Hybrids in Art

Theoretical Perspectives on Art in the Age of Genetics.

The Transgenic Art of Eduardo Kac

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Sammendrag / Norwegian Abstract

Masteroppgaven tar for seg den ”transgenetiske” kunsten til kunstner Eduardo Kac (1962 -). Transgenetisk kunst er en form for biokunst, og bruker levende materie som sitt medium. Mer spesifikt søker kunstformen å bruke bioteknologi til å skape nye arter, enten gjennom å overføre genetisk materiale fra en eksisterende art til en annen, eller gjennom å tilføre en organisme syntetiske gener. I oppgaven ser jeg på tre av Kac’s transgenetiske kunstverk. “GFP Bunny” (2000) dreier seg om en grønn, fluorescerende kanin, som i utgangspunktet skulle fraktes fra laboratoriet den ble skapt i til Kac’s hjem i Chicago, for slik å integreres i samfunnet. Verket inkluderer publikums reaksjoner. ”Natural History of the Enigma” (2003/08) involverer en transgenetisk petunia som bærer et av Kacs gener i sitt vaskulære system. ”Genesis” (1999) oversatte en komprimert setning fra 1. Mosebok til en DNA-kode, som ble inkorporert i fluorescerende grønne og gule bakterier. Publikum kunne bidra til mutasjoner av bakteriene ved å skru UV-lys av og på.

Oppgaven har en multiperspektivistisk tilnærming, som innebærer at jeg undersøker verkene på ulike vis. Jeg forholder meg til Mieke Bals idé om ”travelling concepts”, som grunnlag for en eksaminasjon av dagens kunstbegrep og hvordan transgenetisk kunst forholder seg til dette. Utgangspunktet mitt er tanken om at kunsten både vokser ut av og reflekterer sin egen tid og sitt eget samfunn. Jeg foretar et kort dykk i kunstens og vitenskapens historie, for å vurdere hvor transgenetisk kunst befinner seg i sammenligning. Hvor nært relaterer kunst seg til vitenskap? Hva er ”kunst” i dag?

For å undersøke dette tar jeg for meg *the Alba Guestbook*, en database hvor tilskuerne kunne skrive sine reaksjoner på ”GFP Bunny”. Jeg ser på tilskuerens rolle i forhold til kunstverket, med utgangspunkt i Jacques Rancières beskrivelse av den frigjorte tilskueren. Videre undersøker jeg de etiske synspunktene som ligger til grunn for publikums reaksjoner, ut i fra antagelsen, hentet fra Rancière, om at tilskueren alltid vil tolke verket ut i fra sin eksisterende verdensanskuelse. Jeg ser på transgenetisk kunst som et immanensplan etter Gilles Deleuzes modell, og undersøker hvordan hans begrep rhizomet, satt opp mot Nicolas Bourriauds radikanten, passer på Kac og hans prosjekt. Jeg fortsetter med en diskusjon av de etiske dimensjonene i kunstverkene. Basert på informasjonen fra *the Alba Guestbook* går jeg ut i fra at folk reagerer sterkere på noe som presenteres som kunst, enn de ville ha gjort om det samme ble lagt frem innenfor vitenskap eller i andre kontekster hvor det har et klart formål, og spør: hva er det med kunst som gir det en slik ekstra slagkraft?

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This paper could not have been finished without the help and support of my family and friends. My mother, Unni, "sparred" ideas with me for hours and read her way through numerous drafts. My father, Knut, and Cecilie, gave me valuable thoughts about the nature of art, a few reality checks, and many well-balanced dinners.

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Contents

I. Introduction

Ikke så helt sjældent sker det, at videnskabsmanden og filosoffen ikke ved, hvad det, han siger, indebærer, fordi han bliver på den teoretiske og derfor harmløse tænknings plan, medens kunstneren omsætter det og opdager, hvordan tingene og vor egen tilværelse kommer til at se ud, når man gør alvor af, hvad videnskabsmanden og filosoffen i deres teoris store uskyld har tænkt. *- K. E. Løgstrup*

It is no rare occurrence that the scientist and philosopher does not know what is entailed in what he is saying, as he stays on the level of the theoretical, and therefore harmless, thinking, whereas the artist deciphers it and discovers how things and our very existence will look, when one carries out what the scientist and philosopher, in the great innocence of his theory, has thought. [1]

In the year 2000, a green bunny was suddenly the object of discussion and debate in newspapers, in broadcasts and on websites all over the world. The bunny, named Alba, had been genetically modified to glow a fluorescent green when subjected to UV light. Many newspaper readers never realized that the bunny was presented as a piece of art, but the green albino rabbit was still the definite breakthrough of artist Eduardo Kac. A year before, in a piece called "Genesis", the conversion of a Biblical sentence into DNA sequences resulted in the creation of an artificial strand of glowing bacteria.

These artworks were the first examples of what artist Eduardo Kac terms "transgenic art".[2] This thesis will explore the implications of such artworks, and consider why they are being created. At the center of my research will be the two artworks mentioned above, "GFP Bunny" and "Genesis" respectively, as well as a third transgenic artwork of Kac's, "Natural History of the Enigma", featuring a hybrid flower with human DNA.

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[1] Løgstrup 1983: 17, *my translation*.

[2] From this point on written without quotation marks.

Bio Art, New Media Art, Transgenic Art

Transgenic art is a term coined by Eduardo Kac himself. Brazilian born, Chicago-based artist Kac has been active since the 1980s in art fields ranging from performance, through telecommunications, telepresence and telerobotics to holopoetry.[3] Kac is, in my opinion, a good example of a generation of artists working interdisciplinarily, in the outskirts of the traditional art field, and with a social project. He is considered to be one of the pioneers of bio art, along with Joe Davis, George Gessert and the artistic laboratory SymbioticA.[4]

Biological art (mostly referred to as bio art) is a common term for all art that uses living matter as a medium, producing artworks with the toolbox of biotechnology. The field of bio art is quickly expanding, as artists realize new and inventive ways of utilizing living matter in art. Bio art is generally counted under the umbrella of new media art, meaning art that utilizes media other than the traditional ones (painting, sculpture, etc). Among the other branches of new media art are virtual art, animation, computer robotics and interactive art.[5]

New media art utilizes media that a majority of the population (at least in the Western part of the world) is comfortable with, and accustomed to seeing in other settings. Computers and TV screens are used in everyday life, while paint and stone, the traditional materials, are more exclusive to the arts. Biotechnology is also a well-known component in contemporary society, even if it is, for the most part, still only utilized in professional environments. It was only natural that the new media were brought into an art world where textile and ceramics were already entering the ranks of fine arts, and where paint might as well be splashed onto canvases as carefully applied by brushstrokes.

In addition to the terms I have mentioned, one can also happen to hear these artworks discussed as hybrid arts, a term encompassing artworks in the fields of physical sciences, information visualization, robotics, artificial intelligence, and of course biology. A "hybrid" is the result of crossbreeding, be it of different animals, plants, cars or fields.

With the exception of his performance work, Kac's art production belongs within the new media arts. This last decade, Kac has been working mostly on his transgenic art project. In a few words, transgenic art is a strand of biological art specifically seeking to cross (often

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[3] A short description of these art forms is included in the chapter on the artist and artworks.

[4] *See for instance* Heartney 2008.

[5] *See for instance* Rush 2005.

extremely different) species by means of genetic manipulation, or to transfer synthetic genes to an organism, in both cases creating new, unique living beings. The artist himself stresses how the "nature of this new art is defined not only by the birth and growth of a new plant or animal but above all by the nature of the relationship between artist, public, and transgenic organism".[6] This art, then, has a social focus, as well as being conceptual in nature. A common factor in most of Kac's work is the focus on communication, in the broadest sense of the term.

Transgenic art is one "branch", if you will, of bio art. My discussion will be focused on transgenic art *as an example* of bio art. As there are sections in the text where I may appear to be jumping from one term to the other, I would like to stress that I am *not* using the terms synonymously. It is exactly because I am conscious of transgenic art's *being* bio art that I allow myself occasionally to go from one level to another. The same goes for the relationship between bio art and new media art.

My Project

I first heard about Eduardo Kac through my younger sister. She was just entering university, and was choosing a theme for her *ex.phil*.[7] from a list of suggestions. One had the title "Kunst og moral",[8] and gave the example of Alba the green bunny. I was in the first semester of my Master's, and was immediately excited by the implications of this piece of art. Initially, my focus was mainly on the ethical aspect: can there be any reason good enough to be meddling with nature in such a way? And if your answer is yes, is it defensible to be manipulating animals "*just" to make art*?

My reasons for choosing this particular art form for my studies were naturally complex. If I had to explain my choice in a few words, however, I would put it down to the continual, if slight, feeling of dislike brought on by the ethical aspect of transgenic art, combined with the fascination and intellectual stimulation they induce in me. This mixture has made it possible

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[6] Kac 1998.

[7] *Examen philosophicum* is a first term course aiming to give a philosophical introduction to academic research. It is compulsory to all students starting a Norwegian University undergraduate degree.

[8] *Eng*. "Art and morals", *my translation*.

to work with the material for close to two years, at the end of which I am more excited by the philosophy of this art than I was in commencing.

As I read up on the subject, I was surprised to find that manipulation using genes from other organisms is performed routinely on a variety of animals, as well as fish, plants and bacteria, in laboratories around the world. I reacted with shock and unease to some of the manners in which these creatures were being utilized.[9] It made me view Eduardo Kac's transgenic art differently. In "GFP Bunny", the artwork featuring the green rabbit, one of the main issues emphasized by the artist is the transformation of the lab animal from object- to subjecthood. In "Natural History of the Enigma", where Kac had one of his own genes spliced into a petunia, he addresses the contiguity, the close relationship, of living things, stretching the ideas of similarity and diversity further than most people would think to do. What do we take for granted in our perception of the world?

The presentation in particular of "GFP Bunny" has ruffled a lot of feathers. There are strong, valid reasons for keeping lab animals; in some cases their use saves thousands of human lives. Even some animal rights activists value the lives of fellow human beings over those of other animals. Although many people have argued that there is no objective reason for assessing human lives higher than those of other animals, when faced with a direct choice, speciesism seems to reign. The use of a transgenic animal for art appears to be less easily defensible, as there is nothing *directly* at stake, justifying its creation. The potential loss of human lives, to most, weighs stronger as an argument than any reminder, as art can provide, that animals are being used routinely for research. Especially if the animal (or plant, or bacteria) suffers in any way from its transformation, its maker can appear monstrous to its audience.

Objections aside, presenting transgenic creatures as art does seem to have the potential of disclosing some of the boundaries of the philosophy of ethics. It certainly has shown capable of inciting debate and inspiring the public to think through their own opinions. For myself, I have found this art endlessly exciting because, for each aspect of the artworks I enter into, I find new layers of meaning waiting to be explored. As soon as I got to know more about transgenic art, and realized how many issues were opened for investigation by this art form, my focus shifted increasingly from the ethics and animal rights. Instead, I began to reflect around how I myself had initially received the artworks as I saw them on Kac's website, and

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[9] *See for instance* INRA press service 01.12.05.

how my perception had changed as I learnt more about them. With that in mind, I got more and more interested in how *others* had received the same pieces. Fortunately, I had ready sources at hand. Newspaper articles on all three of my chosen artworks flourished, and the *Alba Guestbook*, a database on Kac's website where people had written their opinions on "GFP Bunny", was a treasure trove of responses.

My particular approach to transgenic art is largely to situate it within current societal discourse. I use differing theories to consider the different aspects inherent in the art form, and give particular notice to the role taken by the spectator. My approach may be colored by my own situation as a Master's candidate at the University of Bergen, Norway, geographically far removed from Brazilian-American Eduardo Kac and most of his exhibitions. I choose to consider my remoteness an advantage, as it gives me a decided "outsider's view" on this art form. Norway has a rather strict legislation on genetic engineering, and the use of the technology for art will probably not be seen in this country for a while yet.[10] However, the issues raised by transgenic art are as relevant in Norway as in other part of the world, and I certainly think the art form will have as interested an audience here as anywhere else.[11]

In the initial process of familiarizing myself with Kac's art, the sources I had available, in addition to Kac's extensive home page, were largely newspaper articles and short video interviews. Fortunately, I was able to gain primary information through fieldwork. I visited Eduardo Kac at his office at the School of the Arts Institute of Chicago, for a lengthy personal conversation. I also went to see one of his scientist collaborators on "Natural History of the Enigma", Prof. Neil Olszewski of the University of Minnesota, who let me into his lab to see how transgenic plants are created, and provided me with invaluable information.

In the first stage of my process, which mainly consisted of reading up on newspaper articles on the various artworks and other online essays, I had discovered an issue that caught my interest: there seemed to be contested terrain around both "GFP Bunny" and "Natural History of the Enigma". In my conversations with Kac and Olszewski, I brought up how the versions I had read differed, and they both responded with some acridity that it is not uncommon for

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[10] Lovdata 01.05.11.

[11] My belief is solidified by there being nine Norwegian writers in *the Alba Guestbook*, as well as by the intrigued reactions I have myself received when discussing transgenic art.

journalists to get things wrong.[12] However, in my own appraisal of the artworks,[13] I realized that the differing accounts of the newspaper articles affected my view of this art. If that was the case, could they not be considered inside the framework of the artworks, as Kac himself lists the reception of the pieces as part of the art?

Plan of the Thesis

Untraditional art wants an untraditional analysis. In my description of the artworks, I will also describe the process of creating them. An analysis of a painting will normally include an assessment of the brushwork in order to determine the painter's style. After the idea stage, the processes of producing the transgenic subjects are strictly within the field of science. It seems only logical that I present the biotechnology behind the artworks, before tackling what makes these particular pieces stray from the field of science to be included in the variable concept of art. There is another reason why I think a grasp of biotechnology is important: on several occasions, upon presenting these artworks, I have been asked, "how do you know this is even possible to accomplish? It might all be a sham!" The flower of "Natural History of the Enigma", to the bare eye, looks just like any other petunia, and the rabbit of "GFP Bunny" has not actually been seen outside of the laboratory. But in familiarizing myself with biotechnology, I have become convinced that there is no *technological* limitation preventing the creation of these creatures.[14]

This introduction goes on to look at the origins of transgenic art, with a brief history of the biotechnology and art that inspired our art form. I present my theoretical foundation, as well as my research questions. The following chapter describes the transgenic artworks, starting out with an artist's biography on Kac, and presenting some of his other bio and transgenic artworks before delving into the three pieces that we will be returning to time and again in the course of the thesis. The chapter's last section presents some reasons for the creation of transgenic art.

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[12] Kac 19.10.10 and Olszewski 28.10.10.

[13] At that point, I still had not visited an actual exhibition of any of the pieces.

[14] Olszewski 28.10.10.

From transgenic artworks, we move on to botany in chapter III. I juxtapose the recently presented figure of the "radicant" to the "rhizome", to see how they fit transgenic art. I explore Mieke Bal's "travelling concepts", and apply Deleuze's "plane of immanence" to art. I use Don Ihde's postphenomenological analysis of twentieth century science as a basis for consideration of the debate between relativists and absolutists, and ask: how far apart are art and science? I go on to consider the relationship between art and science, first in a brief historical sketch, then from a contemporary point of view. Lastly, I look into the concept of aesthetics as it relates to transgenic art.

Chapter IV deals with the spectator. I take a look at the concept of communication, before considering Rancière's figure of the emancipated spectator. Complementing this theory is an exploration of the concept of affect, leaving us with the image of a spectator that chooses what to take away from the encounter with the artwork. With this in mind, I examine the *Alba Guestbook*, as a case study of the reception of "GFP Bunny". The remainder of the chapter poses questions on the notion of truth in art.

In the next chapter, the ethical dimensions of transgenic art are explored. I start out with a general sketch of different stands on ethics in art. I consider how the animal rights issue is represented in "GFP Bunny", and look at Kac's wish to have Alba regarded as a subject. The same chapter also deals with the notion of "the other", listed by Kac in the nine points on "GFP Bunny". In extension of this, I explore the recently presented concept of "semioethics", to see if its theoretical scope can provide a link between "the other", communication and responsibility in transgenic art. Next, I look into some ethical issues implicated by "Natural History of the Enigma". Finally, I examine Kac's notion of commodification, presented in the piece "Transcription Jewels" from the "Genesis" series.

The final chapter provides further historical scope, finding links to surrealism and exploring more inspirations for Kac's transgenic project. I compare the historical notions of the chimera and the hybrid to the current sense of the terms, leading into a closing discussion of the potential effect of transgenic art on our contemporary society.

Where Does Transgenic Art Come From?

Transgenetics has been a branch of biotechnology since Stanley N. Cohen and Herbert Boyer developed recombinant DNA technology in 1973.[15] The ensuing evolution of the field has been proclaimed a revolution. These days, genetics is one of the hottest themes there is.[16] Some of the research of the last two decades suggests that our genome not only influences our looks and proneness for certain diseases, but can also factor in when it comes to temper, political views and religion.[17] The genetic information available today does not give conclusive evidence as to this, however.[18] The paradigmatic shift to viewing genes as information, to be read and interpreted according to their function, has been compared to the computer revolution, and has resulted in the field of bioinformatics. The genetic code is actually the same for all living beings, from pathogenic bacteria through plants, to human beings.

The genetic code was cracked in the early 1960s, a feat attributed jointly to Har Gobind Khorana, Robert Holley and Marshall Nirenberg.[19] In 1973, Cohen and Boyer proved that information from *one* organism could indeed be moved to *another*. They used parasitical enzymes from nature to perform this feat, "cutting and pasting" genes. The cell in which a gene is pasted instantly interprets the information and starts producing the protein specified in the organism the gene came from. This process of recombinant DNA technology is also called gene splicing, and the creatures created with this technology are referred to as transformed, or transgenic creatures.

The great difference between transgenetics and other adaptations of species through means such as grafting and breeding is exactly that the DNA is directly manipulated. Design of genes has reached a level where it may be used to remove some hereditary diseases. It is technically possible to change the appearance or intelligence of the child in the embryo. Ethical considerations, however, make it unlikely that these techniques will become

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[15] Frank 2010: 37.

[16] *See for instance* 21st.Century.co.uk 2011.

[17] *See for instance* Frank 2010: 166-171. The first steps have already been taken towards preventing discrimination on genetic grounds. In the USA, the Genetic Information Nondiscrimination Act (GINA) was passed in 2008; *see* National Human Genome Research Institute 16.01.11.

[18] Pyysiäinen & Hauser 09.02.10.

[19] They received the Nobel Prize in Physiology or Medicine in 1968 "for their interpretation of the genetic code and its function in protein synthesis". Nobelprize.org-1.

mainstream medical procedures any time soon, at least in the West. But we should remember that in the hands of some dictatorships, technology might be utilized to profit the regime (economically or politically).

All the discoveries of biotechnology notwithstanding, the extended knowledge of genes are not providing humanity with as many answers as expected. The Human Genome Project, which engaged hundreds of researchers from over forty different countries over a period of thirteen years, set out to sequence the whole of the human genome. The project was actually finished four years earlier than planned, in 2001, and led to a series of follow-up project focused on mapping individual human genome.[20] However, the results were not as expected. Rather they led to the idea that what we define as genes have less of an influence on our systems than the field had previously supposed. A number of scientists have published their disillusionment with the science of biotechnology and particularly with the potential of genes as sources of information.[21]

A couple of years back, Harvard psychologist Steven Pinker claimed that we "have entered the era of consumer genetics".[22] No longer the subject solely of scientific research, genetics can today be bought and sold like other consumer items. Genome sequencing has been commodified: any layman can purchase the right to have his own genome sequenced, and at a fairly reasonable price at that.[23] Aquarium fish transformed with GFP are sold commercially. Recombinant DNA technology is being used to grow silk, normally produced by spiders, in yeast cells. DNA tests of paternity, of course, are one of the more familiar products of this revolution. In the chapter on ethics, the implications of this commodification process will be considered.

In the aftermath of the biotechnological revolution, increasing attention has been given to the field of "genethics". A combination of the words genetics and ethics, genethics specifically evolved in order to deal with the particular set of ethical issues that the age of genetics had brought. The people involved in the field seek to procure valid ethical or moral guidelines for the use of biotechnology, and for the employment of the increasing knowledge of matters of

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[20] Frank 2010: 42.

[21] *See for instance* Moss 2003.

[22] Pinker 11.01.09.

[23] Frank 2010: 41. In 2008 the Personal Genome Project, aiming to sequence 100 000 personal human genomes, made this technology available to the volunteers for free.

the genome. It deals with a broad range of questions, such as the patenting of human genes and gene therapy; the possibility of neo-eugenics as a result of the technology to "purify" embryos; the issues of cloning; the use of animals as organ donors; and genetic manipulation in agriculture.[24] Eduardo Kac explains that transgenic art is intended as a comment on the issues in question:

> The use of genetics in art offers a reflection on these new developments from a social and ethical point of view. It foregrounds related relevant issues such as the domestic and social integration of transgenic animals, arbitrary delineation of the concept of "normalcy" through genetic testing, enhancement and therapy, health insurance discrimination based on results of genetic testing, and the serious dangers of eugenics".[25]

In the course of the thesis, I will be discussing to what extent Kac's transgenic artworks express his explicated intentions in relation to these issues.

One of Kac's explicit inspirations for his transgenic art project is genetic art, as produced by George Gessert. Gessert, a pioneer of new media art, has made the breeding of flowers into an art form. Since the 1970s, he has created hybrid irises by exposing different species of the flower to each other in the controlled environment of the greenhouse. Gessert's hybrids could not have occurred in the wild, as they have different bloom times and are often the result of geographically separated species.[26]

The step from this kind of art to Kac's utilization of transgenesis can be seen as a natural result of the evolution of biotechnology. Kac himself claims that "contemporary biotechnology has had the cultural effect of enhancing society's awareness of traditional biotechnology",[27] traditional biotechnology being represented by everything from bread and beer to hybrid plants and purebred animals. The painting "The Farm" (2000) by Alexis Rockman presents an image of the evolution of animals guided by humanity through the millennia, but also shows the grotesqueness of the way we have developed animals to be what we want them to be (Figure 1).

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[24] Durant 1995: 60.

[25] Kac 1998.

[26] Kac & Ronell 2007: 118. Artist/photographer Edward Steichen has done a similar project with delphiniums. The dangerous aspect of Gessert's art, to many, is his encouragement that the audience participate in a process of selection, as an illustration of aesthetics as a selective force in evolution, which can give connotations to eugenics, *see* Design|Media Arts 98T.

[27] Kac 2007: 1.

1. Alexis Rockman, "The Farm", 2000. Oil and acrylic on wood panel, 96" x 120". The painting illustrates how animals as we know them today are the result of human manipulation.

The idea of making transgenic art was launched by Kac in 1998, in the essay "Transgenic Art". Kac's original wish was to create a transgenic dog, "GFP K-9 (Dog)", and this project is in continual development.[28] Green Fluorescent Protein (GFP) is a protein found in the Pacific Ocean jellyfish *Aequorea Victoria*. In its enhanced version, as developed by the scientists Osamu Shimomura, Martin Chalfie and Roger Tsien in the 1990s, EGFP is used to create fluorescent creatures, plants and bacteria across the world.[29] GFP is an ordinary component of transgenic research as its property of fluorescence is helpful in tracing the tiniest, individual components of a cell, making it easier for the scientists to find the component they are looking for. It is widely considered harmless, although research by Prof. S.J. Remington suggests that the reactive oxygen species produced whenever a transgenic mammal is exposed to UV illumination "can lead to host cell death".[30]

In the original transgenic art project, as mentioned, Kac sought to transform a dog with GFP. There are, however, still obstacles to overcome in the *in vitro* fertilization of dogs.[31] Until these have been solved, Kac will have to focus on other biotechnological possibilities. The artist's ideas for transgenic art in general, as well as "GFP K-9" in particular, are enumerated in the manifesto-like essay, "Transgenic art". The choice of the species dog for "GFP K-9"

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[28] Kac 1998.

[29] For their work with GFP, Shimomura, Chalfie and Tsien were awarded the Nobel Prize in Chemistry in 2008, *see* Nobelprize.org-2.

[30] Remington 24.10.06.

[31] *See for instance* Rodrigues & Rodrigues 2010.

was not a random one. Kac emphasizes how humans bred the different breeds of dog from the wolf species, molding dog to be ”man’s best friend”.[32]

Theoretical Foundation

Art is in a state of perpetual transformation. Creativity and innovativeness have come to be seen as vital to art. My intention, in this thesis, is to observe a piece of a phase in the transformation of art, with glances to the past as a means of comparison to and grounds for the evolution of the transgenic art form. I am inspired to this, primarily, by Gilles Deleuze’s “plane of immanence” and Mieke Bal’s “travelling concepts”.

Rather than using a single theorist and examining the empirical material using his or her mode of thinking, I have elected to extract pieces of theory from a selection of thinkers, at times representing very different points of view. My multiperspectival approach, hopefully, will not be perceived as overly eclectic, as I relate to Mieke Bal’s idea of “travelling concepts”. This idea constitutes a sort of framework for the rest of my presentation. I have sought concepts and figures that would help me define some of the characteristics of transgenic art. For this reason, I have looked mostly to recent and contemporary theories.

The person from whom I have borrowed the most ideas is Gilles Deleuze. In the “plane of immanence”, I found a platform for exploring the relationships between transgenic art and various aspects of society. In “affects”, I see an alternative to the traditional idea of the reception of art, at the heart of which is interpretation. Affects, on the other hand, are “intensities” that emanate from the artwork to the spectator, but which (s)he can choose whether or not to take in. I connect this to Jacques Rancière’s idea of the “emancipated spectator”, described in the book entitled thus. I also use Deleuze’s “rhizome”-figure, as a comparison to Nicolas Bourriaud’s “radicant”. Bourriaud’s book *The Radicant* presents a figure that I find useful for defining Kac as a contemporary artist. The books on which I am mainly basing my presentation of Deleuze are *Qu’est-ce que la philosophie?*[33] and *Mille Plateaux*,[34] both of which he wrote with Félix Guattari. My presentation of a range of ethical stands on art is based mainly on Kieran Cashell’s book *Aftershock*.

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[32] Kac 1998.

[33] *Eng. What is Philosophy*? Deleuze & Guattari 1994.

[34] *Eng. A Thousand Plateaus*, Deleuze & Guattari 2004.

In my brief look at the history of art and science, I consider the ideas of Immanuel Kant, who was one of the earliest to distinguish between the two. Kant presented a by now extremely well established idea of formalism in art, and I find it interesting to examine to what extent his eighteenth century definition of art can be applied on our twenty-first century artworks.

Research Questions

Curiosity is endless … in a way that answers are not

- Adam Phillips [35]

In this section, I will attempt to pinpoint some of the questions around which my thesis will revolve. As may be gathered from my choice of the quote above, I tend to find questions even more fascinating than answers – they are more open, and can still conceivably be expanded in any direction. I tend to be very fascinated by theoretical approaches. I have an ongoing love affair with how things are connected, with examining the seams between different matters. Transgenic art is, as I see it, an art form of intricate networks of influences and interrelated issues, any of which can be worth exploring. The choices made within these pages are largely based on my own areas of interest. I try to avoid a reductive approach, and my goal certainly is not to find any "universal truths". What I do hope to achieve is to find what I see as the characteristics of this art, at this point in time, from my point of view.

On a worldwide basis, the question "is this art?" has been prominent in the discussion of the transgenic artworks. Superficially, it may seem difficult to separate the creatures presented by Kac from any other transgenic being. Their difference lies predominantly in their purpose and setting. My hypothesis is that many will react more strongly to something that is presented as art, than they would if the same thing was done for science or in other contexts where it is justified by an objective. And so I ask: what is it about art that rouses this extra attention? And where, consequently, is this kind of art positioned in society?

What is the potential importance of transgenic art? Interdisciplinarity appears to be gaining in importance as many people feel that the influence of another field may enrich their own line of work. Transgenic art is one venture from the art field into another realm, that of biotechnology. It comments directly on the methods and the future of genetic engineering. In

[35] Phillips, quoted in Baker 2000: 39.

doing so, it is positioning itself within the societal discourse. The spectator is awarded a large role (explicitly by the artist as well as in the format of the artworks). In "GFP Bunny", the audience's reaction is appointed as part of the artwork. In such a case, the amount of discussion following the launch of the artwork can be one way of measuring the success of the piece. Such a measurement would probably be more in accordance with the premises of the art form than more traditional qualitative evaluations of the art as "good" or "bad".

Eduardo Kac appears to have a clear vision that he wishes to share with his audience. He explicitly lists a number of issues related to his transgenic artworks. Do the spectators oblige the artist, by taking an interest in the issues he mentions as inherent parts of the transgenic artworks?

In this thesis, I am venturing to determine the depths of some new phenomena and activities within the contemporary art field. The transgenic art of Eduardo Kac is utilized rather like a case study, to try to pinpoint some "tendencies" within the part of the contemporary art field that turns outwards, towards a social context. New media arts do not utilize the traditional materials of fine arts. They are not even, necessarily, confined to a traditional exhibition space. What, then, makes them art?

This thesis is, as we have seen, about transgenic art. But it is also an examination of what "the concept of art" means at our present point in time. In the meeting with Eduardo Kac's art project, I encounter some of the "big questions" of our time. In the *Alba Guestbook*, several people commented that Kac "haspresented [*sic*] new ideas about what art is, can be, will be".[36] What is art, today?

In relation to the questions raised by a number of spectators as to the facts of "GFP Bunny" and "Natural History of the Enigma", I find it interesting to explore the concept of truth as it relates to the artworks. What is the difference between truth, knowledge and belief? Which of these concepts seem to dominate in contemporary art? Does it matter whether art is true? And how do you define truth in art?

Transgenic art holds connotations to issues of great ethical depth. Kac specifically seeks to further the discussion of such issues. A natural question, then, is: Should art be ethical?

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[36] *The Alba Guestbook*: Melody McCoy, 12.11.01.

I suggest that transgenic art is one expression of a trend unfolding in the course of the last two decades, of artworks that question the proceedings within certain fields, by embracing the very tools of their chosen field and using them in a different, often outrageous manner. The debates resulting from the artwork thus center on the field itself, often more than on the artwork. Art of this kind can contribute to furthering public discussion of often-unpleasant themes.

II. On the Artworks and the Artist

Perhaps art begins with the animal, at least with the animal that carves out a territory and constructs a house - Deleuze [37]

Eduardo Kac

Eduardo Kac (1962 -) began his artistic career in 1980, with performances in Rio de Janeiro. In 1983 he invented holopoetry – poems that were created specifically to be displayed holographically. Kac finished his studies in communications theory, linguistics, philosophy and semiotics at Rio's Catholic University in 1985, and later studied philosophy and contemporary theory at Universidade Federal, Rio de Janeiro.

In the mid 1980s, a precursor to the Internet using phone lines to communicate text was active in several countries, Brazil among them. Kac used this technology in several artworks in the telecommunications line, exploring concepts of dialogism and the role of new media in the arts. 1986 saw the birth of a new art form, telepresence, in which a person was enabled to communicate with an audience from a remote location, through the long-distance control of an anthropomorphic robot. This technology was not, at the time, available to the public. The telepresence concept was closely linked to the field of telecommunications, and Kac defines several of his artworks as being both telepresence and telecommunication art.[38] Kac got his Master of Fine Arts from the School of The Art Institute of Chicago in 1990, and now works there as a teacher. In December 2001, he was featured by the magazine *ARTnews* as one of ten trendsetters to watch in the art world.[39]

In 1992, an article of Kac's entitled "On the notion of Art as a Visual Dialogue" was published in *Art-Reseaux*.[40] This is still a core subject in his work today. One could say that Kac's main interest, throughout his entire career, has been the concept of communication. Venturing into semiotics, linguistics, communication theory, and dialogism, he focuses

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[37] Deleuze & Guattari 1994: 183.

[38] KAC 2011.

[39] Britton & Collins 2003: 17.

[40] KAC 2011.

always on two-way communication. He himself defines his background as being primarily in poetry.[41] Gerfried Stocker has described Kac's project as follows:

> Rather than limiting himself to the role of interpreting or commenting, he intervenes directly in the technical-systemic and social-structural constituents, not merely to change traditional artistic patterns and behavioral schemata, but rather to re-invent them.[42]

Kac started making ventures into what can be called the realm of bio art in the early 1990s. His first bio artwork, "Essay Concerning Human Understanding", was presented in 1994. In this piece, a bird in a cage communicated with a plant, via a microphone at the top of the cage. In 1997, "A-Positive" and "Time Capsule" in different ways addressed the relationships between humans and machines. Kac created "A-Positive" with Ed Bennett, one of his colleagues at School of the Art Institute of Chicago. In this artwork, a robot and a human being were connected via an intravenous needle, feeding one another. The "biobot", as Kac named it, received blood from the human body, extracting enough oxygen from it to sustain a small, feeble flame – a classical sign of life. The human, in return, got dextrose from the robot, in a symbiotic relationship.[43] The way the robot extracted oxygen from the hemoglobin molecules of the blood is similar to the way we ourselves breathe, oxygen being transported from our lungs to our cells attached to the hemoglobin. Kac broke the borders of the body in order to speculate on the possible "lifelike" properties machines could have in the future. [44]

In "Time Capsule", Kac became the first human being to have a microchip (of the kind used to trace pets) injected in his own body. The artist performed the injection himself, in a happening in Sao Paolo, Brazil. He then registered himself online, in a database located in the United States, giving his own name both as animal, and as owner.[45] Both of these artworks were examples of body art, requiring under-the-skin participation from their human subject.

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[41] Kac 19.10.10.

[42] Stocker, in Kac 1999: 41.

[43] KAC 2011.

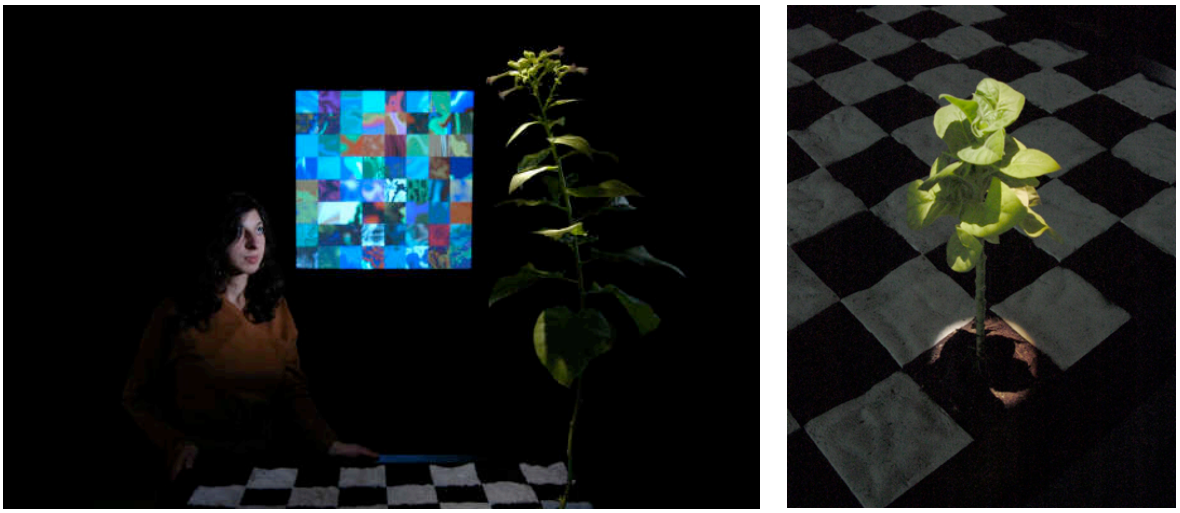
[44] Kac 2004: 225.

[45] KAC 2011.

Transgenic Art

A year later, in 1998, Kac launched the idea of "Transgenic Art" in the text thus entitled, described in the introduction. From there, the project escalated quickly, with the creation of "Genesis" in 1999 and "GFP Bunny" in 2000. We will be discussing these pieces at length, but first, let us look at Kac's other major transgenic artworks. I have chosen to include these, as well, to show how Kac is consistently adding layers to the same project: a social investigation of the possibilities of transgenic creatures, particularly of their capacity for communication.

Move 36



2. "Move 36", 2002/04. Mixed installation. Transgenic plant, earth, sand, animated videos.
Left: from solo exhibition at Galerie Biche de Bere, Paris, 2005. *Right*: Detail of plant.

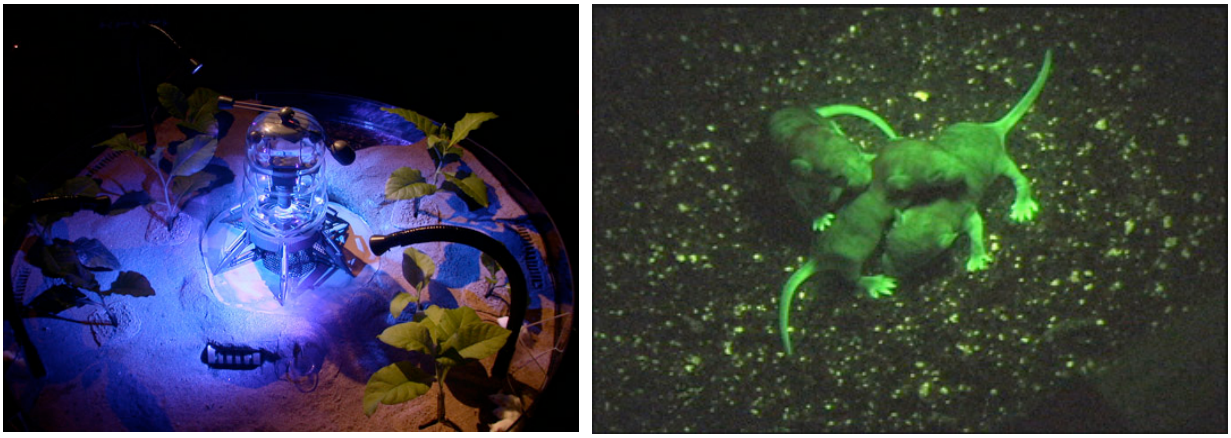
"Move 36" (Figure 2) featured a tomato plant that contained a synthetic gene created by translating the famous statement "Cogito ergo sum" into a DNA code, thus producing the "Cartesian gene". Coupled with the Cartesian gene was a gene causing the leaves of the plant to curl, thus giving a visible affirmation of the presence of the Cartesian gene. "Move 36" was made in reference to the chess match played by chess world champion Gary Kasparov against the computer Deep Blue, in 1997.[46] More specifically, it referenced a particular move made by Deep Blue, where the computer's choice was unexpected and subtle, and unnerved Kasparov enough to throw him for the rest of the game. The tomato plant was placed in a "chessboard" of earth and white sand, at the exact location of the famous move. On opposite

[46] KAC 2011.

sides of the "board", video projections consisting of multiple squares showed short animated loops. The varying patterns evoked the vast number of paths possible in a chess match. "Move 36" is emblematic of the intelligence of the machine triumphing over the human brain.

The Eighth Day

Kac's transgenic art project was merged with his earlier work in telepresence in this 2001 piece, which includes a biobot, as well as transgenic specimens, in the closed environment of a dome (Figure 3). This was indeed a world of artificiality, or, as N. Katherine Hayles calls it, a transgenic ecology.[47] The biblical line from "Genesis" was taken up again in this artwork. The title alludes to the Biblical seven days of the Creation of the world, and adds an extra day for the new, fluorescent creatures. The artwork includes GFP plants, -amoebae, -fish and –mice, in a visualization of how it would be if these new species were allowed to interact with the world. Hayles contends that GFP "can be understood as the mark of the human on the fish, mice, tobacco plants and amoebae coinhabiting the dome".[48]



3. "The Eighth Day", 2001. *Left*: View of dome. *Right*: Detail: Transgenic mice.

As of today, research subjects of GFP modification live their lives in the confines of the laboratories. Kac wishes to show how they could have been integrated in the outside world. Kac collaborated with a range of biologists who created the GFP creatures for the exhibition, as well as hardware designers and fabricators who contributed to the production of the biobot.

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[47] Hayles 2003: 79.

[48] *Ibid*.

Cypher

Kac's last transgenic artwork to date is "Cypher" (Figure 4), created in 2009. A DIY transgenic kit is at the center of the piece, allowing the "viewer/reader/user" to physically transform bacteria with synthetic DNA.[49] The DNA was created with an encoded translation of a poem Kac wrote for the artwork. The bacteria, normally pale, turn a glowing red when injected with the synthetic DNA. The kit, of stainless steel, is shaped to open up "in two halves, like a book".[50] Kac determines the key poetic gesture of the artwork to be "to place in the hands of the viewer the decision and the power to literally give life to the artwork".[51] The piece bears a resemblance to Kac's "biotopes", also bio artworks (although not transgenic). Biotopes are living pieces that change during the exhibition period. They hang on the wall and may initially look like abstract paintings, but consist of thousands of microbes in a medium of earth, water, and other materials.

4. "Cypher", 2009. DIY transgenic kit. Petri dishes, agar, nutrients, streaking loops, pipettes, test tubes, synthetic DNA, booklet, 33 x 43 cm (approx. 13" x 17"). Bacteria here showed transformed and glowing red.

Kac describes the crossing of different breeds as "interspecies communication".[52] All of Kac's transgenic artworks are resultant of collaborative efforts by teams of scientists and artists, and

[49] KAC 2011.

[50] *Ibid*.

[51] *Ibid*.

[52] Kac 1998.

as such are all interdisciplinary in nature, as well. When Kac stresses his role as creator, it is, in essence, more as a mastermind. Artists have always had helpers, as he pointed out to me, from Da Vinci and Rembrandt to Serra.[53] It is the artistic idea that matters. That is the creative process, according to Kac. Everything that follows is just a matter of producing it.

Genesis

"Genesis" (Figure 5) is Eduardo Kac's first transgenic artwork, presented in 1999. The sentence "Let man have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moves upon the earth" was translated into Morse code. Using a system where all dashes were represented by the letter T (thymine), dots by C (cytosine), word spaces by A (adenine), and letter spaces by G (guanine), the Morse code was converted to make up DNA base pairs (Figure 6, *Left*).[54] Kac named the resulting gene the "artist's gene". The gene was cloned into plasmids, and incorporating these into E. coli bacteria, a colony of synthetic bacteria was created (Figure 6, *Above*). The bacteria contained a mutated version of GFP called "Enhanced Cyan Fluorescent Protein" (ECFP), and glowed blue when exposed to ultraviolet radiation.[55] Along with another colony of E. coli bacteria containing "Enhanced Yellow Fluorescent Protein" (EYFP),[56] the transformed "Genesis" bacteria was placed in a Petri dish in a room at the O.K. Center for Contemporary Art in Linz, Austria, in September 1999. The show was part of the Ars Electronica Festival 1999.

The bacteria in the Petri dish were also shown vastly magnified on one of the walls of the exhibition gallery. Broadcast through a microvideo camera, the bacteria glowed large and colorful, in a play between micro and macro perspectives. The original sentence from the Genesis, the translation to Morse code and the resulting DNA code were all displayed on the other three walls. A UV light box and a microscope illuminator made up the rest of the frame for the exhibition. "Genesis" also had an original score of music, composed by Peter Gena. Guidelines for the music were set up by Kac and Dr. Charles Strom, Director of Medical Genetics at the Illinois Masonic Medical Centre, who also performed the bacterial cloning.

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[53] Kac 19.10.10.

[54] Kac 1999: 49.

[55] KAC 2011.

[56] The EYFP bacteria did not contain the Genesis gene.

5. "Genesis", 1999. Transgenic net installation. *Left*: View of exhibition room showing (*from left*) DNA code, enlarged broadcast of the bacteria, Petri dish with bacteria on pedestal, English sentence.

Right: Top of pedestal, with (*from left*) microscope illuminator, UV light box, Petri dish with bacteria, microvideo camera. This set is connected to two networked computers and a video projector.

During the exhibition period, mutations naturally occurred in the bacteria. In addition, the audience was enabled to contribute to the art piece, both in the gallery and over the Internet, by the simple act of pressing a button. This activated UV radiation, making the bacteria fluoresce yellow and blue and contributing to mutations. After the show, the mutated DNA was translated back into Morse, then into English (Figure 6, *Left*), and the resulting new sentence was posted on Kac's website.[57] When the bacterial code is translated back to English, the actual sentence is changed. It no longer directly reflects the content of the Biblical sentence. The change can inspire us to rethink the ancient idea that humans, as the caretakers of the rest of creation, are entitled to decide the fate of other living beings. In the *Boston Globe* article "Cross hare: hop and glow", Kac suggested that the process of the sentence in the artwork was "an expression of humility".[58]

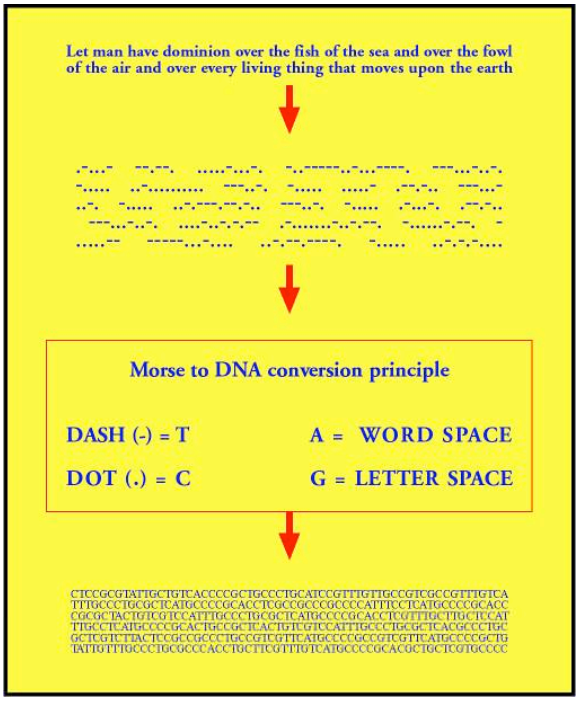
The original sentence used in "Genesis", a compressed version of a sentence out of the Biblical Genesis, was chosen by Kac to draw attention to "the dubious notion – divinely sanctioned – of humanity's supremacy over nature".[59] The choice of Morse is explained by Kac as a representation of the dawn of the information age, the "genesis of global

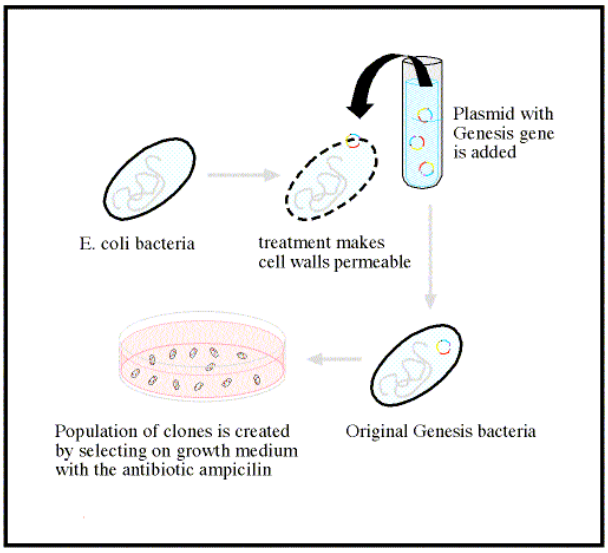
[57] KAC 2011.

[58] Cook 17.09.00.

[59] KAC 2011.

communications".[60] Again, communication comes into play. Contact is made between the two bacteria as they grow and mutate, new color combinations occurring with the conjugal transfer of plasmid. Kac described this process as "transgenic bacterial communication".[61] Transgenic bacterial communication is shown in the combination of three visible evolutions of the bacteria: The bacteria can keep their plasmids, maintaining their cyan and yellow colors, or they can loose their plasmids, resulting in a pale, ochre color. If the ECFP bacteria donate their plasmid to the EYFP (or vice-versa), green bacteria appear, reintroducing the "original" Green Fluorescent Protein, the base for both EYFP and ECFP, to the artwork.





6. "Genesis", 1999. Illustrations.

Left: Conversion principle.

Above: Transformation of bacteria.

The "Genesis" artwork was expanded in 2001, when Kac created a series of new artworks motivated by the original "Genesis" piece. The series comprises "Encryption Stones", "Fossil Folds", "Transcription Jewels", "The Book of Mutations", "In our own image I" and "In our own image II". "Encryption Stones" (Figure 15) is a laser-etched granite diptych with the original and mutated sentence featured in English, Morse and DNA code. "Fossil Folds" consists of a series of 12 carved granite works, with shapes evoking runic inscription. The

[60] Kac 1999: 50.

[61] *Ibid*.

artist's home page suggests that this system of protowriting "critically exposes the conflation of tropes of life and script in molecular biology".[62]

"Transcription Jewels" (Figure 19) consists of DNA from the actual "Genesis" bacteria, crystallized inside a glass "genie bottle", and a gold cast of the "Genesis" protein. Displaying the key elements of the biotech revolution in valuable materials, the artist makes an ironic comment on the process of commodification affecting even "the most minute aspects of life".[63]

7. "The Book of Mutations", 2001 (from the "Genesis" series). Five giclee prints, each 20" x 20" (50 x 50cm).

"The Book of Mutations" (Figure 7) is a series of five giclee prints, the first print featuring the Petri dish of bacteria as seen under white light, the last as seen under ultraviolet light. The three prints in between show different mutated versions of the sentence "Let man have dominion over the fish of the sea, and over the fowls of the air, and over every living thing that moves upon the earth", portrayed in a spiral form. In the second print, for instance, the word "MOVES" has become "IOVES", one connotation of which can be "LOVES", and the word "MAN" has become "AAN". In the third print, "MAN" has become "AND". The hues of the middle prints also provide a transition between the first and the fifth, the second being lighter in color, the fourth very close to the bluish hue of the fifth print. "In our own image I and II" are video installation pieces, one showing moving images of "Genesis" bacteria, the other the three-dimensional "Genesis" protein.[64]

"Genesis" was partially funded by the Daniel Langlois Foundation, Montreal. The Foundation, which in 1999 was only two years old, is a charitable organization with the aim

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[62] KAC 2011.

[63] *Ibid*.

[64] Kac 2004: 260.

of bringing art and science closer together.[65] The Institute for Studies in the Arts, Arizona State University, Tempe, provided the remainder of the funding. Since its opening show in Linz, "Genesis" has been exhibited in roughly forty locations on four continents.[66] Reactions have at times been fierce, which can be seen as a testimony to the philosophical and religious potency of the piece. Lately, the interest in "Genesis" for exhibitions has dwindled. The artist himself sees the lessening in offers to show the piece as a result of our changing times.[67] Perhaps the decade that separates us from the conception of the piece has been enough to make the audience blasé to this kind of biotechnology?[68]

GFP Bunny (Alba)

"GFP Bunny" was, as I have already mentioned, Kac's most interest-provoking artwork to date. It caused a storm of responses from interested parties as well as the general public, generating in a series of response-waves starting with the launch of the artwork in the summer of 2000. Alba the bunny was actually only one out of a selection of rabbits that had been genetically modified with Green Fluorescent Protein (GFP) by the scientists of the INRA (l'Institut national de la recherce agronomique). The French laboratory is one of the leading research facilities of the world – in July 2010 it was named one of the top ten places to work in academia by American monthly *the Scientist*.[69]

Eduardo Kac recounts that he originally conceived of the "GFP Bunny" artwork as a result of the email correspondence between himself and Louis-Marie Houdebine, who was at the time in charge of the transgenic animals at INRA.[70] Transgenic rabbits were already being created and kept at the INRA facilities at Jouy-en-Josas, France, and used in research, mostly in the search for a gastroenteritis vaccine. The research proved successful in 2005, when a patent was issued by the Institute for the production of recombinant virus proteins in the milk of

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[65] La fondation Daniel Langlois 2011.

[66] KAC 2011.

[67] Kac 19.10.10.

[68] *Ibid*.

[69] Urban 2010.

[70] Kac 19.10.10.

transgenic rabbits.[71]

Kac emphasizes how "GFP Bunny" is not an appropriated artwork. The original idea for the artwork was the act of ordering the bunny, its being sent to Kac's home in Chicago and the ensuing coexistence of the rabbit with Kac's family, as well as the reactions of the public to the piece. The first phase of the project was completed in February 2000 with the birth of Alba in Jouy-en-Josas, France. The second phase is the ongoing debate, which started with the first public announcement of Alba's birth. Kac made the announcement in the context of the Planet Work conference, in San Francisco, on May 14, 2000.[72] Originally, Kac had planned to make a happening out of the arrival of Alba in Chicago, an event that would be called *"Descente sur l'herbe"* (a play on Edouard Manet's *"Dejeuner sur l'herbe"*).[73] That would start off the third phase of the project, in which the bunny would become part of Kac's family and live with them from that point on. However, the rabbit never made it to Chicago. The then-Director of the INRA did not approve of using a transgenic research animal for an artwork, and refused Houdebine the right to deliver Alba to Kac. The artist reacted with outrage, and started a campaign that was to last for years, involving debates, happenings and bunny-inspired artworks. "Free Alba" became a slogan, seen in newspapers, on Kac's homepage and in numerous public interventions.

A key person in the evolution of the "GFP Bunny" project was Louis Bec, "zoosystemician", artist and curator, who was at the time the Director of a festival called Avignon Numerique (Digital Avignon), which celebrated the status of the French city of Avignon as European Capital of Culture of the year 2000. *The Boston Globe* relates that Bec was the one who referred Kac to Houdebine, after Kac told him about his idea for a glowing dog.[74] According to the artists' plan, "GFP Bunny" was to be exhibited in Avignon, as part of the festival program, in June 2000. However, with the refusal of the Director of INRA to send Alba to Kac, the planned exhibition had to be restructured.[75]

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[71] INRA press service 01.12.05.

[72] KAC 2011.

[73] Kac 19.10.10. The French "sur l'herbe" can be translated both as "in nature" and "in the green".

[74] Clark 17.09.00.

[75] Bec 2000.

8. “GFP Bunny”, 2000. Transgenic artwork. Alba is shown glowing green, illuminated with blue light (UV light, maximum excitation at 488 nm).

When the INRA would not surrender the glowing bunny to Kac, the media circus began. *The Boston Globe* was the first newspaper to write about how the INRA laboratory would not, after all, send the rabbit to Kac. They reported Louis-Marie Houdebine at INRA to have said that, though his group worked with transgenic rabbits, he “had "never considered" whether an entire animal would glow in the dark”.[76] In mammalians, the standard procedure is for only some cells to be fluorescent. According to this account, then, Alba was indeed unique, glowing brighter than the other transgenic rabbits. Kac claimed he had ”ordered” Alba to be made specifically from the INRA, whereas Houdebine maintained that Kac had chosen that specific bunny among other fluorescent rabbits upon his visiting the laboratory.[77] The scientist also reacted to the picture Kac presented of the rabbit (Figure 8), saying that the brightness and evenness of her green color was such that the picture had to have been Photoshopped.[78] Varying versions of their stories were circulated through hundreds of newspapers worldwide.

In 2002, the American journalist Kristen Philipkoski caused a new stir around the artwork when she reported, in *Wired Magazine*, that Alba was now dead.[79] Her intelligence was from

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[76] Cook 17.09.00.

[77] Houdebine was, according to Kac, under pressure from his superiors. Kac 19.10.10

[78] Philipkoski 08.12.02.

[79] *Ibid*.

a phone conversation with Louis-Marie Houdebine. In the article, "RIP: Alba, the Glowing Bunny", she also reported that Houdebine had said the rabbit was four years old at the time of her death, whereas Kac claimed she was only two and a half years old, having been ordered particularly by him for the project. In the same article, Kac denied Alba's being dead, arguing that it was merely an attempt of the INRA's to put an end to the critical reactions of the public.

Many artists prefer not to talk about their own artworks, maintaining that they are open to interpretation. Kac, on the other hand, is an artist of the "manifesto caliber". He has written numerous articles on his art, explaining in detail the implications he feels that it might have. In the case of "GFP Bunny", he named a total of nine core issues:

> 1) ongoing dialogue between professionals of several disciplines (art, science, philosophy, law, communications, literature, social sciences) and the public on the cultural and ethical implications of genetic engineering; 2) contestation of the alleged supremacy of DNA in life creation in favor of a more complex understanding of the intertwined relationship among genetics, organism, and environment; 3) extension of the concepts of biodiversity and evolution to incorporate precise work at the genomic level; 4) interspecies communication between humans and a transgenic mammal; 5) integration and presentation of *GFP Bunny* in a social and interactive context; 6) examination of the notions of normalcy, heterogeneity, purity, hybridity, and otherness; 7) consideration of a nonsemiotic notion of communication as the sharing of genetic material across traditional species barriers; 8) public respect and appreciation for the emotional and cognitive life of transgenic animals; 9) expansion of the present practical and conceptual boundaries of artmaking to incorporate life invention.[80]

With the change in the artwork caused by the INRA's refusal to deliver the bunny to Kac, yet another dimension was added. This unforeseen alteration was, perhaps, the main reason why the glowing bunny made international news. The controversies surrounding the circumstances of the "GFP Bunny" artwork seem only to have stirred the interest of the audience. Kac considers the reactions of the public a part of the artwork, and from 2000 to 2004 the audience could write their input in the *Alba Guestbook* on the artist's website, ekac.org. The artist's book *It's not easy being green* (2003) compiled a montage of audiences' reactions, ranging from excerpts from the *Guestbook,* through cartoons, to newspaper headlines. "GFP Bunny" is, without a doubt, the most discussed and debated artwork in Kac's transgenic oeuvre.

In addition to the pieces already mentioned, Kac has created several artworks in the "GFP

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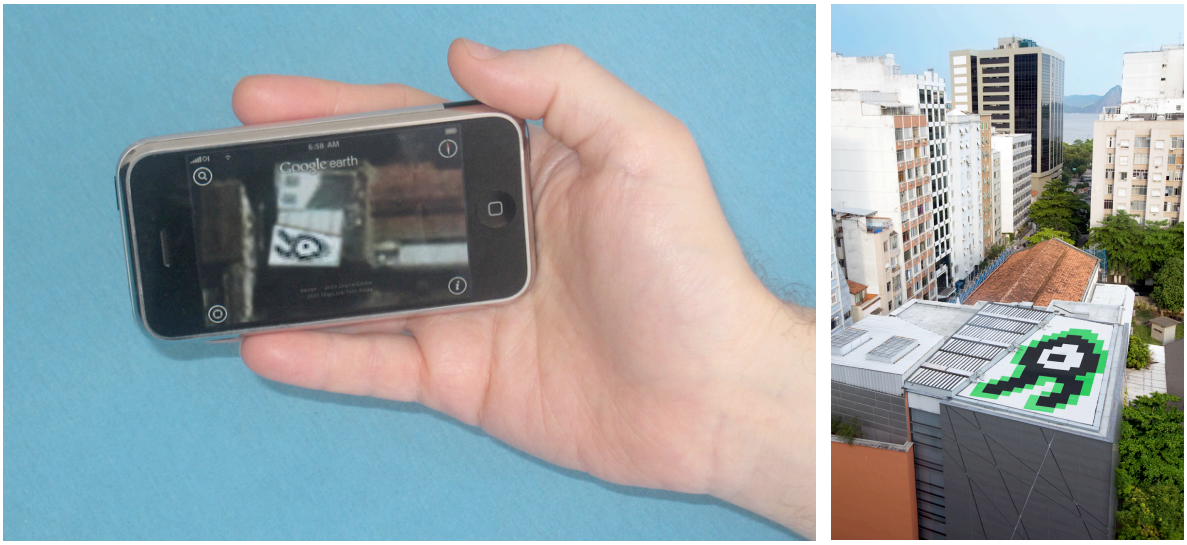
[80] Kac 2004: 265-66.

Bunny" series. In the first few years, when the artist seems to have had hope that he might still get his domestic green rabbit, the pieces evolved around the "Free Alba" slogan. In addition to the pictures of the bunny, there is, for instance, "the Alba Flag", raised outside the artist's house in Chicago in 2001. "Boulevard Alba" from 2006 is a sculpture in the shape of a French street sign, with the inscription "Hommage de la France à la lapine verte en reconnaissance de sa contribution exceptionnelle à la défense du droit des nouveaux êtres vivants".[81]



9. "Lagoogleglyph I", 2009 (from the "GFP Bunny" series). Google Earth work composed of pixelated lagoglyph of rabbit's head at the roof of the Oi Futuro building, Rio de Janeiro, Brazil.

The series "Free Alba" (2001-02) consists of a range of large-scale photographs and drawings. Kac also made a digital interactive piece called "The Alba Headline Supercollider" (2004), in which the audience was encouraged to collide existing headlines about the "GFP Bunny" artwork into new, sometimes absurd sentences. Alba also inspires several series of lagoglyphs. Lagoglyphs are a type of graffiti evolved by the artist, in which he utilizes the colors green and black to create swirls and splashes evoking connotations of moving rabbits, erupting volcanoes etc. In 2009 came the "Lagoogleglyph I", a pixelated lagoglyph referencing a rabbit's head, which was designed to be viewed through a Google satellite

[81] *Eng*. "Homage of France to the green bunny in recognition of her exceptional contribution to the defense of the rights of the new living beings". KAC 2011.

(Figure 9).[82] The situation of the bunny shape in Rio de Janeiro adds the dimension of origins to the artwork, Brazil being Kac's country of birth. For the exhibition at the Enghien-les-Bains Art Center in 2011, the artist placed a second "Lagoogleglyph" shape at the Square de Villemessant in Enghien-les-Bains, France. This second version could be seen from the air and via satellites.[83] Alba having been born in France, there is a certain continuity, almost a sense of "full circle", to having the image of the bunny imprinted both in the landscape of the artist's birth land, and in that of her own.

Kac stresses that "GFP Bunny" is a *social* project. He, as a transgenic artist, is interested "not in the creation of genetic objects, but in the invention of transgenic social subjects".[84] What matters, he states, is "the completely integrated process of creating the bunny; bringing her to society at large; and providing her with a loving, caring, and nurturing environment in which she can grow safely and healthily".[85] His hope is that the process can place genetic engineering "in a social context in which the relationship between the private and the public spheres are negotiated".[86]

Natural History of the Enigma

"Natural History of the Enigma" (2003/08), like the other transgenic artworks discussed here, is composed of several components. The star of the piece is the Edunia (Figure 10), a genetically engineered petunia in the veins of which runs the DNA of the artist. Kac refers to the hybrid flower as a "plantimal".[87] Remarkably, the Edunia looks like any regular petunia. The potency of the artwork is not in its visual aspect, although Kac himself stresses the similarity of the red veins of the flower to the human vascular system. More shocking to the spectator are the potential implications of the use of this type of biotechnology. The weaker visual effect is probably part of the reason why "Natural History of the Enigma", in contrast

[82] KAC 2011.

[83] Kac 21.01. - 10.04.11.

[84] Kac 2004: 271.

[85] *Ibid*.

[86] *Ibid*.

[87] KAC 2011.

to the huge waves of attention caused by "GFP Bunny", only caused weak ripples of interest when it was exhibited in 2009.

10. "Natural History of the Enigma", 2003/08. The Edunia, transgenic flower with artist's own DNA expressed in the veins. Collection Weisman Art Museum.

In addition to the Edunia, the series contains lithographs, seed packs, watercolors, photographs and a large-scale public sculpture. "Natural History of the Enigma" was made in collaboration with professor Neil Olszewski of the Department of Plant Biology and professor Neil Anderson of the Department of Horticultural Science, both at the University of Minnesota. The artwork was first exhibited at the Weisman, the art museum of the same university, between April and June of 2009. Kac won the Ars Electronica Golden Nica in 2009 with this piece, in the category of Hybrid Art.

In the process of creating the Edunia, Kac's gene, isolated from his blood, was cloned. The scientists created a synthetic bacterium by fusing the clone together with an antibiotics (kanamycin) resistant gene. A leaf of a petunia was exposed to a bacterium containing Kac's cloned gene (Figure 11). The bacterium used was agrobacterium tumefaciens, which in its natural form creates tumorous growths on plant stems through *transforming plant cells into nutrients for itself*. Agrobacterium tumefaciens is regularly utilized in laboratories to transform plant cells.[88]

In the case of our artwork, the bacterium melded the cloned gene into the cells of the leaf, whereupon it was exposed to antibiotics. The cells containing Kac's gene consequently survived, when the others died. The hybrid gene was allowed to multiply, forming a callous, a homogenous bulb of undifferentiated cells. The growth of the callous was manipulated with

[88] Olszewski 28.10.10.

two different hormones, auxin and cytokinin. After a period of growth, a higher amount of cytokinin was introduced, inducing sprouts. The sprouts were kept in a high humidity environment to make them root.[89] Out of these humble, controlled origins, the Edunia grew.

Kac chose to use an immunoglobulin G fragment (IgG) from the light chain of his chromosome number 2. The blood was drawn from his body, and the IgG fragment isolated and cloned. IgG is a protein that functions as an antibody, identifying and repulsing foreign bodies. By fusing this particular protein with a plant, a representative of the other, Kac wishes to draw attention to the contiguity of all living things.[90]

Kac's gene is expressed only in the flower's vascular system. This was ensured by a promoter called CoYMV (Commelina Yellow Mottle Virus), created by Neil Olszewski, which drives the expression of a gene only in the veins of the plant. Kac's gene thus is not present in the other parts of the plant. They were able to establish this positively by using the enzyme GUS (beta glucuronidase) as a marker. The enzyme was fused to Kac's IgG fragment, and its activity could be traced using histochemical analysis of the chemical components of the flower's cells. GUS is a bacterial enzyme that has the ability to hydrolyze a compound. It is colorless, but can be cleaved into two blue colored pieces.[91] The method is similar to the staining technique used to spot irregularities in the human vascular system.

"Natural History of the Enigma" was not the first bio art piece made by Eduardo Kac, in which a plant was the protagonist. In one of Kac's early bio artworks, "Teleporting an Unknown State" (1994/96), a plant seed was kept in total darkness, photosynthesis and growth only occurring with the help of remote participants, who triggered light via the Internet. In this piece, the Internet was "used as a life support system",[92] without which the seed could not have grown into the plant that it eventually became. Recall also how "Move 36", described earlier in this chapter, featured a transgenic tomato plant. "Move 36" represented the intelligence of the computer triumphing over that of man. "Natural History of the Enigma", on the other hand, emphasizes the idea that human beings are not that different from the rest of nature.

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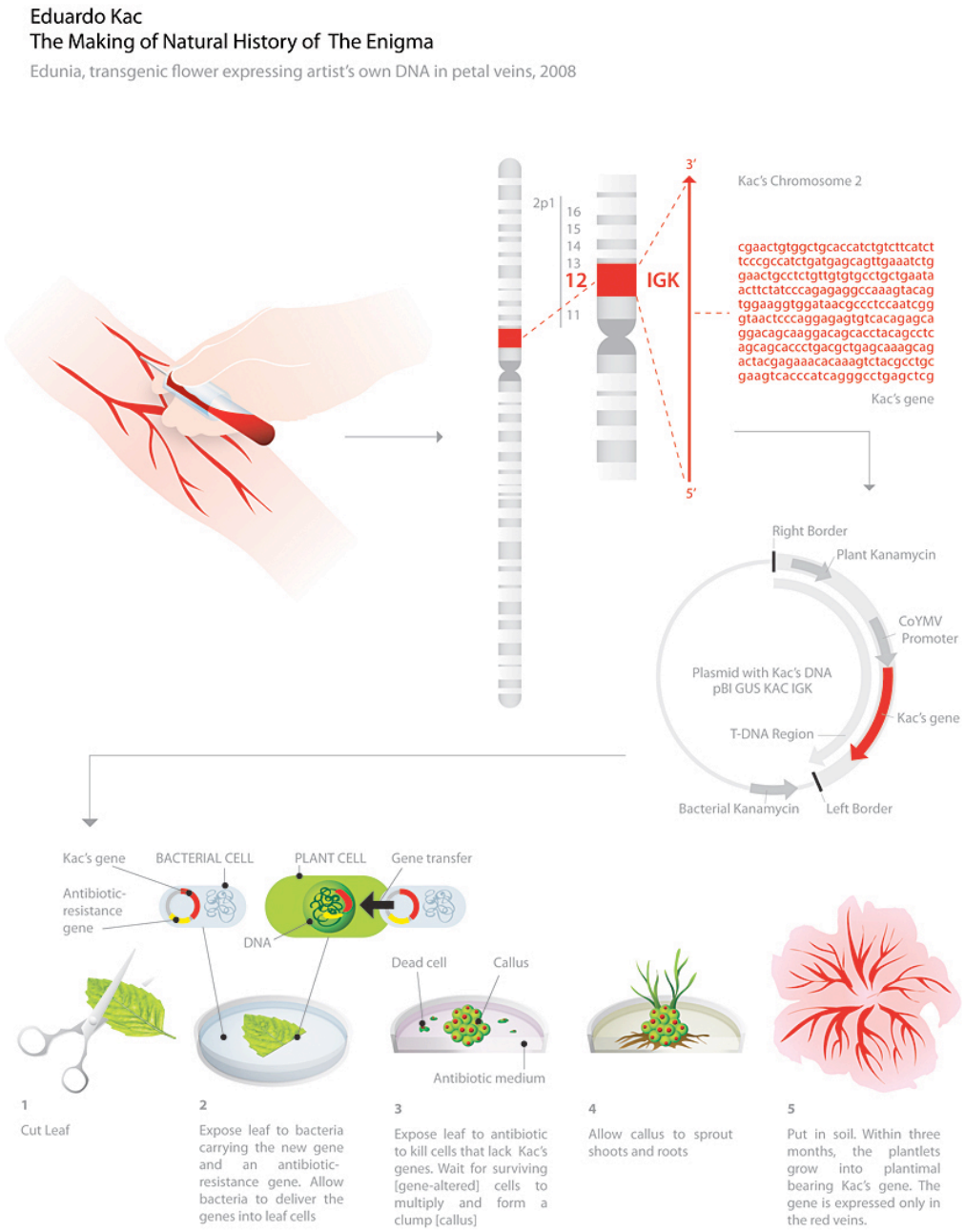
[89] Olszewski 28.10.10.

[90] KAC 2011.

[91] Olszewski 28.10.10.

[92] KAC 2011.



11. Illustration.

As Kac utilizes his own blood for the "Natural History of the Enigma" project we can, in addition to bio art, also call it body art. In "A-positive", Kac broke the borders of the body in order to speculate on the possible "lifelike" properties machines could have in the future.[93]

[93] Kac 2004: 225.

"Natural History of the Enigma" speculates in the possibilities of crossbreeding humans with other species. The bioethical element is strongly present. The question being asked is, ultimately, "what is life?" What does it mean to be human? How should we relate to the creatures that we share this world with? Will we at some point have human beings with wings, or gills, or machines incorporated in their bodies? How should we tackle the fact that this is already a technological possibility?

The title of this piece is intentionally ambiguous and poetic. The ambiguity grants us the freedom to easily make interesting connotations. The term "natural history" was widely used during the 1700s, employed qualitatively and descriptively. It was the complement of natural philosophy, which focused more on explaining why the world is the way it is. In our own time, "natural history" signifies subjects concerning themselves with living organisms and the matters of the earth.[94] Referring to the "GFP Bunny" project, Kac claims that transgenic art "acknowledges the human role in rabbit evolution as a natural element, as a chapter in the natural history of both humans and rabbits, for domestication is always a bidirectional experience".[95] This same reasoning is extended to include the Edunia, and the title of the artwork is probably inferred from this. The word "enigma" is often used to describe something mysterious, and is the name of a metaphorical or allegoric riddle, the solving of which demands great ingenuity. The word could connote to Kac's explicit intention of contributing to the solving of the difficult problems concerning genetics and hybridization.

The visual aspect of the petunia was not altered with the introduction of the human gene. However, Kac repeatedly emphasizes the similarity of the vascular system of the flower to human veins. On his website, he writes that the pink background of the petals, "against which the red veins are seen, is evocative of my own pinkish white skin tone. The result of this molecular manipulation is a bloom that creates the living image of human blood rushing through the veins of a flower".[96] He goes on to say that to create the Edunia "with red veins in which my blood gene is expressed I made a chimeric gene composed of my own DNA and a promoter to guide *the red expression* only in the flower vascular system".[97] This can easily lead to the misapprehension that the vascular system of the petunia is red because of the

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[94] DanBIF 2010.

[95] KAC 2011.

[96] *Ibid*.

[97] *Ibid*. *My emphasis*.

presence of human blood. However, the expression being guided in the vascular system is that of the gene itself, whilst the redness of the veins was already present in the original petunia.[98]

Originally, Kac wished for a more dramatic visual effect. His team of scientists experimented with several different strands of petunia, some of which transformed more successfully than others. One of the early ideas was to genetically manipulate an all white petunia, to give it red veins containing Kac's gene.[99] The petunia finally chosen by Kac was selected for its visual properties. According to Neil Olszewski, the human gene is visible under a microscope, but has had no impact on the visual aspect of the flower.[100] It does not make the artwork less groundbreaking, but I think it interesting that Kac chose to continue to emphasize the visual element. It gives the impression of an artist who, for better and for worse, values the idea more than the result. This goes to show the close relation of Kac's project to Conceptual art.

12. "Singularis", 2008 (from the "Natural History of the Enigma" series). Permanent public sculpture, St. Paul, Minnesota, fiberglass and metal, 14'4" (height) x 20'4" (length) x 8'5" (width). [101] Collection Weisman Art Museum, Minneapolis.

The public sculpture "Singularis" (2008) is intended to illustrate the hybrid protein created in the merging of Kac's DNA with that of the petunia (Figure 12). It was actually the fountainhead for the rest of the artwork, as it was a commission by the University of Minnesota. Its color is a clear red, reflecting the presence of Kac's blood in the art piece. Kac used 3D imaging and rapid-prototyping in order to achieve a visualization of his IgG light

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[98] Olszewski 28.10.10.

[99] *Ibid,* and LeFevre 13.05.09.

[100] Olszewski 28.10.10.

[101] 4,2672 x 6,096 x 2,4384 m.

chain merged with the petunia's anthocyanin1, which is responsible for the flower's pigmentation.

"Singularis" represents several dichotomies. The contrast between the microscopic and the monumental is one that Kac had earlier explored in the "Genesis" piece. One could argue that "Singularis" is a type of nano art, i.e. art portraying the shapes of molecular structures on the atomic level (nano landscapes) in vastly magnified formats. The aesthetical aspect is important in nano art, although the focus on science – what we actually know about the nano landscapes – is an integral part of this art form. An important goal for nano artists is to communicate the progress of nano technology to a larger audience.[102] This goal can easily be seen in context with the communication aspect of Kac's transgenic art project. With this sculpture, Kac also explores another dichotomy, the one between the ephemeral and the lasting: "Singularis" is a permanent sculpture, whereas the cell material of the hybrid flower is in a perpetual process of change. The sculpture is placed outside the Cargill Center building at the St. Paul Campus of the University of Minnesota. It cost 65 000 dollars, and was paid for by a state-funded program.[103]

With reference to a future commercial sale of the hybrid flower, Kac designed six individual seed packs (Figure 13), which were exhibited alongside the flower. The seed packs are shaped to look like butterflies, to bring to mind the natural fertilization process of petunias, the flowers being pollinated by insects. The packs function as an extra reminder that this particular flower was created in a very different way. According to Kac's website, the seed packs were intended to be showed in a closed position, held together with embedded magnets, and the audience was to be invited to open them.[104] In the exhibition at the Weisman, the seed packs were encased in glass, carefully folded in different positions.[105]

The printing on the packs informs about Exposure and Bloom Period, and provides Growing Notes. Kac addresses the audience directly with this sentence:

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[102] Orfescu 2009.

[103] Abbe 17.04.09.

[104] KAC 2011.

[105] Muessig 28.10.10.

> A prolific bloomer, the Edunia is free flowering in the garden and weather tolerant. It is an annual that will grow ten to fourteen inches (25-30 cm) high with 4-inch red-veined wavy-edged blossoms. Good timing and uniformity in flowering guaranteed![106]

In reality, it is completely unlikely that the seeds of the Edunia will ever be sold. The guidelines of the American National Institutes of Health for biological safety do not allow for artificial creations to spread to nature and crossbreed with regular petunias. Almost all of the seeds of the Edunia will eventually be destroyed, although a few will be kept in the Weisman Art Museum as part of the permanent exhibition there.[107] Kac's wish to sell the seed packs in the open market is grounded in the idea that the Edunia can become an integrated part of our natural environment. For him, that is an ideal scenario, but to others it may appear as a biological nightmare.

13. "Edunia Seed Packs," 2009 (from the "Natural History of the Enigma" series). Hand-made paper objects with Edunia seeds and magnets, 4" x 8" (10,16 x 20,32 cm) each. Collection Weisman Art Museum, Minneapolis.

Kac himself stresses how genetically modified "monocrops" are disturbing the local flora, in some cases causing whole species to be extinguished. The creation of new species at the hands of artists, he suggests, can be one way of paying back our environmental debts. He

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[106] KAC 2011.

[107] Muessig 28.10.10.

feels that artists have a responsibility to counteract the extinction of species.[108] Professor Neil Olszewski, in an obvious stab at all the genetically modified, subsidized corn produced in the USA, states that the genetic manipulation of the petunia will "have more use in an art gallery than in a cornfield".[109]

The Edunia is far from the first plant to be transformed with human DNA. For at least twenty years, scientists have been experimenting with plants as hosts for different proteins and enzymes from human DNA, for use within medicine or in industrial processes. Even earlier, one had realized that proteins could be grown in yeast or bacteria in industrial fertilizing machines. There is, however, a clear advantage to growing them in plants. The process of nutrition is a lot simpler when pharmaceutical ingredients can be grown out in the fields – the sun provides most of the energy needed.[110] What *is* a first in the transgenic artwork, on the other hand, is that the human DNA was been drawn from one known individual.[111]

Why Transgenetics in Art?

Why did Kac feel the need to name his artworks a *separate art form*? There is a broad tendency for this in the contemporary art world. For instance, inside the field of electronic art, people have announced the creation of digital art, techno art, video art, robotic art, telecommunication art, byte art, cyber art, and computer art, to mention just a few. Is a division into "narrow" art forms productive? Does it add to the experience? In the case of transgenic art, possibly. If we had referred to these artworks merely as bio art, we would not to the same extent be aware of their close ties to transgenetics. We might have missed some of the issues that are presently noticeable within the artworks.

Eduardo Kac mentions several reasons for why he chose to explore the field of transgenic biotechnology in his artworks. He emphasizes how he as an artist is literally and physically creating new life, as well as the symbolic value of starting thought processes and stimulating the feelings and ideas of the audience. He repeatedly stresses that the seeds of the Edunia will

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[108] Kac 1998.

[109] Salehnia 17.04.09.

[110] LeFevre 2009.

[111] Olszewski 28.10.10.

continue to carry his DNA through generation after generation.[112] This is similar to how he wants to keep Alba as a pet, a member of his own family. His role as a creator is a personal one. He hopes to inspire the discussion of genetic manipulation of animals and plants, and to increase biodiversity.[113]

Kac is persistently preoccupied with biotechnological invention. In biology, the prevalent opinion is that ”synthetic biology” is the next frontier, which will revolutionize future life forms yet another time.[114] In May 2010 it was announced that American scientists had succeeded in synthetically creating a bacterium, an entire cell, as yet another sign that the field is in a stage of breakthrough.[115] In writing about his transgenic art, Kac eagerly refers to the creation of synthetic viruses and the machine synthesizing of DNA sequences, and I do not consider it unlikely that, if given the opportunity, he might in the future try to create completely synthetic bio artworks.

To Kac, man is only a starting point. The evolution of new species, also from the existing human species, is portrayed as a positive scenario.[116] While he cautions against the possible patenting of genome and a new rise of eugenics, he also feels that the “concept of species based on breeding barriers is undone through genetic engineering”.[117] If we put this into context with his earlier work with telepresence and telerobotics, it seems safe to say that the artist is extremely interested in how new technology will influence our future.

However, Kac vigorously protests any allegations that new technology *in itself* is of any great importance to him. He views such a statement as a simplification.[118] The utilization of untraditional materials is exactly that: utilization of materials, enabling him to evolve his artistic concepts.

Eduardo Kac takes a pragmatic view on technology. New innovations will come whether we want them or not, so we might as well ride the wave and comment critically on the

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[112] KAC 2011.

[113] Kac 1998.

[114] Shantaram 2009.

[115] Gill 20.05.10.

[116] Kac 1998.

[117] *Ibid*.

[118] Kac 19.10.10.

development through inventions of our own. He states that Nature "has not created these life forms, and could not create them without intervention; but Nature authorizes their creation all the same — I know this because it has been possible to do it".[119] The role of this art could be to sensitize us to the fact that the experiments we theoretically know are being performed in laboratories around the world, may be closer to affecting our personal worlds than we prefer to consider. Art like Kac's aims not only to comment on society as it is today, but also to shine a light into the future. Ideally, such art can make some people pose the question of "What do I want the world to be like?"

Kac mentions the extinction of ever-more species as one of the causes for his transgenic projects, and defends his art by referring to the adaptations of different species performed by man throughout history. Artists can contribute to increased biodiversity. An important element to Kac is his own role as a creator. In "Natural History of the Enigma" he is particularly concerned with how the plant, in carrying his DNA for generation after generation, will be bringing a portion of himself on into the future. This brings a bit of paradox to his declaration that man should not put himself above his fellow creatures – for isn't genetic manipulation a way of "playing God"? This is a particularly interesting question, I feel, in the context of "Genesis".

Kac clearly does reflect quite a bit on his art. Communication and interaction are key words in his discussions of his art; communication both between the piece and the spectator, the artist and the piece, the spectator and the artist, and between several spectators. Kac views the hybrid, in itself, as a form of communication across species. Communication is a fundamentally relational process, and a great interest of Kac's. He works conceptually, in contrast to the methods of expressionist modernists. One could say that he communicates with his head, more than with his soul. He is a *theoretical* artist. His background in linguistics and literature may have something to do with it. In the publication of "GFP Bunny" he embellished how transgenic art offers a concept of aesthetics that emphasizes "the social rather than the formal aspects of life and biodiversity, that challenges notions of genetic purity, that incorporates precise work at the genomic level, and that reveals the fluidity of the concept of species in an ever-increasing transgenic social context".[120]

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[119] Kac, quoted in Schouweiler 17.04.09.

[120] Kac 2004: 270-71.

Most presentations of “GFP Bunny” concentrate on certain parts of the artwork, most often the ethical issues or the conflict with the laboratory. Kac, as we have seen, mentions a total of nine explicit points in his presentation of the piece. I would like to examine his treatment of the concepts of otherness and hybridity, the artist’s concept of communication, and the widening of the borders for art production to include life invention. Is the audience at all interested in these elements of his art? We will be examining this question more closely in the following chapters. But first, let us take a look at some key concepts and theoreticians, the ideas of which will inform our outlook further on in the thesis.

III. The Science of the Art and the Art of the Science. Traveling Concepts

To arrive at the edge of the world's knowledge, seek out the most complex and sophisticated minds, put them in a room together, and have them ask each other the questions they are asking themselves. - *Edge* [121]

The Radicant and the Rhizome

Our contemporary time is based on networks. We speak of networks of colleagues and friends, broadcasting networks and, of course, the Internet. The interrelations between different fields are more complex than ever before, and the ready availability of information independent of geographical boundaries has created new possibilities for creative activities.

Art theorist Nicolas Bourriaud's recent presentation of the "radicant" personage seems to be an attempt at presenting one current standpoint in the changing nature of "the artist". Bourriaud's radicant personality is an artistic type. The term of radicant is borrowed from biology, where the ivy is one well-known example of a radicant plant. This climber, in addition to its original roots, is continually developing new ones, extending multiple hooks from its stem, enabling it to cover large areas. In Bourriaud's polemical translation to our context, applied to human beings and artists in particular, the radicant is a person in continual motion. (S)he does not allow their origin, their roots, to define who (s)he is. The radicant likes staging their roots in heterogeneous contexts and formats, and is capable of entering the roots of others, understanding and representing them. Bourriaud's radicant is a translator of ideas; (s)he transcodes images and transplants behaviors, and most importantly (s)he exchanges rather than imposing their own views on others.[122] According to Bourriaud, ours is a "culture of setting in motion",[123] a phenomenon he also calls *viatorization*. Our time is characterized by an overload of signs, Bourriaud contends, a great cluttering of things. In a radicant universe, "principles mingle and multiply by means of combinations".[124]

The idea of the radicant is inspired by another biological term, the "rhizome", introduced by Deleuze. He presented the rhizome as an alternative to the rooted tree as an image. "The tree

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[121] Edge.org.

[122] Bourriaud 2009: 22.

[123] *Ibid*. 131.

[124] *Ibid*. 83.

is already the image of the world, or the root the image of the world-tree",[125] he claimed. He used the example of a book, claiming that the first type of book was a "root-book". "The book imitates the world, as art imitates nature",[126] according to him, and the law of the book was the law of the reflection, "the One that becomes two",[127] a binary logic. To Deleuze, this "formula" was "the most classical and well reflected, oldest, and weariest kind of thought".[128] Nature doesn't work that way, he maintained, it is less simple and dichotomous, more circular and multiple. Deleuze related to a "radicle-system, or fascicular root", with "an immediate, indefinite multiplicity of secondary roots",[129] but stressed, in his presentation of the rhizome, its absolute difference from both roots and radicles. Any point of the rhizome can, and indeed must, at any time be connected to any other. The system of the rhizome was summed up in this formula: "Subtract the unique from the multiplicity to be constituted; write at $n - 1$ dimensions".[130] The rhizome provides an ideal image of the Internet, a non-hierarchical web of interconnected significations. As such, it is well fitted to describe how Kac's art concerns itself with communication.

A considerable portion of Kac's art is imparted on the world via the Internet. Alba has never been exhibited in a gallery. The visual manifestations of the artwork are her photo, circulated online; the series of lagoglyphs, drawings and so on produced by Kac; and the texts written by the media and an involved audience. The "Genesis" bacteria, manipulated by the UV light controlled by visitors in the gallery and online, provide another example. The branching nature of Kac's presentation of his art, and his wish to avoid simplifications, is typically rhizomic, but also radicant.

The difference between Deleuze's rhizome and Bourriaud's radicant is that the radicant grows out of one set of original roots, retaining them, but growing new ones as it advances.[131] (S)he follows a path, advances along it, but does not depend on the original root for growth. Instead, the radicant translates her- or himself into the terms in which (s)he moves. Where Deleuze

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[125] Deleuze & Guattari 2004: 5.

[126] *Ibid*.

[127] *Ibid*.

[128] *Ibid*.

[129] *Ibid*. 6.

[130] *Ibid*. 7.

[131] Bourriaud 2009: 22.

attempted to get rid of the concept of the subject, Bourriaud portrays the radicant as "a subject, but one that is not reducible to a stable, closed, and self-contained identity".[132] Artists today, according to Bourriaud, "do not so much express the tradition from which they come as the path they take between that tradition and the various contexts they traverse, and they do this by performing acts of translation".[133]

This, to me, is an excellent image of the artist Eduardo Kac. He is Brazilian-born, with Jewish roots, and is regularly described as a Chicago-based artist. Already in this, we can see that he is not firmly rooted in one tradition. Transgenic art does not seem to belong safely within a Western culture; it could be said to incite "universal" interest. Perhaps most importantly, Kac utilizes materials that traditionally belong within a field far from art: that of biotechnology. Is not this, in itself, an act of translation?

14. "Natural History of the Enigma", 2003/08. Exhibition photograph of the Edunia, from the show at the Weisman Art Museum, Minneapolis, 17.04. – 21.06.09.

The element of instability emphasized by Bourriaud is strongly present in Kac's art, as in so many other new media artworks. The pieces are ephemeral in their biological nature, they are multifaceted, and they are naturally variable. When I saw the Edunia in exhibition, at the *Life*,

[132] Bourriaud 2009: 55.

[133] *Ibid*. 51-52.

Light & Language show at the Enghien-les-Bains Art Center,[134] the plant had only one full-blown flower. At other times, it may sport five flowers, or twenty (Figure 14). In "Genesis", too, the mutation of the bacteria and the corresponding change in colors is an integral part of the piece.

Kac started out with performance, went on to poetry, and took part in a range of new media art forms, lately focused on bio art. The conventional view on such a diverse artist would be that he had not yet "found himself" as an artist. To the radicant, however, the "self" is subject to continuous change, as he moves through a world that is also ever changing. His identity, while not unimportant, does not necessarily have a cause-effect relationship with his art. There is no focus on personal style, as was vital to earlier artisthoods. This quality of the artist translates directly into his art: The living subject-status of transgenic artworks makes them naturally ephemeral and fleeting, which, again, resonates with Bourriaud's idea of the subject. Leaving us with far more questions than they answer, the very existence of the transgenic subjects shines a spotlight on elements of our society that are normally under-articulated in the public sphere.

According to Bourriaud, the radicant can enter any culture and utilize its parameters as if (s)he were born to it. Obviously, most people will view anything that is put in front of them with their individual cultural background as the basis from which they process it. Take Kac's "Encryption Stones" (Figure 15). The etching in granite, it seems to me, is intended to connote to the Rosetta stone. The famous stone showing inscriptions in three scripts, Greek, demotic, and hieroglyphic, interpreted in the nineteenth century by Champollion, was a "key to understanding the past".[135] Kac mentioned the stone in his initial text on "Genesis", written before this piece was created, and suggested that the "triple system of Genesis (natural language, DNA code, binary logic) is the key to understanding the future".[136] I also find a clear reference in "Encryption Stones" to the Ten Commandments, which were written by Moses at the word of God, on two stone tablets. How will this artwork appear to a person unfamiliar with Western and Christian-Hebrew history? A Hindu will not experience the piece in the same way as a Catholic. It will not be readable in its intended connotations. But some elements of the artwork remain, independent of the spectator's culture: code writ in

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[134] Kac 21.01. - 10.04.2011.

[135] Kac 1999: 52.

[136] *Ibid*.

stone, with the corresponding natural impulse to translation.

15. "Encryption Stones", 2001 (from the "Genesis" series). Laser-etched granite diptych with (*left*) the original sentence in English over translations to Morse and DNA code, and (*right*) mutated bacterial DNA over translations back to Morse and English.

Traveling Concepts

Concepts, in the first place, look like words.

- Mieke Bal [137]

A concept is a strange phenomenon. Concepts, at a glance, look like words. But one concept can be more than one word. One word can be many concepts, too. In *What is Philosophy*, Deleuze claims that there "are no simple concepts. Every concept has components and is defined by them" and therefore "is a multiplicity, although not every multiplicity is conceptual".[138] He finds the idea of the concept to be "a matter of articulation, of cutting and cross-cutting. The concept is a whole because it totalizes its components, but it is a fragmentary whole".[139] Fragmentary, yes, but the components of the concept, Deleuze claims,

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[137] Bal 2002: 23.

[138] Deleuze & Guattari 1994: 15.

[139] *Ibid*. 16.

are inseparable. This is because "each partially overlaps, has a zone of neighborhood [*zone de voisinage*], or a threshold of indiscernibility, with another one".[140] Every concept, besides, relates back to other concepts, has a history. Deleuze concludes that each concept "will therefore be considered as the point of coincidence, condensation, or accumulation of its own components".[141] Cultural analyst Mieke Bal has suggested that the "unreflective conflation of words and concepts" are to blame for what she terms "the pervasive predominance of intentionalism".[142] In other words, the undesirable, uncritical acceptance of the conflation of meaning with the intention of the artist could have been avoided by a proper consideration of the concepts in use.

In Mieke Bal's mind, concepts are not firmly established univocal terms. They are dynamic in themselves; they travel between disciplines and historical periods, and in geography. She stresses how, in the process of "groping to define, provisionally and partly, what a particular concept may *mean*, we gain insight into what it can *do*".[143] Concepts are the backbone of the interdisciplinary study of culture, primarily because of their *potential intersubjectivity*. With this, Bal is not saying that they mean the same thing for everyone, rather that they do not. The concept of intersubjectivity, introduced by Karl Popper, presented "a program of idealized consensus and non-ambiguity: intersubjectively defined concepts and methods were to have exactly the same meaning for all concerned.[144] But according to Bal, intersubjectivity can only ever be limited – "relative to groups, views, and consensus" – in the same way that concepts are limited.[145] Bal's intention for intersubjectivity is to present a set of "rules of the game", not having everyone agreeing on the content, but allowing a particular concept to be understood clearly enough to have people meaningfully agree or disagree over the content of it.[146] That will be my own intention in the discussion of concepts as well.

Concepts are, according to Bal, invaluable in the traffic between disciplines. But, within each field, the concepts have acted more as restrictors and definitions than as conveyors of a

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[140] Deleuze & Guattari 1994: 19.

[141] *Ibid*. 20.

[142] Bal 2002: 23.

[143] *Ibid*. 11.

[144] *Ibid*. 12.

[145] *Ibid*.

[146] *Ibid*. 13.

common understanding. The work in need of doing, Bal contends, is "that of unhardening the concept, of de-naturalizing the self-evidence that each disciplinary group had unconsciously adopted".[147] But this process is not one-way. Rather, in an ideal situation, "hardening and unhardening alternate and shift".[148] Following this process, a methodological common ground may be found. The "travel" of the concept, Bal explains, is meant to indicate how the elastic concept can be "the basis for an intellectual adventure".[149]

In Bal's cultural analysis, the "counterpart of any given concept is the cultural text or work or 'thing' that constitutes the *object* of analysis".[150] The concept is only meaningful to her if it can help us to understand the nature of the object better. Objects are seen as "things always-already engaged, as interlocutors, within the larger culture from which they have emerged".[151] I propose to see the transgenic artworks as interlocutors within a globalized society, marked by what Pinker termed consumer genetics. The art form is conveyed, to a large extent, via the Internet. As such, it is at least partially available to people in all corners of the world. It emerged from this global society, where transgenic animals can be ordered online and shipped to a person's home in a matter of days; where plants are routinely transformed to produce medicinal components; and where bacteria and virus can be produced synthetically.

Inspired by Bal's "travelling concepts", I will be using a concept-based methodology. In the course of this thesis, I discuss the changing nature of the concepts of "spectator", "science" and "art". Art historical as my background is, I will still be discussing approaches belonging to philosophy and ethics, in addition entering into the field of biotechnology. As the concept of art itself has broadened in the course of the last century, so too have new fields risen for examining art from diverse angles. Art philosophy, art sociology and broader fields like visual studies and cultural analysis are just a few examples of competitors to traditional art history. Fields, or disciplines, are increasingly seen as artificial constructions, an attempt to create firm boundaries in an environment of frequent overlapping, where the differences are often lesser than the similarities, and the transitions between them ephemerally mobile.

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[147] Bal 2002: 34.

[148] *Ibid*. Bal is a proponent of "elasticity" in concepts, a combined stability and extendibility.

[149] *Ibid*. 14.

[150] *Ibid*. 8, *original emphasis*.

[151] *Ibid*. 9.

The concepts surrounding the transgenic artworks – the subject, the spectator, art, science, aesthetics, and, for that matter, transgenesis – are utilized within so many fields that a disparity of conceptions is almost inevitable. Therefore, in the course of this thesis, I will return time and again to the question of what they can mean, and do (primarily in our context, but also outside of it).

Art as a Plane of Immanence

In the spirit of Bal, I propose to view art, specifically transgenic art, as a plane of immanence. Deleuze conceives of the plane of immanence as being tied strictly to the philosophical. The corresponding planes for art and science are the plane of composition and the plane of reference or coordination, respectively. The plane of immanence is "the image of thought".[152] According to Deleuze, philosophy holds the "exclusive right of concept creation", and science and art do not operate with concepts. If read literally, his idea is hardly compatible with conceptual art forms, including transgenic art. He does maintain that there are other ways of thinking and creating, "other modes of ideation that, like scientific thought, do not have to pass through concepts".[153] He presents this as a hypothesis:

> (F)rom sentences or their equivalent, philosophy extracts *concepts* (which must not be confused with general or abstract ideas), whereas science extracts *prospects* (propositions that must not be confused with judgments), and art extracts *percepts and affects* (which must not be confused with perceptions or feelings).[154]

We will be examining the concept of "affect" in the following chapter. However, I venture to suggest that writing about art (art theory) can, in this sense, be perceived as a philosophy. In the essay "Deleuzes mobile perspektiv og æstetikvidenskaberne", professor of aesthetics Morten Kyndrup suggests that Deleuze is simplifying the production of meaning, in his reduction of art to "noget, der eksklusivt knyttes til og emaneres af det enkelte artefakt".[155] Kyndrup proposes that the plane of immanence can be utilized in an art theoretical

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[152] Deleuze & Guattari 1994: 37.

[153] *Ibid*. 8.

[154] *Ibid*. 24, *original emphasis*.

[155] Kyndrup 1995: 16, *Eng*. "something which is exclusively tied to and emanating from the individual artifact", *my translation*.

perspective, to "spille en produktiv rolle også i enkeltværkanalyser".[156] Perhaps the plane of immanence can be utilized in an analysis of transgenic art?

The plane of composition can certainly be a useful figure for art theorists, but it holds less direct relevance to conceptual art forms. Deleuze, in fact, discusses painting, literature, and music, but is particularly skeptical of conceptual art. He objects to this form of art because he feels that it creates a generalized, neutral representation that is infinitely reproducible. He contends that it is "not at all clear that this way leads either to the sensation or to the concept, because the plan of composition tends to become "informative", and the sensation depends upon the simple "opinion" of a spectator who determines (…) whether or not it is art".[157] Of course, he is referring to the analytic Conceptual art movement of the 1960s, as represented by Joseph Kosuth's "Art as Idea as Idea"-series, which exhibited photostats of standard dictionary definitions of words like "water" and "painting".[158] Transgenic art, I contend, is conceptual in a very different way. The artist provides us with a great deal of information, but the artworks have, I repeat, several layers, with ample space for the spectator to reflect over various issues both aesthetical and philosophical in nature.

Morten Kyndrup suggests – with reservations – that in the context of aesthetics, Deleuze's explicit reflections over the aesthetic and over artworks are less interesting than his broader theoretical movements. He attributes this to Deleuze's not being an aesthetics specialist, thence not driven by the particular interests of the aesthetics field.[159] We who specialize in the arts can, then, be justified in utilizing Deleuze's *philosophy* in our discussion of artistic media. Kyndrup proposes that, using the plane of immanence on aesthetics,

> kunne man i forholdet mellem enkeltværk og "det æstetiske" som immanensplan (begrebet isomorft med det beskrevne forhold mellem "præfilosofisk" immanensplan og filosofisk begreb) sikkert trænge ind i den komplekse relation mellem "kunsten" som betydningsemanerende ramme (her da "præartefaktielt") og værket.[160]

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[156] Kyndrup 1995: 16. *Eng*. "play a productive role, also in the analyses of individual artworks", *my translation*.

[157] Deleuze & Guattari 1994: 198.

[158] Alberro 2003: 30.

[159] Kyndrup 1995: 22.

[160] *Ibid*. 23, *Eng*. "one could, in the relationship between the artwork and "the aesthetic" as a plane of immanence (understood isomorphically with the described relationship between the "prephilosophical" plane of immanence and the philosophic concept), surely penetrate the complex

Art, or the art field, could be seen as a plane of immanence. And one could follow up with the perception of art as movement, as *artisation*, art consistently and continually *becoming*. "Becoming" (*devenir*) to Deleuze "refers to the particular paths along which a concept might be transformed into something else".[161]

The horizon is in movement, Deleuze maintains, and on the plane of immanence we are on "the absolute horizon", with "infinite movement". The movement "takes in everything, and there is no place for a subject and an object that can only be concepts".[162] The plane *is* the movement of the infinite. Infinite movement is double, Deleuze asserts, and "there is only one fold from one to the other".[163] Thinking and being, in this sense, are one, as movement is both the image of thought and the substance of being. Thought and Nature are the two facets of the plane of immanence. If we view transgenic art as a plane of immanence, these two facets are easily distinguished: the transgenic creatures as part of Nature, and the concept of the artworks clearly being Thought.

Deleuze stresses that the plane of immanence must not be confused with concepts. The concepts occupy the plane, but "elements of the plane are *diagrammatic features*, whereas concepts are *intensive features*".[164] I find in the plane of immanence a model into which to fit the contemporary art world, in the sense of the context surrounding the artworks. The plane of composition could certainly be found also in transgenic art, but what is interesting about the plane of immanence is its folds, its combination of concepts.

Diverse movements of the infinite "are so mixed in with each other that, far from breaking up the One-All of the plane of immanence, they constitute its variable curvature, its concavities and convexities, its fractal nature".[165] The plane of immanence is always single, being itself pure variation, but "there are varied and distinct planes of immanence that, depending upon which infinite movements are retained and selected, succeed and contest each other in

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relationship between "art" as a meaning-emanating framework (here, then, "preartifactial") and the artwork", *my translation*.

[161] Patton 1996: 5.

[162] Deleuze & Guattari 1994: 38.

[163] *Ibid*.

[164] *Ibid*. 39, *original emphasis*.

[165] *Ibid*. 38.

history".[166] The movements of the infinite constitute the elements of the plane of immanence, whereas concepts are "intensive ordinates of these movements, like original sections or differential positions".[167] The concepts can "mark out the intensive ordinates of these infinite movements".[168]

Concepts are events, Deleuze contends, but "the plane is the horizon of events".[169] The fields of art and biotechnology can be seen as concepts, folding to move together and apart in the plane of transgenic art. The reactions of the audience, and the social dimensions of the artworks, might also be perceived as folds in the plane.

Science Wars

Relations between different scientific fronts have often been tense. Philosophy professor Don Ihde calls the ongoing debate between absolutists and relativists "wars of interpretation". The main questions appearing again and again are: Is science to be understood as an absolute, ahistorical, supercultural phenomenon, or is it embedded in human culture and susceptible to the fallibilities of humanity? What is the most appropriate interpretation of science? Who gets to interpret it? From what perspectives do the interpretations take place?[170] And what, if anything, does the knowledge of who made the interpretation mean to the general public?

Traditionally, as Ihde observes, the interpretations of science were made from within the field of science. Most philosophers of science in the early twentieth century were trained in physics or mathematics. This held for most of the early historians of science, too, and the rest regarded the historiography of science as a biography of great men and great discoveries.[171] The practicing scientists' "double role" as both subject and object of the scientific evaluation in grant applications, for instance, is seen by Mieke Bal, too, as an epistemological problem.[172] To this day, the tradition of regarding science as an absolute has its supporters.

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[166] Deleuze & Guattari 1994: 39.

[167] *Ibid*. 40.

[168] *Ibid*. 42.

[169] *Ibid*. 36.

[170] Ihde 2009: 6.

[171] *Ibid*. 7.

[172] Bal 2002: 30.

The internalist view has the advantage of being "in the know", but also the clear disadvantage of subjectivity, a word abhorred by scientists since the beginning of science.

Logical positivism held strong in the 1930s through -50s, Ihde informs us, preserving the image of science as a "theory-producing machine", verified through logical coherence and experiment. The 1950s saw an antipositivist trend, which added history to the notion of science practices. Antipostivists emphasized historical particularity and paradigm shifts. In the 1970s, the idea of science as a *social practice,* with negotiated and constructed results, gained ground. Social constructionism discussed how phenomena developed in social contexts, while actor network theory focused upon how laboratory practices were interventional and manipulative.[173]

The 1980s brought a realization that science is reliant on technology, in post-Heideggerian, post-Ellul, post-Marxian philosophies of technology.[174] Science could not exist without the instruments and laboratories with (and in) which it is practiced. In his analysis, Don Ihde points out how Heidegger had seen technologies as relative to their concrete use contexts.[175] Heidegger also regarded modern physics as dependent on technical apparatuses. As Ihde puts it, "modern science is *instrumentally, or technologically embodied*".[176] Science needs technology, in other words. But technology might just as easily be used in art, or other aspects of society.

The 1980s and -90s also saw feminist views on science as gendered in cultural practice. Sandra Harding, for instance, presented her concepts of "strong" and "weak" objectivity in the early 1990s. She argued that modern science "represents 'weak objectivity' because it does not take into account its own cultural and historical conditions of possibility".[177] "Strong objectivity", on the other hand, could be achieved through "*strong reflexivity* which involves an exploration of our own cultural and social locations as researchers".[178] As a result of these differing influences, millennium science is seen as acculturated, with knowledge that is produced out of practices.

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[173] Ihde 2009: 67.

[174] *Ibid*. 7.

[175] *Ibid*. 33.

[176] *Ibid*. 35, *original emphasis*.

[177] Harding, discussed in Jørgensen & Phillips 2002: 202.

[178] *Ibid*. *Original emphasis*.

In the nature sciences, positivism remains a strong force. The "science wars" are not over. Some scientists feel threatened by relativist approaches, and particularly do not like the humanities referring to their fields as "sciences".

The brief presentation of what Ihde terms "science wars" was included in order to have a foundation for posing another question: is bio art, in utilizing biotechnology, conveying a stance in the debate? Is it attempting to bridge the distance between the fields? Some researchers who work with biotechnology on a daily basis have spoken positively about bio art. They view it as a means for spreading knowledge of the possibilities of the field. Other scientists feel that utilizing the technology for art is wrong, and can only twist the opinion of the public against hard-working scientists. Spectators have repeatedly expressed gratitude towards Kac, for making them think about issues of which they had been previously oblivious. Is art really that far removed from science?

Trade Secrets

If it is, the distance can probably be found in the approach. Science is by nature reductive. It isolates elements upon which experiments can be conducted and knowledge gained. Art, on the other hand, is freer, as Kant, in the eighteenth century, demonstrated. The nature of the work of art as symbolic form leaves it "open to wide interpretation".[179]

Eduardo Kac, as a layman, an artist, does not per se have the power to be a part of the world of science – he is breaking the borders of where he is supposed to be. In transgenic art, I find the argument that the discourse of monodisciplinary or multidisciplinary fields should not be created solely by the insiders of those fields. The appropriation of the "trade secrets" of other disciplines has come to be a trademark of theoretically oriented contemporary art. By making himself an actor in a field he should not, by rule, be entering, I contend that Kac is actually empowering himself, and by extension other laymen. The artist does not feel that his ordering GFP organisms is appropriation, but in a greater societal discourse he could arguably be seen to be appropriating the role of scientist. What does this do to the scientific discourse of the field? Who is allowed to speak about the science?

[179] Anker & Nelkin 2004: 42.

Science in Art History

There is a long tradition for works of art inspired by science. Art, of course, has not always had the etymological meaning that it does today. Well into the seventeenth century, the word was used to indicate what we would today term skill or craft, it was something one *had*, not something that *was*. Of the seven medieval "liberal arts", only music and poetry were included of the art forms we know today.[180] Painting and sculpture were referred to as "mechanical arts", and lower in status. Ever since antiquity, what we refer to as the fine arts have been defended with indications of their proximity to what is now referred to as "hard sciences" or "nature sciences".

In the Renaissance, particularly in Italy, the advent of Humanism led to an increased naturalism in art, based on observations of the outside world.[181] Artists like Leonardo da Vinci and Andreas Vesalius began pursuing anatomical exactitude in their drawings, utilizing medical knowledge and mathematical figures.[182] Optical theory at the time was in rapid development as a result of advancements in technology, and artists took advantage of the increased knowledge to develop the linear perspective. In his *Della pittura* of 1435, Alberti claimed that the painter, because understanding of the laws of nature was necessary for accurate delineation, must actually *be* a scientist.[183] The level of skill and education needed to be a good painter were put forward as reasons for granting the art form a place among the liberal arts. The idea of historical "progress" in art made the artist into something more than a craftsman.

The fact that "Renaissance men" like Leonardo and Alberti, who dabbled in every skill, chose art as their primary field, contributed to its gradually heightened status. New writings on art, most significantly the artist-historiographies of Giorgio Vasari, also factored into this process. Vasari was the force behind the founding of the Florentine Academy of Design in 1563,

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[180] Beardsley 1966: 105.

[181] Blunt 1962: 1.

[182] Anker & Nelkin 2004: 2.

[183] Alberti, discussed in Beardsley 1966: 124.

which provided artists with a formal education of mathematics.[184] The nature sciences were now seen as ideal models for art.

The compulsion to imitate Nature continued on into the seventeenth century. However, the idea of how this was to be done underwent a change. From a realistic, sensual depiction in the late fifteenth century, the view of an *ideal imitation* of Nature gained ground during the sixteenth century, culminating with the advent of the Academies in the 1600s and 1700s. Creating the "ideal" meant painting "the general form of things".[185] Sir Joshua Reynolds, in his *Discourses on Art* (1769-90), summed up the ideas of the last two centuries with the suggestion that the artist must extract the best out of many models, creating "an abstract idea of their forms more perfect than any one original".[186] Reason, at this point in time, was seen as the greatest of faculties. It was the age of Cartesian rationalism, of "universal truths" based on the principles of arithmetic and geometry.[187] The French Academy, founded in 1648, was based on a set of rules, which justified their hierarchy of genres.

Immanuel Kant produced an early distinction between "art" and "science", identifying "**to be able** from **to know**".[188] According to Kant's *Critique of the Power of Judgment* (1790), one should use the judgment of taste when looking at art. Such judgment is ideally devoid of emotion and interest.[189] The aesthetic experience is "disinterested" because the artwork should be seen as an end in itself. It has a worth of its own, and should not be "useful". The "purpose" of art lies in its formal qualities. In the realm of aesthetics, we utilize our reflective judgment, tied to the power of imagination. This is the judgment that comes into play when we want to find some universal principle by means of a given particular.[190] Kant followed the prevalent opinion of the eighteenth century by awarding the universal a higher role than the singular. The reflective judgment cannot derive universal principles from anywhere, Kant maintained, but it can "give itself such a transcendental principle as a law".[191]

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[184] Kemp 1990: 93.

[185] Reynolds, in Beardsley 1966: 150.

[186] *Ibid*.

[187] Beardsley 1966: 140.

[188] Kant 2000: 183, *original Bold*.

[189] *Ibid*. 107.

[190] *Ibid*. 67.

[191] *Ibid*.

Kant was one influence in the development of Romanticism, where the artist was seen as a genius, and art as an inspired product of the imagination. Scientific knowledge was no longer a requisite in the great artist, as (s)he was rather perceived as a vessel for divine inspiration. The Kantian formalist and autonomist ideas to varying degrees influenced the view on "art" through the next centuries, and gained ground in modernist theory.[192]

In the art field, the new art forms that emerged around mid-century caused a reflection in theory, with several attempts to define the very nature of art. Recently presented theories of art have often opposed the idea of "art for art's own sake", in an art view that plays down the role of pure aesthetics. Instead, the social aspects of the art are emphasized, and the question of "what does art *do*?" is posed rather than the much-discussed question of what art *means*.[193] The social ramifications are typically seen more as a network of interactions than as a binary and linear system. One of my goals in writing this thesis is to find out to what extent transgenic art fits the current perception of the concept "art". Is there one dominant contemporary interpretation? And what alternative art views exist?

Science in Contemporary Art

Salvador Dali was the first artist to utilize the newly discovered shape of the DNA molecule in artworks, with the 1957/58 painting *Butterfly Landscape, The Great Masturbator in Surrealist Landscape with DNA*.[194] Both science and art took a while to take advantage of the 1953 discovery of the double helix, but in the 1970s the development in science gained in speed, and from the early 1990s on, art has started to catch up.

Medicine has been a recurring theme in art, and with the development of new, computerized imaging technologies such as PET scans and MRIs, the visual arts had a veritable feast of inspiration.[195] Nano art, digital art and video art are just a few examples of the new art forms resulting from this development. Even outside of the *visual* arts, technology has been utilized in sound installations like Daniel Jolliffe and Jocelyn Roberts's "Ground Station" (1999-

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[192] *See for instance* Gamboni 2005.

[193] The reader may recollect that Bal proposed examining concepts for what they can do. Is a diminished focus on meaning an interdisciplinary trend?

[194] Anker & Nelkin 2004: 23.

[195] *Ibid*. 2.

2003), where a digital electronic piano played sounds based on a computer's processing. The computer was hooked up to GPS (global positioning system) satellites, and used an algorithm created by the artists to transform data from the GPS into musical notation.[196]

In his text "GFP Bunny", Kac himself relates how art, throughout the twentieth century,

> progressively moved away from pictorial representation, object crafting, and visual contemplation. Artists searching for new directions that could more directly respond to social transformations gave emphasis to process, concept, action, interaction, new media, environments, and critical discourse. Transgenic art acknowledges these changes and at the same time offers a radical departure from them, placing the question of actual creation of life at the center of the debate. Undoubtedly, transgenic art also develops in a larger context of profound shifts in other fields.[197]

Since the early 1990s, "sci-art" exhibitions and symposiums "have become a prominent feature" within the Western art field.[198] Anker and Nelkin claim that art's "depictions of science matter", as works of art can act as a bridge between scientific knowledge and "the world of cultural meaning".[199] Valerio Deho, curator of the biennial exhibition DNArt, contends that art can "render technology intelligible to the public".[200]

These statements show how drastic a change the view on art has undergone during the last few centuries. From being *justified by* similarities to science in the Renaissance and Rationalism, art, today, can *influence* science. Artworks can arguably give scientists, as well as the public at large, new insight into their own field.

In his foreword to Anker and Nelkin's *The Molecular Gaze. Art in the Genetic Age*, Philip R. Reilly, MD and CEO of Interleukin Genetics, names his first encounter with Dali's 1963 piece "Galacidalacidesoxyribonucleicacid" (Figure 16) as the first time he "seriously thought about DNA",[201] and suggests that the encounter influenced his abiding interest in the

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[196] Jolliffe 2003.

[197] Kac 2004: 272.

[198] Anker & Nelkin 2004: 1.

[199] *Ibid*. 4.

[200] Deho, quoted in Anker & Nelkin 2004: 4.

[201] Reilly, in Anker & Nelkin 2004: xii.

exploration of DNA. Similarly, several scientists have expressed their belief that transgenic art can help recruitment into the field of biotechnology.[202]

16. Salvador Dali, "Galacidalacidesoxyribonucleicacid", (Homage to Crick and Watson), 1963. Oil on canvas, 4 × 5 m. The painting presents an ambiguous image of science and religion intertwined.

In a Kantian turn, Deleuze suggests that art "wants to create the finite that restores the infinite".[203] The singular can introduce the universal. In our time, the singularity of art is no longer seen as a weakness, as it was in the eighteenth century. Kant's concept of reflective judgment is, in fact, not far from Deleuze's idea of a "shock to thought", which we will discuss further in the following chapter. The rabbit in "GFP Bunny" contains cells foreign to mammals, and these are visibly expressed in its green glow. When we encounter Alba, the concept of "bunny" is expanded. As one writer observed in the *Alba Guestbook*: "There are some very strange angles on bunnydom on this website".[204] In "Natural History of the Enigma", the petunia is far less familiar than it seems at first glance, and the implications inherent in the piece, of human DNA being crossed into other species, are truly mind-boggling.

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[202] Olszewski 28.10.10, and *The Alba Guestbook*.

[203] Deleuze & Guattari 1994: 197.

[204] *The Alba Guestbook:* Anonymous, 26.07.03.

Art versus Science?

Why is the art form of transgenic art emerging at this particular point in time? Art historian Edward Lucie-Smith has already drawn the line from the return to the subject matter, to Kac's artwork "The Eighth Day". He sees in this piece a questioning exploration of our current attitudes towards creativity, not unlike the 1970s and -80s artists' take on current politics and great causes.[205] Disinterestedness is no longer considered an important goal in the viewing of the artwork, nor is objectiveness necessarily worth striving after. However, the idea created by the Kantian philosophical tradition, that we view works of art with a different kind of perception from the one we use on "normal" objects, still seems to be prevalent. Most people regard the concept of "fine art" with a mixture of awe and disgust. Perhaps this is part of the reason why objects or happenings, viewed as "art", seem to have more potency than what a similar occurrence would have had without this tag.

Apart from the specific circle of scientific magazines, for whom it is a main topic, the progress of biotechnology is discussed surprisingly seldom in media worldwide. Only the "great breakthroughs", discoveries that, it is believed, will cause vast changes to occur within our future society, get mention in mainstream publications and broadcasts. However, even many aspects of the day-to-day occurrences of the field are such as would interest a broad specter of the public. They are just not exposed to it, and consequently do not know much about it.

The artist holds a unique position in the exploration of evolution and technology. Despite recent debate, the illusion of, or striving for "objectivity", remains a scientific paradigm. One of the conditions of science is for the scientist to distance himself from the emotional aspects of his work. One of the worst charges to bring against a scientist is still that of subjectivity. The artist, on the other hand, is free not only to explore the "unscientific" parts of newly invented technology, but also to present it to the public and thus stimulate public debate. Such debate can help us reexamine the notions of creation.

[205] Lucie-Smith 2003: 26.

The Aesthetics of Transgenic Art

Transgenic art, by contrast, offers a concept of aesthetics that emphasizes the social rather than the formal aspects of life and biodiversity, that challenges notions of genetic purity, that incorporates precise work at the genomic level, and that reveals the fluidity of the concept of species in an ever increasingly transgenic social context. - *Eduardo Kac* [206]

Aesthetics today does not only entail beauty. An extended concept of aesthetics is systematically developed in the work of Wolfgang Welsch,[207] who has named three primary fields of significance, of which sensation or perception is the one called the aesthetic element. Art, naturally, is the artistic element, while beauty is called the callistic-sublime element. The idea is reminiscent of Deleuze's percepts and affects, but does not in the same way maintain that artworks should deal solely with the realm of sensation. Welsch maintains that reality is, increasingly, "aesthetically constructed".[208] In the wider concept, which I read as being applied to the *field of aesthetics*, the aesthetic element is construed as something diverse from the element of beauty.

In his introduction to Eduardo Kac's book *Telepresence and Bio Art*, James Elkins maintains that Kac's art, while not specifically political or critical, entails a strong rejection of aesthetic questions.[209] This is adherent to the view of Arthur Danto, according to whom it is "an atmosphere of theory which makes an object a work of art".[210] It also fits in well with the Conceptual art of the 1960s and -70s; the artists of that movement were in strong opposition to formalist aesthetics.[211] Art is by definition non-aesthetic when it is indistinguishable from the rest of reality on a perceptual basis. The qualities of the artworks may be artistic, but they are not aesthetic in the sense of being perceptual or affective.[212]

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[206] Kac 2004: 270-71.

[207] The extended aesthetics concept is called *aisthetics*, after the Greek *aisthesis*, which is also the origins of the word aesthetics, but originally denoted sense perception. Bø-Rygg 2007: 11.

[208] Bø-Rygg 2007: 18.

[209] Elkins, in Kac 2004: ix.

[210] Bø-Rygg 2007: 12.

[211] Osborne 2000: 2.

[212] Bø-Rygg 2007: 13.

Following this definition, I cannot agree with Elkins's judgment on transgenic art, although quotes such as the above by Kac enable me to understand how he could arrive at such a conclusion. Alba the rabbit is, after all, presented *glowing green*. The way I read these artworks, the verification issues surrounding both Alba and the Edunia arise specifically out of Kac's need to portray them in a visually stunning way. The picture of the bunny is the greenest it could possibly be and be real. The implications of Alba's transgenic nature would be the same even if she only had a slightly greenish tinge, but the color is visually engaging, even pleasing to the eye. The redness of the Edunia's veins is no different from the color of any other petunia of the same breed, but it does connote to the crimson of human blood vessels, and might even have done so without the artist's emphasizing it time and time again. As I have mentioned, its visual properties were why Kac chose that particular petunia. And why would he include two colors to the "Genesis" bacteria, when his artist's gene is only present in one of them, if not to have the added dimension of the colors visually emphasizing how the bacteria were mutating?

I contend that Kac's transgenic art is aesthetic in the sense of being visually pleasing. Perhaps their visuality is rather like a Trojan horse, transporting his challenging ideas to a broader audience in order to help us in our becomings?[213] Kac's goal, as we have seen, appears to be getting his audience to reflect on the issues he is presenting to them. The visual impression the artworks are making, if he really does not care about aesthetics and beauty, may be the artist's way of inviting his audience to take a closer look, the form luring the spectator to ponder the content. Similarly, I suggest that Kac may be using sentiment to his advantage in his taking Alba as a *pet* (Figure 17). The very emotional introduction to his "GFP Bunny" text seems slightly out of character, when surveying the totality of his production. In the description of his first encounter with the rabbit at the INRA, the artist relates how his "apprehensive anticipation was replaced by joy and excitement. Alba (…) was lovable and affectionate and an absolute delight to play with".[214]

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[213] Thanks to Unni Sørensen for this suggestion.

[214] Kac 2004: 264.

In art, we encounter something unknown, which our learned sense of judgment has difficulties processing. Immanuel Kant stressed that only "production through freedom, i.e., through a capacity for choice that grounds its actions in reason, should be called art".[215]

Kant is typically seen as the father of formalism. But Paul Guyer, an expert on Kantian ethics, locates in Kant's ideas on aesthetics an angle on the content of the artwork, as well. He argues that the "authors of the theory of disinterestedness did not intend to make a problem for the ethical criticism of art".[216] Kant wrote that the content of a work of art "*aesthetically enlarges the concept itself in an unbounded way*".[217] An artwork, then, can set "the faculty of intellectual ideas (reason) into motion",[218] inspiring the free play of imagination around the content of the artwork. To Kant, it is "self-evident that such content will typically consist of moral ideas", and therefore "our response to those ideas in that context must be part of our response to such works as works of art".[219]

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[215] Kant 2000: 182.

[216] Guyer 2008: 16. In the eighteenth century, moralism was naturally included in the mainstream criticism of art, as they thought ethical defects detracted from the artwork's capacity to emotionally engage the viewer.

[217] Kant, quoted in Guyer 2008: 22, *original emphasis*.

[218] *Ibid*.

[219] Guyer 2008: 22.

IV. The Spectator. Audience Reception or Involvement

We have to recognize the knowledge at work in the ignoramus and the activity peculiar to the spectator. - *Rancière* [220]

Who Receives the Artwork?

So far, we have been focusing on the art as generated by the artist. This chapter will concentrate on the role of the spectator. In my musings on Kac's art, I use both the term of "spectator", and of "audience". This is because the conceptual nature of the artworks makes the experience about more than just the visual aspect. "Spectator" signifies onlooker or viewer, while "audience" means hearing, listening, and also someone who listens. Eyes versus ears, then. You need both to take in the full spectrum of bio art (particularly in pieces like "Genesis", which contains a soundtrack). One way of getting around the trouble of definitions would be adopting the term "participant", which is often seen in relation to artworks that require or encourage participation from the people on the receiving end. Inspired again by Bal, I have, however, landed on the opinion that the use of traditional terms, given new meaning, is fitting to the context. Which term is used is not really that important, as long as it is clearly defined. After all, the term "art" has different connotations today than it did a hundred years ago. My more particular reason for choosing the term spectator is Jacques Rancière's excellent adaptation of the word to a contemporary context.[221]

Wittgenstein's duck-rabbit sketch from *Philosophical Investigations* can illustrate how it is possible to appreciate the same piece of art in several different ways, toggling between the different modalities of aesthetic perception.[222] I contend that this image holds, also for the non-visual elements of the art. Artworks operate on several levels. In our perception and digestion of them, we are ever maneuvering between these levels, sometimes feeling the emotional effect they have on us, sometimes considering their societal ramifications or making other intellectual reflections. Sometimes, we appreciate the visual impression, the form of the piece, not caring about the content, and at other times we feel the message of the artwork more than the form.

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[220] Rancière 2009: 17.

[221] Rancière 2009.

[222] Cashell 2009: 10.

Transgenic art appears to make a point out of challenging and transforming the conception as well as the perception of cultural and societal issues. Other art forms have other purposes (expressive, formalist, *etc*.), and I think it moot to try to conceive of "art" as one concept, to be easily fitted within one set of frames. Kac's art project can be placed somewhere between conceptual and performative art. His artworks may not be characterized as relational, but they are not far from it in their weighting of the role of the spectator. In their focus on communication, they are explicitly dialogical.

In this chapter, I will be making a case study of the *Alba Guestbook*, as it is the broadest representation of how the audience received "GFP Bunny". No such database exists on our other transgenic artworks. It would have been interesting to look at the reception history of "Genesis", which has been showed in forty locations worldwide, and is clearly a successful and thought-provoking piece. The reception of "GFP Bunny", on the other hand, has been extremely influenced by the unforeseen event of Alba being kept at the INRA. She has never been shown live to an audience, and the circumstances surrounding her creation remain muddled. In my analysis of the entries in the *Guestbook*, I consider in particular how the fact that she was kept in France is the main source of interest to a large portion of the audience.

In addition to considering the specific reactions of the audience, I will also be reflecting around some questions already suggested, regarding what we view as art, and how we view art. In doing so, I will be looking at the ideas of Rancière about the emancipated spectator, and at the Deleuzian concept of affects. I will also be discussing the concept of "truth" in art, as it seems to have directly influenced the debate surrounding "GFP Bunny". First of all, however, we should look at one of the most prominent concepts in Eduardo Kac's discourse, which also involves the spectator: that of communication.

What is Communication?

Is communication a rational process, something consciously transmitted from sender to receptor? Not necessarily, according to Kac. He is explicitly concerned with communication on many levels; recall that he has studied communication theory, linguistics and semiotics as well as philosophy. We have seen his concepts of interspecies communication and transgenic bacterial communication. Mikhail Bakhtin and Martin Buber are, according to the artist

himself, major sources of inspiration for this broad concept of communication.[223] Thomas A. Sebeok describes communication in the broadest way as "the transmission of any influence from one part of a living system to another part, thus producing change".[224] What is being transmitted is different forms of *messages*. A message "is said to be "coded" when the source and the destination are "in agreement" on a set of transformation rules used throughout the exchange".[225] For a message to be conferred, there has to be a transfer of sign(s) from a sender to a receiver. In order for this transfer to occur, the message must be *encoded* "at the interface between internal and external message systems",[226] and consequently *decoded* in a process of interpretation. Because of entropy, the measure of disorder in the system, the message that is decoded "can never be identical with the message formulated".[227]

"Genesis" illustrates this the most clearly out of the transgenic pieces. It is focused on the language of codes: the code of DNA, the code of Morse, the code of English. If you wish to understand the meanings of any artwork, it is necessary to decode or decipher it. An artwork is inherently multivocal: it can always be decoded, read, in different, sometimes competing, ways. But this is more than usually explicit in "Genesis", in which the translation from one code to the other, and back, is the very foundation of the piece. The Genesis of "Genesis", in a very real sense, is the ability to transform a sentence, words, into bacteria, life. The artwork can also be seen as an illustration of how translations inevitably result in some changes from the original content.

Three out of the nine core points listed by Kac on "GFP Bunny" explicitly mention dialogue or communication. They represent different *levels* of communication:

> 1) ongoing dialogue between professionals of several disciplines (art, science, philosophy, law, communications, literature, social sciences) and the public on cultural and ethical implications of genetic engineering
>
> 4) interspecies communication between humans and a transgenic mammal

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[223] Kac 2004: 278.

[224] Sebeok 1991: 43.

[225] *Ibid*. 49.

[226] *Ibid*. 48.

[227] *Ibid*. 49.

7) consideration of a non-semiotic notion of communication as the sharing of genetic material across traditional species barriers

The first point fits easily within what most of us would define as communication. Dialogue is used synonymously with communication in common usage. The entities expected to dialogue are all humans. What is the goal of this first point? The way I read it, it entails several elements: to further the interaction and communication of professionals with other professionals, within disciplines and across; of professionals with the public; and of members of the public with other members of the public. They are all to dialogue on cultural implications of genetic engineering, and on ethical implications. This may seem fairly straightforward, but is already rather ambitious. Taking into account the "science wars" discussed in the previous chapter, it can be seen as a hope of increased interaction. It entails the idea that bio art can be a spur to interdisciplinary communication between "the fronts" of these wars, and thus act as a bridge.

Interspecies communication, as we have already seen, is only just within the semiotic notion of communication. Anyone who has ever had a pet knows that interaction with animals does entail a form of two-way communication. A cat pacing around its feed bowl looking at you, a dog scraping the door and whining. The fact that the animal in question is transgenic, does not in itself change the nature of the communication. It does of course add another dimension to it.

It is at the seventh point that the concept of communication as we generally conceive of it is really challenged. This wide concept of communication is not only non-verbal; it is arguably non-semiotic. The non-semiotic notion of communication represents a break with the poststructuralist tradition, which was focused precisely on a broad concept of semiotics. Are the "Genesis" bacteria communicating with each other? Is Kac communicating with the petunia, in electing to have his gene spliced into it? If the sharing of genetic material can be communication, we may need to rethink our relationship to everything we encounter in this world, up to and including the individual cells of our own bodies.

At this point, the enlightened reader may expect me to examine the transgenic artworks in light of Bakhtin, or Buber, both of whom are mentioned by Kac as inspirational figures.[228] I have elected not to do so, as dialogism is not my field and there are other issues that interest

[228] Kac 2004: 271.

me more. Instead, I would like to take the opportunity to illustrate a point about the spectator's selective approach to the art. Since I, personally, would prefer to ponder other aspects of the artworks, I am free to do so, even if the dialogical nature of the artworks is clearly of enormous importance to the artist, as illustrated in so much of his writing. This, after all, is not a thesis about Kac's views on his own art, rather it represents my interpretations of the artworks, which is naturally informed by my own set of skills and my personal understanding of the world. The point I am making here is at the core of Jacques Rancière's concept of the emancipated spectator.

The Emancipated Spectator

In the first chapter of *The Emancipated Spectator*, Rancière relates how "it seemed to me that the absence of any obvious relationship between the theory of intellectual emancipation and the question of the spectator today was also an opportunity".[229] He sets out to fill the absence, telling us that it was "necessary to reconstruct the network of presuppositions that place the question of the spectator at the heart of the discussion of the relations between art and politics".[230]

Characteristically, Rancière discusses the concept of spectator from differing points of view as if they were his own, leading us in a merry chase until finally arriving at what he has to say. Rancière describes "the paradox of the spectator" as the basic formula of critiques of theatre. The paradox to which he is referring is: "there is no theatre without a spectator",[231] but that *being* a spectator is a bad thing. According to the proponents of this view, Rancière explains, viewing is seen as an opposite to knowing, and to acting. The role of the spectator is inherently passive and ignorant.

From this diagnosis, however, the accusers have drawn two different conclusions. The first is that the theatre is absolutely bad and should be abolished. Instead, we should embrace "the choreographic community", where everyone moves in accordance with a "community rhythm".[232] This was the view of Plato, Rancière informs us, and, to him, it makes the most

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[229] Rancière 2009: 1-2.

[230] *Ibid*. 2.

[231] *Ibid*. Rancière's example is the theatre, but it holds as well in our own context of transgenic art.

[232] *Ibid*. 5.

sense considering the diagnosis. The *prevailing* solution, however, was to retain the premises, but change the conclusion. What we need, the changed conclusion went, is a theatre *without* spectators. Instead of the spectator, one should have active participants who could "learn from as opposed to being seduced by images".[233] Within this view, Rancière goes on to relate, there are two main formulations, one of which allows the spectator some distance, in which to "refine his gaze",[234] the other seeking to draw the audience in altogether, forgoing any distance.

But the solutions have something in common. They contain the "logic of the pedagogical relationship" between the schoolmaster and the ignoramus.[235] Inspired by Jacotot, Rancière opposes this "inequality of intelligence" to intellectual emancipation, in which all manifestations of intelligence are self-equal.[236] The ignorant schoolmaster is one who has "renounced the 'knowledge of ignorance' ",[237] and wants his pupils to learn through a process of self-learning. The gulf separating two positions, Rancière contends, is the same in the theatre's conviction of the problem of passivity as an opposite of activity, as in the schoolmaster's condescension to the ignoramus. Is it not "precisely the desire to abolish the distance that creates it?"[238] Rancière asks. The oppositions described are *not* logical dichotomies of clearly defined terms. Therefore, they must be challenged. Only then can emancipation begin. We must understand that viewing is also an action; the spectator does act.

I find a link between the thinking of Rancière and that of Kac in their shared intent to dispose of dichotomies. Kac is consistently set on avoiding simplifications, and getting people to think for themselves. The spectators of "GFP Bunny", as we shall see, take all sorts of stances. Their stances are based on their own opinions, which are the basis for their reactions to the artwork.

According to Rancière, the emancipated spectator is one who chooses which parts of the spectacle to take in. The artist may wish him or her to "see this and feel that, understand some

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[233] Rancière 2009: 4.

[234] *Ibid*. 5.

[235] *Ibid*. 8.

[236] *Ibid*. 9.

[237] *Ibid*. 11.

[238] *Ibid*. 12.

particular thing and draw some particular conclusion",[239] but the spectator sees and understands the spectacle on his or her own terms. Rancière does own that most artists do not wish to dictate a lesson to the spectator, but that they assume that what will be read into their work is what they have *themselves* been thinking. Kac seems to be guilty as charged here, in his manifesto-like texts citing the different aspects of his pieces (recall the nine core points of "GFP Bunny"). Does he not trust his audience to make their own interpretations? Performance, to Rancière, is a "third thing (…) whose meaning is owned by no one".[240] Does the audience's reception conform to Kac's "instructions", or do they respond to something else inherent in the artworks?

Affects

Brian Massumi has pointed out that, in the understanding of culture, our entire vocabulary "has derived from theories of signification".[241] Ernst Van Alphen discusses how jumping straight to interpreting the meaning of the artwork or book "can only end up in the already known".[242] If you take into account the *affective* operations in the reception of art, on the other hand, the interpretation of meaning is slowed down, allowing us that "shock to thought" which can open our minds to new territories.[243] Since I am arguing that transgenic art can, ideally, "shock people to thought", I find it worthwhile to explore the concept of affect.

Deleuze's concept of "affect" must not be confused with emotion, although the Latin *affectus* means precisely emotion or passion.[244] Affects "come from an interaction with objects, an environment, or other people. Because of its origin in interaction, one can say that the transmission of affect is social in origin, but biological and physical in effect".[245] But affects are not feelings. Jill Bennett has proposed to define feeling as "the moment of awareness of

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[239] Rancière 2009: 13-14.

[240] *Ibid*. 15.

[241] Massumi 1996: 221.

[242] Van Alphen 2008: 30.

[243] *Ibid*. 21.

[244] *Ibid*. 23.

[245] *Ibid*.

affect through which the self is experienced".[246] Affect, as included in Bennett's definition, seems to be only "intensity". According to Deleuze, affect is "a zone of indetermination, of indiscernibility"[247] that does not have a content or meaning, but produces feelings, emotions, and thoughts. The same affect can evoke different responses in different people. The affective is not the same as the emotional, and certainly not as the sentimental. Affect is "man's nonhuman becoming".[248] By becoming, Deleuze does not mean a transformation of one being into the other, but "something passing from one to the other".[249]

"Art does not have opinions", Deleuze contends.[250] Not even when artists specifically include the spectators' reactions and their own texts reflecting on the piece, in the artwork? An important factor in Deleuze, as I read him, is the idea that art, philosophy and science are all *modes of thinking*. What separates them is what they are *thinking with*. The artist, Deleuze maintains, thinks by means of sensation. Art is "the name of the object of an encounter, but also the name of the encounter itself, and indeed of that which is produced by the encounter".[251] The encounter with the artwork can make the spectator "shocked to thought". Art can provide the spectator with "impressions which force us to look, encounters which force us to interpret, expressions which force us to think".[252] It seems to me that this is exactly the reaction Kac is trying to achieve. He wishes to set the audience off on a chain of thoughts, get them to reflect on the issues he is raising.

According to Van Alphen, there are three possible outcomes in the production and transmission of affect: we can "reject the affect, project it elsewhere, or accept or "absorb" it".[253] The affects, in other words, can be wanted or unwanted. It is when affects are discerned and processed that they are given content, and can "shock us to thought". This view of affects is concurrent with Rancière's idea of the emancipated spectator's selective reception. Do the audience see all of Kac's intentions when they receive the artworks? To Rancière, it is just as

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[246] Bennett, quoted in Van Alphen 2008: 24.

[247] Deleuze & Guattari 1994: 173.

[248] *Ibid*.

[249] *Ibid*.

[250] *Ibid*. 176.

[251] Deleuze, discussed in O'Sullivan 2006: 2.

[252] Deleuze, quoted in Van Alpen 2008: 22.

[253] Van Alphen 2008: 29.

well if they do not. If the artist's intentions "rule" the progression of the artwork, he has become a schoolmaster.

The Reception of GFP Bunny

The case of "GFP Bunny" caused an enormous amount of varied reactions. Obviously, the role of the audience is a larger one here than in traditional visual arts, as Kac explicitly names their reactions as part of the piece. In this perspective it is particularly interesting to explore whether Kac's art is understood differently from how he himself wishes to portray it.

James Elkins has pointed out that, to a large extent, the art world expects an artwork to have been created partially with the intent of inducing affect in the viewer. According to Elkins, Kac leaves this up to the individual spectator ("participant") and does not, himself, speculate on the feelings he may have stirred up. Kac's focus is on the production of new forms of communication, language, and code.[254] Kac may not be explicitly concerned with the *feelings* of his audience, but I do think he cares about their thoughts.

The audience, as mentioned, plays an important role as part of Kac's art – the reactions to the original artwork is an integral part of the art. After Kac has opened the piece to the public, it continues to evolve without his influence, whereas the audience is allowed to interact with it. This is most literally the case in "Genesis", where one can cause mutations in the bacteria to occur by pressing a button either in the gallery or online, directly contributing to the changed content of the Biblical sentence every time the DNA is decoded. In "GFP Bunny", the *Alba Guestbook* and the "Alba Headline Supercollider" revolve around audience participation. The artist's book *It's Not Easy Being Green*, which publishes selected responses to "GFP Bunny", obviously would not exist without it. "Natural History of the Enigma", where the audience theoretically could walk out of the exhibition with seed packs of the "Edunia" and plant them in their own gardens, also contains a strong element of this.

The Alba Guestbook

In treating the reception of "GFP Bunny", I hope to discern which elements of Kac's

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[254] Elkins, in Kac 2004: viii.

intentions disappeared in the multitude of impressions. As described in chapter II, the artist mentions nine core issues that he feels are being addressed in "GFP Bunny". But it does seem as if many of these tend to be ignored by the majority of his audience. Has an artwork failed if the audience responses differ greatly from the artist's expectations? Or should the *amount* of responses be counted as a measurement of the artwork's success?

The *Alba Guestbook* was active from 2000 through 2004. In this five-year period, a total of 635 entries were written, the highest number of which (208) was entered in 2001. To be fair, the first entry of the year 2000 was on October 13th, so the 89 entries of the following 2 ½ months prove that the interest was not long in manifesting itself. 2002 brought 180 entries, but then audience involvement seems to be dwindling, with only 94 entries in 2003 and 64 in 2004. Though most of the writers were from the USA, 37 countries were represented, ranging from Denmark through Pakistan and Australia to Ecuador. Entries were written in Spanish, Portuguese, German and even Scottish Gaelic, in addition to English. The entries ranged in length from a single word ("cool"[255] and "hello")[256] to 532 words.

The Cuddly Factor. Views on Pets

There can be little doubt that the decision of the INRA director not to send Alba to Chicago greatly added to the attention and press given to the piece. A bunny is a very cuddly, lovable animal. When showing her green picture, I have had comments that she looks ripped out of Miss Potter's fairytales. In contrast, eco artist Mark Dion's "Survival of the Cutest (Who Gets on the Ark?)" (1990) presents a critic approach to the "problem of charismatic megafauna", or photogenic animals.[257] Kac's choice of a transgenic bunny may have added a different dimension to the artwork than would have, for instance, a transgenic rat.

The *Alba Guestbook* illustrates this thoroughly. A majority of the entries concerned how the rabbit should be allowed to come home to Kac, who loves it the most. Many of the guest book writers were pet owners, who empathized with Kac on a private/personal level. Some offered tips on pet care:

> WHEN she does come home, I highly recommend having her spayed becausefemale rabbits have a high chance of ovarian cancer, which spaying prevent.You can then very easily train her to use a litter box,

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[255] *The Alba Guestbook*: S.R. Clarke, 09.04.02.

[256] *The Alba Guestbook*: Jeremy, 16.08.02.

[257] Dion, quoted in Baker 2000: 177.

> just like a cat,and she can live in your home without a cage. You must take care though,to keep wires and cords out of her reach due to chewing. I have a 4 yearold rabbit who has been cage free since she was 6 mo. old. She also travelswith us world-wide. They make wonderful pets. You can see her at: http://hometown.aol.com/janamarie/myhomepage/pet.htmlI really wish you lots of luck in bringing her home. Not too convincedon making her green, though, even for art....and my husband is an artistso I can understand you somewhat. Jana[258]

It seems clear that the involvement felt by Jana and the other pet owners is on an emotional level, more than an intellectual one. Jana's comment that she's skeptical to the greenness of the bunny is symptomatic – the most stunning element of the artwork, the transgenic nature of the rabbit, is less important to her than the pet owner fellowship demonstrated in the paragraph above. The eighth point of Kac's nine issues, concerning the public appreciation of the emotional life of transgenic animals, appears to achieve great recognition. The fifth point, the integration and presentation of the rabbit in society, did not happen, but most of the audience wished that it had.

17. "GFP Bunny", 2000. Eduardo Kac with the transgenic rabbit Alba, photographed at the INRA premices in Jouy-en-Josas, France. Several writers in the *Alba Guestbook* state that they think the artist looks as cute as the bunny in this picture.

[258] *The Alba Guestbook*: Jana, 23.10.00. NB: All of the entries are relayed as they are in the *Guestbook*, many of them containing a number of spelling errors. The recurring lack of spaces every few words seems to be a defect of the *Guestbook* itself. For me to sic each error individually would not aid the reader.

Almost half of the entries (294) responded to Kac's "Free Alba" campaign, with some version of the wish to "allow Alba to come home and live with Kac".[259] This sentiment appears to have been particularly strong in 2003, when 70 out of 94 entries were along that line. People were sympathetic with Kac's distress in not having "his" rabbit delivered to him (Figure 17).

In a few cases, the writers, all animal lovers, were negative to transgenic art, but all for Kac getting Alba as a pet:

> I might not agree with this form of art, but I do know that a rabbitneeds a proper home. I, myself, am the owner of an adorable Dwarf rabbit.His name is Carrot Cake, and I'm sure that if he could understand whatI've been telling him about Alba, then he would agree. Alba should comehome! [260]

In *The Postmodern Animal*, Steve Baker diagnosed postmodern artists and philosophers with a fear of pets, or rather, with "anthropomorphophobia", a fear of being accused of "uncritical sentimentality" towards animals in their close vicinity.[261] James Serpell's survey of attitudes to pets noted that people concerned with the wellbeing of companion animals are "damned with the accusation of sentimentality, as if having sentiments or feelings for other species were a sign of weakness, intellectual flabbiness or mental disturbance".[262]

Baker has suggested that Deleuze's view of pets as uninteresting animals, because they are too close to humanity (living in houses, eating prepared foods, generally participating in civilized life), is the dominant view of thinkers on domesticated animals. Pets, even more than livestock, are not proper animals.[263] Deleuze goes so far as to say that pets "invite us to regress, draw us into a narcissistic contemplation".[264] According to this view, Kac's wish to take Alba into his family is certainly selfish, and not a constructive evolution for neither the rabbit, nor the family. The artist's selfishness is a recurring criticism from the *Alba Guestbook* writers, if for different reasons.

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[259] *The Alba Guestbook*: P D Park, 07.03.04.

[260] *The Alba Guestbook*: Shannon, 19.10.00.

[261] Baker 2000: 175.

[262] Serpell, quoted in Baker 2000: 176.

[263] Baker 2000: 167-72.

[264] Deleuze & Guattari, quoted in Baker 2000: 168.

Indignation

84 entries in the *Guestbook*, out of the total of 635, expressed a negative opinion of Kac and his art. Reactions were often to the very process of transgenic transformation, and several commented on the differential value between transforming animals for art, and doing so for the sake of medical progress:

> Mr.Kac had no right. No animal deserves this. It doesn't matter whereAlba goes, she'll never be happy the way she is. Mr.Kac is crazy! The lifeof a living creature isn't worth art. I don't see any art in what thisworm of Mr.Kac did. It's OK to do medical research on animals, but a jelly-rabbit!Definitly, E.Kac is crazy. I rest my case.[265]

In its outrage, this comment touches on some of the questions posed in the Introduction. Melanie clearly feels that there is a difference between an animal being used for research in a laboratory, and taking the same animal out of its research setting and keeping it around "just" for art. This is an outlook shared by many of the writers negative to Kac's art. One, in an entry very similar to Melanie's, suggested: "If you want a green bunny, buy some hairdye".[266] To these writers, the purpose of a lab animal can be a justification, but they can see no justification for a live, green rabbit on the art scene. Melanie, as such, made more of an argument than other critics, who commented directly to Eduardo Kac: "You are not an artist, you are sadist. stop the cruelty. why don'tyou transform yourself?"[267]

The opinion that "GFP Bunny" was not an artwork was uttered in several of the entries. They disagreed with Kac's ninth point, which stated that this piece should expand the borders of art to include life invention. Several of the writers suspected that Kac was selfishly seeking to promote himself with the piece, one asking whether it was "just a publicity stunt to get funding?"[268]

Some writers were worried about the possibility of the GFP gene getting into wild populations of rabbits, creating "unnatural mutation in the wild".[269] Another concern was that accepting this kind of genetic engineering for art would open the gates for other forms of manipulation,

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[265] *The Alba Guestbook*: Melanie, 25.10.00.

[266] *The Alba Guestbook*: JL, 05.02.01.

[267] *The Alba Guestbook*: emit mahoney, 01.12.00.

[268] *The Alba Guestbook*: Frankenschteen, 20.07.01.

[269] *The Alba Guestbook*: Lauren Kessinger, 04.12.00.

which would be more harmful. Others were simply of the opinion that animals are not supposed to glow, and that one should not tamper with Nature for any reason. One told Kac outright to stop "trying to play God".[270]

Formalist Response

Some of the writers took a more enthusiastic stance, without relating to any of the nine points that Kac himself had drawn up. Some of the entries, often short ones, just stated that Alba was a cute bunny, or more strongly: "ALBA IS BEAUTY".[271] Others took a more original approach:

> I am a research assistant about interior designing in Turkey. My name is Nazli Batirbaygil.
> For sometime I am thinking designing a lighting fixture who doesn't need neither electrical energie nor solar energie. Finaly I discovered via internet this bioluminescent life. Than when I saw your art work "eight day" I realy loved it. I wonder how does it work? I wonder also if it's possible to develop a lighting fixture that we can use in our homes? I know that it is possible toproduce this bioluminescence syntheticaly but I don't know in which conditions does it work. If you can help me a little I will be happy. Thank you for your interest.[272]

This entry definitely adds another aspect to the artwork, in considering the utilization of these animals as sources of lighting! Of course, Batirbaygil is referring to "The Eighth Day", which also contains "lower" forms of life, namely plants and bacteria. Still, a most extreme viewpoint in the range of people who think Alba is "groovy" and would love to have such a pet to bring to raves.[273] In considering how bioluminescent life can be useful as a light source, Batirbaygil is not really viewing the rabbit as art at all. However, as Kac has named the audience reception part of the artwork, these responses can themselves be viewed as art.

The idea of genetically manipulating humans with GFP seems to hold a great deal of fascination for some. One writer included a link to a manipulated picture of Kac with Alba, where the artist's hands and face are a clear, green color.[274] Another offered to be the first

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[270] *The Alba Guestbook*: Nicki, 03.02.01.

[271] *The Alba Guestbook*: Robin, 04.08.02.

[272] *The Alba Guestbook*: Nazli Batirbaygil, 19.01.03.

[273] Any or all of these entries, of course, may be sarcastic.

[274] The picture can be seen at http://www.petboxes.com/eKac.jpg. *The Alba Guestbook*: Alba Supporter, 23.05.02.

transgenic human, while several animal lovers, angry over the use of an unconsenting animal for transgenesis, suggested that he use himself or his daughter next time.

Response on Content

The entries do vary greatly in their approach, ranging from quite simple statements such as "bunny = love"[275] to more considered entries. There are surprisingly few entries, for such a forum, that directly answer another writer's entry, in conscious debate. I will, however, include an excerpt of one answer, a response to Pam Barrie, who had suggested that Kac did not conceive of Alba:

> Pam snides at the fact the Chicago Tribunereporter did not reach the scientists in time for his story, but failsto notice that the Boston Globe reporter did reach the scientists. TheBoston Globe article says: "The scientist who created her for Kac, Louis-MarieHoudebine, said he doesn't know when, or if, Alba will be allowed to joinKac, but said that she is healthy, and even noted that she has a "particularlymellow and sweet dispostion." (Boston Globe, 9/17/2000). Here we hear itdirectly from the scientist. This is clear and conclusive evidence of Kac'screative gesture (…) Pam seems to imply that the fact that scientists atINRA and elsewhere had created transgenic rabbits before somehow altersKac's work. I disagree. The question is not (…) when was the first transgenic rabbit created, or how many transgenicrabbits INRA had created before Alba, but what is the cultural impact ofKac's work. In my view, Kac's work is art of the utmost importance, precisleybecause of the complexity and the depth of the philosophical and socialissues he raises.[276]

Walter Silverstone has taken some time to ponder the implications of "GFP Bunny". He enters into serious debate with Pam Barrie, whose entry was also well considered, although arriving at a very different conclusion. She was of the opinion that, since the scientists did all the work of creating Alba, the rabbit was only appropriated by Kac, and that his failure to inform his audience of the exact circumstances of her creation detracted from the value of the artwork. Pam did not think Alba was "the property, physical or intellectual, ofEduardo Kac".[277]

These entries showcase a point that I have been making before, about the differing versions of the bunny story creating confusion and contributing to a more heated debate, which is less focused upon the other issues raised by the artwork.

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[275] *The Alba Guestbook*: yuki young, 02.12.04.

[276] *The Alba Guestbook*: Walter Silverstone, 03.12.00.

[277] *The Alba Guestbook*: Pam Barrie, 01.12.00.

However, a percentage of the writers did comment on the issues they perceived in the artwork. Many of the entries remarked on the ability of "GFP Bunny" to stimulate "humanconversation and congitive processes in a world that has dulled our sensesand our mind".[278]

There were some instances of "professional" feedback, both from artists and scientists. Out of nine entries where the writer reported to be a scientist, two were negative:

> True Scientists deal with the stereotype of the Mad Scientist.Mr. Kacdoes nothing but reinforce this stereotype, making people fear scienceand genetic research. Experiments like this have limited what real scientistcan do in the US.[279]

Several of the other scientists, however, emphasized how transgenic art could help recruitment into their classes:

> My students in biochemical engineering love the bunny.In fact, we really would like to house one here at SJSU. Believe it ornot, just showing a digital photograph of Alba is helpful as part of arecruiting tool. Any chance we could buy one? It would be a big help forour efforts to promote genetic engineering.[280]

Recall my discussion of the "science wars" in chapter III. Kac did succeed in contributing to the debate on the cultural implications of his own art. "GFP Bunny" also seems to have made some people reflect on the use of genetic engineering overall. However, the wellbeing of Alba appears to have been a greater concern to a large portion of the audience. The first and eighth point on Kac's list of issues, we may conclude, were the most discussed in the public debate. The second, third, fourth, and seventh, were almost completely ignored.

It's Not Easy Being Green

In the artist's book *It's not easy being green*, Eduardo Kac has compiled a selection of responses to "GFP Bunny". The contents range from cartoons published by newspapers to children's emails. The book contains a transcribed ABC interview with Kac, and also a fictional interview with the artist, written by a student for a Stanford course on the history of artificial life. An article by Annalee Newitz launches the idea of "biopunk", and presents Kac's transgenic art project as an example of "biopunk art". Newitz's main goal with her "biopunk revolution" seems to be the freedom of genetic data, in the sense that we as

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[278] *The Alba Guestbook*: Lucy Roberts, 15.12.00.

[279] *The Alba Guestbook*: Biologist, 27.12.00.

[280] *The Alba Guestbook*: Claire Komives, 04.12.01.

individuals should own the rights to our individual genome.[281] Interestingly, the entries included from the *Alba Guestbook* are universally positive. The twenty excerpts do offer some variations in style, but the writers are all definitely impressed by the bunny. There is not a single item in the book expressing, for instance, that transgenic art is sick and twisted, although this view was represented by almost a hundred entries in the *Guestbook*. It may be argued that, by omitting all negative responses, this selection presents a glorified image of the reception history of "GPF Bunny".

Truth and Trust in Transgenic Art

In the spring of 2010, I held a lecture for my fellow Master's students on "Natural History of the Enigma". One of the questions from the audience was "how do we know that this was really done?" How can we trust the scientific claim that merging human and plant DNA is even possible to accomplish? The element of uncertainty is an integral part of the artwork. Kac himself never mentions how the Edunia is visually conforming to other petunias of its mother species. The redness of the veins is likened to the color of human blood, in a symbolic gesture. This does not harm the spectator's perception of the piece, instead perhaps adding to the aesthetic experience. However, once it is made clear, from other sources, that the redness is the same as that of any other petunia, it may very well weaken our belief that *any* part of the piece is as it seems. It can even make us question "belief" in itself.

The questions of truth and belief have concerned many a philosopher through the ages. Recurring questions have been: How can we ever claim to know that something is true, unless we have seen it with our own eyes? Do we even know it is true because we have seen it? Is there one truth?

We have already mentioned the verification questions surrounding Alba. To what extent does it change the audience's perception of the artwork and the artist that the main effect of the piece, that is, the greenness of the rabbit, may have been manipulated in Photoshop? Does it matter what is true? Do we need to know the facts behind the artwork to judge it fully? Does truth in art have a lot to do with facts? Are these questions that Kac is posing, or is it a part of the artwork not intended by the artist?

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[281] Kac 2003.

One part of "GFP Bunny" that was definitely unintentional was the uproar following the INRA change of heart, when the differing versions of the story being broadcast enormously added to the interest and the amount of publicity given to the "GFP Bunny" piece. Deleuze, according to Paul Patton, saw similarities between philosophical concepts and films: like a concept, the film "changes nature if one of the components is altered".[282] This is as true for a visual, and particularly for a conceptual artwork. The nature of "GFP Bunny" would not have been what it is without the INRA controversy, as our perusal of the *Alba Guestbook* has shown.

The Edunia looks like any other petunia. The piece, like all bio art, is transient and ephemeral. When we see the flower on its pedestal in the gallery, we are required to accept as truth that it is something else and more than what we can immediately perceive. The implications of the Edunia, however, will live on long after the hybrid flower is physically gone. "Natural History of Enigma" does involve groundbreaking new biotechnology, but the most important aspect of the project is the thought processes it can set off in the spectator, and in people reading about it in the newspaper or online.

An ambiguous relation to truth, knowledge and authenticity gained ground with the onset of postmodernism.[283] Harold Pinter, in his Nobel Lecture, said: "truth in drama is forever illusive. You never quite find it but the search for it is compulsive (…) The search is your task (…) But the real truth is that there never is any such thing as one truth to be found".[284] He was referring to drama, but it holds as well for other art forms.

Art does not "need" to be true in the way that science does. Research hypotheses are reliant on verification, and need to be "proven". In any situation in life, we may experience almost a sense of betrayal if something is portrayed to us, and we accept it as true, but later learn that it is not. But if we have such an experience in interaction with art, it affects us primarily on this emotional level. If we had learnt that something we "knew" as scientific fact was false, it would affect our entire worldview. This does not mean that the experience of truth or untruth in art is of little importance, though. Especially in the case of intellectual or philosophical art,

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[282] Patton 1996: 5.

[283] *See for instance* Baker 2000: 12.

[284] Pinter 2005.

as transgenic art is, it may affect us intellectually as well as emotionally. We may speak of a sort of individual learning process, what Rancière describes as emancipated spectatorship.

In the case of "GFP Bunny", we see a classical media approach to facts – simply print what some other newspaper has already written. "The Alba Headline Supercollider" shows the artist's experience of the media portrayal, and especially how the newspapers all print basically the same thing, only altering the content to spin it towards the interests of their core readership.

Effective Debate?

Do transgenic artworks have a greater and/or different effect on the debate surrounding the subjects they raise, than do essays and media entries? Do we react more emotionally when we view something as art? Will we tend to be more critical, or less so, than when seeing something in for instance an academic setting? In the course of this chapter, we have seen that the public debate tends to simplify the implications of the artworks. However, "GFP Bunny" did to a great extent contribute to debate. A public debate will inevitably be carried out on different levels. If some of the entries were unconsidered, and a few clearly meant as a joke, there were many who voiced their opinions eloquently. In our time, one measurement of the success of an artwork can be its faculty to generate interest. If we measure "GFP Bunny" on that scale, it was definitely successful as an artwork.

There does seem to be a lot at stake here. Commentaries from the audience can contribute to widening or tightening the borders that Kac is trying to create awareness of, thus influencing, for instance, a future decision on the direct genetic manipulation of human embryos. The relation of the audience to ethics will be one of the issues discussed in the following chapter.

V. Ethics in Transgenic Art

The value of something for itself, for its own sake, as an end in itself, is intrinsic.

- J. Baird Callicott [285]

Should Art be Ethical?

From the examples drawn from the *Alba Guestbook*, we can see that the ethical aspect is an important consideration of the audience's in the reception of transgenic art. Is it also important to the artist, in the decision to start on a project? Should art be ethical? What constitutes an ethical work of art? In his 1998 "Transgenic Art" essay, Kac emphasized that ethical concerns "are paramount in any artwork, and they become more crucial than ever in the context of bio art".[286] In this chapter, I will take a look at how the individual spectator's preconceived notions and values influence how they perceive the artworks. The animal rights issue is prominent in the discussion of "GFP Bunny", and deserves mention in this context. From there, I go on to examine the concepts of the subject, and "the other", both of which are mentioned in Kac's nine points from "GFP Bunny". Considering the question of responsibility, I take a look at the new field of "semioethics", and discuss some of the ethical dimensions of our transgenic artworks.

According to Kieran Cashell, art that is inherently ethical is often characterized by an emotional response, for instance shame or abhorrence, in the spectator.[287] It is ethical because it makes the spectator react ethically. While this can apply to, say, "GFP Bunny" or "Natural History of the Enigma", it does not seem to be the most widespread reaction. The majority of "GFP Bunny's" audience reacts emotionally *but not ethically*. They sympathize with Kac. Another percentage reacts with intellectual interest, focusing on the implications of the artworks. Only the last major group (a lot smaller than the sympathetic one) could be said to react ethically according to the definition provided by Cashell: their outrage is certainly emotional, as well as morally engaged.

Out of the sympathetic group, a large percentage can be accused of sentimentality. Sentimentality, in the art theoretical discourse, is often seen as an opposite of seriousness – It is hard to take sentimentality seriously. In his book *The Postmodern Animal*, Steve Baker

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[285] Callicott 2005: 280.

[286] Kac 1998.

[287] Cashell 2009: 127.

pointed out that sentimentality "*matters*; its formal expression is a problem".[288] Its problematic nature can be explained with the observation that sentiment "seems to go hand in hand with moralizing".[289] Sentiment and morality are clearly negatively laden words to the postmodernist mindset. Is this still the case today? Do these concepts need to be pompous and excluding? Emotion and rationality are dichotomies – can they be found to go together?

With his transgenic artworks, Kac is creating life forms that, in their capacity as artworks, symbolize the shape of modern biotechnology. The view of the artist is that all artworks are symbolic, as they produce a world of understanding.[290] At the same time, Alba and the Edunia are living organisms participating in the world around them. In addition to being symbols, they are also symptoms.[291] Man takes a more active stand in the creation of new life than ever before. The question of whether this is as it should be is not one that is asked too often, and asking it in the context of art places biotechnology wide open to debate. A fundamental ethical question that I find in transgenic art is: "Should we do things just because we can?"

Many spectators, upon encountering transgenic artworks, are struck with a sense of "right- or wrongness". The prerequisites for settling on one or the other are complex. Different people will make differing reflections based on their own, preexisting set of values. In the following section, assorted points of view on the relationship between art and ethics will be discussed.

Moralism, Autonomism, Contextualism

Moralists hold that art is subject to the same laws and norms as the rest of society. Moralism is generally considered to have originated with David Hume, though in the field of aesthetics he is more famous, perhaps, for his empiricism. A moralist perceives the morality of art as directly impacting on its aesthetic value. In other words: if an artwork is "morally defective", it must be aesthetically flawed, too. Kieran Cashell mentions the novel *Lolita* by Vladimir Nabokov as an example of the problem of moralism.[292] The formally exquisite prose of the book is in stark contrast to its storyline about an unrepentant pedophile. A moralist would

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[288] Baker 2000: 177, *original emphasis*.

[289] Baker 2000: 177.

[290] Kac 2004: 276.

[291] *See* Mitchell 2005.

[292] Cashell 2009: 30.

have to condemn it as artistically flawed, despite its aesthetical beauty. Anthony Julius concludes that moralists and artists "cannot be reconciled, and that there is no third position available to harmonize the contrary perspectives".[293]

Noël Carroll's "moderate" moralism, however, hopes to achieve this third way. He suggests that where moral value "*is* significant to a work of art, it is therefore also relevant to the aesthetic value of that work".[294] The intention of the artist is an important factor to Carroll: if an artwork does not invoke a moral response *when one was intended by its producer*, the design of the work is faulty, and the work itself, therefore, is an aesthetic failure. But, following this logic, it is possible for a work of art, which was not intended to have a moral impact, to be aesthetically and artistically successful without arousing moral feelings in the viewer.

In opposition to moralism is autonomism, the view that ethical and aesthetic criticisms are separate. All art, in this view, is "indemnified from evaluation in moral terms".[295] R.W. Beardsmore traced the idea back to Oscar Wilde's proposition that the critic ought to "recognize that the sphere of art and the sphere of ethics are absolutely distinct and separate".[296] An artwork can be ethically defect and still be aesthetically pleasing, and vice versa. Kieran Cashell points out that since it does not acknowledge works of art that possess ethical significance, even when relevant to the complete aesthetic evaluation of the artwork, autonomism "is compelled to treat any works that do as hybrid deviations, as art mutations that cannot be considered purely artistic".[297]

If you hold this view, then, you will tend to identify the aesthetic elements of the artwork with form, while everything un-aesthetic, consequently, is associated with content. It is an inherently formalist view. Cashell contends that "recent tendencies in art practice (…) aggressively challenge exactly these arbitrary ideological divisions".[298] He goes on to suggest that when confronted with "morally transgressive art, autonomism is rendered redundant as an

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[293] Julius 2002: 9.

[294] Carroll, discussed in Cashell 2009: 31.

[295] Cashell 2009: 28.

[296] *Ibid*.

[297] *Ibid*.

[298] *Ibid*. 29.

explanatory model of art practice".[299] The moral relevance of certain artworks, he contends, actually increases their aesthetic value, rather than subtracting from it.

On the other hand, moralism is paradoxically compelled to "adopt a formalist approach to the work's aesthetic value".[300] Daniel Jacobson has demonstrated how the moralist, when encountering "immoral" art, must either "rescind its aesthetic value altogether, thereby denying it artistic status, or (…) continue somehow to accept it as art while remaining unmoved by – or disgusted by – its offensive moral message".[301] If the latter approach is chosen, what remains is a formalist judgment of the artwork separated from its content.

How will these differing stances relate to transgenic art? The art that Kac creates can hardly be said to be moralistic, as he contents himself with posing questions, and leaves it up to the spectator to settle on an answer. As I have already suggested in my discussion of Deleuze, it seems more appropriate to consider transgenic art philosophical in nature, as it seems to be centered on the intellectual response, more than the emotional one. An autonomist, however, would have to regard it as moralistic, as it does engage "with a moral or political agenda".[302] Its aesthetic status is thereby automatically lessened, to an autonomist. The practical examples of this view are seen particularly in the entries of the *Alba Guestbook* that protest that transgenic art is not, in fact, art.

Transgenic art is more about content than form, as Eduardo Kac himself sees it. As such, it does not adhere to the autonomist idea of aesthetic autonomy. But the spectator, of course, is free to judge the art autonomically. If we consider, again, the *Alba Guestbook*, we find quite a few entries that may be perceived as autonomist, in the sense that they are formalist at the expense of content. Consider the group that viewed fluorescent beings as a cool source of lighting. They certainly found the aesthetical aspect to be the most interesting one in this artwork, and did not engage in a discussion about ethics.

The *Alba Guestbook* also got its share of moralist responses, judging the action of using transgenic animals for art as bad, and thereby also judging it as bad art, or not art at all. The

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[299] Cashell 2009: 42.

[300] Jacobson, quoted in Cashell 2009: 44.

[301] Cashell 2009: 44.

[302] *Ibid*. 42.

moralism seems to have been motivated either religiously, or by a consideration for animal rights.

Contrasting moralism, Cashell describes "immoralism" as "the provocative idea that the ethically problematic characteristics of certain transgressive artworks can contribute positively to their artistic value".[303] Moral defects in art need not be aesthetical defects, even when relevant to the aesthetic value of the piece. This idea also contradicts autonomism, with its insistence that morality should not be taken into account.

"Ethical pluralism" is a model that acknowledges, "that conflict between mutually opposed yet equally reasonable attitudes arises because moral values are neither exclusively oppositional nor commensurate with each other".[304] This relativist approach has as its point of departure the view that moral concepts cannot be expected to apply equally to diverse situations. Berys Gaut, in an example of ethical pluralism, has taken immoralism in a new direction. His "contextualism" suggests that, *occasionally*, "what makes a morally questionable work unethical may be found to contribute positively to the artistic value of that work".[305] Gaut protests against immoralism's connotation that moral defects "are automatically aesthetic merits".[306] Rather, the "deployment of whatever principle may be required in the particular circumstances" should be our guide.[307] Contextual details must be taken into account in a contextualist analysis.

I have listed the above approaches in order to showcase how the integral values of an individual spectator influence how (s)he perceives the artwork. What *I* see as the most important part may matter a lot less to *you*. As we saw in the previous chapter, different spectators viewed the same artwork, "GFP Bunny", with completely different eyes. Their emphasis on the various aspects of the piece varied as much as did their reaction to the content. What they learned from the artwork, how it "shocked them to thought", we may conclude, depended on their preexistent set of values.

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[303] Cashell 2009: 45.

[304] *Ibid*. 13.

[305] Gaut, discussed in Cashell 2009: 45.

[306] *Ibid*.

[307] *Ibid*. 46.

The Animal Rights Issue

A hand-painted roadside sign in rural Massachusetts reads:

For Sale
Rabbits
Pets
or Meat [308]

How should we, as humans, relate to other animals and the rest of creation? Ethical theorists, journalists, artists and the rest of the population, continuously debate this basic question. There seems to be no one, right answer. The quote above is a striking example of how animals are used as commodities. The utilizations of rabbits suggested on the sign, as food or pets, are incompatibly dichotomous. As Ivan Gaskell points out, the sign "starkly evokes the human propensity to put something to more than one use".[309] Six writers of the *Alba Guestbook* wrote that they would like to kill or eat Alba, in contrast to all the entries that proclaimed her rights.

Some animal rights activists hope that the artwork may contribute to publicizing the plight of lab animals.[310] Others, however, have reacted with outrage to art like Alba. How does this relate to the general treatment of animals by humanity? Animals are, of course, frequently used as organ donors and for medical research. Even people who do not like to see animals suffer, often acknowledge that this is a lesser evil considering the alternative. Animal testing has led to major breakthroughs in medicine, saving thousands of human lives. Animal rights activists are often viewed as "softies", who think animals are worth as much as humans and cannot bear the idea of inflicting pain. However, the last few decades have brought considerable changes to the theories of animal rights. Peter Singer's book *Animal Liberation*, published in 1975, has popularized the idea that if an animal is capable of feeling pain, it must be included in our moral considerations.[311] According to Singer, there is no rational defense for excluding non-human animals from morality. If we cause an animal to suffer, therefore,

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[308] Gaskell 2008: 229.

[309] *Ibid*.

[310] Kac 2003: 9.

[311] Cashell 2009: 169.

we are morally and ethically accountable. According to a utilitarian frame of mind, such suffering should be justified by a greater good being gained from it.

I find the case of Alba to have interesting similarities with artist Guillermo Habacuc Vargas's show in Nicaragua in 2007, where a stray dog was kept chained up in a gallery with food and water close by, but outside of reach (Figure 18). Nearby, the words "Eres Lo Que Lees" ("You Are What You Read") were written out in dog biscuits. Rumors were spread through the media that the dog had died in the gallery. The circulated pictures of the starved animal led to a great scandal, and outraged reactions. The gallery later reported that Habacuc had fed the dog after hours, and the artist himself emphasized how none of the visitors of the gallery had made it their business to feed the animal, skinny and exhausted as it was.[312] Whether the dog lived or not was never ascertained. Here is one similarity to Alba: The virtual aspect, that few (or in the case of Alba, none) of the audience have seen the living subject of the artwork, adds an extra element of uncertainty. Perhaps it is all just a simulacrum? After postmodernism we know fair well that things are not necessarily as they seem – what does this really mean to the perception of the art?

18. Guillermo Habacuc Vargas, show of Natividad, 2007. Códice Gallery in Managua, Nicaragua.

There are thousands of starving stray dogs in Nicaragua, just as there are genetically manipulated animals in laboratories around the world. What is it about the art setting that makes us so angry with its maker? Perhaps the artist is actually offering himself up as a scapegoat, or a Christ figure, accepting the blame for more wrong than he did? Our anger at

[312] Couzens 30.03.08.

artists who showcase existing problems may be one way of covering up a sense of helplessness when faced with the larger issue.

In the *Alba Guestbook*, the people who were angriest at Kac mostly emphasized that he lacked respect for animals, that he was out to further his own goals at the expense of animals, and that genetic manipulation goes against nature. Their responses were emotional and often irrational. Other negative entries were more reasoned, and involved discussion of many of the questions raised by Kac, and a few he did not raise.

Kac maintains that the use of GFP "is absolutely harmless, since GFP is species independent and requires no additional proteins or substrates for green light emission".[313] But, as several of his audience have pointed out, hormone treatments of the egg donor and surrogate mother, surgery to implant eggs and exposure to UV radiation can all give increased stress levels and risk of cancer.[314] These hazards may not be guaranteed to confer harm, and certainly do not constitute severe animal mistreatment, but they are enough to call into question a statement of the procedure being "absolutely harmless". This categorical statement from the artist, to me, slightly decreases the value of the artwork "GFP Bunny", in its intended capacity of stimulating debate. There clearly is no harm intended, and the animal does not appear to feel any pain as a direct result of Green Fluorescent Protein being present in its cells. This being the case, I personally would prefer the artist to acknowledge the added potential for debate inherent in the uncertain status of GFP.

In *Aftershock*, Kieran Cashell addresses the ethical issue of Damien Hirst's use of animals in his art. Utilizing dead pigs, sharks and cows, Hirst's art is in Cashell's opinion fundamentally unethical because of its lack of respect in dealing with non-human animals. Cashell owns that the immorality is lessened because the animals are already dead when Hirst gets them; he does not kill anything except insects, which fall outside of the suffering animal category. According to Singer's definition, then, Hirst's art is not immoral. But this does not content Cashell. He turns to Kant's categorical respect and expands it from the term people, to include all sentient beings. Cashell's definition of "sentient" is quite wide, covering all creatures that are capable of suffering. His version of categorical respect emphasizes the concern to treat

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[313] Kac 1998.

[314] *See for instance The Alba Guestbook*: Adam Zaretsky, 17.07.01.

animals "always as an end and never as a means".[315] If we accept this as a moral guideline, is Kac's art within the moral/ethical range?

Subjecthood and Intrinsic Value

The categorical respect was tied up to Kant's idea of dignity, but in his original form the term was strictly limited to people. To Kant, humans were the only rational beings on Earth. He owned that even animals have the capacity to reflect, but "only instinctively, namely not in relation to a concept".[316] Proposals to accord an intrinsic value to animals, as Cashell suggested in the above, are a common occurrence in the animal protection discourse. A division is visible between those who wish to extend the term rational beings to some non-human animals, for instance primates or mammals, and those who argue for another intrinsic-value-conferring property to replace rationality.[317]

A key element of "GFP Bunny" is Kac's wish to have Alba treated and regarded as a subject. If we emphasize this element, her transition from objecthood can be perceived as a transformation from being a means – the lab animal's purpose, after all, is scientific progress – to an end in and of herself. Is it that simple? Does her status as art not make her a means? For that matter, is a pet normally an end, or is it the means of comfort and company to its owner? The latter, of course, depends on the owner's attitude.

Does Kac's regarding Alba as a subject absolve him of responsibility of her transformation? As I have mentioned, GFP is generally considered harmless to the animals transformed, but there is research available that suggests that it can be harm*ful*. If these preliminary results turn out to be true, GFP animals may have a shorter lifespan than normal, with an increased chance of pain near the end of it. In such a case, their use in lab work can be considered defensible from the utilitarian point of view – there is greater gain than pain. But what happens when a lab animal is removed from the context for which it was created? Kac himself claims to have ordered the rabbit from INRA to be made specifically for him. That makes his ethical responsibility to Alba greater than if he had only chosen a rabbit at random upon

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[315] Cashell 2009: 173. Kant's categorical respect is often referred to as the Second Maxim of his categorical imperative, see Guyer 2005: 146.

[316] Kant 2000: 15.

[317] Callicott 2005: 285.

visiting the lab, as Houdebine claimed. Of course, the rabbit never actually left the lab, so this whole mind exercise is centered on intention. In fact, you could say Alba actually ended up being a means to more ends than her fellow transgenic rabbits.

On the other hand, you could also say that her life has more purpose. After all, I am discussing animal rights in this art theoretical paper, as a result of their coming to mind with this very artwork. Alba is both subject and object – the object of interest, the object of pity – but she is not a thing. The thingness of animals was often emphasized in the art of postmodern artists, for instance that of Robert Rauschenberg, who said of his "Monogram" piece that "a stuffed goat is special in the way that a stuffed goat is special", refusing interpretation.[318]

Mieke Bal mentions the "subject" as an example of why she thinks a concept-based methodology is crucial. She describes a situation where a philosopher, a psychoanalytic critic, a narratologist, an architectural historian, and an art historian are discussing signs and ideologies. When the word "subject" comes up, confusion sets in, as "the first participant assumes the topic is the rise of individualism; the second sees it as the unconscious; the third, the narrator's voice; the fourth, the human confronted with space; and the fifth, the subject matter of (…) the depicted figure".[319] Their disciplinary training, she suggests, has never given them reason to reflect upon whether the word subject is, in fact, a concept, and might be utilized as different, exclusionary methods within diverse disciplines. What kind of "subject" does Kac see, in his transgenic creations?

Becoming "The Other"

Where's my carrot?

- Alba, The Alba Guestbook [320]

This title lists two concepts mentioned by Kac, which are important both to how we view communication in the context of this art, and by extension to the role of the spectator. Kac appears to be encouraging us to voluntarily step into the space of "the other". From the *Alba Guestbook*, we can gather that he achieved at least a limited success: there are two separate

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[318] Baker 2000: 80.

[319] Bal 2002: 5.

[320] *The Alba Guestbook*: Alba, 07.01.04.

entries where people actually take on the voice of Alba, arguing what they perceive to be her point of view.

Ernst Van Alphen describes how looking at art, or reading, can lead to a process of *heteropathic identification*. The spectator, the self doing the identification, in this process "takes the risk of – temporarily and partially – "becoming" (like) the other".[321] Van Alphen gets the concept of heteropathic identification from Kaja Silverman, who separated between that and *idiopathic identification*, in which the self takes "the other into the self on the basis of a (projected) likeness".[322] With idiopathic identification, the other "becomes like" the self, difference is cancelled and possible tension thus removed. Van Alphen argues that heteropathic identification is more affectively powerful, dangerous and exciting.

This idea is consistent with Deleuze's suggestion that there are three kinds of animals. The first, and to him the least interesting as it is too close to human subjectivity, is family pets, "individuated animals". The second is "animals with characteristics or attributes", meaning they serve a purpose of myth, of state, of science. Lastly, he mentions "more demonic animals … that form a multiplicity, a becoming".[323]

Deleuze builds on a "Nietzchean conception of the cosmos as the ceaseless becoming of a multiplicity of interconnected forces".[324] Nothing "is", it "becomes". Therefore, there is no use in talking of an identity. He believes in "the existence of very special becomings-animal traversing human beings and sweeping them away, affecting the animal no less than the human".[325] Viewing Alba the bunny in this context gives us a somewhat complex problem. Like any animal, she is "other" to us. Her transgenic nature adds to her otherness, making her extraordinarily unfamiliar. In that sense, she should belong within Deleuze's category of "demonic animals". On the other hand, Kac does plan to take her into his family as a pet. To Deleuze, a proximity to humans will result in a lessening of the animal. Kac, conversely, seems to regard this as a statement in the debate on otherness, and wants her to be regarded as a subject.

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[321] Van Alphen 2008: 28.

[322] *Ibid*.

[323] Deleuze & Guattari, quoted in Baker 2000: 125.

[324] Ronald Bogue, quoted in Baker 2000:103.

[325] Deleuze & Guattari 2004: 261.

Mutations are, to a smaller or larger degree, continually occurring in nature. Throughout history, humans have learnt to exploit this to breed forth the most valued properties, of both plants and animals. The albino rabbit is a natural mutation, which in the wild has only a slight chance of survival. Domesticated, however, it had as good a chance as any other rabbit of transmitting its genes to the next generation. The mutation of an albino bunny to fluorescence is not one that could have occurred naturally, of course. In the wild, a green bunny would have a distinct handicap. The lack of a natural habitat and a natural origin are characteristics of the monstrous creature.[326]

Mark Hutchinson, in discussing the art of young British artists in the 1990s, argued that the monster "might prove to be a more complete idea of subjectivity than the rational, moral western subject".[327] Referring to the "monsters" of John Isaacs, he described them as "ontological monsters: for us, it is what they are rather than what they do, that makes them monstrous".[328] An ontological monster is monstrous because it is an unnatural creature (as opposed to epistemological monsters, who are defined by their monstrous behavior). Hutchinson distinguished between "freaks" and "monsters" by explaining that a freak's "deformities go to reassure the 'normal' subject of her normality. The freak is the product of an ugly accident whereas the iconic monster has a very particular causal narrative behind it, explaining why it looks the way it does."[329] The *intentional creation* of the monster is given weight here. A monster is not a reassurance of the normality of the rest of the world, it is an *intentional break with* (or widening of) this concept of normality.

A monster is not a freak. It was created for a reason, and has its own purpose. What is "the purpose" of "GFP Bunny"? Kac is certainly exploring the concept of alterity. Steve Baker has noted how Kac problematizes the status of the animal in our culture, and how humanity is defined mostly by emphasizing how humans are different from other animals.[330] Baker points out that Kac's outlook has points of similarity with that of Derrida, who is concerned with

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[326] Hutchinson 1998: 159.

[327] *Ibid*. 148.

[328] *Ibid*. 157.

[329] *Ibid*.

[330] Baker 2003: 27.

"the animal that therefore I am".[331]

Kac himself mentions Levinas as an important figure in the discourse of "the other". He emphasizes how, to Levinas, "the Other can not be known as such. Instead, the Other arises in relation to others, in a relationship of ethical responsibility".[332] One of the recurrent themes in Jacques Rancière's writing from the 1980s on is the wish to reveal that discourses founded on the singularity of "the other" are "ultimately predicated on keeping the other in its place".[333] In this, he challenges Levinas's "ethics of alterity", proposing that equality does not require a similarity in conditions. As may be recalled, Rancière fears that the desire to abolish distances often end up creating and sustaining them.

Semioethics and Responsibility

Augusto Ponzio and Susan Petrilli have conceived of "semioethics", a combination of semiotics and ethics, as a critique of stereotypes. The purpose of semioethics is to show that there are networks of signs present where there seem to be none, and to present connections and intrigues where seemingly there are only distinct borders and distances.[334]

Ponzio and Petrilli stress that communication has a greater depth than what can be found in the "reductionist" communication model of sender-receiver. The real depth of communication, they contend, is as "ambito di formazione e funzionamento della rete segnica della semiosi umana".[335] The "rete segnica", the "network of signs", gives a more complex understanding of communication than a sender- receiver model can provide, according to them. The complex process of communication coincides with the process of social reproduction,[336] they continue, which even includes, to them, needs. They propose to expand

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[331] Baker 2003: 27. Derrida describes his relationship with his cat, and how he is embarrassed when the cat sees him naked. In French, the title reads *L'animal que donc je suis (à suivre),* and plays on the shared form of *être* (to be) and *suivre* (to follow) in first person singular present. Additional translations suggested by D. Wills are "the animal that therefore I become by following" or "the animal that therefore I follow". Derrida 2008: 162. The similarity to Deleuze's becomings is apparent.

[332] Levinas, discussed in Kac 2004: 282.

[333] Rockhill 2004: 2.

[334] Ponzio & Petrilli 2003: 145.

[335] *Ibid*. 149. *Eng*. "area of formation and function for the network of signs of the human semiosis", *my translation*.

[336] *It*. "processo della riproduzione sociale", *my translation to English*.

Sebeok's hypothesis of biosemiotics, relating it to ethical perspectives like those presented by Welby, Pierce, Bakhtin and Morris.

Their semioethics accepts the responsibility to show the limitations of the current social form of communication, through renouncing extreme individualism, and pointing to signs of how humanity is endangering all life on Earth. It is an ecological approach Human beings, they suggest, should, because of the dangers of our present historical situation, stop being *rational* animals, and start being *sensible* (or reasonable) ones.[337] The result of this transformation, they hope, will be to trade in the fear of "the other" with sympathy, "riscopre, al di sotto della *paura dell'altro* (…) la *paura per l'altro*".[338] Ponzio and Petrilli's ambition for semioethics is that it can recognize the rights of "the other". The *other*, they suggest, can become an *alternative*.

In the preceding pages, ideas of the network, as well as of communication, have been discussed in relation to transgenic art. Semioethics seems to combine the two in a manner well suited to transgenic art. What is at stake is, precisely, the implications of the connections between living beings. With an expanded concept of communication and semiotics, there comes a stronger sense of responsibility towards "the other".

Kac repeatedly stresses his responsibility to his creations. The spectators, too, seem to be very concerned with this factor. The concept of responsibility comes up mostly in the discussion of "GFP Bunny", which is natural as Alba was intended by Kac to be a pet. He writes of when he held her in his arms in Jouy-en-Josas, on April 29, 2000, that she "immediately awoke in me a strong and urgent sense of responsibility for her well-being".[339] His wish to integrate the transgenic subjects in society appears to be grounded in this sense of responsibility. Concurrently, as we have seen, some of the reactions to "GFP Bunny" were opposed to what they felt was a lack of responsibility by Kac, in the process of creating Alba.

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[337] Ponzio & Petrilli 2003: 153, *It.* "da animale razionale diventi animale ragionevole".

[338] *Ibid.* 154, *original emphasis. Eng.* "to discover, underneath the *fear of the other* (…) a *concern for the other*", *my translation.*

[339] Kac 2004: 264.

Ethical Connotations of Natural History of the Enigma

When considering a transgenic plant, of course, the thought of genetically modified foods is never far away. Neil Olszewski, as we have already seen, referred to the cornfield as a less rewarding arena for plant gene modification than the artistic project of "Natural History of the Enigma". Inherent in the artwork are several questions currently under discussion in the field of genethics.

Kac's wish of letting the seeds of the Edunia multiply for generations is clearly motivated by his expressed intent of contributing to biodiversity. Following this train of thought, "Natural History of the Enigma" can also be read as a contribution to the debate surrounding the controversial Gene Use Restriction Technologies (GURTs). GURT is the name given to a group of tools that in different ways regulate gene expression. They include a variety of proposed methods for controlling the spread of genetically manipulated crops, such as the Control of Plant Gene Expression (CPGE), also called "terminator and traitor technology".[340] "Terminator technology" will produce crops that grow normally and produce seeds, but the development of the embryo is arrested so that the seed will not germinate. With "traitor technology", a desirable transgenic trait is only expressed if the crops are sprayed with a particular proprietary chemical, which is sold separately, often by the same company.

If genetically manipulated plants were to "escape" their fields and interbreed with non-modified plants, it could severely disrupt the ecological balance of vast areas, and possibly lead to the extinction of some "natural" breeds. Keeping crops under control is clearly vitally important. However, it is a common fear that the technologies facilitating control could make farmers dependent on multinational companies with questionable motives.[341] Small farmers using local seed would be left with a disadvantage in a market dominated by designer seed. The opponents also worry about " 'the integrity of creation' being threatened by the mechanistic world view of biotechnology".[342] Consideration should be given to keeping genetic diversity available for the future, not allowing tailored mono-crops to reign supreme. An interesting perspective is the juxtaposition of the risks of genetically manipulated plants (or other organisms) with the risk of "exotic" species displacing native populations.

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[340] Kameswara Rao 2009.

[341] *Ibid*.

[342] Levidow & Tait 1995: 124.

Commodification

Kant wrote that everything "has either a *price* or a *dignity*. Whatever has a price can be replaced by something else as its equivalent (…) But that which constitutes the condition under which alone something can be an end in itself does not have a mere relative worth, i.e., a price, but an intrinsic worth, a *dignity*".[343] Intrinsic value, however, is not a constant. From having a dignity, something can change to having a price.

19. "Transcription Jewels", 2001 (from the "Genesis" series). Glass bottle, purified Genesis DNA, gold cast of Genesis protein, wood. Approximately 2" (5cm) each.

The commodification of research material, even in universities, has been increasingly noted and debated in the last ten years.[344] With commodification is meant the act of turning something into a commodity, commercializing it, particularly applied in cases where the item in question has not traditionally been regarded as a commodity. Eduardo Kac comments on this trend with his piece "Transcription Jewels" (Figure 19) from the "Genesis" series. Here, he uses expensive materials to show the core emblems of the biotech revolution, namely the gene and the protein, as valuable objects to be coveted. Highly ironic in its approach, the piece points to how even genetic building materials, tiny as they are, are quickly made into commodities on the world market, to be bought and sold.

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[343] Kant, quoted in Callicott 2005: 284.

[344] Majunder *et al*. 2008: 207.

Biotechnology, of course, has long since moved into the realm of business, as well. As we have just discussed, the implications of biotechnology on agriculture seem to be leaving small farmers at a disadvantage. Money will be an important factor, from the perspectives of both the proponents and the opponents, in the discussions of how these technologies will be utilized in the future.

As I have mentioned earlier, one of the main arguments against transgenic art is the lack of a clear, *valuable* purpose. If the purpose of biotechnology in general is not the betterment of the human race for philanthropic reasons, but rather the amount of money to be earned from it, one could scarcely say that science fares any better. If biotechnology can abolish some of the worst diseases known to humanity, for instance through curing HIV/AIDS or cancer, it seems inevitable that this will be attempted. However, if research is conducted mainly for commercial purposes, there is every reason to question the ethics of such operations.

As Kac himself raises this issue in a transgenic art setting, I find it only logical to pose the question of the possible commodification of transgenic art, as well. The transgenic subjects of Kac's art (particularly Alba) are alive and will not last long, which makes them tricky commodities.[345] However, as we have seen, Kac has produced a series of pieces around each of them. These consist mainly of photos, paintings and videos, which are a lot easier to sell. Art, too, is bestowed a market value, and the full-time artist is reliant on sales and grants in order to continue his work. To some extent, the idea that "this needs to sell" must influence the content of artworks, as it influences most of the factors of life.

[345] The Edunia is naturally ephemeral as well, but it does have the possibility of being sustained over a longer period of time through cuttings, which makes it technically still first generation and genetically identical. Olszewski 28.10.10.

VI. Hybrids and Chimeras. Some Reflections on the Preceding Pages

I demand that he who still refuses … to see a horse galloping on a tomato should be looked upon as a cretin. *- André Breton*

I find myself especially drawn by such engaging new beings as the tomato with a gene from a cold-sea-bottom-living flounder *- Donna Haraway*[346]

Surrealism Made Real – as in a Dream

What earlier served as matter for science fiction and surrealist artists, has entered the sphere of facts and science. Our time has seen men walk on the moon, animals be cloned and recreations of the Big Bang undergone. Where does that leave art?

The Surrealist movement of the 1920s and -30s, here represented by the André Breton quote, had a rather simple basis for their fantastical pictures. They valued the free association, the unconscious combination of elements that were ordinarily regarded as unconnected. The Surrealists were known to manipulate words as if they were objects, and to manipulate objects as if they were words, in the employment of such methods as automatic drawing and collage.[347] In fact, "as Anna Balakian notes, Surrealism established a closer bond between poetry and art than ever before".[348] Particularly the vicinity of language to art ties Surrealism to transgenic art, which, as we have seen, is very much concerned with dialogue and codes, two main ingredients of language. In the case of "Natural History of the Enigma", it may be recalled, Kac also drew on his background in poetry in the creation of the title. The connection of normally unrelated elements, of course, is at the very heart of transgenic art, which directly fuses different species together. In addition, as we have seen, Salvador Dali was one of the first artists to create art inspired by the recently discovered shape of the DNA molecule.

The quote by Donna Haraway was taken from the 1997 book *Modest_Witness@Second_Millennium.FemaleMan©Meets_OncoMouse™* . Seventy years separates her approach from that of the Surrealists. A lot of her discourse revolves around the post-human, her version of which is the cyborg – the human-that-is-machine. She was the one

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[346] Breton and Haraway, both quoted in Goodeve 25.03.11.

[347] Bohn 2002: 142.

[348] Balakian, discussed in Bohn 2002: 141.

who stated that "Humanity is a modernist figure", and went on to famously contend that "we are all (…) cyborgs".[349] Importantly, "all" in this case includes not only humans, but also laboratory animals. The first being to be called a cyborg was a white lab rat, which got an osmotic pump implant in the late 1950s.[350]

Eduardo Kac's approach bears some similarities to Haraway's. In his "Transgenic Art" essay, he contends that the skin "is no longer the immutable barrier that contains and defines the body in space. Instead, it becomes the site of continuous transmutation".[351] This attitude precedes his transgenic art project – recall Kac's piece "Time Capsule", described in chapter II, where the barrier of the skin was broken with the injection of a microchip into his body. Equally urgent, Kac continues, is addressing "the emergence of biotechnologies that operate beneath the skin (or inside skinless bodies, such as bacteria) and therefore out of sight".[352] We might paraphrase Haraway's famous statement, and say that we are all hybrids.

After postmodernism, where "everything" was examined as social and cultural constructions, there now seems to be a trend for realizing the creation of fantastical visions. Though postmodernism may be past, we remain in free flow, the borders between social reality and fantasy having been challenged. Where are the firm boundaries? New technology, especially Internet and the introduction of virtual reality, has changed the perception of concepts like identity. In this world of few firm footholds, it would not be strange if we were to feel a constant vertigo and estrangement.

Curiously, many do not. One answer to why we do not feel more estranged from the world than ever before can, perhaps, be found in Bourriaud's analysis of the radicant personality. People are able to adapt to our constantly changing perception of reality, by flowing freely from one area to the other, adopting new perspectives and new media, but retaining their roots as they do so.

In his first text on transgenic art, Kac cites the history of the chimera, from Greek mythology on.[353] The chimera was a hybrid creature, a fire-breathing combination of goat, lion and

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[349] Haraway, quoted in Baker 2000: 100.

[350] Baker 2000: 100.

[351] Kac 1998.

[352] *Ibid*.

[353] *Ibid*.

serpent. The term genetic chimera is used to describe an artificially created offspring of two or more separate species, which expresses the genetic material of one species in some of its cells, and of the other in the rest.[354] Kac does refer to Alba as a chimera, but emphasizes that he means "chimerical" "in the sense of a cultural tradition of imaginary animals, not in the scientific connotation of an organism in which there is a mixture of cells in the body".[355]

In nineteenth century side shows, "chimeras" were the most popular of freaks: the dog-faced boy, the bear lady – and although they were not genetic chimeras, they were described as "missing links" between humans and other animals.[356] As Hutchinson pointed out, their freakishness reassured the audience about their own normality. "Normal", however, has always been a relative term, with variable perimeters. And with the increased possibilities for alteration brought on by genetic engineering, the concept of normalcy today seems to bear little validity.

In naming his sources of inspiration for "Natural History of the Enigma", Kac mentions the mannerist Arcimboldo, who in the 16th century painted a series of pictures portraying nature in human forms. He also refers to Julien Offray de La Mettrie's *L'Homme Plante* of 1748, quoting him on how "the singular analogy between the plant and animal kingdoms has led me to the discovery that the principal parts of men and plants are the same".[357] For hundreds of years, Kac seems to be implying, some people have seen the contiguity of life, rather than the separateness between species. Transgenic artworks, of course, could not have been made without the progress made in modern science. But just as important to the genesis of the art form is imagination, and a sense of the similarity of different creatures.

In the way that Kac as well as the audience discuss the transgenic subjects, particularly Alba and the Edunia, I read a *demystification* of the vision of the transgenic creature. The hybrid and the chimera have been the subjects of myths since the time of the ancients. Often, the visions have been dystopian. A recent example is the Canadian movie *Splice* (2009), a sci-fi thriller portraying how two rebellious scientists splice together the DNA of multiple organisms, hoping to revolutionize science and medicine. The secret crossing of human DNA

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[354] *See* Center for Genetics and Society. A famous example is the "geep", a creature with genetically distinct lines of cells of both goat and sheep.

[355] Kac 2004: 264.

[356] Anker & Nelkin 2004: 82.

[357] La Mettrie, quoted in KAC 2011.

with that of several other mammals, as well as fish, plant, and fowl, results in an amphibious, winged humanoid that goes rogue.[358] The Greek chimera is distantly reflected in this new, fantastic creature. Anker and Nelkin maintain that chimeras "have always reflected the social, scientific, and religious circumstances of their time".[359] In our time of genetic chimeras, they reflect all of the possibilities and dangers of the biotechnological development.

When showcased as art, I contend, all of the issues inherent in the creatures are amplified, as they do not "hide" behind a clear purpose. Transgenic art relates to the transgenic being as subject, and is interested in its positioning in society. It provides a surprisingly "close-up" encounter with the transgenic subjects, a sense of closeness that is simultaneously disturbed by their very "otherness", which, for me, is based prevalently upon the uncertainty as to what they really are. Are they dangerous? Are they "real"? What do they suggest about our future?

Kac appears to have an ambivalent attitude to both his own and other people's roles as manipulators of nature. Transgenic art seems to point the attention to how slim are the borders between humanity and the rest of creation, with the comment that we should not put ourselves on a pedestal. As such, it fits seamlessly into the eco-wave that we are currently experiencing.

Kac's art is very topical to our times, as it is concurrent with and dependent on the technological inventions that enable the improvement and alteration of genes by direct interference on a DNA level. In the summer of 2009 the first monkey babies were born ever to have three genetic parents. It is now possible to cleanse maternal DNA of hereditary diseases, which can be a huge leap forward for medicine. We are one step closer to designed embryos, and the difficult question of where to draw the line in biotechnology has rarely been as hot as now.

Transgenic art can be seen as a contribution to the debate surrounding genetic manipulation. It is a separate science of art, raising debate around current ethical problems, and questioning what we tend to take for granted. It does seem like transferring objects of science from the laboratories, renaming them subjects of art, as in the case of Alba, causes an increase in

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[358] Natali 2009.

[359] Anker & Nelkin 2004: 108.

attention and concern for the grey border areas of ethics and what is actually occurring in the name of science.[360]

Kac's transgenic artworks do not only establish dialogues between science and art. They also provide a space for broader debates on ethics and contemporary society. Dialogues are established between the spectators, the artist and the media; between society, science and contemporary art; and between former and present understandings of the art field itself. Can transgenic artworks give the individual spectators impulses towards determining their personal answers to some of the major questions of our time?

Conclusive Remarks: What Defines Transgenic Art?

This thesis has examined where transgenic art is situated, in relation to theory and society at large. It has employed a multiperspectival approach, drawing on several theorists in the investigation of the possible impact zones of this art form.

My three chosen artworks are rather different, and they have received different amounts of attention in the course of the thesis. "GFP Bunny" has been my most frequent example. This is largely due to the bounty of spectator's responses available for analysis. The divergence between the original concept of the artwork and its final shape also presented ample raw material. My examination has concluded that the wide variety of the responses is resultant from the spectators' diverse worldviews. A moralist will make very different reflections around "GFP Bunny" than an autonomist will. Few people are fully one or the other, and to a certain extent I do feel that Kac succeeds in his ambition of promoting the discussion of different notions within the debate.

Løgstrup, in my introductory quote, expressed his conviction that the artist can decipher the theoretical thinking of scientists and philosophers, and discover how their theory, when carried out, can change how we view our existence. Art has the potential to expose a part of the world fundamentally. Kac's transgenic creatures can provide us with a space for reflection around biotechnology and genetics. Their status as art make the issues they refer to stand out in isolation, unprotected by monetary or medical *raisons d'être*.

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[360] Cf. Løgstrup in my introductory quote.

We have seen how Kac wishes to "shock people to thought". He wants his audience to reflect on the issues inherent in the artwork, and explicitly lists what he finds these to be. His wish for control may be somewhat excessive. Contemporary spectators are active participants in the reception of the piece, and choose which parts to take in. The affects emanated by the artworks can be rejected, projected or absorbed, in a process that also influences the understanding of the meanings of the art.

All transgenic artworks are fleeting in nature. They do not remain the same, even from one second to the next. One of the characteristics of traditional visual art is its stability. A painting or a sculpture, once created, remains the same, only altering when introduced to an exhibition space. In the traditional "performance arts", dance, theater and music, however, one would not expect any two performances of one piece to be the same.[361] Can transgenic art, then, be seen as a new stage in the evolution of performance?

Transgenic artworks, we see, do not fit comfortably within the traditional definition of visual art. "Natural History of the Enigma" and "GFP Bunny" are, however, *original* – they cannot be reproduced *en gross*, as they contain a subject that is unique. We have seen that Alba is not the only existing green bunny, but she is one individual, uniquely herself. The Edunia, too, is truly one of a kind, the only plant to contain human DNA from one known individual. In their uniqueness, these artworks differ from the art of photography or literature, which can be infinitely reproduced, each copy identical to the others.

Transgenic art utilizes the tools of biotechnology in order to create living art subjects. In what way is transgenesis in art different from transgenesis as a whole? The domains of art and science are both contested terrains. Kac dares to enter into both, challenging every dichotomy. We have seen how artists through the ages have attempted to "make scientific" the concept of art, and have utilized a variety of scientific methods and technologies. But art does not become science. Nor does science become art. What is it that sets them apart?

Vital to all transgenic artworks (and many other bio artworks) is this: What separates them from other biotechnology is their *purpose* (or, as some would put it, their lack thereof) as art. They are *presented* as art. In this, they follow a tradition of conceptual art going back to Marcel Duchamp's readymades. However, it is more complicated than that. Kac never conceives of the artwork only as consisting of a transgenic creature. The social context is just

[361] Lamarque & Olsen 2004: 71.

as important, as well as the philosophical implications of their existence. It is the combination of these parts that makes up the totality of the artwork, constituting "the plane of immanence" of transgenic art.

I find in transgenic art an ambitious inducement to interdisciplinary communication, between fields that are ordinarily on tense terms. The ambition also includes the broader sphere of the public, in a wish to spur public debate. Ideally, transgenic art might serve as a bridge between the sciences and the art field, opening up for new possibilities in the intermediate.

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Conversations

Kac, E. (Artist; Professor, Art and Technology Studies, School of the Arts Institute of Chicago), Personal Conversation. 19.10.10.

Muessig, L. (Registrar for Collections, Weisman Art Museum, University of Minnesota), Personal Conversation. 28.10.10.

Olszewski, N. (Professor, Dep. Of Plant Biology, Ph.D., University of Minnesota), Personal Conversation. 28.10.10.

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Kac, E. (21.01. - 10.04.11), *Life, Light & Language*. Retrospective show at Enghien-les-Bains Art Center, Enghien-les-Bains, France. 09.02.11

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Nota Bene

In citing Internet resources, the date on which I found the resource is given directly before the Internet address. All dates are given in the format DD.MM.YY. I follow US Standard English, and where my literature derivates from it, I have taken the liberty of adhering to their spelling only inside of quotation marks. In quotes, as well, I follow the punctuation given by the quoted author, therefore sometimes deterring from my chosen style. Artworks are given in quotation marks, and artist's books are given as books, in Italics.

The *Alba Guestbook* proved a challenge to cite. I related to it as one separate database of entries inside Kac's website. However, with multiple entries made by different writers, I chose to cite each writer's name, and the date in which the entry was written, in order to facilitate the reader's cross-referencing. As the names often are not given in full, I chose to deflect from the pattern of giving surnames only in the footnotes, choosing instead to give the name as it is written in the *Guestbook*. The *Guestbook* is also riddled with spelling errors, and there appears to have been a defect to the database, resulting in missing spaces at regular intervals. In the interest of authenticity, I have quoted these faithfully, but, because there are so many errors, I have elected not to *sic* every one individually. In such a forum, you often cannot know for sure whether the entry is written in earnest, or if it is intended sarcastically or as a joke. All I could do was relate to what I found in the text.

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12. “Singularis”, 2008 (from the “Natural History of the Enigma” series). Permanent public sculpture, St. Paul, Minnesota, fiberglass and metal, 14'4" (height) x 20'4" (length) x 8'5" (width). Collection Weisman Art Museum, Minneapolis. Photo: ekac.org.

13. “Edunia Seed Packs”, 2009 (from the “Natural History of the Enigma” series). Hand-made paper objects with Edunia seeds and magnets, 4” x 8” (10,16 x 20,32 cm) each. Collection Weisman Art Museum, Minneapolis. Photo: Rik Sferra, ekac.org.

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19. “Transcription Jewels”, 2001 (from the “Genesis” series). Glass bottle, purified Genesis DNA, gold cast of Genesis protein, wood. Approximately 2" (5cm) each. Photo: ekac.org