used by the homunculus to its own end and so our orphan technology will be adopted and changed – more than likely for artistic purposes as well scientific. Whether this critical dialectic relationship between art and artifice can be continued under the genetic homunculus is subject to question. For instance, the homunculus, itself a technological artefact, can create art that critiques technological exploitation.

Figure 8: *G.E.U. Emergency*: Camera view prior to anaesthesia. 1979. 30cm x 40cm. Colour photograph of a video screen. (Orlan [sa]).

Orlan (figure 8) has already proven that the technology of the hegemonic machine can be used by its subject to subvert it, by creating forms that she herself wishes to take that are contrary to the norms of beauty imposed by patriarchal society. This art is likely to have a great impact upon the genetic

homunculus's arbitration of its own body – gene manipulation therapy may become a cosmetic practice of the homunculus. The "bizarre" technologies that are used today in transgenic and surgical art may be accepted practice in the future, when the genetic homunculus decides to be the mediator of its own body.

The slow blurring of the boundaries between art and technology and technology and the human body that are prevalent today will be adopted by the genetic homunculus when it is created and this communion will doubtless continue with new technologies as they are developed and perfected. The technological integration of the genetic homunculus with further genetics, cybernetics and electronics will doubtless be influenced by contemporary art as well as contemporary science. The artist Stellarc fashions functioning cybernetic limbs for performance pieces and Orlan uses her own body as sculptural material under the plastic surgeons knife and the shamans of prehistory used their own bodily fluids to paint with – the genetic homunculus will likely further integrate its art technology and body in ways previously unimagined – and indeed this is necessary, lest it remain in the clutches of its progenitors forever. The genetic homunculus can only be free of imperial domination when it has reclaimed sovereignty over the artifice of its body.

The relationship between art and technology, especially in ergonomics has previously been to make the technology seem less alien, less frightening, designed to make the interface between the two less jarring, but this has also had the result of altering technology to different ends – the wonder of computer technology becoming smaller and easier to use has led to the incorporation of computer technology into cellular phones. Despite this, humans are less concerned by the fact that art is an extension of humanity than we are by the fact that technology is an extension of human function. The Laboratory is, in spite of everything, a cold place. As the insidious, creeping tendrils of technology slowly warm into an embrace, the desire for a return to the Nature of old becomes apparent, a re-establishment of the boundaries between it and the Laboratory.

Art can subvert the goals of the ruling power-structure through the use of technology to apparently fruitless ends. This decontextualisation of technology has served to make it 'friendlier' and thus has placed it outside the realm of the Laboratory.

The art made today, especially that art dealing with the politics of body and its arbitration will have an enormous and important impact upon the mediation of the genetic homunculus's creation. Any form of mediation the body undergoes via artistic endeavours, we can only infer, will (like human technological and genetic agency) be inherited by the homunculus. Art itself is important in this regard, however in its traditional incestuous relationship with commerce and its position as eternal commodity (Pepperell 1995), it is less so. Nonetheless, it is precisely this relationship with commodity that lends art its transcendent ambitions. The artist himself offers up a piece of his soul, his mortality – a sacrifice – in order to have a permanent record of it and the buyer offers a sacrificial barter of trade, so that his status will be elevated – he vicariously increases his potency by attaining a record – not only of Nature, but also of the artist.

This is very important when looking at the current trend of using biological material in art pieces – as in the work of Kac and Stellarc. Whether intentional or not, this so-called bio-art points to our hope of transcendence through genetics, however it does this by very imperialistically imposing the artistic archetype upon living organisms, it questions the medical processes whereby humanity hopes to achieve immortality and brings oftentimes clandestine and ethically questionable genetics research methods to light – as in Kac's *GFP Bunny*. This sort of technological art is at once disturbing and fascinating, as it holds portents of the mediation of the body of the homunculus itself. That biological art is commodified (as genetic research, the work has monetary worth) is even more unsettling especially when we consider its application to the engineering of human genes. In questioning the blind faith humanity puts in the legal entities and institutions who control genetic technology to do what is ethically and morally correct, bio-art

questions the ethics of the idea of transcendence, describes plainly what the implications of such transcendence are (the morally suspect act of imposing mediation upon the very nature of another being's physicality being the most pressing) and exposes its folly (there can be no transcendence – only change). The commodity of bio-art (whether intentionally or not – it is after-all funded by the institutions and corporations that promote and perform genetic research) can be said to show us this transcendence of mortality that art and technology offer – and it cuts the ridiculous form of a glow-in-the-dark rodent.

The genetic homunculus represents the first true record of humanity and perhaps we fear what we sacrifice to see this realised more than we fear than its result, because that sacrifice is mortality itself. As previously mentioned, in humanity's own destruction, the sacrifice of ourselves to transcend time, humans create the final work of art. In death, humanity will see created our most lasting piece, our art in defiance of death. Indeed, art itself exceeds time – by its very nature it is a record. Biological art shows us this horrible truth – that there is no real transcendence of humanity, or at least that if there is, it requires death – it exposes the genetic homunculus as the image of humanity in the mirror – ever present to us and never without us, but never real unto itself, the simulated image that would destroy its creator by its very existence. When pieces of this unattainable transcendence are glimpsed, when we catch sight of the genetic homunculus in the biologically engineered works of art, or in the biological research of contemporary genetic science, humans become frightened and indignant because it represents our death, the complicity of nature in this death and the death of the natural – perhaps much of the reason for the repugnance of bio-art. For the first time the symbolic immortality offered by art is subverted by the fact that art itself shows us the true face of immortality, but impressively does not strip art of this function, perhaps because it yet retains some commercial value, some exploitability. Primarily, the *realised* transcendence offered by genetic technology is shown in our art (art offers another kind of transcendence) and these two types of transcendence are shown to be completely different and

mutually exclusive – the one purely symbolic and the other real. The real is the symbolic divorced of its power and signifies death.

If art offers hope of transcendence and technological art exposes that there can be none, how then can the two reconcile? The answer is simple – the one is not like the other – the one is symbolic, the other actuality, hence they can not and do not reconcile. Thus art subverts the technology it employs as medium, precisely to expose the flaws of that technology. Symbolic transcendence is always more important than true transcendence, because true transcendence requires death and most especially the death of the dream of transcendence – art loses its power completely in this regard – thus it is not something humans wish to attain.

Art, as a transcendent commodity, is very important and has particular bearing on the genetic homunculus, because here is seen yet another link to alchemy. Beyond the ideals of post-feminism, post-humanism and the body, the idea of art on a biological scale, as that which could possibly beautify or augment, but most importantly subvert, is highly beneficial. The commodity production of the genetic homunculus as medical transcendence (of age, disease, *et cetera*) will likely spark the goals of perfective art in this arena – just as the plastic surgery boom of the mid-eighties sparked the art of such post-humans as Orlan. This is an example of how the second generation genetic homunculus will subvert its creators – just as the cyborg subverts cultural norms, the genetic homunculus will subvert natural norms.

Figure 9: Jane Alexander, *Street cadet with harbinger.* 1997. Fibreglass, oil paint, found objects and fabric. Dimensions variable. (Jane Alexander 1999).

The genetic homunculus is not necessarily an idealistic siting of post-humanity. Although it is, according to Jabir Ibn Hayyan, an ideal creature, its attendant ideologies are less than favourable. The genetic homunculus is undeniably 'other' to humanity and is feared as much for its 'unnaturalness' as for the moral hubris we see implicit in its creation. We see this presentation of the homunculus in Jane Alexander's works (figure 9). She presents us with the abject other – her homunculi are the street children and the abused. For Alexander, the homunculus is something frightening and wretched, pitiful and hopeless. She uses it as a vehicle for exposing prejudice, which is undoubtedly what is presented in a created being. The created other features heavily in her works, as metaphor for the constructions of otherness in the marginalised spectres that make up those groups, especially street children. Alexander's homunculi are weirdly proportioned, pale and frightening – their faces resemble masks and animal heads. The identities of her homunculi are imposed upon them – in the

Bom Boys series, most are even cast from the same mould and simply dressed differently, with different masks.

The created other, the technological self and the technological created are specific realities of contemporary science and, very soon will be features modern life as aspects of genetic technology filter through to the public. Humans have already witnessed assisted pregnancies, *in vitro* fertilisation and pre-selective genetics. Muotri et al (2005) report that the successful chimeric integration of human stem cells in mouse brains has been implemented – the interspecific chimera produced human motor neurons from stem cells implanted into its brain. As beings with the power to control technology and also subvert the purposes of the technocracy through raising awareness, it falls to every person to make decisions about where we choose to take the technology that will bring about an intelligent homunculus, like those presented in the visual texts at the beginning of this chapter. It is highly likely that if the new laws governing chimera research continue to go in favour of the research institutions and, if these advances in science are made available to the public, all three types of genetic homunculus that are presented here will come into being. The genetic homunculus already threatens human sovereignty of rights in the continual denial of basic human liberties that genetic homunculi face in research conditions. Muotri et al (2005) observe that their part-human chimera exists purely as a research object, much like any laboratory rat. Genetics researchers control the means of life and death of their subjects within the laboratory, but this research has consequences outside the laboratory too. This refiguring of the modes of life and death is leading humanity towards a biotechnological mode of procreation and reproduction.

In contemporary visual culture it is imperative to recognise the two dominant approaches to handling the genetic homunculus. Although there are many shades of attitudes towards the genetic homunculus, ranging from tolerance, indifference or tentative optimism to extreme prejudice either for or against its

creation, it helps to group these approaches into utopian or dystopian binaries, as this is most often how the genetic homunculus is dealt with in visual culture. This is especially evident in popular cinema and the visual arts and is due to the relationship of visual culture to technology.

Art and, in particular, visual art can serve both as a mechanism of subversion with regards to the dominant technological order or technocracy and as a means of reinforcing it. This relationship is described in the following visual texts in detail, in order to formulate a theoretical context for the presentation of the arguments put forward that deal with the representation of the genetic homunculus as ideal and dystopian post-human standpoints. The following examples of visual culture illustrate clearly the differing fields of argumentation for and against the creation of the genetic homunculus and they will for this reason be discussed in finer detail than the other samples mentioned previously.

4.2 The homunculus as dystopia

Sir Thomas More's 1516 description of Utopia, the island with the perfect socio-political system, may aptly describe the posthuman design for issues regarding state and nation, but in the more literal sense. Advocates of transhumanism describe *eu*topic notions of egalitarianism, social harmony and the betterment of humankind in an imagined, future, democratic, classless society. However the question of whether this state of harmony and parity can exist is dubious. Abrams (2004) cites Foucault when he suggests that the recovery of self from the state by a mode of re-figuring the self is the traditional method of extracting the body from the gaze of a surveillance society. However, the emergent modes of radical re-figuring of the self (through genetics, artificial intelligence and robotics) are also the primary means of surveillance in contemporary society (Abrams 2004).

Clearly there is some disparity between the envisioned utopia of the transhumanists and the current trends in post-human technology development.

The utopian view of the post-humanists is centred on the seamless integration of natural and artificial, but it must be examined here whether this can truly be possible. Of course the utopian teleology of this amalgam of natural and artificial is that it should be seen as natural, while a dystopian outcome (or rather the lack of any positive outcome) may reveal that the fusion is in fact supreme artificiality. The posthuman design may ultimately be revealed as utopia – a nowhere place. The genetic homunculus must be examined as a kind of utopia in Haraway's (1991) sense of nature as a topic place for forum of ideas and exchange of rhetoric, due to the fact that as yet, an intelligent genetic homunculus remains merely a theoretical concept. However it is possible to use examples from visual culture to explore the possibilities of utopia and dystopia. The expression of the homunculus and other post-human, future technologies as Adam and Eve components of a technological Garden of Eden is exclusively an utopian design and may be revealed as fallacy. Nonetheless, the crucial factor is really only whether technology is seen as alien to nature or the artificial is embraced.

The idea of perfection through oneness with nature can be found in William Blake's *Albion's Dance* (figure 10). At a time when humanity's technology was pregnant with the promise of a new age of wonder, (the beginning of the Industrial Revolution) William Blake personified Albion as a perfect being – a radiant, pure soul. Notions of the perfect soul as a mythological utopia were familiar to Blake, who was a student of alchemical imagery, evidenced in the numerous references to alchemy in his drawings and paintings. Blake was aware of the alchemical symbolism of such an image. In *Albion's Dance*, Blake depicts a perfect being, overflowing with the *lumen naturae* – the light of nature.[1] The light of nature begins as the spirit that represents that part of nature that is in human beings. This perfect being, radiant with the lumen naturae, is the

[1] The concept of lumen naturae was put forward by Paracelsus to be that inner quintessence of the soul that signified and was a result of our link to *Mater Natura.* This light of nature was the spiritual magic that allowed the alchemists to unite with nature in the purification of the metals during the opus magnum and was a concept of purity. All alchemical initiatory rites were aimed at purifying the soul to allow the lumen naturae to become stronger in the Alchemist – the purification of the soul until only the light remained. In the perfect being, the lumen naturae occurs at its brightest.

personified Albion.[1] The personification of Albion as spiritual quintessence, the lumen naturae, represents a cycle of perfection through the return to nature. This symbolic cycle goes:

Spiritual quintessence (nature) → spiritual quintessence (in man) → Albion (nature and man united - personification) → spiritual quintessence (nature)

The jump from 'perfect human' to perfect nation is not a large leap in conceptual thought, especially when one considers the obvious notion that a nation is made up of its people, or the idea that Adam, the Biblical first man and Lilith, his demonesque first wife, were created from the clay of the earth.

Whether this was intended as a reverent reference to the technological apotheosis that was occurring at the time is highly unlikely, however. Blake did not see the union of humanity with nature as being brought about by technology – if anything he saw the Industrial Revolution as anathema in this regard. It is far more likely that the image is intended to hearken back to an imagined perfect past – a return to the power and innocence of nature – a theme that permeates Blake's poetry and art. Nonetheless, regardless of whether Blake saw the technological explosion happening in England as a blessing or a curse, the image of the perfect being in this work is noteworthy, as it represents an attitude towards the perfection of humanity (especially through a union with nature) that is significantly idealised.

This idealisation of perfected humanity was alchemically inspired and indeed did have 'scientific' or, rather, technological significance. Jung (1967) calls the necessary steps to achieve this kind of perfection (that perfection brought about by a purification of the soul) the *Aniadia,* which are those "fruits and powers of

[1] The archaic name for England that came to symbolise a kind of utopia to certain romantic poets – the England of old. It represents a notion of England as a kind of Arcadian Jerusalem and is a popular image amongst the romantic English poets.

paradise and heaven … those things which by thought, judgement and imagination promote longevity in us" (Jung 1967:154). These represent a completion of natural transformation that was intended, according to Jung, to have the aim of emotional balance and wholeness for the alchemists (Jung 1967). It may be presumptuous to argue that the homunculi put forward by Paracelsus (Jung draws these arguments from Paracelsian treatises on homunculi and the purification of the soul) did indeed represent this very transformation, but it is not far-fetched. The alchemists after-all believed that they could attain spiritual harmony by technological means (the *opus magnum*) and the alchemic homunculus is essentially a 'spiritual' being created technologically. Jung states that "there was no question of implanting the inner man in a Christian sense, but of a 'scientific' union of the natural with the spiritual man with the aid of arcane techniques of a medical nature" (Jung 1967:157).

Figure 10: William Blake, *Albion's dance* (c. 1794). Watercolour and ink on paper 40 x 30 cm. (Roob 1996:553).

The being in *Albion's Dance* shows us a vision of the immortal human – at least as it is idealised to be – a being that is one with nature and natural process – unified and complete. The alchemic symbolism of humanity's union with nature is that of purification, but it is also symbolic of the quickening of nature – the fertilisation of nature by humanity's labour. According to Eliade (1974) nature for the alchemists was slow to work and alchemical labour could catalyse her processes, hence the alchemical maxim: "*Quod natura relinquit imperfectum, ars perfecit*" (What nature leaves imperfect, art perfects). The current 'art' in the quest to find the homunculus and supposedly perfect humanity, like the art of the alchemists, is technology. This speeding up of nature can only be achieved by technological means. This reading of William Blake's *Albion's Dance* sets the tone for the examination of the three crucial visual texts discussed in this chapter, in that it discloses how artistic representations of humanity can be seen in terms of imagined social design. The idea of nature or the natural is also revealed to be important in constructions of utopia or dystopia.

4.2.1 Andrew Niccol's GATTACA *(1997)*

Directed by Andrew Niccol, *GATTACA*[1] (1997) is a film that focuses on a man's struggle to succeed in the face of gross discrimination and disenfranchisement. The film concentrates on a dystopian future society where *valids,* the genetically superior elite, are given preference over the genetically-inferior *in-valids,* who face discrimination based on their genetic susceptibility to disease and their tendency to be less intelligent and less athletic than *valids*. *Valids* form the upper echelons of society and are, for all intents and purposes, created to excel. They are manufactured by a pre-coital selective process whereby the best genes of the mother are paired with the best genes of the father prior to conception.

[1] The title 'GATTACA' is composed of the initial letters of the four DNA nucleotides, adenine, cytosine, guanine and thymine, hence the capitalisation.

Figure 11: Film still from *GATTACA* 1997. (Niccol 1997).

The aesthetic of the film is deliberately sterile, cold and slick (figure 11). The characters only wear suits or uniforms (the suit itself a kind of uniform), with the exception of the protagonist's parents at his birth (a cinematic device employed to contrast his naturalness with his environment). Highly modern buildings dwarf the human characters, while small, skyless spaces, harsh, deep-focus interiors and vast, filtered exteriors stress the regimented nature of the *GATTACA* society. The effect of neatness in the angular nature of the *mise-en-scene* and indeed in the rigid, stark lines cut by the immaculately-dressed characters is almost insect-like, as in a colony of bees. The overriding effect is that of efficiency. There is little room in the aesthetic of the film for casualness or nonconformity.

In the film, the hero, Vincent Freeman (played by Ethan Hawke), is forced to fraudulently assume the identity of one of the genetically superior *valids* in order to fulfil his dream of space-flight at the prestigious Gattaca Aerospace Corporation. The *valid,* Jerome Eugene Morrow (Jude Law) gives Vincent samples of his hair, blood and urine, so that he can pass periodic DNA tests inside the Gattaca building, while Vincent undergoes orthopaedic surgery to make himself taller to complete the fraud.

The laws of the society presented in *GATTACA* prohibit discrimination against the *in-valids*, but they are laws that are easily circumvented and not taken seriously. Throughout his life, Vincent is forced into the niche of the derogatorily named *faith-births* because of his inherent genetic flaws. Vincent must be home-schooled because the schools refuse to pay the high insurance fees necessary to keep *in-valids* on the premises and his congenital heart defect makes him a shut-in. Before Vincent's subterfuge with his *valid* cohort, he can only obtain a janitorial job at the Gattaca Corporation.

GATTACA presents a societal hierarchy based, on a primary, social level, upon the idea of genetic determinism[1] (which becomes a kind of birth-prophecy for children in that society, with the tendency towards self-fulfilment). Kirby (2000) argues that already genetic determinism is an overarching popular view in contemporary society that is by no means necessarily true, but is rapidly gaining favour in the scientific community due to its overwhelming presentation as fact in popular culture and the media. Kirby (2000) avers that this philosophy leads to the exclusion of certain genetic traits as inferior and necessarily damning. Quoting Jeremy Rifkin, he argues that the line between what are seen as undesirable traits such as a predisposition to cancer and what are merely a genetic traits such as a propensity for obesity, is blurred and indefinable.

Genetic determinism as a belief has its roots, according to Kirby (2000), in the early proponents of eugenics, to which the idea of accelerating human evolution through the manipulation of human genetics is central. In the *GATTACA* society, a new-eugenics is practiced under sanction of law and is rooted in well-meaning scientific preventative medicine. However a sinister underbelly to this prophylaxis is revealed in the genetic discrimination that is rife in the society.

[1] Genetic determinism can briefly be defined as the notion that all aspects of a human life (or indeed that of any other organism) are reducible to its genetic make-up, that is, that the fundamental parts of an organism (DNA) determine such things as height, eye-colour, behaviour patterns and personality.

Niccol's film introduces the viewer to a future where genetic determinism is held in such high esteem as to seem necessary and infallible, making it prescriptive for parents to pre-select the traits of their children. Niccol attempts to explode this notion and expose the dark side of genetic determinism. Through his determination and willpower, Niccol's protagonist, Vincent, proves that the system is flawed and thus that genetic determinism is not an exact science so refined that it is capable of prediction, but rather a mechanism of oppression and subjugation that is simply another form of eugenics. This denial of genetic determinism is echoed in the films tag-line, "There is no gene for the human spirit".

In the film, the relationship between Vincent and his co-conspirator, Jerome, is pivotal. Jerome is an ex-professional athlete (a swimmer), who is left crippled after a failed suicide attempt. Jerome's attempt to kill himself after coming second in a major race serves to highlight the poignancy of a society that holds genetic excellence as its highest virtue. While in the film the new eugenic society forces *in-valids* to assume menial jobs in the name of genetic determinism; Vincent remarks that the *valids* suffer under the "burden of perfection". Jerome cannot come to terms with the fact that he did not win because he believes that he is perfect and his failure is thus not a cause for harder practice, but a shattering of his entire world view. To Jerome, his failure is evidence that he is not in fact perfect. As a result, Jerome is torn between admiring Vincent's determination and despising his genetic inferiority.

Jerome Eugene Morrow (whose name literally means Holy-Named Well-Born of Tomorrow) exchanges the fluids that make up his medical fingerprint, his blood and urine, for a kind of deputed life through Vincent, evoking the ritual of the blood sacrifice – life for life. In this sense, there is an equation of Jerome to the figure of a god – he is the facilitator of Vincent's life amongst the other genetic gods, vicariously living through his creation. The element of Jerome that allows Vincent to keep up his trickery is the very thing that makes him godly, his DNA.

The story of Vincent is therefore the archetypal tale of humans in the kingdoms of gods. Like Orpheus's lyre in *Hades*, Vincent requires some technological aspect to allow his deception. The grudging intermediary between godliness and humanity is Jerome – the Promethean god which has humanity's best interests at heart, while Vincent Freeman (literally The Conquering Free Man) adopts the role of the masked trickster, the free agent or subversive element working to undermine the system. He accepts the mask of godliness as his prosthesis.

Vincent's use of another man's DNA to perpetrate his deception is key here. In using another person's DNA, Vincent becomes a kind of *Doppelgänger.* Although he does not look like Jerome, he assumes every aspect of the life that is reserved for him. The *valids* would recognise him as a fraud, were it not for meticulous attention to the details of his disguise. Vincent does not become a homunculus, in the true sense, by assuming this prosthetic mask, after all, he is not Jerome Eugene Morrow, but he is, in effect, a synthesis of two people – himself and Jerome. Vincent is a homunculus in that he seeks prosthesis in the genes of another. He is not physically combined, but he is fundamentally altered by this prosthesis – he becomes the master of his own fate.

Vincent and Jerome share a binary connection, bipolar and complementary in every way – where Vincent is weak, Jerome is strong and vice versa. The two are forced into one life – a reality that is brought to light by Jerome's need to also keep up appearances when two police officers visit his home. Jerome must climb the massive spiral stair-case – the exemplar of the film's obstacle, a DNA strand – using only his arms. Jerome and Vincent require each-other for different reasons - Jerome needs to feel that his perfect DNA is useful for some success and Vincent needs to prove to himself that he can triumph over impossible odds. In epic terms, Vincent represents the model of mortal desire for divinity. Like Prometheus, Jerome is freed by a mortal – through Vincent, he is able to leave his wheelchair by proxy and influence the world once again.

At the end of the film, Jerome Morrow kills himself when Vincent achieves his goal of space-flight. Morrow's suicide closes the relationship between his divinity and Vincent's mortality – because that distinction has been broken down by Vincent's immutable spirit. Although Vincent still requires Jerome's DNA to pass as *valid,* his goal has been accomplished and so he has no more need to prove himself. Similarly, Jerome, having vicariously achieved excellence, has attained what his superior genetics never allowed him – freedom from the burden of superiority. Each man no longer requires the other to live and there is no more need for the difference to be shown between the two people, because they have become the same person.

Before Vincent's departure, Jerome gives him enough DNA samples to last "two lifetimes". This seemingly insignificant comment actually serves to highlight the nature of the relationship between the two men – that Vincent is actually living for both of them. Jerome's death is very alchemical. He burns himself in a furnace, wearing his silver medal, which turns gold in the bright, orange light of the flames. Though he dies, his protégé lives on, transcendent, with the essence of Jerome's life now in his hands. Jerome becomes the alchemist who suffers, dies and is resurrected in Vincent.

GATTACA presents a unique bio-politics that is absent in many thematically similar science-fiction films of its time. The film is submitted as a bio-ethical text that has bearing on contemporary socio-scientific policies. The film presents the viewer with unambiguous ethical foci, namely the cultural consequences of prognostic genetics; the implications of the eradication of "undesirable" traits and human imperfections and the phenomenon of genetic discrimination against those who do not have access to genetic enhancement (Kirby 2000).

Niccol does not hesitate to provide answers to ethical the questions that arise from the use of genetic predetermination to root out genetic defects The use of extrapolative genetics, for Niccol, is highly dubious as it is exclusive of human

free will and determination. For him, the prediction of a person's future prior to birth runs the risk of becoming self-fulfilling, as in the case of Vincent before he decided to change his lot. Niccol is worried that genetic determinism will lead to fatalism and the idea that any imperfection is undesirable and necessarily damning. Niccol undermines the notion that human fallibility can be considered a defect, by presenting a strongly humanist message over a deluge of posthumanist imagery.

Niccol insinuates that humanness is defined by its flaws and that no perfect state can possibly exist, because humans are not trained culturally to think critically – rather critical thinking is inherent to human beings and the ideal notion of perfection will always be challenged. Therefore, *GATTACA* puts forward a future where purging undesirable traits leads simply to changing the conception of what is undesirable. The result of this can only be discrimination and oppression.

The construction of biotechnology as a tool of oppression and discrimination in *GATTACA* would seem to emerge from the cyberpunk (or rather, bio-punk) genre. Traditional cyber-punk always uses the element of technology as the free agent – wherever the ruling order has taken over the aberrant order there is a reclaiming of the subversive technological constituent. In *GATTACA* there is reclamation of humanity itself. The human component once again takes over the role of the unpredictable element. This is not that different from the cyber-punk genre as it may seem, however. The destabilising element in cyberpunk is always human – the robot that develops reasoning; the drug addict that breaks away from the perfect society in order feel again; the clone that desires to be human are all examples of the human aspect challenging dystopian societies.

Niccol presents a bioethical text that is free of religious rhetoric and re-establishes human rights as the benchmark whereby bio-ethics must be examined. Humanity and basic civil liberties are the paragon of Niccol's film. The triumph of the human spirit is a key theme of the film and must not be glossed

over. It serves to emphasize the importance of the ingredient of human flaws to society and the consequences of predictive science by showing the sterility and impossibility of the genetic project. Because the ruling order prescribes the mode of change and because it is dogmatically enforced, the homunculus loses all its subversive characteristics, putting humans in the spotlight as the elements of surprise. The hyperbolic importance of genetic prediction in *GATTACA's* culture highlights the folly of seeking the ultimate prosthesis.

4.2.2 Patricia Piccinini's We are Family *(2003)*

In her 2003 sculptural installation for the Venice Biennale, *We Are Family*, Patricia Piccinini offers a strange collection of creatures and corrupted forms, instantly recognisable as being natural, but completely divorced from normalcy. Strange genetic freaks interact with human children, who nonchalantly ignore their grotesqueness, treating them with the innocent indifference accorded all well-used playthings. The work comprises several sculptures perched on couches and sofas, purpose-designed to accommodate them, or sitting on the floor amongst the viewers.

The sculptures themselves are at once beautiful in execution and hideous in implication, echoing the ambivalence of the emotional response the viewer has when observing them (one is torn between sympathy and repulsion). The installation consists of several individual pieces, which interact directly with the environment and the viewers walking among them and indirectly with each-other. Only three pieces in the installation will be examined in this study, for the sake of brevity.

Figure 12: Patricia Piccinini *Still life with stem cells,* 2003. Polyester resin, oil paint, found objects, human hair. Dimensions variable. (Patricia Piccinini [sa]).

Still Life with Stem Cells (figure 12) shows a child playing with or petting curious abortions of form, innocently unaware of their grotesqueness. The forms look like pre-embryonic creatures existing in a bizarre semi-living state (they look alive, yet have no visible means of locomotion, no means to ingest food or expel waste, or to respire. They appear warm and mammalian, possessing the texture of human skin, yet they have none of the characteristics of a mammal, bearing more resemblance to amoebic creatures or embryos). The alien, pillowy amorphs are reminiscent of the type of natural curiosities in one might find in medical museums or universities – only in this work they appear to be presented for amusement, rather than study. What is truly bizarre is that the viewer is acquainted with them as toys or pets, completely pathetic and dominated. One is tempted to see them as wholly non-threatening, helpless lumps of live tissue. However, the ‘creatures’ do represent a threat. The threat that they expose is the threat of a violence that humanity will do unto itself and its progenitor, nature. They represent the violence of the system imploding – of the inability to control or make sense of a system that has spiralled out of control and the threat of the simulacrum made real – the threat of Baudrillard’s implosion (Baudrillard 1994).

The tangent of violence is inverted in these sculptures – their true grotesqueness lies in the human sculpture's familiarity with the abominated "creatures". These human surrogates should experience the same mingled revulsion and pity that the viewer feels when looking at the sculptures, but the artist denies the viewer this catharsis. Instead, these children interact smilingly with them, imparting their aura of benign curiosity onto the viewers themselves. The viewers are thus reminded that they are just as guilty of their humanness – *related* to Piccinini's works in every way. Her sculptures present creatures exploited as endearing pets and curiosities for infantile and overly-curious human masters.

In the title of the installation, Piccinini toys with the linguistic concept of familiarity, family and familial relationships. The name of the exhibition *We Are Family,* plays with the notion of family in the sense of taxonomic rank, in that the creatures presented are genetically related to humans; family in the sense that *The Young Family* (Figure 13) is a small nuclear family, which immediately draws attention to their humanness; and the relationships between pets an their owners, in that pet-owners often see their pets as "a part of the family". The nature of the family and the family in an environment, or space is dealt with in these works. In Piccinini's family, there is no private space, no retreat of normalcy for these creatures to return to. They are exposed and displayed as art-pieces. In this way the artist also questions the idea of a 'normal' family environment and the planes of interaction between the nuclear family and the outside world.

Figure 13: Patricia Piccinini *The Young Family,* 2003. Polyester resin, oil paint, found objects, human hair, leather, wood. Dimensions variable. (Patricia Piccinini [sa]).

The abrogation of the norm in these works extends beyond the mere flesh-and-blood principles of family, however. The work is a contemplation of humanism. The sculptures display explicitly the collapse of traditional medical, scientific and social models and the failure of materialism. The children in her works, innocent, but afforded a position of great power and dominance over the genetically enfeebled, the reduced other, are human in the finest traditional sense (in that they dominate the other creatures in the works with impunity) and this is proven by their stark juxtaposition with the "monsters". However, the truly shocking revelation about these works is not that the viewer identifies with the children, but that the viewer sees him/herself in the creatures. The creatures are human enough to evoke a deep sense of sympathy and pity for them.

The interplay of normalcy and grotesqueness once again invokes the dialectic of natural and artificial. In this case, it would seem that Piccinini has presented us with the traditional trope of (normal = natural) and (grotesque = artificial). However this can not withstand the fact that the sculpture is clearly showing that it is not so much the monsters that are abhorrent, but the children, who are looking on with such wide-eyed innocence, oblivious to the fact that the situation

should seem abhorrent. Thus this idea is subverted in favour of a far more seditious dialogue.

Piccinini is openly critical of contemporary genetic science. Her work shows a contempt for the ruling genetic-scientific order that is equally informed and venomous. The explicitness of the work is ironically where its subtlety lies – the work becomes an exposition of scientific possibility, an exhibit at some kind of futuristic World's Fair. This work reproves the current laxness in scientific ethics and at the same time questions the relationships of humans to each other, to animals and to possible homunculi that might be born of the manipulation of the human genome.

Such evocations of terror call upon us to consider a blurring of the fields of value (coloniser and colonised; conqueror and conquered) in that the victor in this case is most certainly also the victim. *Leather Landscape* (Figure 14) is awash with colonial metaphor – the creatures' environment, a miniature, white landscape reminiscent of a zoo habitat, is itself a landscape of the colonised – a habitat specially designed to accommodate them, much like the homelands were during the apartheid years. The difference here however, is that the creature never had an original habitat or home, so either we must imperialistically consider that this is its 'natural' environment simply by virtue of the fact that it had none to begin with, or we must consider that the creatures genetic parents have been disenfranchised in the most heinous way – two species have been displaced from their natural habitats or homelands and their offspring have been denied the right of heritage.

Figure 14: Patricia Piccinini *Leather Landscape,* 2003. Polyester resin, oil paint, found objects, human hair, leather, wood. Dimensions variable. (Patricia Piccinini [sa]).

This is not only denial of humanity for the monsters (who are, after all, part human), but also abnegation of humanity for the viewer. The viewers relinquish their humanity in the silent space between the object and the subject, that is, in the implied complicity that their gaze imparts upon them. The viewer is as much a monster as the creature in the false habitat. Herein lies the irony of the work – the viewer's monstrous nature is reflected in the eyes of the pitiful creatures and they are forced not only to sympathise with them, but to contemplate the whole power exchange – they are forced to recognise that they have done this to themselves. The space anticipates the viewer and the dialectic is formed in this way.

The endearing (although ghastly) pets are a reminder of the failure of the technocracy in the collapse of values of human rights. The question of ownership – no longer what, but *who* is the owner and *whom* the owned – is critical to this installation. The fact that the laws that govern genetic science are opaque to the public and that little public forum exists where the ethics of genetic technologies may be discussed and future genetic research goals (and even past research) scrutinised by the public, is the reason these sculptures are useful. The sculptures present the viewer with a possible future reality – one feasible

consequence of the bio-technology revolution and force the viewer to critically engage genetic science as a new dominant social force.

The creatures that Piccinini presents us with are so frighteningly aberrant because they represent the arm of genetic science that is not geared towards the betterment of humanity, but instead towards the satisfaction of curiosity. It is not the cure for cancer that humans fear; rather it is the route science takes to get there. Piccinini shows the viewer the reverse side of the purification and perfection of man. Her creatures show the death and transfiguration of humanity into something terrible and pitiable.

Human beings have progressed to such a state where their control over the environment, their corporeal influence upon it and the influence it has upon them as corporeal beings, is such that their idea of the supernatural has changed - if a human being can be made by another human being, is there a use for God? Because it would seem that humans can no longer separate themselves or their consciousnesses from the environment they can, by the same line of reasoning, no longer separate themselves from each other, ideas, nature or god. Nor can the possibility of collective consciousness be escaped. Human ideas of god, nature and self appear to be as a result, transcendent.

The creation of the genetic homunculus ushers in an era of natural production,[1] of natural manufacturing. Already the birth of natural manufacturing can be observed in the interference with natural processes that occurs in the genetics industry. In contemporary genetic science, the evolution of the species is being determined in the retort and the processes of nature are being hastened and determined by human technology as a result of decisions made in the courts of today. Terms of ownership, identity and corporate and human rights will have to be renegotiated in light of the fact that homunculi will essentially become corporate product. This is because genetic homunculi, or even human upgrades

[1] I take this phrase to mean the process whereby nature creates through technology and how this is possible will be explained shortly.

(that are likely to become mandatory or perhaps even necessary for even the most basic jobs), will be manufactured by the businesses we give rights to do so. This re-negotiating will require the complete restructuring of our views on what it means to be (post)human, as well as our relationship with nature and will be a consequence of the outcome of our present debates on the matter. The current Western, capitalist approach to nature is still largely interventionist, as it has been since the industrial revolution (and even further back). This approach to nature informs the creation of a genetic homunculus, but it must be re-evaluated for the homunculus itself, because of the fact that for the first time the arbiters of the technology will be the technology themselves.

4.3 The Homunculus as Utopia – Orlan's *Hybrids*

The genetically engineered being is often cited as dystopic, but the binary alternative can create out of great and frightening monsters the vigorous and interesting new entities and identities of the counter-culture. This idea, presented in Orlan's *Hybrids, a* series of works spanning the latter part of her career that deal specifically with the artist's image as a hybridised subject, arises from the cyborg counter-culture espoused by Haraway (1991) and is likely to become important in fashioning the physicality of the genetic homunculus, when genetic technology is made accessible to the public. The ideals of beauty have been simply cultural ordinance until now, but with the genetic homunculus one sees the ability to fashion imperialistically a being's very physicality. Orlan uses the transposition of stereotypical cultural identities onto her digital image to show a melding of cultural identities – hers with the super-imposed one.

Through digital image-manipulation, Orlan is able to remind the viewer of the freedom of the digital space (where it is possible to form malleable and different identities falsely). This work also calls to mind the superimposition of ethnic traits on the identity of a genetic homunculus, which might be involuntary (imposed at genesis) or voluntary (acquired after genesis through gene therapy). Although

this is probably chiefly intended as a comment on ethnicity and beauty and how these elements are superimposed upon the body, it can also show how our artistic bent is liable for the changes imposed upon our genetic successors.

The relevance of the *self-hybridisation* Orlan presents in these works to the genetic homunculus is self-evident, because for a homunculus to achieve any semblance of sovereignty over its own body and identity, it must self-hybridise – that is, it must change its own physicality with the prostheses available to it.

Transgenic art - that art which is created using genetic materials from different species - is very likely to be furthered into the domain of the genetic homunculus, although perhaps not only in the form of the Frankensteinian genetic freaks created by the overly-curious geneticists Hollywood has shown us, but created by the homunculus itself – like the performance work of Orlan, which is created by surgically altering the artist's own physicality.

The concept of altering one's figure, facial features or even identity by surgical procedure is not new; however, in Orlan's works, she does reclaim the tools of the cosmetic surgeon – who can be seen as a kind of vulture of the image-culture – in order to form a subversive physical identity and to construct new ideals of beauty. This work becomes the ultimate denial of colonising ideas of beauty and the male gaze. By using plastic surgery, the medium employed by hundreds of thousands of people to conform to the canon, Orlan sabotages the mechanism and makes it her own. She re-creates the very mode of her being in a way that is sometimes grotesque, sometimes beautiful. She recovers, seeks re-possession of dominion over the ability to govern how others see her – she is both the artist and the art object.

Though perhaps at times repulsive and masochistic, the governance of the body is retrieved by the artist and the patriarchal imperialism of gaze destabilised. For the genetic homunculus, this type of statement is important because it means

that when it breaks free of the previous generation through technology, as she has done, that is, when it non-violently turns its technology against its creators (another operation of the singularity), it will likely be as a result of and in (perhaps oppositional) reaction to inherited values of its creators. However, unlike humans, homunculi will be able to alter their physicality through much more permanent and yet even more pliable technology. Orlan's denial of medical imperialism through its perversion will ring true for the homunculus artist/art object as well – the second generation genetic homunculus will subvert the artifice of its creators and reclaim its body.

Indeed the strictures of art and ethics would never allow the previous generation to influence its offspring in any way that could be perceived as negative, however, technology of the homunculus's age will be such that the genetic homunculus could affect itself in the same way that Orlan does, by cyborg prosthesis. Orlan herself is not a homunculus. A cyborg, certainly, but her genetics are still inviolable – her changes are purely cosmetic and as such she can not alter herself in a permanent way – such that it will affect her progeny.

Art can subvert the ruling power-structure and this is evident in the employment of new technologies as art. This is both a way of coming to terms with new technology and fighting back against the constant cannibalistic commodification of culture. Art subverts the Laboratory by becoming technology. The myth of transcendence through technology and the paradoxical duality of its non-existence (ideal, eternal life) versus its realisation (real, eternal death) are exposed by art and our attempts to create the genetic homunculus. The genetic chimera that bio-art has presented to us has exposed the impudence of genetic technology. With the technology available to Orlan, she has the ability to simulate and accelerate natural processes as the alchemists did, but she can not yet create generations of children with unique physical features when she breeds.

Figure 15: Orlan. *In between – Venus-Orlan # 23*. 1994. Colour photograph in lightbox. 126cm x 134cm. (Orlan [sa]).

In the two of her works (figures 15 and 16) under discussion in this chapter, Orlan calls attention not only to the ideals of beauty and the autonomy of identity, however, but also to the emergent bio-politics of reproduction. The arena of the genetic homunculus is centred in the new governance of reproduction that genetic research has presented in recent cultural expositions. Orlan shows the identities she presents as possibilities of the cyborg culture, but her works are specifically and even pointedly cosmetic. *In Between – Venus-Orlan* (figure 15) depicts the artist's portrait with an image of Classical beauty superimposed over it – Botticelli's *Venus*. The artist herself, although indistinct, is still present as herself, the notion of superimposition requires that there be an original image and an image that is placed over that original, whereas, were this an image of a genetic homunculus who had been imperialistically disenfranchised by an image-crazed culture, there would be no visible superimposition. The image would precede the territory. This is why scientific intervention in the process of reproduction is so important.

Orlan's use of technology to alter her physicality has always concerned the subversion of imperialistic structures, but for the first time the technology is available to change the very physical-makeup of a human entity through gene therapy. The fact that genetic technology interferes directly with human reproduction is stressed in these works. Images of the technologically-altered self call for a broader conception of reproduction and the inclusion of reproductive technologies as legitimate aspects of governance of body. If a woman has a right to terminate her pregnancy, or to breed with whomever she chooses, does she not also have the right to create her child as an interspecific genetic homunculus? Orlan presents possible human forms that she herself has mediated and changed according to her own whims. Why not create a child in a similar, artistic process? Of course the systems of ethics for these new forms of visual and aesthetic critique have yet to be written.

Contemporary culture is awash with reproductive imagery – from the images of warm, sleeping foetuses suspended in the womb and blurred sonographic hands to the ever iconographic DNA strand. Orlan's *African self-hybridation* (sic)*: half-white, half-black Mbangu mask with face of Euro-St.-Etienne woman in rollers* (figure 16) is also such an image, although not explicitly. The image toys with the possibility of altering one's physical make-up, transcending boundaries of race, ethnicity and even gender. If this sort of "self-hybridisation" is possible through technology, it forces the viewer to reflect on what technologies could be employed to achieve such ends. Unlike *In between – Venus-Orlan, African self-hybridation* depicts a complete synthesis of different races and cultures, a child of Orlan's own creation. The image of reproduction represents, for humans, the ultimate hope of transcendence – the child is the redemption of the parent and the fulfilment of the biological desire for survival.

Figure 16: Orlan. *African self-hybridation: half-white, half-black Mbangu mask with face of Euro-St.-Etienne woman in rollers*. 2002. Digital photographic print 125cm x 156cm. (Orlan [sa]).

Although ideas of transcendence are always problematic from a feminist perspective, leaning, as they tend to do, towards historical and patriarchal mythos, Orlan's works, though feminist, portray strong transcendental themes. The notion of the mirror-body, the separation and synthesis of opposites and the physical perfection of the human corporeal form are all ideas that Orlan plays with in *African Self-Hybridisation.* Orlan combines the always separate entities of Self and Other, revelling in the confusion of boundaries that this fusion represents and fashioning a transcendent new form. Orlan's idea of perfection is transgressive and intermediate, rather than distilled and goal-oriented, but the idea remains the same.

Reproductive technologies are perhaps the most intimate of our prostheses. For this reason, it is not difficult to see why post-humanists like Robert Pepperell believe that that humans are biological creatures is simply a current status, but that it is not necessary for defining who we are or who we should be: There seem

to be no essential discrepancies, or absolute separations, between corporeal humanity and computer simulation, cybernetic organism and biological organism, robotic technology and human goals (Pepperell 2005). The age of the human as we know it is drawing to a close:

> [T]echnology is but an extension of human activity and therefore part of what constitutes humanity as a whole. One consequence of this is that machines and devices are no longer regarded as alien agents to be tamed and controlled, but are embodiments of human ingenuity and intelligence (Pepperell 2005:[sp]).

Moving towards understanding how the genetic homunculus will be handled by humanity, it is important to appreciate the implications of its creation. Orlan understands that the creation of a being that is different from nature poses problems of violence to the body and the infringement of rights, but that this is not historically unprecedented:

> Since World War II, with the explosion of cybernetics and commodity culture (the latter facilitated by new technologies of reproduction, manufacture and communication) and the growing awareness of the brutal potential of technology in its militaristic forms, the utopian view has collapsed. Enactment and performance have replaced translation as modes for articulating the hinge between body and technology. Visual theorists from the I950s into the I970s revelled in more and more aggressive enactments of the body as a performance of the work of art and, through this practice, insisted on the coextensivity of body/machine and vision/machine, of artist and interpreter (Jones 2001:21).

For Orlan, the homunculus does not necessarily embody the culmination of human desire for immortality, but she embraces technology and the potential for the creation of new and interesting bodies of discourse. The so-called ‘soft technologies’ are Orlan’s transgressive medium of doing violence to her own body, or rather to the body of constructed gaze

There must be no doubt that the genetic homunculus is a being created by the technocracy for commercial gain. The companies that deal in genetic technology do not do so for purely philanthropic reasons – genetics, like any other field of

medicine – pays high dividends.[1] The genetic homunculus is like any other commodity entity in many ways, however Orlan realises that it has important differences that humans are not prepared for – it has the ability to reason, to think as humans do and better; it is a living being created by human artifice and it can evolve on its own terms. When the processes by which it is made are observed, this entity becomes enormously complex. It is simply not possible to look at the genetic homunculus from a non-biased standpoint. If we can afford it the status of commodity, where does that leave humanity? The same broad terms of negotiation can certainly be twisted to reverse the tables on humans. When the inferior species (i.e. humans) becomes governed by the superior (genetic homunculi), then there is no reason that all life should not become commodity.

Although the physicality of genetic homunculi is governed by the companies, scientists and governments that create them and their agendas, they are also, to a large extent, able to control their own physicality through means of technological alteration that will be available to them. The genetic homunculus, like the human, is also a cyborg. Issues of body and identity will be just as important to a homunculus as they are to people, perhaps even more so – their very physical nature is colonised and mediated by an imperial other, as well as by themselves.

For a homunculus, questions of race, gender and even culture become questions no longer of nature but of choice – choices made by the imperializing Other, but also made by the homunculus (gene altering therapy and cybernetic extensionism are the technologies of the genetic homunculus) – this can be taken to mean that what are for us issues of deep-seated, dynamic, cultural

[1] The homunculus can only come about as a purely commodity artefact, not only because the enormous cost involved in the research and development of such a technology prohibits any but the billion-dollar corporate entities from creating one, but also because our desire to live indefinitely is significantly tempered by what we are morally prepared to do to achieve that goal. The Elizabeth Bathorys of this world aside, not many are prepared to do what they find morally reprehensible in order to become immortal. The creation of a homunculus still has vampiric undertones for many.

discussion will become for the genetic homunculus a very culturally-loaded form of gene-aesthetics. The homunculus is likely to be the summation of the alchemist's desire for eternality through his own works - of authoring an eternal being – a race that will see the fusion of nature and culture, a union of humankind and godkind. Humanity will have assimilated both nature and divinity through technology, but this is not to say that the genetic homunculus will be free of its Frankensteinian stigma.

CONCLUSION

The homunculus centres on certain crucial elements of alchemic thought, namely: the idea of death and subsequent transcendence; the process of purification of metals or other substances in the alchemist's instruments (which corresponds to the spiritual transformation of alchemist himself); the idea that all natural objects are on a path towards perfection, which the alchemist speeds up by intervening in and replacing the function of Nature; and the technology of the alchemist aids in this deception of time. Within the Alchemist's forges and alembics, the spiritual essences of substances are disaggregated and combined in the process of simulating and hastening Nature in order to attain perfection.

Nature can be seen as a chaotic stage, or locus of discourse, upon which, combined and interactive knowledges compete and play out the structures that form contemporary perceptions of nature. These knowledges comprise the players on the stage, which are the humans, animals, objects and technologies that can be found in the world. The interactions between these objects and subjects form differential models of perception and act as parts of nature itself.

The formulation of post-human theory requires a refiguring of the humanist view of nature, humans and technology. All technology is a function of humanity and acts to extend human agency. Humans and machines are indivisibly linked and each helps to further the goals and evolution of the other. The end of the human era comes about when the output of machines becomes truly unpredictable. It is impossible to see humans and human consciousness as limited to the human body and thus post-human theory advocates oneness with technology, nature and humanity.

Technology progresses from a state that is external in relation to the human body, to a state of being internal. Humanity is reaching a stage where the

artificial is continually expanding and the real is consistently marginalised. The difference between the real and simulated reality is impossible to distinguish. Clones, the ultimate simulacrum, represent the destruction of the original and the denial of sex.

The history of human genetic engineering shows a steady progression of legal and ethical issues towards permissiveness. Recent recombinant genetic engineering encompasses he synthesis of different species with human stem-cells, forming part-human, interspecific chimeras. Ethical debate on these issues shows a clear discrepancy between the implementation of policy and corporate responsibility; a lack of public knowledge of and the availability of research results to the public; and the conflation of genetic research with patient-oriented care on the part of the public and patient-advocates.

The themes of purification, death and transcendence and the synthesis of opposites are vital to the understanding of the alchemic homunculus. These motifs are, although at conception localised to the view of alchemic philosophy as a spiritual art, also present in modern conceptions of the genetically engineered being. There is strong correlation between the notions of transcendence and the idea that genetic science is aimed at the prophylactic perfection of the human organism. The idea of death and subsequent transcendence corresponds to the fact that, on an evolutionary scale, the homunculus can bring about the extinction of humanity in the quest for superiority, due to the function of evolution.

The homunculus is the model of goal-oriented evolution, because its physiological make-up is altered by intelligent will. The homunculus is a being whose reproductive genesis will be completely mediated by the will of the previous generation and its physical body can be changed according to its own whims. Evolution and indeed extinction, can be seen to be an interdependent relationship between organism and environment.

This discursive type of interaction between organisms and nature is indicative of the unfixed, chaotic quality that nature possesses as a topic-place. Because the interactions between the objects on the natural stage can be seen to be constantly forming and reforming nature as a result of being on the natural topos, nature can be seen as complicit in the formation of new created entities. The natural stage is complicit and profane with regards to humans and the new "bodies" formed by humans and their technology.

For this reason, there can be no separation of the ideals of real and unreal, because the artificial is also natural in this sense. The genetic homunculus, therefore, is real unto itself. Nonetheless, it still represents death because of its being brought into reality as a copy, because the copy instantly devalues the original in the infinite reproduction that it represents. More literally speaking though, the genetic homunculus also represents imperceptible death in the evolutionary sense, since one state of being ceases to exits as it evolves to another.

This extinction of humanity and the birth of the genetic homunculus is a singularity in that it will change the negotiation of sentient life on the planet. This is a result of the fact that the genetic homunculus will be created by its genetic predecessors. The establishment of non-human intelligences in modern society and how those intelligences are dealt with by humans will affect the future arbitration of humans by their genetic offspring.

It is clear that the similarities of the alchemical homunculus to the genetically engineered being are so great as to merit the use of the term genetic homunculus. The genetic homunculus represents an over-arching human desire to transcend mortality and both the genetically engineered being and the alchemic homunculus entities are brought about by the death of a perceived "unenlightened" or "impure" state of being. The alchemical notion of hastening

natural processes also corresponds to the intercession in evolution that is inextricable from genetic interference in human DNA.

It may be inferred that the alchemists initiated the concept of the Laboratory as the surrogate womb of the Earth Mother and this notion can be used to describe contemporary interventions in nature. Technology operates within nature's surrogate womb, the Laboratory – as the facilitator of the creation, fusion and deconstruction of malleable bodies. The Laboratory is the place where the homunculus is born. It is the stimulator of the processes by which humans may become immortal – the place where things are disaggregated and re-combined – it is built on record. Technology is the intervening and catalysing process in the simulation of reproduction. It would seem that the alchemist's dream of the indefinite extension of human life, has found new roots in the transhumanist movement. The homunculus can be seen as a post-human being.

The homunculus is important because the human clone can be seen as the first human-made machine that is as truly self-aware and unpredictable as humans are and the genetic homunculus, already a reality, has the potential to extend human agency beyond humanity. It is unlikely that our advances in the fields of non-biological artificial intelligence and cybernetic intelligence will be so enormous in the next ten to twenty years as to completely simulate human intelligence, it is far more probable that a human being will be cloned before this eventuality arises) and a *genetically engineered* clone, a genetic homunculus can certainly be seen as an intelligent, human-made machine.

It has been shown that the genetic homunculus can be seen as both a dystopic and as a utopic design for post-humanity and in this it must also be seen as plural, divided and irreconcilable. This is because the nature of the genetic homunculus is unrepresentable – it is only expressable in the manner by which it interacts and in the case of the three visual examples studied in detail in this

dissertation, that interaction is between the imagined creature and a possible social dynamic – a predicted future state.

In Andrew Niccol's (1997) film *GATTACA*, a likely dystopia of class distinction caused by genetic elitism is presented. The Nietzschean *Übermensch* is shown to be an undeniable outcome of genetic technology – the unavoidability of social, politial and legal change in light of exclusive technologies is highlighted by this visual text. It was demonstrated that the film's aesthetic and epistemological concerns reinforce humanist biopolitics and antipathy towards technological elitism. As a complex narrative that focuses on the relationship of a genetically enhanced being and a non-genetically enhanced being, *GATTACA* presents a realistic, human relationship between humans and their genetically superior counterparts. The two men are juxtaposed in order to draw attention to both the frailty of supposed genetic perfection and the strength of human will in the face of genetic weakness. The incredible struggle of the principal character against discrimination by the genetically superior beings presents a future society where the prevailing mythos of genetic determinism is imperialising and oppressive, while also being inherently flawed in that it does not recognise the factors of human determination, will, love or other intangible human characteristics.

In Patricia Piccinini's installation, *We are Family,* the abject is articulated as presenting the nature of the homunculus, where it is the homunculus that is the oppressed being rather than the human. Through Piccinini's sharp critique of Imperial, materialist dogma, the lack of responsible governance in terms of genetic technology, as well as scientific intemperance is revealed. By presenting terrible abortions of form that look like animal/human hybrids or chimeras, Piccinini presents a conclusion of the Industrial narrative of history – the complete denial of nature. Piccinini attracts attention to the disenfranchisement of her creatures by placing them on specially-made modernistic "landscape" couches made of leather, recalling post-colonial debate over the displacement of indigenous peoples and the implications of ownership and confiscation of rights.

The alternative approach to the homunculus in visual culture -- that of the homunculus as a kind of cyborg-eutopia -- was shown to be explored in Orlan's *Hybrids* series. The use of the new genetic technology as infinitely interchangeable prostheses by the genetic homunculus is, for Orlan, a way of destabilising the dominant power structures of the technocracy. Access to genetic technology makes questions of race, beauty and even sex malleable and as such imperialising structures of the owner/owned can be subverted. Orlan offers views of homunculi that tear down traditions of perfection and improvement in favour of a fully pliable identity.

It can be concluded that the relationship of the visual arts to technology is subversive and as a result, the visual texts presented in this paper serve to offer relevant commentary on the current phenomenon of genetic technology in society. Because art is itself a type of spiritual technology, humans can use it to come to terms with and, establish public forum for, new and frightening technologies. Art is positioned as a cultural record-marker, closely linked to technology by its employment of technology as a medium and as a kind of technology itself, but this relationship is seditious. Bio-art is a good example of this, in that it offers absurd or useless prosthesis and essentially scrutinises the technology it uses. Art has been shown to subvert the goals of the technocracy by implementing its own praxis. Art's relationship with technology was exposed as being both insubordinately commentary and rebelliously coital and therefore important to the homunculus. However, at the same time as being dissident, the same questioning of technology helps to form the counter-cultural identity of the technologically created being. The function of technology depends entirely upon the controller and as long as the culture of commodity can annex it back from the technocracy, the homunculus can arbitrate its own identity. The return to the earth mother is consummated in the chaotic unpredictability of art – technology can not be truly chaotic without some element of dissent.

With this study, I hope to address a lack of scholarly literature that deals with the phenomenon of the genetically engineered being as it pertains to alchemy by putting forward ideas that support the notion of the genetic homunculus as a theoretical framework for the negotiation of the sentient post-human being that is presented by contemporary research into recombinant genetic science that involves the use of human genetic material.

It has been shown that the alchemists believed that there could be no transcendence without prior torment and death – this applied as much to the *lapis* as it did to the initiates of the mysteries of alchemy (Eliade 1971). While the existence of a soul in the homunculus can perhaps be accepted, it is difficult and extremely problematical to debate such a thing on pure conjecture. That the transcendent and enlightened state represented by the homunculus must succeed a 'death' of humanity, is equally jarring to human sensibilities, but nonetheless a factor one must consider when creating a new being with technology.

It follows that the homunculus should rather be discussed in relation to the development of new technologies – as a commodity artefact. Hence it can be concluded that the arbitration and genesis of the homunculus, both by the corporations that create it and by the homunculus itself is important to an understanding of the debates that form the basis for its creation. The alchemists' dream of superseding time through their technology is realised in the genetic homunculus, but this is only half true. It is only as an idea that immortality holds power – when it sees realisation it signifies death. Transcendence always requires the death of the previous state of being. It is impossible to hold the idea that the homunculus is human simply because it contains some of the DNA that humans do – the genetic immortal is simply too different to be considered human and it is possible that humans will even be made extinct by their genetic progeny if the scientific mode of reproduction replaces the current one, or if they breed with the homunculus. This Singularity is brought about by the insurmountable

differences between humanity and its progeny, both physical and ideological, that total union with technology engenders.

Already the cyborg post-humanity that Haraway posited appears to be seeing fruition in ways that seemed like science fiction only a few years ago, but humanity is a far cry from reaching the state of purity and enlightenment that the alchemists advocated as necessary to attain such harmony with nature as to merit the transcend time. In other words, we can not move forward to a full conception of what it means to create a human clone, without an understanding of how it would be viewed and how it would affect conceptions of nature, technology and art – the foci of this research. I do not claim to present such an understanding, but rather to offer views that might aid in the formation of such an understanding. The examination of contemporary theories on the relationship of nature and technology that leads to a position of nature and technology as they would be seen with the birth of the first genetic cyborg, the first genetic homunculus, as well as an examination of how alchemic philosophy has shaped these views reveals such insight.

Modern 'alchemists' have created technologies that could, as predicted by Raymond Kurzweil (2005) extend the average human lifespan almost indefinitely by the year 2050, by fending off the seven factors that cause our bodies to age and deteriorate.[1] Not only this, but by reducing the self to an essence, as in the case of downloading the human mind onto virtual memory and selecting genes to perpetuate for inclusion in a genetically engineered clone, humans transcend time and become immortal. The dire consequence of this is that the ultimate self-

[1] Ward (2006:27) states:

> There are only seven major types of age-related damage to the human body: The first is cell loss without replacement, the second is the accumulation of cells that should not accumulate. Three problems have to do with the internal workings of the cells themselves – mutations in the chromosomes, mitochondria and lysosomes and, lastly the final two problems have to do with the accumulation of indigestible molecules between the cells and the accumulation of chemical bonds that link long-lived proteins together, stiffening elastic tissues such as muscles and artery walls. All of these factors are currently under study and reversal processes are being developed.

liberation of humankind is not only deliverance from time, but also emancipation from the effects of nature through a becoming of nature – a creation of virtual immortality through the manipulation of nature with technology – but also subsequent death.

A severe limitation of this study is that a unified theory of the human soul can not be established scientifically, or without resorting to religious dogma or superstition. Since the alchemical debate about the plausibility of the creation of the homunculus involved the question of the soul, it would greatly contribute to the study if the soul could be discussed in empirical terms, in the interest of comparison. One is forced to concede that the soul is an area that is, for now, hermetically sealed to scrutiny. Indeed, any human conception of a soul is liable to be a fallacy, as the assumption of the existence of a soul assumes the ultimate existence of a reason for the soul and that stems once again to the unanswerable question *why are we here?* One may be forced to consider that humans will never be able to find a quantifiable, empirical prognosis of the soul, but it is still useful to note its significance in the question of a being created by human technology. The issues of soul concerning the homunculus are innumerable and lead to how humans will deal with the homunculus in its first generation, (because this will be the last generation of homunculi that they will make decisions for) and this in turn may lead to its arbitration of humanity in the years after.

It has been shown that by ‘creating’ life (and thereby restructuring our definitions of nature) anew in the genetic clone, humans have proven their role as a productive arm of nature – whether it be in a literary, theoretical or in a physical sense, humans are architects that build nature from natural artefacts in natural processes, both physically and from perceptions and ideas of nature itself.

The interventionist approach to nature has yielded the fact that all the players (nature, humanity, technology) are constantly changing in a discursive process

as science adapts to nature which adapts to human bodies, to which human bodies adapt *et cetera ad infinitum*. Therefore it may be concluded that by creating a 'more efficient' human race over generations of progenerative evolution, humanity will realise that they have created a *different* human race, because diseases and ailments will adapt with humanity, as will conceptions of beauty, mental health and intelligence. The result may be a race that has become taller, healthier and longer-lived, but these ideas will, of course, all be relative to the conceptions of the day and it certainly will not be 'human' by any contemporary definition. It is my position that this idea of the altered, evolved, *neo*-human race is derived from the alchemic dream – a race imbued with virtual immortality through its own technology, its melding with nature – a state brought about by learning her secrets, imitating her processes, speeding up her works and ultimately replacing or becoming one with nature.

However, the question is not what *we* (human beings) will be in a thousand years, as it is doubtful that people will even exist on the terms that can be understood as human today, it is a question of what *the result* of our genetic endeavours will be, because simply by the process of intervention, differences in both the physiological and the ideological are created that are impossible for humanity to surmount. A gene-altered android can, anthropologically speaking, no more be considered the same as a human than *homo erectus* can be considered the same as *homo sapiens* and beyond this physiological difference there is a deeper social difference that will likely see fruition. The homunculus, imbued with virtual immortality, would have no fear of death – mortality is a great motivator for social dynamics. Factors such as age and class demographics, as well as medicine and the keeping of historical record will certainly be altered by a potentially immortal being with a perfect memory, for instance. What is seen in the development of the science of genetics, is precisely informed by the alchemical Anthropos ideal – the formation of the perfect being, but this being is not human.

Because of the fact that the genetic homunculus has not yet been created as an intelligent being, it is very difficult to define epistemologically. It squirms and defies ideological encapsulation. What has been presented in this paper is not an account of the physiological or ideological nature of the genetic homunculus, but rather an exposition of the ideological factors that contribute to its creation that might give hints towards such understanding. The intelligent homunculus is not like Haraway's cyborg in that it has not yet seen fruition, but we are headed so rapidly towards a time when it will become a reality that we should at least be on the lookout for the heralds of its arrival. These harbingers are the genetics, cybernetics, artificial intelligence and nano technologies that are already augmenting us in ways that would have seemed like darkest magic to the alchemists of old. Telematic agency, bio-technology, electronic implants, tissue regeneration and countless other prosthetic technologies created in just the past two decades are very rapidly making us virtually immortal. The time of the singularity is at hand. The Earth-Mother is restless and her surrogate is heavily pregnant. The Laboratory is waiting to give birth.

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