ROSY SBRANA

WS0A Digital Arts

Student number: 0215575A

Supervisor: Prof. Anitra Nettleton

WORDS: 16.239

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INTRODUCTION

For many centuries beauty has been defined and represented in literature, fine art and philosophy. Concepts of beauty have evolved over the centuries and vary depending on the historical contexts within which they were developed. With the growth of technology the realization of 'ideal' beauty has become easier to achieve because technology has provided us with options such as cosmetic surgery or digital manipulation. These means are increasingly dominating the search for bodily 'perfection' in contemporary Western culture. This essay will examine the use of surgical or digital technology to create images of beauty, specifically focusing on contemporary representations of the female face. The project will examine the relationships connecting artists who have used surgery and those who have used digital technology to create representations or counter-representations of the ideal female face. Most of the images I will be dealing with are of women, thus referring to a feminized concept of beauty in western culture. My focus is the female face because, as the most recognizable and visible part of the body, it is a direct signifier of identity and beauty that has been transformed into a surface of inscription of cultural ideals of Western beauty (Pacteau, 1994).

Beauty is a theme of inquiry which runs through the histories of western, eastern and African art, and has formed the basis of philosophical debate in numerous societies. The study of aesthetics and representation is a very broad area; I do not intend to define nor invent a theory of beauty as I would just be repeating what already has been discussed in many other places. However, I will be working with existing literature on Beauty such as that by Umberto Eco, Plato, and Kant, and will develop an argument that will interrogate ideas about the evolution of theories of beauty in its current relation to technology.

Contemporary notions of beauty are strongly influenced by popular culture where women's faces can be seen in magazines, television and even on buses and tall buildings (billboard posters). Within consumer culture an attractive body and pretty face is promoted as a large contributor to happiness among women, as the media images that we are exposed to may make us more conscious about the way the photographed women

look and thus about the way that we are 'supposed' to look. New technologies and female identities are fundamental in my discussion because today notions of the self are constantly being reconfigured.

This essay will discuss different kinds of technological advances that can be used to create bodily beauty. These are: cosmetic surgery, digital compositing, software for facial beautification and digital retouching. I will look at the controversial surgical performances of Orlan, who, while she is not exactly striving for an idealized transformation of her face, nevertheless offers a critique of notions of beauty by creating 'grotesque' environments and images, in order for her audience to acknowledge the pain and suffering cosmetic surgery entails. I will further discuss the use of digital interfaces to improve the practice of plastic surgeons as well as the use of graphic technology to create images of perfection such as the work of Glenn Feron, who produces representations of 'extreme' beauty for commercials and glossy magazines to such an extent that the images of the models lose any 'natural' idiosyncratic features they actually possess. Through a close analysis of these technologies I will be able to demonstrate that images of beauty of the female face today, continue to be creations that barely relate to actual people. While artists offer a critique of notions of beauty as unreal and constructed, actual surgery and the commercial use of digital manipulation of the female face strive to reinforce Western and Renaissance-derived notions of beauty.

LITERATURE REVIEW

Technology has become an important aspect in the development of contemporary understandings of the link between appearance and identity because it allows the fantasies of some women in contemporary global culture to appear closer to reality. New technologies have constantly been explored by both artists and scientists, in order to look deeper into the form and function of the face as a vector of beauty and a symbol of identity.

In this report I will be looking at ways in which creative technologies can be used not only to realize the apparently universal and timeless social desire among women to be beautiful and perfect, a desire fuelled by the dominance of visual imagery in popular culture and advertising, but also to challenge the notions of what perfection is. I will be examining artists that have used faces as subjects of expression to either promote or reject notions of ideal beauty. Examples of these are Orlan, Terry Gilliam, Nancy Burson, Sandra Kemp and Glenn C. Feron. The project will examine actual manipulations of the face using plastic surgery, and virtual manipulation of the image of the face using digital technology; here I will be specifically focusing on the use of technology as a tool for manipulation and change of the female face.

I have found the study of aesthetics and representation is of deep interest throughout my practice and I am fascinated by the fact that I can easily be influenced by my surroundings and how this affects my judgment and perception of the beautiful. In order for me to discuss the issues surrounding concepts of ideal beauty in today's society, I have to look back at theory that speaks about and describes the fantasies and desires of beauty in art and aesthetics, largely working with the following sources.

The classification of ideal beauty in this day is highly influenced by the aesthetic theories that have been formed throughout history. Kemp acknowledges that the ancient Greeks believed that the idea of facial beauty was a question of proportion and that, for medieval artists the perfect face could be neatly divisible into sevenths (Kemp, 2000). Contemporary writers such as Umberto Eco (2004), Naomi Wolf (1990), Francesca A.

Miglietti (2003) and Kate Ince (2000) have further elaborated ideas on beauty which will help me achieve an enhanced understanding of the ways beauty is being represented today.

Umberto Eco's *On Beauty* (2004) deals with the ideas of beauty that have informed sensibilities from the classical world to modern times. He begins by identifying those cases in which a certain culture has recognised that there are things "pleasing to contemplate independently of the desire we feel for them" (Eco 2004: 10); in doing so Eco reviews the things humans have considered to be beautiful over thousands of years. According to Eco's observations, a beautiful thing is something that would make one happy if they possessed it, but would still remain beautiful if they did not. What we consider beautiful can be associated with pleasure: "if we judge on the basis of our everyday experience, we tend to define as good not only what we like, but also what we should like to have for ourselves" (Eco, 2004: 8). He argues that beauty has never been absolute and immutable, but that it has taken different characteristics depending on each historical epoch. This is why he discusses the various models of beauty within his text. Artists such as Botticelli with *The Birth of Venus, 1482* and Lucas Cranach with *Venus with Cupid Stealing Honey, 1506*, he argues, were inspired by the fashions of their own day, which embodied geometrical proportion and natural surroundings; just as, at present, many artists are stimulated by the technological advances of our society.

Towards the end of the text Eco looks at images of beauty that have been presented through media and advertising. Here he speaks of people who follow ideals of beauty made by a world of commercial consumption, offered by glossy magazines, cinema or television. Eco associates media art with existing models of art that have inspired many creations to this present day.

> "All things considered, the ideals of beauty presented by mass media over the first sixty years of the twentieth century refer to models originating in the 'major arts'. The languorous women who appeared in the ads of the 1920s and the 1930s are reminiscent of the slender Beauty of the Art Nouveau and Art Deco movements. Advertising material for a variety of products reveals Futurist, Cubist and Surrealist influences" (Eco, 2004: 425).

Popular media are constantly emphasizing the benefits of being beautiful, as they are dominated by images that represent an idealized version of the body. Examples of these images are seen in glossy magazines, such as *Glamour* and *Cosmopolitan*, where everything is about high fashion brands, dieting, cosmetics and sex. We are also exposed to media images on an everyday basis when we come across billboard advertisements, images in retail stores, on television and the internet. This of course is very influential on those individuals who have a constant desire for control over their appearance within a particular social space.

Consumer culture has been a leading inspiration for artists who have used their bodies as tools for protesting or encouraging a form of scientific representation in art. Francette Pacteau discusses the theme of beauty within the field of representation of women in western culture in *The Symptom of Beauty* (1994). The author recollects issues of beauty that accompanied the appearance of feminism in the 1970s, where female artists developed anger towards media and advertising, protesting against a world in which it was important for women to appear as exclusively young and beautiful. In this vein, artists such as Cindy Sherman, the Guerrilla Girls, and Orlan used their bodies as modes of expression in order to reject beauty from the commercial world of women as models of a particular kind of appearance. Similarly to Eco, Pacteau considers the idea of "beautiful" as something that varies between historical periods and cultures. She interrogates the "symptom of beauty" as it appears in images made by and for men, such as images of women in cinema and advertising, but also in the fragments of ideas on beauty from the past that have been integrated into the present (Pacteau, 1994). An example of this is a photograph of the famous Audrey Hepburn who appeared in a 1987 edition of 'Femme' magazine. The image appeared alongside the results of an opinion poll, in an article titled "La beauté idéalé" (ideal beauty). The article "aimed at establishing which physical attributes of others most commonly arouse our envy" (Pacteau, 1994: 145).

Within consumer culture an attractive body and pretty face are promoted as a large contributor to happiness, as the media images that we are exposed to may make us more conscious about the way we look and the way that we are supposed to look. Angelika

Taschen's *Aesthetic Surgery* (2005) is an elegant and fascinating insight into plastic surgery from the mid 1800s up to the present day. In this book, the author analyses how society is increasingly becoming obsessed with physical beauty, to a point where some people would pay any price for it. The text contains a variety of images and illustrations that demonstrate the evolution of plastic surgery, including images of the earliest face-lifts in the 1900s, breast augmentations, transgendered operations, plastic surgery in Hollywood, and extreme body modifications by artists such as Orlan and Terry Gilliam. Taschen describes the influence of plastic Hollywood beauty in today's society as follows:

> "To this day, Hollywood big-budget productions have defined concepts of beauty for women around the world - as well as for men. Actors and actresses are turned into role models of physical aesthetics, blueprints for our perception of beauty" (Taschen, 2005: 11).

Juergen Mueller, in the same volume, discusses the role of *Plastic surgery in the movies.* He speaks about the film maker Terry Gilliam who created a movie titled *Brazil* (1984). The piece consists of various plastic surgery approaches where some women are transformed into attractive 'ideals' and others may end up as "amorphous blob" (Mueller, 2005). One of the characters in the film receives a facelift as an artistic performance that comments on rich women in society who have "turned themselves into art objects, human canvases for competing surgeon-artists to wage their bizarre discourse on" (Mueller, 2005: 156). Gilliam's piece emphasizes that "the transgression of life's natural order can only end in extreme grotesque, heralding the decay of this society" (Mueller 2005:156). Mueller also discusses the film *The First Wives Club* (1996); he describes its theme as a male - dominated society that forces women into an unnatural pursuit of youth. The role of the 'surgeon' in this film is a rational and sensible doctor who warns his patients against crossing the boundaries of reasonability. Mueller believes that a beautiful body can put every woman's goal within reach (Mueller 2005).

Taschen's text also includes statements by some of the world's most famous aesthetic surgeons who have given personal insight on concepts of beauty.

> "When you look at popular magazines, you quickly realise that today's aesthetics are totally focused on appearance and superficiality. The laws of capitalism are in

full force here, all that counts is a flawless façade. This is highly regrettable" (Sebagh, cited in Taschen, 2005: 262).

Sebagh comments on notions of beauty in our current society where magazines and the media are constantly promoting images and products that focus on the attaining of physical beauty.

> "To me the most beautiful women are Audrey Hepburn - she is so 'sleek and chic'- and Katherine Hepburn. Who has a perfect face" (Sebagh, cited in Taschen, 2005: 266).

> "I deal with harmonies of proportion every day. Essentially, all our insights into these harmonies can be traced back to the Ancient Greeks and the Romans, and even later Renaissance and its timeless art. As the cradle of Western culture, the Mediterranean region and its art are a paramount influence even in my profession" (Wolfensberger, cited in Taschen, 2005: 271).

Amelia Jones also discusses body art in *Body Art: Performing the Subject* (1998), where she looks at performance art of the 70s and 90s. This text looks at body art practices which enact subjects in "passionate and convulsive" (Miglietti, 2003) artistic representations of the effects of social and private experiences within postcolonial Western Culture. Jones articulates body art by looking at postmodernist artists such as Shneeman, Kusama, Wilke and Ono who represent their interconnectedness with society and place the body within the realm of aesthetics as a "political domain" (Jones, 1998: 13). Jones argues that

> "The profound shifts in our experience of ourselves and the world occasioned by new bio-, communications, and travel technologies are both performed by and reflected in recent body-oriented practices, which can thus tell us a great deal about the philosophical and political implications of this rethought paradigm of the condition of postmodernism." (Jones, 1998: 18)

Within the text we see new forms of body art practices that opened up a domain which challenges the disciplines of art history and criticism of "disinterested" aesthetic judgement. Taschen (2005) discusses performances by artists such as Orlan, Shigeko Kubota and Laura Aguilar that are sometimes characterised by slitting, dislocating, fragmenting, decentring and displacing their bodies.

Kate Ince discusses the work of French Multimedia and performance artist Orlan in *Orlan: Millennial Female* (2000). She follows the 35-year old career of the artist. Over

the last decade the artist's performances have consisted of cosmetic surgery. A piece titled *The Reincarnation of Saint Orlan* (1990) was the beginning of Orlan's surgical self-reinvention:

> "The first official instalment of Orlan's surgical self-reinvention took place on 30 May 1990. It was the beginning of a planned sequence of operations, each of which was to focus on a specific feature of Orlan's face. There was no one model for Orlan's self-remodelling; each feature is surgically resculpted to match a specific feature on a different great icon in the history of Western art…" (Ince, 2000: 6).

Ince describes the media and locations that the artist uses for her live performances which have all involved the use of quasi-theatrical sets, costumes, cosmetic surgeons, and multiple media (Ince, 2000). She draws on critical receptions by a range of theorists across the disciplines of visual arts, gender, philosophy and medicine. Examples of these are Sarah Wilson and Gladys Fabre who deal with issues of materials, dress and fashion raised in Orlan's art. Ince also discusses the importance of technology in Orlan's work where she refers to the influential writing of feminist historian Donna Haraway, who is well-known for her writings on *A Cyborg Manifesto* (1985) where she argues that in our time we are all "chimeras, theorized and fabricated hybrids of machine and organism; in short we are cyborgs" (Haraway, 1985: 517).The studies made by Kate Ince demonstrate Orlan's commitment to question issues of 'identity' throughout her career.

The body as a subject for expression is also discussed by Francesca Alfano Miglietti is *Extreme bodies* (2003). This book is a theoretical reflection on the use of the body in art as a subject of manipulation and change, due to its relationship with culture.

> "The body has long since become one of the sites in which forms of knowledge converge, creating their own systems of awareness and understanding, a luminous field of uncertainty upon which to establish an intensely violent politics, through apparently liberating, a culture with a winking, conspiratorial tone that from time threatens death on the bonfire, employs tortures or promises youth and beauty. Everything that has to do with the body, that manifests itself as transparent or seductive or threatening, becomes an irreversible sign of power that changes but still persists in its multiple incarnations" (Miglietti, 2003: 15)

Miglietti discusses forms of contemporary art that celebrate the fusion of man and machine. This book explores the works of artists such as Orlan, Cesare Fulline, and

Reuven Cohen who have embraced the presence of technology in their lives. The author describes the technological creations of some of these artists as 'morphologies' or 'updated bodies'. She defines the artworks as means of communication and as identities that are expressed through pure appearance, where the human body can transmit the prospects of new forms of representation that become projects of reality. In this process, she claims, the body becomes a perfect image and an 'illusion of perfection'.

> "The body is the site of an experimentation blending creation and selection, the birth of a generation produced through models, through the morphologies of simulation, the necessity of the achievement of perfection and the implacable spectacular result: man and machine fused into a single organism, the definite culmination of the political and social conflict that opposed, in radical materialism, man to machine" (Miglietti, 2003: 232).

Digital Desires (2000), edited by Cutting Edge, the women's research group includes a collection of essays written by a group of women who work in and across art, design, media, architecture, photography and cultural theory. This team had its starting point at The Woman's research Group Conference organized by "Cutting Edge" and held at the University of Westminster in November 1998 where the group discussed important issues in digital technology such as cyber feminism and the politics of artificial life, computers and a sense of self, metaphors and reality of virtual space and the "technological sublime" (Cutting edge, the Women's research group, 2000). Cutting edge is dedicated to a feminism of empowerment which acknowledges issues that relate to women's rights. The essays in the text examine the ways in which new technologies are having a radical impact on existing debates about gender and they demonstrate feminism's political commitment to diversity. An example is Sandra Kemp's *Technologies of the face* (2000), which analyses overlapping discourses of new technology, science and art and discusses how the new facial topologies of today affect the understanding of individual identity.

Sandra Kemp discusses ways in which the face has been represented in art, inspired by our relationships with technology. She describes an exhibition titled "10" (1998) by Mathew Cornford and David Cross who created a beauty contest in which participants' faces were compared to an ideal of symmetry and proportion, advocated by philosophers such as Plato and then judged by facial recognition software (Kemp, 2000) . Almost 200 photographs were taken and ten were chosen to be the most beautiful, based on the

computer program that Cornford and Cross designed (Kemp, 2000). The faces were analysed using police and security facial recognition software generating "a kind of androgynous uber-beauty created by melding a range of famously beautiful faces" (Kemp, 2000: 7). The program compared the contestants' faces and then the computer selected the winners based on the program's numerical ranking and scores. The exercise was intended to point out the arbitrary nature of beauty contests based on the contestants' abilities to spend the money necessary to fit a societal ideal. The result demonstrated that most of the winning images represented similar looking faces. Corresponding to Eco's arguments about the construction of ideals of beauty, Kemp proposes that the reason for this is because scientific research suggests that symmetry is the classical requirement of beauty, advocated by philosophers such as Plato, Aristotle and Socrates. "…it is our own values, our anachronistic belief in physical perfection that will shape the way the future develops" (Kemp, 2000: 7).

Anne Balsamo looks at the relationships between bodies and technologies in her text *Technologies of the Gendered Body* (1996).

> "This book describes a contemporary culture conjuncture in which the body and technology are conjoined in a literal sense, where machines assume organic functions and the body is materially redesigned through the application of newly developed technologies" (Balsamo, 1996: 2&3).

Balsamo elaborates scholarly discourses on the body that include popular culture as well as works of body theory. The book includes examples of everyday media such as magazines, advertisements and television programs, and signals ways in which the natural body has been "dramatically refashioned" within contemporary society. In an essay titled *On the Cutting Edge: Cosmetic Surgery and New Imaging Technologies,* Balsamo examines the discourse of cosmetic surgery as it relies on new technologies of visualisation that are used to section the body into isolated parts in order to transform it into a visual medium. Balsamo believes that cosmetic surgeons do not simply "medicalize" (Balsamo, 1996:57) the female body, but they actually redefine it as an object for technological reconstruction. This essay examines visualisations of technologies used in the practice of cosmetic surgery, where new imaging technologies are articulated with traditional and ideological beliefs about gender (Balsamo, 1996).

11

"Cosmetic surgery enacts a form of cultural signification where we can examine the literal and material reproduction of ideals of beauty. Where visualisation technologies bring into focus isolated body parts and pieces, surgical procedures actually carve into the flesh to isolate parts to be manipulated and resculpted" (Balsamo, 1996:58).

Balsamo argues that all plastic surgery also involves aesthetic judgments of symmetry, proportion and harmony. In fact she emphasises that there is a large amount of existing literature that reports the scientific measurement of facial proportions in the attempt to accomplish aesthetic perfection (Balsamo, 1996). According to Balsamo plastic surgeons are fascinated with the measurement of the ideal (Balsamo, 1996). An example of the literature she discusses is that of Nelson Powell and Brian Humphreys, who claim that "beauty itself is a relative measure of balance and harmony" (cited in Balsamo, 1996: 178). Powell and Humphrey argue that the ideal face is divided into five parts, each of which is expressed in mathematical and geometrical detail in terms of anatomical distances, contour lines and facial angles. These authors were interested in the geometrical constitution of the ideal face (Powell & Humphreys, in Balsamo, 1996).

"Even though they work with faces that are individually distinct, surgeons use codified measurements as guidelines for determining treatment goals in the attempt to bring the distinctive face alignment with artistic ideals of symmetry and proportion" (Balsamo, 1996: 60).

Christiane Paul discusses technological art forms in *Digital Art* (2003). Digital technologies have become a significant medium in contemporary art production. What is known as digital art today, has gone through several name changes since it first emerged; in the 1970s this new form of art was known as "computer art", and then it was later identified as "multimedia art". After an evolution of experimentation with the digital medium, artists today refer to digital art as "new media art" (Paul, 2003). This book provides an analysis of the technological and historical evolution of multiple forms of digital art. Paul looks at artists who have used digital technologies to study and compare structural and compositional elements of existing images; the writer introduces us to an evolutionary realm of digital aesthetics, looking at various themes within in digitals arts such as artificial life, animation, identity, film, sound, software, gaming and the internet (Paul, 2003). Paul shows us the digital works of some artists who have embraced the diversity of multimedia technology (Paul, 2003).

In the first chapter titled: *Digital Technologies as a Tool,* Paul looks at the works of a few artists such as Nancy Burson, Lillian Schwartz, and Scott Griesbach, who have worked with digital imaging, photography and print (Paul, 2003). Nancy Burson is one of the artists in the field of computer-generated art, who is celebrated for her major contribution to the development of 'morphing' technology in digital arts. This involves the transformation of one image into another using image compositing. Paul discusses a piece by Nancy Burson titled *Beauty Composites* (1982), where the artist uses technology to merge images of faces of film stars such as Bette Davis, Audrey Hepburn, Grace Kelley, Sophia Loren, and Marilyn Monroe (Paul, 2003). The project aimed to investigate issues on beauty that focused on elements of culturally defined ideals. "The face literally becomes a topographical record of human aesthetics, a document and history of standards of beauty that at the same time suppresses individuality" (Paul, 2003: 29). More and more artists are working with different forms of media. Paul argues that in digital media, technology can be used so subtly that it is often hard to distinguish whether an artwork has undergone digital processing, but it can also be used to such a degree that the 'reality' of a piece is constantly open to question (Paul, 2003).

Oliver Grau is interested in the development of Digital art within the intercultural contexts of the histories of art in *Media Art Histories* (2007). This book assembles a collection of essays by some of the most established researchers in the emerging field of New Media, such as Andreas Broeckmann, Edward A. Shanken and Felice Frankel. It explores the relationships between art, science and technology and focuses on the status of digital art of our time. In an essay by Edmond Couchot titled *The Automatization of Figurative techniques: toward the autonomous image,* the writer describes a digital image as being the result of an automatic calculation made by a computer.

> "The computer automatically creates the shapes, the colours, the movements of the image…the digital image that shows on the screen is not only a luminous surface that the eyes see, it is also a product of calculation, a program and a machine" (Couchot, 2007: 183).

In an essay titled *Image, Process, Performance, Machine: Aspects of an Aesthetics of the Mechanic,* Andreas Broeckmann, discusses the use of the 'machine' in artistic practice.

He speaks of the aspects and aesthetics of mechanical devices within a 'digital culture', which he believes to be "a social environment, field of action and interaction, in which meanings, pleasures, and desires are increasingly dependent on their construction or transmission and thus their translation by digital devices" (Broekmann, 2007: 194). It is thus important to acknowledge the revolution of digital technology in order to understand the ways artists use technology today to create representations of facial beauty, as many of these technologies are developed by computer scientists who may not necessarily be as visually creative as graphic design artists.

Within the realm of digital art, there are several types of different media that are being used by artists. For example, Broeckmann discusses the importance of computer software as a medium for representation. Since the 1990s, software has come to refer to

> "programs that run specific tasks on computer systems. 'Executables' are coded sets of rules that can be worked through by a machine in iterative processes, executing tasks which interlock with other processes, turning the computer into a complex machine that is part black box, part tool, part display" (Broekmann, 2007: 198).

The notion of the 'machine' in this text, refers not only to machines as technological devices, but also as productive assemblages of forces that can be technical, biological, social, semiotic, or other. Media art today explores the aesthetic potential of interactive and multimedia image worlds. Artists of this period mentioned in *Media Histories*, such as Karl Sims (1993) and Michel Bret (2004) combine art and science by using the most complex technology to generate images.

Stephen Wilson discusses the intersections between art, science and technology in *Information arts* (2002). This book focuses on "the revolutionary work of artists and theorists who challenge the separations initiated in the Renaissance. It points toward a possible future in which arts can reassume their historical role of keeping watch on the cultural frontier in which the sciences and arts inform each other" (Wilson, 2002: 3). Wilson investigates artworks that explore technological and scientific frontiers and that question the new possibilities and implications of technological innovation. His text does not look at images of technological facial beauty; however it shows images of the digital world that relate to my discussion because the works explore a virtual perspective of the

14

world where computers can make anything appear possible. The book includes examples of research organisations such as ART+COM, F.A.B.R.I.C.A.T.O.R.R, Canon ArtLab and Studio for Creative Inquiry, which have contributed to the research and development of scientific and technological research in contemporary culture. ART+COM for example, founded in 1988, is a German organization that focuses on the research that combines perspectives of computer technology, communication, and design. One of the themes discussed is 'Computer Media' which is a significant focus in Wilson's text. This section looks at artists that create technological works using computer graphics, animation, digital video, and interactive multimedia.

Philip Hayward discusses the use of technology in his text *Culture, technology & creativity in the late twentieth century* (1990). He studies the origin of the term 'technology' and its relation to science and technology.

> "With industrial design and its synthesis of elements belonging to the engineer, the artist and the scientist, a special language will at the same time evolve to enable all three to co-operate, and new ways will be found to explain their purposes; perhaps also new and higher creative activity will come into being; designing new material and spiritual values, a kind of synthesis of all the tasks and method involved in the pursuing all the aims of science, technology and art" (Hayward, 1990: 3).

The book consists of a series of essay that are concerned with contemporary issues of technology and cultural production, looking closely at the artistic forms that have been profoundly influenced by mechanical and scientific innovations. The anthology attempts to critically discuss the relationships between cultural practice and technology, thus the author analyses the ways in which new technologies and computer programme can be defined as determining aspects of the development of culture; he investigates the ways in which creative use of new technologies may have determined the design and development of these applications; in addition he discusses the effects that technological innovations have had on particular forms of artistic and cultural practice (Hayward, 1990).

In the text the essay titled *Power, access and ingenuity: electronic imaging technologies and contemporary visual art*, Jeremy Welsh discusses the techniques of the artist who uses digital technology. "The artist's concern, at the technical level, has to do with

technique, with the ability to manipulate and transform materials" (Welsh, 1990: 149). The role of the artist in contemporary production is constantly evolving together with the creative process. Welsh discusses examples of artworks that could 'only' be made through the use of technology. Examples of these are video works by Milena Journey (1990) and Frank Koen (1989). What seems to be certain, as Welsh states, is that

> "electronic technologies will continue to penetrate every level of our culture, from production to distribution, and that new technologies will call forth new responses from artists anxious to use them" (Welsh, 1990: 158).

The types of representations that I will be discussing in this paper, such as the *Beauty Composites* (1982) of Burson and the *Reincarnation* (1990-1993*)* composites of Orlan offer a means of exploring connections between science and art where the role of the scientist is just as important as that of the artist in the creation of notions of beauty. The use of technology is a key instrument in the creation of "ideal" and non ideal faces in both the scientific realm of surgery and the aesthetic realm of art. This is a thread that has not been traced in any of the existing literature but can be followed through in many of the examples discussed.

CHAPTER 1

New technologies have allowed women to enact the reproduction of ideal beauty over the past 100 years. Still today women have been willingly resorting to surgical interventions in order to appear more acceptable according to standards of beauty common in contemporary culture. Women are easily influenced not only by the increasingly promising advances of technology, but also by advertising and media.

Technology is becoming a significant factor in the development of individuals' identity, especially among wealthy individuals who are privileged enough to be able to have more control over their lives and bring their fantasies of having immortal, beautiful and socially accepted bodies, closer to reality. Many artists today have made their bodies into material personifications of human identity by engaging in self-mutilation of their bodies or in the algorithmic transformation of an image of their bodies in order to reflect ways in which some individuals have allowed technology into their lives. This chapter will discuss the works of artists who have used digital or surgical interventions to represent or to oppose commonly promoted images of beauty of the female face in contemporary society.

Theories on beauty have developed and changed throughout history, demonstrating that ideals of beauty have been in constant evolution. Women today are subjected to images of beauty that are continuously being promoted by the media. In the 1950s for example, the voluptuous and sensual body of Marilyn Monroe was one of the most popular models of ideal beauty. Women of the 50s fantasized about achieving her alluring femininity, because she was considered one of the most beautiful icons of their time (Taschen, 2005). The image of the Hollywood star may have been a fantasy for many women; however by this period actresses had already begun to undergo plastic surgery in order to make their faces appear even more attractive according to the principles of beauty promoted by the movie-industry. In the 1920s for example, Hollywood introduced the camera close-up. This was an extreme zoom into the face of the actors that not only engages the viewer's emotions, but also reveals the flaws in the face of the actors (Taschen, 2005).

> "I find it fascinating how drastically the concept of female beauty continues to change, both culturally and historically. In the 1950s Marilyn Monroe was an icon of beauty - she wouldn't be one today. Or as a cultural example: Arabic regions still tend to favour voluptuous female bodies, in total contrast to the Western world" (Cellin, cited in Taschen, 2005: 263).

Feminine beauty has been technologically achievable for many years, but as technology has expanded, so has the number of experts who have changed and improved the methods of surgical and digital beautification, thus increasing the possibilities of achieving perfection. According to Kathryn Morgan the realm of beauty in contemporary western culture has come to be dominated by a variety of experts such as cosmetic surgeons, nurses, manicurists, hairstylists, dermatologists, and dieticians. "All these experts provide services that can be bought; all these experts are perceived as administering and transforming the human body into an increasingly artificial and ever more perfect object" (Morgan, 1991: 31). A woman's pursuit of beauty, Morgan argues, "is often associated with lived experiences of self creation, self fulfillment, self transcendence, and being cared for" (Morgan, 1991: 35). Further, consumer society entices women to purchase femininity either through submission to cosmetic surgery or through the magic of computer graphics. Ann Balsamo describes cosmetic surgery as a procedure that "enacts the literal and material reproduction of ideals of beauty" (Balsamo, 1996: 58).

The earliest developments of aesthetic surgery are said to have begun in the late 19th century, as Sander Gilman says: "It is between 1840 and 1900 that virtually all of the present procedures for aesthetic alteration of the body are introduced." (Gilman, 2005: 62). However, these operations were intended for the "improvement" of individuals' appearances, depending on the standards of beauty as determined by the higher echelons of society.

> "People have always looked up or striven for the next step up on the social ladder. In times of famine, voluptuous bodies were regarded as beautiful. When men and women worked in the fields, a pale complexion was favoured…In the roaring twenties, androgynous faces and bodies were popular…in the 50s the buxom pin-up girl was favoured…" (Taschen, 2005: 11).

Ann Balsamo discusses the use of graphic interfaces in plastic surgery (Balsamo, 1999). The author looks at technology as a tool that can be used to define aesthetic goals before

an actual surgical intervention. Balsamo believes that all plastic surgery involves aesthetic judgments of proportion, harmony and symmetry. In fact, plastic surgeons are often encouraged to acquire some familiarity with classical art theory so that, as Fordham observes, they are better prepared to "judge human form in three dimensions, evaluate all aspects of the deformity, visualize the finished product, and plan the approach that will produce an optimal result" (Fordham, cited in Balsamo, 1996: 58). Balsamo suggests that plastic surgeons are fascinated with the measurement of the ideal.

Medicine and surgery have developed and improved over the years, allowing cosmetic surgeons to facilitate their practice, and to introduce new methods for "measuring" and improving a patient's facial structure. The most commonly used methods of facial analysis used to be radiographic and photographic, where the facial profile of a patient would be rendered in a two dimensional medium. Surgeons used Polaroid cameras to produce instant pictures that they would use as prototypes to indicate the locations of incisions, marked by drawing lines on the image. This was used as a communication method that would assist in discussing the surgical expectations and outcomes with the patient. Today however, this method is no longer used by the top cosmetic surgeons world wide, because scientists have developed cutting edge three-dimensional digitizers that offer a more sophisticated approach to facial analysis. Plastic surgeons today use graphic interfaces in order to visually display the transformations that they wish to achieve (Balsamo, 1996).

Digital imaging has become an essential medium for the groundwork of cosmetic surgery because it provides more information about the results that the surgeon wishes to accomplish. The use of computerized imaging allows the surgeon to manipulate and transform a picture of the client's face. In a consultation, the surgeon displays two images of the client. One image will remain untouched and 'natural', serving as a 'before' prototype; the other will be manipulated using image processing technology, where the surgeon brings into play his/her artistic skills to redesign the face of the client, in order to give a visual idea of how his or her face would most likely appear after surgery. This is an interesting process for developing the 'beautification' of a woman because, before she is even touched by a surgical tool, the image of her face is refashioned into a

representation of someone who may appear to be another being, but is in fact the same person with more 'attractive' features. With a few simple clicks, the human face can be transformed into a perfect depiction, which, if realized using cosmetic surgery, could give its recipient a chance at being more acceptable in society, because her (or his face) would be more symmetrical, and more beautiful.

Computer imagery is not only used to manage patient's expectations but it is also useful as a surgical planning device. The software can calculate the distance, angle, or surface of the image that has been modified, therefore it allows for computerized quantification of the treatment goals. An example of one of the commercial cosmetic surgery imaging systems is the *Mirror* system from Canfield Scientific. This software allows the patient to see the most accurate representation of the results of procedures including skin rejuvenation, nasal refinement, breast augmentation, and hair replacement (Balsamo, 1996).

The surgeon takes a high-resolution digital photograph of the treatment area, and then uses sophisticated graphics to change the image to reflect the results of surgery. Even though the modified image may appear to be the ideal result desired by the client, certain tissue changes of the face cannot be predicted accurately. Surgical incisions or implantations may disrupt layers of the skin, fat and muscle; as Balsamo states, "how those incised tissues heal is a very idiosyncratic matter - a matter of the irreducible distinctiveness of the material body" (Balsamo, 1996: 77). Often people get so carried away by the ideal image of their face presented using the software that they do not acknowledge/anticipate the pain involved after the actual procedure and during the healing process.

Cosmetic surgery however has not always been for the sheer embellishment and psychological liberation of individuals; in the late 1980s the French multimedia and performance artist who calls herself "Orlan" took an anti aesthetic approach towards cosmetic surgery. Orlan seeks to emphasize the stark physicality of her surgeries by forcing her viewers to acknowledge the reality of surgery and its painstaking healing

process. She is famous for her controversial plastic surgery performances which are choreographed and directed by the artist herself.

Birth records and interviews with members of the French art community indicate that Orlan was named Mireille Suzanne Francette Porte in the French town of Saint-Etienne on May 30, 1947, but the artist has declined to confirm this name, insisting on a particular identity which she has constructed for herself. What we do know, therefore, is that in 1971, she rechristened and thus re-invented herself as "Saint Orlan" (Friedling, 2000). Orlan has used cosmetic surgery in the context of techno-biology in order to experience her own transformation. She is influenced by developments in medicine, biotechnology, digital innovations, her own body experiences and art history. Her performances were not simply documented surgical interventions; they also included sound, poetry, decorations, dance and costumes designed by famous couturiers such as Paco Rabanne, some of the best practicing plastic surgeons and, most importantly, the use of her own flesh. By using her flesh Orlan puts forward the forms of self mutilation that were used by medieval penitents and saints in overcoming their bodily lust and attaining a spiritual state. Through her surgeries the artist has sacrificed herself for the good of others. Cook speaks of Orlan's philosophies of her surgeries art which she defines as "Carnal Art".

> "Carnal Art loves the baroque and parody; the grotesque, and other such styles that have been left behind, because Carnal Art opposes the social pressures that are exerted upon both the human body and the corpus of art. Carnal Art is anti-formalist and anti-conformist" (Cook, 2003).

According to Jasmine Rault, Orlan's work is not aimed to criticize plastic surgery but to criticize an aesthetic system that has accepted the refashioned body as part of a societal conquest and to expose all the processes that go into producing fashionable, beautiful, and perfect bodies through plastic surgery (Rault, 2000). Her performances remind us that human bodies are constantly being forcibly produced due to the influence of advertising and the media, which expose us to models of beauty from the glamorous world.

> "Her body escapes the control of the market, it eludes that capitalist logic that proposes and imposes a stereotypical canon, a prefabricated model to

stimulate supply and demand, it detaches itself and retaliates against the imposed models of female icons of male desire, and thus becomes a non conformist, anti-aesthetic and antithetical body" (Miglietti, 2003: 169).

In a series of major surgical operations through the 1980s and '90s, Orlan reshaped her features to fit computer representations of mythic icons, some of which were based on Renaissance paintings. In 1990, Orlan decided to be 'reincarnated' by altering her face and body through a series of carefully planned and documented operations. The project was titled *The Reincarnation of Saint Orlan* (1990) and consisted of a series of nine facial surgeries the artist underwent in order to appropriate specific features from the world of art history. The surgeries took place in the span of three and a half years (1990-1993).

The title "Reincarnation" grows out of themes that Orlan has developed over thirty years of performance. Most of these themes involve inspiration from imagery of Catholicism, Duchampian methodology, and idiosyncratic feminism, raising questions about the relationship of identity to the human body and art (Lovelace, 1995). These surgical performances took place after the artist had produced a composite piece using digital technology, where she combined models from the works of Sandro Botticelli's *Venus* in *The Birth of Spring* (1482), Gustave Moreau's *Europa* (1869), Francois Gerard's *Psyche* (1778), Fontainebleau's version of the goddess *Diana*, and Leonardo Da Vinci's *Mona Lisa* (1503-1506) by choosing the best features of each work to appropriate and create a hybrid woman (O'Bryan, 1997). The digital composites served as prototypes for the surgeons, in order for them to recreate these depictions on a live human face. But, unlike those used by plastic surgeons now, Orlan's computer generated images challenged the conventions of an aesthetic ideal; one that women often wish to obtain through surgery.

Orlan chose these European art-historical models because to her and most of her viewers, they represent mainstream ideals of beauty which are still manifested in contemporary society; however her intention was not to achieve an idealized beauty based on commodities of society, but rather to work against notions of aesthetic unity and identical resemblance, where the process of modification was a key aspect of the project (O'Bryan, 1997). With the transmutation of her face, Orlan is constantly shifting her identity, challenging the surgical protocols that are used for rejuvenation and beautification.

Orlan's digital composites incorporated the temples of the *Mona Lisa*, the nose of *Diana*, the mouth of *Europa*, the chin of *Venus* and the eyes of *Psyche*. The artist chose

> "the Mona Lisa for the androgyny resulting from the palimpsest of Leonardo Da Vinci's self portrait beneath her image, Venus because of her connection to fertility and creativity, Diana for her insubordination to men and aggressivity as the goddess of hunting, Europa because Gustave Moreau's painting of her is unfinished, and because her look to another continent showed her interest in an unknown future, and Psyche because of her need for love and spiritual beauty" (Ince, 2000: 46).

With the assimilation of different models, the artist deconstructs beauty by choosing the best features from each figure. The most exaggerated feature of all is the forehead because it is constructed with substances that are normally used for cheek, bone and chin implants (fig.1-2).The result did not resemble a natural human forehead, but rather a "grotesque" representation where the artist intentionally wanted to create horn-like protrusions above her eyebrows.

Fig. 1
The Reincarnation of Saint Orlan, 1990 – 1993
Simulation, Screenshot

Fig. 2
The Reincarnation of Saint Orlan, 1990 – 1993
Photograph (completed)

The mutation of Orlan's forehead was produced in her seventh performance titled *Omnipresence* (1993). This surgery was broadcast live to fifteen art galleries in different countries around the world, and viewers could ask Orlan questions during the operation. Orlan created a post-performance installation of Omnipresence at the Sandra Gering Gallery in New York featuring, as Lovelace describes, an extremely graphic videotape of the operation, as well as bloody artifacts: the gallery display included forty one photographs taken daily in order to document Orlan's face recovering from surgery (Lovelace, 1995). Images included her face bandaged, swollen, scarred and discolored. The images were juxtaposed with forty one composites of the desired result (the morphing of selected features from classical paintings). The project offered an ironic comparison between the digitally manipulated images and the photographs of her physical, bodily healing process. Orlan exposed plastic surgery as a lengthy, painstaking, inaccurate, and imperfect process that does not offer immediate positive results.

The seventh, eighth and ninth performances marked a radicalization of the artist's surgical projects which were characterized by the formation of a "mutant body",

parodying the pressures that women undergo in order to conform to beauty standards (Miglietti, 2003).

> "Orlan's project calls for a body that does not want to be anaesthetised, aware of its own metamorphosis, of the continual crossing of boundaries on the part of violent medical, scientific, technological, theological and mass-media intrusions; it is a project for a body that rejects the standards of beauty of special offers, a project for a monstrous, freakish, different body" (Miglietti, 2003: 169).

According to Francesca Miglietti, most of Orlan's work focuses on the deconstruction of the ideals of feminine beauty (Miglietti, 2003). By deconstructing iconic images of the past in order to create new ones, the artist in a sense denies the notion of her having a fixed identity. Orlan's wish to transform herself through surgery however preserves the notion that there is a fixed and historical ideal of femininity and ideal beauty that governs the construction of female identity in our capitalist society, even though she is not concerned to arrive at any particular ideal of femininity.

> "My work is a fight against nature and the idea of God…the inexorability of life, DNA based representation. And that is why I went into cosmetic surgery; not looking to enhance or rejuvenate, but to create a total change of image and identity. I claim that I gave my body to art. The idea is to raise the issue of the body, its role in society and in future generations, via genetic engineering, to mentally prepare ourselves for this problem" (Orlan cited in Evergreen academic web pages, 2006).

During the operations, Orlan presents her body as a monument to an excessive social desire for physical alteration. Alyda Faber proposes that Orlan's performances challenge the individuals' need to have control over their body (Faber, 2002). By remaining conscious in her surgeries, she exposes the unacknowledged suffering that comes with the attempt to achieve the physical perfection that is portrayed in women through fashion and advertising. To watch the procedure of Orlan's skin being opened up and flesh removed would feel like witnessing an obscene act (Lovelace, 2002). According to Carey Lovelace, seeing cuts in the face violates our sense of separation between the visceral and the human, between public and private space. Orlan, violating the boundary between inside and outside, through this series of disfiguring (or refiguring) operations is considered to be representing a grotesque body, not only because of the obscenity of the operations, but also because of her lack of eroticism in the performances (Lovelace,

1995). Jones believes that Orlan "produces a body of suffering enacting the reversibility of self and other" (Jones, 1998: 227). The artist confuses the boundaries between the interior and exterior body pointing out that plastic surgery, rather than allowing individuals to gain control over their bodies, intensifies their vulnerabilities and mortality (Jones, 1998).

Dwelling in the area of the "grotesque" (Lovelace, 1995: 7) is not unusual for Orlan, who has spent her career challenging gender stereotypes, and defaming religions. One cannot discuss Orlan's work without commenting on its relationship to Catholicism, as the artist has referred to saints, martyrdom, and the mortification of the flesh, throughout her work. Her choreographed surgery settings also recall an emphasis on rituals in Catholicism (Jones, 1998). The very theme of *Reincarnation* itself alludes to one of the major metaphysical tenets of Christianity. Lovelace highlights that it is these iconographical religious subthemes that give Orlan's work its resonance (Lovelace, 1995).

Fig. 3
The Reincarnation of Saint Orlan, 1990 – 1993
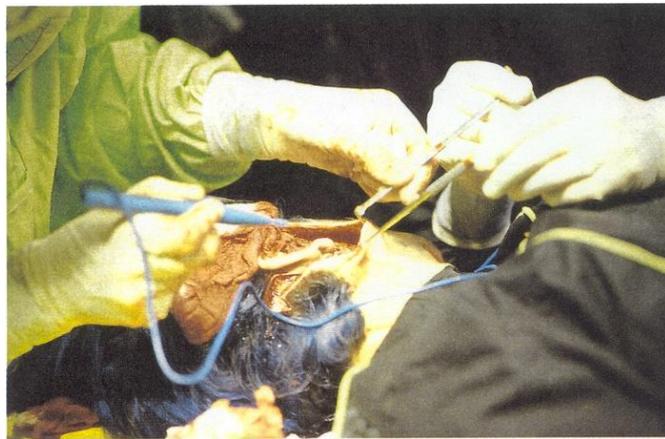Scene from the operating room

Fig. 4
Omnipresence, 1993
Scene from the operating room

Fig. 5
The Reincarnation of Saint Orlan, 1990-1993
Scene from one of the performances

CHAPTER 2

Digital imaging is an important feature in the world of science and medicine, but it is also used as an essential tool within much contemporary art practice. Many artists today make use of technological advances in their work, and several have taken great interest in the use of computer graphics as their primary medium. Nancy Burson was among the early pioneers in the field of computer generated art, best known for her contribution to the design of morphing technology, which transforms one image into another through composite image processing, enabling law enforcement officials to locate missing people (Paul, 2003). To help find missing children, Burson would blend the latest photographs of each child with those of older family members in order to create an "aged" image of the missing child, in order for the officials to have an idea of how the children might look several years later (Mosher, 1998). The artist uses traditional photography and cutting edge technology to create work that challenges cultural values, and tests the limits of visual perception. Fascinated by the interrelationships between man and machine, for the past 20 years Burson has been exploring the human face and its mutability. From 1979 to 1991, she developed a series of projects that experimented with new technologies, including imaginative facial composites combining various photographs and a series of evocative digitally altered faces.

In the early 1980s, when digital graphics were still in their early stages of development, Burson produced a series of computer-generated composite portraits in collaboration with programmers Richard Carling and David Kramlich, who were then working at the Computer Corporation of America. The project created an average simulation of several images by mapping facial coordinates and then finding their mean. The images were achieved by what is described as "a patented facial warping system" (Grundberg, 1985). This system works by computing the differences of the aligned images of a young face and an old face by approaching 3D geometry information to perform physical simulation. The geometric information is then transferred in order to modify the appearance of other objects directly in images (US Patent, 2007). In her pictures we come across images of healers, individuals who resemble Jesus, composites of modern icons and political leaders, but also deformed faces and virtual realities. In *One* (2004), for example, Burson uses her morphing methodology as a means to express a new syncretic faith. She

expresses a form of godliness by combining images of Jesus, Bhuddha and Mohammed into one face, superimposed one on the other and the result revealed that all three of the images were surprisingly similar (Mahoney & Grünert 2000). Mahoney and Grünert suggest that these faces fascinate their worlds because there is some DNA for wonder or peace inscribed on them (Mahoney & Grünert, 2000). Yet, these religious icons are familiar to us not because they are portraits revealing actual likeness between the people they purportedly represent, but because they all possess some common stereotype of divinity and perfection defined by many different societies.

Burson's work has always addressed notions of beauty as defined by society and culture. She has created two composites that capture the value of our understanding of beauty. The *First Beauty Composite* (1982) is a combination of some of the icons which she posited to be the most beautiful women of the 1950s including: Bette Davis, Grace Kelly, Audrey Hepburn, Sophia Loren and Marilyn Monroe. The *Second Beauty Composite* (1982) is a combination of similarly chosen beauty icons of the 1980s including: Jane Fonda, Diane Keaton, Jaqueline Bisset, Meryl Streep, and Brooke Shields. These multifaceted portraits capture and epitomize the differences in the ideal female face of the 1950s and that of the 1980s (Lancon, 2003).
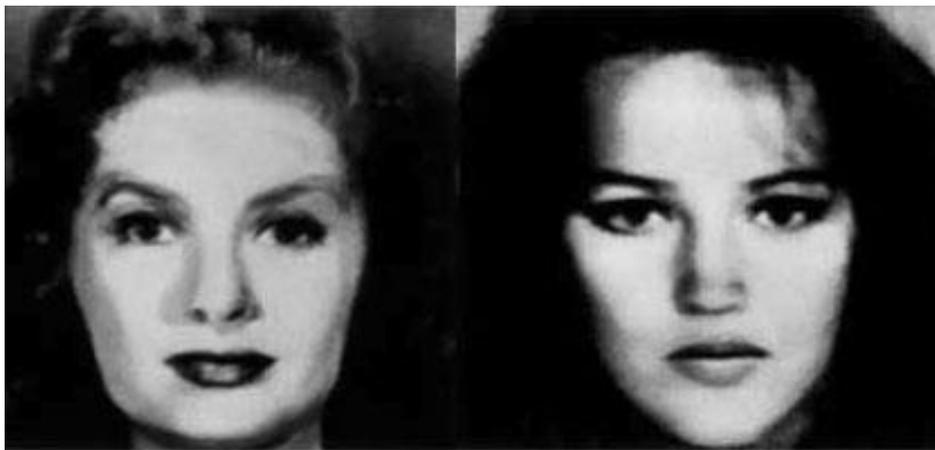

Fig. 6
First Beauty Composite, 1982
Gelatin silver computer-generated prints

Fig. 7
Second Beauty Composite, 1982

According to Christine Paul, the composites

"are investigations into beauty that focus on the constituent elements of culturally defined ideals. The face literally becomes a topographical record of human aesthetics, a document and history of standard of beauty that at the same time suppress individuality" (Paul, 2003: 29).

Each composite in this pair represents an 'average' of five popular female movie stars. Transmitted through movies and TV, their features have become deeply embedded in the individuals' consciousness. These composites put a face on contemporary physical perfection, but they are primarily ironic projects that parody the very notion of ideal beauty. Burson proposes that the stars are themselves already composites, fabrications for popular consumption, and that notions of ideal beauty are arbitrary and time-bound (Grey Art Gallery, 2002). According to Angela Taschen, most actresses have had to resort to cosmetic surgery in order to protect their careers (Taschen, 2005). In the 1920s for example, Hollywood introduced the concept of the camera close up, an extreme zoom into the actor's face that was indented to make the film more engaging for the viewers, but it also reveals any flaws and imperfections on the face of the actor. Hollywood stars had to resort to plastic surgery so that their faces could appear flawless for those extreme camera close ups. Taschen highlights that Marylyn Monroe had to get rid of "bumps on her nose" as well as "a small flaw around the chin" which were corrected with aesthetic surgery (Taschen, 2005: 11).

In a world flooded with such fantasies of flawless beauty, Burson's Polaroid portraits question society's dreams of perfection and encourage viewers to re-evaluate and confront their vulnerability and mortality. In the mid-1990s, she refined her ideas about the relative nature of beauty by challenging cultural ideals of attractiveness, in a series of large scale Polaroids. These images are representations of individuals whose faces have been altered either by cancer, reconstructive surgery, or prostheses. To produce these images Burson combined two or more scanned images on a computer monitor, then photographed the resulting "portrait" using a five-minute exposure.
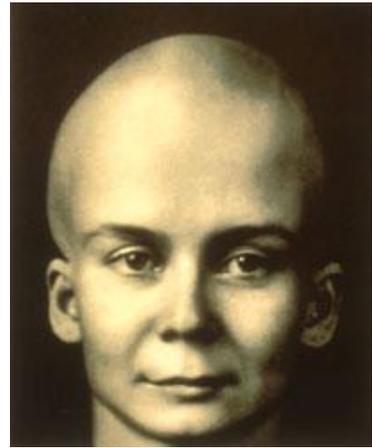
Fig. 8 Untitled, 1988 Fig. 9 Untitled 1989 Fig. 10 Untitled 1990

Polaroids of computer generated Composites

Burson's Polaroid portraits also explore perceptions of visual normality and abnormality of the body. These (Figures 8, 9, 10) large images made their debut in 1990 at the Jayne H. Baum Gallery in New York. The life-sized head-shots are large enough to surround viewers, allowing them to have a patent view of the imperfections exposed on the faces of the people in the pictures. Some of the images showed portraits of people with extremely large eyes (fig. 9) that are disproportioned to the rest of their face; one image combines a human face with the glass eyes of a doll (fig. 8); another merges human eyes with a mannequin's head (Atkins, 1991). The Grey Art Gallery describes her hybrid images are described as follows:

> "Her startling hybrids such as an apparently ordinary woman with the vacant glass eyes of a doll, or a woman's head topped with an outsized cranial dome fuse the realistic with the fantastic, producing images that are both whimsical and unsettling" (Grey Art Gallery, 2002).

Burson's work shows that in visual images individual or idiosyncratic physical appearance can be erased or entirely altered by technology. In 2002 she exhibited some of her most celebrated works at the Grey Art Gallery at New York University. The project was titled "Seeing and believing: The art of Nancy Burson". The exhibition included composite photographs, computer-altered photographs and drawings, featuring her interactive installations: the *Human Race Machine*, where the viewers had the option of seeing what they would look like as African, Asian, Caucasian, Indian or Hispanic: Burson believes that the concept of "race" is not genetic but it is social. With this project

she tries to emphasise that different racial groups do not exist because there is only one race, the human race (Fisher, 2005); *the Age Machine*, where the viewers could see how they would look in 25 years, the *Couples Machine,* which combines photographs of men and women to allow couples to view how their offspring may look, and the *Anomaly Machine* where the viewers could see how they would look with various facial deformities. The human face, as Burson's work suggests, is a peculiar and malleable thing that is never the same; nothing is fixed about it, because there are so many different types of faces that vary in beauty, youth, race, power, sex, family, species or godliness[1].

Burson's determination to produce an interactive aging machine led her to Experiments in Art and Technology (EAT), the organization founded in 1966 to help connect artists and scientists. She was paired with computer graphics pioneer Carl Machover, in the hope of building the Age machine. At the time Machover did not believe that the age machine could be achievable because they did not have the advanced scientific resources that they needed (Atkins, 1991). Thanks to technological advances of the mid-seventies, including the manipulation of still images by computers and the conversion of video imagery into digital data, Burson's Age Machine project began to look practicable. The project was finally taken on by MIT's Architecture Machine Group in 1976, and in 1981 the program was created. That same year, she began working with two Cambridge-area computer scientists, David Kramlich and Richard Carling who refined the system by increasing its speed, adapting it for the personal computer, and making it interactive. The technological input of other scientists who collaborated with Burson has been important in the development of her project that progressed from surveillance technology into digital artwork.

In Burson*'s Human Race Machine*, rather than emphasizing the differences between racially defined groups, she attempts to highlight the similarities in all people.

> "My intention in building *The Race Machine* was to allow us to move beyond difference and arrive at sameness. When I discovered, while doing research on a project involving genetics, that there is no gene for race, I felt it was one of the most important things to understand about genetics. The DNA of any two humans is 99.97 percent identical. And then *The Race*

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[1] The concept of "godliness" seen in Burson's work, is briefly discussed earlier in this text: see pages 28-29

Machine became *The Human Race Machine*. We are all related, all connected, all one" (Burson, in Genomic art, 2001).

To alter someone's racial features, the computer digitally morphs an image of the participant's face with that of a phenotypical average of the specified racial type (Walker, 2006). The viewer sits in front of a computer where a digital camera takes a picture of his or her face. The participant adjusts points on the image of their face by aligning it within a specified grid where the computer then maps the edges of their facial features (Walker, 2006). After pressing the buttons on display to select the desired "race", the image will change through a spectrum of skin colors, making ones features undulate slightly until he or she appears aesthetically different (Rivers, 2005). In attempting to neutralize racial differences Burson's *Human Race Machine* participates in an identity performance. Each skin tone or facial identity is digitally applied like a mask, a layer that can be removed and reapplied continuously (Walker, 2006).

Burson hopes the Human Race Machine will allow people to step into other people's shoes; to create racial integration and "oneness". The machine is based on one philosophy: "that the similarities between people of various races far outweigh the differences" (Rivers, 2005). To Burson, there is only one race, the human race. She believed that the best way to show that would be to give people the chance to manipulate their ethnicity and see themselves differently (Rivers, 2005). According to Cornblatt, Burson's idea of hybridity is one of homogenization, in which obvious similarities between humans are highlighted very subtly, while the differentiating features are erased with a politically-correct softening of most racially distinct characteristics. (Cornblatt, 2006)

> "I think what's important is that we understand that we are 99.9 percent alike. It's all about sameness and not about difference, and I think if we focus on that then it would further our chances of going from "I-ness" to "We-ness" to Oneness, and I think that is what will hold humanity together" (Burson, in Egg the art show, 2002).

These digital artists have used technology and creativity to challenge the boundaries between reality and fantasy, creating imagery that questions the norms of individual appearance and which subverts commonly-held beliefs about the nature of beauty.

CHAPTER 3

Image manipulation has become a significant feature of contemporary art practice and is particularly prominent in the commercial world. Advertising companies have been using graphic programs since the 1960s (Paul 2003) for many kinds of product promotions, but especially in the area of promoting objects and services for consumption by women where every product has to represent the beauty that it 'promises'. The 1960s was a particularly significant decade for the history of digital technologies as it laid the ground-work for much of today's technology and artistic exploration. Women's faces are often seen in various media including broadcasting, magazines and newspapers, promoting the latest cosmetic products and representing some of the biggest brands in the world such as Revlon, Estee Lauder, and Clinique. Most of these faces possess the qualities of a culturally defined "ideal" that most Western women admire. Thesander argues that "it is not enough to have a woman's body or to be feminine; you have to meet the social demands of femininity" (Thesander, 1997: 8). These demands are often inequitable and restrictive because they attempt to make women fit physically and behaviourally into the particular feminine ideals that are being voiced (Thesander, 1997). On television we often see faces of popular icons that not only represent the ideal contemporary fashionable image and stand for exclusive cosmetic brands, but also portray a kind of beauty that shapes women's notions of what beauty should be. Some of the idols have undergone a series of surgical interventions in order to mould their bodies into perfection, and others use cosmetics to at least maintain their youth and appear more desirable.

The images of beautiful women that we are exposed to by the media are just images after all, and it is often questionable whether these women are actually as perfect as they seem in photographs. Thesander emphasises how a beautiful body can be reformed into a cultural image of femininity through various artificial means (Thesander, 1997). Other than the use of cosmetic surgery and beauty products for the pursuit of perfection, an important example of an "artificial" means is the use of digital manipulation software.

Besides the fine artists that have used graphic interfaces to comment on the influence of capitalist society on the idealisation of the body, there are also artists who use these

interventions for no other reason than to make a living. Among these we find software developers who design the actual software and graphic artists who use the software for creating such images of beauty. A recent tool for image retouching that can significantly enhance the attractiveness of a face in a portrait image has been developed by the computer scientists Tommer Leyvand, Daniel Cohen-Or, Gideon Dror and Dani Lischinski. The project titled *Digital Face Beautification* (2006) morphs photographs of human faces into more attractive versions of themselves by making subtle adjustments to the distances between hundreds of different facial features (Biever, 2006). This system has given magazine editors and advertisers a new creative tool, but it can also help amateur photographers and people at home touch up their own digital images.

Fig. 11
Before
ACM Siggraph, 2006
Technical sketches

Fig. 12
After

Fig. 13
Before
ACM Siggraph, 2006
Technical sketches

Fig. 14
After

The project began when in 2005 a team led by Leyvand's colleague Yael Eisenthal asked for volunteers to rate the attractiveness of faces in almost 200 photographs. They developed a program that would analyze these images, measuring distances between facial features and ratios such as that between facial width at eye and mouth level, and the thickness of the eyebrows (Biever, 2006). The computer then compared the images with the attractiveness ratings given by the volunteers in order to create a set of rules, known as the "beauty function" (Biever, 2006). Finally "the corresponding modified facial distances are embedded in the plane and serve as a target to define a 2D warp field which maps the original facial features to their new, 'beautified' locations" (Leyvand, Cohen-Or, Dror & Dani Lischinski, 2006). Leyvand presented his work on the 3rd of August 2006 at the SIGGRAPH conference in Boston.

> "It may be safely assumed that any model that we encounter on a magazine cover today has been digitally manipulated by a skilled, talented retouching artist. Since the human face is arguably the most frequently photographed object on earth, a tool such as ours would be a useful and welcome addition to the ever-growing arsenal of image enhancement and retouching tools available in today's digital image editing packages" (Leyvand, Cohen-Or, Dror & Lischinski, 2006) .

Looking at the before and after examples (Fig. 11-12), one can argue that the models do not differ greatly in appearance: however, in the "after" images, their features appear

more aligned and balanced, creating a correct "proportion between the parts" (Eco, 2004: 74). In fig. 11, the model's eyes and eyebrows are not perfectly aligned; the left side of her lip is slightly higher than the right side; her jaw is large and could be said to lack delicacy and grace. In fig. 12 the computer software has adjusted the alignment of her eyes and eyebrows in order for them to look harmonious in relation to one another; the shape of her lips has been modified in order for them to look equal on both sides of her face and the width of her jaw has been decreased. If we divide the model's face into two sections, the "before" image shows that the left side of her face is not exactly the same as the right side of her face, thus demonstrating noticeable differences between them. The "after" picture of the model shows that the features on both sides of her face are in closer relation to one another.

Theories of proportion differ across the different ages and from one culture to another; Eco speaks of various kinds of ideas on beauty of proportion, however in this report, I am concerned with beauty of proportion and harmony in relation to the works discussed. According to Eco, it is common sense to judge a well proportioned thing as beautiful (Eco, 2004). He suggests that this explains why, since ancient times, many theories on beauty have been identified with proportion. He acknowledges that beauty has never been an absolute attribute but has displayed different aspects depending on the historical epoch and country in which it occurs (Eco, 2004). Thus he demonstrates that although beauty has been celebrated in numerous ways throughout history, our modern idea of what a beautiful face is today can still be related to certain rules of aesthetics that have been in use since ancient times. In the second century AD for example, Galen believed that

> "beauty does not lie in the individual elements, but in the harmonious proportion of the parts, in the proportion of one finger in relation to another, of all the fingers to the whole hand, of the rest of the hand to the wrist, of this last to the forearm, of the forearm to the whole arm, and finally of all parts to all the others" (Galen, cited in Eco, 2004: 75).

Eco demonstrates his argument through reference to a number of specific historical western theories; such as that of Plato, who in the fourth and fifth century defined beauty as "harmony and proportion" (Plato, cited in Eco, 2004: 48); that of Theognis, who in the sixth century, described how the Muses, Graces and daughters of Zeus would chant gracefully that "what is beautiful is loved" (Theognis, cited in Eco, 2004:39); that of

Bagnoregio, who In the late 1200s thought that there was "no beauty and pleasure without proportion" (Bagnoregio, cited in Eco, 2004: 62); and that of Wincklemann, who in the late 1700s considered the beauty of Greek sculptures to be a "noble simplicity and a calm grandeur, both in pose and expression" (Wincklemann, cited in Eco, 2004:47).

> "…the fairest bond is that which makes the most complete fusion of itself and the things which it combines; and proportion is best adapted to effect such a union" (Plato, cited in Eco, 2004: 51)

Eco argues that one of the first requisites for philosophers to define beauty in ancient Greece was that of order, proportion and symmetry. In the sixth century BC for example, artists would create sculptures that had eyes at equal level, the breasts, arms and legs would also be equally distributed in relation to each other (Eco, 2004). There has also been an importance in mathematical reflection when dealing with the creation of 'beauty'. He claims that the pre-Socratic philosophers such as Thales, Anaximander and Anaximenes aimed to give a definition of the world as an ordered whole governed by a single law and concludes that this meant that the Greeks were thinking of the world as a form, and perceived correspondence between form and beauty (Eco, 2004). This he demonstrates through to Plato's Timaeus (fifth-fourth century BC) where he philosophizes about the beauty of 'geometrical forms' based on the beauty of proportion and the mathematical concept of the universe (Eco, 2004).

> "At next we have to determine what are the four most beautiful bodies which could be formed, unlike one another, yet in some instances capable of resolution into one another, for having discovered thus much, we shall know the true origin of earth and fire and of the proportionate and intermediate elements" (Plato, cited in Eco, 2004: 67).

The Pythagoreans were also famous for their mathematical reflections on the view of the universe. They believed that "all things exist because they are ordered and they are ordered because they are the realization of mathematical laws, which are at once a condition of existence and of Beauty" (Eco, 2004:61). Observing figures 13 and 14 in relation to an understanding of Pythagorean rules of symmetry and proportion, I have noticed that in the "After" images, the model's eyebrows are rounder then those of the "Before" model, indicating that the computer software read that the "Before" model's eyes and eyebrows were not at a balanced position. The eyes in fig 13 are quite small, making her face look very big. In fig. 14 the computer has increased the size of her eyes

and the distance between them, making her face look more feminine. The model in the "before" image (fig.13) seems unhappier than the one in the "after" image (fig 14). This may be because her lips turn down, [they look as if they were frowning] seeing that it is simply the natural shape of her mouth. In the "after" picture, one can notice that the digital retouching software has corrected the shape of her mouth by raising her lips and increasing the size of them. The model's eyes have also been enlarged slightly and moved further away from her nose on either side. Here she looks much more pleasing to the eye, not only because the software has rendered her features to be more symmetrical with a better proportional balance between the parts, but also because the model herself appears to be much more affable.

The scientific work of Leyvand and his collaborators is an interesting look into the world of digital beautification, but this form of facial transformation is subtle enough that the models are still recognizable. The photographs show that the faces have certainly improved in attractiveness relative to how an attractive woman is thought to appear within the beauty culture of this day. But are they perfect? Would they be considered beautiful enough to be featured on a magazine cover? If we were to neglect the fact that the 'after' images show a definite improvement and we looked for actual flaws in these images, according to the expectations of the media, we would probably find quite a few. For example, the freckles on the face in figure 12 and the dull blonde hair which actually could be blonder; or the extremely pale skin of the face in figure 14 and the little strands of hair that dangle over her face. These subtle imperfections are sometimes unsatisfying in the world of extreme beauty, where supermodels and movies stars have to constantly personify flawlessness, to such an extent that they almost seem inhuman.

Glen C. Feron specializes in creating such images where every part of one body and face must appear flawless. Feron has worked for glossy magazines and companies such as Miramax films, Black Men Magazine, Black Men's Swimsuit, Cheri Magazine, Columbia Records, High Society Magazine and NBC. He specializes in making existing images of beauty appear even more beautiful by retouching everything from veins to armpits, elbows, knees, body fat, stomach size, cellulite, wrinkles, and any trace of aging, to enlarging breasts, removing or diminishing various articles of clothing, tattoos and any

sort of natural contour or shape (Feron, 2008). The women pictured in the work of Feron are presented as a series of professional accomplishments. Every detail of these women's bodies has been altered so that not even the slightest trace of 'imperfection' can be noticed.

The images that Feron manipulates are mostly photographs of women who already possess characteristics of ideal beauty, but this is not satisfactory within our current culture of fashion and beauty, where technology allows us to seek more than what is realistically possible. Feron embraces the natural beauty of women and transforms them into perfect beings. The artist makes these women appear superhuman and perfect beyond reality. Figures 15 and 16 are examples of Feron's photographic transformations before and after they have been retouched.

Fig. 15
Feron G. 2008
Retouched photographs

Fig. 16
Feron G. 2008

These are two portraits of the same model (fig. 15-16), one of which is a simple photograph and the other is the same image that has been digitally altered using image manipulating software, such as Photoshop and a variety of programmes at his disposal. Some manipulating procedures that Feron uses include: enhancing and smoothing the skin, removing dark circles under the eyes, adding makeup, lash enhancements, adjusting shadows under the eyes, smoothing lip wrinkles, adding shine to hair etc (Feron, 2008).

40

Most of these changes have been made in the "after" portrait of the model in figure 16. The difference between the two pictures is exceptionally obvious: the tone of the model's face has been enhanced in order for her to appear flawless and luminous; her eye colour has been changed from dark brown to bright green, thus complementing the colour of her skin and hair; virtual make-up has been added to her face giving her plumper lips, and smoother eye contours; her forehead has been smoothed in order to eliminate the appearance of facial hair. Using these programmes, not only can artists capture the beauty of women, but can also allow these women to appear even more beautiful after they have been virtually modified. Personification of ideal beauty has a long history in the West: it was an important concept in the Renaissance where paintings of people, derived in form from ancient Roman portraits, were characterised by harmonious proportions among all the elements of the face. The Renaissance artists' perception of beauty was determined by their philosophical environment, their visual experience and by the demands of their patrons (Haughton 2004). Feron's idealization of beauty, which could be argued to be a recent manifestation of the same lineal development, is similarly determined by the environment he is exposed to: that of contemporary capitalist culture of the West and the influence of the media. The advertisers, in Feron's case, would represent the "patrons", the ones who determine what kind of "beautiful" they want to see in the images they rely on to sell their products.

Renaissance painters were constantly trying to improve their status and were respected in the same way as the sculptors, poets, and architects, who could effortlessly copy and sometimes improve on ancient original works and make them look much more beautiful without having to rework existing images. The artists would emulate classical art by reproducing statues in their paintings or by recreating classical paintings from contemporary ancient descriptions (Haughton, 2004). Feron may not be the first to discover the art of "reconstructing", but he has adopted a different way of painting using digital technology. Unlike the Renaissance artists, Feron does not create his reproductions on a blank surface but he is commissioned to retouch existing photographs and make them appear "ideal" according to the requirements of his clients and the influence of popular culture.

Digital technology is especially used for media and advertising, where images of celebrities and models stimulate the aesthetic fantasies of many women today.

Fig. 17	Fig.18
Before	After
Feron G. 2008	Feron G. 2008
Retouched photographs	

Figures 17 and 18 appeared in an article titled "Retouched by an angel" in The Daily-Fashion week of September 2005.

> "Have you ever felt outrage at boutique publications that run unretouched party photos of you? Well the Daily enlisted 53-year old New Rochelk based retoucher Glenn Feron to perfect the candid images of some of the industry's most beautiful personalities. Here, *Elle*'s Nina Garcia shows off her Eva Longoria glow" (The Daily, cited in Feron, 2008).

Comparing figures 17 and 18 one can notice that the 'before' photograph shows the fashion Director Nina Garcia in her 'natural' form. Wrinkles, freckles and age spots are visible, as well as signs of aging around her neck. In the 'after' representation that has been modified by Feron Garcia hardly looks her actual age (43).

> "By now readers have no idea what a real 60 year old face looks like in print because it's made to look like 45. Worse 60-year-old readers look into the mirror and think they look too old, because they're comparing themselves to some retouched face smiling back at them from a magazine" (Giano, cited in Wolf, 1990:63).

This should not imply that all women feel old when they look in the mirror, as many of the wealthier people in West are living longer and healthier lives. A healthy lifestyle would normally have an effect in preventing early signs of ageing. But artificial ways of controlling these selfsame symptoms of ageing such as plastic surgery can show such extreme results that people who can afford plastic surgery do not have to worry so much about the health or otherwise of their lifestyles.

Feron has retouched the faces of popular icons for commercial magazines such as Hype Hair, Braids, swimsuit and SSY. Most of the images he works on are seen in women's magazines; these have become quite an influential part of many women's lives. Magazines such as Vogue and cosmopolitan elicit a "raving, itching, parching product lust, and abiding fantasy" (Wolf, 1990:52) in their readers.

> "Women's magazines for over a century have been one of the most powerful agents for changing women's roles, and throughout that time they have consistently glamorized what the economy, their advertisers...needed" (Wolf, 1990:47).

Fig.19	Fig. 20
Before	After
Feron G. 2008	Feron G. 2008
Retouched photographs	

The Images of beauty that we see on glossy covers constitute a particular model that is promoted in most countries of the world and especially in the market driven Western

culture. Wolf believes that magazines have a voice that draws women to admire them (Wolf, 1990). As though the magazines possessed an authoritative voice that is so attractive, often women forget about how advertising might influence the reader and mislead certain women into believing that such "retouched" beauty is actually achievable. The images of glamour and the articles on how to achieve beauty are some of the things that women tend to admire; perhaps because they give women hope and persuade them to think that they could also be just as perfect. Wolf argues that the power of the 'perfect' face on a magazine cover is far reaching not because of anything special about the face, but because millions of women are looking at the same face and knowing (by visual and social persuasion) together that it is a beautiful face (Wolf, 1990). Wolf believes that such retouching of women's faces is equivalent to erasing their identity, power and history (Wolf, 1990). Yet it is the images of the beautiful women of all time that have survived longest – from Nofret in Egypt to the Mona Lisa and beyond. Beauty has always been one of womanhood's greatest powers in unequal relations between men and women.

CONCLUSION

Aesthetic ideals have been altered and reinterpreted across time in accordance with the developments of Western society and its industry. Concepts of the ideal female face have been profuse and in constant evolution: they have varied from images of symmetrical muses to pictures of digitally retouched models. What we perceive as beautiful today may differ from ideas of beauty of the past, but there are still certain conventions that apply to our current judgment of a beautiful face. The philosophies of proportion and harmony of ancient Greece for example, are adapted in the works of Glenn Feron and Leyvand where beauty relies on the equal distribution of individual's facial features. The work of plastic surgeons and graphic artists involves the cultivation of detailed precision and calculation, as it is part of their job to aim for perfection.

In this essay I have looked at the use of digital and surgical interventions to create images of beauty and to create images that subvert notions of beauty. I have discussed new methods of plastic surgery consultations where surgeons are now able to visually predict the interventions that they discuss with their clients. This allows their clients not only to have a clearer idea of what they may look like after the procedure, but also to visually stimulate their fantasies in order for them to want to undergo surgery even more, and without acknowledging the painstaking phases of transformation and recovery during and after surgery. In fact during the healing process the face looks nothing near to beautiful, as Orlan has demonstrated in her choreographed surgical performances *The Reincarnation of Saint Orlan* (1990-1993), where the artist had the flesh of her body cut and rearranged in order to exhibit the actual vulnerabilities that women have to go through to achieve beauty. With her surgeries Orlan created a chronological change of her image and her body, not allowing for her identity to ever be fixed. I have looked at the ways Orlan has deconstructed beauty by reducing it to its best parts: mythological and classical characters from art history such as *Venus* and *Europa.*

I have discussed the processes of 'transformation' for both cosmetic surgery and digital manipulation which seems to be the constant requirement for the realization of beauty. From one image to another I have analyzed the differences between an image that is not

considered perfect and image that is. The scientific experiment of Leyvand and his colleges shows a mathematical way of improving the image of a face according to pre-determined and culturally specific criteria. His program was based on algorithms and calculations that were indented to locate certain points on a face and align, enlarge, shrink, or smooth the unbalanced features of a face. Leyvand's project may have improved the pleasantness and proportion of a face, but it did not create sheer 'perfection', which today has become a necessary requirement in most successful commercials and beauty clubs. Perfection has also become a perceived necessity for many women who cannot help but get bombarded and hypnotized by such imagery. Feron's retouched beauties are examples of imagery that we often see on covers of magazines, where models and actresses take a flawless form. The images show no evidence of age, history and identity, as though the retouched woman represents the living equivalent of a mannequin. Feron realizes the extreme social desires for physical perfection in his retouched images, in contrast to Orlan, who uses her body to challenge these fantasies.

Technology has allowed for artists to create images of post humanity and hybridity whether they represent or counter represent notions on beauty. Feron's airbrushed photographs are a look into our current world of cosmetic surgery, but they are also perhaps a look into the future of the face of Westernised females of the moneyed classes, where many more women may resort in changing their 'identity' and might actually end up looking all the same. Will the 'bliss' of perfection suppress individuality? Burson shows us the combination of famous female faces in her Beauty composites (1982) where images of celebrities transform into portraits of the unknown. It is hard to recognize any of the individual icons when their faces have all been pasted one on top of the other, as though they no longer had their individual identities.

Contemporary beauty culture promotes fantasies of flawless beauty. Some women can afford to realize these fantasies, and can consciously change their appearance through cosmetic interventions. This is not as simple as it sounds though because with the beauty comes the pain and the 'self mutilation' process that is often unacknowledged. In creating images of beauty through technology a coupling between a human being and an

electronic or mechanical apparatus is developed, creating what Balsamo would describe as a "cyborg" (Balsamo, 1999). A cyborg is a figuration of post-human identity who promotes the disappearance of the "natural" body. Through the use of technology as a means for human hybridization, cyborgs represent unfamiliar otherness which challenges the stability of human identity (Balsamo, 1999). According to Harraway, the identity of women today relates to the concept of a cyborg because they are both symbolically and biologically "produced" and "reproduced" through social interactions (Baslamo, 1999). The destruction of Orlan's body and the insertion of foreign objects into her face (forehead implants) reveal a shift from her natural appearance, to a different persona that is perhaps a cyborg that constructs a relation between the "artificial" and the human. This point can also be made in the creation of retouched digital models, who may not have to undergo drastic surgical interventions because they are just images, however these images also become part of a hybrid world where personal identity is suppressed because every model looks like another.

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