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Cyborgology and the Limits Of Human and Machine Implosion

A Thesis Submitted
By Kristina C. Marcellus
Toward the Fulfillment of the Requirements
For the Master of Arts Degree
In Sociology
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DEDICATION

This thesis is dedicated to my parents, my grandparents and my sister, all of whom have helped me in more ways than they know.

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Introduction

Anxiety accompanies human/machine intersections. This condition is, however, relatively new. Early work on machinic extensions of humans (men in particular) for space travel occurred at roughly the same time as other forms of technology, such as television, began to proliferate in everyday life. With the increasing rate of this proliferation, some might say invasion, of technology, it is now widely acknowledged the extent to which various forms of technology shape our worlds. At times, this anxiety takes a phobic turn, questioning the extent to which these technologies, as a whole, benefit human life on this planet:

> In our more reflexive moments, we are suspicious that the technological instruments intended to heal and bring us together - the telephone, the automobile, the airplane, the computer, the fax machine, medical apparatus - are in truth driving us further apart. We fear that we are isolated bodies, plugged into technological toys and tools but divorced from the comforts of human proximity and touch. Even worse, the material products of technical-scientific reason have proliferated until they promise to transform the planet into a wasted metallic reflection of its misguided demigod. (Rushing and Frentz, 1995:13-14)

Fear of isolation and environmental degradation and anxiousness about the possibility that an increased relationship with and/or reliance upon technology might mean that *humans could not survive without machines*; perhaps even that human and machine are becoming integrated at the expense of 'pure' humanness In short, the boundary between human and machine is becoming blurred, if not eradicated. Terranova (2000) notes:

> This mutation has been brought about, on the one hand, by the

> exposure to simulated images in the most traditional media, and, on the other, by the slow penetration into our daily life of almost invisible technological gadgets, from contact lenses to personal computers. This process of 'invasion' of the human body and psyche by the machine is destined to increase over the years (it is already doing it spectacularly) and give rise to a potentially new race of human beings whose symbiosis with the machine will be total. (270)

There is a foundation for this phenomenon of "treating the human form as a problem to be solved by dis/assembly" to allow articulation with the machine (Hayles, 1995: 326), that stretches back to the early days of cybernetic research in the middle part of the twentieth century. Dumit (1995) calls it 'cyborg envy', and defines it as:

> a sociopathic condition which was formed around the interwar period and in conjunction with various military research programs and the assistance of a technophiliac popular media. It involves an apparatus of producing our selves as brain-function measurements, allowing deficient, normal, and even super levels to be demarcated.
>
> In this condition, alongside stressful fears of the human species being outpaced by the world, appears the dream of individual technological redemption through making better humans. Now, to some extent we are all afflicted by the desire for technological enhancement, understanding our bodies as somewhat deficient cyborgs. (348)

As long ago as 1966, around the same time that work was beginning in earnest on amalgamating human and machine, it was noticed that "our relation to the machine has become quasi-symbiotic" (Dechert, 1966:35). More contemporarily, Featherstone and Burrows (1995) have articulated various points along the continuum of human-machine fusions: "At one end we have 'pure' human beings

and at the other fully simulated disembodied post-humans which can only exist in cyberspace" (11). Moving away from the 'pure' human pole, they note three stages in human-machine integration. First, the aesthetic manipulation of the body's surface (cosmetic surgery, muscle grafts, transplants from either humans or animals) which serve to blur the visual cues used for distinguishing between humans and non-humans as well as between genders. Second are the more fundamental alterations and/or enhancements of the functioning of the inner body and alternatives to replace organic functioning (biochip implants, upgraded senses, prosthetic additions). Featherstone and Burrows (1995) note that "both categories enable the body to be disassembled and reassembled with a high degree of functional specialization" (11). Finally, the third stage is that of "operators who move around in cyberspace and whose bodies are wired up to computers for input and output flows of information" (ibid.). It is the tension between the broad definitions that can be derived in part from these categories with which this thesis is concerned. On one hand there are physically embodied human-machine interfaces and on the other metaphoric cyborgs that do not physically exist. Baudrillard, as is further discussed throughout this thesis, claims that the human and the machine are already intertwined. This may be considered an instance of implosion. The tension resulting from the varying definitions of 'cyborg' with reference to the application of the theory of implosion is the main concern of this thesis.

The relationship between humans and their environment, both natural and technological, is characterized as a form of denial: "We are a cyborg society of tools, machines, and organisms but we deny it. We deny our connection to the organic, and we deny responsibility for the technosciences that we make" (Gray, 2002:194). What all of these observations about the various combinations of human and machine have in common is a confusion not only about the extent to which the relationship should be allowed to progress or exist, but also about what renders one a cyborg. The question asked by all, at one level or another, is this: Are humans becoming cyborgs? Or, have humans *already* become cyborgs?

Definitions

An answer would require the fleshing out of what the terms 'human' and 'cyborg' mean. It is also important to examine the process of 'becoming', particularly in the context of a melding of human and machine to bring about a new creature - what will here be taken to be the cyborg. 'Human', in this thesis, represents a loose and commonsense definition. No hairs will be split to exclude or include a particular trait or characteristic. Fetuses, the comatose, those kept alive by means other than their own, amputees, cognitively or physically impaired individuals and anyone who falls in between or outside of these categories are included. Perhaps a definition of technology is also needed. Again, it is a broad

and loose definition including everything from a simple walking stick or fork, as aids to human daily life, to complex mechanical devices like computers and cell phones, to nanotechnologies. In short, anything that humans have created to make life easier, longer, more pleasant, more far-reaching - tools of various description and in the broadest sense. Both of these definitions are meant to be as inclusive as possible so as to facilitate discussion not only of the widely varying definitions of 'cyborg' present in the academic literature but also to illustrate that regardless of the technology or definition of the human employed, the cyborg as a truly new and physically embodied hybrid resulting from the collapse of the traditional binary of human and machine is a fiction.

A problem arises when examining the definitions of 'cyborg' that circulate in academic literature on the subject. Featherstone and Burrows (1995), for example, write that:

> the term cyborg refers to cybernetic organism, a self-regulating human-machine system. It is in effect a human-machine hybrid in which the machine parts become replacements, which are integrated or act as supplements to the organism to enhance the body's power potential. (2)

Tomas (1995:21) calls the cyborg a radical vision of what it means to be human in the late twentieth century. For Gray (2002), a cyborg does not even have to involve the human since "any organism/system that mixes the evolved and the made, the living and the inanimate is technically a cyborg".(2) His understanding of a human cyborg is emphatic and extremely broad: "If you have been

technologically modified in any significant way, from an implanted pacemaker to a vaccination that reprogrammed your immune system, then you are definitely a cyborg." (2)[1] Gray further defines a semi-cyborg as "intermittent or temporary human-machine symbiosis" (75) such as dialysis. Hayles (1995) picks up this very broad definition, noting that:

> Cyborgs actually do exist; about 10% of the current U.S. population are estimated to be cyborgs in the technical sense, including people with electronic pacemakers, artificial joints, drug implant systems, implanted corneal lenses and artificial skin. A much higher percentage participates in occupations that make them into metaphoric cyborgs, including the computer keyboarder joined in a cybernetic circuit with the screen, the neurosurgeon guided by fiber-optic microscopy during an operation, and the teen gameplayer in the local videogame arcade. (322)

The issue here is that the broadest of these definitions include too much to be dealt with at once. The focus of this thesis will be on technologies that are of an enduring physical quality (mechanical in some lasting way), and that are concretely joined to the human body in one way or another. Metaphoric cyborgs are a different matter altogether and are dealt with here only as counterpoints to physical incarnations such as those discussed by Gray (2002) and others. Wilson (1995) provides a definition of 'cyborg' that comes closer to the one that will be primarily dealt with here:

> I will become a cyborg, if only an absurd and inadequate one, when I bring together both a cybersystem (a widely diffused

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1. Gray's definition is perhaps as broad as it is to make the issue of cyborg citizenship hit closer to home. See Gray, 2002.

> structure of technological utilities) and a bodily system (a tightly interlaced web of physiological capacities, memories and mythology), forcing both networks of rhizomes to cohabit within my consciousness. (255)

'Cyborg', for the purposes of this thesis, will represent a figure that is based on a human body that has physical technological elements appended/ attached/implanted for some functional purpose, and does not distinguish between those who employ prosthetics for functional equivalence, such as pacemakers or eyeglasses, and those who are prosthetically enhanced for some other reason, more along the lines of *The Six Million Dollar Man* (1972, Dir. Richard Moder). The uneven balance of power between the human and the machine is at issue here. While it is the human that must incorporate the machine, it is the machine that is often thought to be the stronger of the two (see Chapter One). The gradual movement of prostheses from outside to inside the human body acknowledges the unstable relationship between the human and the machine. Indeed, it begs the question of who (or what) is 'eating' who? (see Morse, 1994) The chapters that follow keep this idea of the cyborg in mind as they examine two major points: first, the extent to which the human body and technology, usually in one machinic form or another, intersect to create a hybrid of the two; and second, the varying definitions of 'cyborg' that are deployed, as well as how these various usages of the term influence the interaction of humans and all forms of their technology.

Implosion

Because the relationship between humans and machines is coming to be seen more and more as one of indistinguishability in a physical rather than metaphorical sense, Baudrillard's (1983a, 1983b) notion of implosion is here employed as a conceptual tool to examine the extent to which this indistinguishability is actually represented by the incarnations of cyborgs presented in the following three chapters. Implosion can be loosely defined as the collapse of two poles into one another so that the differences that previously existed between them are no longer present. All flow between the two is also halted and made impossible as a result of the lack of distance between them. What was previously two becomes a hybrid, a unified one. It is not a matter of a whole being created in which elements of both 'parents' are identifiable; rather, what is created is completely new. Baudrillard (1983a) uses the example of the masses to make this point: they absorb and neutralize meaning and any attempts made to make them make sense. Out of this inertia is created a hyperreality, which is a result of the masses' refusal to differentiate, to produce meaning from the signs presented to them. The 'black hole' that is the masses absorbs everything without distinction and diffuses it. If anything can be said to emerge from this, it is the indistinguishability that results. This argument can be extended to include the lack of distinction between subject and object, signifier

and signified, the medium and the message, as well as mass and media (these examples will be further discussed in Chapter Four). In the case at hand, the human-as-subject and the machine-as-object would have to twist into one another so that this distinction, this binary, between subject and object, also disappears. If this were to occur, the result would be implosive.

Another justification, less important to the task at hand, for the usage of implosion as a theoretical model and tool is that Baudrillard himself appears to have taken the indistinguishability of human and machine as, perhaps, inevitable. In "Xerox and Infinity" (1988), Baudrillard notes that although this combination is at present stuck at the point of machines being prostheses, which could be said to be the mid-point of the spectrum of subject-object as it applies to implosion (more on this in Ch. 4), this is a relationship which is bound to become closer and closer until humans will have transferred all of their thought, intelligence, and gaze to the machine - a new and different definition of the cyborg. One that is still not implosive, but that points to a symbiotic relationship that *could* reach the point of indistinguishability, and thus implosion, should the current track of 'progress' be followed.

What this thesis aims to do is debunk the myth of the physical cyborg-as-hybrid, that is, as an implosive figure. No matter what the human body or the technology employed, the end result is never a completely new creature, but rather one that is a very clear combination of human and machine. This will be

accomplished by examining the deployment of the figure in several different discourses. What results from this examination is not a claim that these non- or quasi- cyborg figures lack value or importance, but rather, at present, that it must be remembered that a combination of human and machine is based first on the human body and second on technology. This means that the two are not inextricable, nor does the machine truly take over the human body. The reliance upon tools and other technologies may increase, but the price will not likely be the human species.

The Material

There are three different discourses to be examined in this thesis: (post) World War II military science, which pays special attention to the cybernetics work of Norbert Weiner; that of feminism, which takes as its starting point Donna Haraway's 1985 "Manifesto for Cyborgs" and continues its examination into the cyberfeminist literature; and that of media studies, which examines representations of the cyborg in film, television, print fiction, and performance art.

The three are related in several ways. The importance of the Internet for the cyberfeminist cyborg, for example, has ties to military research and history. Representations of militaristic cyborgs abound in film and television - Steve Austin (*Six Million Dollar Man*) was a US Air Force test pilot and *Robocop* was

a police officer. Both maintain ties to their human lives even after becoming machinic humans. In addition, gender is a theme that runs through all three of the chapters. In the first, women are largely excluded from the discussion, whereas they are the focus of the second chapter. The third notes that there are differences in the representation of male and female cyborgs in various media. Issues of embodiment are present in each of the chapters as well: the adaptation of the (male) body for space travel is a focal point of Chapter One, but in Chapter Two, the emphasis is on the disembodied experience of women working in cyberspace. Embodiment enters the discussion in Chapter Three in the form of looking at the various representations of fictional cyborgs present in relatively contemporary media.

There are further similarities and differences between the three areas that are more specific than the themes outlined above. First, throughout all of the source material, there is a thread of purpose in the combination of human and machine, generally with the result of challenging the boundaries of convention. Adaptation for space travel and the myriad representations of enhanced-human crime fighters are the most obvious examples here, but this also applies to the feminist literature, particularly where the emphasis is on creating networks of women, that is, extending the conventional boundaries of communication. However, the treatment that the human body as a whole receives in each of the areas examined here varies. In post-war military science, the body was taken

to be a whole but one that must be enhanced. The emphasis on joining individuals together in cyberfeminist discourse presents the body as isolated, whereas in many of the representations of the cyborg in the various media, the weakness of 'pure' human flesh is illustrated by the high resistance to injury of enhanced bodies. This is turn leads to another similarity: all of the areas examined here not only take a human-centred approach to the problem but also betray an underlying current of individualism by attempting to create a human that can survive in space by wearing a suit or by implying that one individual can certainly make a difference in their surroundings when armed with technology, be it in creating a global network of women or getting rid of neighbourhood nuisances. The optimism with which the combination of human and machine is greeted varies among these three areas. Where early twentieth century military science enthusiastically embraced the possibilities of this new union, feminists approached it more critically by exposing the uses to which technology is put while adopting specific technologies as tools of daily life. Popular culture and other mediatic representations of the cyborg depict both optimistic and pessimistic outcomes of the combination of human and machine.

It is within feminist discourse and the contemporary mediatic representations of the cyborg that the metaphoric cyborg dwells. This is a creature that is not literally joined to technology but one that is instead increasingly reliant on it. This, perhaps, can be considered the closest to an

instance of implosion in the Baudrillardean sense. Because, however, a number of different definitions of 'cyborg' circulate, the challenge here is to determine the extent to which this implosion can be grafted on to physical examples of human/machine combinations that are labelled 'cyborg'.

Method

The choice of these three areas over others was made primarily on the basis of prominence of the figure of the cyborg. They also attempt to provide a rough chronology of the evolution of both the figure and the uses to which it is put, beginning with post-World War II military science, which can be considered the starting point of North American work on the subject. Feminist discourse, considered here in Chapter Two, provides the first major critical examination and theoretical use of the figure and thus requires exploration here. It also makes extensive use of the cyborg as metaphor, which provides a useful counter-example to the physical incarnations exposed in both Chapters One and Three. Finally, because the cyborg is an increasingly present figure in popular culture, the uses to which it is put in various media are also important to investigate. What the choice of these three areas is meant to convey is the wide-ranging use of the figure of the cyborg as a combination of human and machinic elements. Because each of these areas deal with the cyborg as such a combination

(although with differing attitudes ranging from military science's enthusiasm to feminism's wariness to the mixed messages conveyed by the many media sources which employ the figure), Baudrillard's idea of implosion is important to examine given that his metaphoric use of the concept fits with a metaphoric definition of 'cyborg' but may not fit well with a more literal one. Other human-machine combinations were left out, particularly those where a machine serves as a replica or simulation of a human, such as androids and human-shaped robots, for reasons of space and clarity. An examination of the various stages of the evolution of the cyborg from robot form would be, as Gonzalez (2000) discusses, a very dense (and lengthy) project. It is by beginning with the point at which humans sought to integrate machinic elements into their functioning that the scope of the project was limited.

The sources used in this project were not predetermined and are by no means exhaustive. By beginning with a few texts from each of the fields, it was possible to determine what the key texts were. Those texts that perhaps should have been included in the current discussion but did not make it were, more likely than not, left out because of either space or oversight. The method of research used dealt mostly with reading and searching to fit together the pieces that seemed so disparate at the beginning of the project. The major themes that arose from investigation into the uses of the figure of the cyborg, and which will be here discussed, are largely the same as those given above. Each chapter

does pick out other themes with which to deal, but these are largely brought out to clarify other, broader, themes.

Overall, what this project seeks to do is examine the lineage of the figure of the cyborg from its beginnings in mid-twentieth century military science through its usage in socialist feminist and cyberfeminist discourse to popular mediatic representations. The goal is to expose the figure as not one of hybridity or novelty, but as fantasy, for good or evil, of the amalgamation of human and machine into a new, implosive, embodied creature. Just as the very word 'cyborg' was a neologism resulting from the joining of 'cybernetic' and 'organism', so too is the reality of the joining of human and machine; the boundary and difference between the two still exists and is often plainly visible and painfully obvious.

Introduction

It has been said that contemporary humans often behave "as if we were cybernetic organisms - confusing the mechanical and the organic, the inner and outer realms, simulation and reality, even omnipotence and impotence" (Levidow & Robins, 1989:7). This is hardly surprising when one considers that the language employed to discuss much of human behaviour frequently takes a mechanistic turn. An example: "The human being is under constant threat to its survival, the threat being recognised as that, primarily, of uncertainty. The human being has to be *programmed* to continually minimise the uncertainty with which it is beset" (Brix, 1967:106, emphasis mine). Other, more contemporary, sources take this human-as-machine thought even further: "Technologies are human beings fused to their niche. Technologies are an osmosis, the intelligent matter that inseminates and intertwines itself into the human" (Dyens, 2001:8). What both of these examples imply is that humans are limited in their capacities, that they need to be augmented, as in the space exploration applications of cybernetic technology; extended, as in McLuhan's idea of the various media acting as extensions of man (McLuhan,1964)[1]; even improved by technological

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1. In a 1951 letter McLuhan distinguished his theory of communication as participation from others, including Weiner, whose theories are transmissional. McLuhan considered these other theories to be lacking in that they failed to "understand the techniques and functions of the traditional arts as the essential type of all human communication" (Theall, 2001:60). Theall (2001) notes that "[McLuhan's] view of communication as a shared process of human making - of producing and reproducing cultural works (one of the leading forms being conversation) - recognizes the collective aspect of social communication" (61).

assistance, as in the case of vaccination and/or immunization practices.

With specific reference to post-World War Two cybernetic and military science discourse, this chapter will examine the 'need' to create a new kind of human, one which functions in alignment with the technologies which surround him or, increasingly, her.[2] Special attention will be paid to the work of Norbert Weiner, a founding figure in the field of cybernetics. His vision for cybernetics, made clear in the subtitle of his *Cybernetics: Control and Communication in the Animal and the Machine* (originally published in 1948), was a "program of inquiry that would extend the use of concepts and techniques of proven value in the physical sciences and technologies to the life sciences and eventually to the study of society" (Rosenblith, 1967:271). He based his work on the similarities he detected between control mechanisms and communicational organizations found in machine systems[3] and analogous systems in living organisms (Tomas, 1995a:27). Weiner recognized that the potential for negative effects arising from his work did exist, should the technologies he pioneered fail to be humanistic.

The key theme of this chapter is the view of the human body as a machine, that is, with discrete parts that could possibly be substituted for

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1. Since the bulk of this chapter deals with an era of science and technology that excluded women, the use of 'man' or 'men' is meant to denote the male human rather than 'mankind' or 'humans'.

2. For purposes of clarity, the following definitions will be employed throughout this chapter: System: "an organized collection of interrelated elements characterized by a boundary and functional utility." (Dechert, 1966: 23); Interface: an area of contact between one system and another (Dechert, 1966)

machinic parts. Toward this end, mid-twentieth century military science worked first to replicate the functioning of various human body parts, such as the brain, and then to replace or enhance those parts in the human with their machinic counterparts. As is further discussed below, Weiner's goal with his work in prosthetics was to do just this. He wanted human and machine to function as a single unit in a self-regulating feedback loop. More contemporary representations of the figure of the cyborg betray this beginning in that they portray these individuals, or 'units' as functioning. This is particularly true of the razorgirl Molly in William Gibson's *Neuromancer* (1984) - she has not only integrated machinic elements into her body, but her reflexes have been upgraded to allow the blades beneath her fingernails, for example, to respond to her nervous system. It is also the case that this type of addition to the human body exists today in the form of pacemakers and other internal mechanics, but neither the fictional representations nor the embodied prosthetics move beyond the early work of cyberneticians - simulating and replacing a body part or appending one that did not exist previously does not cause the loss of the distinction between human and machine.

For the purposes of this discussion, it is important to note that both military science and initially non-military science appropriated for military uses frequently result in technologies being developed *primarily for military purposes*. This chapter deals with both types of science and technology to illustrate that a non-

military science and/or technology with explicitly humanistic[4] goals (i.e. Weiner's cybernetics) may be seized upon by military interests, the efforts of which result in a mutation of those goals to decidedly anti-humanistic ones. Finally, the chapter also examines the disjunctures present within this era of science and/or technology with respect to efforts to simulate human functions, as well as to the creation of (or lack thereof) seamless human-machine interfaces.

History, Feedback, and the Body

The word 'cybernetics' is derived from the Greek *kybernetes* meaning steersman (Dechert, 1966) and, according to Weiner (1961), does not date back any further than 1947. This field, an interdisciplinary study of self-regulation in animals and machines, began at a 1942 meeting in New York sponsored by the Josiah Macy Foundation (Dechert, 1966). The result of the meeting was the first paper dealing with the topic, entitled "Behavior, Purpose, and Teleology", written by Weiner, Arturo Rosenbluth and Julian Bigelow. In it, they distinguished between examining an entity based on functional analysis and an examination based on a behaviouristic approach. "[w]e conjectured that the mechanism of voluntary activity was of a feedback nature, and accordingly, we sought in the human voluntary activity for the characteristics of breakdown which feedback

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3. Humanisitic will here be taken to mean large-scale "human interests, needs, values, and principles", rather than those qualities defined for specific interests.

mechanisms exhibit when they are overloaded" (Weiner, 1967: 223-4).

The concept of feedback is key in cybernetics, and is one that predates the field. Sadie Plant notes that the governor, an early system of machine regulation or limitation, similar to those found on automobiles' speedometers today, may have been the first feedback machine:

> Perhaps the first cybernetic machine was the governor, a basic self-regulating system, which, like a thermostat, takes the information feeding out of the machine and loops or feeds it back on itself. Rather than a linear operation, in which information comes in, is processed and goes out without any return, the cybernetic system is a feedback loop, hooked up and responsive to its own environment. (Plant, 1995:53)

Because the information that is processed is looped back into the system, it is useful to consider the cybernetic feedback loop as a trial and error exercise. Trials inevitably provide errors which are then used to improve the next trial (Brix, 1967). This is, for the most part, the same system employed by organizations to organisms and beyond, in their effort to survive (Brix, 1967). Brix (1967: foreword, n.p.) notes that "almost anything that has dynamic characteristics and which responds to external circumstances can be analysed by cybernetic methods." This view, evident in the work of many of Brix's contemporaries, does much to account for the mechanistic view of the human body that would develop within cybernetic (and other) discourse.

This image of the human body as machine figures heavily in early cybernetic research. The literature surrounding research in the field was focussed primarily on making connections between living organisms and machine systems

(see Weiner, 1967:38). In the very earliest research the emphasis was on parallels between the two rather than the creation of an interface between them, although efforts were made toward this end. The discourse was phrased in terms of the application of mechanical language to human bodily functions: "Cybernetics [...] proposed a radically different solution to the fundamental nature of the human organism by proposing that its Being be reduced to an organizational *pattern* whose operational logic was also co-extensive with other organisms and types of machine systems" (Tomas, 1995a:27-8). At the same time, however, Weiner points out that "cybernetics takes the view that the structure of the machine or of the organism is an index of the performance that may be expected from it" (Weiner, 1967: 79). The implication of this viewpoint is that although cybernetic methods may be applied to the study of anything that both possesses dynamic characteristics and responds to external stimuli, there may, in many cases, be lowered expectations from an organism than from a machine, despite the application of machinic language to organic forms. An early branch of cybernetic research, teleoperations, illustrates this. Although "a teleoperator is a *general purpose, dexterous, cybernetic machine*," the mechanical elements added to the organism, in this case human, are for the sole purpose of augmenting "a normal man, or in the case of prosthetics, helps a handicapped man become more nearly normal"[5] (Johnsen & Corliss, 1995: 84-5).

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4. Prosthetic devices are a source of great discussion in the academic literature in this field, and will thus be examined later in this paper, especially in Chapters 2 and 4.

The organism must be supplemented by the (superior) machine for it to become superior itself.

The Mind and the Machine

One of the peculiarities of cybernetics that became increasingly apparent as work progressed was the fact that all efforts to find parallels between humans and machines succeeded only in finding similarities between machines built for a specific purpose and narrowly defined functions of the human body. The metaphor of the machine being applied to the body provided a vision of the body *as machine*, separable into many discrete parts each with its own function. McLuhan points out that this is not a new phenomenon:

> It is one of the mysteries of cybernation that it is forever challenged by the need to simulate consciousness. In fact, it will be limited to simulating specialist activities of mind for some time to come. In the same way, our technologies have for thousands of years simulated not the body but fragments thereof. (McLuhan, 1966:101)

This imitation of consciousness is something that has preoccupied the field of cybernetics from the very beginning (Roszak, 1986), but has frequently been seen as limited, even 'blinkered':

> To simulate the functions of the brain by a machine is to make a machine which processes information in order to secure the survival of a biological organism of which it is an integral part, not to mention the species to which the biological organism belongs. Until someone has some specific ideas about how to build a machine of this type, it seems advisable to stop talking about

> mechanical simulation of the human brain. (Taube, 1961:77)

Roszak's interpretation of the project of simulated consciousness is slightly more optimistic, but is still firmly within the argument that full simulation is yet to come:

> The human mind has been on the agenda of the mechanists since the first crude clockwork models of mentality appeared in the eighteenth century. Now that paradigm of intelligence has matured along with our technology into the data processing model of thought. The mind in all its aspects can now be seen as 'nothing but' a rather complicated information-shuffling machine that works up its highest powers from simple, formal procedures that organize data points. And just as the ultimate proof of the mechanistic model in medicine is the invention of a mechanical heart or kidney that will sustain life, so in cognitive science the effort is to invent a machine that will convincingly imitate the highest functions of the minds [sic] - its power to reason, to judge, to decide. (Roszak, 1986: 207)

This passage is worth quoting at length to illustrate not only the piecemeal efforts at imitating various parts of the body, but also the divisions within the scientific sector, each part of the body being left to a different area of specialism. Although the whole endeavour may be covered by the umbrella term 'cybernetics', the various branches of scientific research were, at this time, still functioning for the most part in isolation from one another. Indeed, there were dissenters to the utopian vision of simulated consciousness and human functions, citing shortcomings on both sides of the human-machine dichotomy:

> The view being advanced here, in contradistinction to the prevalent view, is that there are radical and basic discontinuities between digital computers and living organisms; that the essential characteristics of living organisms cannot be simulated, copied, imitated, or surpassed by machines. It is also true that the essential characteristics of machines cannot be profitably copied, simulated, or imitated by living organisms. (Taube, 1961:84)

Taube's overall argument is that the goal of simulation should be eliminated in favour of examination of the idea of the machine extending the function of the brain and processing information it would not ordinarily be able to handle into forms that it may (Taube, 1961:77). He also points out another vital area of concern, and one which has not been adequately addressed: "If human functions are to be replaced by machines, the basic requirement is an understanding of human functions" (Taube, 1961:95-96). This is especially important with respect to simulated consciousness, given that the human brain has yet to be decoded, but should also be taken into consideration in regards to other simulated human functions.

Weiner and Cybernetics

'Cybernetics' and the various scientific apparatuses it spawned are generally considered to be modern Western creations (Tomas, 1995). The field grew rapidly after the Second World War, and especially after the publication of Weiner's *Cybernetics: Control and Communication in the Animal and the Machine* in 1948. A later edition of Weiner's *The Human Use of Human Beings* (1967, originally published 1950) included an afterword by one of his colleagues in which Weiner's goals and visions for the field are discussed: "His hope was that *Cybernetics* would provide a common approach to the study of communication and control processes in machines, organisms, and societies,

and that this approach would enhance human dignity rather than defile it" (Rosenblith, 1967).

This vision for the future of cybernetics still included the idea that the field's primary purpose was an "interdisciplinary inquiry into the nature and physical basis of human intelligence with the object of reproducing it synthetically" (Singh, 1966:5). Thus, the description of 'cybernetic' excluded "all preprogrammed machinery, such as time-controlled ovens, record-changing phonographs, and much of the machinery of automatic production lines" (Johnsen & Corliss, 1995: 85), a general definition that has existed to this day (see Mann & Niedzviecki, 2001). True cybernetic organisms always had man in the feedback loop. Although man is always included in the self-regulating feedback loop, this loop "must function without the benefit of consciousness in order to cooperate with the body's own autonomous homeostatic controls" (Clynes & Kline, 1995: 30). Once again, man was considered inadequate to consciously regulate the functions of the machinery with which he would be augmented, thus placing the machine in a superior position, since it if the machine regulates itself as a part of a system which includes the human body, it also regulates, to a certain extent, the body. Weiner himself was of the opinion that man's place in the feedback loop was vital since at the time the functioning of those machines capable of 'learning' or modifying their operation based on previous operation and its results had not been perfected.

Certain kinds of machines and some living organisms - particularly

> the higher living organisms - can, as we have seen, modify their patterns of behaviour on the basis of past experience so as to achieve specific anti-entropic ends. In these higher forms of communicative organisms the environment, considered as the past experience of the individual, can modify the pattern of behaviour into one which in some sense or other will deal more effectively with the future environment. (Weiner, 1967:67)

Weiner began with the notion that there are massive analogies between control functions in men and machines (Taube, 1961). His work

> provides a useful overview of different phases in the development of automata. His periodization is of interest because of its focus on shifts in motive force and the way that these shifts are related to parallel history of the body [...]Weiner's two-fold periodization is significant because it reveals an awareness, by one of the principle founders of cybernetics, of important disciplinary phases in a machine-based history of the western body. It is also significant because it draws attention to *parallel phases* in the body's functional reimaging as a fundamental element in a machine culture. (Tomas, 1995a:23)

The being that Weiner envisioned was conceived as an "active, hierarchically governed, self-regulated and goal oriented machine" and "marked a new threshold of intelligence, which extended beyond that which has been previously established on the basis of automated, factory-based machine systems" (Tomas, 1995a:25). This entity was based on Weiner's taking note of the fact that there is a relationship between the feedback (as well as other) systems dynamics in artificial and natural systems (Gray, 2002). Gray points out that "this is what makes the cyborg possible - communication across the divide between the living and the inanimate." (Gray, 2002: 179)

Part of the reason that Weiner's work is important is because he himself

acknowledged that there are ramifications of human practice on the external environment: "We have modified our environment so radically that we must now modify ourselves in order to exist in this new environment. We can no longer live in the old one. Progress imposes not only new possibilities for the future but new restrictions" (Weiner, 1967:66). It is unlikely that a founding figure of cybernetics would have made a statement contrary to this one since it so enthusiastically supports work being done in the field, but Weiner did acknowledge the potential for ill-effects resulting from cybernetics (see Weiner, 1961). He seemed, at times, unsure of how the (then) very mathematical field of cybernetics would be used in the social sciences, while at the same time being aware of the possible limitations of work in the area. His "expectations of cybernetics are definitely tempered by an understanding of the limitations of the data which we may hope to obtain" (Weiner, 1961:25). As is mentioned above, Weiner was hopeful that cybernetics would have practical applications, particularly concerning prostheses for lost or paralysed limbs. An extended quote from *Cybernetics* (1961) serves to illustrate clearly what Weiner hoped would result from the field:

> The loss of a segment of limb implies not only the loss of the purely passive support of the missing segment or its value as mechanical extension of the stump, and the loss of the contractile power of its muscles, but implies as well the loss of all cutaneous and kinesthetic sensations originating in it. The first two losses are what the artificial-limbmaker now tries to replace. The third has so far been beyond his scope. In the case of a simple peg leg, this is not important: the rod that replaces the missing limb has no degrees of freedom of its own, and the kinesthetic mechanism of the stump is fully adequate to report its own position and velocity. This is not the case with the articulated limb with a mobile knee and

> ankle, thrown ahead by the patient with the aid of his remaining musculature. He has no adequate report of their position and motion, and this interferes with his sureness of step on an irregular terrain. There does not seem to be any insuperable difficulty in equipping the artificial joints and the sole of the artificial foot with strain or pressure gauges, which are to register electrically or otherwise, say through vibrators, on intact areas of skin. The present artificial limb removes some of the paralysis caused by the amputation but leaves the ataxis. With the use of proper receptors, much of this ataxia should disappear as well, and the patient should be able to learn reflexes, such as those we all use in driving a car, which should enable him to step out with a much surer gait. (Weiner, 1961:26)

Thus, although he was working in a predominantly mathematical field, Weiner's interests in and hopes for cybernetics clearly betray a rather humanistic vision of where the field would or should go. It is important to recognize that for all the optimism of the field at this time, the problem of fragmented simulation of human parts and functions by machines as well as the polarity of the human and the machine remained foregrounded.

Military Applications and the Space Race

Later, cybernetics began to move from the margins of science and technology to the forefront of the military-industrial complex. In 1962, Kline and Clynes were working on a way to adapt man to space travel. According to Clynes (1995:35), "the concept of the cyborg was to allow man to optimize his internal regulation to suit the environment he may seek." At this time the

environment that was being sought was outer space. The 'space race' provided part of the impetus for the popularized version of man-machine systems that began to appear at the time. Tomas (1995a:35) argues that this could be traced to the fact that this combination "reintroduced mimesis in the shape of anthropomorphism back into the history of automata."

The man-machine identity that was lacking in early cybernetic work began to come to the fore with the involvement of various military establishments around the world, but specifically that of the United States. This identity is "achieved not by attributing human attributes to the machine, but by attributing mechanical limitations to man. From one point of view, it doesn't matter very much whether the leveling is down or up, so long as the end of the process is the assertion of man-machine identity" (Taube, 1961:42-43). While this may be the case, that the direction of the levelling does not matter as long as the interface is there, the fact remains that where there is an interface, the machine must be adapted to serve the needs of the human involved. In the case of prostheses, the machine not only fits with the human body but also *simulates the appearance of the human form*, if only part of it. By the time that Clynes and Kline were working on the cyborg idea, the sense of man adapting himself to the environment had been supplanted by an increased estimation of the function of the machine. The point of the cyborg, according to Clynes and Kline (1995:31), is that it "deliberately incorporates exogenous components extending the self-regulatory control function of the organism in order to adapt it to new

environments." This betrays the feeling at the time, partially brought on by the developments in computer technology, that the 'grunt work' should be performed by machines where possible, thus allowing man to be "free to explore, to create, to think, and to feel." (ibid.)[6] It is presumably this model that allowed Neil Armstrong to utter the now-famous words upon landing on the moon rather than having to concentrate on the control system that was keeping him alive in the new environment of Earth's moon.

There is, however, no way to completely remove man from the feedback loop. But there is also little possibility of removing machines from endeavours to explore, for example, outer space.

> Like any scientific model, cybernetics must create an ideal, imaginary, world in order to impose its order on the real world. Yet it is impossible to design a system that perfectly simulates and anticipates the real-world events that it is assigned to control. Moreover, despite heroic attempts to adapt humans perfectly to such elaborate systems, people often resist such adaptation. (Levidow & Robins, 1989: 8)

Thus, if humans are to continue their efforts to free themselves from the confines of Earth's landmass[7], there must, at some point, be machine involvement to allow humans to explore without being perfectly suited themselves to enter these new

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6.There is, however, some debate as to the actual role of computers in cybernetics. Writing in the same year (1966), Diebold asserts that computers are not at the heart of the field, while Dechert maintains that computers are important to cybernetics because "they oblige us to sort out vague ideas and feelings from clearly formulated univocal ideas and relations if we wish to manipulate them by machine" (1966:4).

7. 'Earth's landmass' is here used due to the equally foreign environments of outer space and deep ocean exploration.

environments. Machines used for this purpose are truly prostheses in that they improve and expand the functioning of completely human systems.

An important area of cybernetic research was, and still is, in the application of cybernetic systems to weapons. The idea, developed almost forty years ago, that the "most sophisticated man-machine systems today are basically extenders of human perceptive, data processing, and motor capabilities" (Dechert, 1966:30), still figures heavily into the weapons systems being developed to integrate military men (and now, women), their tools (such as auto-pilot functions), and their weapons. Robins and Levidow (1989) note with regard to computer-based instruction, particularly of soldiers, that

> Human performance is redefined according to cognitive models derived from weapons systems, where the priority is to optimize the system's potential. Human thinking, memory, problem-solving and learning are modelled after their anthropomorphic counterparts in machine intelligence systems. Beneath its benign veneer, such education serves at once as laboratory, production site and legitimation for this military-based agenda, which in turn is increasingly writ large as a military information society. (9)

There is here a strong parallel to the training of new model soldiers to at least act like machine augmented humans if they cannot be actual cyborgs in the sense of a combination of organic and machinic (see Gray, 1989:44). However, there is a problem here: how precisely does one act like a cyborg? What do cyborgs act like? Within the military scientific discourse, a cyborg is generally taken to mean a human being enhanced in some fashion through the use of technology but what statements like the above betray is essentially the ultimate dream of

capitalism superimposed onto a militaristic system: a perfectly efficient, obedient, tireless, and indestructible worker/soldier whose production is without loss and without entropy. That is not, however, a cyborg. It is instead a robot.[8] So long as humans are included in the feedback loop of what are still essentially cybernetic systems, this robot-dream will remain a phantasy.

Human/technological systems are not myths. Cybernetics was appropriated by various military projects very early in its development for the purpose of developing weapons systems composed of human/machine feedback loops. Chris Hables Gray (1989) explains that

> weapons have always played an important role in war, from before the Greek hoplite to the tankers of the world wars. Today, however, it is not just that the soldier is influenced by the weapons used; not he or she is (re)constructed and (re)programmed to fit integrally into weapons *systems*. The basic currency of war, the human body, is the site of these modifications - whether it is of the 'wetware' (the mind and hormones), the 'software' (habits, skills, disciplines) or the 'hardware' (the physical body). To overcome the limitations of yesterday's soldier, as well as the limitations of automation as such, the military is moving towards a more subtle man/machine integration: a cybernetic organism ('cyborg') model of the soldier that combines machine-like endurance with a redefined human intellect subordinated to the overall weapons system. (43)

World War Two had a fair amount to do with this branch of cybernetic research. Some point to the military for an example of the first cyborg (using, of

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8. Baudrillard's second order of simulation is represented by the robot. It is, at root, a worker, bearing no resemblance to humans. Production is the dominant principle of the robot; all relation to a 'real' worker has been abolished and its only truth is in its mechanical efficacy. (Baudrillard,1983b:92-95)

course, a looser definition of 'cyborg' than did those involved with cybernetics work of the time period) with World War Two as the apex (see Gray, 1989). Psychologists and engineers, working together during the war to respond to problems faced by pilots and operators dealing with increasingly complex weapons, attempted to design weapons that better fit with the limitations and abilities of humans (in this case, men). What was developed was "a single operating unit, a new hybrid of man and machine" (Noble, 1989:18). As time has progressed, the goal has now become to

> develop biochips that can be activated by hormones and neural electrical stimulation and which can, in turn, initiate hormonal and mental behavior in humans. It is hoped that such human-machine integration will result in quicker reaction times, better communication, improved control and greater reliability overall. (Gray, 1989:53)

Should this goal be realized, it will signal a reversal: it is now the human in the system that will be altered, whether physically, mentally, or pharmacologically, to fit the needs of the machine rather than the other, traditional, way around. Ideally, the military wants to engineer the human element in weapons systems in the same way that it designs and engineers the hardware and software components of such systems (Noble, 1989). This appears to be a concept taken from the work of Clynes and Kline (1995): that the adaptation of man rather than changing the environment opens new possibilities for human exploration. They were speaking of space, but the same can be said of the environment as weapons hardware in contemporary military machinery.

Perhaps this idea is not far off. Contemporary representations of the cyborg provide a quasi-military vision of the figure that appears to involve the modification of the human to fit the weapon. Films such as the *Terminator* series (Dir. James Cameron, 1984,1991; Dir. Jonathan Mostow, 2003), the *Robocop* series (Dir. Paul Verhoeven, 1987; Dir. Irvin Kershner, 1990; Dir. Fred Dekker, 1992) and countless B-movies (the *Cyborg Cop* series [Dir: Sam Firstenberg, 1988, 1994], *Cyborg2* [Dir. Michael Schroeder, 1988]), as well as television representations such as *The Six Million Dollar Man* (Dir. Richard Irving, 1972) and *The Bionic Woman* (Dir. Richard Moder, 1975) illustrate not only a hyper-masculine cyborg but also inform the relationship between men and machines in the popular imaginary. The men in these films are generally highly trained as police officers, killing machines, or armed forces personnel who have undergone either physical or mental transformations of some kind to make them more 'efficient', often for the purposes of mass destruction. Despite the apparently seamless union of man and weapon, these representations maintain a cybernetic vision of a man-machine system.

Early cybernetic discourse, for all its essentially utopian visions of the interface between human and machine, is, at root, based on the *opposition* rather than *integration* of the two. This is not to say that the integration of organic and non-organic is impossible; Taube, writing in 1961, acknowledges this: "There is first the opposition between human and machine, which is sometimes expressed as an opposition between the physiological and the mechanical. It is certainly

possible to say that at a deeper philosophical level this opposition disappears" (2-3). As the discourse evolves and even mutates into other fields where the figure of the cyborg is used more as a metaphor than a physical construct, or as both, this fundamental opposition gradually changes into a more flexible interface. Indeed, the very definition of the word 'cyborg' changes, moving from a rigid interpretation based solely on cybernetics work to one which considers a much looser relationship between the human and the technological to be worthy of the descriptor/title 'cyborg'.

Introduction

Weaving has been called the original woman-machine interface (Plant, 2000a). This image is frequently employed by cyberfeminists to describe the activities of contemporary women and technology, particularly with reference to cyberspace and/or the Internet and/or virtual reality (VR) (Wakeford, 2000).[1] Following Haraway (1985), the figure of the cyborg is often employed in this discourse as a means of describing the new being that emerges from the intertwining of women and technology, a figure which accepts new technologies as tools like any other and gets on with the business of using them (Plant, 2000; Soper, 1999) - in short, a metaphorical incarnation of the cyborg rather than a literal one. This is a sharp contrast to the cyborg of mid-twentieth century military science, which was based on an idea of the body as a machine composed of various and discrete parts that may be simulated and replaced as required or desired. Although this view and the resulting research attempted to blur or erase the line between human and machine, the feminist cyborg is a tool user.

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1. Although these terms are sometimes used interchangeably, there are differences between them. 'Cyberspace' is a term originally found in Gibson's *Neuromancer* (1984) and is used to describe a world of disembodiment produced by the interface of humans and communications technology, what Gibson calls 'jacking in'. It is also used to describe the 'virtual space' created through interactions and by design on the Internet. The Internet was developed by the American military as a means of enabling rapid communication across distance, as well as attempting to decentralize control structures, and does not include sensory stimulation. It is now widely available to audiences beyond the military. VR (virtual reality) may be understood to describe a world where technology enables sensory communication via stimulation technologies attached to the body, across distance (see Schroeder, 1994). Gibson's cyberspace includes sensory stimulation for those 'jacked in'. That is, the body at the console experiences phenomena in cyberspace as though the body was immediately physically proximate to those phenomena. These three terms, following both academic literature and cyberpunk, will here also be used interchangeably.

Technology is used as an implement to get on with a given task or tasks and is not considered to be a replacement for human functioning. This argument, however, lapses into the debate surrounding prosthetics since some maintain that the use of any tool renders one a cyborg. Although this is not the viewpoint taken here, it is important to keep in mind due to the various definitions of 'cyborg' that are employed in the areas examined here. Feminist cyborgology takes the approach that technology is a partner of sorts, to be worked with rather than replaced by. This could be considered to be a step back from the military scientific cyborg, which works to integrate the machinic into the human, even if at the expense of organic parts of the human body.

The post-World War II military-scientific cyborg was hardware-based. Contemporary feminist discourse takes as its cyborg both the operators of machines that access cyberspace (Tomas, 1995a:38-39) and the cyborg that results from embracing and manipulating the confusion of contemporary woman's social reality for one's own purposes (Haraway, 1985). This idea of the cyborg is not universally accepted:

> However satisfying such an imaginary blend might be, the actual status of the cyborg is murky as to whether it is a metaphor, a dreamlike fantasy, and/or a literal being; and its mode of fabrication and maintenance is, practically at least, problematic. (Morse, 1994:157-158)

It is, perhaps, inappropriate to limit the uses and functions of the cyborg in these discourses to only two since "the cyborg is text, machine, body, and metaphor -

all theorized and engaged in practice in terms of communications" (Haraway, 1991a:212). Arguably, what distinguishes the feminist cyborg from all others is that it is fundamentally about multiplicity, fluidity, and confusion (Landsberg, 1995). Haraway (1991b) notes that "feminism is about the sciences of the multiple subject with (at least) double vision" (195;see also van Loon, 1996). Its purposes are similarly multiple, but all point toward the creation of a new social reality for women and, by extension, for everyone.

This plurality is a key feature of cyborg identity for feminism:

> Haraway's notion of the cyborg foregrounds the ambiguous constitution of the body and subjectivity - predicated on the blurred boundaries between organism and machine, the individual and the technological, the fictive and the real. (Balsamo, 2000:153)

Where the existing patriarchal system depends on the maintenance of binary oppositions, the blurring of these boundaries is what makes the cyborg so useful for feminist purposes (Lupton, 1995:101). Plant (2000) explains that

> there is no authentic or essential woman up ahead, no self to be reclaimed from some long lost past, nor even a potential subjectivity to be constructed in the present day. Nor is there only an absence or lack. Instead there is a virtual reality, an emergent process for which identity is not the goal but the enemy, precisely what has kept at bay the matrix of potentialities from which women have always downloaded their roles. (335)

Plant (1995) also points out that a distinguishing feature of cyberfeminism is that it does not, as many of its predecessors did, "seek out for woman a subjectivity, an identity or even a sexuality of her own: there is no subject position and no identity on the other side of the screens" (63). It may be argued that this also

applies to socialist feminism in its inherent multiplicity and absorption/incorporation of new technologies. Indeed, Haraway's appropriation of the term 'cyborg' is demonstrative of this fact given that the word itself, as well as the concept it represents, has origins in the highly patriarchal institution of military science (Haraway, 1985:68; see also Springer, 2000).

This new social reality is, in part, the result of increased interaction with technologies of various kinds (Markussen, 1995), whether via appropriation of existing technologies or adoption of new technologies. Baudrillard, drawing on McLuhan, notes that the particular arrangement of signifying objects and images affects the way in which the individual sees the world, and that with each major transformation from one world-view to the next there is a sense of disorientation and discomfort with respect to the loss of the previous world-view (Clark, 1995:114). This new way of viewing the world includes a transformation of gender identity and traditional relationships (Edwards, 1995:84). Tomas (1995a) argues that although traditional systems of difference such as race and gender still exist, it is entirely possible that these may one day be eclipsed by technological differences. If this were to be the case, if one potentially hierarchical and oppressive system of difference replaces a system that is known to be so, Gray's (2002) caveats regarding cyborg society would be proven true: "Our cyborg society is not the reinvention of everything from politics to poetics; it is the transcription of old problems onto new forms" (188).

The very idea of the cyborg, either as metaphor or materially realized entity, depends on the abolition, or at least blurring, of binary oppositions, especially those of organic/natural and technological/cultural (Balsamo, 1995; Springer, 1991).[2] The polarity of gender (female - male) is another such binary opposition, and so is also vulnerable to the same reconstruction processes that work on challenging the organic - technological opposition (Balsamo, 1995:216). What makes this binary more challenging to blur and/or eradicate is that gender is a naturalized marker of human identity (Balsamo, 1995:217). So, where one's body may incorporate a pacemaker or prosthetic limb, the individual is generally still called human. The polarity of organic and technological is actually a spectrum that allows room for various combinations of the two. The same does not apply in the case of the gender binary: a body must be either female or male....at least in physical, embodied space. The cyborg is a fitting figure for the feminist project since women and cyborgs are both culturally produced and reproduced (Balsamo, 2000).

Haraway's 'Manifesto'

This chapter is concerned with examining the cyborg in socialist feminism,

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2.Haraway (1985:68-71) acknowledges three boundary (binary) breakdowns that make possible the analysis found in the 'Manifesto'. They are: human/animal; organism/machine; physical/non-physical.

after Haraway's (1985) "A Manifesto for Cyborgs: Science, Technology, and Socialist Feminism in the 1980s", and cyberfeminism, especially where the uses of technology constitute new grounds for opposition and resistance. It will discuss the impact of Haraway's (1985) "Manifesto", as well as some of the more current cyberfeminist literature. Issues of embodiment, subjectivity and resistance will tie into a examination of feminist uses of VR as a means of framing a new social reality.

Published originally in *Socialist Review* in 1985, Donna Haraway's "A Manifesto for Cyborgs" began what would become an enduring theme in socialist feminism. According to Edwards (1995), "this discourse is primarily concerned with the psychological and cultural changes in self-imagination brought on by the analogy between computers and minds" (74). The cyborg as Haraway depicts it is generally considered a product of late-capitalism with an oppositional agenda (Tomas, 1995a; Sandoval, 1995). Haraway (1985) calls the cyborg a creature in a post-gender world (see also Tomas, 1995a; Springer, 1991).[3] It certainly embodies boundary anxiety: "Indeed, as an oppositional cyborg's multiple articulations suggested, and as Clynes had already suggested in 1965, this most recent of reconceptualizations in the domain of automata was symptomatic of the body's uncertain future in the mid to late twentieth century" (Tomas, 1995a:37).

3.The cyborg as a post-gender construction will be examined in the next chapter through the examples provided by popular culture.

Haraway (1985:66) claims the figure of the cyborg as representative of women's changing experiences in the late twentieth century. This hybrid figure brings together imagination and material reality, the combination of which makes possible historical transformation (Haraway, 1985:66). The condition of being a cyborg is universal; *everyone* is a cyborg. The key issue becomes what to do with this identity. Wilson (1995) notes that "the solution to the condition of being a (discursive) cyborg is not to turn your back upon technology, but rather to understand it well enough to use it for your own constructive purposes" (244). Unfortunately, as Haraway (1985; see also Wise,1997) acknowledges, technology may be a double-edged sword for the feminist cause: although it has potentially liberatory applications, the feminization of many areas of work in information technology creates new opportunities for exploitation and oppression (see also Quinby,1997). Wise (1997) makes the point that 'home work' or the 'techno-cottage' industry may serve to put women back in the home, and thus, seemingly emancipatory technologies may turn into a form of entrapment. A useful way to go about utilizing Haraway's 'Manifesto' (1985), suggests Wise (1997), is to combine it with feminist work being done on embodied, sexed, differentiated and partial subjectivities. Haraway (1985) provides a chart as a means to illustrate the 'informatics of domination', the result of a transition from "an organic, industrial society to a polymorphous, information system - from all

work to all play, a deadly game" (80).[4]

Haraway (1985) argues for "a politics rooted in claims about fundamental changes in the nature of class, race, and gender in an emerging system of world order analogous in its novelty and scope to that created by industrial capitalism" (79-80). It may become possible, at this point, that Haraway's 'Manifesto' (1985) could

> provide new metaphoric grounds of resistance for the alienated white male subject under first world conditions of transnationalization, and thus the metaphor 'cyborg' represents profound possibilities for the twenty-first century [...] An oppositional cyborg politics, then, could very well bring the politics of the alienated white male subject into alliance with the subaltern politics of U.S. third world feminism (Sandoval, 1995:409).

If this were to come to fruition, would it not be proof positive that Haraway's universal cyborg existence was a reality, drawing as it must upon fragmented and fluid identities to bring into agreement two seemingly disparate groups?

The question that naturally follows interrogates the methodology of realizing this potentiality. The combination of hydra-headed identities with increasingly accessible technology is a good place to start. Cyberspace "provides opportunities to explore the form limits, abilities, and expression of bodies in ways unavailable in other social contexts" (Green, 1997:59).

4.Haraway's columns describe this movement. The columns begin with 'representation' and 'simulation' respectively, a debt to Baudrillard's orders of simulation (1983).
These orders and their place within the larger cyborg discourse will be discussed in depth in Chapter 4.

Feminist-Cyborgs and Cyberspace

Cyberspace has many possibilities, but a good number of these require a considerable adjustment for the human bodies involved (Schroeder, 1994). Chris Hables Gray (2002) describes the experience of being part of an academic meeting in cyberspace:

> In what truly must seem a miracle (the immaculate conversation?), everyone can talk at once, because your text eventually comes up, with everyone else's, on the screen. As you sit there with your mind racing and your fingers dancing, the most your body can do is squirm. After several hours of this, you want to stand up, wave your arms and scream. (132)

Some would argue that this is the case in *any* meeting that goes on for several hours, but the embodied experience of being in a room with one's colleagues offers several distractions (noticing a particularly horrid tie, watching others fidget, even just looking around) as well as several comforts (there are other *people* involved in the discussion, the convention of taking turns speaking generally applies). Two issues arise out of the use of cyberspace for work and for play. The first questions the role of cyberspace and/or VR in the (re)production of systems and structures of knowledge and power, and the second interrogates the embodied experience of this type of interaction, both with other users and the hardware associated with accessing cyberspace/VR.

In reference to play in cyberspace, Stone (1995) points out that "the aleatory, rough-and-tumble quality of CSCP (computer-supported cooperative

play) generated an environment in which ideas are continually shaken up, new risks are taken, and new formations emerge" (245). This might also be applied to the use of cyberspace for work. In either situation, innovation and extension are required and the result is the creation of new formations. Rather than a traditional environment, with colleagues sitting in a conference room or with friends with a three-dimensional game/environment, in cyberspace, something is added (the machine mediator and all the new and special effects/possibilities that it makes possible) and something is subtracted (the physical immediacy of others). The boundary between work and play is blurred in cyberspace. One is able to use the same computer for both, may wear her pyjamas to board meetings (in the absence of a webcam[5]), and may play Solitaire while writing up the day's report. It is then not surprising that cyberspace provokes deep anxieties about boundaries and borders on much larger issues (Edwards, 1995:83).

In writing specifically about VR technologies, Green (1997) notes that they are gendered in the same ways that the institutions which produce them are (see also Quinby,1997). Because of this, VR itself does not constitute a decisive break with present modes of being, but rather maintains many of the ideologies which support the present social formations of late capitalism (Cooper, 1997;

5.A webcam is a digital camera used to provide live pictures to an Internet/cyberspace environment. It operates as time-lapse still photography rather than as a continual streaming feed as in video cameras. The length of time between frames may be greatly varied, with results ranging from an approximation of 'real-time' action to a new frame every quarter or half an hour or more.

Squires, 2000).

Prosthetics and Patriarchy

Gray (2002) points out that most figures in the development of machine integration (doctor-inventors, corporate leaders, governmental bureaucrats) are men. Thus, there is "no surprise for feminists in fact that when phallocentric culture produces women in virtual space, it produces exactly the same 'models' as it produces in other representations and simulacra" (Wise, 1997:185). Plant (1995) argues that women themselves are simulations, imitations of "anything valued by man", and so embody the very possibility of mimesis. In being able to "fit any bill [...] she is already more than what she imitates" (59). This is what makes her threatening.

> The matrix weaves itself in a future which has no place for historical man: he was its tool, and his agency was always itself a figment of its loop. At the peak of his triumph, the culmination of his machinic erections, man confronts the system he built for his own protection and finds it female and dangerous. (Plant, 1995:62)

Technologies which enable the human to go beyond the boundaries of their organic physicality and immediate sensory experience are examined by social and feminist theorists as masculinist and presupposing a masculinist form (Green, 1997). Two elements here at play may account for this viewpoint. First, the assumption of masculinist form is especially appropriate if the discussion

hearkens back to (post-) World War II military-scientific efforts to integrate man with his weapons of war and to better equip 'him' for prolonged space travel (see Ch.1). Second, the idea of bodily integrity and/or 'improvement', if considered a particularly masculine notion especially as related to labour, is fundamentally opposed to socialist feminist and cyberfeminist conceptions of the utilization of technology as a means of altering a political system which places women in the category of 'goods' (Plant, 1995), and thus outside the 'real' political arena. Representations of literal cyborgs, that is, an organic body modified/enhanced through (generally) visible technological modification, are gendered, female cyborg bodies being more penetrable, and thus vulnerable, than male cyborg bodies.[6] Balsamo (1995) points out that "the technological fragmentation of the body functions in a similar way to its medical fragmentation: body parts are objectified and invested with cultural significance" (234). The entire gendered body functions along the same lines: women are stereotypically considered 'soft' as opposed to the 'hardness' of men (see Foster,2000).

In what may be considered a particularly masculine point of view in the context of the current discussion, Wilson (1995) notes that "a machine both sheds parts and acquires new ones easily. The human perspective seems to insist upon organic integrity as the only possible norm" (246). Sobchack (1995)

6.The anxiety surrounding the permeability of the human body will be discussed through popular representations in the next chapter.

does not accept that the presence of her prosthetic leg makes her a cyborg.[7] She is still human, but one with a different method of motility. It could be argued that, in line with the socialist feminist cyborg, she has integrated/adopted this technology for her own purposes. Sobchack (1995) notes the transparency associated with prosthetics - it is the body that must incorporate the technology rather than the reverse. A feminist cyborg may capitalize on the perceived permeability of the female body as another way to use technology to her advantage. On the other hand, because the technologies that may be adopted are gendered in the same way as are those who create them, this practice may allow increased utilization of technology but toward an end that does not challenged the patriarchal practices associated with their production.

A prosthesis is, it should be remembered, an artificial part, one which is dependent on the body to which it is appended or implanted. It is not independent of the lived body and is not

> an android. An android, existing in the contemporary world only in the crude prototypical form of drone-robots, even though deeply etched into our cultural mythology, is a self-contained artificial life form. A prosthesis is a part, a supplement to a human body, and not, however completely integrated, self-contained. (Wilson, 1995:242-3)

An appended prosthesis is a tool, but because of its visibility it also deeply

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7.A prosthesis is "an artificial body part that supplements the body, but a part that carries an operating system different from the body's organic processes." (Wilson, 1995:243) Others consider prostheses to be an extension of the human body, ranging from a fork to the Canadarm. For the purposes of this discussion, the former definition applies unless otherwise noted.

troubles the human/machine binary that other potentially cyborg-creating technologies do not:

> An appended body part not only recalls the previous, now missing, organic part, but actively calls into question the body's integrity. A prosthesis, however hopeful and future-yearning, is also mnemotechnic. It evokes a consciousness of dis-integration (with may be either, or both, historical or fictional). For that reason, a hybrid body poses a disturbing dilemma: would you (would anyone) choose to have yourself enhanced by the addition of prosthetic parts when that process, however it begins, must dis-integrate your body, dissolving its boundaries, and batter down the fortified castle of you identity? (Wilson, 1995:251)

Sobchack (1995) raises the question of the human-ness of prosthetics, noting that "without my lived body to live it, the prosthetic exists as part of a body without organs - a techno-body that has no sympathy for human suffering, cannot understand human pleasure and, since it has no conception of death, cannot possibly value life" (213). Given the anxiety surrounding the blurring of the human/machine boundary, Sobchack's argument can be read to betray a concern about the *amount* of prosthetic enhancement in a single human body: if the replacement of an organic part with a non-organic part means a loss of the human-ness of that part, what happens if/when the body becomes more prosthetic than organic?

This appears to play into a certain questionable idea of the mind and the body as separate and unrelated. Wise (1997) ties the separation of mind and body to the phallocentric fantasy of domination in cyberspace:

> "The 'fantasy of reason', like the fantasy of uninvolved sex, relies

> on the central tenet of the logos - that the mind and body are somehow separate entities, which is itself a fantasy. That is, what enables the logocentric male subject to fantasize domination in cyberspace is that he is extending into another fantasy space his fantasy, that reason defines him. For feminists considering the political and creative implications of VR and other cyber-technologies this recognition is very useful. In being caught by the fantasy that male domination of real space can be extended to domination of cyberspace, phallocentric subjectivities are problematized. Their presence in cyberspace is a simulation of a fantasy that they fail to recognize in their lived ontology, and encountering this simulation threatens to undo their subjectivities in the real. (182)

Gray (2002) comments that "the cyborg penis is quite the fitting sign for postmodern patriarchy: threatened, inconsistent, yet in the end adaptable and bolstered by technology, and so still functioning," although perhaps only for the time being (105). How long can technological crutches keep patriarchy functioning, particularly if feminists are infiltrating the space which patriarchy takes to be the latest site of its domination? Plant (1995) goes so far as to question the masculinity of the practice of entering cyberspace: "Entering the matrix is no assertion of masculinity, but a loss of humanity; to jack into cyberspace is not to penetrate, but to be invaded" (60). This invasion or penetration is arguably old hat to women, and could provide the edge required to stave off patriarchal domination in cyberspace (see van Loon, 1996).

Cyberspace and Lived Reality[8]

An important feature of cyberspace is that it allows for new and different ways of communicating and interacting, ways which may either be physically impossible or taboo in lived reality (Gray, 2002). The development of technology offers a means by which the material body may be freed from the confines of immediately lived space (Featherstone & Burrows, 1995). Where women are concerned, this avenue of opportunity may prove to level the playing field of labour: the "new transferable intelligence" of women begins to be valued over "the strength or single-mindedness which once gave the masculine its power" (Plant,2000:334). In other areas of life, those outside of cyberspace, it is unlikely that this will happen in the foreseeable future. If the organic body can be perceived as a 'problem', virtual reality may be able to solve it, "at least temporarily, by *hiding* it" (Morse, 1994:179). What this would entail, however, is a near complete fusion between computer/cyberspace accessing device and user, since it is, at this point, not possible for cyberspace and lived reality to be one in the same.

The relationship between cyberspace and the 'real world' is a source of vibrant debate. Cooper (1997) points out that "the world existing prior to VR

8.'Lived reality' is sometimes abridged into 'IRL' (In Real Life) in the context of Internet chat groups, a term which betrays not only the fantastical perception of cyberspace but also the possibilities provided by on-line environments.

cannot simply be seen as a historical constraint to be shed as useless baggage" (97). The world prior to and outside of VR/cyberspace is one of the major limiting factors in the realm's potentiality, although some argue that the digital representation created by the user is outside and opposed to being marked by the elements that work at marking the physical body (Green, 1997). As has already been discussed, the idea that "'technology' becomes purely digital, and can thus be rendered a-social and a-cultural" (Green, 1997:61) is false. Both the technology and those who use it (as well as the virtual identities/bodies they create) are marked by the 'real' world in which they were created:

> the virtual bodies produced through engagements with virtual reality technologies are embedded in 'pre-virtual' material social relations and, as such, necessarily incorporate social practices which categorize and standardize bodies, and also assume relations of difference and inequality between bodies. (Green, 1997:59; see also pp.66-7)

Squires (2000) notes that "if we are to salvage the image of the cyborg we would do well to insist that cyberfeminism be seen as a metaphor for addressing the interrelation between technology and the body, not as a means of using the former to transcend the latter" (360). The result should be a combination of bodies and technologies that seeks change in the 'real world' by beginning in a space somewhat removed from it, although not completely. Vasseleu (1997) points out that virtual reality is not an entirely new environment since "the intelligibility of bodies has always been conditioned by their ability to form intersections with, and live their reality as, multiple culturally determined spaces"

(46). Although cyberspace may be the space in which an oppositional politics may be formed, to make a significant impact it is necessary to read what happens there back into lived reality (Cooper, 1997; Green, 1997) since "the kind of protest that has the potential to make fundamental political change is embodied" (Gray, 2002:44).

Cyberspace and Resistance

Some think that cyberspace can be used to "undermine both the world-view and the material reality of two thousand years of patriarchal control"(Plant, 2000:325). As a relatively new technology, its development has been concurrent with similar advances in other areas:

> As media, tools and goods mutate, so the women begin to *change*, escaping their isolation and becoming increasingly interlinked. Modern feminism is marked by the emergence of networks and contacts which need no centralized organization and evade its structures of command and control (Plant, 2000:328).

These networks of women and technology represent a change from the highly organized political framework that may have characterized earlier feminist efforts to nebulous movement which requires some strategizing, yes, buf one that may be begun before any articulation or organization arises (Wise, 1997).

What becomes an interesting problem, given the fact that it is a relatively new environment and far from universal alternate reality, is the magnitude of

impact that change in cyberspace can have on the world outside of itself. Change, 'IRL', is embodied and unsafe: "You can totally disrupt the fabric of the Net without risking your actual body at all. To do the same in the real world is impossible" (Gray, 2002:43). This betrays the problem of order in cyberspace versus the 'real world': cyberspace, by its design, functions predictably (Chesher, 1997). Human involvement is the only unpredictable factor in the equation. In the world outside of cyberspace, this unpredictability can become dangerous. Thus, negotiating cyberspace can be seen as physically 'safer' than negotiating the world beyond it. Conversely, while cyberspace is allegedly physically safe, it lacks the possibility of discovery that is always present in the world outside its digitally constructed boundaries: "You can only find what has already been found" (Nunes, 1997:167).

The fluidity of the female body has been cited as an advantage for women in their creative and resistive uses of cyberspace (Plant, 2000), particularly where the potentials of female sexualites "break through or explode the mythos and logos of patriarchy" (Wise, 1997:190). Although this is important for the feminist project of changing the social reality of women, and by extension everyone, fluidity, adaptation, and networking are factors that can be used by multiple groups of 'others' to achieve the same end; that is, to establish a system that, unlike patriarchy, does not rely on domination and oppression. Sandoval (1995) explains that those who have been surviving under patriarchy for several

generations already have the techniques: "colonized peoples of the Americas have already developed the cyborg skills required for survival under techno-human conditions as a requisite for survival under domination over the last three hundred years" (408). Cyberspace has the potential to provide a way of connecting, of networking, for historical 'others', particularly because of its a-spatial construction (Wise, 1997; Springer, 2000). Plant (2000) notes that 'others' such as women

> are admitted on the understanding that they are duty-bound to honour and obey the members of the species to which they were enslaved: the members, the male ones, the family of man. But self-organizing processes proliferate, connections are continually made, and complexity becomes increasingly complex. In spite of *its* best intentions, patriarchy is subsumed by the processes which served it so well. The goods do get together, eventually. (329)

Through the creation of networks of support and solidarity among groups of 'others' (Wise, 1997; Wakeford,2000), feminists may succeed in creating a space that is free of patriarchal control and domination, even if it is unlikely that, in the foreseeable future, this space extends beyond virtual reality.

Introduction

The cultural fascination with cyborgs has a long past. Ancient Greek and Hindi tales tell of half-human, half-metal creatures (Gray, 2002:4). Gonzalez (2000) demonstrates that the history of human-machine amalgamations continued from ancient times to the present. In contemporary culture, the most prevalent representations of this coupling can be found in cyberpunk fiction, on television, in movies, and, as Oehlert (2000) notes, in comic books[1]. The images presented in these media can be read in two ways: first, as a coupling between a human body and electronics or machines, and secondly, as the identity of organisms embedded in a cybernetic information system (Balsamo, 2000), a definition that is also used in feminist discourse. These representations of the figure of the cyborg disrupt ideas of 'other', but frequently do not succeed in creating a truly hybrid creature in any concrete way:

> Every cyborg image constructs an implicit opposition between machine and human; at once repressing similarities and highlighting distinctions. This is the science fictional character of the cyborg- it is a hybrid, but the specific traits which mark its human-ness and machine-ness vary widely. Signs of human-ness and, alternatively, signs of machine-ness function not only as markers of the 'essences' of the dual natures of the hybrid but also as signs of the inviolable opposition between human and machine. This is to say that cyborgs embody human characteristics that reinforce the difference between humans and machines. (Balsamo,

1.Children's toys, which tend to be highly gendered in orientation, are also a source of cyborg representations (see Schwab, 1987); a recent print advertisement from a major national department store offered $10 off the Hot Wheels Octoblast Cyborg City race track.

2000:149)

The proliferation of representations of the cyborg, then, are not so much about attempts to predict what may occur to the human body in the future, but are more about expressing the fears and fantasies of contemporary culture that surround the increasing presence of technology, particularly where it intersects with the human body.

Lupton (1995) notes that, "in an era in which risks to the health and well being of the fleshy body abound, in which ageing and death are feared, the cyborg offers an idealized escape route" (101). The figure of the cyborg in many contemporary cultural representations is forced to take on human anxieties about the short-comings of the human body. This is, however, a difficult projection to maintain. While the figure is ideally the human body improved through its bond with technology, what representations of the cyborg frequently succeed in doing is presenting an image that *reinforces* rather than blurs the boundaries between human and machine:

> [i]n many ways, those created figures might be seen not to dissolve the boundaries of human and the technological but to serve as clarifying mirrors for the human. The image may appear as a distortion of a conceptual ideal but it does provide an instance of the very self-division that constitutes Western subjectivity. Particularly in fictional forms, but implicitly, I think, in scientific and philosophical arguments, the imaginary technological humanoid figures are means of displaying the human encounter with itself. (Rayner, 1994:125-6)

Perhaps, then, it is no surprise that mainstream representations of cyborgs do nothing to challenge the dominant ideological view of human, machine, and

femininity: "in fact, what look like provocative notions of a human identity, are not; they reassert a distinct identity between machine and human in a 'post-technological world" (Balsamo, 2000: 156). It is this idea which is the key theme in this chapter, and is the one that most clearly demonstrates, because of its contemporary nature, that literal representations of the figure of the cyborg have not moved beyond the fragmented approach taken by early military science. The representations of the cyborg in various media are, in some ways, tied to the feminist cyborg in that they utilize the same definition of a controller operating in cyberspace. They are closer to the cyborg of military science, however, in that they not only frequently depict the figure as of quasi-military origin, but also in that they are most frequently men. This can be considered reflective of the anxieties surrounding human and machine interfaces, as well as representative of the fact that Baudrillard's idea of implosion has not occurred in any literal way.

Upon examining contemporary representations of the figure of the cyborg, it becomes clear that rather than creating a new being, a true hybrid, contemporary media succeed only in creating humans with machinic elements or machines with human characteristics. Oehlert (2000), discussing comic book cyborgs, saliently points out that

> [a]s opposed to pilots of fighter aircraft who require a great deal of their attention to be focussed the operation of their system, Cyborgs whose systems are managed intuitively require little of their attention to be diverted from the actual combat. The issue of humanity with comic book cyborgs then, is not if the machine will take over the human side of the equation, but what will the human half choose to do with his new abilities? (119)

This observation may easily be applied to representations of the cyborg in other media, and is indeed also the case with 'real-life' cyborgs:

> As the Twentieth Century approaches the Twenty-First, modern technology is making cyborgs of us all. As our sensory, mental, and physical powers are being expanded by machines, we are all becoming Six Million Dollar persons. Electronics extend our eyes, ears, and voices; processing powers; prosthetic devices, plastic aortas, and pacemakers extend our very limbs and lives. (Rollin, 1979:306)

These modifications of human perception and interaction with their environments does not create a new species or group of markedly different beings. Human interaction with technology is just that - interaction. Prosthetics and/or artificial replacement parts do not fundamentally change the nature of the human; a human with a prosthetic arm or a pacemaker is still a human, albeit one with non-human additions. Full integration of the human and the artificial is not achieved, as the artificial part remains separate and distinct from the rest of the human body.

This chapter will examine representations of the figure of the cyborg in several media. Works to be focussed on include William Gibson's cyberpunk novels, *Star Trek*'s 'The Borg', Martin Caidan's *Cyborg* (1972), which was the basis for television's *Six Million Dollar Man* (1972) and *The Bionic Woman* (1975), and various filmic representations ranging from *Blade Runner* (Dir. Ridley Scott, 1982) to the *Terminator* (Dir. James Cameron, 1984, 1991) and *Robocop* (Dir. Paul Verhoeven, 1987: Dir. Irvin Kershner, 1990; Dir. Fred Dekker, 1992) series. So-called 'real life cyborgs' will also be examined. The work of Austrailan

performance artist Stelarc will be particularly emphasized, as well as the performative aspects of the work of Canadian engineer and self-styled cyborg Steve Mann.

Cyberpunk

Counter-cultural guru Timothy Leary (2000) notes that cyberpunk refers to the personalization, and thus popularization, of knowledge and information technology. "Innovative thinking on the part of the individual" (534). Cyberpunks are not necessarily located exclusively at the high-technology end of the spectrum. They are instead "sophisticated adepts along the continuum of hardware intersystems that comprise the material expressions of a systematic culture of technology" (Tomas, 2000:180). Cyberpunks work well with various forms of technology and consider it to be easily fused to any biological system, particularly human systems (Dyens, 2001:74). The conjunction of human and machine in cyberpunk discourse results in a highly adept tool-using human, where technology is the tool and acts as a naturalized extension of the human system. The new life fluid of this amalgamation is information, which Tomas (2000) terms "a new form of blood in this post-industrial cyborg world" (176).

Cyberpunk as a genre of science fiction is concerned overwhelmingly with the dismissal of the body, or 'meat', in favour of the ultimate goal - pure, bodiless mind (McCarron, 1995). "The body, for cyberpunk writers, is an 'accident',

unconnected to the pure substance of mind. They are fascinated by 'enhancement'; throughout their novels the human body becomes less organic and more artificial, increasingly machine-like" (262). The Cartesian distinction between body and mind in cyberpunk is a prevalent theme, and is often given shape in distinctions between, for example, the 'console cowboys' and the Artificial Intelligences such as Wintermute in Gibson's *Neuromancer* (1986)[2]. The differences between these two also have to do with access to information. Where the Artificial Intelligences (AIs) are frequently corporate-owned cyberspace watchdogs, the console cowboys work to access the information monitored by the AIs. Technology, then, can work both for and against a cyberpunk and/or console cowboy:

> For cyberpunks technology is inside the body and the mind itself. Yet it is also global: the satellite media net, the multinational corporation both recurring as dominant literary tropes in cybernovels. Cyberpunk is characterized by its integration of these technologies with a hedonism and a counter-culture 'guerilla' political consciousness, which - in contradistinction to 1960s counterculture that was rural, romanticized and anti-science - takes the hacker along with the rocker as its cultural icon. (Squires, 2000:363)

But, as Leary (2000) notes, political activism may not be the only motivation behind cyberpunk[3]:

> Cyberpunk is, admittedly, a risky term. Like all linguistic

2. Gibson's work will be discussed further below.

3. Taylor (2001) provides a useful categorization of the various incarnations of the hacker since the inception of the computer industry. Although the overlaps between Leary's use of 'cyberpunk' and Taylor's list of 'hackers' is large, the terms do not themselves overlap.

> innovations, it must be used with a tolerant sense of high-tech humour. It's a stop-gap, transitional meaning-grenade thrown over the language barricades to describe the resourceful, skilful individual who accesses and steers knowledge/communication technology towards his/her own private goals. For personal pleasure, profit, principle, or growth. (534-5)

It is here that perhaps the most sizeable gap between cyberpunk and fictional console cowboy is to be found: console cowboys engage in cyberpunk kinds of activities because it is a matter of survival rather than principle. But, it should also be noted, both cyberpunk and console cowboy operate subversively, frequently with pirated technology (Dyens, 2001). Leary (2000) explains the cyberpunk toolkit, noting that cyberpunks are

> fascinated by navigational information - especially maps, charts, labels, guides, manuals, which help pilot one through life. [The cyberpunk] continuously searches for theories, models, paradigms, metaphors, images, icons, which help chart and define the realities which we inhabit. (538)

This fairly utopian vision of cyberpunk is not shared by all. McCarron (1995) argues that

> despite cyberpunk's reliance on and fascination with technology, the genre is deeply conservative and anti-technology, implacably hostile to any further erosion between the human and the mechanical. In the 'face' of increasing mechanization, cyberpunk's Cartesian privileging of mind allows its readers to reassert their supremacy over the machine. (271-2)

Within William Gibson's cyberpunk novels, McCarron's argument would appear to be valid, as I will now show.

Gibson's *Neuromancer* and *Count Zero*

David Tomas (2000) notes that "Gibson's novels and short stories are influential examples of 'cyberpunk' literature, a genre of science fiction literature that deals with first-generation cyborg or machine/human symbiotic activity in an immanent post-industrial information-governed universe." (175) 'First generation' implies that, perhaps, the interface has not been perfected, that there are still gaps between human and machine. This is apparent in Gibson's cyberpunk novels. *Neuromancer* (1986) is the story of Case and Molly as they engage in a somewhat covert data recovery operation for Armitage. At play in the novel is the juxtaposition of the two main characters, Case and Molly. Case is a 'console cowboy' who 'jacks in' to cyberspace to earn his living recovering/stealing data, and so deals with cyberpsychic or software technology, as opposed to Molly's material technicity as a 'razorgirl' whose body and reflexes have been altered to create a combat/security machine. Both rely on technological edge to be successful in their fields. According to Tomas (2000),

> Technological edge can be defined as the product of a successful conjunction of advanced technological hardware and contextually sophisticated techniques. This conjunction produces a technoscape that is also common to the functional architecture of the technophilic body functions - the structure and capacity of the human memory, the range and sensitivity of the senses, the relative questions of organically constrained speed and power. (179)

This idea meshes with Clark's (1995) breakdown of the two basic models of the

cybernetic body present in Gibson's work. The first is a disembodied but perceiving consciousness that is operative in cyberspace, what could also be considered a metaphoric cyborg. The second is a hardwired 'immersion' in virtual space. What Clark's schema lacks is an account of the myriad versions of the altered body present in Gibson's cyberpunk.

It is for this reason that the three categories of comic book cyborgs outlined by Oehlert (2000) are more appropriate. His first category is that of the simple controller, which encompasses informational interfaces, vaccinations, and technical manipulation of genetic information. The second is that of the biotech integrator. This category includes such things as prostheses and human/machine weapons systems. Finally, the category of the genetic cyborg includes direct machine-human connexions and the downloading of human consciousness. Each of Oehlert's categories are represented in *Neuromancer.* Case is the simple controller, Molly the biotech integrator, and Case's aid, the Dixie Flatline, as a downloaded and formerly human consciousness fits into the third category of genetic cyborg. What is important to acknowledge about these three categories is that the first two categories appear to be currently existing and as such are, again, based on human bodies interacting with or modified by technology. Molly's body is structurally modified with an enhanced nervous system to allow faster deployment of the "ten double-edged, four-centimeter scalpel blades" that are housed beneath her fingernails (Gibson, 1986:25). She is still human, her tools are simply more readily accessible. Case must use

external technology to access cyberspace, making him little different than contemporary Internet users who must type and click to access their information. The third category, however, is completely fictional. As has already been discussed, embodiment is a key element for human-machine interaction. Without the body, the technology cannot make this kind of connexion.

Tomas' (2000) notion of the technophilic body plays upon this idea of embodiment:

> A *technophilic body* is the product of various degrees of aesthetic and functional transformations directed to the human body's surface and functional organic structure. Such transformations can be divided into two distinct categories. The first category is composed of techniques and technologies that are used for various *aesthetic* manipulations of the body surface. These include cosmetically redesigned faces, muscle grafts and animal and/or human transplants that effectively blur visual cues for gender and human/non-human differentiation. The second category is directed to fundamental *functional* alterations to the human body's organic architecture. It includes biochip implants, prosthetic additions mediated by myoelectric coupling, and redesigned upgraded senses. (176)

What is peculiar about Gibson's work, however, is that the degree of human-machine integration plays a less prevalent role than the issues of 'pure mind' and downloaded consciousness/Artificial Intelligence. The attention paid to the apparently masculine activity of 'jacking in' for work and the Artificial Intelligences[4] that populate cyberspace exceeds by a substantial margin the

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4. Gibson's Artificial Intelligences are acutally neither male nor female, but appear in human form when they need to communicate with humans. They most frequently in Gibson's novels appear in male form, such as the Finn or Neuromancer.

attention paid to those interfaces that involve contiguity between the body and technology. Case may choose to 'jack out', but Molly is always, in her way, 'jacked in'.

Martin Caiden's *Cyborg* (1972) tells a related story, one that chronicles the story of Steve Austin, a military test pilot. After a horrible crash, he is left severely disabled. The military powers-that-be decide to turn him into an experiment in building the ultimate human by enhancing him with technology. This is the novel upon which television's *Six Million Dollar Man* was based. It is interesting to note that although the majority of the novel focuses on Austin's crash, rebuilding and rehabilitation, this is dealt with only in the theme song of the television show: "Steve Austin, astronaut, a man barely alive. Gentlemen, we can rebuild him. We have the technology. We have the capability to make the world's first bionic man. Steve Austin will be that man. Better than he was before; better, stronger, faster." As a bionic man, Austin's 'enhancements' are permanent in the same way that Molly's are permanent; both have built-in, non-removable prosthetic tools that allow them to perform their jobs with technological edge.

The main assumption in Gibson's cyberpunk is that boundaries between subjects, their bodies, and the outside world are being reconfigured, that is, that the binaries are beginning to blur (Featherstone & Burrows, 1995:3). This idea provides the background for the cyberpunk belief that "existence is a territory where biology, technology, and culture fuse into one another" (Dyens, 2001:73). It is, however, a fantastic vision. If it can be assumed that the three were

separate in a pre-cyberpunk reality, they certainly remain so now. Each may, indeed does, impact upon the others, but there is a perceptible difference between them, and the points of intersection do not always convey a positive vision in Gibson's work:

> His works prefigure a culture where the organic architecture sustaining the human sensorium has undergone various degrees of collective biotechnological prosthetic transformation. From the point of view of the cultural complexity of their technological and ecological vision, the best of Gibson's works are therefore positioned at the imaginative threshold of potential post-industrial techno-dystopian cultures. (Tomas, 2000:175)

But perhaps these 'techno-dystopian cultures' are not that imaginative. Perhaps they are more contemporary than future-looking. Featherstone (1999) points out that

> the ways in which science fiction influences business and research practices, as in the case of William Gibson's (1986) influential descriptions of cyberspace, is a further process of extending the horizon of expectations of human-machine fusions. Such processes directly and indirectly help to modify our everyday common-sense understanding of how bodies work. (2)

From a contemporary point of view, it is true today that biology, technology and culture are separate. If they were not, they could not be said to impact upon or influence one another for they would be one in the same, an implosive phenomenon.

Cyborgs on Film

Cyborg films, particularly *Blade Runner, Robocop,* and the *Terminator* series, present problems with human-machine fusion. *Blade Runner* most specifically presents a moral conflict in which humans are seen to be 'good' and machines are seen to be 'bad' (Featherstone & Burrows, 1995). Pyle (2000) notes that there are implications for understandings of the nature of being human in the creation of filmic cyborgs:

> *Blade Runner* and the *Terminator* series not only reflect upon the threats to humanity posed by unchecked technological development, they raise even more probing questions about the consequences of our definitions of the human. These films demonstrate that when we make cyborgs - at least when we make them in movies - we make and, on occasion, unmake our conceptions of ourselves. (124-5)

Cyborg films present images of the figure that range from purely machine-based military models to genetically tailored human simulations (Tomas, 2000). Examples range from Schwarzenegger's Terminator to the replicants in *Blade Runner. Terminator 2* provides an interesting example of what is not technically a cyborg, one which fits into the human simulation end of the filmic cyborg spectrum. The T-1000 (Robert Patric), being made of a molten metal closely resembling mercury, is not a cyborg. It is instead a shape-shifter capable of taking the form of anything it touches, with the exceptions of machines with moving parts and objects that do not have the same volume as itself (*Terminator 2*, Dir. James Cameron). Dyens (2001) points out that

> this film marks a turning point in our understanding of representation. Here, for the first time in the history of cinema, the distinction between reality (the 'normal' images of the film) and culture (the film's special effects) no longer applies. A real cyborg materializes in *Terminator 2*, a 'thing' whose essence is perfectly half-human and half-technological (since even minute examination of the film negatives upon which physical reality is imprinted, does not allow us to distinguish between actor and cyborg). *Terminator 2* tears the body away from its signifiers, plasticizing it, melting it down, and then resolidifying it later. (84)

Although this shift is the product of digital imaging technology, the second Terminator, as an inaccurate cyborg, neatly sidesteps the anxiety created by other cyborgs on film. Because it starts from a point other than that of the human, viewers may be frightened by the shape-shifting abilities that abet its violence. What is interesting to note is that there is a progression in the *Terminator* films from the mechanical cyborg being demonized in the first film to the completely synthesised Terminator being placed in the role of the 'bad guy' in the second film. This may reflect an increasing acceptance of human-machine fusion in Western culture, but more likely indicates the film maker's push for the fantastic in his villains. What makes this situation even more interesting, however, is that the first Terminator was not a cyborg either. The difference in the creation of anxiety in audiences lies in the form in which the two Terminators were constructed. It can be inferred that because the first Terminator is mechanical, it was assembled in human form. The second Terminator, however, does not have an original physical form, having instead the ability to take on

shapes as it requires.[5]

Holland (1995) argues that the fears regarding technology in cyborg film are essentially two-fold - being replaced by and/or becoming machines. This is revealed in the anxiety that surrounds *Blade Runner*: "the film has thus reached a limit of sorts, a limit that reveals that in *Blade Runner* when humans make cyborgs, it means the unmasking of the human through an anxious recognition that both were assembled in the first place" (Pyle, 2000:132). *Blade Runner*'s replicants are mechanical human simulations, and thus are not cyborgs. The real anxiety in the film lies in the quality of the simulations. "More human than human" is the motto of the replicant manufacturer, Tyrell (*Blade Runner*, 1982). This theme is picked up in *Terminator 2*:

> But though the film appears to deepen the distinction between human and machine, setting the moral and ethical principles of a human education against the threatening autonomy of a mutable technology, it achieves this distinction by way of a hybrid intermediary that upsets the stability of the opposition. The cyborg can learn, and it seems to acquire - to earn - from its contact with humans nothing less than genuine human subjectivity. The film's overt humanist thematics are thus made tenuous when it is revealed that the cyborg terminator is indispensable to the opposition: both for the story of the human opposition *to* the machines and for the conceptual opposition *between* human and machine. In one sense, the cyborg is benevolent only because of its complete obedience; at the same time, however, the opposition between human and machine is placed at the mercy of the cyborg. (134)

The first *Terminator* juxtaposes human and machine in a similar way: "[Kyle]

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5. A third installment of the *Terminator* series is slated for release in 2003, and will be directed by Jonathan Mostow. It is called *Terminator 3: Rise of the Machines.*

Reese and the Terminator are twisted mirror images: humans have built subjective, intelligent military machines, but are reduced to a militaristic, mechanical emotionless subjectivity in order to fend off their own products" (Edwards, 1995:83). Sarah Connor, the female lead in both *Terminator* movies, is represented in the second film as a warrior but, despite her masculinized body, is still susceptible to pain and injury, both physical and emotional/psychological, while the hyper-masculine Terminator is not.

Pain in cyborg films is often "invoked as a sure signifier of human-ness" (Holland, 1995:162). The machinic in cyborg film is frequently presented in masculine form (the Terminators, Robocop) while the human is represented by the presence of women (Sarah Connor in the *Terminator* series, Murphy's wife and partner in *Robocop*). The women in cyborg films are vulnerable to pain and injury where their machinic male counterparts are not. The gender coding present in these films depicts males as hyperreal soldiers with little attempt made at either exploring or crossing gender boundaries (Featherstone & Burrows, 1995). It may be that the prevalence of gender coding in cyborg film contributes to the anxiety provoked by *Blade Runner*. Here, there are no dominant non-replicant female characters. Rachel, Tyrell's assistant, is exposed early in the film as a replicant and Pris is known to be one before she is visually introduced. The conclusion of Ridley Scott's director's cut of the film leaves open the possibility that Deckard may also be a replicant but for the majority of the film he is assumed to be human. So, where the typical cyborg film would place women

in Deckard's position, *Blade Runner* confuses gender coding in the genre by making women into machines. This gender coding extends beyond the concepts of pain and vulnerability. Women in cyborg films are frequently placed in stereotypical roles: Sarah Connor is in a psychiatric hospital in the second *Terminator* film, Rachel is a secretary, Pris is a prostitute or 'pleasure unit'. Thus, it is apparent that "the cinematic imaging of cyborgs might suggest new visions of unstable identity, but often do so by upholding gender stereotypes" (Balsamo, 2000:156).

The relationship/distinction between mind, body, and 'self' also appears to be contested in cyborg films. A 'genuine' human mind is frequently the essential element of a human person (Holland, 1995). Within the vast category of cinematic cyborg characters, there is something of a hierarchy based on the presence or absence of a 'self': those purely mechanical/technological figures are contrasted to cyborgs that are more closely 'human' (Holland, 1995). The presence of a mind is a source of difficulty for Robocop : "among the many cyborg films, none captures so well what would have to be the cyborg's divided consciousness, the sense of being an improved artifact and of having been once a fully human person" (Wilson, 1995:253). The cyborg point-of-view sequences in *Robocop* are a way of displaying this dualism:

> The convention of showing the world through the cyborg's eyes complete with typed designations and commands, though familiar from other films, entrains what becomes an important subtext in [*Robocop*]: the cyborg has been given a new consciousness, but he struggles to regain his old human self-awareness. (Wilson,

1995:252)

The *Terminator* films also use cyborg point-of-view sequences, but to different ends. What is meant by showing the audience what the Terminators see is the establishment and reinforcement of difference:

> The *Terminator* blends a perverse, exaggerated masculine ideal - the ultimate unblinking soldier, the body-builder who treats his body as a machine - with images of computer control and robotic single-mindedness, complete with the alien subjective reality provided by the Terminator's-eye sequences. (Edwards, 1995:81)

Cyborg film as a genre, while creating anxiety about machine - human relations, does little to represent a true hybrid. *Robocop* is probably the closest to being a true, implosive, cyborg since his human predecessor, Murphy, is dependent upon the technologies that have been used to create Robocop for any form of survival. What prevents even this union of technology and the human from being completely successful is the kind of machine into which Murphy is made: he has been given a new consciousness, but it is still a masculine consciousness, one that augments the pseudo-military characteristics of Murphy's human consciousness and thus makes no attempt at the creation of a new kind of being. Springer (1991) notes that the discourse in both the scientific community and in popular media surrounding the 'fusion' of humans with computer technology is often presented in positive terms as a way of escaping the "imperfections of the human body" but that this discourse "simultaneously uses language and imagery associated with the body and bodily functions to represent its vision of human/technological perfection" (303). Even Robocop is

a human first and a machine second rather than a 'humachine', a form of being that is simultaneously both.

The Borg

Fuchs (1995) calls *Star Trek: The Next Generation*'s[6] The Borg

> a neosocialist cyborg 'community' which is interconnected through bioengineering and other advanced technologies, [which] appear to be androgynous humanoids. In spite of their individual bodies, however, they constitute a single consciousness. Ruthless and emotionless (like all who oppose the optimistic imperialism of the USS *Enterprise*), the Borg reproduce themselves by assimilating bodies [...] by literal physical penetration. (281; see also Rayner, 1994)

Clarke (2002) terms the collectivity an "organic artificial life form" that is frightening and not tolerated because of its lack of individuality and autonomy (48-9). This is typical of recent science fiction's stress on "the dark side, the 'undecidables and double binds' of cyborgian potential in which modified humanoids [...] pose terrifying threats which must be overcome" (Wilson, 1995:243-4). These are conventional fears surrounding not only issues of autonomy and individuality, but also anxieties about technological transgression of biological and cultural definitions of the human (Rayner, 1994). The main plot line surrounding The Borg centres on the issue of collective mind, and thus

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6. 'Data', another character in the series and of similar construction as the Terminator, is also sometimes referred to as a cyborg (see Gray, 2002). He is, in fact, a highly advanced android, and thus will not be discussed in depth here.

largely neglects the implications of human-machine fusion (Benford & Malartre, 2002).[7]

The various *Star Trek* series tend to represent perfection in technological, intellectual, or social utopias as leading to "cruel, totalitarian, and inhumane exercises of power" (Rayner, 1994:129). The Borg, as a variation on this theme, is alarming because it appears to be invincible. This is a direct result of its method of reproduction, as well as its hyperconformity and lack of individuality:

> The Borg accumulates the knowledge of other races before annihilating them; it is self-corrective and self-regulating, and thus cannot be destroyed by conventional weapons. Its humanoid parts are identical to the collective whole and 'single-mindedly' focused on its imperative to assimilate everything in its path. That total self-absorption in its own imperative and computer capacities precludes emotions like sympathy, compassion, or fear and recognition for the 'otherness' of the other, which also precludes negotiation and dialogue, identification, and difference. (Rayner, 1994:128)

Additionally, in the context of the series, The Borg is cast as a contrast to the crew of the *Enterprise*. Where the crew are individuals within a military-style hierarchy, The Borg is not only a collective, but also has no hierarchy because there is no leader. The presence of and emphasis on individual units of The Borg, such as the Borg Queen in *Star Trek: First Contact*[8], Hugh in the *Star Trek:*

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7. Levy (1997) discusses collective intelligence in detail, defining it as "a form of *universally distributed intelligence*, constantly enhanced, coordinated in real time, and resulting in the effective mobilization of skills [...] The basis and goal of collective intelligence is the mutual recognition and enrichment of individuals" (13), a very Borg-like definition indeed.

8. The Borg Queen may be the closest to individual that The Borg get. "The Borg Queen brought order to the multitude of voices within the Borg shared consciousness. She was the 'one who was many,' in that she embodied elements of individuality as well as being the central node in a vast group mind." (Okuda & Okuda, 1997:50)

The Next Generation episode 'I, Borg', Picard as Locutus in both *Star Trek: First Contact* and *Star Trek: The Next Generation* episode 'The Best of Both Worlds, Part I', and Seven of Nine in *Star Trek Voyager*, serve only to draw further attention to the distinction between the crews of the various ships and The Borg collective, rather than locating sparks of individuality within The Borg.[9] The extreme cohesion of The Borg draws attention to fears surrounding issues of power and control: "The Borg is alien because it is fully self-identical. It signals the imagined horror of total self-absorption and self-sameness that cannot stand outside itself and therefore cannot resist its own power" (Rayner, 1994:138), and thus embody fears about "absolute power and prodigious technology" (Rayner, 1994:129).

The Borg, although individual units are meant to be identical to one another, falls prey to the same kinds of gender coding that are apparent in representations of cyborgs in other media. The presence of female bodies is not a surprise given the method of reproduction (absorption of entire species) practised by The Borg, but the most prevalent image of a female-bodied Borg unit, Seven of Nine, is hyper-feminine.[10]

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9. Only Borg units that have left the collective are individualized: Picard returns to the *Enterprise* after having been kidnapped by The Borg and assimilated into Locutus; Seven of Nine is allowed an individual identity after much of her Borg technology has been removed.

10. The extent to which Seven of Nine is deployed on *Star Trek Voyager* as a sex symbol was made apparent to me when I attempted to locate on the Internet series stills depicting the transformation from 'pure' Borg to *Voyager* crew member. Several of the images I downloaded were, to my surprise, nude/topless photographs of the actress who plays Seven of Nine, Jeri Ryan, more than one of which showed Ryan wearing the Borg make-

Representations of Cyborgs and Gender

Balsamo (2000) argues that female cyborg images do more to challenge the opposition between human and machine than do male cyborg images because of the traditional, stereotypical associations of femininity being less compatible with technology than is masculinity, but, she points out, female cyborgs still perpetuate gender stereotypes. Springer (2000) elaborates:

> Most cybernetic women in cyberpunk, however, fail to give us a radically non-human vision of computerized existence. Repressed human memories and heightened emotions continue to motivate these hardwired women even after they have redesigned themselves. Instead of escaping from their human predicaments and entering a liberated electronic realm, they become haunted and powerful killers. Computerized minds harden and fortify them rather than provide partial and fluid cyborg identities. Actual computer characteristics are in fact distorted by their characterizations. The physical passivity that human computer users adopt is recast as aggressive violence. The miniaturization and subtlety are refashioned into bulging muscles that more closely resemble the enormous size and force of industrial technology. Additionally, gender, instead of disappearing, is often heightened after cybernetic transformation, a point that is obvious in the Hollywood representations of ultra-male cyborgs like the Terminator and Robocop. (344)

Cyborg bodies are unnatural in their crafting; they are hyperbuilt (Balsamo, 2000). Male cyborgs are especially good examples of this, the images doing nothing to challenge gender binaries or stereotypes, or distinction between humans and machines: "[...] cyborgs and men are compatible images which

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up/prosthetics she wears on the series.

mutually support cultural associations among masculinity, rationality, technology and science" (Balsamo, 2000:150). As Springer (1991) points out, what is particularly interesting to note here is the change from men to hyper-male cyborg figures in film:

> Whereas traditional constructions of masculinity in film often relied on external technological props (guns, armoured costumes, motorcycles, fast cars, cameras, and so on) to defend against disintegration, the cinematic cyborg heralds the fusion of the body with the technological prop. (318)

'Fusion' is perhaps not the right word. As has already been discussed, the interface of humans with their tools is not so much about the literal joining of the two, but is rather more about the speed and skill with which those tools may be used.

Regardless of the sex of the represented cyborg, it becomes clear that gender is more of an issue in the creation of cyborgs than is the attempt at closing the gap between human and machine (Squires, 2000; Springer, 1991). Thus, it would appear that although efforts to create a human-machine hybrid abound, there is little consideration given to creating a hybrid that is based on *human* rather than male *or* female bodies:

> While it may be understandable that cyborgs have humanoid bodies and even the appearance of human bodies [...] this does *not* in itself fully explain or justify the highly muscled and exaggerated gendered nature of the bodies. Rather, the cyberbodies are represented in such a highly gendered way to counter the threat that cyborgs indicate the loss of human bodies, where such a loss implies the loss of gendered distinctions that are essential to maintaining the patriarchal order (which is based on exploiting difference) [...]. (Holland, 1995:159)

Representations of female cyborg figures in film and fiction are not of the same nature as those of male cyborg figures. Interactions between women and technology are often illustrated through the masculinization of the female form - the body-building Sarah Connor in *Terminator 2* on the human end of the spectrum and on the machinic end, *Blade Runner*'s highly professional Rachel. Again, however, it should be noted that neither Rachel nor Sarah are cyborgs. Additionally, it is important to examine those films that have been the most popular - the cyborg is almost always in masculine form. Action heroines are somewhat lacking in contemporary popular cinema, illustrating that technology is still more associated with the masculine than the feminine. Thus, in cyborg films in particular, when (if) the human body ever becomes truly obsolete, "the technological things will be gendered and there will still be a patriarchal hierarchy" (Springer, 1991:318).

Technology and Bodies in Art

Performance artist Stelarc uses his body in conjunction with technology to illustrate his point that the body is obsolete[11].

> OBSOLETE BODY: It is time to question whether a bipedal, breathing body with binocular vision and a 1400cc brain is an

11. Stelarc "dispassionately" refers to his body as 'the body', which Zylinska (2002) points out "foregrounds the 'originary prosthecity' of self-hood and its situatedness in the network of the relations that criss-cross the envelope of the skin" (229).

> adequate biological form. It cannot cope with the quantity, complexity, and quality of information it has accumulated; it is intimidated by the precision, speed, and power of technology and it is biologically ill-equipped to cope with its new extraterrestrial environment. The body is neither a very efficient nor a very durable structure. It malfunctions often and fatigues quickly; its performance is determined by its age. It is susceptible to disease and is doomed to a certain and early death. Its survival parameters are very slim. It can survive only weeks without food, days without water, and minutes without oxygen. The body's LACK OF MODULAR DESIGN and its overreactive immunological system make it difficult to replace malfunctioning organs. It might be the height of technological folly to consider the body obsolete in form and function: yet it might be the highest of human realizations. For it is only when the body becomes aware of its present position that it can map its post-evolutionary strategies. It is no longer a matter of perpetuating the human species by REPRODUCTION, but of enhancing male/female intercourse by human-machine interface. THE BODY IS OBSOLETE. (Stelarc, 1998:117)

Scheer (2002) examines how performance art may be understood as a "demonstration and testing of a concept involving the active presence of the artist's body" (82) and notes that in all of Stelarc's work, the body "functions as an interface between technologies" (83). Tomas (1995b) explains the bodily transformation that occurs in this kind of art:

> As opposed to the active use of the human body, in performance art, or its absence in conventional object-based installation art forms, performed installations use a human body, but restructure its presence in such a way as to reduce it to the status of a mere component in an economy of artifacts and environment. The human body is transformed, under these circumstances, into an unusual entity since its new spatial position, its *site specificity* or 'installed' sense of situated and objectified self, is the direct product of this economy. (257)

Although the term 'post-human' is frequently used to describe this stage of bodily existence, Appleby (2002) suggests that 'trans-human' would be a more

appropriate term because "while the post-human reifies the human as a fixed point that can be passed or overtaken, the trans-human problematizes any notion of a universal fixed human subject" (106-107; see also Clarke, 2002). This is a useful concept for this discussion since part of the difficulty in ascertaining the extent to which the figure of the cyborg may be considered a site of implosive indeterminacy is determining what precisely constitutes 'human' to begin with. Springer (1991) notes that the interface between humans and computer technology impacts greatly upon, but does not destroy, human subjectivity. It creates a new identity, but in the same way that the automobile may be said to have changed North American identity. It is a new technology, a new tool, with which to negotiate a new environment.

In contemporary North America new environments are frequently introduced through technological change. These new environments require a rethinking of the relationships between human and nature, body and mind, individual and society, and human to machine (Poster, 2002). It is in this context that the work of Stelarc as an example of the effort to negotiate a new technological environment is instructive:

> The body's identity as an installed and performed organism is, as such, more accurately portrayed through its physical relationship to its new conditions and specifications of existence. Indeed, it is perhaps most accurately grasped through a system of *technicity* whose pattern of similarities and differences are rooted in the technical specification of the artificial environments that serve as its new breeding ground. [...] A performed installation can therefore be considered, from the point of view of its systemic powers of representational/perpetual transformation, as well as through its

> power to separate body and consciousness, to function as a special kind of mimetically integrated *technology* - ultimately, a complicated imaging system through which a living human body is radically refashioned. (Tomas, 1995b:253)

This separation of body and consciousness is key to Stelarc's performances in that it troubles what are often taken to be well-established boundaries.[12] Appleby (2002) elaborates:

> The body is a zone of organized forces rather than a discretely bounded entity. Thus the performances do not point towards a post-human condition; they open up the possibility of novel interactions and new forms of connectivity between bodies and their environments, leading one to wonder where the body ends and the environment begins. If Stelarc's work has any importance, it is tied not to the possibilities of interstellar migration, but rather to his problematization of our ideas about bodily limits and our definitions of the human. (110)

It is interesting to note, as Dery (2000) does, that issues of power are absent in Stelarc's schema, which renders the Stelarcian cyborg "powerful but not empowered" (583). Massumi (2002), in describing one of Stelarc's pieces, attempts to place his work within a more collective realm that emphasises the commonalities of the human species:

> It is important to note that this kind of performance setup stages sensation collectively. After all, human bodies never come in ones. A single body evolving is an absurdity. The individual, isolated body of the suspensions was a default position of sensation, just as the skin is the default container of human intensity. And, just as the body has already extended beyond the skin into a mutual prosthesis with matter, from its first perception, so, too, is the

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12. Clarke (2002) acknowledges that Stelarc's work, particularly STOMACH SCULPTURE, renders transparent the reliance on technology for the construction of both internal and external self-identity.

> individual body always-already plugged into a collectivity. (120)

There are no references to social and/or economic situatedness of the cyborg, which reinforces the idea that the true cyborg is a thing of fiction rather than of reality.

Steve Mann as Performance Artist

Stelarc is not the only human who attempts to alter perceptions of the lived body's experiences with its environment through the use of technology, although he is certainly the only one who explicitly acknowledges that his work is performance art. Steve Mann has been making and wearing computers since the late 1970s (Mann, 2001). He does so, however, under the banner of science rather than art. Mann's performance differs from Stelarc's in that Mann's prostheses are semi-permanent, although still removable. Mann's WearComp (wearable computer) technology serves many of the same functions as Stelarc's machinic prostheses; his body is also used as an interface between technologies, especially through his EyeTap camera, which is used to broadcast pictures from his field of vision to the Internet (Mann, 2001). The performative aspect of Mann's work is difficult to overlook, especially when one examines the evolution of the technology of the wearable computer from the early 1980s to the present (Mann, 2001:5). The technology is always visible and always appears as a

prosthesis, a mechanical addition, to his body. This is particularly evident in Mann's (2000) description of the lengths to which he has gone to improve the functioning of the interface of his body and the technology:

> I've tried everything from dyeing my hair with copper and plating it with aluminum, so that my whole body would act as a Faraday cage when fitted with a conductive hat, to designing special clothing with conductive threads. While many of my designs could be described as crazy, and many of the solutions were hardly as glamourous as an aluminum hairdo, the process of invention has led to some very practical embodiments that address the physical problems we will face when many of us decide to become cyborgs. Which is to say that I no longer receive unexpected jarring shocks, and have been able to devise new methods of protecting my brain from potentially damaging radiation that do not involve hair dyes and metal hats. (11-12)

It is interesting to note that in this passage, Mann seems to be not only playing himself up as the guinea pig for the cyborg life that he claims many of us will adopt, but also attempts to demonstrate that being a cyborg is really not all that bad - 'See? Look at how far we've come!'. By offering himself as the spokesman of the cyborg life, Mann demonstrates that technology can be intimately integrated into day to day life as well as implying that the more people adopt cyborg technologies for themselves, the less performative and spectacle-causing it will be (see Mann, 2001 especially chapter one).

Some of the uses to which Mann puts his WearComp technology render even more transparent the extent to which performance is involved. 'Vicarious Soliloquy', as a method of remote lecturing, is perhaps the best example. Mann (2001) explains how he began giving these kinds of lectures and addresses:

> In recent years, as demands on my time have increased, I have developed a new way of delivering speeches. It is a method of making 'personal' appearances without actually being physically present in the auditorium. [...] What I have dubbed the Vicarious Soliloquy system arose quite naturally out of delivering lectures. I'd typically use a video projector, and plug the projector into a computer, which would then have a link to my main Web pages, so that giving a presentation was a simple act of showing the audience a series of web pages. Since I wear (or, in the more existential sense, 'am') an embodiment of my WearComp apparatus, one of the Web pages I showed would allow the audience to see the world from a cyborg perspective. At this point in the lecture, I would broadcast, on the screen facing the audience, my real-time view through the WearComp device. [...] Having delivered this type of lecture multiple times, I began to wonder why I was physically present at the conference site, particularly when the number of invitations to give talks was growing. I came up with the idea that I'd do exactly the same thing as before, with one minor difference: Only my connection would be there - not my face, my avatar, or any other part of me, just the existential aspect of facilitation by which the audience could vicariously be me rather than see me. (16-18)

Although the very nature of giving addresses is performative, Mann's method is unique because it utilizes his prosthetic technology to get around the traditionally embodied nature of lecture-giving. He may appear to be a disembodied presence, the Dixie Flatline of the academic world, to the audience, but has instead taken video-conferencing to a new level. There is nothing new about Mann's WearComp system other than its wearability. The same effect could be generated by carrying a video camera with a live feed to the Internet.

Both Stelarc and Mann put their bodies in the middle of a technological milieu to illustrate either explicitly or implicitly that, on various levels, the body is at once a component, an interface, and, they would say, inadequate without

technological additions to meet the challenges of a contemporary technological environment. These views are not at all far from Gibson's cyberpunk as embodied by Case and Molly, nor from the television and movie versions of cyborgs - all somehow speak of a world in which technology and flesh are intimately intertwined by necessity rather than by choice.

Introduction

Baudrillard's connection to the notion of the cyborg is most evident in his idea of implosion, that is, "an effect in which the opposing poles of determination vanish according to a nuclear contraction or retraction of the old polar schema which has always maintained a minimal distance between a cause and an effect, between subject and object [...]" (Baudrillard, 1983b:56). Taken to its extreme, a physically embodied cyborg is indeed a true hybrid figure, one in which the human and machine components of its composition are indistinguishable; the poles have been collapsed. Although other Baudrillardean ideas may be found lurking in this project - whether it be just beneath the surface of the argument or just beyond its reaches - the main theoretical concepts and themes to be utilized here include, predominantly, implosion, but also simulation and the relationship(s) between humans and their machines.

As the first three chapters of this project have illustrated, there is no implosive figure resulting from the literal collapse of human and machine. Machines are always, on some level, prostheses of the human. Prostheses can be considered the midpoint of the subject-object continuum, the very poles of which are, in a particular fashion, a clear difference between the two on one end and implosion, or the obliteration, of the two on the other. This is a useful way of looking at the movement from one end of the spectrum to the other. A 'pure' human, one with no mechanical or machinic additions, can be considered the

subject and, conversely, the machine the object. A prosthesis, as Sobchack (1995) points out, becomes a part of the body to which it is appended, thus giving it a quasi-subject status, but if removed it becomes object again. With implosion, the polar schema of subject and object is obliterated. In this case, if implosion were to occur, there could be no distinction between either subject and object or human and machine.

Because this thesis is an examination of the tasks to which the figure of the cyborg is put in various discourses (whose definitions of the term are not completely identical), each of the definitions employed will be examined through a Baudrillardean lens. This chapter will rehearse the ordered presentation of the thesis, examining first the military-scientific definition with respect to simulation and Telematic Man, then the cyberfeminist version in relation to the use of technology and pleasure. The Telematic Man resurfaces in the examination of the cultural/media studies use of the term, particularly as it applies to celibate machines and the idea of the cyborg as a successor species. In each instance, the deviations from the 'true' hybrid nature of the cyborg will be exposed by looking at those of Baudrillard's ideas that most closely examine the kind of cyborg used in the discourse. After explaining simulation, this chapter will begin with an explanation of implosion as it applies to this project.

Simulation

Because Baudrillard makes it clear that simulation begins with implosion (Baudrillard, 1983b: 57), it is necessary to outline what leads up to this point (namely, the orders of simulacra) to gain a clearer understanding of what is meant by the latter concept. There are a number of different elements to Baudrillard's description of the orders. What will be emphasised here are the phases of the image associated with each order, as well as the corresponding machinic representations.

Prior to the beginning of the orders of simulacra, the image as well as the sign is a reflection of basic reality. Signs are limited in number, not widely diffused, and represent an exchange relationship between parties; in short, they are motivated rather than arbitrary (Baudrillard, 1983b: 84). It is with the Renaissance that the orders begin. Here, in the first order of simulacra, the image masks and perverts basic reality. This is illustrated by the automaton as a theatrical counterfeit of the human. This order, the counterfeit, does not abolish difference. Rather, it supposes an always detectable rift between reality and its imitators (Baudrillard, 1983b:94-95). The second order, that of production, "simplifies the problem by the absorption of the appearances, or by the liquidation of the real, whichever" (Baudrillard, 1983b:95). Represented by the robot, this order masks the *absence* of basic reality. There is no longer a questioning of appearance as occurred with the automaton. Instead, the robot does not try to

resemble the human, focussing rather on the "common substance of production and work" (Baudrillard, 1983b:94). In the current era, the reigning order is that of simulation. Here, the image bears no resemblance to a basic reality of any kind - it is its own pure simulacrum. Signs here are produced from a model and according to a code which determines in advance all combinations and modulations. DNA (deoxyribonucleic acid), according to Baudrillard, is the prophet of this order (Baudrillard, 1983b:103). The order of simulation is embodied in the automaton, which Baudrillard calls "an interrogation upon nature, the mystery of the existence or non-existence of the soul, the dilemma of appearance and being" (Baudrillard, 1983b:93). It is at this point, where there is no longer any reference to any reality, where signs refer only to one another in equivalence, that implosion becomes possible.

Implosion

Baudrillard observes in "Xerox and Infinity" (1988) that "Am I man? Am I a machine? There is no longer an answer to this anthropological question" (n.p.). This is, perhaps, the clearest statement of Baudrillard's opinion that there is no longer any distinction between human and machine, that this difference has been erased. The process by which this could be said to come about is that of implosion. This idea implies not only that the binarism associated with these two concepts has collapsed, but that the flow between them has also been erased -

there is no longer any distance between human and machine, which makes flow of any kind impossible. They are one and the same.

Implosion as a concept requires further explanation. In *Simulation* (1983b), Baudrillard offers several examples of implosion at work, among them television and DNA. He writes: "In both there is only a nebula indecipherable into its simple elements, indecipherable as to its truth" (58). At root, what implosion requires is the negation of difference between one pole and another. This is not an easily determined process:

> In fact, this whole process only makes sense to us in the negative form. But nothing separates one pole from the other, the initial from the terminal: there is just a sort of contraction into each other, a fantastic telescoping, a collapsing of the two traditional poles into one another: an IMPLOSION - an absorption of the radiating model of causality, of the differential mode of determination, with its positive and negative electricity - an implosion of meaning. (Baudrillard, 1983b:57)

The disappearance of the gap between poles, the calling into question of the traditional models of causality (true/false, subject/object, means/ends), creates an undecipherability of the two terms of the equation or opposition.

As noted in the Introduction to this thesis, Baudrillard (1983a) employs several examples to illustrate the process of implosion including signifier and signified, the medium and the message, and the mass and the media. The masses function as a vacuum, consuming everything and absorbing rather than reflecting it. There are no differences produced by the masses. All efforts to represent them or to make them function according to the logic of power fail.

They want only one thing - spectacle. It is here that the masses absorb the media. Because the masses are concerned only with the spectacle, they treat all information and/or attempts to produce meaning as such. They prefer the medium over the message. Baudrillard's (1983a) example of terrorism also fits in here since everything that has to do with terrorism is reversible (death, the media, violence, victory)(115). It is in this reversibility that terrorism succeeds most. The 'victim' of a terrorist-related death is irrelevant to the masses - all that matters is the spectacle that it creates. Any meaning that could have been attached to this (or any other event) is absorbed by the masses, then neutralized and diffused, and finally disappearing without a trace. This is the same way in which the implosion o f the media into the masses functions. The media attempt to create meaning but are enveloped by the masses as spectacle, the medium along with the message. What ultimately results from this is an indistinguishability between medium and message, mass and media, and signifier and signified. The masses do not function according to a code as such, favouring instead fascination, spectacle, and the wholesale absorption of those signs presented to them. The poles of signification thus collapse, the masses having absorbed and diffused both sign and meaning (Baudrillard, 1983a:36). Everything drawn into the vacuum of the masses circulates in a hyperreality where the real as referential has been eliminated by its being made a model.

It is here that the human/machine dualism can be examined. Contemporary efforts, such as cosmetic surgery, to combat aging and genetics

can be read as an attempt by humans to become more human than human, that is, hyperhuman. The incorporation of machines into the human body as part of this effort is, however, doomed to failure not only because of the inevitable inclusion of food and waste as processes of the human body, as Morse (1994) notes, but also because machines within or appended to the body are not human. Their inclusion signals the emergence of something different, neither human, hyperhuman, nor machine. But this becomes sticky in the consideration of polar indistinguishability. Humans and machines have yet to be absorbed within one another to the extent that is present in Baudrillard's examples of implosion, not having reached the point of indecipherability out of which the cyborg as true hybrid could emerge. The use of prostheses of various kinds could be considered a movement toward this point, but one which is occurring slowly.

The cyborg, from this standpoint, could provide a counterexample to Baudrillard's (1983a) claim that 'smooth' or slow implosion is doomed to failure. This claim is made in reference to the transition from implosive systems (such as those of 'primitive' societies) to explosive systems (such as those present in contemporary Western civilization). The transition from human and machine to cyborg is one that mirrors the implosion currently being experienced by the expansion-oriented Western civilization because this expansion has become uncontrollable. But the expansion of the human body has not become uncontrollable - yet. The violent and catastrophic implosion discussed by

Baudrillard (1983a) as the only possible kind of implosion in the case of Western civilization is not one that can be said to be occurring in the case of the implosion of the human and the machine. This one is still slow because it has not yet reached universal proportions. It may be true that "implosion is inevitable, and every effort to save the principles of reality, of accumulation, of universality, the principles of evolution which extol expanding systems, is archaic, regressive, or nostalgic" (Baudrillard, 1983a:60), but at present neither the human nor the machine have disappeared on a scale that requires nostalgia.

This is related to the idea of the cyborg because the understanding of the figure as a seamless amalgamation of human and machine is, in the areas examined here, false. There is always a perceptible difference between the two. Rather than implosive, many of the uses of the term remain in the first of Baudrillard's orders of simulacra, but under a new name. No longer an automaton where the image conjured is that of an imitation of the human, but a cyborg, where the human has been enveloped into the machinic in an imperfect attempt at creating a new creature that is an 'improvement' upon the human but still all too human.

Implosion cannot be said to explain or resolve the tensions present in the consideration of the cyborg as an embodied, physical creation. If a metaphoric cyborg can be said to exist, as in the feminism and various mediatic representations, Baudrillard's implosion, as metaphor itself, may be considered to be more useful since it accounts for the increasing encroachment of and

dependence upon technology in the lives of humans. There may indeed be little dispute that a metaphoric cyborg can exist and could be considered an example of implosion. The application of the theory of implosion fails where the cyborg is portrayed as or taken to be a physical and embodied hybrid, as is the case in both post-World War Two military science and a great number of contemporary representations of the figure in various media. Cyborgs and implosion, although overlapping concepts, are not synonymous, which is what this thesis has attempted to illustrate.

Early Cybernetics and The Creation of Simulations

Baudrillard notes that both the fantasy and the creation of intelligent machines results from either humans' secret desperation for intelligence or because humans have succumbed to the weight of "monstrous and useless intelligence" and therefore seek to thrust it onto machines to lighten the load (Baudrillard, 1988:n.p.). He writes that "entrusting this intelligence to the machines in some ways sets us free from all pretensions towards exhaustive knowledge" (Baudrillard, 1988:n.p.). Although Baudrillard may refer here to the creation of artificial intelligence, this can be tied to some of the early cybernetic research that attempted to replicate human brain functioning and consciousness. Here, early cybernetics researchers, as well as those today, sought to create a simulation of the functioning of the human brain, among other bodily functions

and capacities. But, as is discussed in Chapter One, these attempts at simulating human functioning in the form of intelligent machines result in only partial successes: "Indeed, these intelligent machines are only artificial in the weakest sense of the word - decomposing the operations of language, of sex, of knowledge and in their most basic elements, of digitalising such operations to resynthesise them according to models" (Baudrillard, 1988:n.p.).

Baudrillard further notes that these kinds of machines offer the spectacle of thought and that humans, as they manipulate them, "devote themselves more to this spectacle of thought than to thought itself" (Baudrillard, 1988:n.p.). This phenomenon cannot be considered representative of implosion since the implosive is necessarily, as a result of the end of panoptic and perspectival space, the abolition of the spectacular (Baudrillard, 1983b:54). Where implosion has occurred

> [t]he medium itself is no longer identifiable as such, and the merging of the medium and the message (McLuhan) is the first great formula of this new age. There is no longer any medium in the literal sense: it is now intangible, diffuse and diffracted in the real and it can no longer even be said that the latter is distorted by it. (Baudrillard, 1983b:54)

Humans have not moved beyond the manipulation of machines, intelligent or otherwise, to a space/time/level/stage where medium and message are indistinguishable. There remains, particularly in the case of the so-called cyborg, this distinction, and others: male/female; human/machine; animate/inanimate.

This is perhaps best illustrated by Baudrillard's figure of the Telematic (or

Virtual) Man.[1]

> The Virtual Man, immobile in front of his computer, makes love by the screen and gives classes by teleconference. He becomes a spastic, probably with a cerebral handicap too. This is the cost of becoming effective. Just as we can suggest that glasses or contact lenses might one day become the integrated prosthesis of a species whose gaze has gone, so we can fear that artificial intelligence and its technical aids will become the prosthesis of a species whose thought will have disappeared. (Baudrillard, 1988:n.p.)

The emphasis here on prostheses is not to be taken lightly. "Xerox and Infinity" (1988) and *Simulation* (1983b) can be played against one another with respect to the degree of integration of humans and their machines - machines and humans in the form of the cyborg are not implosive since the distinction between the two is always present in some degree. Machines are rather the prostheses of humans. The idea that the cyborg is somehow a truly hybrid mix of the two is pure fantasy, as is made clear in the filmic representations of cyborgs discussed in Chapter Three. There is always, at some level, no matter how small, a distinction that can be made between human and machine. As long as this is the case, the combination of humans and machines known as cyborgs *cannot be implosive in any concrete sense.*

A question that arises from this issue is the extent to which humans desire this kind of relationship with their machines. The fear of becoming something other than human is an area that requires further examination. It would appear

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1.Baudrillard uses 'man', in this case, to represent both male and female.

as though humans would rather become 'better' in some way and maintain their humanness than become something in which human traits are indistinguishable from those of their machines. The setting of boundaries and demarcation of distinctions between human and machine remains important, if only in the form of noting what obstacles still must be overcome in order to create an implosive figure such as a cyborg.

Cyberfeminism and Pleasure

Baudrillard claims that it is pleasure that separates humans and machines and that machines lack artifice (Baudrillard, 1988:n.p.). I assert that until this gap can be overcome, there can be no true cyborg, no implosive figure of this sort. Telematic Man's use of the Minitel[2] for the purposes of sending 'sweet' messages (called 'Minitel Rose' in France) is parallelled in the cyberfeminist 'cyborg' ideal of women becoming empowered by adopting technology and using it for their own purposes. Just as Telematic Man uses the computerized telephone system to send love letters, cyberfeminists use the Internet to build networks of resistance and challenge - both can be considered uses other than those for

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2.The explanation of this term given in "Xerox and Infinity" (Baudrillard, 1988) is "refer[ring] to the telephone system that has been established in France on a computer network, and made freely available to every home" (n.p.).

which the respective systems were designed.[3] Here again, however, the technology used in either case is only an aid, a prosthetic, an extension of human capabilities. There is not only a physical distinction between user and machine but also a functional distinction; that is, the user manipulates the machine to perform functions s/he cannot alone. This is the nature of prosthetics and extensions. No matter the extent to which machines may emulate human functioning and appearance or to which humans may develop (further) machine functioning, as long as there remain elements of the human or the machine that cannot be simulated/emulated by the other, the distinction between the two will exist.

Pleasure, generally considered to be a trait specific to some organic species and especially to humans, is a boundary that machines have not yet crossed. They may be programmed to display signs of pleasure, such as a smile, but cannot, it is believed, experience the sensation behind the expression. This is, perhaps, simply one more isolated human function that machines will eventually be able to simulate - early cybernetics research did, after all, simulate one function after another. Indeed, *Blade Runner*'s (1982) Pris has, as a 'pleasure unit', been constructed to do just that. But, as Taube (1961) notes, human functioning must be understood before it can be replicated rather than simply represented in fiction. Also, this threshold (pleasure) is one that is key to

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3.Taylor (2001) notes that this type of use of technology can be considered a form of hacking.

creating a hybrid of human and machine, one whose composition is not of bits and pieces of each but is instead something different even at the molecular level, born of the implosion of the human/machine binary.

The issue of fear again arises in considering *how* humans use their technologies, particularly when examining the machinic language that is often employed by humans to describe themselves. What becomes apparent is that the human use of technological language applied to their own functioning not only resonates with the fear of lost humanness but also appears to be an attempt to invoke machinic metaphors as prophylaxes. By describing oneself or others in machine-like terms, the hope of 'improvement' by association with machines is combined with a drawing of attention to the fact that one is not a machine. Protecting oneself against complete absorption by the machine while taking on machinic qualities appears to be a human tactic of ensuring that the implosion implied by the use of the word 'cyborg' does not come to pass.

It is, however, within feminist discourse, that examples of metaphoric cyborgs can be found. Haraway's (1985) use of the term demonstrates this. If Baudrillard's theory of implosion, particularly in his description of the Telematic Man, can be considered a metaphor as well, a case can be made for the existence of such creatures. Where the application of the theory fails, however, is when that other definition of cyborg is employed, that which begins in mid-twentieth century military science and is continued in fictional, particularly filmic, representations of the figure.

Celibate Machines and Cyborgs on Film

Some species are bred for work and nothing else. Mules, for example, are the offspring of horses and donkeys, and are work animals. They cannot procreate with one another to produce other donkeys - that is a task left to further combinations of horses and donkeys. Similarly, combinations of humans and machines cannot, as a unit, breed to produce other combinations of humans and machines. It is the human that must first procreate and then allow technology to begin working with/in/on the offspring. It could even be argued that the combination of humans and machines frequently results in a work relationship of some type. This is certainly seen in the films discussed in Chapter Three. The *Terminator*, *Robocop*, and Steve Austin (the protagonist of Caiden's (1972) novel *Cyborg* and television's *Six Million Dollar Man*) are all products of human flesh being combined with technology for the purposes of accomplishing some work-related goal that could not be accomplished by an unaided human. If any of these characters were to breed with others like them, the result would be far removed from the technologically altered versions of themselves. In the case of the *Terminator*, the result would be machinic and in the case of Steve Austin, the result would be human. Humans who are altered by technology and who choose to breed with others who are also technologically altered (say someone with a pacemaker with someone else who has an artificial arm) do not produce as their offspring similarly technologically altered humans. The issue is first human and

then may have technology appended to their bodies. *Star Trek*'s 'The Borg' is another example of this - all Borg units are born humanoid, assimilated and modified into the collective by the implantation of machinic parts such as a "magnifying right eye and neural net programs integrated into their bodily systems" (Wilson, 1995:n256). They also exist for a clearly defined work-like goal - perfection. As a sexually celibate entity, the Borg does not procreate, it assimilates.

This issue of celibacy appears in Baudrillard's "Xerox and Infinity" (1988) in the discussion of artificial intelligence as celibate. But Baudrillard also notes that the celibacy of artificial intelligence extends to Telematic Man because his integration with the machine has become so complete. Telematic Man, who both works and plays at the same machine, is like the Borg - celibate and non-procreating. If this is the case, that someone like Telematic Man, Baudrillard's version of a cyborg, is celibate but not alone, would it not mean by extension that Telematic Men are not born, but are rather created? Here again there is a rift between human and machine - not only do the machines not feel pleasure, but they also do not breed. Humans do both.

Conclusion - Cyborg as Successor Species

Given the non-procreative nature of Telematic Man as Baudrillard's representation of a cyborg, it would seem absurd to claim, as Gray (2002) does,

that the cyborg is a successor species. The anxiety surrounding the end of the human appears to have incorporated a half-hopeful idea that some part of humans will survive in the form of the cyborg (see Hayles, 1995). But even this notion incorporates some uneasiness:

> For some time now there has been a rumor going around that the age of the human has given way to the posthuman. Not that humans have died out, but that the human as a concept has been succeeded by its evolutionary heir. Humans are not the end of the line. Beyond them looms the cyborg, a hybrid species created by crossing biological organism with cybernetic mechanism. Whereas it is possible to think of humans as natural phenomena, coming to maturity as a species through natural selection and spontaneous genetic mutations, no such illusions are possible with the cyborg. From the beginning it is constructed, a technobiological object that confounds the dichotomy between natural and unnatural, made and born. (Hayles, 1995:321)

Some question whether the combination of human and machine actually does result in the preservation of the human side of things. Springer (1991), for example, notes that "fusion with electronic technology thus represents a paradoxical desire to preserve human life by destroying it" (322).

What does all this mean in the context of the current discussion? As will be examined further in the Conclusion to this project, the differences between humans and machines are, at present, too great for the cyborg to be considered implosive. Lacking the capacities to both experience pleasure or to procreate, machines lag behind humans. Conversely, humans lack many of the capabilities possessed by machines. The difference between the two is that a human may annex machinic abilities through the use of various technologies, but the reverse

is only currently possible only in fiction.

What has become evident throughout the examination of the difference between implosive figures and those that are currently billed as embodied cyborgs is that past and contemporary cyborgs are not implosive at all. They are, instead, combinations of humans and their technologies in which it is always possible to determine where the human stops and the machine begins. This does not mean that some future cyborg figure may not be implosive. Quite the contrary, as is evident when Taube (1961) states that "no novelist ever imagined anything so fantastic but that he wasn't outdone by a reputable scientist" (18). For the time being, however, implosion is not a concept that can be used as descriptor of embodied cyborgs past and present.

Introduction - The Beginning of the End

McLuhan (1966) points out that "another way of looking at our situation today in the age of cybernation and information machines is to say that from the time of the origin of script and wheel, [humans] have been engaged in extending their bodies technologically" (100). The technologies discussed in this project are also extensions of the human body, but are more closely connected to the body than script and wheel. This increasing proximity and contiguity of technology with the body appears to have created some worry about what this means for definitions of the human. But it has also spawned a new field of study, complete with new language and new ideologies put forth by technophilic academics, among others. Gray (2002) describes cyborg epistemology as thesis-antithesis-synthesis-prosthesis. Zylinska (2002) outlines the definition of 'cyborgology' as recognizing "that the 'extensions of man' must be analysed not from a human point of view but from a position of inbetweenness, as the very process of 'extending humanity' undermines the inviolability of the boundaries of the human self and the non-human, machinic other" (3).

It could be argued that neither of these ideas run counter to what has been discussed here. It is 'cyborgization' that begins to make it all sound a bit more like science-fiction than a scholarly analysis of the present. According to Gray (2002), "cyborgization transcends the human, dissolving old distinctions between nature and culture or organic and mechanic" (183). All of this is not to say that

these works are lacking in any way, only that, at times, their focus is too forward-looking and not firmly enough grounded in the present. I owe all of these works a great debt - they were, after all, the basis for this thesis. This is a weakness in my work as well as of those that I cite: looking too far forward, beyond the actual embodiments of human and machines that circulate today. Baudrillard's (1983a) claim that implosion is inevitable is one that I can respond to only by noting that the primary focus of this thesis is an exploration of the uses or representations of the figure of the cyborg both past and present. Implosion may well be inevitable but, at least where humans and machines are concerned, it still has yet to occur with the violence and catastrophe that accompanies Baudrillardean implosion.

The kinds of human-machine unions examined here are not implosive because they are, in all cases, individual human bodies with machinic appendages (or, conversely, machines with human appendages). Even where humans have literally taken the technology into their bodies, as with pacemakers and artificial joints, there is always a clear line where the human ends and the machine begins. But this is not the image that is conveyed by much of the literature surrounding the meeting of the human body and various forms of technology. Instead, when the discussion turns to the integration of human and machine, the inseparability of the two, one has a sense that it is not only metaphor that is being employed, that if I am truly tied to my laptop at some point my flesh and the keyboard become one. It is a science fiction view of the real

situation, that humans are becoming increasingly reliant on their technology and that they demand that it function according to their specifications, but it functions exclusively on the level of metaphor. Tension still exists where the cyborg is considered to be an embodied being.

It should be pointed out that the melding of human and machine that appears to be so eagerly anticipated is a possibility that requires further advances in not only the technology itself, but also the interface between humans and the technologies. But this raises a few questions: what will these technologies entail? How can they be created? Are they desirable? Are they needed? The idea that artificial intelligence may solve some of these problems raises a question of its own: if artificial intelligence becomes a reality, will this make the issue of seamless human-machine integration redundant or will humans desire technological additions to their bodies regardless? These kinds of questions need to be examined, especially given the ever-increasing rate of technological change. It would seem that taking a step backwards from the current emphasis on future possibilities to the state of contemporary human-machine interaction would be a good place to start in attempting to deal with these questions.

Recap - The Present and Future of Cyborg Research

This thesis has examined the uses to which the figure of the cyborg is put

in several discourses. In each of these, the cyborg has been made to represent the hopes and fears of its human creators. In the work of military scientists, the cyborg embodied the future of human adaptation to new environments without having to wait for evolution to take care of humankind's inadequacies. As Kline and Clynes (1961) note:

> In the past, the altering of bodily functions to suit different environments was accomplished through evolution. From now on, at least in some degree, this can be achieved without alteration of heredity by suitable biochemical, physiological, and electronic modification of man's existing modus vivendi. (346)

In an era when technology was rapidly extending into everyday life, this view of combining human and technology was greeted with open arms. The still very external nature of these combinations appears not to have raised many fears of this relationship becoming too close, although some, such as Taube (1961), did question the order in which scientific work should progress, noting that understanding human functioning was a prerequisite of attempting to simulate or duplicate it. At the same time that work progressed on outfitting men for space travel and exploration, efforts were also made to replicate human functioning. Although this did contribute to work on space travel, one of the other results can be identified as the early stages of work on and interest in artificial intelligence, evidenced by the attention to attempts to simulate human brain functions (such as the current work on creating a chip to simulate the functioning of the hippocampus).

Artificial intelligence, as noted above, is one of the areas in which further

study must be done. Of particular interest to me is the military history of the project and the applications to which it is put, as well as the surveillance and privacy implications of 'smart' technology, an offshoot of work on artificial intelligence. The representations of AI in the popular media also require attention, especially when one considers the human form that is usually given to such creatures/creations. Why does this occur? Perhaps it is human vanity combined with a nurturing feeling towards what they create. That is, because it is intelligent and was created by humans, humans must also be intelligent and so give the artificial intelligences they create a human form. But perhaps not. Further investigation is required to adequately address the issues surrounding the creation, use, and representation of artificial intelligence.

In Chapter Two, the cyborg was used in a more metaphoric way to convey the possibilities of women embracing technology and using it to form networks of resistance and support, as well as providing what can be considered an example of the metaphoric cyborg as implosive figure. Haraway (1985) and others did acknowledge that the proliferation of technology is, for women, a double edged sword, one that can both help them and harm them, particularly through the creation of the technocottage industry which can re-place women in the home while they sell their labour to outside interests. The use of technology for purposes other than those for which it was intended is a major point around which the hacker literature circulates. An examination of the potential alternate uses of virtual reality technology would be interesting and useful to illuminate the

ways in which hacking and cyberfeminism may both evolve.

The cyberfeminist literature also speaks a great deal to issues of embodiment and technology. It is perhaps here that the strain between bodies and technologies is most apparent, not only for the purposes of resistance, but also for the day to day lived experience of becoming technologically altered. What are the practical issues involved in being a cyborg? (see Morse, 1994 for a discussion of alimentary processes in the cyborg). How do these differ from traditional ideas of what it means to be human? Are there sex and/or gender distinctions present in cyborgs that are not present in humans? It may be from the feminist literature that the most productive and accurate answers to questions like this will come.

Representations of cyborgs in the popular media overlap with both military science and feminist work, and should be examined more closely. Currently, cyborgs are frequently depicted as hypermasculine figures with close ties to violence of some kind. Female cyborgs of the same ilk are few and far between. Androids and robots are more frequently found in both male and female form - the replicants in *Blade Runner* and Commander Data, his brother Lor and 'daughter' Lal in the *Star Trek* series, for example. There is, in fact, a continuum present in these representations with human on one end and machine on the other. In between fall the various definitions of cyborg that have been employed in various discourses. Sorting out the extent to which cyborgs exist at all would be useful for future work in this field, given the extreme vagueness and confusion

that the term appears to convey and that this thesis has attempted to expose as problematic. Again, the human form given to androids and robots as well as to artificial intelligences requires examination. Why are things created to work given a human form even when it is not required?

Although a discussion of the similarities and differences between McLuhan's and Baudrillard's ideas of implosion already exists (see Genosko, 1999), a discussion of the distinctions between the two with specific reference to the impacts they have on human/technology relationships would be useful. Indeed, this thesis could be revisited and reconceptualized by dealing with McLuhan's implosion rather than that of Baudrillard, and by slightly modifying the definitions of human, technology, and cyborg employed. Where Baudrillard sees implosion as a necessarily violent and catastrophic event, McLuhan's conception may be no less violent, but it paves the way for "the intimacy of the Global Village" (Genosko, 1999:94). The human and the technological are the explicit focus of McLuhan's version of implosion, which makes it a valuable avenue for further work.

As a final idea for future research, I would like to suggest an examination of the extent to which the literal amalgamation of human and machine is feared, desired, and/or needed. The forward-looking work of many of the authors cited here provides ample opportunity to make a closer examination of both the fear and the desire encountered in the academic literature and popular Western representations of the cyborg. To what extent would the seamless joining of

human and machine serve a useful purpose? Some of the same issues raised in this work would be encountered in work of that nature as well, such as, what makes one a cyborg? But perhaps if these kinds of questions can be dealt with in stages and from a particular point of view, a clearer picture of the nature of actual interactions between humans and machines would be possible.

Where Are We?

This thesis had as one of its goals the illustration of what some of the weaknesses are in the discussion of the figure of the cyborg. Where does that leave us? I would hope in a position to begin asking questions about the history and future of the figure of the cyborg. Investigations into the present are also required, and will inform discussions of both past and future. Above all, what is necessary to untangle the mess surrounding intersections of the human body and technology is a broad approach to the problem, one that has no home discipline and that thrives in the interstices. The cyborg is itself a figure that attempts to divest itself of boundaries and borders and as such demands an approach that can follow it through its various incarnations.

It is also hoped that further applications of theoretical concepts to the figure will be fruitful, and will not only help to explain the cyborg, but will also illustrate the use of abstract concepts in attempting to understand concrete phenomena, particularly where there are both metaphoric and literal uses and

meanings of the same term. The use of Baudrillard's idea of implosion here was meant to point out the fallacy of the idea that the cyborg is the result of the obliteration of a clear distinction between human and machine, despite its closer fit with the idea of a metaphoric cyborg. It was also meant to demonstrate that the application of theoretical concepts is useful in the endeavour of cross-disciplinary study.

The Future of the Human

Rickover (1966) states that "technology is nothing but tools, techniques, procedures - the artifacts fashioned by modern industrial man to increase his powers of mind and body" (110). This has been carried over to the present, when Bell (2000) notes that:

> The question of human-machine interface has occupied a central place in discussions of cyberspace, especially in relation to its effects on our experiences of embodiment and subjectivity. Are we now so inseparable from our computers that we have effectively become them? Are they us? Are the extensions of our identities - prostheses? Do we blend with them, each incorporating the other, to become hybrid cybernetic organisms - cyborgs? (4)

While this is clearly not the case, some, such as Stelarc (1998), go even further in positing that a hybrid of human and machine may not be the final step:

> Cyborg bodies are not simply wired and extended but also enhanced with implanted components. Invading technology eliminates skin as a significant site, an adequate interface or barrier between public space and physiological tracts. The significance of the cyber may well reside in the act of the body shedding its skin. (116)

Others are not so enthusiastic about the possibility of the eradication of the human altogether. Gray (2002) points out that:

> Cyborgs are often grotesque, illegitimate, disordered amalgamations that transgress not just good taste but good sense. They are dangerous. They are exciting, transcendent, exuberant, even liberating. They dwell on the border between cultures, between living and dead, between organic and inorganic, between natural and artificial, between now and the future, and in doing so they obscure, and reify, these very boundaries. (195)

It is the reification of these boundaries that is key to a discussion of the current state of the cyborg. The issue is not so much the obscuring of these borders as about the maintenance of them that challenges evoke.

It is also necessary to keep in mind that all technologies can be used for good and/or evil. Gray (1995) elaborates:

> The same technology that will hardwire a pilot into the computer that flies the jet and enables the missiles will allow our friend, hit by a speeding truck, to walk again. There is no choice between utopia and dystopia, good Terminator or Evil Terminator - they are both here. (465; see also Kroker, 1993:40-41)

Technology, when annexed to the human body, has implications that extend beyond an individual body. The existence of humans in the world impacts upon that world. But before it can extend outward to the world, there are implications for the traditional ways of thinking about the interaction of the various elements of the human. Rushing and Frentz (1995) explain that "the mind/body dichotomy of modernism gives way to the postmodern *tri*-chotomy of mind/body/machine, and the mind and the body, once fighting a Cartesian battle for preeminence, are now both vulnerable to annexation by technology" (14).

This is bound up with the, at times, frightening relationships that humans have with their machines. Don DeLillo, in his novel *White Noise* (1985), includes a scene in which the protagonist, Jack, and a colleague, Murray, are discussing the fact that Jack may be dying as a result of exposure to environmental effluents. He is unsure of what to do, and Murray offers this advice:

> You could put your faith in technology. It got you here, it can get you out. This is the whole point of technology. It creates an appetite for immortality on the one hand. It threatens universal extinction on the other. Technology is lust removed from nature [...] It's what we invented to conceal the terrible secret of our decaying bodies. But it's also life, isn't it? It prolongs life, it provides new organs for those that wear out. New devices, new techniques everyday. Lasers, masers, ultrasound. Give yourself up to it, Jack. Believe in it. (285)

The belief in technology brings us, perhaps, almost full circle, back to the faith in the benefits of technology that seemed to abound in the earliest of the three areas examined in this project. It is also this faith that has allowed the question of the cyborg to come into being by permitting new technologies to proliferate to the point where they are indeed a part of everyday human life. But does this mean that they have become a part of the human body such that it is no longer possible to distinguish human from machine? The answer that this thesis attempted to support is no. There remain differences that are, at present and in the areas examined, insurmountable. There is no doubting that humans and machines are tied to one another, but they are not united, showing only one face to the world. Instead, they exist and grow together in a symbiotic relationship (see Dyens, 2001 and Pepperell 1995), at least for the present.

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